Chapter 1

Introducing AutoCAD 2004

In This Chapter

- Getting the AutoCAD advantage
- Using AutoCAD and DWG files
- Meeting the AutoCAD product family
- Using AutoCAD LT instead of AutoCAD
- Upgrading from a previous version

Maybe you're an engineer or architect in a small office whose time has come to switch from drafting boards to CAD. Maybe you tried to use AutoCAD a long time ago but gave up in frustration or just got rusty. Maybe you currently use an older version, such as AutoCAD Release 14 or (shudder!) something even older. Maybe you're completely new to CAD and yearn for the wealth and fame of full-time drafting work. (Good CAD drafters can become well-paid and valued team members in many companies.)

Whatever your current situation and motivation, I hope that you enjoy the process of becoming proficient with AutoCAD. Drawing with AutoCAD is challenging at first, but it's a challenge worth meeting. CAD rewards those who think creatively about their work and look for ways to do it better. You can always learn more, discover a new trick, or improve the efficiency and quality of your drawing production.

AutoCAD started as an MS-DOS-only program, when real men and women typed commands and didn't use toolbars or dialog boxes. Autodesk ported AutoCAD to many GUI (graphical user interface) operating systems, including Macintosh, several flavors of UNIX, and Windows. Autodesk now develops AutoCAD for Microsoft Windows only. (AutoCAD 2004 works with Windows XP, 2000, and NT 4.0.) AutoCAD's not the easiest program to learn, but it's gotten easier and more consistent. AutoCAD is pretty well integrated into the Windows environment, but you bump into some vestiges of its MS-DOS legacy — especially the command line. This book guides you around the bumps and minimizes the bruises.

Why AutoCAD?

AutoCAD has been around a long time: since 1982. AutoCAD started the transition from *really expensive* mainframe and minicomputer CAD systems costing tens of thousands of dollars to *merely expensive* microcomputer CAD programs costing a few thousand dollars.

AutoCAD is, first and foremost, a program to create *technical drawings;* drawings in which measurements and precision are important, because these kinds of drawings often get used to build something. The drawings you create with AutoCAD must adhere to standards established long ago for hand-drafted drawings. In fact, in a few remote corners of the world technical drawings still are created with pencils and paper. The up-front investment to use AutoCAD is certainly more expensive than the investment needed to use pencil and paper, and the learning curve is much steeper, too; you have to learn to use a computer as well as learn AutoCAD. Why bother? The key reasons for using AutoCAD, not pencil and paper, are

- **Precision:** Creating lines, circles, and other shapes of the exactly correct dimensions is easier with AutoCAD than with paper.
- **Modifiability:** Drawings are much easier to modify on the computer screen than on paper. CAD modifications are a lot cleaner, too.
- **Efficiency:** Creating many kinds of drawings is faster with a CAD program — especially drawings that involve repetition, such as floor plans in a multi-story building. But that efficiency takes skill and practice. If you're an accomplished pencil-and-paper drafter, don't expect CAD to be faster at first!

Figure 1-1 shows a simple building plan on the AutoCAD 2004 screen.

Why choose AutoCAD? AutoCAD is just the starting point of a whole industry of software and hardware products designed to work with AutoCAD. Autodesk has helped this process along immensely by designing a series of programming interfaces to AutoCAD that other companies — and Autodesk itself — have used to extend the application. Some of the add-on products have become such winners that Autodesk acquired them and incorporated them into its own products. When you compare all the resources — including the add-ons, extensions, training courses, books, and so on — AutoCAD doesn't have much competition.

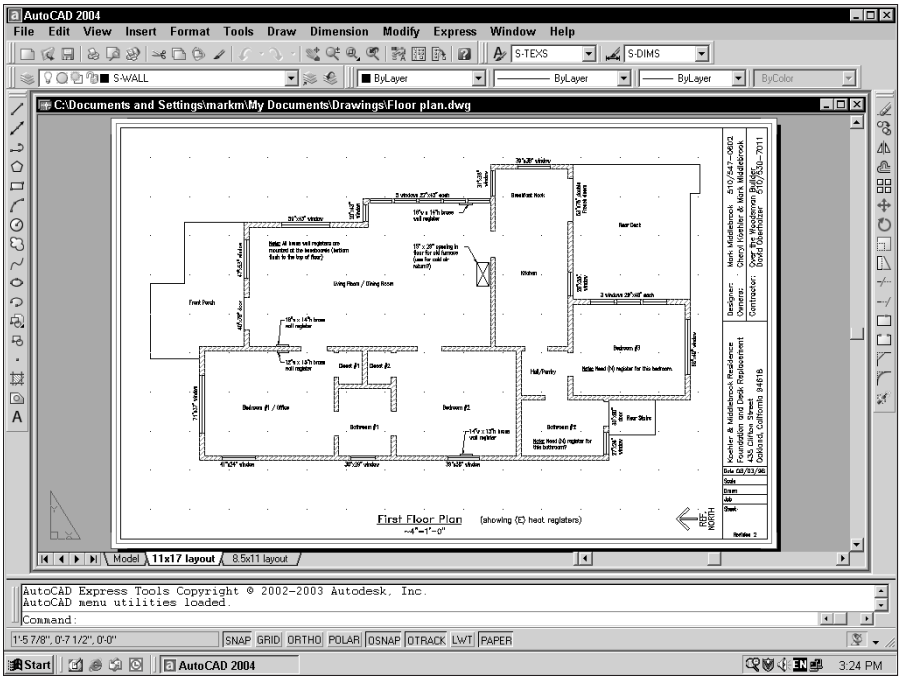

Figure 1-1: Plan to be floored by the drawing capabilities of AutoCAD 2004.

The Importance of Being DWG

To take full advantage of AutoCAD in your work environment, you need to be aware of the DWG file format, the format in which AutoCAD saves drawings. In most cases an older version of AutoCAD can't read a DWG file created by a newer version of AutoCAD.

- Newer versions of AutoCAD can read files created by older versions.
- You can use the "save as" option in newer versions to save the file to some older DWG formats.

AutoCAD 2004 breaks the string of "all the same DWG" versions that AutoCAD users enjoyed over the previous three upgrades. Table 1-1 shows which versions (described later in this chapter) use which DWG file formats.

Table 1-1 AutoCAD Versions and DWG File Formats

AutoCAD LT Version	*AutoCAD Version*	*Release Year*	*DWG File Format*
AutoCAD 2004 ("A2k4")	AutoCAD LT 2004	2003	Acad 2004
AutoCAD 2002 ("A2k2")	AutoCAD LT 2002	2001	Acad 2000
AutoCAD 2000i ("A2ki")	AutoCAD LT 2000i	2000	Acad 2000
AutoCAD 2000 ("A2k")	AutoCAD LT 2000	1999	Acad 2000
AutoCAD Release 14 ("R14")	AutoCAD LT 98 & 97	1997	Acad R14
AutoCAD Release 13 ("R13")	AutoCAD LT 95	1994	Acad R13
AutoCAD Release 12 ("R12")	AutoCAD LT Release 2	1992	Acad R12

Working with AutoCAD is easier when your coworkers and colleagues in other companies all use the same version of AutoCAD and AutoCAD-related tools. That way, your DWG files, add-on tools, and even the details of your CAD knowledge can be mixed and matched among your workgroup and partners. In the real world, you'll probably work with people — at least in other companies — who use AutoCAD versions as old as Release 14.

Many programs claim to be *DWG-compatible* — that is, capable of converting data to and from AutoCAD's DWG format. But achieving this compatibility is a difficult thing to do well. Even a small error in file conversion can have results ranging in severity from annoying to appalling. If you exchange DWG files with people who use other CAD programs, be prepared to spend time finding and fixing translation problems.

AutoCAD users who are running different versions of AutoCAD also have to do extra work to share files. Usually, the people with the lowest-numbered version of AutoCAD have to ask their colleagues to "save as" their version. This extra work of different versions increases the pressure on people who work together to upgrade, or not upgrade, together. People on earlier releases are likely to get newer files that they want to use but can't open in their version of AutoCAD; people on later releases are worried that features will disappear from their drawings when they save the files in an earlier format.

AutoCAD 2004 does not include an option for saving files to the R14 DWG file format. This omission creates problems if you want to send DWG files to clients or consultants who are still using AutoCAD Release 14. (And there are quite a few of these folks — R14 was popular, and AutoCAD 2000 through 2002 didn't tempt everyone to upgrade.) See the end of this chapter for more information about this limitation and how to deal with it.

AutoCAD-based applications

Autodesk has expanded AutoCAD into a whole product line of programs with AutoCAD as a base and specialized, discipline-specific add-ons built on top and included as one complete product. As a Release 2004 user, you'll be looking for the AutoCAD 2004-compatible versions of these tools, which should appear a few months after AutoCAD 2004 ships. These discipline-specific flavors of AutoCAD include Autodesk Architectural Desktop and Autodesk Building Systems (mechanical, electrical, and plumbing), Autodesk Mechanical Desktop, Autodesk Map, AutoCAD Land Desktop, Autodesk Survey, and Autodesk Civil Design.

To make matters even more confusing, Autodesk now offers Autodesk Revit and Autodesk Inventor, software applications that compete with Architectural Desktop and Mechanical Desktop, respectively. Revit and Inventor are not based on AutoCAD; they sacrifice AutoCAD compatibility in favor of a more fundamentally design- and 3D-oriented approach to CAD. Whether they ultimately will replace the traditional AutoCAD-based applications remains to be seen.

In addition to the products from Autodesk, thousands of AutoCAD add-on products — both discipline-specific and general-purpose — are available from other software developers. These companion products are sometimes called *third-party applications*. Visit `partnerproducts.autodesk.com/` for more information about what's available.

Seeing the LT

AutoCAD LT 2004 is one of the best deals around, a shining example of the old 80/20 rule: roughly 80 percent of the capabilities of AutoCAD 2004 for roughly 20 percent of the money. Like AutoCAD 2004, AutoCAD LT 2004 runs on mainstream Windows computers and doesn't require any additional hardware devices. With AutoCAD LT, you can be a player in the world of AutoCAD, the world's leading CAD program, for a comparatively low starting cost.

AutoCAD LT 2004 is a very close cousin to AutoCAD 2004. Autodesk created AutoCAD LT 2004 by starting with the AutoCAD 2004 program, taking out a few features to justify charging a lower price, adding a couple of features to enhance ease of use versus full AutoCAD, and testing the result.

As a result, AutoCAD LT 2004 looks and works much like AutoCAD 2004. The opening screen and menus of the two programs are nearly identical. (LT is missing a few commands from the AutoCAD 2004 menus.)

In fact, the major difference between the programs has nothing to do with the programs themselves. The major difference is that AutoCAD LT lacks support for several customization and programming languages that are used to develop AutoCAD add-ons. So almost none of the add-on programs or utilities offered by Autodesk and others are available to LT users.

AutoCAD LT also has only limited 3D support. You can view and edit 3D objects in AutoCAD LT, so you can work with drawings created in AutoCAD that contain 3D objects. However, you cannot create true 3D objects.

The lack of 3D object creation in LT is not as big a negative for many users as you might think. Despite a lot of hype from the computer press and CAD vendors (including Autodesk), 3D CAD remains a relatively specialized activity. The majority of people use CAD programs to create 2D drawings.

Although you may hear claims that AutoCAD LT is easier to learn and use than AutoCAD, the truth is that they're about equally difficult (or easy, depending on your nerd IQ). The LT learning curve doesn't differ significantly from that of AutoCAD. AutoCAD was originally designed for maximum power and then modified somewhat to improve ease of use. AutoCAD LT shares this same heritage.

Fortunately, the minimal differences between LT and AutoCAD mean that after you have climbed that learning curve, you'll have the same great view. You'll have almost the full range of AutoCAD's 2D drafting tools, and you'll be able to exchange DWG files with AutoCAD users without data loss.

This book covers AutoCAD 2004, but almost all of the information in it applies to AutoCAD LT 2004. The icon that you see at the left of this paragraph highlights significant differences.

2004: An AutoCAD Odyssey

You should know this before you upgrade from a previous AutoCAD release:

- **Wash those old Windows:** AutoCAD 2004 does not support older versions of Windows, such as Windows 98 and Me. You must use Windows XP (Professional or Home), Windows 2000, or Windows NT 4.0 (with NT Service Pack 6a applied).
- **DWG file compatibility:** AutoCAD 2004 introduces a new version of the DWG file format, which older versions of AutoCAD can't open. You can use the "save as" option to create DWG files for users of AutoCAD 2000 and 2002, but not for AutoCAD Release 14 and earlier versions.
- **Application compatibility:** If you use third-party applications with a previous version of AutoCAD, there's a good chance that they won't work with AutoCAD 2004. That's certainly true of applications developed with the ARX (AutoCAD Runtime eXtension) and VBA (Visual Basic for Applications) programming interfaces.

  Many *LSP (AutoLISP)* programs written for previous versions of AutoCAD work with AutoCAD 2004.

- **Increased computer system requirements:** For AutoCAD 2004, Autodesk recommends a 500 MHz Pentium III or better processor, at least 128MB of RAM, 1024 x 768 or higher display resolution, 300MB of available hard disk space, and an Internet connection.

Before you upgrade

If you plan to upgrade from a previous version, such as AutoCAD 2002, 2000, or Release 14, these are the things that you need to think about:

- **Is your hardware adequate?** Check the requirements in the preceding section. If you can meet the requirements with a simple hard disk or memory upgrade and your computer is otherwise working fine, go for it. If you need to upgrade more than one or two components, it likely will be cheaper and easier to buy a new computer.
- **Is your operating system adequate?** A new computer should come with a current operating system — probably Windows XP — so you'll kill two burdens with one wad of dough.
- **Do you use any add-on programs with AutoCAD?** There's a decent chance that they won't work with AutoCAD 2004. Ask the developer about compatibility and upgrades, test the programs yourself, be prepared to live without them, or look for substitutes.
- **Are you exchanging DWG files with others who use AutoCAD 2000 through 2002?** If so, remember to "save as" to the AutoCAD 2000 format before sending files to them. Or get them to upgrade, too!
- **Are you exchanging DWG files with others who still use AutoCAD Release 14?** If so, be prepared for extra-special file exchange hassles. AutoCAD 2004 can't save to the R14 DWG format. You can save to the Release 12 DXF format (see Chapter 17 for instructions), which AutoCAD Release 14 will open, but the resulting file will be "dumbed down" to make the file palatable to a 10-year-old version of AutoCAD. Life is happier for everyone involved if those AutoCAD Release 14 users to whom you send DWG files to upgrade to AutoCAD 2004.

2004 has more

Upgrading is worth the effort. Although AutoCAD 2000 through 2002 included plenty of new and changed stuff, it wasn't obvious that a lot of that stuff would help people make better drawings more efficiently. Much of the new stuff in AutoCAD 2004 benefits everyday drafting work and should make your relationship with AutoCAD a happier one. Among my favorites are

No Express service?

The AutoCAD 2004 CD-browser screen includes separate links for installing the main AutoCAD 2004 software and the Express Tools, so make sure that you run both setup programs. If your menu bar doesn't include the Express menu shown in Figure 1-1 earlier in this chapter, you need to install the Express Tools from your AutoCAD 2004 CD. Just pop the CD in and, when the CD-browser page appears, click the AutoCAD Express Tools Volumes 1–9 link.

- A cleaner, more functional interface, especially when you launch AutoCAD and create new drawings. (See Chapter 2.)
- Automatic file compression, which reduces DWG file sizes by 10–50% and drawing load times by more modest amounts.
- Text indents and hanging indents. Finally, we can create numbered and bulleted lists such as this one in AutoCAD! (See Chapter 9.)
- Numerous xref improvements, including a simple method of opening xrefs for editing, more sensible xref search paths, xref change notifications, and a Reference Manager utility. (See Chapters 13 and 15.)
- Better tools for CAD standards compliance. (See Chapter 14.)
- Restoration of the ever-popular Express Tools, which came with AutoCAD Release 14 and 2000 but disappeared from 2000i and 2002.

AutoCAD 2004 includes other goodies — look for the icon that you see at the left of this paragraph.

AutoCAD 2004 is a worthy new version. If you've been putting off upgrading, and especially if you've been hanging out with AutoCAD Release 14 for five years now, this probably is a good time to take the plunge.