

CHAPTER ONE

Introducing AutoCAD



IN THIS CHAPTER:

- ▶ Exploring AutoCAD's interface
- ▶ Working with AutoCAD files
- ▶ Getting to know basic tools
- ▶ Drawing a rough sketch



Introduction

The way things were in the Elizabethan era, a director would have expected a **set** builder to produce a set by hand without any drawings. Over time, theatre has embraced the newest and most innovative technologies. It has progressed from candles to computerized lighting boards, from backstage **Foley artists** to surround sound, and from hand-operated **fly systems** to motorized fly systems. As a new approach to drafting, which has largely been done by hand, many theatres have begun to use computer-aided drafting (CAD, also commonly referred to as computer-aided design) software.

Originally developed to lower costs and reduce the time needed to create complex prototypes, CAD software generates two- and three-dimensional graphics by processing geometric calculations. This helps designers from several industries prepare accurate drawings and specifications for production purposes. Industries that use CAD include engineering, manufacturing, architecture, interior design, and of course, entertainment.¹

For theatre, CAD can be used to generate accurate and detailed technical drawings for set designs, but it also has many additional benefits. For example, drafters who use CAD can work out calculations “on the fly,” reduce the time and energy needed for laborious drawing tasks, and make quick alterations to existing drawings. Furthermore, CAD drawing files can be easily emailed to theatres around the world, where they can be printed on demand.

One of the most exciting aspects of CAD—and what really sets it apart from hand drafting—is that it allows the director and **production team** to virtually “walk through” the set in three dimensions to scrutinize, review, and modify it before it is built. It’s like having a digital version of a designer’s traditional **maquette**.

In this book, we’ll introduce you to one of the more popular CAD applications, AutoCAD, to start you on your way to drafting accurate technical drawings for set designs. Now let’s get this show on the road!

Downloading a Free Copy of AutoCAD

If you are a student, you are probably working on a licensed educational version of AutoCAD at school. If you would like to work with AutoCAD on your home computer, you can obtain a free copy from the AutoDesk Education Community at the following link:

<http://students.autodesk.com>

¹ *Yahoo Education Encyclopedia*, s.v. “computer-aided design,” accessed August 9, 2011, <http://education.yahoo.com/reference/encyclopedia/entry/computerAD>.

Getting Started with the Set-Up

Though you're probably eager to jump right in and start drawing, before you start drafting in AutoCAD, you need to understand the basics of using the application. Let's have a look at AutoCAD's interface, drawing files, and some drawing commands. This will make it easier to understand the book and communicate with other AutoCAD users. Now let's get started.

LAUNCHING AUTOCAD

AutoCAD launches just like any other Windows application.

- 1) Double-click the *AutoCAD 2011 - English* shortcut (Fig. 1.1) on your desktop.
Alternatively, launch the application through your computer's start menu: *Start > All Programs > Autodesk > AutoCAD 2011 > AutoCAD 2011 - English* (Fig. 1.2a).
Your computer will make some noise and launch AutoCAD.

THE WELCOME SCREEN

When you launch AutoCAD 2011 for the first time after it is installed, the *Welcome Screen* will be the first thing you see. It includes videos, workshops, and other information to help you learn about AutoCAD 2011.

- 1) For now, uncheck the box next to *Show this dialog at startup* at Fig. 1.3a.
- 2) Close the *Welcome Screen* by clicking the X at Fig. 1.3b.*

Fig. 1.3

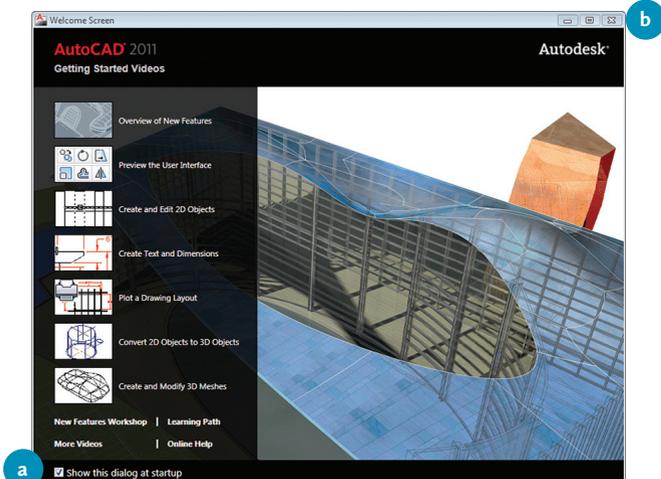


Fig. 1.1

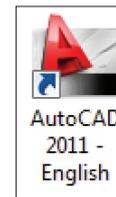
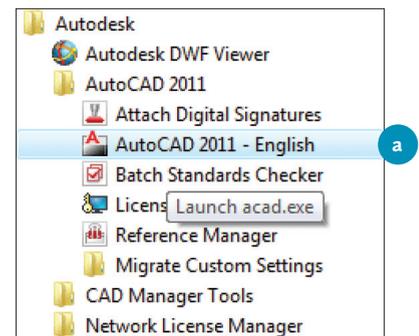
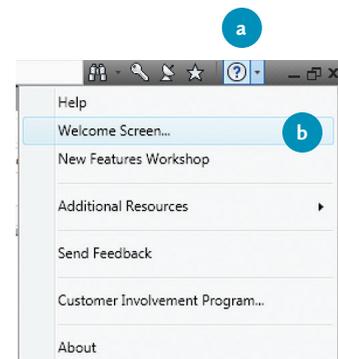


Fig. 1.2



* We won't cover the *Welcome Screen* in this manual, but any time you would like to browse through its demos and videos, simply open it like this:

- 1) Click the arrow for the *Help* drop-down menu on the upper right of the application at a:
- 2) Select *Welcome Screen...* (b).



THE APPLICATION WINDOW

AutoCAD runs within the Windows operating system and opens as a window on your computer screen.² This *Application Window* offers commands and options for AutoCAD drawing files.

Have a look at the *Application Window*. The *title bar* is the row that runs across the top of the window (see also Fig. 1.12 on page 36). In the centre of the *title bar*, you'll see *AutoCAD 2011 - Drawing1.dwg*, which is the name of the current document. On the left are the *Application Menu* and the *Quick Access Toolbar*. On the right are the *InfoCenter* and the buttons used to control the *Application Window*.

As with all Windows applications, the AutoCAD window can be managed with the buttons in the top right corner of the *title bar*.

Test out the *Minimize*, *Restore*, and *Maximize* buttons (Table 1.1) to see how they behave. Notice how the application is minimized to the Windows *taskbar* at the bottom of your computer screen (Figs. 1.4, 1.5). If you accidentally close AutoCAD, there's no need to worry; you can easily relaunch it as shown earlier.

Fig. 1.4



Windows Taskbar:
AutoCAD window
minimized

Fig. 1.5



Windows Taskbar:
AutoCAD window
floating or maximized

Fig. 1.6

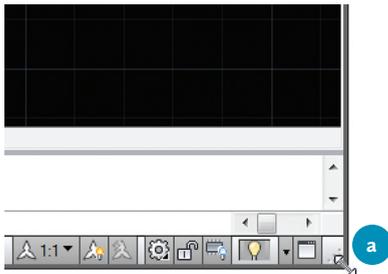


Table 1.1. Window buttons

Full screen window	Floating window
<p>Minimize: Shrinks the Application Window to the Windows taskbar at the bottom of your computer screen</p>	<p>Restore: Reduces the Application Window to a smaller floating size</p>
	<p>Maximize: Increases the Application Window to full screen</p>
	<p>Close: Closes the AutoCAD application</p>

Notice that when you click the *Restore* button, it becomes the *Maximize* button as the application switches to a floating window. In this state, the *Application Window* can be resized to suit your needs.

- 1) Move the mouse pointer to a corner or an edge of the *Application Window*. The pointer will become a resize handle (Fig. 1.6a).
- 2) Press and drag the mouse to adjust the window to your liking.

² Although there is a version of AutoCAD available for the Mac, this book will deal only with the Windows version.

THE APPLICATION MENU

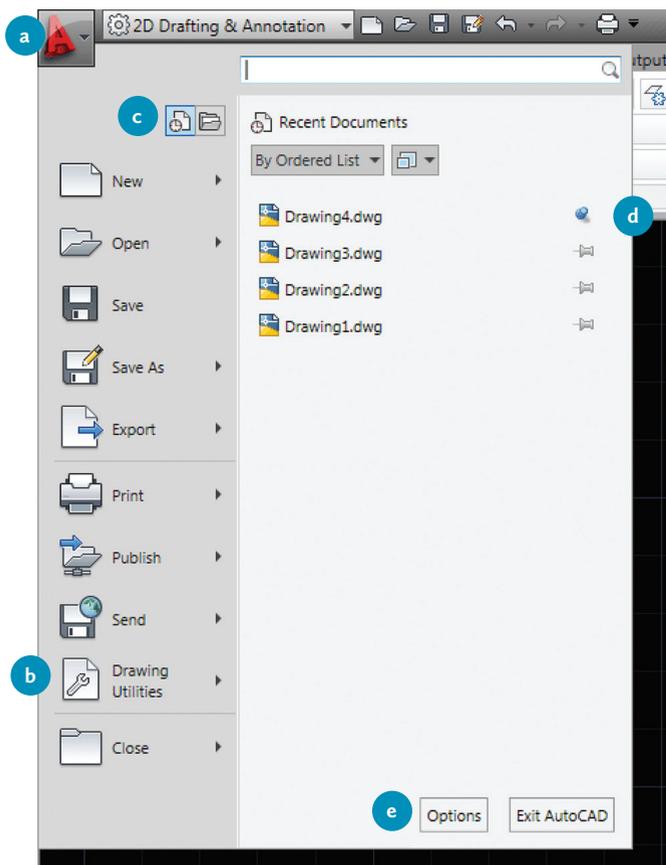
When you click the big red A at **a** in Fig. 1.7, the *Application Menu* will open. It contains common commands for managing files, most of which will be discussed later in the book. Take note of the *Drawing Utilities* item at **b**, which contains options, such as *Units*, for adjusting your drawing.

Also helpful are the *Recent Documents* and *Open Documents* buttons at **c**. *Recent Documents* provides you with an alphabetical list of the most recently opened drawings. To keep a file in the list long-term, click the *push-pin* button at **d**.

Clicking the *Open Documents* button at **c** shows you the list of documents currently open in AutoCAD and provides you with a quick way to switch between them.

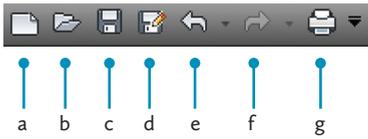
Notice that this menu also provides you with a button at **e** for quick access to the application's main *Options* dialogue box where you can change settings, such as the background colour* of the drawing area.

Fig. 1.7



* Note that a number of words, such as “color,” “center,” “dialog,” etc. are spelled according to American conventions within the AutoCAD interface.

Fig. 1.8



THE QUICK ACCESS TOOLBAR

To the right of the *Application Menu* is the *Quick Access Toolbar*, which contains many of the same commands.

- 1) Hover your mouse over the buttons to see their tooltips: *New...* (Fig. 1.8a), *Open...* (b), *Save* (c), *Save As...* (d), *Undo* (e), *Redo* (f), and *Plot...* (g) (or *Print...*).
Notice that to the right of the *Undo* and *Redo* buttons at e and f are downward arrow buttons that each open a drop-down list of recent actions you performed in your drawing. You can jump to any of these actions with just a click.

THE INFOCENTER

Included on the right side of the *title bar* is the *InfoCenter*. Its two key features are the *Help* button at Fig. 1.9a and the *Type a keyword or phrase* search field at b.

The *Help* button (a) simply launches *AutoCAD 2011 Help* in your default browser.

- 1) Click the *Help* button.
The *AutoCAD 2011 Help* home page will open. Notice the *Search* field at the top right of the website and, in the navigation bar on the left, the *User's Guide* and *Command Reference* links are particularly useful.*

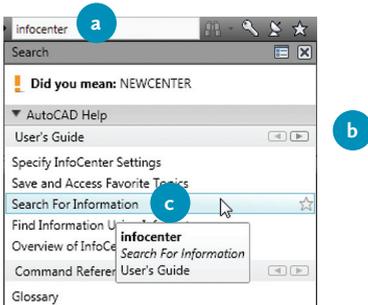
* You can also launch the *Help* home page by typing "Help" in the command line and pressing *Enter*.

Fig. 1.9



You can also find information on a topic directly within AutoCAD. Try the following example.

Fig. 1.10



- 1) Type *InfoCenter* in the search field at Fig. 1.10a and press *Enter*.
A drop-down list appears. Notice that within the list, major dark grey headings collapse and expand vertically with a click, and there are navigation arrows to the right of the subsection headings (b) to allow you to scroll through more information horizontally.
- 2) Click *Search For Information* at c under the *User's Guide* section.
A browser window will open the appropriate section of *AutoCAD 2011 Help*.

WORKSPACES

A workspace is the collection of items that are set up to create different user interfaces (UI) for specific types of drawings. If you look at Fig. 1.12 (page 36), the workspace is made up of the *ribbon*, *drawing area*, *command window*, and *status bar*.

AutoCAD offers several different workspaces. Set designers and drafters are most likely to use the *2D Drafting & Annotation* workspace and the *3D Modeling* workspace.

For the technical drawings of the set, we'll work with *2D Drafting & Annotation*, which opens by default when you launch the application for the first time. We'll also work with the *3D Modeling* workspace in Chapter 6 to create a three-dimensional drawing.

Check to see whether your workspace is set to something other than the default. If it is, change it back now:

- 1) Click the *Workspace* drop-down menu at the top left of the application.
- 2) Select *2D Drafting & Annotation* at Fig. 1.11a.

After using a workspace, you will quickly become accustomed to where things are located and be able to work efficiently.

THE 2D DRAFTING & ANNOTATION WORKSPACE

Now let's examine some basic components of the two-dimensional workspace.



Fig. 1.11

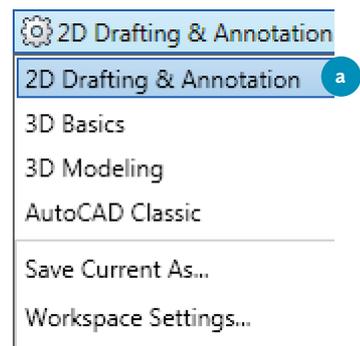


Fig. 1.12

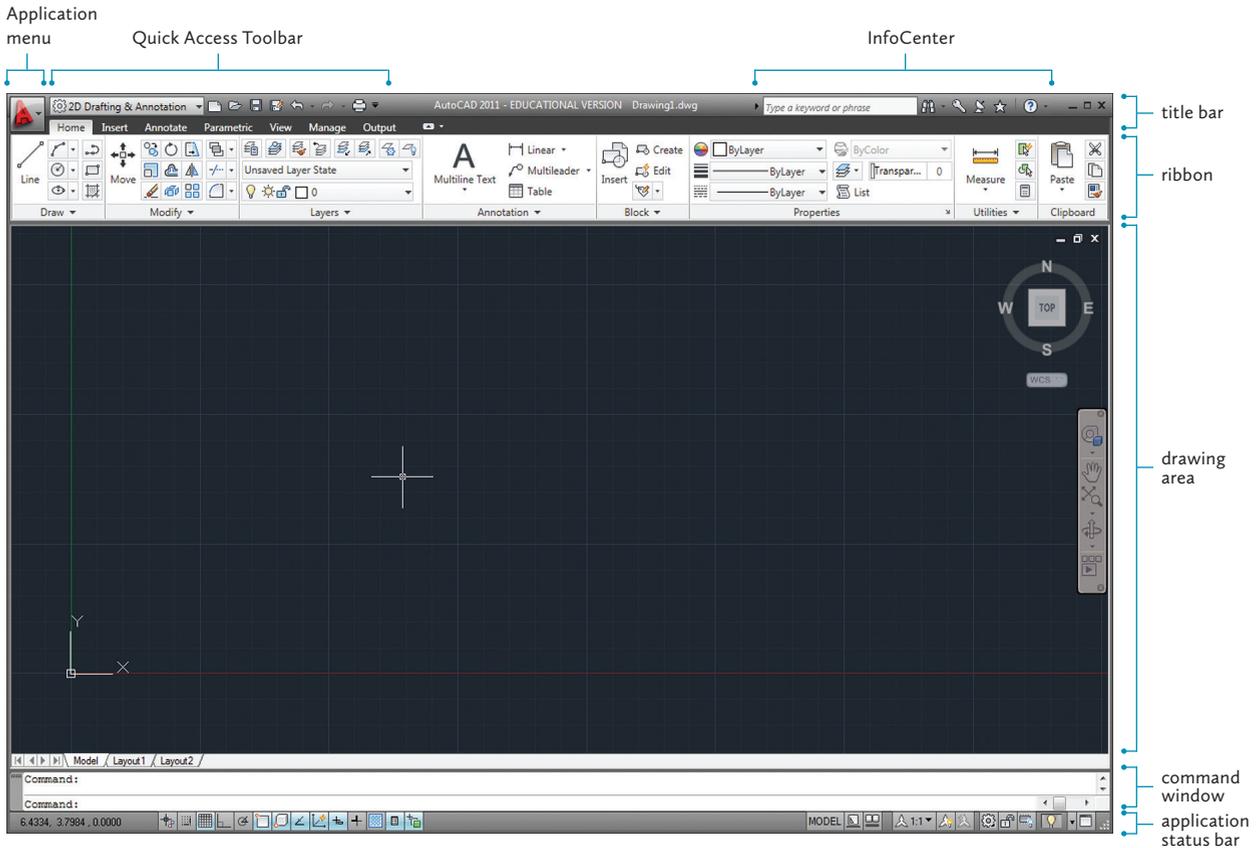


Fig. 1.13

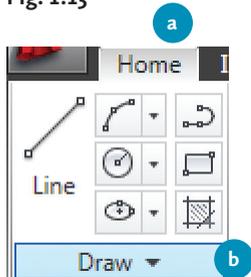
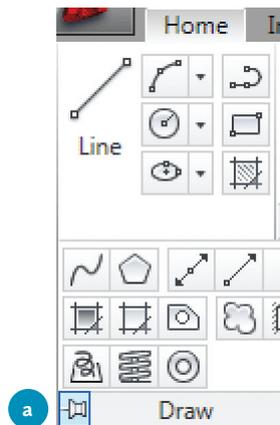


Fig. 1.14



THE RIBBON

Below the *title bar* in Fig. 1.12, you will find a palette called the *ribbon* which contains many of the application's commands and options.

- 1) Click the *Home*, *Insert*, etc., tabs on top. You'll see that each contains different sets of command buttons inside rectangular panels.
- 2) In the *Home* tab at Fig. 1.13a, click the arrow next to the title of the *Draw* panel at b. This opens a menu called a slide-out or fly-out menu, which contains additional commands.
- 3) Click other arrows on the panels and you'll see they also contain additional command buttons.
- 4) Whenever you need to, click the *push-pin* button (Fig. 1.14a) to lock a slide-out menu open.

TABS AND PANELS

As you just saw, the *ribbon* contains buttons that allow you to activate AutoCAD commands or display options and information. The buttons we'll use frequently in the beginning can be viewed in the *Home* tab panels:

Draw activates drawing commands such as *Line*, *Arc*, *Circle*, *Rectangle*, *Polyline*, and *Hatch*, which you will use to draw lines or objects.

Modify activates commands that allow you to modify lines and objects you have drawn. Some examples are *Erase*, *Rotate*, *Scale*, *Stretch*, *Copy*, *Mirror*, *Offset*, and *Fillet*.

Layers activates commands to add drawing layers, or hide or lock them. This panel also contains commands to configure layer *Linetypes* and *Colors*, and to select the *Current* layer to draw on.

Properties controls the properties that are associated with each object that you have drawn. Several drop-down lists can control object *Color*, *Lineweight*, *Linetype*, *Transparency*, and *Plot Style*. Most objects inherit the default properties assigned to them by the layer (*ByLayer*) in which they are drawn, but groups of objects called blocks can be assigned their own properties (*ByBlock*) and individual objects can also be assigned their own unique properties.

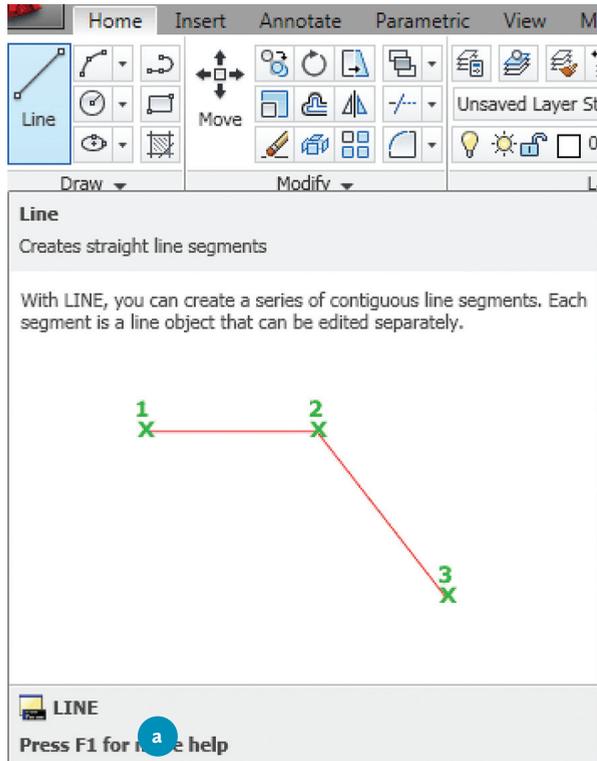
Utilities contains commands used to measure a *Distance*, *Radius*, *Angle*, and *Area* in a two-dimensional drawing. It will come in very handy when we begin drafting. Besides the measuring commands, you'll find the *ID Point* button, which is used to determine the exact location of a point.

Later when we add measurements and labels to drawings, we'll also examine panels such as *Dimensions* in the *Annotate* tab and we'll learn about panels that are specific to 3D drawings. If you don't understand much of this right now, don't worry; you'll catch on as we put it into practice.

TOOLTIPS AND THE F1 KEY

A great feature to take advantage of on the ribbon is the tooltip. Pause your mouse pointer over a button on the interface, and a small pop-up tip will appear. As you can see in the *Line* command tooltip in Fig. 1.15, you can press the *F1* key to open the related help topic (a) while the tooltip is active or after the command is activated.

Fig. 1.15



THE MINIMIZE RIBBON BUTTON

Another neat feature of the *ribbon* is the space-saving *Minimize* button. It's a small upward arrow button to the right of the *Express Tools* tab (Fig. 1.16); notice the small drop-down arrow next to it.

- 1) Click the drop-down arrow (Fig. 1.16a). You'll see a menu with four options for minimizing the ribbon.
- 2) Select one of the first three options to set the level of minimization you want. The *Cycle through All* option at c sets the button so you can alternate between all three minimization levels.
- 3) Now, click the upward arrow button at b. See how you can switch between the full *ribbon* and the minimized option you chose.
- 4) Click it again to switch back.

Fig. 1.16

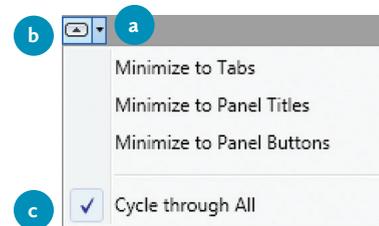


Fig. 1.17



THE COMMAND WINDOW

At the bottom of the *Application Window*, you'll find the *command window* (Fig. 1.17). This is a palette that gives you feedback by displaying commands, options, messages, and variables. It also prompts you for keyboard and mouse input. The chronological list of every command you've activated during a work session can be seen by using the scrolling arrows at the right or by resizing the window using the vertical resize handle \updownarrow on the top edge of the palette.

The input line at the bottom of the *command window* is called the *command line*. It allows you to use the keyboard to tell AutoCAD what to do.

Often when you activate a command by pointing and clicking your mouse, the *command window* lets you know what your next step is and what information you have to enter.

THE APPLICATION STATUS BAR

You'll find the *application status bar* (also called the *status bar*) at the bottom of the workspace. The *status bar* contains several buttons for turning drawing and display options on and off. These buttons are highlighted in blue to indicate that they are turned on. We'll turn on these buttons as we need them throughout the manual. For now, toggle them all off.*

At the left end of the *status bar*, you'll see three sets of numbers separated by commas (Fig. 1.18a). This is the drawing coordinates display. The first number is the X coordinate of your cursor and the second one is the Y coordinate. The X coordinate refers to the horizontal location of a point on a grid, whereas the Y coordinate refers to the vertical location of the same point. The third number, known as the Z coordinate, is only active when you draft in 3D. Together, these display the coordinate values of your current cursor position within the drawing area.

Try moving your cursor around to see how its coordinates change at Fig. 1.18a.**

Fig. 1.18



* You'll need to pay a little more attention to the Transparency button, which still looks highlighted when it is turned off.

** Looking at the coordinate values, you'll see that inches are displayed in decimals. This is done for the sake of precision, but it is more common to format inches with fractions. We'll change this a little later.

Fig. 1.19

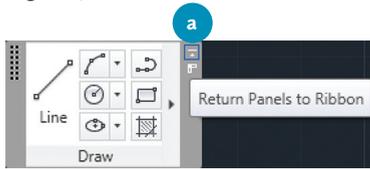
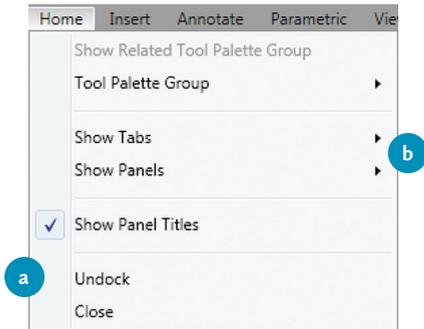


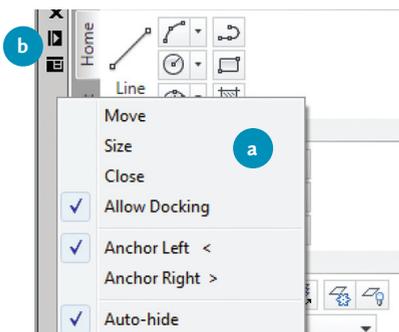
Fig. 1.20



* The name of the palette becomes visible once it's floating.

** If you accidentally close the floating ribbon palette, just enter the word "ribbon" in the command line.

Fig. 1.21



*** You can often double-click the move handle of a floating or docked palette to instantly change its state. Try double-clicking the move handle of the command window to float it. Now do it again to dock it.

FLOATING AND DOCKING WORKSPACE ELEMENTS

AutoCAD lets you personalize the workspace the way you like it. By default, the tabs and panels adhere to the docking region at the top, sides and bottom of the drawing area. But as you'll see, you can easily drag items around the interface. For example, you can drag the tabs to change their order. It's also possible to detach and reattach palettes and panels at your convenience. This is called floating and docking.

To float a panel:

- 1) Click the panel's name to drag it into the *drawing area* at Fig. 1.19a. The panel will float and its move handle will appear on its left. You can move it around and place it where you like.
- 2) Click the *Return Panels to Ribbon* button at b to reset it in the ribbon. Or drag it back into place on the ribbon.

To float the *ribbon*:*

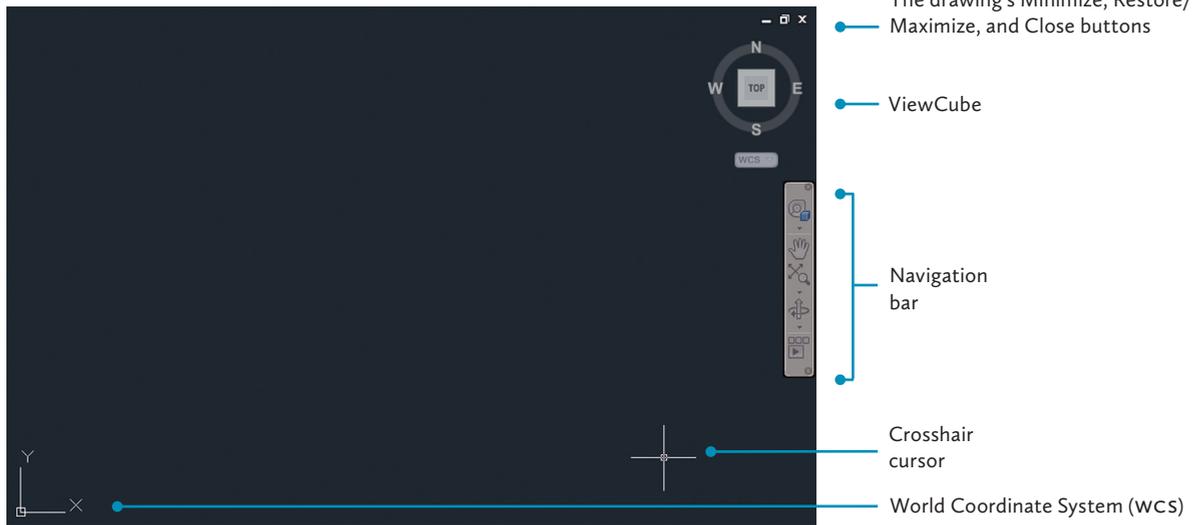
- 1) Place the cursor over any tab and right-click to see the *ribbon's* context menu (the right-click menu).
- 2) Select *Undock* at Fig. 1.20a. The *ribbon* palette will float on the *drawing area*.
- 3) Right-click the palette's move handle, which is the vertical grey bar on its left, and you'll see the *Properties* menu at Fig. 1.21a. (Note that you can also get this menu by clicking the third button from the top.) This will give you options to dock the *ribbon* to the left or right of the drawing area. When you need more space, the *Auto-hide* option at Fig. 1.21b can be handy. You can also prevent a palette from docking if you prefer it to float by default.**

For now we'll return the palette to its original spot.

- 1) Press and hold the move handle and drag it back to the top of the *drawing area* to see what happens. When the pointer approaches the edge, the palette will be replaced by a rectangular outline indicating it is ready to be docked.
- 2) Let go, and the *ribbon* will dock itself.***

Now that you are familiar with the interface, you can rearrange the workspace the way you like it. The *Save Current As...* item of the *Workspace* drop-down menu lets you name and save your customized workspace.

Fig. 1.22



THE DRAWING AREA

The area reserved for drawing files is the dark space in Fig. 1.22. This is called the *drawing area*. AutoCAD uses dark grey as the default background colour. ****

Notice the drawing's *Model* tab (Fig. 1.23a) at the bottom left of the *drawing area*. It shows you that you are currently working in the drawing's *model space*.

- 1) Click the *Layout 1* tab at the bottom left of the drawing area (Fig. 1.23b).
The *MODEL* button (not the same as the tab) on the right side of the *status bar* will change to *PAPER* to show that *paper space* is turned on. This white area represents a sheet of paper used when your drawing is ready to print.
- 2) Click the *Model* tab (a) at the bottom left of the application window to return to *model space*.

**** Often the drawing area in this manual has been changed to white for the sake of clarity. If you'd like to change the background colour, right-click the drawing area and select Options... from the context menu. Then select Display, click the Colors... button and choose White from the Color: drop-down menu; click the Restore all contexts button to return to the default colours.

THE VIEWCUBE

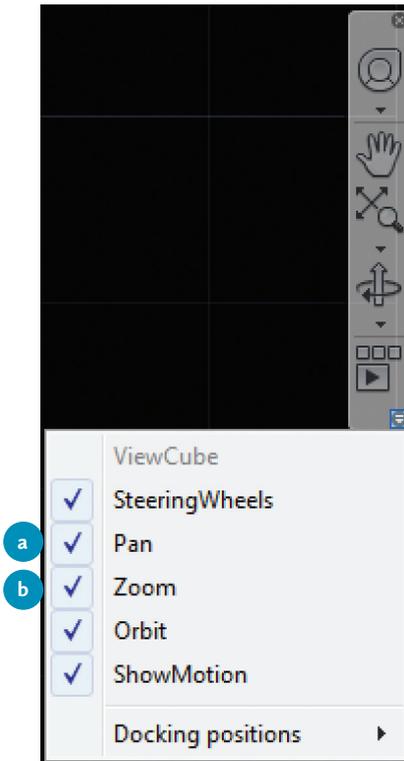
You can see the *ViewCube* in the upper right corner of the drawing area. We will cover this in Chapter 6, so we'll turn it off for now.

- 1) Click the *View* tab on the *ribbon*.
- 2) Locate the *Windows* panel.
- 3) Click *User Interface*. A drop-down list will appear.
- 4) Uncheck *ViewCube*.

Fig. 1.23



Fig. 1.24



THE NAVIGATION BAR

The *navigation bar* contains tools that help you look at your drawing. You can decide which tools are visible by clicking the arrow for the fly-out options menu at the bottom of the bar. The most commonly used tools for 2D drawings are the *Pan* and *Zoom* tools (see Fig. 1.24a and b). We'll look at these in detail later.

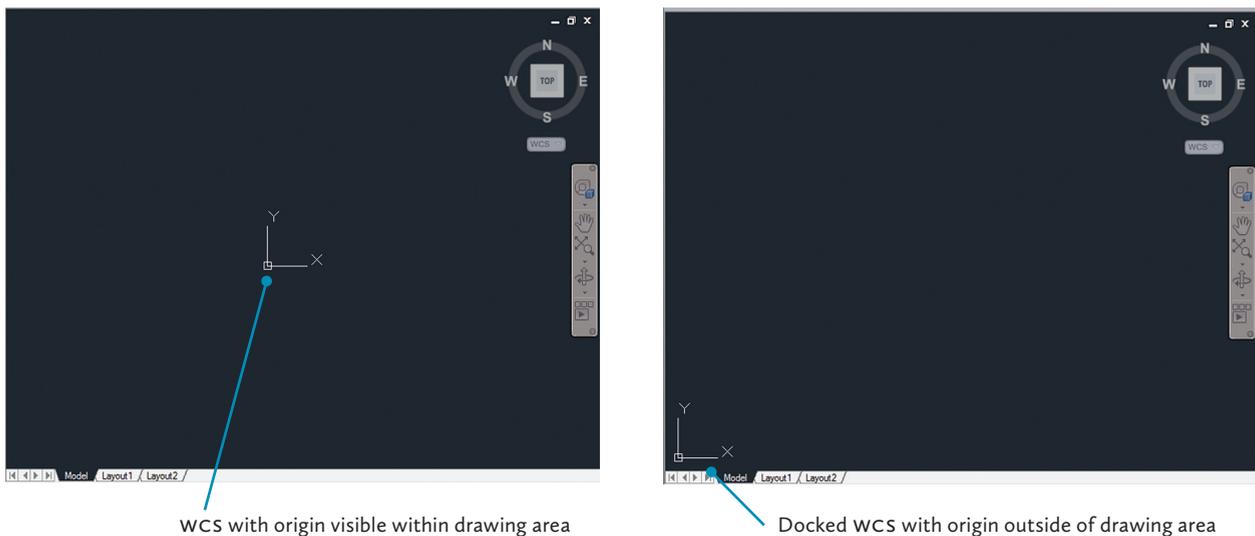
THE WORLD COORDINATE SYSTEM (WCS) AND USER COORDINATE SYSTEM (UCS)

Remember the drawing coordinates at the left of the status bar? They are measured in relation to the *world coordinate system (WCS)*. If you think of the drawing as a digital world, the *WCS* is the fixed origin of the coordinates that define a drawing's points. When the *Grid Display* setting on the *status bar* is on (turn it off after you experiment), you'll also see a red horizontal line representing the X-axis and a green vertical line for the Y-axis of the coordinate system.

When the *origin* is within the drawing area, the *WCS* icon will overlay the *origin*. If the *origin* is not in the drawing area, the icon will dock itself in the lower left corner of the *drawing area*.

Sometimes it is useful to move the *origin* to create a *user coordinate system (UCS)*, which gets its name because it is user-defined. However, when an object with a *UCS* is copied from one drawing to another, AutoCAD will always drop the *UCS* and reorient the object to the *WCS*. As a general rule, try to stick with the *WCS*. There is no need to worry much about *UCS* yet, as this is a fairly advanced topic.

Fig. 1.25



Working with Drawing Files

Drawing files are the most important documents for your project because they store your work. They are opened in the drawing area and saved separately from the rest of the workspace.

CREATING NEW FILES FROM TEMPLATES

AutoCAD starts new documents from templates. A template contains a set of preferences allowing you to create new files without having to make changes to the settings each time. For example, templates set *drawing units* and the background colour of the *drawing area*.

As we've seen in Fig. 1.12, when AutoCAD launches, a new file called *Drawing1.dwg* opens with it by default. This is typically a file made from a template that contains preferences for two-dimensional drafting.

Let's cover the *New* command to give you a better idea of templates.*

It's time to create a new file.

- 1) Click the *Application Menu* in the upper left corner of AutoCAD.
- 2) Select *New* > *Drawing* from the menu options (Table 1.2). The *Select template* dialogue box appears.
- 3) Select *acad.dwt* (Fig. 1.26a), which is a template file.
- 4) Click the *Open* button (b). A blank drawing called *Drawing2.dwg* will open in the *drawing area*.

AutoCAD is used in many different industries, so it offers a choice of templates to start drawings with. The two that are covered in this manual are the classic *acad* template and the *acad3D* template. Both have decimal formatted imperial inches as the default units. This means, for example, that a quarter of an inch will be displayed as 0.25".

* Throughout the manual, tables such as Table 1.2 are provided to show you ways to activate a command either with your mouse or with your keyboard.

Table 1.2. New command

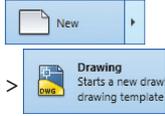
	Application menu:
	
	Quick Access Toolbar:
	 (New/Qnew)
	Keyboard shortcut:
	Ctrl + N
	Command line entry:
	new

Fig. 1.26

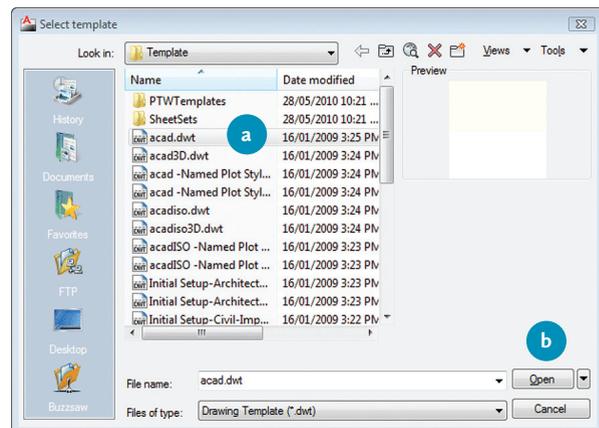
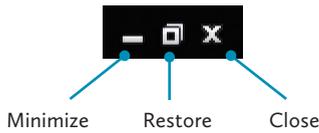


Fig. 1.27



SWITCHING AND MANAGING DRAWING WINDOWS

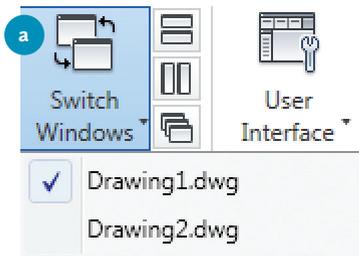
Just like the *Application Window*, drawing files also have *Minimize*, *Restore*, *Maximize*, and *Close* buttons just below the *ribbon* to the right (Fig. 1.27). These buttons are particularly useful for switching between files when you are working with more than one at a time.

- 1) Click the active drawing's *Minimize* button. Your drawing file will minimize within the *drawing area* and you'll also be able to see the other drawing either restored or minimized.
- 2) Click the *Maximize* button for one of your two drawings so that it fills the *drawing area* again.

Probably the simplest way to switch between open windows is through the *Switch Windows* button.

- 1) Click the *View* tab. You'll see the *Windows* panel at the right side.
- 2) Click the *Switch Windows* button as shown at Fig. 1.28a. A drop-down list will appear, allowing you to select the drawing you want to switch to.

Fig. 1.28



You can also use the buttons in the *Application Menu* that were described in Fig. 1.7 (see page 33).

- 1) Click the *Application Menu* (the big red A) in the upper left corner of AutoCAD.
- 2) Click the *Open Documents* button. You'll see the *Open Documents* list appear, which allows you to select the open document you want to work on.

Lastly, you can use the *Ctrl + Tab* and *Shift + Ctrl + Tab* key combinations to move forwards and backwards through the sequence of open drawings.

Table 1.3. Sample drawing file
Drawing1.dwg

* Remember that getting into the habit of saving frequently is good practice. This helps you avoid losing your work should AutoCAD or your computer ever crash.

SAVING DRAWING FILES

Saving your files lets you store your drawings until you are ready to work on them again. The AutoCAD drawing file extension is *.dwg* (an abbreviation of “drawing”), and it is automatically added to the end of the file names you save (Table 1.3). This file extension lets the computer know which application is used to open the document. If it is not visible, your Windows operating system may be set to hide extensions; if so, it is useful to change your Windows folder settings to display file extensions. If the extension is removed from a file's name, you may encounter difficulties when you try to open it.*

Connect your USB drive if you have one—more on this later. Next, name and save one of the files immediately:

- 1) Activate the *Save As...* command by choosing a method in Table 1.5. The *Save Drawing As* dialog box will open (Fig. 1.29).
- 2) Click the *Save in:* drop-down list shown at Fig. 1.29a.
- 3) Select your main saving location. In this book, it's a portable USB drive, though you may want to save to another location.
- 4) Name the document *rough_sketch* at **b**.**
- 5) Click the *Save* button (**c**).

Fig. 1.29

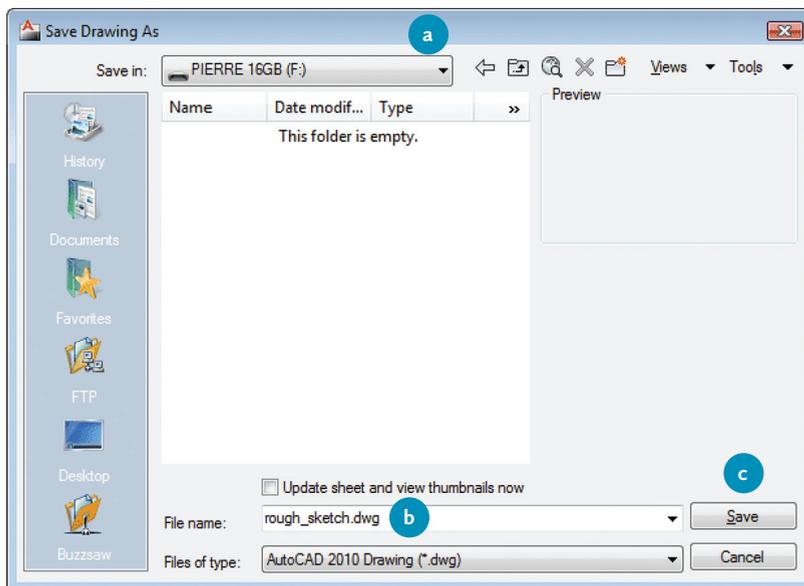


Table 1.4. Save command

	Quick Access Toolbar:
	Application Menu:
	Keyboard shortcut: Ctrl+S
	Command line entry: save

Table 1.5. Save As command

	Quick Access Toolbar:
	Application Menu:
	Keyboard shortcut: Shift + Ctrl + S
	Command line entry: saveas

** The way you name your files helps you sort and find them easily. In this book, file names use underscores (_) instead of spaces between words. File names for the set drawings will begin with a capital letter while other drawings will stick with lowercase letters. A rule used to name files is called a naming convention. For other options for naming files effectively, see Appendix A on naming files.

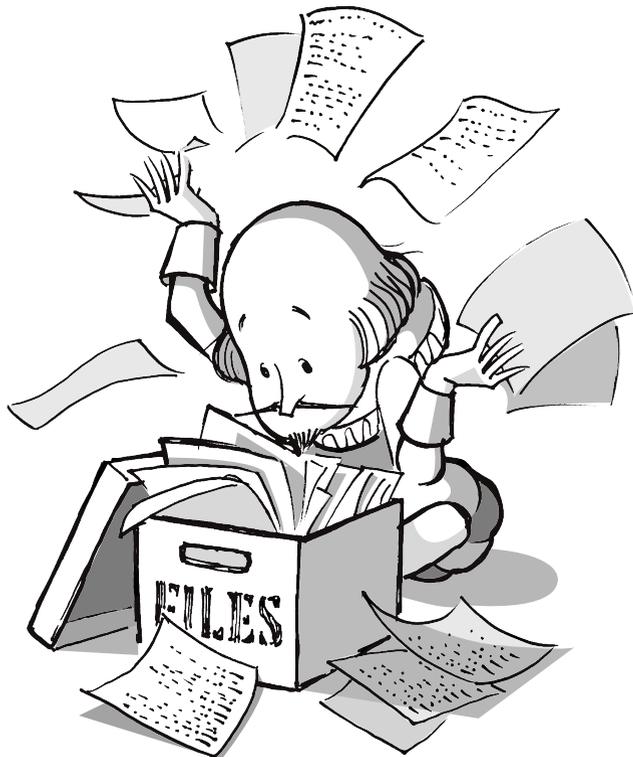
DRAWING VERSIONS

Occasionally, you may need to open your drawing files in an older version of AutoCAD. For this situation, you have the option to save your document in various versions of AutoCAD in the *Files of type*: drop-down menu. Whenever you are in such a situation, refer to the options in Table 1.6 to decide which file type to choose for the version of AutoCAD you will be using.*

* Note that settings such as drawing units that apply directly to your document will be saved with your file. You won't need to reset those each time you reopen it. However, workspace settings are not saved with files.

Table 1.6. AutoCAD versions and file types

AutoCAD Version	Files of type
v13, v14, 2000, 2001, 2002, 2003	AutoCAD LT97/LT98/R14/2000/LT2000/Drawing (*.dwg)
2004, 2005, 2006	AutoCAD 2004/ LT2004 Drawing (*.dwg)
2007, 2008, 2009	AutoCAD LT2004/2007 (*.dwg)
2010, 2011	AutoCAD 2010 (*.dwg)



DISPLAYING THE FULL FILE PATH

If you are new to computers and AutoCAD, you may find it difficult to find your files. It is possible to see the complete path to an open file in the *title bar* if you change the *Open and Save* options in the *Options* dialogue box:

- 1) Click the *Application Menu* button.
- 2) Select the *Options* button on the lower right side of the menu (see Fig. 1.7 on page 33). The *Options* dialogue box will open (Fig. 1.30).
- 3) Select the *Open and Save* tab as shown at **a**.
- 4) Locate the *File Open* box at the top right side.
- 5) Check off the *Display full path in title* option (Fig. 1.31a).

Another quick way to open the *Options* dialogue box is to right-click the *drawing area* and select *Options* from the right-click (context) menu.

Now, whenever you have a file open in AutoCAD, you'll be able to see the breadcrumb trail within the *title bar* as shown in Fig. 1.32.

Fig. 1.30

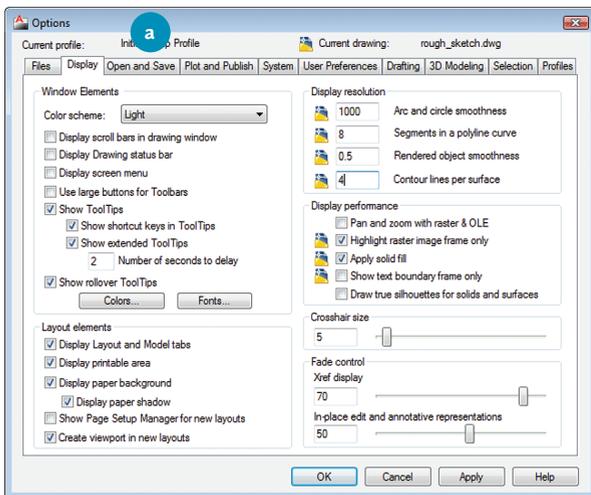


Fig. 1.31

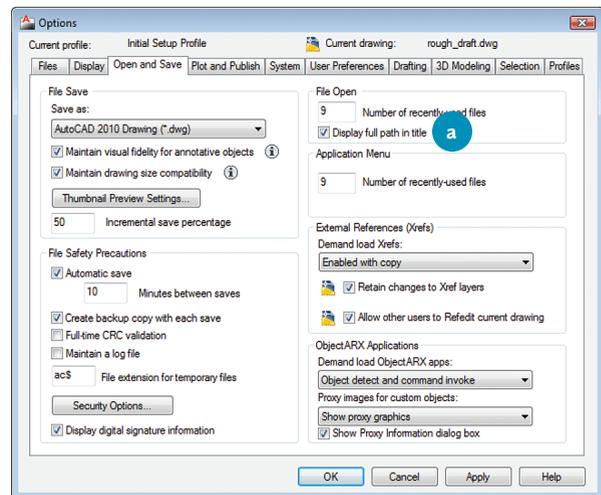


Fig. 1.32

AutoCAD 2011 - EDUCATIONAL VERSION F:\USB_key\rough_sketch.dwg



Table 1.7. Backup file example

Drawing1.bak

* Consult the [Backup Files Location and Automatic Saving](#) sections of [Appendix B](#) for more information on protecting your files.

Table 1.8. Sample file version history

Dussol_Ground_Plan_1.dwg
 Dussol_Ground_Plan_1.1.dwg
 Dussol_Ground_Plan_1.2.dwg

** Remember that if you remove your USB drive without ejecting first, the file system can be corrupted and you could lose access to your files. Always right-click it and choose *Eject* from the menu before pulling it out.

For more strategies for protecting your work, see [Appendix B on Extended File Protection](#).

PROTECTING YOUR WORK

Drat! Computers and applications can crash. Files can become corrupted and impossible to use. Hard drives wear out over time. USB drives can be damaged or lost and networks can fail. In order to protect the hours of work you've put into a drawing, you need to save often. However, you also have several other alternatives to protect your work.

BACKUP FILES

Generally, when you save an AutoCAD file, AutoCAD saves a backup copy in the same location (Table 1.7). This is helpful if your current file gets corrupted; simply replace the .bak extension with .dwg to regain your file.*

FILE HISTORIES AND EMAIL

Every time you open an existing file, work on it, and then save it again, you overwrite your previous work. Each time you save, it represents a step in the development of your project. If you only save a single file, you are essentially keeping all your eggs in one basket, and you risk having to start all over again if the file ever gets corrupted.

A simple solution is to save versions of your work to create a history. Simply add a number to the end of the file name each time you make significant progress in your project (Table 1.8). Then store older versions of your files in a separate folder.

An even easier and thriftier way to create a file history is to email yourself copies of your files after your work sessions. This will give you a chronological series of drawings in both the Sent and Inbox folders of your email account. What's great about an email account is that it also serves as storage device if you're on a tight budget.

Don't take the risk of losing all your work! With a file history, you'll at least be able to return to a previous step in your project without having to start from scratch.

HARDWARE STORAGE DEVICES

Another way to safeguard your work is by saving your files to different storage devices. This is important in case any one device breaks down. To protect your work, take advantage of storage media such as USB memory drives, email accounts, hard drives, and network servers when available.

The rule is to keep copies of your files on more than one hardware device at a time. Let's assume that you own a USB drive, have a web email account, and work on school computers that are linked to network servers. These are four locations that you can use to store backup files.**

Table 1.9. Proposed file storage locations for a student

Main Storage	Thrifty Storage	Temporary Storage	Backup Storage
			
External USB storage drive	Email account server	Computer hard drive	Network server

Beginning with Basic Drawing Tools

And now for the words you've been desperately waiting for: Let's draw! Here are a few tools you will need to start drawing lines.

THE ESCAPE KEY

While you draw, it's helpful to know that when you activate a command in AutoCAD, you can normally use the *Escape* key to deactivate it. The same holds true for many other operations you might want to escape from. For example, if you accidentally clicked the *Open... Ctrl + O* option in the *Application Menu*, simply press *Escape* (see Fig. 1.33a) to cancel the operation and return to your work. Keep the *Escape* key in mind whenever you're trapped in a sticky situation.

Fig. 1.33

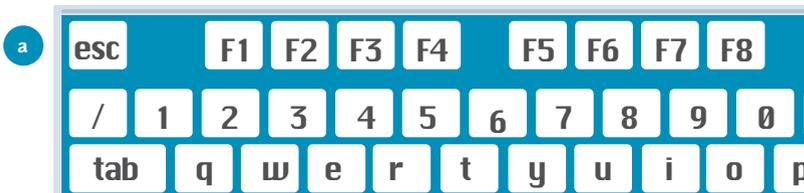
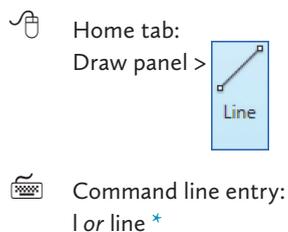


Table 1.10. Line command



* Note that only a few commands allow you to type the first letter as a shortcut.

THE LINE COMMAND

If you haven't stopped working since the previous sections, you should have two drawings open: *rough_sketch.dwg* and *Drawing2.dwg*. If you don't already have *rough_sketch* opened, open it now (see Table 1.12 for the *Open* command).

There is a choice of methods to activate the *Line* command. Now is the time to experiment with them.

- 1) Click the *Line* command in the *Home* tab (Table 1.10). Notice that whichever method you use to activate the *Line* command, the *command window* will prompt you with this message:

```
Command: _line Specify first point:
```

The application is asking you to specify where you would like to start your line.

- 2) Place the cursor (also called the crosshair cursor) anywhere in the drawing area and click the mouse. The *command window* will offer you the choice to...

```
Specify next point or [Undo]:
```

The second choice in the square brackets means that you can enter *U* to undo the last point without deactivating the command.

- 3) Move your cursor around the screen and you will notice that a line follows it from the first point you specified. This is known as the *rubber band line*.
- 4) Now click anywhere in the drawing area to complete the first segment of your line. Notice that the *command window* keeps prompting you for the next point. You can keep adding as many segments to the line as you wish.
- 5) End the line by doing one of the following:
 - ▶ Press *Enter* on the keyboard.
 - ▶ Right-click in the *drawing area* and select *Enter* from the context menu.
 - ▶ Press the *Escape* key.

THE UNDO COMMAND

Often you'll find that you make mistakes and need to return to an earlier stage in your drawing to make a correction. Like most applications, AutoCAD lets you undo the steps you've completed.

Both the *Quick Access Toolbar* and the *command line* allow you to undo several steps at once (Note: You must have completed at least one command in order to undo it). You'll notice that the *Undo* button is accompanied by a drop-down list (Fig. 1.34), which displays a history of steps completed. Select one of the items in the list to return to a previous stage of your work.

Similarly, when you enter the *Undo* command in the *command line*, the *command window* will prompt you to enter the number of steps backwards that you would like to take.

```
Command: Undo
Current settings: Auto = On, Control = All,
Combine = Yes, Layer = Yes
```

```
Enter the number of operations to undo or [Auto/
Control/BEgin/End/Mark/Back] <1>:
```

Some current settings are displayed in the *command window*, but notice what's written in the *command line*: <1>. The number in angle brackets at the end of this prompt indicates the default number of "undos," which is set to 1. You can either just press the *Enter* key to automatically undo one command or enter another number and press *Enter*. (Note that any new number you enter will become the default, so try to stick with 1 for now to avoid confusion.)

Guess what? You can undo an *Undo*. This is called *Redo* and you'll notice that the *Redo* button is to the right of the *Undo* button.

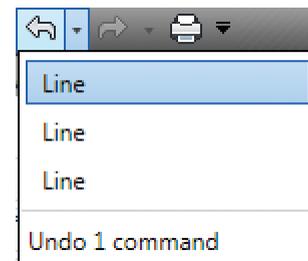
THE SPACE BAR

Whenever you have used a command and need to use it again, simply press the *Space Bar* to reactivate it. Try drawing a line. Now press the *Space Bar* to reactivate the *Line* command. How handy is that?

Table 1.11. Undo command

	Quick Access Toolbar: 
	Context (right-click) menu: Undo
	Keyboard shortcut: Ctrl + Z
	Command line entry: undo, u

Fig. 1.34



SELECTING AND SHIFT-SELECTING

To select several lines or objects there are three alternatives:

- ▶ Simply click them one by one.
- ▶ Drag from left to right to draw a *window selection box* (Fig. 1.35a) around them with the cursor; the objects must be inside the box to be selected. The resulting light-blue box has a solid outline.
- ▶ Drag from right to left to draw a *crossing selection box* (Fig. 1.36a) that simply touches the objects you want. The resulting light-green box has a dashed outline.

Whenever you select an object in the drawing area, it becomes *ghosted* (Fig. 1.37), which means that the line pattern changes to dashed and blue *grips* appear to help you manipulate it as shown at Fig. 1.37a.

If you accidentally select too many lines, simply press the *Shift* key and click the objects you want to deselect.

Fig. 1.35

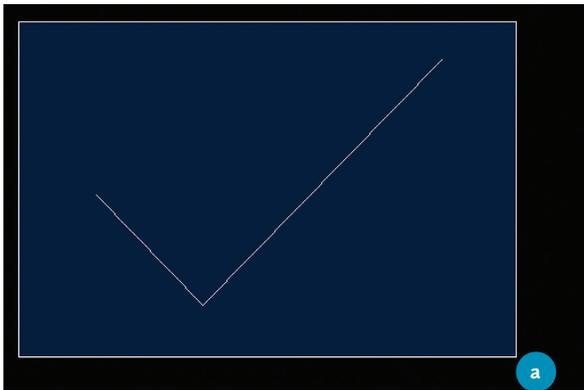


Fig. 1.36

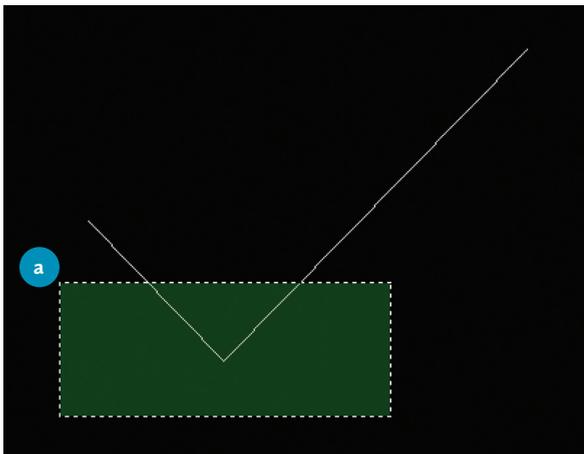
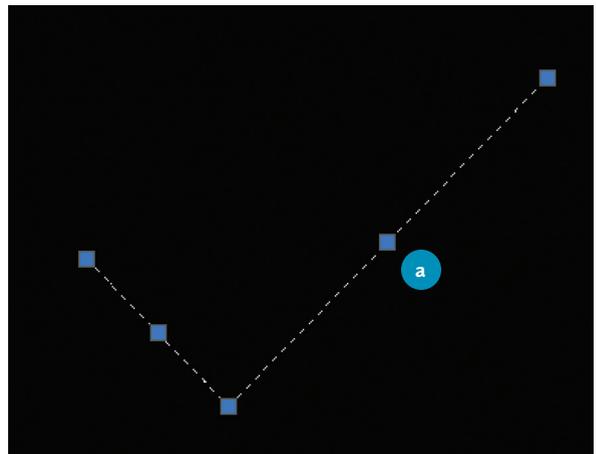


Fig. 1.37



Drawing a Rough Sketch

SHAKESPEARE. I would like you to create a rough sketch of the ground plan for *A Matter of Murder and Peerage in the Scottish Manor* to give me a taste of all this modern technology. I hear that using AutoCAD for drafting looks a little different from using a pencil and I would like to compare.

Let's give this sketch a try.

OPENING A FILE

Before you begin, make sure that your external storage drive is connected to the computer and that the *rough_sketch.dwg* file you previously saved is open.

- 1) Activate the *Open* command (Table 1.12). The *Select File* dialogue box will open (Fig. 1.38).
- 2) Now select the file as shown at Fig. 1.38a and click the *Open* button at Fig. 1.38b (or simply double-click on the file name to open your document).



Fig. 1.38

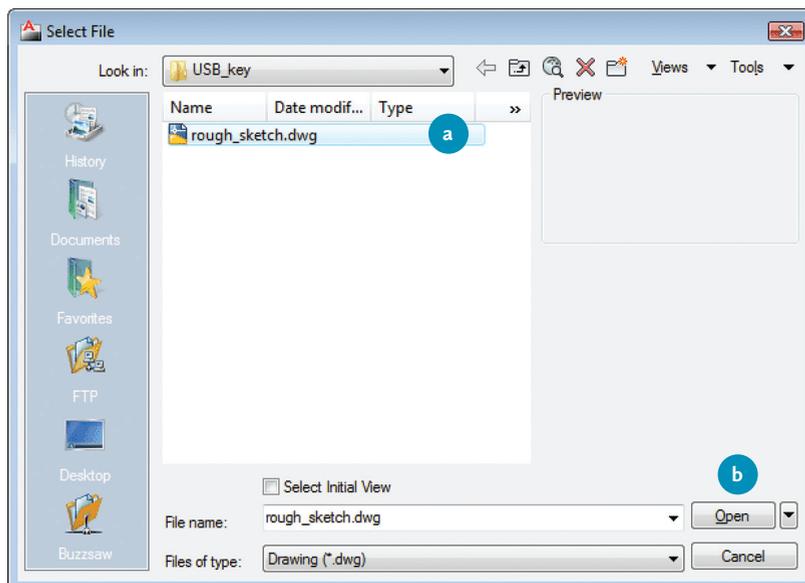


Table 1.12. Open command

	Quick Access Toolbar:
	Application Menu:
	Keyboard shortcut: Ctrl + O
	Command line entry: open

DRAWING FREEHAND

We are going to draw a ground plan freehand style. Sometimes this is called the interactive method of drawing; it allows you to test out your ideas quickly. It's not quite drafting because the drawing is not scaled or measured, but it will let you to get a feel for drawing with AutoCAD. This method can be useful for testing different possibilities for a stage layout.

* You'll notice "do-it-yourself" headings such as the one on the right throughout the manual. They indicate that you can apply what you've learned earlier to complete the task on your own.

Do It Yourself*

Referring back to what we've already covered, recreate the drawing pictured in Fig. 1.39 as closely as you can.

In Fig. 1.40, notice there is a *Preview* box (a). This is where a thumbnail image of your drawing shows up before you open it. In order for it to show your entire drawing, your drawing needs to be centred in the *drawing area* before you save it.

Fig. 1.39

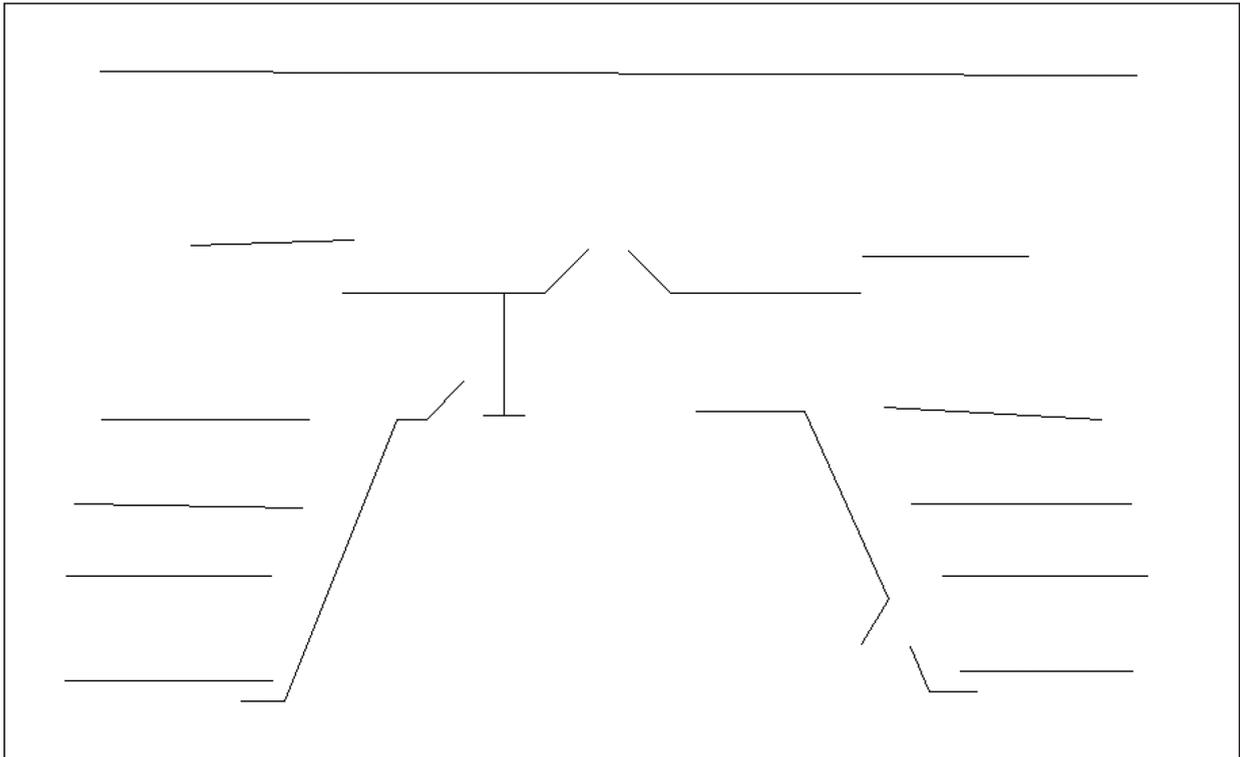
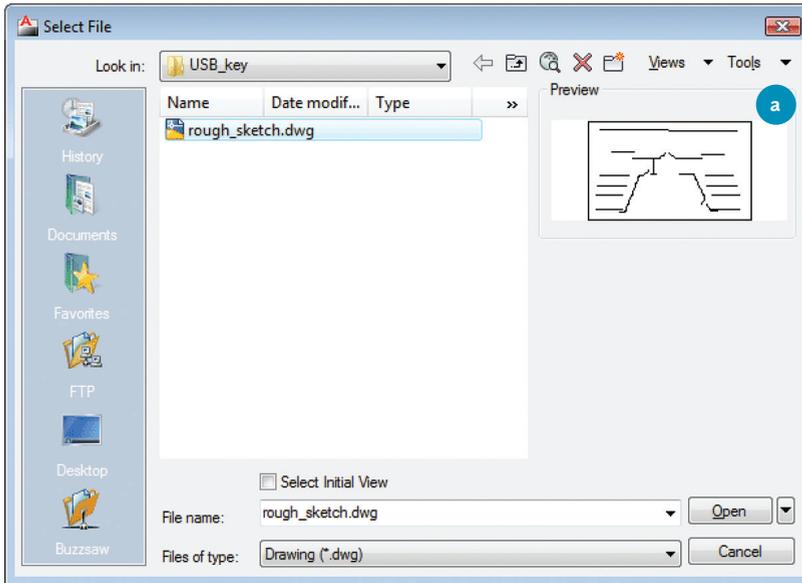


Fig. 1.40



- 1) Locate the *navigation bar*.
- 2) Click the *Zoom Extents* button. (Hover the pointer over the buttons to see the tooltips if necessary.)
- 3) Save the sketch.**

** In general, this book asks you to save to a USB drive. However, AutoCAD is increasingly available for students to install on their own computers. If you have your own copy of AutoCAD, feel free to save your drawings to your personal computer.

Chapter Summary

SKILLS LEARNED

You now know the names of AutoCAD's interface elements. You can open, switch between, and save drawing files as well as apply strategies to protect your work. Finally, you know how to use some basic drawing commands to draw lines, undo and escape from commands, and reactivate commands quickly through the keyboard.

PROJECT CHECK

You created and saved this file: *rough_sketch.dwg*

