AutoCAD® LT

The Complete G...

David S. Cohn

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The Complete Guide

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To my parents, Elaine and Barney Cohn, with love.

Acknowledgments

Introduction

What Is AutoCAD LT?

AutoCAD, the largest selling computer-aided drafting (CAD) program in the world, is very expensive and complex. While many people would like to use AutoCAD, price and complexity sometimes put AutoCAD beyond many potential users' reach. With that in mind, Autodesk created AutoCAD LT, a versatile subset of many of AutoCAD's most powerful drawing features in an easy-to-use Windows-based package.

AutoCAD LT is 100 percent compatible with AutoCAD. Drawings created with AutoCAD can be opened, edited, and printed using AutoCAD LT. Similarly, any drawings created using AutoCAD LT are completely compatible with AutoCAD.

Ultimately, the result of using any CAD program should be increased speed and accuracy in producing drawings, whether your application is architecture, medical engineering, clothing design, mechanical engineering, technical illustration, land management, structural engineering, graphics, electrical engineering, or boat design. If you cannot use the program efficiently, AutoCAD LT will not help you in your professional endeavors. To use AutoCAD LT effectively, you must understand how its commands operate so you can develop methods for accomplishing your drawing tasks.

System Requirements

AutoCAD LT runs on any 386, 486, and Pentium-based PC or compatible computers running MS-DOS 3.31 or higher and Windows 3.1 in Enhanced mode. The system must also be equipped with a math coprocessor, a minimum of 4MB of RAM, and a hard disk with at least 8MB of free disk space. Your computer should also be configured with a permanent Windows swap file, a Windows-supported VGA display screen (or higher), a Windows-compatible pointing device, and a Windows-supported printer or plotter.

What Is AutoCAD LT: The Complete Guide?

AutoCAD LT: The Complete Guide completely describes every facet of AutoCAD LT. It provides ready answers to your questions about any AutoCAD LT command, feature, or variable. This book is not a tutorial, although Part One, AutoCAD LT Basics, takes you through the fundamentals of the program. You could use this book to learn how to use AutoCAD LT, but it is primarily a reference book. Although I do not expect that you will read this book from cover to cover, you will want to spend time studying a particular command or feature.

How the Book Is Organized

I have tried to make every facet of *AutoCAD LT: The Complete Guide* useful. Part One describes the AutoCAD LT drawing environment and basic drawing and command concepts. Part Two is an alphabetically organized reference containing every AutoCAD LT command. Part Three contains a listing and descriptions of AutoCAD LT's system variables. The appendices include information about different files that come with AutoCAD LT, the organization of the pull-down menus, and information about customizing the program. A detailed general index in the back of this volume lists all commands, functions, and topics this book covers. Even though you will be able to find most subjects listed alphabetically in the book, some topics are within the text. The general index will help you find these topics.

Typographical Conventions

Some standard conventions are used throughout this book, especially when listing command keystrokes.

↵	When you see this symbol, press the Enter or Return key on your keyboard. If not listed explicitly, you should press the Enter or Return key at the end of any command keystroke line.
Ctrl B	This means that you should press the key labeled Ctrl and the B key at the same time. You'll see other similar Ctrl key sequences, such as Ctrl C.
Command:	All AutoCAD LT program prompts appear in this font. Literal user response is shown in a similar font but in bold type. For example, Command: **LINE** means that you should enter the letters L I N E (the LINE command) in response to AutoCAD LT's Command: prompt. You must also press ↵ to complete the entry.
	If you are being instructed to make a choice, the response is shown in bold type and enclosed in parentheses. For example, From point: **(select a point)** means that you can select any point you wish. Generally, you need to complete your entry by pressing ↵ (except when you select a point with the pointing device).
	Only when you must press the Return key without making any other entry is ↵ actually included in the text, such as to complete the LINE command: To point: ↵
<Y>	When AutoCAD LT prompts you to respond, it often displays a default value inside angle brackets (<>). You select the default value by pressing ↵. When the actual value displayed is shown in an example, the default appears in monospace within the angle brackets:
	Rotate objects as they are copies? <Y>:
<default>	When the actual default value necessarily varies depending on the particular situation, the value or an explanation of the value appears in italics within angle brackets:
	Object snap target height (1-50 pixels) <current value>:
LINE	All AutoCAD LT commands are uppercase, although the program is not case sensitive and accepts uppercase and lowercase spellings, and combinations, as input.
Redraw	Dialog box titles as well as selections from menus and dialog boxes are shown in this sans serif font.
ITALIC	Within the text, any literal response that you should type is shown in italic type. For example, type *ENDP* is an instruction for you to actually type the letters E N D P.

Production Notes

For those interested in what it takes to produce a book like this, I would like to mention the hardware and software I used. The entire text was written using Microsoft Word for Windows version 2.0. All drawings and illustrations were created using AutoCAD LT. The computer screens were captured using Collage Complete (Inner Media, Hollis, NH). Additional editing and annotation was done with Image-In (Image-In Inc., Minneapolis, MN). Unnumbered drawings were output either as slide files or as encapsulated PostScript files using AutoCAD LT's PSOUT command.

All text was written on a 33MHz 80486-based PC equipped with a Matrox MGA graphics board and 8MB of RAM. All graphics were produced on a Micron 60MHz Pentium-based PC equipped with 32MB of RAM and a Diamond Viper PCI graphics board. Both machines were connected to a LANtastic peer-to-peer network (Artisoft, Tucson, AZ) and the rough manuscript was printed across the network on a Hewlett-Packard LaserJet 4.

Contents

Part 1

AutoCAD LT Basics

AutoCAD LT Basics

This part introduces AutoCAD LT. It teaches you about AutoCAD LT's drawing environment, how to create and save a drawing, and how to edit existing drawings. You will also learn about AutoCAD LT's coordinate systems, how to organize your drawings, how to use the dimensioning features, and how to print or plot your drawings. A discussion of additional features that help you work faster concludes this part.

AutoCAD LT offers many different methods to do the same thing. For example, to activate a command, you can select it from a menu, the toolbar, or the toolbox, or even type its name after the `Command:` prompt on the command line.

When AutoCAD LT runs, it displays two separate windows: the Graphics window where you actually create and edit drawings and the Text window which contains a list of all commands and prompts, and your responses to those prompts. You can switch between these windows by pressing `Alt` `Tab`, just as you would to toggle between any other active Windows applications, or by pressing the `F2` key. Generally, the Graphics window remains on top. Occasionally, however, a command needs an entire screen to display text information. In these situations, AutoCAD LT switches automatically to the Text window.

The Drawing Environment

When you double-click the AutoCAD LT icon in the Windows Program Manager, you start the AutoCAD LT program. AutoCAD LT's Graphics window appears, similar to Figure 1. It contains these elements:

- Title Bar
- Menu Bar
- Toolbar
- Graphics Area
- Graphics Cursor
- Toolbox
- Command Line

Screen resolution affects the way the Graphics window looks on your system. For example, if you run Windows at 640x480, you may see fewer buttons on the toolbar.
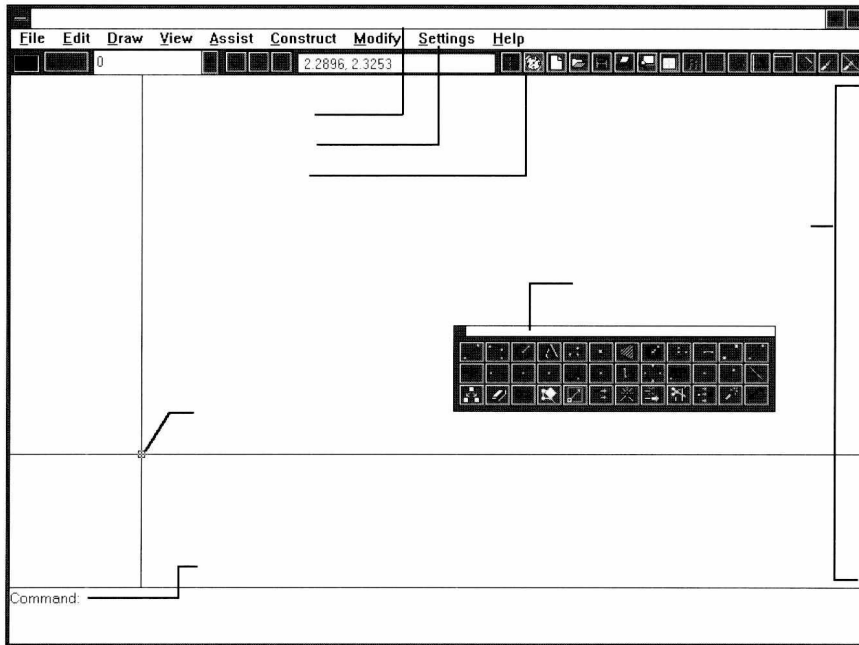
Figure 1

Title Bar

The title bar indicates that you are currently in the AutoCAD LT Graphics window. The current drawing name is to the right of the hyphen. If you have not named the drawing, the window is labeled "AutoCAD LT - UNNAMED."

Menu Bar

The menu bar provides access to most AutoCAD LT commands. It contains nine pull-down menus that organize AutoCAD LT's commands into general categories. You can select a command by clicking on the menu name to display the pull-down menu and then clicking on the command name. Figure 2 shows a typical pull-down menu.

Two different pull-down menus are available: Short and Long. The Short menu contains a subset of AutoCAD LT commands. The Long menu contains all AutoCAD LT commands. You can switch between the Short and Full menus by selecting either **Short** or **Full** from the **Settings** pull-down menu.

An arrow to the right of a menu selection name, for example **Arc ➤**, indicates that the menu contains an additional submenu that you can display by clicking on the menu item.

An ellipsis (...) to the right of a menu selection name, for example **New...**, indicates that AutoCAD LT displays a dialog box when you select the menu item.

Almost all menu names and selections have one underlined letter. In the case of a menu name, this indicates that you can select a pull-down menu by simultaneously pressing the ⎡Alt⎦ key and the under-
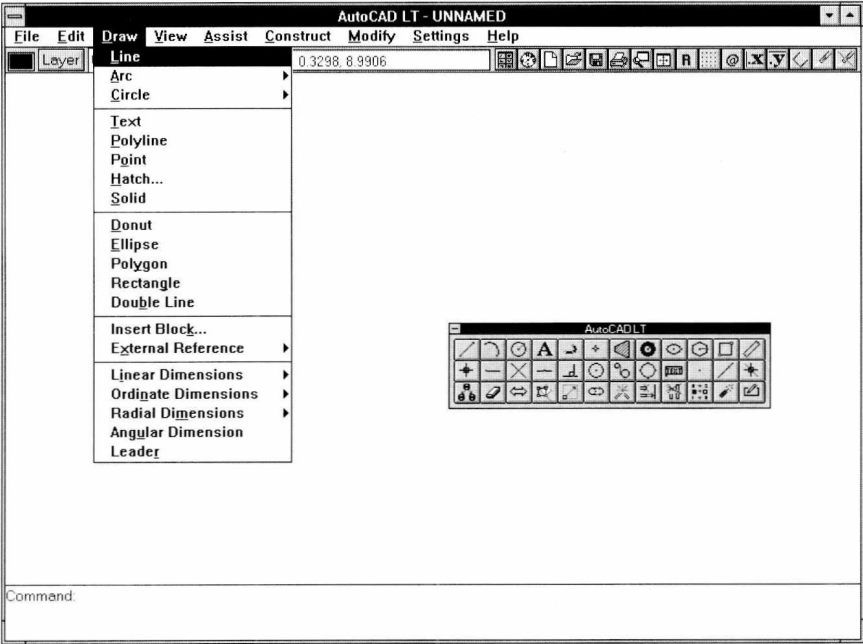
Figure 2

lined letter. For example, to see the **File** pull-down menu, press ⟨Alt⟩ ⟨F⟩. After a pull-down menu is open, you can select an item on the menu by simply pressing the underlined letter corresponding to it.

For more information about pull-down menus, *see* Appendix A: Pull-Down Menu Reference.

Toolbar

The toolbar, shown in detail in Figure 3, contains a number of buttons and displays which provide important information about the drawing and allow you to select frequently used commands with a single pick instead of typing them or selecting them from the pull-down menus. The first seven buttons and displays are always present.

Figure 3

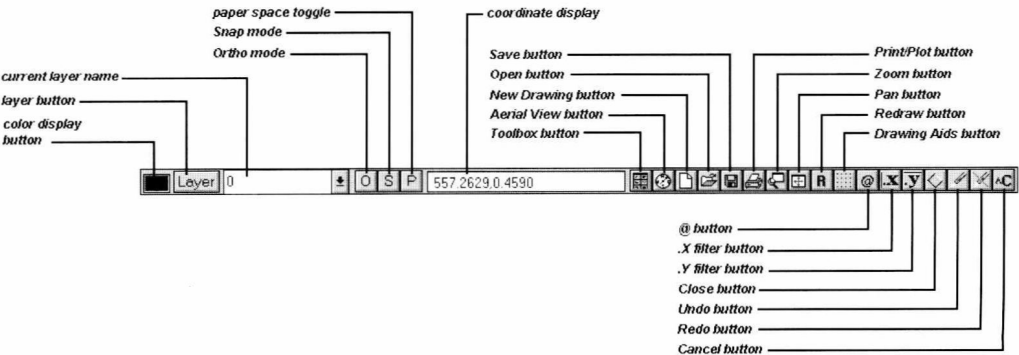|	
Color Display button	This button displays the current color. AutoCAD LT draws every entity you create using this color. The current layer normally determines the color. The use of layers is described in the alphabetic command reference (*see* DDLMODES and LAYER in Part Two). Clicking on the color display button displays the **Entity Create Modes** dialog box. This dialog box provides explicit control over the properties assigned to drawing entities (*see* DDE-MODES in Part Two).
Layer button	Clicking on this button displays the **Layer Control** dialog box. This dialog box lets you control the use of layers (*see* DDLMODES in Part Two).
Current Layer Name button	When you draw with AutoCAD LT, it places the entity you create on the current layer. This information box displays the name of the current layer. If you click on this box or the arrow button to its right, however, a drop-down list box similar to Figure 4 appears. It lists the names of all layers in the drawing. To make a different layer current, double-click on its name in the list. If the drawing has more than eight layers, the drop-down list has scroll bars you can use to scroll through the layer list.
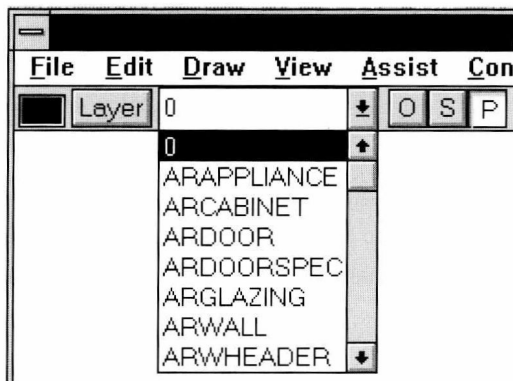
Figure 4

Ortho Mode button	This button toggles Ortho mode on and off. When Ortho mode is on, AutoCAD LT automatically draws lines at right angles to the current graphics cursor orientation (*see* ORTHO in Part Two).
Snap Mode button	This button toggles Snap mode on and off. When Snap mode is on, AutoCAD LT automatically locks the graphics cursor onto an imaginary grid within the drawing. As you move the mouse, the graphics cursor snaps to these grid points (*see* SNAP in Part Two).
Paper Space Toggle button	This button toggles between model space and paper space. Generally, you create objects in model space and then switch to paper space to annotate and plot different views of your objects. This toggle remains inactive when AutoCAD LT's TILEMODE variable has a value of 1. (For more information, *see* the MSPACE, MVIEW, and PSPACE commands in Part Two and the TILEMODE system variable in Part Three.)

Coordinate Display button	This area of the toolbar, also called the status line, displays the current X- and Y- coordinates within the drawing's Cartesian coordinate system. Using coordinates in a drawing is described later in this part. Normally, the coordinate display shows the position of the graphics cursor and is constantly updated as you move the mouse. If you click on this display area, however, you toggle the coordinates display on and off. When the display is off, AutoCAD LT updates coordinates only when you move the mouse and then press the pick button (the left mouse button).

You can customize the remaining buttons. The number of buttons actually displayed varies depending on your screen resolution. (See Appendix B for information about customizing these toolbar buttons.)

Toolbox button	This button controls AutoCAD LT's toolbox. Clicking on this button toggles the toolbar between its four possible states (*see* TOOLBOX): Off Displayed vertically along the left side of the graphics area Displayed vertically along the right side of the graphics area Displayed horizontally and floating (movable) within the graphics area
Aerial View button	This button displays the Aerial View window. After this window is displayed, pressing this button toggles between the Graphics window and the Aerial View window (*see* DSVIEWER in Part Two).
New Drawing button	Pressing this button activates the NEW command to begin a new drawing (*see* NEW in Part Two).
Open button	Pressing this button activates the OPEN command to open an existing drawing (*see* OPEN in Part Two).
Save button	Pressing this button activates the SAVE command to save the current drawing (*see* SAVE in Part Two).
Print/Plot button	Pressing this button activates the PLOT command to produce a printed copy of the current drawing (*see* PLOT in Part Two).
Zoom button	Pressing this button activates the ZOOM command to change the display magnification (*see* ZOOM in Part Two).
Pan button	Pressing this button activates the PAN command to move within the drawing at the current display magnification (*see* PAN in Part Two).
Redraw button	Pressing this button refreshes the graphics area (*see* REDRAW in Part Two).
Drawing Aids button	Pressing this button displays the **Drawing Aids** dialog box, from which you can control AutoCAD LT's various modes as well as the Snap and Grid (*see* DDRMODES in Part Two).
@ button	This button helps you enter relative coordinates (*see* Coordinates later in this part). AutoCAD LT stores the most recent drawing coordinate. Pressing this button retrieves that coordinate.
.X Filter button	This button helps you enter coordinates by letting you filter a coordinate selection so that AutoCAD LT "sees" only the X-coordinate (*see* X/Y/Z filters later in this part).

.Y Filter button	This button is similar to the **.X Filter** button, but filters instead for only the Y-coordinate.
Close button	This button helps you draw lines or polylines. Selecting the **Close** button ends the LINE or PLINE command by creating a final line or polyline segment whose endpoint is the same as the start point for the first line or polyline segment (*see* LINE and PLINE in Part Two).
Undo button	This button reverses the action of the previous command (*see* U in Part Two).
Redo button	This button reverses the action of the previous U or UNDO command (*see* REDO in Part Two).
Cancel button	This button cancels an active command.

Graphics Area

The graphics area is where you actually create your drawings. This area's size is initially determined by the prototype drawing (*see* Beginning a New Drawing—Prototype Drawings later in this part) but changes whenever you use the PAN or ZOOM commands.

You can control the graphics area by setting drawing limits, the lower-left and upper-right coordinates controlling the portion of the graphics area in which you can draw (*see* LIMITS in Part Two). The actual portion of the graphics area a drawing occupies is called the drawing's extents. The extents may be less than the drawing's limits. If limits checking is turned off, the drawing's extents may actually exceed the drawing's limits. You can always use the ZOOM command to change the magnification of the graphics area so that you can view either the drawing's limits or the drawing's extents (*see* ZOOM in Part Two).

Graphics Cursor

The graphics cursor represents your pointing device within the graphics area. As you move your mouse, the graphics cursor moves. Within the graphics area, the cursor is normally a small target box centered on a cross-hair. The cross-hair extends across either the entire graphics area or the entire active drawing window. When you move the cursor outside the graphics area, a Windows arrow cursor replaces the graphics cursor.

Occasionally, the graphics cursor's appearance changes. For example, whenever AutoCAD LT prompts you to select an object, the cursor changes into a small square called a pick box (*see* Entity Selection later in this part). Whenever AutoCAD LT displays a dialog box, a Windows arrow cursor replaces the graphics cursor. Some commands, such as COPYIMAGE, change the graphics cursor into a small cross-hair (*see* COPYIMAGE in Part Two).

Toolbox

The toolbox, shown in Figure 5, contains a number of buttons for selecting frequently used commands with a single pick instead of typing them or selecting them from the pull-down menus. Although a toolbox is supplied with AutoCAD LT, you can customize all its buttons (*see* Appendix B for information about customizing the toolbox).