Chapter 1

This Is AutoCAD

AutoCAD has been around since 1983 when version 1.4 was introduced. Its longevity is the result of a solid product and a steadily expanding set of capabilities. The latest iteration, AutoCAD 2004, is faster, has an improved interface, and includes new features based on the more popular end-user wish-list items. AutoCAD 2004 also offers something that won't be visible at first glance. Autodesk wanted to make sure that their latest version of AutoCAD would be one of the most reliable ever, so AutoCAD 2004 has been through one of the most extensive beta-testing programs in the history of AutoCAD. Users have always cited reliability as one of AutoCAD's most important features, and AutoCAD 2004 should prove to be a solid performer.

Before you can start to make use of AutoCAD 2004's new capabilities, you'll need to become familiar with the basics. If you are completely new to AutoCAD, you'll want to read this first chapter carefully. It introduces you to many of AutoCAD's basic operations, such as opening and closing files, getting a close-up look at part of a drawing, and changing a drawing. If you are familiar with earlier versions of AutoCAD, you might want to read through this chapter anyway to get acquainted with new AutoCAD 2004 features. So let's get started!

Topics in this chapter include the following:

- The AutoCAD Window
- Opening an Existing File
- Getting a Closer Look with the Zoom Command
- Saving a File As You Work
- Making Changes and Opening Multiple Files
- If You Want to Experiment…

TIP *In this chapter, and throughout the rest of the book, when we say "AutoCAD," we mean both AutoCAD and AutoCAD LT. Some topics will only apply to AutoCAD. In those situations, you'll see an icon indicating that the topic does not apply to AutoCAD LT. If you are using AutoCAD 2004 LT, these icons can help you focus on the topics that are more relevant to your work.*

Taking a Guided Tour

First, you will get a chance to familiarize yourself with the AutoCAD screen and how you communicate with AutoCAD. As you do the exercises in this chapter, you will also get a feel for how to work with this book. Don't worry about understanding or remembering everything that you see in this chapter. You will get plenty of opportunities to probe the finer details of the program as you work through the later chapters. To help you remember the material, you will find a brief exercise at the end of each chapter. For now, just enjoy your first excursion into AutoCAD.

WARNING *AutoCAD 2004 is designed to run on Windows NT4 with service pack 6, Windows 2000 and Windows XP. It is not designed to run on Windows 98 or Windows Me though some users have reported running it successfully on Windows 98. If you are using a network license version of AutoCAD, you may also use Windows 2000 server edition or Windows NT4 server edition with service pack 5. This book was written using AutoCAD 2004 on Windows XP Professional with a Windows Classic desktop theme.*

If you already installed AutoCAD and are ready to jump in and take a look, proceed with the following steps to launch the program:

1. Choose Start ➢ All Programs ➢ Autodesk ➢ AutoCAD 2004 ➢ AutoCAD 2004. You can also double-click the AutoCAD 2004 icon on your Windows Desktop. LT users will use AutoCAD LT 2004 in place of AutoCAD 2004.
2. The opening greeting, called a *splash screen,* tells you which version of AutoCAD you are using, to whom the program is registered, and the AutoCAD dealer's name and phone number, should you need help.
3. After the splash screen closes, you see the AutoCAD Window with a blank default document named `Drawing1.dwg` as shown in Figure 1.1.

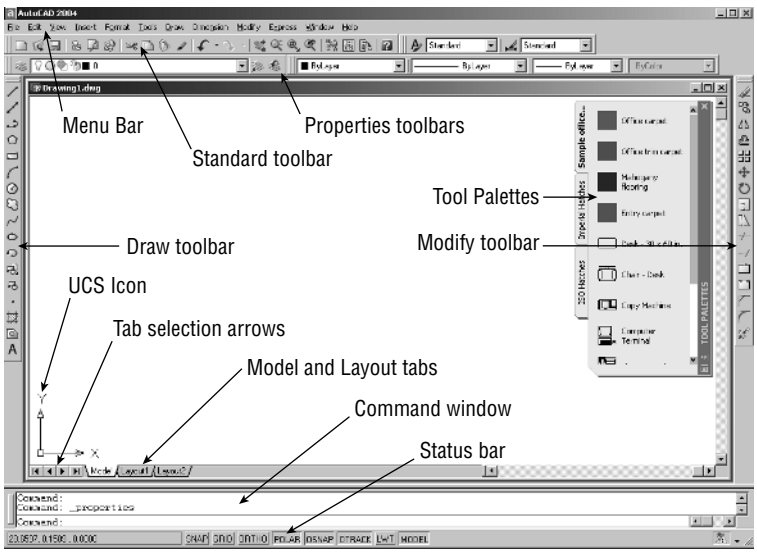

FIGURE 1.1 A typical arrangement of the elements in the AutoCAD window

NOTE *If you see the Startup dialog box after step 3, click Cancel. AutoCAD displays a default document as shown in Figure 1.1. You'll learn more about the Startup dialog box in Chapter 2.*

Let's take a look at the AutoCAD window in detail. Don't worry if it seems like a lot of information. You don't have to memorize it all, but by looking at all the parts, you'll be aware of what is available in a general way.

LT only

AutoCAD LT users will see the Active Assistance window. This window is an aid to new users, and it provides immediate help with AutoCAD commands. For now, you can close it by clicking the Close button in the upper-right corner. To prevent the Active Assistance window from appearing automatically, right-click the Active Assistance icon in the Windows tool tray (it is a question mark icon in the lower-right corner of the computer screen), and choose Settings from the shortcut menu to open the Active Assistance Settings dialog box. Click the On Demand radio button, and then click OK. You can open the Active Assistance window at any time by choosing Help ➢ Active Assistance from the AutoCAD menu bar.

Message to Veteran AutoCAD Users

AutoCAD, like many popular programs, is continually evolving. Quite often, that evolution forces us to change some old and cherished habits.

If you've been using AutoCAD for a while, and you've grown accustomed to certain behaviors, you can take certain steps to make AutoCAD 2004 a more familiar environment.

You can, for example, restore the Enter (↵) function to the mouse right-click instead of using the newer shortcut menu. Follow these steps:

1. **Choose Tools ➢ Options to open the Options dialog box.**
2. **Click the User Preference tab.**
3. **In the Windows Standard Behavior group, click the Right-Click Customization button to open the Right-Click Customization dialog box.**
4. **Click the ENTER radio button in the Command Mode group, and then click the Apply & Close button.**

Another option is to turn on the time-sensitive right-click option at the top of the Right-Click Customization dialog box. With this option, a quick right-click is the same as pressing the Enter ↵ key but you can still access the right-click shortcut menus by holding down the right mouse button a bit longer. You can even set the duration required to open the right-click shortcut menus.

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MESSAGE TO VETERAN AUTOCAD USERS *(continued)*

If you prefer to enter commands and command options through the keyboard instead of using dialog boxes, you can do so for a number of commands. Here is a list of commands that normally produce a dialog box.

Array	Attdef	Attedit
Bhatch	Boundary	Group
HatcheditImage	Insert	Image
Layer	Layout	Linetype
MtextBlock	Osnap	Pan
Partialopen	Purge	Rename
Style	Units	View
Wblock	Xbind	Xref

To use these commands from the command prompt, add a minus sign (–) to the beginning of the command name. For example, to use the old Layer command, enter **–layer** at the command prompt. To use the old Pan command, enter **–pan** at the command prompt. (By the way, when you enter **–pan** from the command prompt, the command reverts to the "classic" method of panning in AutoCAD, in which you click two points to indicate the direction and displacement, instead of the "real time" pan. This "classic" method is useful when you want to pan your view a specific distance because it allows you to enter the pan distance and direction.)

Even if you don't care to enter commands from the keyboard, knowing about the use of the minus sign can help you create custom macros. See Chapter 20 for more on AutoCAD customization.

The AutoCAD Window

The AutoCAD program window is divided into six parts:

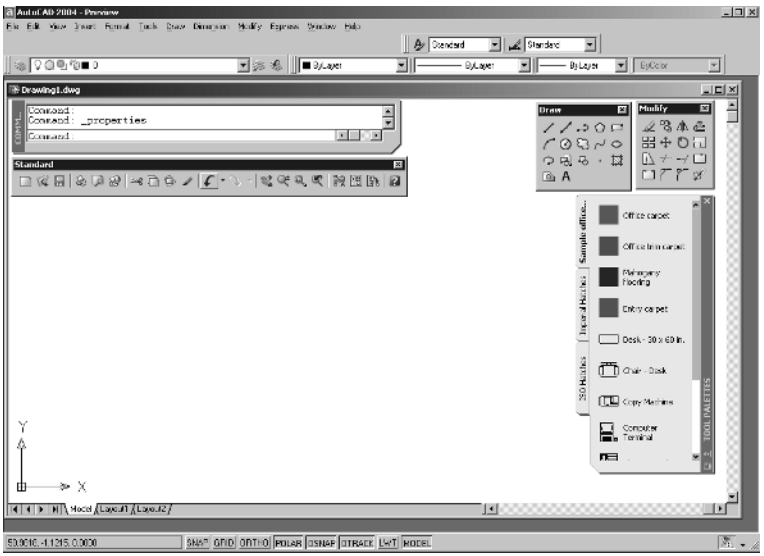
- Menu bar
- Docked and floating toolbars
- Drawing area
- Command window
- Status bar
- Tool Palettes

TIP *A seventh hidden component, the Properties palette, gives you detailed information about the objects in your drawing. You can also use it to modify some of those properties. You'll learn more about the Properties palette in Chapter 4.*

Figure 1.1 shows a typical layout of the AutoCAD program window. Along the top is the *menu bar*, and at the bottom are the *Command window* and the *status bar*. Just below the menu bar and to either side of the window are the *toolbars*. The *drawing area* occupies the rest of the screen. (By the way, your screen may show the drawing area in black. You can set the drawing area background color using the Options dialog box. Appendix B describes how to do this. (The figures in this book show the drawing area background in white for clarity.)

You can easily move and reshape many of the elements in the AutoCAD window. Figure 1.2 demonstrates how different AutoCAD can look after some simple rearranging of window components. You can move toolbars from their default locations to any location on the screen. When they are in their default location, they are in their *docked* position. When they are moved to a location where they are free-floating, they are *floating*.

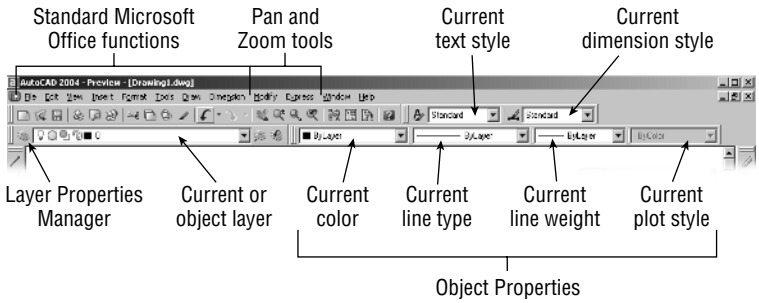
FIGURE 1.2
An alternative arrangement of the elements in the AutoCAD window



The menu bar at the top of the drawing area (as shown in Figure 1.3) offers pull-down menus from which you select commands in a typical Windows fashion. The toolbars offer a variety of commands through tool buttons and drop-down lists. For example, the name or number of the *layer* that you are currently working on is displayed in a drop-down list in the Properties toolbar. To the right of the layer name are icons for tools you can use to work with the layer. The tools and lists on the toolbar are plentiful, and you'll learn more about all of them later in this chapter and as you work through this book.

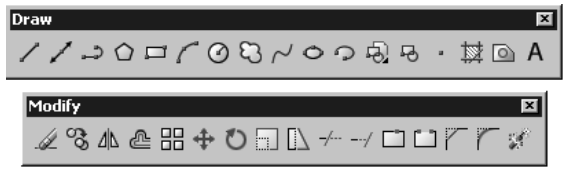
TIP *A layer is like an overlay that allows you to separate different types of information. AutoCAD allows an unlimited number of layers. On new drawings, the default layer is 0. You'll get a detailed look at layers and the meaning of the Layer tools in Chapter 4.*

FIGURE 1.3
The components of the menu bar and the Standard toolbar.



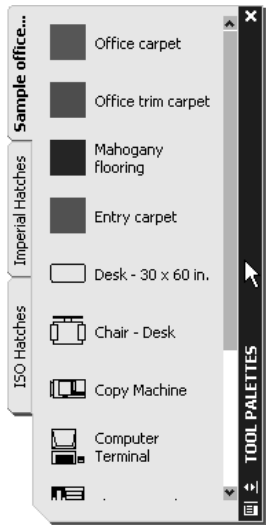
The Draw and Modify toolbars, which are normally docked on either side of the drawing area, offer commands that create new objects and edit existing ones. These are just two of many toolbars available to you. Figure 1.4 shows these two toolbars in their floating state.

FIGURE 1.4
The Draw and Modify toolbars as they appear when floating



The Tool palettes offer a quick way to gain access to frequently used symbols, known as *blocks* in AutoCAD. You can create your own symbols and add them to the palettes. You'll get a closer look at the Tool palettes in Chapter 2.

FIGURE 1.5
The Tool palettes

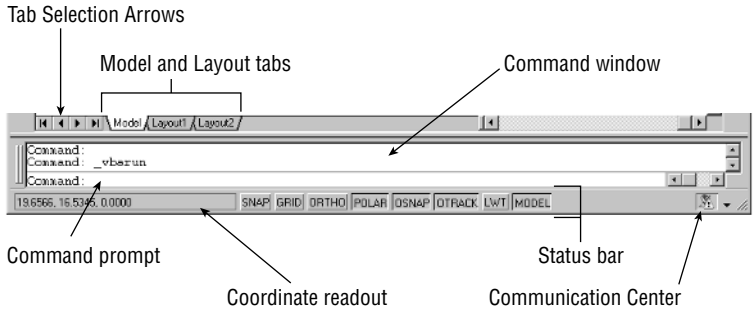


The drawing area—your workspace—occupies most of the screen. Everything you draw appears in this area. As you move your mouse around, crosshairs appear to move within the drawing area. This is the drawing cursor that lets you point to locations in the drawing area.

At the bottom of the drawing area, you'll see a set of tabs. These tabs give you access to the Layout views of your drawing. These views let you lay out your drawing as in a desktop publishing program. You'll learn about the Layout tabs in Chapter 7. The arrows to the left of the tabs let you navigate the tabs when there are more tabs than can fit in the AutoCAD window.

The Command window, located just below the drawing area, gives you feedback about AutoCAD's commands as you use them. You can move and resize this window just as you move and resize toolbars. By default, the Command window is in its docked position, as shown in Figure 1.6.

FIGURE 1.6
The status bar and the Command window



Below the Command window is the status bar (see Figure 1.6) The status bar gives you information at a glance about the state of the drawing. For example, the coordinate readout toward the far left of the status line tells you the location of your cursor.

TIP *In a new installation of AutoCAD, you will see a message balloon in the bottom right corner of AutoCAD. This message balloon alerts you to the latest news and information regarding AutoCAD through a feature called the Communication Center. You'll learn more about the Communication Center in Chapter 2.*

PICKING POINTS IN THE DRAWING AREA

Let's practice using the coordinate readout and the drawing cursor.

1. Move the cursor around in the drawing area. As you move, notice how the coordinate readout changes to tell you the cursor's location. It shows the coordinates in an X,Y, Z format.
2. Now place the cursor in the middle of the drawing area and click the left mouse button. You have just picked a point. Move the cursor, and a rectangle follows. This is a *selection window*; you'll learn more about this window in Chapter 2.
3. Move the cursor a bit in any direction; then click the left mouse button again. Notice that the selection window disappears.
4. Try picking several more points in the drawing area. Notice that as you click the mouse, you alternately start and end a selection window.

If you accidentally click the right mouse button, the shortcut menu appears. A right mouse click frequently opens a menu that contains options that are *context sensitive*. This means that the contents of the shortcut menu depend on where you right-click as well as the command that is active at the time of your right-click. If there are no appropriate options at the time of the right-click, AutoCAD treats the right-click as a ↵. You'll learn more about these options as you progress through the book. For now, if you happen to open this menu by accident, press the Esc key to close it.

TIP *The ↵ symbol is used in this book to denote the Enter key. Whenever you see it, press the Enter key, also known as the Return key.*

The UCS Icon

In the lower-left corner of the drawing area, you see an L-shaped arrow. This is the *User Coordinate System (UCS)* icon, which tells you your orientation in the drawing. This icon becomes helpful as you start to work with complex 2D drawings and 3D models. The X and Y arrows indicate the x- and y-axes of your drawing. The little square at the base of the arrows tells you that you are in what is called the *World Coordinate System*. Chapter 17 discusses this icon in detail. For now, you can use it as a reference to tell you the direction of the axes.

If You Can't Find the UCS Icon...

The UCS icon can be turned on and off, so if you are on someone else's system and you don't see the icon, don't panic. It also changes shape depending on whether you are in Paper Space mode in a Layout tab or in Model Space! If you don't see the icon or it doesn't look as it does in this chapter, see Chapter 13 for more information on Paper Space and Model Space. Chapter 17 gives you more information on the UCS icon.

The Command Window

At the bottom of the screen, just above the status bar, is a small horizontal window called the *Command window*. Here AutoCAD displays responses to your input. By default, it shows three lines of text. The bottom line shows the current messages, and the top two lines show messages that have scrolled by or, in some cases, components of the current message that do not fit in a single line. Right now, the bottom line displays the message `Command` (see Figure 1.6 earlier in this chapter). This *prompt* tells you that AutoCAD is waiting for your instructions. As you click a point in the drawing area, you'll see the message `Specify Opposite Corner`. At the same time, the cursor starts to draw a selection window that disappears when you click another point.

As a new user, pay special attention to messages displayed in the Command window because this is how AutoCAD communicates with you. Besides giving you messages, the Command window records your activity in AutoCAD. You can use the scroll bar to the right of the Command window to review previous messages. You can also enlarge the window for a better view. (Chapter 2 discusses these components in more detail.)

TIP *You can think of the Command window as similar to the Address or Location input box found in web browsers. It allows you to manually input data through the keyboard. It also tells you what's going on in the program. As you become more familiar with AutoCAD, you may find you don't need to rely on the Command window as much. For new users, however, the Command window can be quite helpful in understanding what steps to take as you work.*

Now let's look at AutoCAD's window components in detail.

The Pull-Down Menus

As in most Windows programs, the pull-down menus on the menu bar offer an easy-to-understand way to access the general controls and settings for AutoCAD. Within these menus you'll find the commands and functions that are the heart of AutoCAD. By clicking menu items, you can cut and paste items to and from AutoCAD, change the settings that make AutoCAD work the way you want it to, set up the measurement system you want to use, access the help system, and much more.

TIP *To close a pull-down menu without selecting anything, press the Esc key. You can also click any other part of the AutoCAD window or click another pull-down menu.*

The pull-down menu options perform four basic functions:

- Display additional menu choices
- Display a dialog box that contains settings you can change
- Issue a command to create or modify your drawing
- Offer an expanded set of the same tools found in the Draw and Modify toolbars

As you point to commands and options in the menus or toolbars, AutoCAD provides additional help for you in the form of brief descriptions of each menu option, which appear in the status bar.

Here's an exercise to let you practice with the pull-down menus and get acquainted with the way you issue AutoCAD commands:

1. Click View in the menu bar. The list of items that appears includes the commands and settings that let you control the way AutoCAD displays your drawings. Don't worry if you don't understand them yet; you'll get to know them in later chapters.

2. Move the highlight cursor slowly down the list of menu items. As you highlight each item, notice that a description of it appears in the status line at the bottom of the AutoCAD window. These descriptions help you choose the menu option you need.
3. Some of the menu items have triangular pointers to their right. This means the command has additional choices. For instance, highlight the Zoom item, and you'll see another set of options appear to the right of the menu.

TIP *If you look carefully at the command descriptions in the status bar, you'll see an odd word at the end. This is the keyboard command equivalent to the highlighted option in the menu or toolbar. You can actually type these keyboard commands to start the tool or menu item that you are pointing to. You don't have to memorize these command names, but knowing them will be helpful to you later if you want to customize AutoCAD.*

This second set of options is called a *cascading menu*. Whenever you see a pull-down menu item with the triangular pointer, you know that this item opens a cascading menu offering a more detailed set of options.

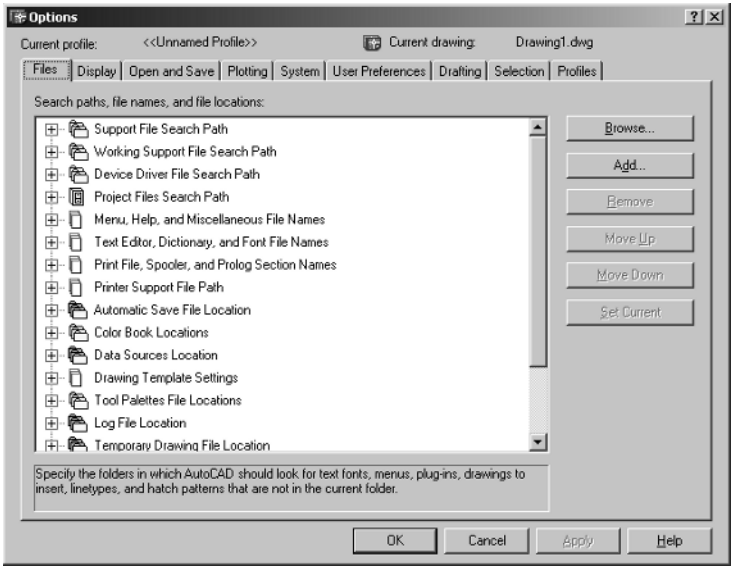
You might have noticed that other pull-down menu options are followed by an ellipsis (. . .). This indicates that the option displays a dialog box, as the following exercise demonstrates:

1. Move the highlight cursor to the Tools option in the menu bar.

TIP *If you prefer, you can click and drag the highlight cursor over the pull-down menu to select an option.*

ACAD only

2. Click the Options item at the bottom of the menu to open the Options dialog box. (LT users will not see a Profiles tab.)

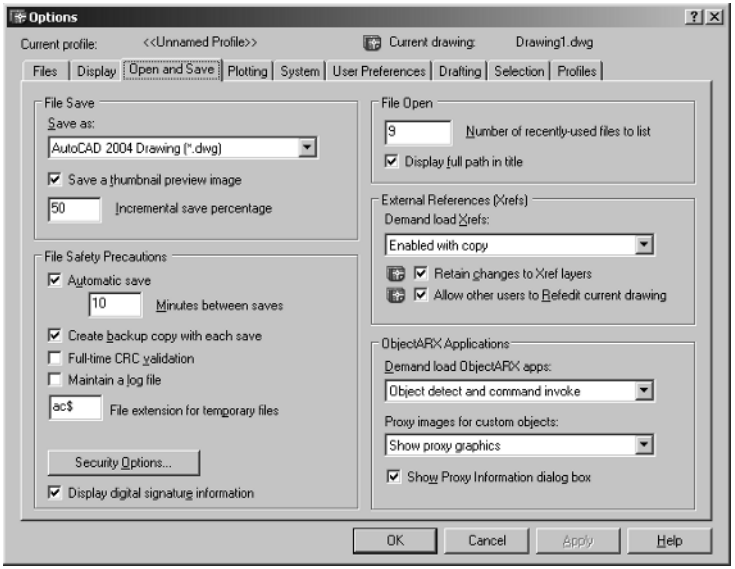


TIP The list in the Files tab of the Options dialog box works much like Windows Explorer. Clicking the plus sign to the left of the items in the list expands the option to display more detail.

This dialog box contains several "pages," indicated by the tabs across the top, that contain settings for controlling what AutoCAD shows you on its screens, where you want it to look for special files, and other "housekeeping" settings. You needn't worry about what these options mean at this point. Appendix B describes the Options dialog box in more detail.

ACAD only

3. In the Options dialog box, click the Open And Save tab. The options change to reveal new options. (LT users will not see the Object ARX Applications group, and the Allow Other Users To Refedit Current Drawing option in the External References (Xref) group is also not available.)



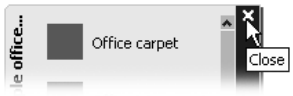
In the middle-left side of the dialog box, you'll see the Automatic Save check box, with the Minutes Between Saves input box set to 10 minutes. This setting controls how frequently AutoCAD performs an automatic save.

4. Change the 10 to 20, and then click OK. You have just changed AutoCAD's Automatic Save feature to automatically save files every 20 minutes instead of every ten.

TIP If you want to know more about the settings in the Options dialog box, check out Appendix B.

The third type of item you'll find on pull-down menus is a command that directly executes an AutoCAD operation. Let's try an exercise to explore these commands.

1. Click the X in the upper-right corner of the Tool palettes to close it. You won't be using it for a while.



2. Click the Draw option from the menu bar, and then click the Rectangle command. Notice that the Command window now shows the following prompt:

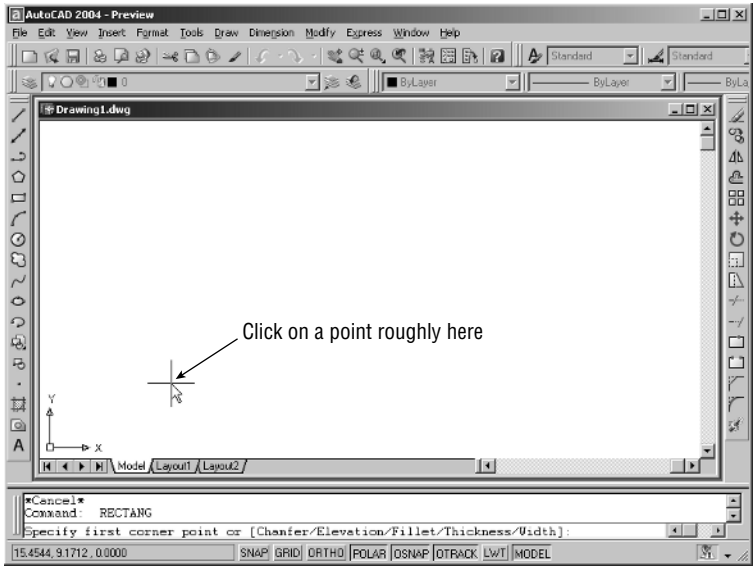
```
Specify first corner point or [Chamfer/Elevation/Fillet/Thickness/Width]:
```

AutoCAD is asking you to select the first corner for the rectangle, and in brackets, it is offering a few options that you can take advantage of at this point in the command. Don't worry about those options right now. You'll have an opportunity to learn about command options in Chapter 2.

3. Click a point roughly in the lower-left corner of the drawing area, as shown in Figure 1.7. Now as you move your mouse, you'll see a rectangle follow the cursor with one corner fixed at the position you just selected. You'll also see the following prompt in the Command window:

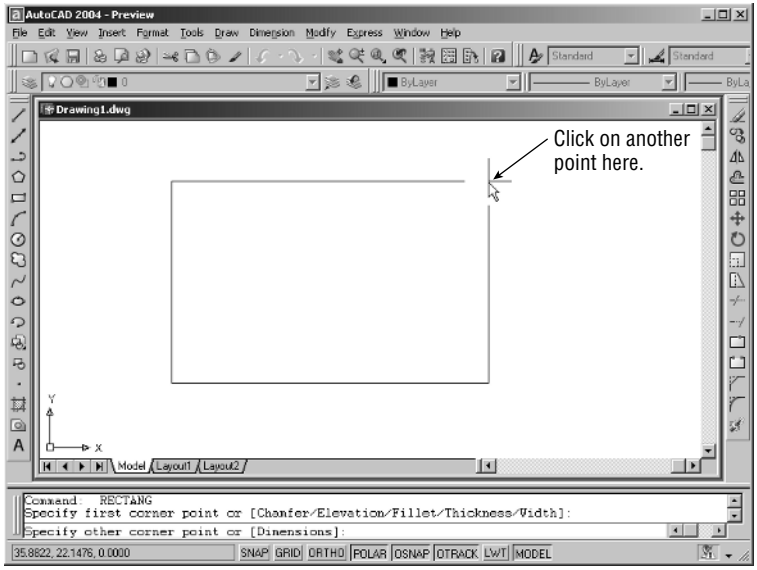
```
Specify other corner point or [Dimensions]:
```

FIGURE 1.7
Selecting the first point of a rectangle



3. Click another point anywhere in the upper-right region of the drawing area. A rectangle appears (see Figure 1.8). You'll learn more about the different cursor shapes and what they mean in Chapter 2.

FIGURE 1.8
Once you've selected your first point of the rectangle, you see a rectangle follow the motion of your mouse.



At this point, you've seen how most of AutoCAD's commands work. Many drawing and editing functions display messages in the Command window. You'll find that dialog boxes are offered when you want to change settings. Also, be aware that many of the pull-down menu items are duplicated in the toolbars, which you will explore next.

COMMUNICATING WITH AUTOCAD

AutoCAD is the perfect servant: It does everything you tell it to, and no more. You communicate with AutoCAD using the pull-down menus and the toolbars. These devices invoke AutoCAD commands. A command is a single-word instruction you give to AutoCAD telling it to do something, such as draw a line (the Line tool in the Draw toolbar) or erase an object (the Erase tool in the Modify toolbar). Whenever you invoke a command, by either typing it or selecting a menu or toolbar item, AutoCAD responds by presenting messages to you in the Command window or by displaying a dialog box.

The messages in the Command window often tell you what to do next, or they offer a list of options, usually shown within square brackets. A single command often presents several messages, which you answer to complete the command. These messages serve as an aid to new users who need a little help. If you ever get lost while using a command or forget what you are supposed to do, look at the Command window for clues. As you become more comfortable with AutoCAD, you will find that you won't need to refer to these messages as frequently.

As an additional aid, you can right-click to display a context-sensitive shortcut menu. If you are in the middle of a command and are not selecting points, this menu offers a list of options specifically related to that command. For example, if you right-click your mouse before picking the first point for the rectangle command in the previous exercise, a menu appears, offering the same options that are listed in the command prompt, plus some additional options.

Continued on next page

COMMUNICATING WITH AUTOCAD *(continued)*

A dialog box is like a form you fill out on the computer screen. It lets you adjust settings or make selections from a set of options pertaining to a command. You'll get a chance to work with commands and dialog boxes later in this chapter.

The Toolbars

Although the pull-down menus offer a full range of easy-to-understand options, they require some effort to navigate. The toolbars, on the other hand, offer quick, single-click access to the most commonly used AutoCAD features. In the default AutoCAD window arrangement, you see only the most commonly used toolbars. Other toolbars are available, but they are hidden from view until you open them.

The tools in the toolbars perform three types of actions, just like the pull-down menu commands: They display further options, open dialog boxes, and issue commands that require keyboard or cursor input.

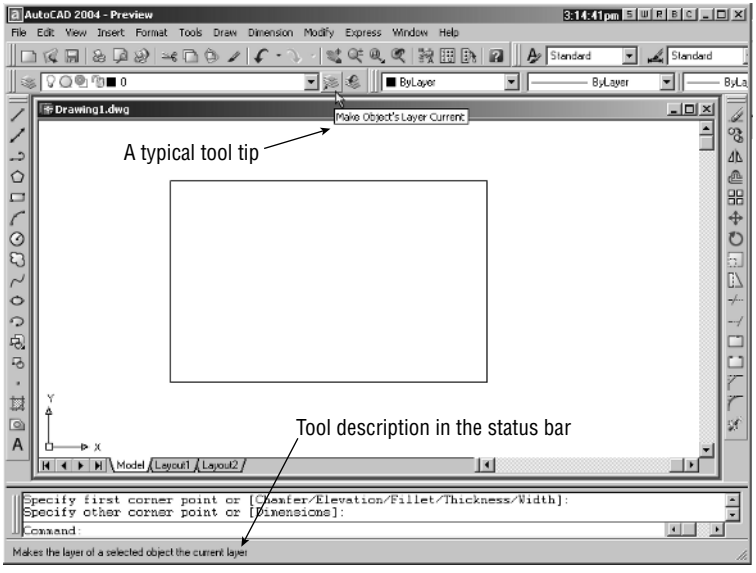
THE TOOLBAR TOOL TIPS

AutoCAD's toolbars contain tools that represent commands. To help you understand each tool, a *tool tip* appears just below the arrow cursor when you rest the cursor on a tool. Each tool tip helps you identify the tool with its function. A tool tip appears when you follow these steps:

1. Move the arrow cursor onto one of the toolbar tools and leave it there for a moment. Notice that a brief description of the tool appears nearby—this is the tool tip. In the status bar, a more detailed description of the tool's purpose appears (see Figure 1.9).

FIGURE 1.9

Tool tips show you the function of each tool in the toolbar. AutoCAD also displays a description of the tool in the status bar.



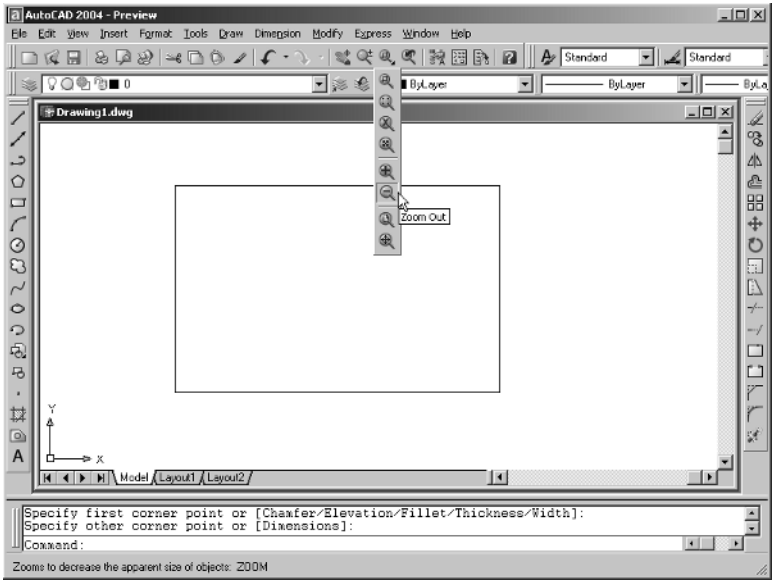
2. Move the cursor across the toolbar. As you do, notice that the tool tips and status bar descriptions change to describe each tool. The keyboard command equivalent of the tool is also shown in the status bar at the end of the description.

Working with Flyouts

Most toolbar tools start a command as soon as you click them, but a few tools display a set of additional tools (similar to the cascading menus in the menu bar) that are related to the tool you selected. This set of additional tools is called a toolbar *flyout*. If you've used other Windows graphics programs, chances are you've seen flyouts. Look closely at the tools just below the Express or Dimension pull-down menu options on your screen or in Figure 1.8 earlier in this chapter. You'll be able to identify which toolbar tool has a flyout; it has a small right-pointing arrow in the lower-right corner of the tool.

The following steps show you how a flyout works:

1. Move the cursor to the Zoom Window tool in the Standard toolbar. Click and hold the left mouse button to display the flyout. Don't release the mouse button.



2. Still holding down the left mouse button, move the cursor over the flyout; notice that the tool tips appear here as well. Also, notice the description in the status bar.
3. Move the cursor to the Zoom Window tool at the top of the flyout and release the mouse button.
4. You don't need to use this tool yet, so press the Esc key to cancel this tool.

As you can see from this exercise, you get a lot of feedback from AutoCAD!

Moving the Toolbars

One characteristic of AutoCAD's toolbars is their mobility. They can be either floating anywhere on the AutoCAD window or in a docked position. *Docked* means the toolbar is placed against the top and side borders of the AutoCAD window so that the toolbar occupies a minimal amount of space. If you want to, you can move the toolbar to any location on your desktop, thus turning it into a floating toolbar.

Later in this section you'll find descriptions of all of AutoCAD's toolbars, but first try the following exercise to move the Standard toolbar away from its current position in the AutoCAD window.

1. Move the arrow cursor so that it points to the vertical bars, called *grab bars,* to the far left of the Standard toolbar, as shown here:

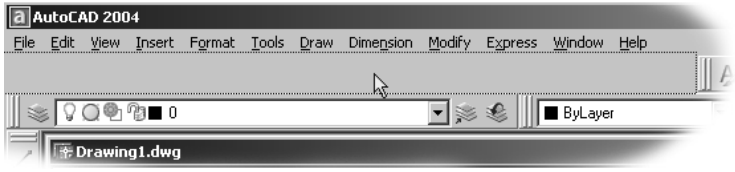
2. Click and hold down the left mouse button. Notice that a gray rectangle appears by the cursor.
3. Still holding down the mouse button, move the mouse downward. The gray box follows the cursor.
4. When the gray box is over the drawing area, release the mouse button and the Standard toolbar—now a floating toolbar—moves to its new location.

You can now move the Standard toolbar to any location on the screen that suits you. You can also change the shape of the toolbar. Try the following steps:

1. Place the cursor on the bottom-edge border of the Standard toolbar. The cursor becomes a double-headed arrow, as shown here:

2. Click and drag the border downward. The gray rectangle jumps to a new, taller rectangle as you move the cursor.
3. When the gray rectangle changes to the shape you want, release the mouse button to reshape the toolbar.

4. To move the toolbar back into its docked position, place the arrow cursor on the toolbar's title bar and slowly click and drag so that the cursor is in position in the upper-left corner of the AutoCAD window. Notice how the gray outline of the toolbar changes as it approaches its docked position.



5. When the outline of the Standard toolbar is near its docked position, release the mouse button. The toolbar moves back into its previous position in the AutoCAD window.

TIP *You can also move a toolbar from a docked position to a floating one by double-clicking the toolbar's grab bar. Double-click the title bar of a floating toolbar to move the toolbar to its docked position.*

You can move and reshape any of AutoCAD's toolbars to place them out of the way and still have them ready to give you quick access to commands. You can also put them away altogether when you don't need them and bring them back at will, as shown in the following steps:

1. Click and drag the Draw toolbar from its position at the left of the AutoCAD window to a point near the center of the drawing area. Remember to click and drag the grab bars at the top of the toolbar.
2. Click the Close button in the upper-left corner of the Draw floating toolbar. This is the small square button with the X in it. The toolbar disappears.
3. To recover the Draw toolbar, right-click the border or grab bar of any toolbar—but not a toolbar button. A shortcut menu of toolbars appears.
4. Locate and select Draw in the shortcut menu. The Draw toolbar reappears.
5. Click and drag the Draw toolbar back to its docked position in the far-left side of the AutoCAD window.

TIP *If you do not want the toolbar to dock but instead want it to appear "floating" near the border of the AutoCAD Window, you can press the Ctrl key before you click and drag the toolbar into position. This prevents toolbars from automatically falling into a docked position.*

AutoCAD remembers your toolbar arrangement between sessions. When you exit and then reopen AutoCAD later, the AutoCAD window appears just as you left it.

TERMINOLOGY TO REMEMBER: CASCADING MENU

When this book asks you to select an option from the pull-down menu, you will see the notation *Menu* ➢ *Option*. For cascading menus, the notation will be *Menu* ➢ *Option* ➢ *Option*; the second ➢ *Option* is in a cascading menu. In either case, the selected menu option issues a command that performs the function being discussed. As mentioned earlier, the actual command name appears in the status bar when you point to a menu option or toolbar tool.

You may have noticed several other toolbars listed in toolbar shortcut menu that don't appear in the AutoCAD window. To keep the screen from becoming cluttered, many of the toolbars are not placed on the screen by default. The toolbars you'll be using most often are displayed first; others that are less frequently used are kept out of sight until you need them and select them from the list. Here are brief descriptions of all the toolbars available:

3D Orbit Tools to control 3D views (not available in LT).

CAD Standards Tools that let you check the layer, dimension, and text styles against standards that you have created (not available in LT).

Dimension Commands that help you dimension your drawings. Many of these commands are duplicated in the Dimension pull-down menu. See Chapter 9.

Draw Commands for creating common objects, including lines, arcs, circles, curves, ellipses, and text. This toolbar appears in the AutoCAD window by default. Many of these commands are duplicated in the Draw pull-down menu.

Draw Order Commands that let you arrange the order of overlapping objects. If an object covers another object that you need to have visible, you can use the Draw Order to "move" an object behind another or to the back of a set of objects (not available in LT).

Inquiry Commands for finding distances, point coordinates, object properties, mass properties, and areas.

Insert Commands for importing other drawings, raster images, and OLE objects.

Layer Drop-down list and tools for controlling layer properties located just below the Standard toolbar.

Layouts Tools that let you set up drawing layouts for viewing, printing, and plotting.

Modify Commands for editing existing objects. You can move, copy, rotate, erase, trim, extend, and so on. Many of these commands are duplicated in the Modify pull-down menu.

Modify II Commands for editing special complex objects such as polylines, multilines, 3D solids, and hatches.

Properties for a set of drop-down lists and tools for manipulating the properties of objects. This toolbar is normally docked to the right of the Layer toolbar, just below the Standard toolbar.

Object Snap Tools to help you select specific points on objects, such as endpoints and midpoints. See Chapter 3.

Refedit Tools that allow you to make changes to symbols or background drawings that are imported as external reference drawings. See Chapter 13 for more about external references (not available in LT).

Reference Commands that control cross-referencing of drawings. See Chapters 6 and 13.

Render Commands to operate AutoCAD's rendering feature. See Chapter 18 (not available in LT).

Shade Offers tools to control the way 3D models are displayed. See Chapter 16 for more on Shade (not available in LT).

Solids Commands for creating 3D solids. See Chapter 19 (not available in LT).

Solids Editing Command for editing 3D solids. See Chapter 19 (not available in LT).

Standard The most frequently used commands for view control, file management, and editing. This toolbar is normally docked below the menu bar.

Styles Tools that control style options such as text styles and dimension styles.

Surfaces Commands for creating 3D surfaces. See Chapters 16 and 17 (not available in LT).

Text Tools for creating and editing text.

UCS Tools for setting up a plane on which to work. UCS stands for User Coordinate System. This is most useful for 3D modeling, but it can be helpful in 2D drafting, as well. See Chapter 17.

UCS II Tools for selecting from a set of predefined user coordinate systems.

View Offers tools to control the way you view 3D models. See Chapter 16 for more on 3D views.

Viewports Tools that let you create and edit multiple views to your drawing. See Chapter 13 for more about viewports.

Web Tools for accessing the World Wide Web, as discussed in Chapter 22.

Zoom Commands that allow you to navigate your drawing.

You'll get a chance to work with all the toolbars over the course of this book. If you use the book simply as a reference, be sure to read through the exercises for explanations of which tools to use for specific operations.

MENUS VERSUS THE KEYBOARD

Throughout this book, you will be told to select commands and command options from the pull-down menus and toolbars. For new and experienced users alike, menus and toolbars offer an easy-to-remember method for accessing commands. If you are an experienced AutoCAD user who is used to the earlier versions of AutoCAD, you still have the option of entering commands directly from the keyboard. Most of the keyboard commands you know and love still work as they did.

Another method for accessing commands is to use accelerator keys, which are special keystrokes that open and activate pull-down menu options. You might have noticed that the commands in the menu bar and the items in the pull-down menus all have an underlined character. By pressing the Alt key followed by the key corresponding to the underlined character you activate that command or option, without having to engage the mouse. For example, to issue File ➢ Open, press Alt, then F, and then finally O (Alt+F+O).

Many tools and commands have keyboard shortcuts; shortcuts are one-, two-, or three-letter abbreviations of a command name. As you become more proficient with AutoCAD, you may find these shortcuts helpful. As you work through this book, the shortcuts will be identified for your reference.

Finally, if you are feeling adventurous, you can create your own accelerator keys and keyboard shortcuts for executing commands by adding them to the AutoCAD support files. Chapter 21 discusses how to customize menus, toolbars, and keyboard shortcuts.

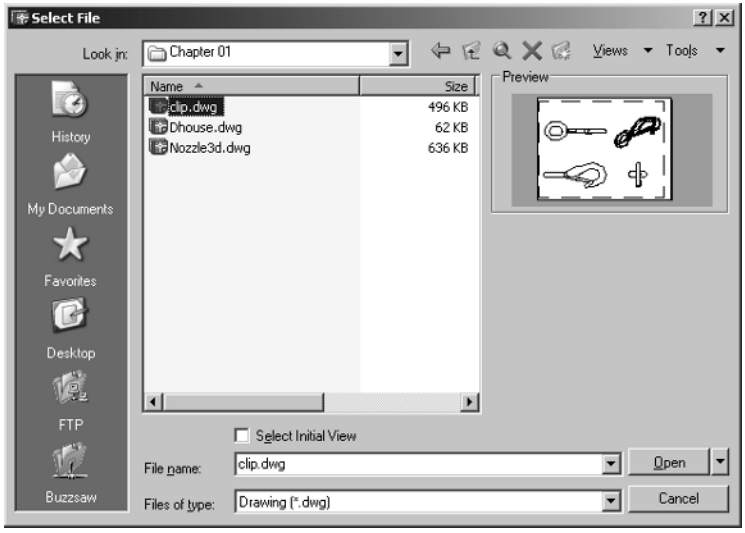
Working with AutoCAD

Now that you've been introduced to the AutoCAD window, let's try using a few of AutoCAD's commands. First, you'll open a sample file and make a few simple modifications to it. In the process, you'll become familiar with some common methods of operation in AutoCAD.

Opening an Existing File

In this exercise, you will get a chance to see and use a typical Select File dialog box. To start with, you will open an existing file.

1. From the menu bar, choose File ➢ Close. A message appears asking you if you want to save the changes you've made to the current drawing. Click No.
2. Choose File ➢ Open to open the Select File dialog box. This is a typical Windows file dialog box, with an added twist. The large Preview box on the right allows you to preview a drawing before you open it, thereby saving time while searching for files. To the left is a panel known as the Places List in which you can find frequently used locations on your computer or the Internet.



TIP *If you don't see a Preview box in the Select File dialog box, click the word View in the upper-right corner, and then select Preview from the list that appears.*

3. In the Select File dialog box, open the Look In drop-down list and locate the `\AutoCAD2004\Projects\Chapter 01` folder. (You may need to explore the list to find it.) The file list changes to show the contents of the `\AutoCAD2004\Projects\Chapter 01` folder.

4. Move the arrow to the `Clip.dwg` file and click it. Notice that the `Clip.dwg` filename now appears in the File Name input box above the file list. Also, the Preview box now shows a thumbnail image of the file.

TIP *The* `Clip.dwg` *drawing is included on the companion CD. If you cannot find this file, be sure you installed the sample drawings from the companion CD. See the Readme file on the CD for installation instructions.*

5. Click the OK button at the bottom of the Select File dialog box. AutoCAD opens the `Clip.dwg` file, as shown in Figure 1.10.

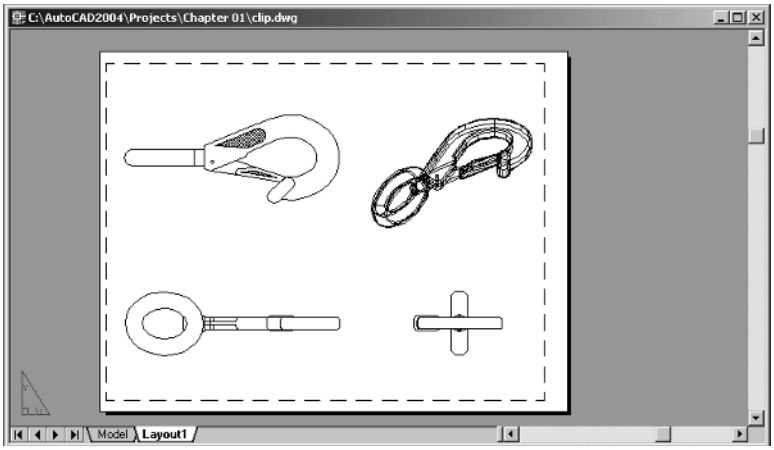
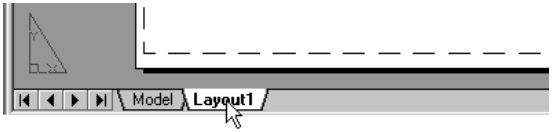


FIGURE 1.10
The Layout view of the `Clip.dwg` file

The `Clip.dwg` file opens to display a Layout tab view of the drawing. You will know this by looking at the tabs at the bottom of the AutoCAD Window. Currently, the Layout1 tab is highlighted.



You may recall that a layout is a type of view that lets you lay out different views of your drawing in preparation for printing. Also notice that the AutoCAD window's title bar displays the name of the drawing. This offers easy identification of the file.

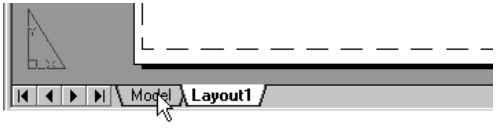
This particular file contains both 2D drawings and a 3D model of a typical locking clip. The Layout tab view shows a top, front, and right side view as well as an isometric view.

Getting a Closer Look

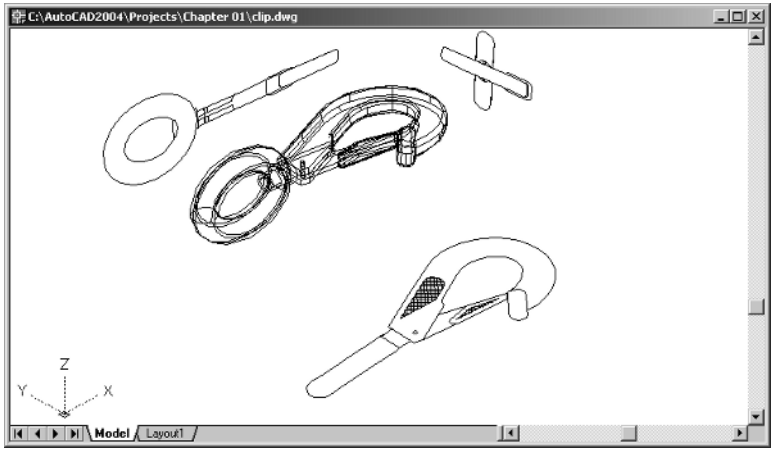
One of the most frequently used commands is Zoom, which gives you a closer look at a part of your drawing. It offers a variety of ways to control your view. Now you'll enlarge a portion of the clip drawing to get a more detailed look. To tell AutoCAD what area you want to enlarge, you use what is called a *zoom window*.

You'll start by switching to a Model Space view of the drawing. The Model tab places you in a workspace where you do most of your drawing creation and editing.

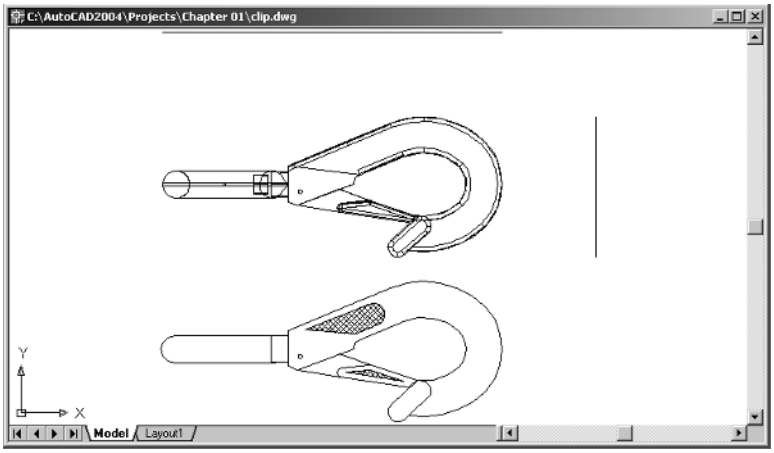
1. Click the Model tab at the bottom of the AutoCAD window.



Your view changes to show the full 3D model with the 2D representations of the model.



2. Choose View ➢ 3D Views ➢ Plan View ➢ World UCS. You can also type **Plan↵ ↵**. Your display changes to a two-dimensional view looking down on the drawing.



3. Click the Zoom Window button on the Standard toolbar.

   You can also choose View ➢ Zoom ➢ Window from the pull-down menu or type the command: **Z↵ W↵**.

4. The Command window displays the `First corner:` prompt. Look at the top image in Figure 1.11. Move the crosshair cursor to a location similar to the one shown in the figure; then left-click the mouse. Move the cursor and the rectangle appears, with one corner fixed on the point you just picked, while the other corner follows the cursor.

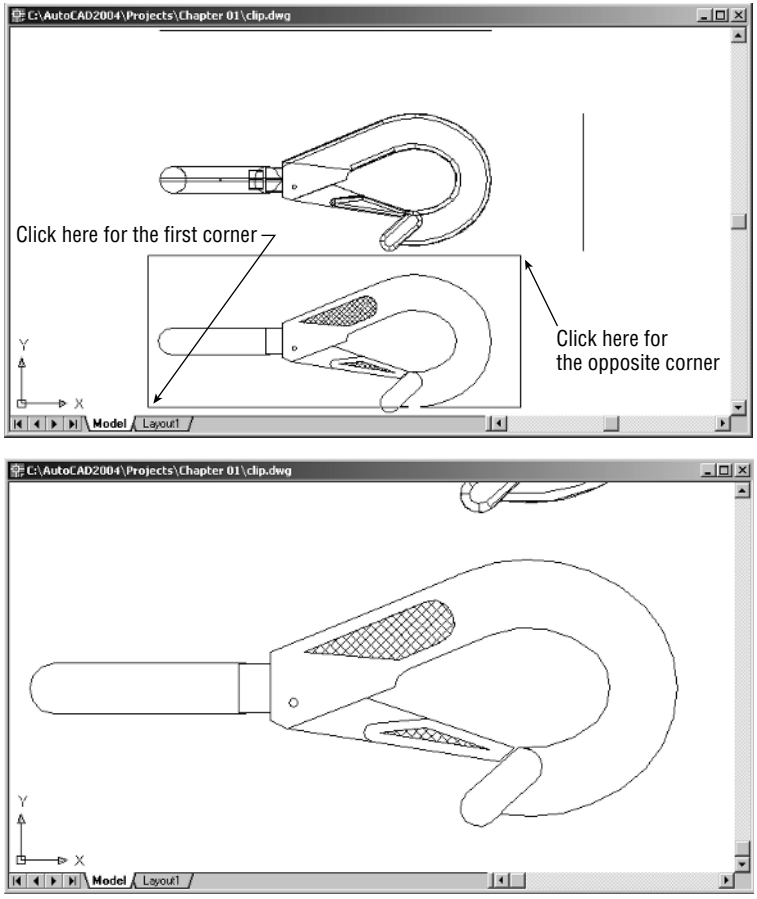


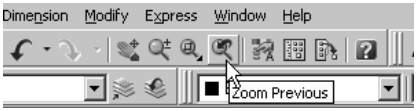
FIGURE 1.11
Placing the zoom window around the clip

5. The Command window now displays the `Specify first corner:` and `Specify opposite corner:` prompts. Position the other corner of the window so it encloses the lower image of the clip, as shown in the top image in Figure 1.11, and left-click the mouse again. The clip enlarges to fill the screen (see the bottom image in Figure 1.11).

TIP *If you decide that you don't like the position of the first point you pick while defining the zoom window, you can right-click the mouse and re-select the first point. This only works when you enter* ***Z*** ↵ ***W*** ↵ *to issue the Zoom Window command or when you select Zoom Window from the Standard toolbar.*

In this exercise, you used the Window option of the Zoom command to define an area to enlarge for your close-up view. You saw how AutoCAD prompts you to indicate first one corner of the selection window and then the other. These messages are helpful for first-time users of AutoCAD. You will use the Window option frequently—not just to define views, but also to select objects for editing.

Getting a close-up view of your drawing is crucial to working accurately, but you'll often want to return to a previous view to get the overall picture. To do so, click the Zoom Previous button on the Standard toolbar.



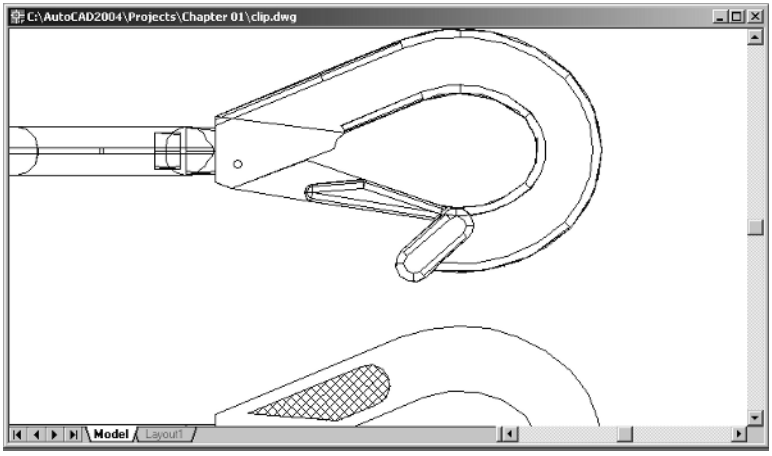
Do this now, and the previous view—one showing the entire clip—returns to the screen. You can also get there by choosing View ➢ Zoom ➢ Previous.

You can quickly enlarge or reduce your view using the Zoom Realtime button on the Standard toolbar.

TIP *You can also zoom in and out using the Zoom In and Zoom Out buttons in the Zoom Window flyout of the Standard toolbar. The Zoom In button shows a magnifying glass with a plus sign; the Zoom Out button shows a minus sign. If you have a mouse equipped with a scroll wheel, you can zoom in and out just by turning the wheel. The location of the cursor at the time you move the wheel will determine the center of the zoom. A click-and-drag of the scroll wheel will let you pan your view.*

1. Click the Zoom Realtime button on the Standard toolbar. You can also right-click and choose Zoom from the shortcut menu. The cursor changes to a magnifying glass.
2. Place the Zoom Realtime cursor slightly above the center of the drawing area, and then click and drag downward. Your view zooms out to show more of the drawing.
3. While still holding the left mouse button, move the cursor upward. Your view zooms in to enlarge your view. When you have a view similar to the one shown in Figure 1.12, release the mouse button. (Don't worry if you don't get *exactly* the same view as the figure. This is just for practice.)

FIGURE 1.12
The final view you want to achieve in step 3 of the exercise



4. You are still in Zoom Realtime mode. Click and drag the mouse again to see how you can further adjust your view. To exit, you can select another command besides a Zoom or Pan command, press the Esc key, or right-click your mouse.
5. Right-click now, and choose Exit from the shortcut menu to exit the Zoom Realtime command.

As you can see from this exercise, you have a wide range of options for viewing your drawings, just by using a few buttons. In fact, these buttons, along with the scroll bars at the right side and bottom of the AutoCAD window, are all you need to control the display of 2D drawings.

The Aerial View Window

The *Aerial View* window is an optional AutoCAD display tool. It gives you an overall view of your drawing, regardless of the magnification you are using for the drawing editor. Aerial View also makes it easier to get around in a large-scale drawing. You'll find that this feature is best suited to complex drawings that cover great areas, such as site plans, topographical maps, or city planning documents.

You'll find a detailed description of the Aerial View window in Chapter 6. As you become more comfortable with AutoCAD, you might want to try it.

Saving a File As You Work

It is a good idea to save your file periodically as you work on it. You can save it under its original name (choose File ➢ Save) or under a different name (choose File ➢ Save As), thereby creating a new file.

By default, AutoCAD automatically saves your work at 10-minute intervals under the name `AUTO.SV$`; this is known as the *Automatic Save* feature. Using settings in the Options dialog box or system variables, you can change the name of the autosaved file and control the time between autosaves. See Chapter 3 for details.

Tip *By default, in Windows XP, the* `AUTO.SV$` *file is stored in the* `C:\Documents and Settings\User Name\Local Settings\Temp\`. *You can find the exact location for your system by entering* ***Savefilepath*** ↵ *at the command prompt.*

Let's first try the Save command. This quickly saves the drawing in its current state without exiting the program.

Choose File ➢ Save. You will notice some disk activity while AutoCAD saves the file to the hard disk, and you'll see a progress indicator in the status bar. As an alternative to choosing File ➢ Save, you can press **Alt+F S**. This is the accelerator key combination, also called *hotkey*, for the File ➢ Save command.

Now try the Save As command. This command displays a dialog box that allows you to save the current file under a new name.

1. Choose File ➢ Save As or type **Saveas**↵ at the command prompt to open the Select File dialog box. Notice that the current filename, `Clip.dwg`, is highlighted in the File Name input box.

2. Type **Myfirst**. As you type, the name `Clip.dwg` disappears from the input box and is replaced by `Myfirst`. You don't need to enter the .dwg filename extension. AutoCAD adds it to the filename automatically when it saves the file.
3. Click the Save button. The dialog box closes, and you will notice some disk activity.

You now have a copy of the clip file under the name `Myfirst.dwg`. The name of the file displayed in the AutoCAD window's title bar has changed to `Myfirst`. From now on, when you use the File ➢ Save option, your drawing will be saved under its new name. Saving files under a different name can be useful when you are creating alternatives or when you just want to save one of several ideas you have been trying out.

TIP *If you are working with a small monitor, you might want to consider closing the Draw and Modify toolbars. The Draw and Modify pull-down menus offer the same commands, so you won't lose any functionality by closing these toolbars. If you really want to maximize your drawing area, you can also turn off the scroll bars and reduce the Command window to a single line. Appendix B shows how to do this. You can also gain some extra drawing space by clicking the Maximize button in the upper-right corner of the drawing area.*

Making Changes

You will frequently make changes to your drawings. In fact, one of AutoCAD's primary advantages is the ease with which you can make changes. The following exercise shows you a typical sequence of operations involved in making a change to a drawing:

1. From the Modify toolbar, click the Erase tool (the one with a pencil eraser touching paper). This activates the Erase command. You can also choose Modify ➢ Erase from the pull-down menu.

   Notice that the cursor has turned into a small square; this square is called the *pickbox*. You also see `Select objects:` in the command prompt area. This message helps remind new users what to do.
2. Place the pickbox on the cross hatch pattern of the clip (see Figure 1.13) and click it. The cross hatch of the clip becomes highlighted. The pickbox and the `Select object:` prompt remain, telling you that you can continue to select objects.
3. Now press ↵. The cross hatch disappears. You have just erased a part of the drawing.

In this exercise, you first issued the Erase command, and then you selected an object by clicking it using a pickbox. The pickbox tells you that you must select items on the screen. Once you've done that, press ↵ to move on to the next step. This sequence of steps is common to many of the commands you will work with in AutoCAD.

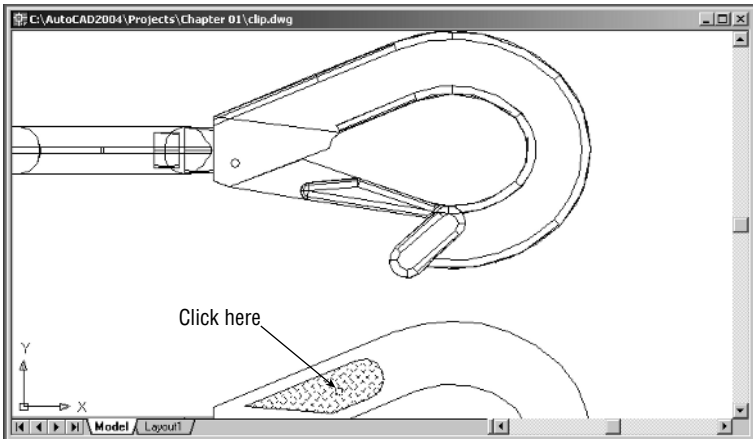


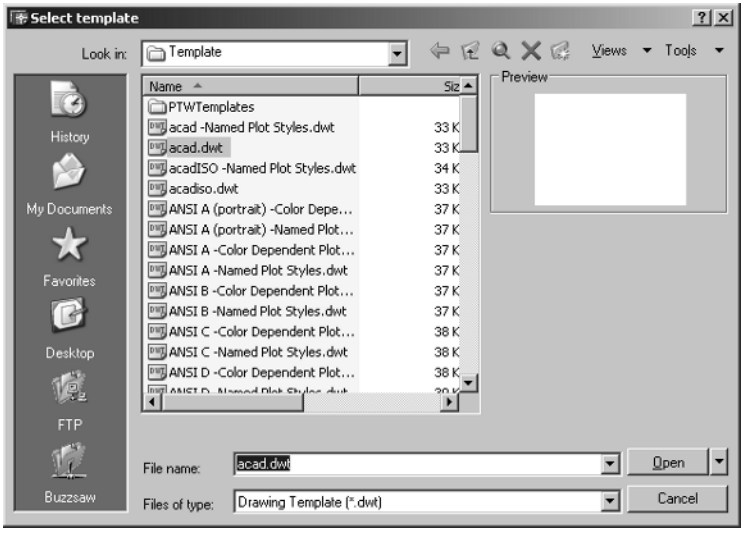
FIGURE 1.13
Erasing a portion of the clip

TIP You can also click an object or a set of objects and then press the Delete key.

Opening Multiple Files

You can have multiple documents open at the same time in AutoCAD. This can be especially helpful if you want to exchange parts of drawings between files or if you just want another file open for reference. Try the following exercise to see how multiple documents work in AutoCAD.

1. Choose File ➢ New to open the Select Template dialog box.



2. Make sure `acad.dwt` is selected, and then click Open.

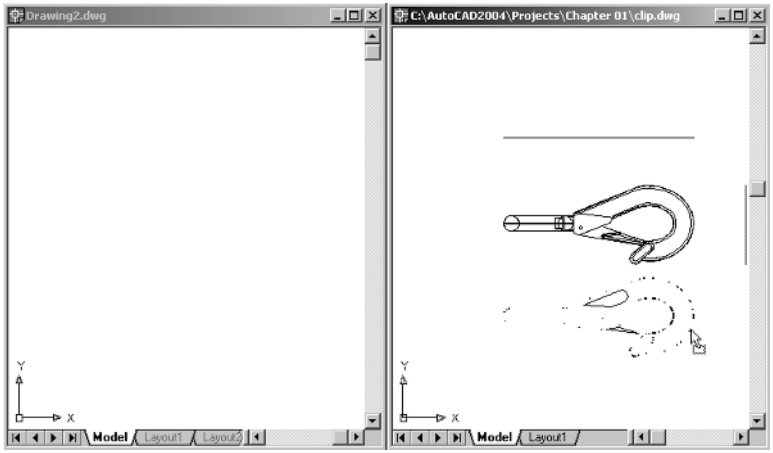
NOTE *If you see the Create New Drawing dialog box after step 2, click the Start From Scratch button and select* ***Imperial****, then click OK and AutoCAD will display a default document. You'll learn more about the Create New Drawing dialog box in Chapter 2.*

3. Choose Window ➢ Tile Vertically to get a view of both drawing files. The options in the Window pull-down menu act just like their counterparts in other Windows programs that allow multiple document editing.

TIP *When you create a new file in AutoCAD, you are actually opening a copy of a template file as you saw in step 1. A template file is a blank file that is set up for specific drawing types. The* `acad.dwt` *file is a generic template set up for imperial measurements. Another template file called* `acadiso.dwt` *is a generic template useful for metric measurements. Other templates are set up for specific drawing sheet sizes and measurement systems. You'll learn more about templates in Chapter 6.*

You can now see both of the files you have open. Let's see what can be done with these two files.

1. Click in the window with the clip drawing to make it active.
2. Choose View ➢ Zoom ➢ All to get an overall view of the drawing.
3. Click the 2D version of the clip at the bottom of the clip drawing to select it. A series of squares appears on the drawing. These are called handles, and you'll learn more about them in the next chapter.
4. Click and drag the selected object, but avoid clicking any of the blue squares. You'll see a small rectangle appear next to the cursor.



5. While still holding the left mouse button, drag the cursor to the new file window. When you see the clip appear in the new drawing window, release the mouse button. You've just copied part of a drawing from one file to another.

Now you have two files open at once. You can have as many files open as you want, as long as you have adequate memory to accommodate them. You can control the individual document windows as you would any window, using the Window pull-down menu or the window control buttons in the upper-right corner of the document window.

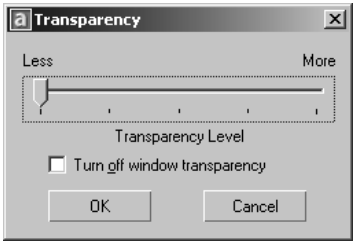
Adding a Pre-Drawn Symbol with the Tool Palette

In the last exercise, you saw how you can easily copy an object from one file to another using a click-and-drag method. Now let's take a look at another tool that lets you click and drag symbols into your drawings.

1. Click the Tool Palettes tool in the Standard toolbar to open the Tool palettes.
2. Make sure the Sample Office Project tab is selected in the Tool palettes, and then click and drag the Chair - Desk symbol from the Tool palettes into the new file window. The chair symbol appears in the window.
3. Click the Imperial Hatch tab, and then click and drag any of the solid patterns into the chair. The chair is filled with the solid pattern.

While you've got the Tool palettes open, let's look at some of its unique features.

1. Right-click the Tool palettes, and then choose Transparency from the shortcut menu to open the Transparency dialog box.

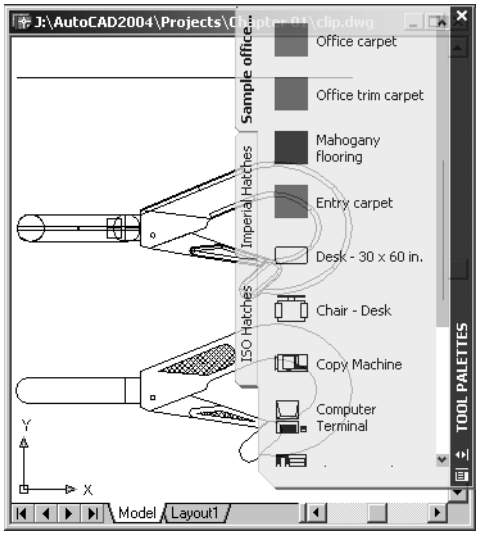


2. Move the Transparency Level slider to the middle of the dialog box, and then click OK. You now see objects that are "behind" the Tool palettes.

You can't actually select points that are "behind" the palettes as you draw, but the Transparency feature can help you visualize your drawing more easily while the palettes are open.

Let's take another look at a display feature of the Tool palettes.

TIP *The Command window also has a Transparency option. To use it, you must first move the Command window to an undocked position toward the middle of the AutoCAD window. You can then right-click the Command window title bar and choose Transparency. You will see the same Transparency dialog box you see when you right-click the Tool palettes and choose Transparency.*



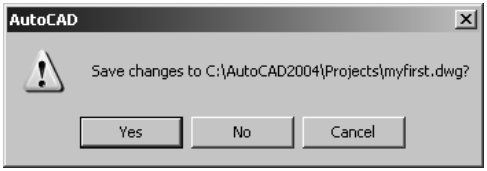
1. Right-click the Tool palettes again, and choose Auto-Hide.
2. Move the cursor away from the Tool palettes. The Tool salettes close so that just the Tool palettes title bar is visible.
3. Move the cursor on top of the Tool palettes title bar. The palette opens to reveal the palettes.
4. Turn the Auto-Hide feature off by right-clicking the Tool palettes and selecting Auto-Hide.
5. Click the X in the upper-right corner of the Tool palettes.

The Tool palettes offer a way to quickly add fill patterns and pre-drawn symbols to your drawing. It is a great tool to help you manage your library of custom, pre-drawn symbols. You've just gotten a taste of what it can do, but to make full use of its capabilities, you'll need to learn about blocks, hatch patterns, and the AutoCAD DesignCenter. You won't see much of this tool in the beginning of this book, but keep it in the back of your mind as you begin to learn more about AutoCAD. After finishing the first part of this book, you can skip ahead to Chapter 22 to learn how to use and customize the Tool palettes.

Closing AutoCAD

When you are done with your work on one drawing, you can open another drawing, temporarily leave AutoCAD, or close AutoCAD entirely. To close all the open files at once and exit AutoCAD, choose File ➢ Exit.

1. Choose File ➢ Exit, the last item in the File menu. A dialog box appears, asking you if you want to "Save Changes to `Myfirst.dwg`?" and offering three buttons labeled Yes, No, and Cancel.



2. Click the No button.
3. AutoCAD displays another message asking you if you want to save `Drawing2.dwg`, which is the new drawing you opened in the last exercise. Click the No button again. AutoCAD closes both the clip drawing and the new drawing and exits without saving your changes.

Whenever you attempt to exit a drawing that has been changed, you get this same inquiry box. This request for confirmation is a safety feature that lets you change your mind and save your changes before you exit AutoCAD. In the previous exercise, you discarded the changes you made, so the clip drawing reverts to its state before you erased the handle. The new drawing is completely discarded, and no file is saved.

If you only want to exit AutoCAD temporarily, you can minimize it so it appears as a button on the Windows XP or Windows2000 status bar. You do this by clicking the Minimize button in the upper-right corner of the AutoCAD window; the Minimize button is the title-bar button that looks like an underscore (_). Alternatively, you can use the Alt+Tab key combination to switch to another program.

TIP *The AutoCAD Express Tools offer the Close All Drawings and Quick Exit tools that let you close multiple .dwg files at one time. See Chapter 20 for more on the Express tools.*

If You Want to Experiment...

Try opening and closing some of the sample drawing files on the accompanying CD.

1. Start AutoCAD by choosing Start ➢ Programs ➢ AutoCAD 2004 ➢ AutoCAD 2004.
2. Close the AutoCAD 2004 window, and then choose File ➢ Open.
3. Use the dialog box to open the `Myfirst` file again. Notice that the drawing appears on the screen with the handle enlarged. This is the view you had on screen when you used the Save command in the earlier exercise.
4. Erase the cross hatch, as you did in the earlier exercise.
5. Choose File ➢ Open again. This time, open the `Dhouse` file from the `Figures` folder. The 3D `Dhouse` drawing opens.
6. Choose File ➢ Exit. Notice that you exit AutoCAD without getting the Save Changes dialog box for the Dhouse drawing. This is because you didn't make any changes to the `Dhouse` file.