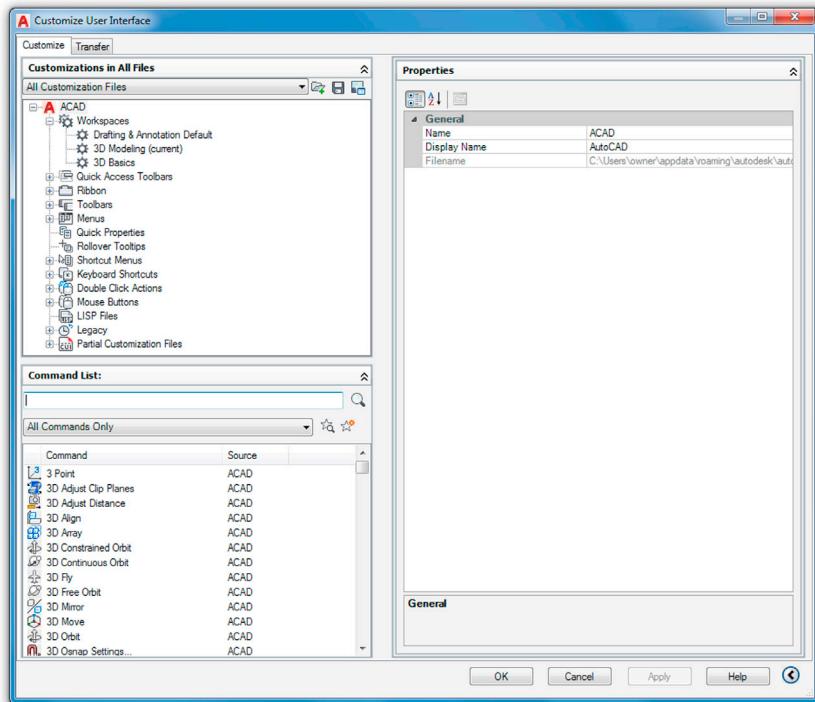


## Chapter 14

# Options, Shortcuts, CUI, Design Center, and Express Tools



### Learning Objectives

In this chapter, we introduce a variety of advanced tools and discuss the following:

- Options dialog box
  - Files tab
  - Display tab
  - Open and Save tab
  - Plot and Publish tab
  - System tab
  - User Preferences tab
  - Drafting tab
  - 3D Modeling tab
  - Selection tab
  - Profiles tab

- Shortcuts and the `acad.pgp` file
- Customize User Interface (CUI)
- Design Center
- Express Tools

By the end of this chapter, you will learn how to significantly customize your environment and speed up your work via importing predrawn blocks and using shortcuts to accelerate command input.

Estimated time for completion of this chapter: 2–3 hours.

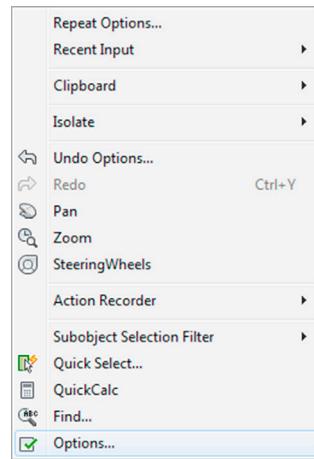
## 14.1 OPTIONS

Our topics for this chapter are the Options dialog box, followed by the concept of Shortcuts (the `acad.pgp` file), and the Customize User Interface (CUI). We then look at the Design Center and the Express Tools. These topics introduce you to basic customization, greatly enhance your efficiency, and I hope dispel any possible remaining frustration with making AutoCAD look and behave how you want it to.

The Options dialog box is your access point for basic AutoCAD customization menus, and through it, you can change many essential settings and tweak AutoCAD to your personal taste and style. Almost every user finds a few items worthy of changing, and knowing this dialog box is absolutely essential. Often, while covering this topic, students remark how they have been annoyed by some feature (or lack of it) and now know how to turn it off or on. This is exactly why we introduce this dialog box or cover it in more detail if you have already seen it.

Note that our goal is not to go over every single item in Options; it is far too big for that, and it is unnecessary anyway. Instead, we outline the most important features and explain why they are necessary. There are instances where you will be advised against changing the default values of one item or another. If you want to know more, press F1 (Help files) while in each of the tabs for a detailed outline of every single feature. Note, however, that you should first have a clear understanding of the selected items this chapter focuses on before going into more detail.

To access the Options dialog box, right-click anywhere in the drawing area, and a menu appears, as shown in Fig. 14.1. Click on the last choice: Options... Alternatively, you can also just type in `options` and press Enter.



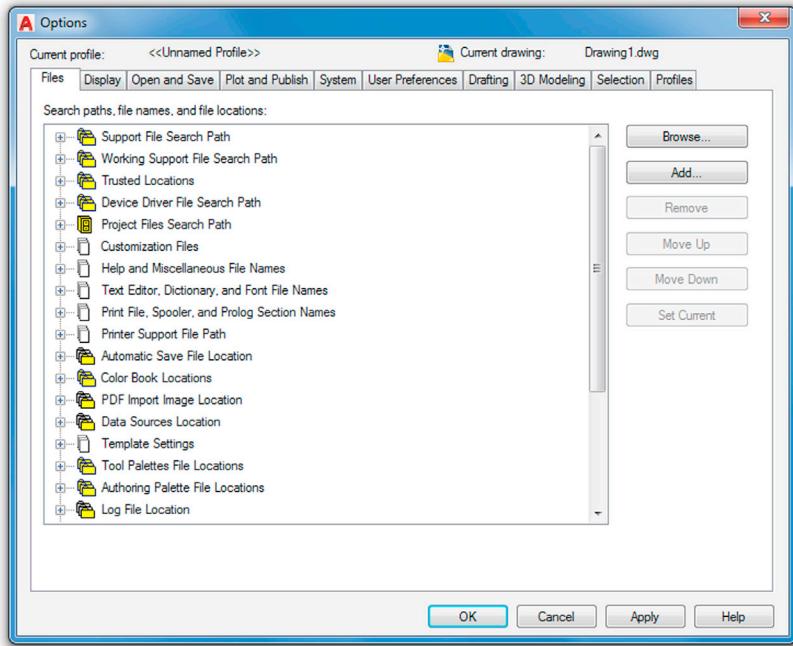
**FIGURE 14.1** Accessing Options...

A sizable dialog box called *Options* appears. Across the top you will see the following tabs: Files, Display, Open and Save, Plot and Publish, System, User Preferences, Drafting, 3D Modeling, Selection, Profiles, and Online. You will likely see Display as the active default tab. With the exception of the 3D Modeling tab (which we leave for the 3D chapters), we go over each one and introduce all the significant features of each. In some cases, it is a thorough discussion, and in others, just glance at. Go ahead and click on the very first tab (Files) and let us begin.

### Files Tab

This first tab is the easiest to go over for the simple reason that you rarely have to change anything here. What are all these listings, then? When AutoCAD, or any software for that matter, installs in your computer, it spreads out all over a certain area of the disk drive (where you indicated it should go on installation) and drops off necessary files as it sees fit.

What you are looking at in [Fig. 14.2](#) is a collection of paths to some of those files as they appear after an installation. They are deemed to be appropriate for a user to access. You can view each path and modify it by clicking on the plus signs. There are quite a few of them, indicating locations of a variety of important AutoCAD functions: Help files, automatic saves, and the like. Some of these you may recognize, some you may not.



**FIGURE 14.2** Files tab.

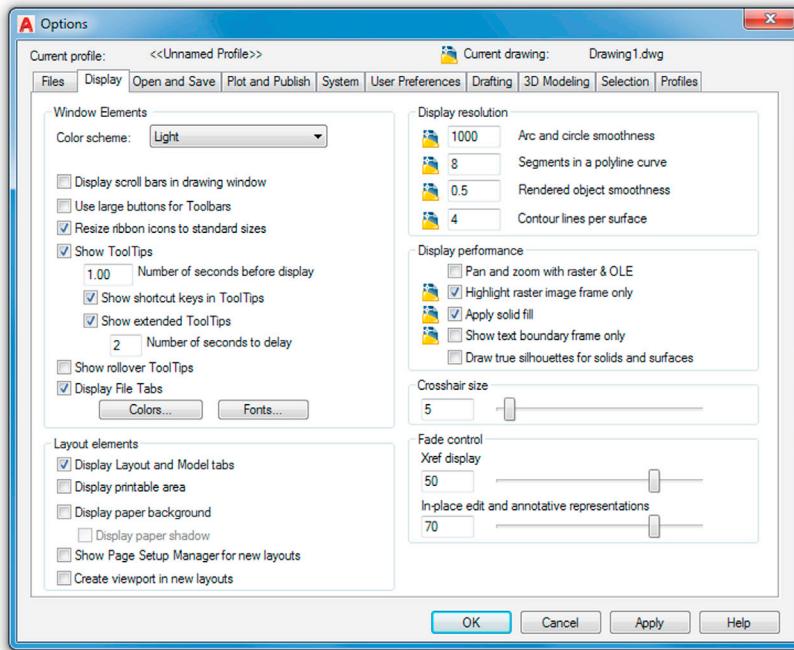
Be careful though; default settings are a good thing in this case. If you change the end location of some file, often you (and sometimes AutoCAD itself) may not find it, and difficulties result, such as when you try to move the device driver files. It is strongly advised to leave most of these as they are, as there really is no compelling reason to change the preset locations. There are really just a few file paths that *may* need changing, as listed next:

- *Automatic Save File Location*: The default path is C:\users\owner\appdata\local\temp (or something similar). You may want to change that to an easier-to-find locale if you plan on using Autosave.
- *Log File Location*: The default path for these saved text window data logs reside at C:\users\owner\local\autodesk directory (or somewhere near there). If you plan to log certain activity on your project, you may want to relocate these.
- *Action Recorder Settings→Action Recording File Location*: This path should be set to your file's project folder if you plan on using the Action Recorder (a [Chapter 15](#), Advanced Design and File Management Tools topic).
- *Plot and Publish Log File Location*: These data logs are for plots, and they also reside in the C:\users\owner\local\autodesk neighborhood. Reset them to some easier-to-find locale if you plan on keeping logs of print jobs.

Other than these four items, the average user will have little to change among these paths, and I can count on just one hand the amount of times I needed to do this in all my years of drafting. If you do wish to learn, via a detailed description, of what each path means, press F1 while you have the Files tab open.

## Display Tab

From here on forth, we group and discuss everything by category, similar to how AutoCAD groups everything within these tabs—by a named topic, with frame drawn around it. We list them from top to bottom and left to right. The Display tab ([Fig. 14.3](#)) has Window Elements, Layout elements, Display resolution, Display performance, Crosshair size, and Fade control. Among them are quite a few items of interest.



**FIGURE 14.3** Display tab.

### Window Elements

The first thing you will notice is the Light/Dark theme selector. By default AutoCAD 2017, just like its predecessor, has the Dark theme as a default. It was changed to Light way back in [Chapter 1](#), AutoCAD Fundamentals—Part I for better visibility on a printed page and to save ink. You can certainly set it to Dark if you wish to achieve that somewhat menacing, cutting-edge look.

Working your way downward, you do not really need the first three boxes checked unless you really like the scroll bars (a holdover from AutoCAD's early days) or need to see larger toolbar buttons; however, those *are* very useful for the visually impaired. Below that is the Ribbon icon resizing, just a minor adjustment, which you can also leave unchecked. The next five boxes feature various ToolTip-related settings, and these are actually good to leave checked to explain the meaning of new toolbars and other items. Included in there is the delay time, with 1 or 2 seconds adequate. Leave Display File Tabs checked as well.

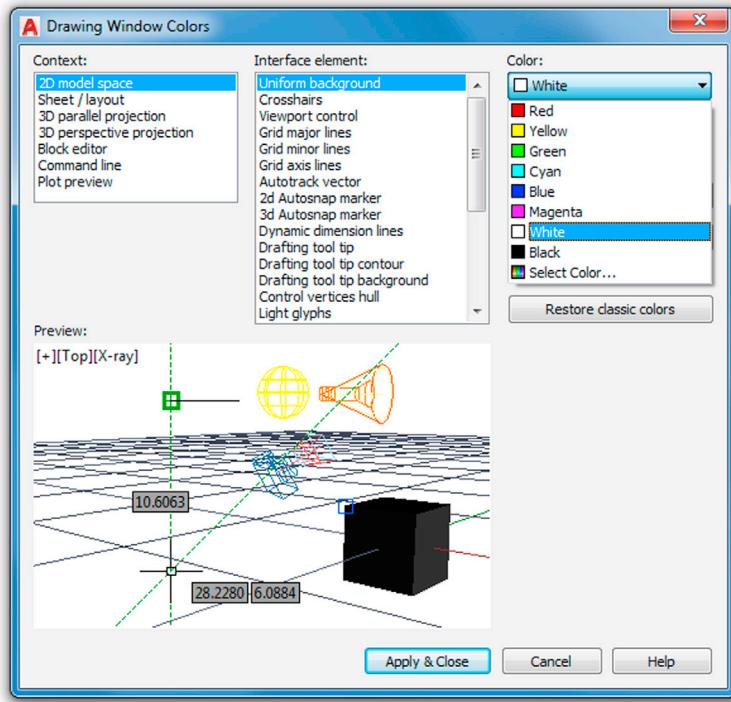
The Colors... button just below ToolTips refers to the color of your screen background. Generally this is colored black, as preferred by most (but not all) users. Black is a good choice for the simple reason that the dark background throws less light at your eyes from the screen and lessens fatigue. The only catch is that printed paper output is always white, and some people prefer seeing the design as it would appear in real life, on white paper, hence the white background.

Obviously, it is easy to get used to the black background and pretty much disregard the “paper” aspects of the output, and this is what most users do. In this and most textbooks, however, the screen background color is always white to save ink and blend images smoothly with the white paper.

Other colors are available, of course (actually all 16 million colors are available as a background), but as we joke in class, if you see someone using a bright neon green background, stay away—this is probably not a sane individual! To change the color scheme for practice, press the Colors... button, and the dialog box shown in [Fig. 14.4](#) appears.

Here, you can select from the general Context: menu on the left (only the first choice, 2D model space, for now), and select some element in the Interface element: menu on the right (e.g., the Uniform background). Then, pick the color you want this element to have. [Fig. 14.4](#) shows white being chosen. Note the sizable number of choices in both the left and middle columns. AutoCAD allows for the color of just about anything to be changed; browse through all the choices to get familiar. If you change so much that you forget what you did, you can always press the Restore classic colors button on the right of the dialog box. When done, press Apply & Close.

The Fonts... button, to the right of Colors... in the Display tab, refers to the font present on the command line text, not the font in the actual drawing, so unless you have an objection to the Courier New font (the default), do not change anything.



**FIGURE 14.4** Drawing Window Colors with White selected.

### Layout Elements

In this category at the bottom left, it is recommended to uncheck all the boxes except the top one: Display Layout and Model tabs. Generally, all those options (area, background, etc.) are distractions and unnecessary in Paper Space, as was discussed in more detail in [Chapter 10](#), Advanced Output—Paper Space. As with many such suggestions, it does come down to personal taste. Check out Paper Space with and without these buttons checked to determine how you prefer it.

### Display Resolution

Moving to the upper right of the Display tab, we have the Display resolution category. Here, it is suggested to leave all but one field as default. That field is the Arc and circle smoothness value, which is 1000 by default. That was set low for historical reasons that have to do with accelerating regenerations on slower, old computers by having arcs and circles be made up of small lines. You can set that to the 20000 maximum, which is fine for today's fast machines.

### Display Performance

This category is also a bit of a throwback from the old days of slow computers. These five checked boxes combine to accelerate regeneration of various elements. It is best to leave everything as default, with box 2 and 3 checked and the others unchecked.

### Crosshair Size

Moving down we have the Crosshair size setting. Crosshair size is generally a personal preference. Many leave it at a “flyspeck” setting, which is 5, but increasing the size to a full 100 is recommended, as this makes life easier when you are in a Paper Space viewport, as detailed in [Chapter 10](#), Advanced Output—Paper Space, or checking if a drawn line is straight by comparing it to the straight-edge crosshairs. In the end, it is up to you, and experience has shown that newer users prefer the flyspeck, while the veterans stick to the full size.

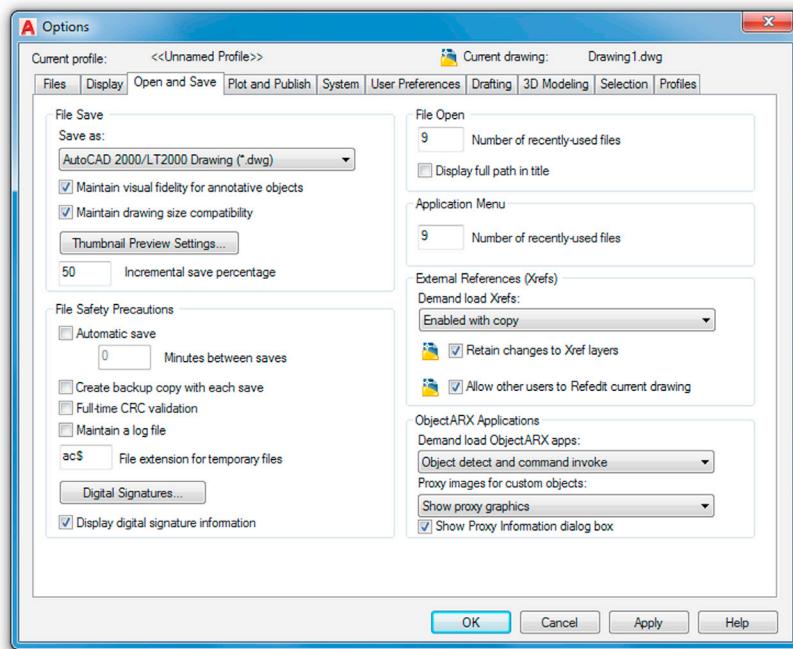
### Fade Control

The last category at the bottom right has to do with how dark the xref is when you are editing it in place, a [Chapter 17](#), External References (Xrefs) topic. For now, the default settings are fine.

If you want a more detailed description of what each selection means, press F1 to read the Help files while you have the Display tab open. Alternatively, hover the mouse over each element for a brief description. If you are done, do a final check to see that your settings reflect what is in [Fig. 14.3](#) and let us move on to the next tab.

## Open and Save Tab

The Open and Save tab ([Fig. 14.5](#)) contains the File Save, File Safety Precautions, File Open, Application menu, External References (Xrefs), and the ObjectARX Applications categories. Several important features are worth discussing here, most of them contained inside the two categories on the left-hand side: File Save and File Safety Precautions.



**FIGURE 14.5** Open and Save.

### File Save

In this category, let us take a look at the top option, labeled *Save as:*. This drop-down menu is very important, as it allows you to permanently save your files down to an older version of AutoCAD. The significance of this cannot be overstated because you simply cannot open a file created on a more recent version using an older release. AutoCAD is an often updated software, with new releases every year (since 2004), and you can rest assured that not everyone is running the same version. I have seen AutoCAD 14 (from the mid-1990s) running on a company PC as late as 2006. While that may have been an isolated case, AutoCAD 2010, 2011, 2012, and 2013 are still in widespread use, and nothing is more frustrating to someone than getting a copy of your files for collaboration and not being able to work with them.

Autodesk of course realizes this and allows you to save files down on a case-by-case basis during the save procedure. AutoCAD even automatically saves four releases down anyway (to 2013). But to be safe (if it is not already set this way), select the AutoCAD 2000/LT 2000 Drawing (\*.dwg) choice, as seen in [Fig. 14.5](#); that way you “undercut” about 14 releases and assure that the file can be accessed by just about everyone. We can skip over the rest of the options under the File Save category (leave everything as default) and move down to the File Safety Precautions category.

## File Safety Precautions

Let us work our way top to bottom in this category. The Automatic save check box is the first thing we encounter, and it is about as close to controversial as something in AutoCAD gets. The suggestion is this: Do not use it. Others may say, why not, it is there. The argument against it is simple: As a computer user, you need to save your work often, no matter what application you use. To rely on automatic saves is to invite trouble when you use a program that does not have an automatic save (or it is not turned on). As an AutoCAD user, you should be saving your work every 5 to 10 minutes, something students often do not do in class.

There are also some practical difficulties with Automatic save. For one thing, you need to exit a command to save a drawing. AutoSave does this for you, so even if you are in the middle of something, you are kicked out for AutoSave to run (except while in block editing mode). Other issues are where AutoSave files go and what extension they have. You can set where they go using one of the paths under the File tab, but then all AutoSave files go there, regardless of what actual drawing is open, and overwrite existing files. The extension of AutoSave files is .sv\$.

In summary, while AutoSave can be set up, it is not advisable to rely on it; often, you see veteran programmers and computer users ignore this feature in all computer use and save instinctively every few minutes. If you do wish to use AutoSave, simply turn it on by checking the box and setting a time threshold (Minutes between saves) just below that.

The Create backup file with each save check box can also be mildly controversial, as it seems like a good idea initially, yet does not stand up under scrutiny. Backup files (if the option is checked) are created every time you save a file. A backup file (.bak) is essentially a regular drawing file (.dwg) that is cloaked with an extension Windows does not recognize, but you do (see [Appendix C, File Extensions](#) for more info on all extensions). If the .dwg file is lost, then the .bak file can be renamed and, voila, the drawing is there again. So, what is wrong with this? Well, in theory nothing, but in real-life use there are a few issues.

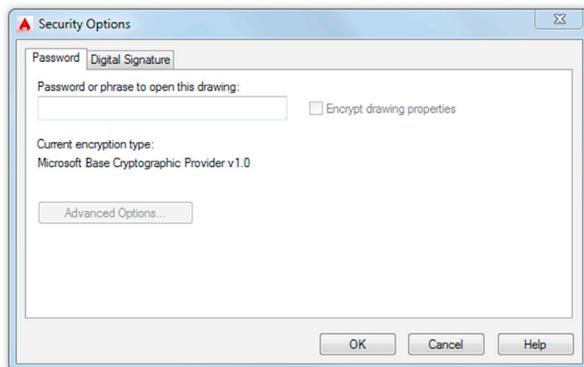
The main problem is that backup files actually double the size of your project folders; it is like having a copy of every drawing file next to the original. They are just not necessary. The combination of cheap storage media and a heightened sense of risk in recent years have prompted just about every company to do daily and weekly backups. Also, AutoCAD's drawings rarely "go bad" to the point of being unrecoverable by the Audit and Recover commands. Finally, backup files reside right next to the drawing files themselves, and if you lose the entire folder, they all go. Rarely do you lose just the drawing; even then, going to the previous night's backups is enough to get them back. So, while some would argue that no harm is done by keeping the .bak files, one could also say, why add the extra junk to your company's server? Ultimately, the choice is up to you, although sometimes company policy may dictate the use of backup files, and this is beyond your control.

Moving further down, most users do not need Full-time CRC validation. CRC stands for Cyclic Redundancy Check and is an error checking mechanism for when your drawings seem to crash after you bring something in. This does not happen often, so you generally do not need this feature on.

Maintain a log file makes AutoCAD write the contents of the text window to a log file, also an unnecessary feature for most users. File extensions for temp files can also be left as the default ac\$.

Digital Signatures... is a relatively new feature in AutoCAD that addresses the need to secure or authenticate the drawings. This is not often used, as most AutoCAD drawings are not secret in nature, but the idea is intriguing and worth a look. When you click on the button, the box in [Fig. 14.6](#) appears.

The first tab allows you to add a password to the drawing. Then, the drawing can be opened only by someone who knows the password; although be careful—if the password is forgotten, the drawing is lost. The second tab has to do with



**FIGURE 14.6** Security Options.

a digital signature. This is a lengthy topic in itself and is sometimes used when collaborating with others. In short, a user installs a certificate from a digital security vendor (VeriSign in this case), which allows for a “digital signature,” which in turn prevents changes to the drawing or keeps track of them. This is a very simplified version of the concept, of course, but if your company already uses this, then no further explanation is necessary; if not, you will likely not care about this feature anyway.

### *File Open*

Moving to the top right of the Open and Save tab we have File Open category, which simply shows a number of recently open files, up to nine. Leave as the default max, with Display full path in file unchecked as that may take up a lot of room across.

### *Applications Menu*

This is the same idea as File Open but refers to the application menu’s recent documents. Leave it as default.

### *External References (Xrefs)*

These fine points of external reference loading and usage are best left as default.

### *ObjectARX Applications*

ObjectARX is a relatively complex topic that requires some programming background to fully understand. It stands for AutoCAD Runtime Extension and is an API for customizing and extending AutoCAD. An API in turn stands for application programming interface, which specifies how software components should interact with each other. ObjectARX Software Development Kits are available to third party programmers and software engineers to develop plug-in applications for each release of AutoCAD. See [Appendix F, AutoLISP Basics and Advanced Customization Tools](#) for more information on this. As far as this category is concerned, leave everything as default and allow AutoCAD to show and load the associated apps and proxy graphics, which are visual objects that are not “proxied” and have no graphical equivalent.

If you want a more detailed description of what each selection means, press F1 to read the Help files while you have the Open and Save tab open. Alternatively, hover the mouse over each element for a brief description. If you are done, do a final check to see that your settings reflect what is in [Fig. 14.5](#) and let us move on to the next tab.

## **Plot and Publish Tab**

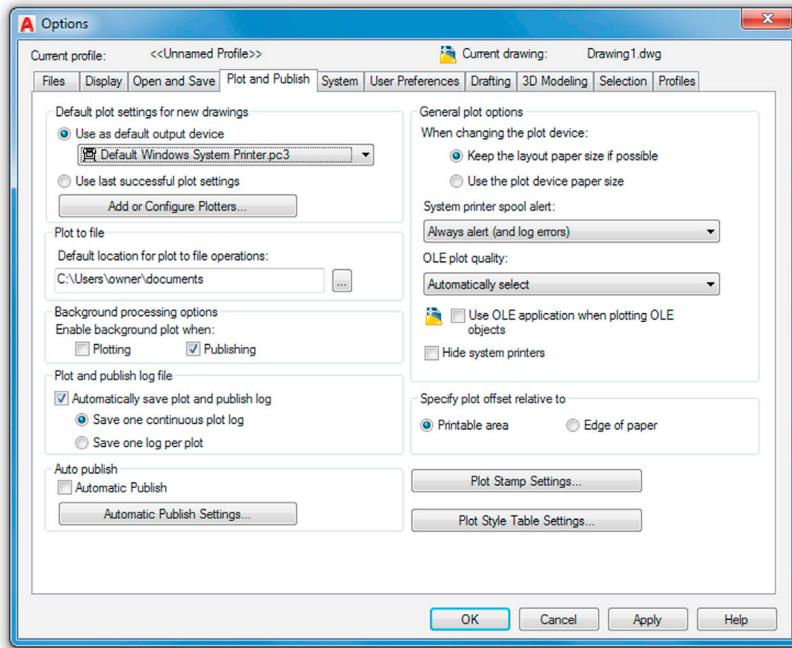
The Plot and Publish tab ([Fig. 14.7](#)) contains the Default plot settings for new drawings, Plot to file, Background processing options, Plot and publish log file, Auto publish, General plot options, Specify plot offset relative to categories, and also two separate buttons at the bottom right: Plot Stamp Settings... and Plot Style Table Settings. Except for a few items, not a tremendous amount is important under this tab for the average user. We run through everything with some general comments and descriptions.

### *Default Plot Settings for New Drawings*

This category selects the default plotter or adds a new one. However, this should not be done from here but rather from the Windows control panel. When new plotters or printers are added, AutoCAD notices them, as well as what the chosen default is. In the end, however, this is of little significance. Recall from [Chapter 9, Basic Printing and Output](#) that the printer settings for each drawing are set individually. Therefore, leave everything here as default.

### *Plot to File*

In this category, a drawing can be plotted to a .plt (plot) file and saved in this location. While this is generally an outdated legacy command from the old days of .plt files being sent (or physically carried on a floppy disk) to plotters, it has found some use today when taking drawings to a printing company. The company may not have AutoCAD, or anyone qualified to operate it, so instead they accept the .plt files, which are nothing more than ready-to-print code that can be interpreted by any plotter.



**FIGURE 14.7** Plot and Publish.

### Background Processing Options

This category has to do with being able to plot in the background while working on a drawing. With the Plotting option unchecked, you must wait until the plotting is complete before continuing. Publishing may take longer, so you want to allow this by checking it.

### Plot and Publish Log File

This category is an option that creates (or turns off) the log feature, which is nothing more than a record of the Job name, Date and time started and completed, Full file path, Selected layout name, Page setup name, Device name, Paper size name, and a few others. It is recommended to disable (uncheck) this feature unless there is a specific reason to create a record of all this information.

### Auto Publish

This category is an option that allows you to automatically create design web format (DWF) files. DWF is a topic all unto itself. The basic idea is to generate vector files that can be viewed by others who have the Autodesk Viewer or, if not, then through a browser. You need this box checked only if you planning on generating these files to give to someone or to put your drawings up on the web.

### General Plot Options

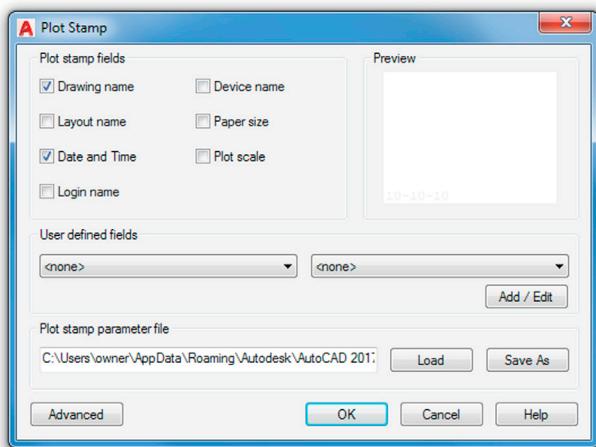
Moving to the upper right of the Plot and Publish tab, we have the General plot options category. This has to do with system printers and the output quality of object linked embedded (OLE) items, a topic to be discussed in [Chapter 16](#), Importing and Exporting Data. The OLE plot quality drop-down choices can be adjusted depending on what is embedded. In this case, leave everything in this category as default, as these are the most reasonable choice for the average user.

### Specify Plot Offset Relative To

Leave this category as default, as you generally want to have the printable area as the start point of any plot offsets, not the edge of the paper, to ensure extra room.

### *Plot Stamp Settings...*

This button, at the bottom right, is an item of interest. A plot stamp is simply a text string that appears on all output when activated in the Plot dialog box. This text string has information on a variety of parameters, but the ones of most interest include the drawing name and the date and time. This can be useful for internal check plots (obviously not for final output), to show where the drawing is on the company server or to indicate which paper output is the latest based on the date and time. Bring up the Plot Stamp (Fig. 14.8) by clicking the button, and use the Advanced button in the lower left to further refine the plot stamp if need be; these settings mostly have to do with the size and position of the stamp.



**FIGURE 14.8** Plot Stamp.

### *Plot Style Table Settings*

Leave everything under this button as default. These settings are addressed elsewhere, such as the plot dialog box and the plot style manager. See [Chapter 19](#), Advanced Output and Pen Settings for more on this.

If you want a more detailed description of what each selection means, press F1 to read the Help files while you have the Plot and Publish tab open. Alternatively, hover the mouse over each element for a brief description. If you are done, do a final check to see that your settings reflect what is in [Fig. 14.7](#) and let us move on to the next tab.

## **System Tab**

The System tab (Fig. 14.9) contains the Hardware Acceleration, Current Pointing Device, Touch Experience, Layout Regen Options, General Options, Help, InfoCenter, Security, and the dbConnect Options categories. Much like the previous tab, not a tremendous amount is important under this tab for the average user except for a few items. We run through everything with some general comments and descriptions.

### *Hardware Acceleration*

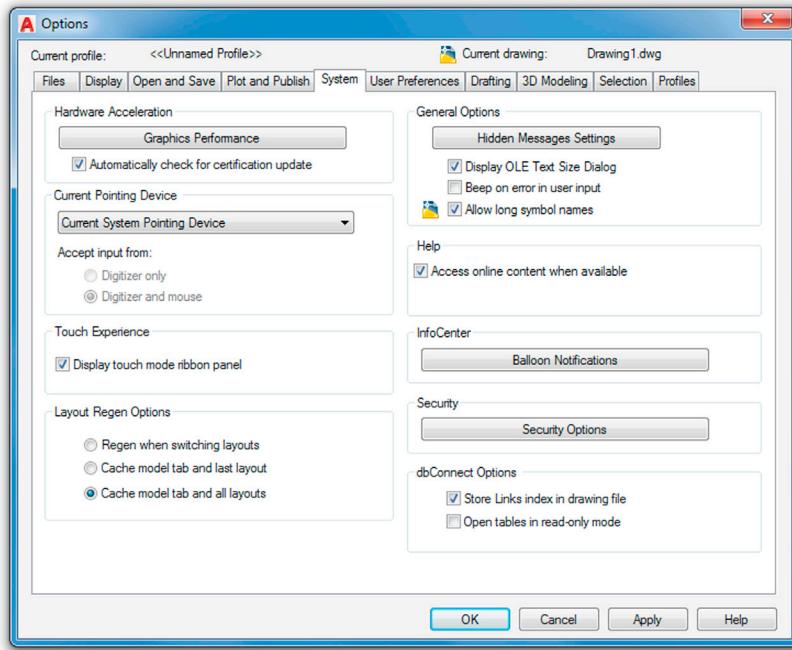
This category, and the associated Graphics Performance button, is tailored toward 3D performance tweaks, and the category was even called 3D Performance in a previous version of AutoCAD. It details various graphics settings and system descriptions. These settings are already optimized automatically and should be just fine for the average user. Feel free to run through the Tuner Log, which can be seen after a few clicks—lot of interesting information is in there for the tech savvy.

### *Current Pointing Device*

This category allows for setting up digitizer operations, a topic not relevant to most users, who have no digitizer.

### *Touch Experience*

The Touch Experience has to do with a touch pad and is also irrelevant to most users.



**FIGURE 14.9** System tab.

### *Layout Regen Options*

This category should be left as default; it refers to regeneration of layouts when you switch to them. With today's fast machines an extra regen here and there does not affect productivity.

### *General Options*

Leave everything in this category as default. Here resides perhaps one of the most annoying features of AutoCAD: The "Beep on error in user input" option. This may push a student just starting out and making lots of errors over the edge. You definitely do not want that box checked!

### *Help*

Unless your computer is not connected to the internet, keep this box checked to access online content.

### *InfoCenter*

The InfoCenter and its Balloon Notifications button refer to the various information balloons that appear with helpful updates or tidbits of information. Although an advanced user may find them annoying, as a student you should keep them around. Briefly explore the button to see what options it allows you in regard to these notifications.

### *Security*

The category refers to dealing with \*.exe (executable) files and \*.lsp (AutoLISP) files. Leave everything as default.

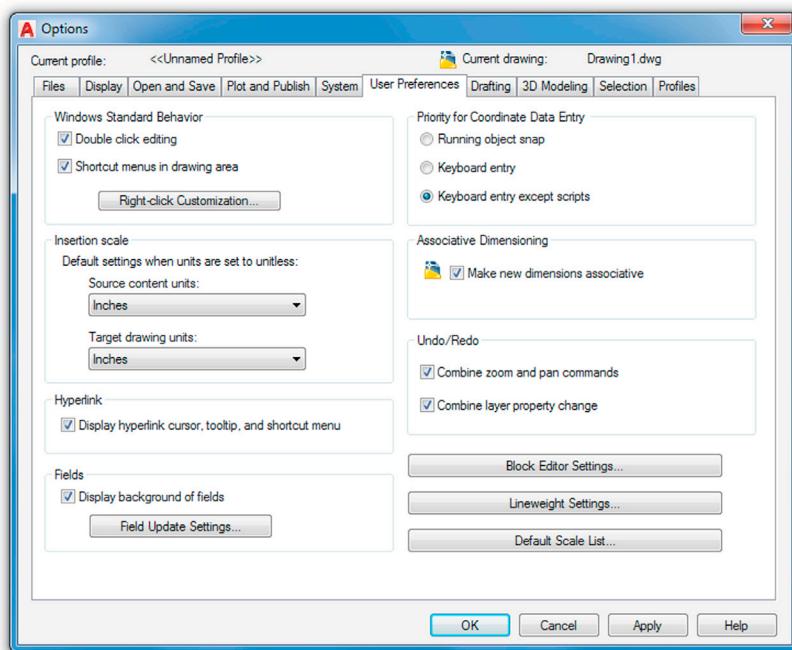
### *dbConnect Options*

This category should also be left as default. The *db* refers to database connectivity, which is also not relevant to most users but may be important in some high-end custom applications, where AutoCAD is linked to a database.

If you want a more detailed description of what each selection means, press F1 to read the Help files while you have the System tab open. Alternatively, hover the mouse over each element for a brief description. If you are done, do a final check to see that your settings reflect what is in [Fig. 14.9](#) and let us move on to the next tab.

## User Preferences Tab

The User Preferences tab ([Fig. 14.10](#)) contains the Windows Standard Behavior, Insertion scale, Hyperlink, Fields, Priority for Coordinate Data Entry, Associative Dimensioning, Undo/Redo categories and the Block Editor Settings..., Lineweight Settings..., and Default Scale List... buttons. Some significant items lie under the first category. We describe it in detail and run through everything else with some general comments and descriptions.



**FIGURE 14.10** User Preferences tab.

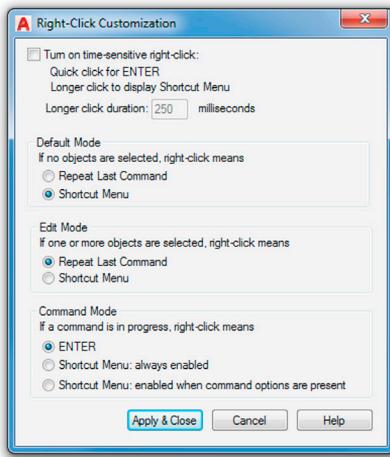
### Windows Standard Behavior

This category concerns speed, which is a topic near and dear to the hearts of most AutoCAD users. Since time equals money, whatever technique accelerates drafting speed is always welcome. One of the more important ones (shortcuts) is discussed later in this chapter. Another important “trick” is to set your mouse buttons to the most likely and needed settings for fast drafting. As such, the Right-click Customization... button is very important. Keeping the boxes above that button checked as a default, click on it, and the dialog box in [Fig. 14.11](#) appears.

Your mouse settings should be as shown in [Fig. 14.11](#), with the last one, Command Mode, set to ENTER. This subtle but powerful setting speeds up your basic drafting by allowing you to instantly finish commands by using the right mouse button instead of having to press Enter on the keyboard. Also set Edit Mode to Repeat Last Command and Default Mode to Shortcut Menu. The time sensitivity settings at the very top refer to the mouse button “reaction times.” The default 250 millisecond value happens to be a good time for most people, so nothing else needs to be adjusted here. Press Apply & Close.

### Insertion Scale

This category controls the scale for inserting blocks; leave the default values.



**FIGURE 14.11** Right-Click Customization.

### *Hyperlink*

This category controls visual settings of hyperlinks; leave this box checked as the default is fine. We cover hyperlinks in the next chapter.

### *Fields*

This category sets field preferences, which you should leave as default. A field is text in AutoCAD drawings that automatically updates itself (after a regen command) whenever there is a change in the values to which the field is connected. I have not found them to be widely used.

### *Priority for Coordinate Data Entry*

Moving to the top right of the User Preference tab, this category controls how AutoCAD responds to coordinate data input, also not necessary to change for most users.

### *Associative Dimensioning*

Leave the box under this category checked, since all dimensions should be associative (meaning, if the geometry changes, so do the dimensions associated with it).

### *Undo/Redo*

This category controls undo and redo for zoom and pan; leave both boxes checked to save some time if you have to go back a lot of steps. They are then combined and skipped over.

### *Block Editor Settings...*

This button changes the environment of the block editor. You worked with that editor when you first learned dynamic blocks. Clicking on it brings up the Block Editor Settings dialog box, where you can change just about every color, size, and font parameter. For most users, it is best to leave everything as a default.

### *Lineweight Settings...*

This button displays the Lineweight Settings dialog box. These settings can be adjusted when setting up the .ctb files, as described in [Chapter 19](#), Advanced Output and Pen Settings; so they are not needed here. Leave everything as default.

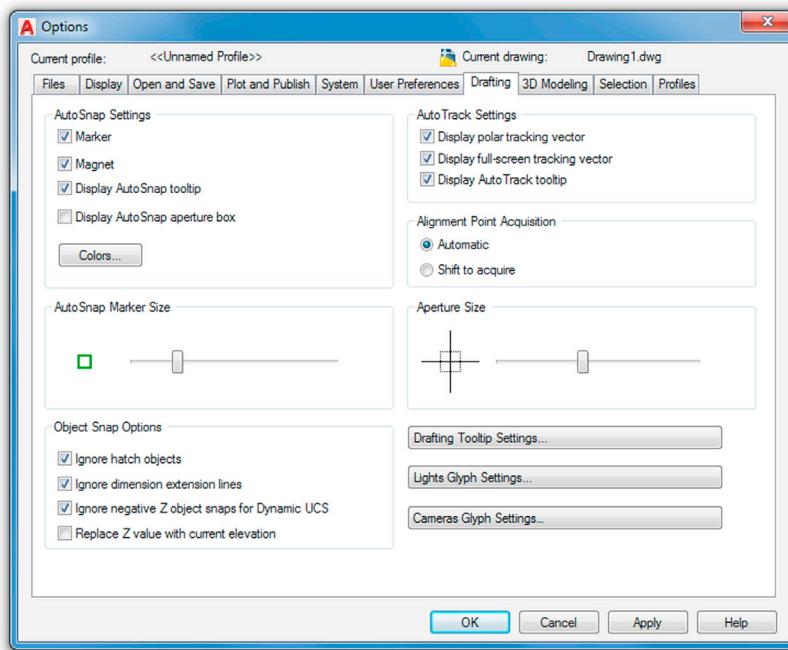
### *Default Scale List...*

This button displays the Edit Scale List dialog box. Additional scales are rarely needed but can be added here, if you have some unusual requirements. This may be more of an issue with Metric units, as engineers may use more scales than architects.

If you want a more detailed description of what each selection means, press F1 to read the Help files while you have the User Preferences tab open. Alternatively, hover the mouse over each element for a brief description. If you are done, do a final check to see that your settings reflect what is in [Fig. 14.10](#) and let us move on to the next tab.

## Drafting Tab

The Drafting tab ([Fig. 14.12](#)) contains the AutoSnap Settings, AutoSnap Marker Size, Object Snap Options, AutoTrack Settings, Alignment Point Acquisition, and the Aperture Size categories, as well as the Drafting Tooltip Settings..., Lights Glyph Settings..., and Cameras Glyph Settings... buttons. The entire left side of this tab is devoted to snap point markers, those colored geometric objects that represent endpoints, midpoints, and the like. No really critical items are here, so we run through everything with some general comments and descriptions.



**FIGURE 14.12** Drafting tab.

### *AutoSnap Settings*

Leave everything in this category as default, including Colors, unless you prefer something different.

### *AutoSnap Marker Size*

Leave this category as default, unless you have trouble seeing the symbols or find them too big. The sizing of the marker is easily adjusted via the slider.

### *Object Snap Options*

Also leave everything in this category as default. You especially want to make sure that the Ignore hatch objects (the first box) is checked off, as that would make the object snap go crazy trying to snap to every piece of a complex hatch pattern.

### *Auto Track Settings*

Moving to the upper right of the Drafting tab, we have the AutoTrack Settings category. It has to do with AutoCAD's OTRACK tracking tool, which is briefly discussed in [Chapter 15](#), Advanced Design and File Management Tools, along with other miscellaneous topics. Leave these settings as default for proper operation of that tool.

### *Alignment Point Acquisition*

Leave the setting in this category as default.

### *Aperture Size*

Aperture Size is perhaps the one item that may occasionally be adjusted to suit the user's taste, but generally keep it the same size or slightly larger than the AutoSnap marker. If the aperture is too big, it may be distracting or may actually be confused with small rectangles on the screen.

### *Drafting Tooltip Settings...*

This button features minor nuanced adjustments to drafting tool tips (such as distance or angle displays) and their visibility to the users (the transparency). Leave all them as default.

### *Lights Glyph Settings ... and Cameras Glyph Settings...*

These buttons are minor color settings for lighting and cameras and are not relevant at this point; leave them as default.

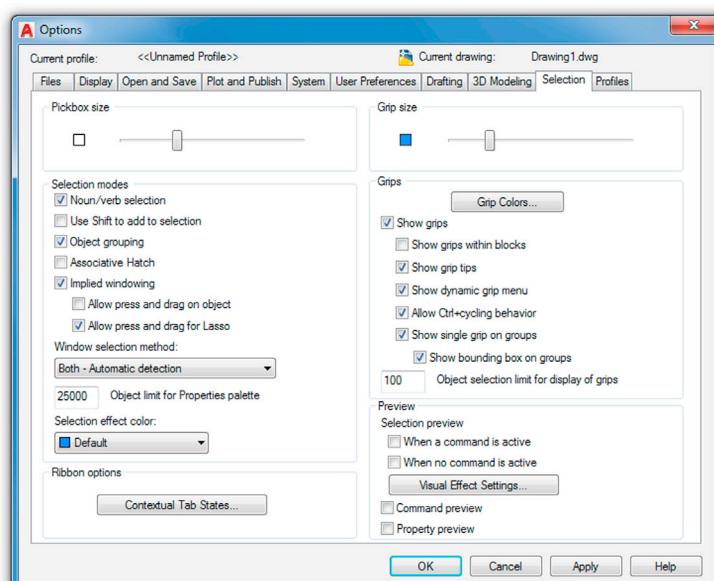
If you want a more detailed description of what each selection means, press F1 to read the Help files while you have the User Drafting tab open. Alternatively, hover the mouse over each element for a brief description. If you are done, do a final check to see that your settings reflect what is in [Fig. 14.12](#) and let us move on to the next tab.

## **3D Modeling Tab**

Settings and adjustments under this tab are not discussed in this 2D-only level of thi book.

## **Selection Tab**

The Selections tab ([Fig. 14.13](#)) contains the Pickbox size, Selection modes, Ribbon options, Grip size, Grips, and Preview categories. Some important items are under the Visual Effects Settings... button under the Preview category, so we cover that in detail, and run through everything else with some general comments and descriptions.



**FIGURE 14.13** Selection tab.

## Pickbox Size

This category is simply what the cursor becomes when you are in the process of picking something. Set it too small and you have trouble selecting the geometry. Set it too big and you select more than you wanted. Generally, leave it at the default size shown in [Fig. 14.13](#).

## Selection Modes

This category is just more adjustments to object selection. Leave them all as default, as seen in [Fig. 14.13](#), including the Window selection method choice. The Object limit for Properties palette can be left as the ridiculously high default of 25,000. Rarely will you have that many objects selected or even present in your drawing.

## Ribbon Options

This category provides some options regarding contextual tab states. Leave them as default.

## Grip Size

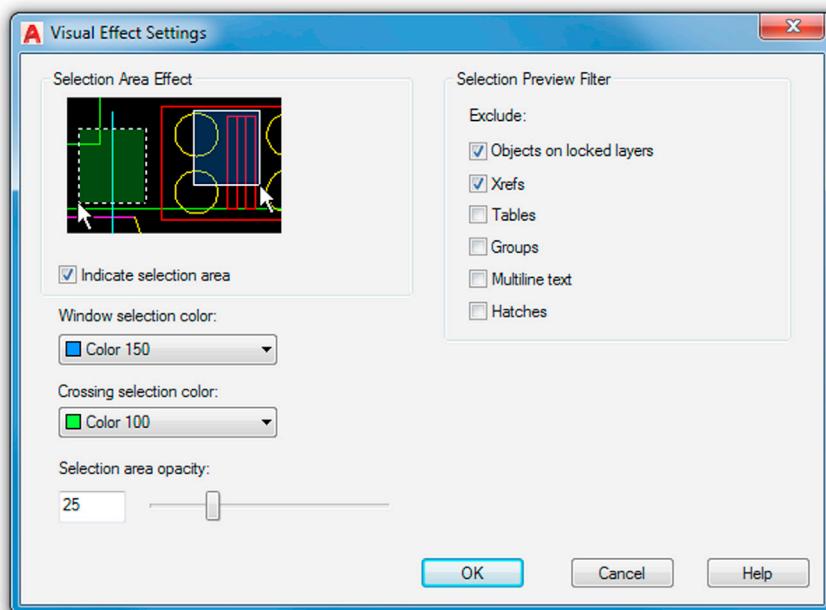
Moving to the upper right of the Selection tab, the Grip size category with the slider adjustment should be self-explanatory. Leave the grips as default size unless you prefer bigger or smaller ones.

## Grips

This category has yet more grip settings for colors and other adjustments. There is really no reason to change grip color. Blue means cold (unselected), red means hot (selected), and hover can be any color (default Color 11 is just fine). Leave the other settings as default; you want the grips enabled but not inside blocks. Leave the maximum amount of grips that can be shown at 100 so as to not overwhelm the drawing if you select more.

## Preview

This category is a relatively new feature in AutoCAD that causes objects to “light up” when your mouse hovers over them. In AutoCAD 2015, this effect was made more subtle, eliminated dashing the objects, and only added a gray highlight to them. If you find this feature distracting, you can turn it off by unchecking the first two buttons. To leave it on but modify the settings, click the Visual Effects Settings... button. When you press it, you see what is shown in [Fig. 14.14](#).



**FIGURE 14.14** Visual Effects Settings.

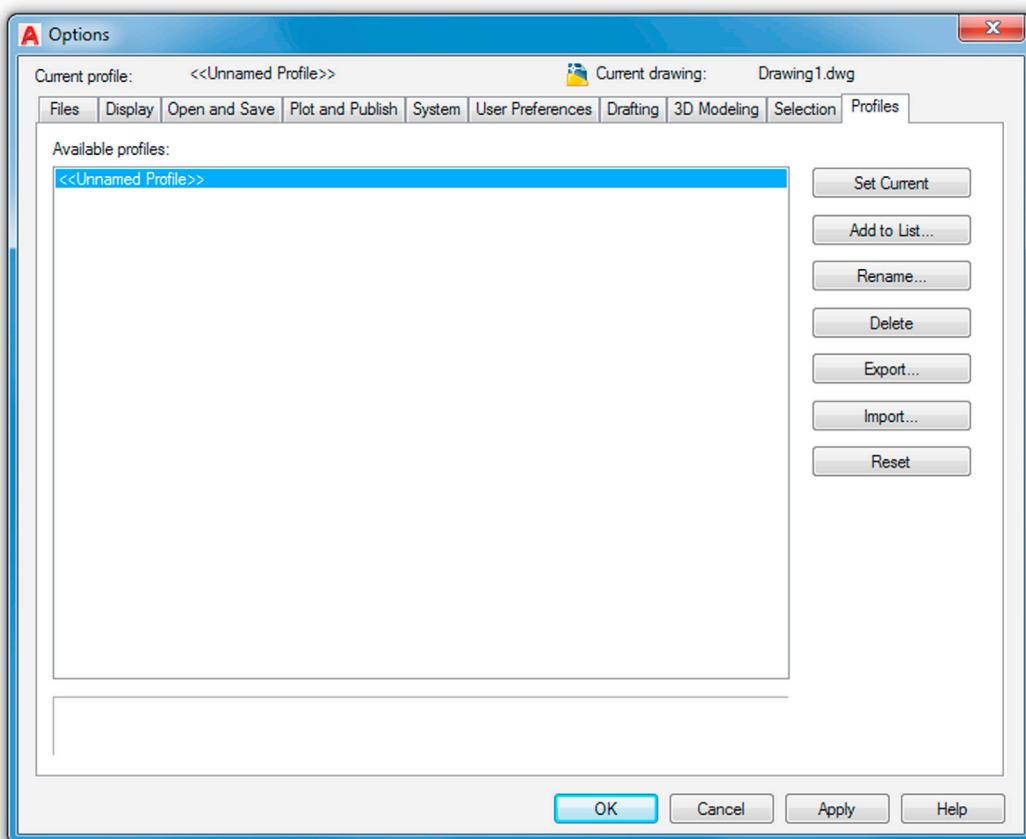
On the left side of this dialog box are various controls for the internal colors of the familiar Window/Crossing as well as the new Lasso tool. You can change those colors as well as their intensities by varying the Selection area opacity slider. You can also eliminate them, as the colors are technically unnecessary; what is important is whether the selection rectangle is dashed or solid. If you prefer minimum fuss with your selection methods, you can remove the colors by setting the opacity at zero or uncheck the Indicate selection area button.

If you want a more detailed description of what each selection means, press F1 to read the Help files while you have the User Selection tab open. Alternatively, hover the mouse over each element for a brief description. If you are done, do a final check to see that your settings reflect what is in [Fig. 14.13](#) and let us move on to the next tab.

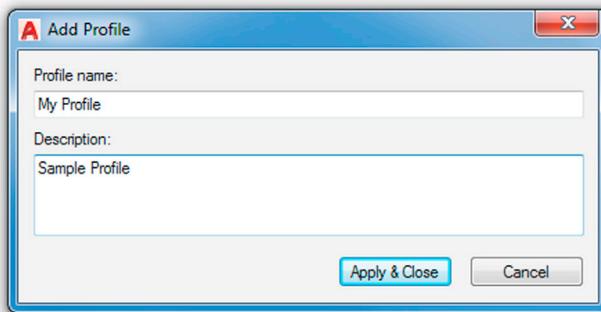
## Profiles Tab

This tab ([Fig. 14.15](#)) is simply there to save your personal settings, so if someone else is using AutoCAD on your computer and prefers other settings (maybe that neon green background color), that person can set his or her own and save them as well. Simply press the Add to List... button and enter a name for the profile, as seen in [Fig. 14.16](#); finish by pressing Apply & Close.

The profile is added to the list (as many as you want can be added) and can be restored by selecting it and pressing Set Current. Profiles can be exported (as .arg files), imported, renamed, and deleted as needed. Profiles were more relevant in the days when PCs were more expensive and each one in a company may have had a few users, but some people still use them to avoid office arguments about exactly how AutoCAD “should look” if one were to “borrow” a PC for the day, then change AutoCAD to suit his or her taste, and forget to reset it to how the original owner or user likes it.



**FIGURE 14.15** Profiles tab.



**FIGURE 14.16** Add profile.

## 14.2 SHORTCUTS

Recall that it was mentioned in the previous pages how important speed is to an AutoCAD designer. One of the tools to help you work faster was already mentioned, the mouse Right-Click Settings under the User Preferences tab. Shortcuts, however, are another important way to accelerate your input. They are useful only if you type. If you are a diehard Ribbon or toolbar user and abhor the keyboard, then you have no need for them. Many students, however, end up typing quite a lot, even if they also integrate some toolbar and Ribbon use. The reasons are simple: Typing is a fast, very direct method to interact with AutoCAD and remains quite popular despite other methods. However, to take advantage of this, you need shortcuts, as typing out the full command defeats the speed advantage.

You may have already been using shortcuts all along. Instead of typing in `arc`, you may have just pressed the letter `a`; instead of `move`, the letter `m`. This is exactly what is meant by shortcuts: It is the process of shortening the typed commands so they can be entered faster. What we want to do here is put all this on solid footing and outline exactly how to set your own shortcuts to make best use of them.

### pgp File

Here is a basic primer on shortcuts. They have been a part of AutoCAD since the early days, when typing commands was the best (and, in the very beginning, the only) way to interact with the software. Abbreviating the commands was the logical next step to speed up typing, and that capability was integrated into AutoCAD as well.

The abbreviations are stored in a file called `acad.pgp`, which resides in the Support folder of your AutoCAD installation. AutoCAD comes with a wide range of preinstalled shortcuts, but the file is easily found and meant to be modified to suit the user's taste and habits. The key here is that you need to have your shortcuts memorized (or it makes no sense to use them in the first place), and of course, you need to pick the most efficient abbreviations of the commands. To that end, AutoCAD does not care what you use—it can be names of your relatives if you so choose—but obviously you want to use something that makes sense to you and shortens the typing effort. Ultimately, the first letter, first and second letters, or first and last letters are used for all but a few of the commands.

Here are some suggestions for the Modify commands:

- Erase: `e`
- Move: `m`
- Copy: `c`
- Rotate: `ro`
- Scale: `s`
- Trim: `t`
- Extend: `ed`
- Fillet: `f`
- Offset: `o`
- Mirror: `mi`

The idea here is to abbreviate the most often used commands in the shortest way possible. If, for example, there is a conflict between two commands that start with the same letter (e.g., circle and copy), then you determine which command gets used more often and give that command fewer letters. Copy is generally used more often, so it would be c and circle would be ci.

Sometimes, doubling up of letters is done, such as with array (aa), because a is taken by arc, and so on. Listed in Fig. 14.17 is a sample acad.pgp file. It is presented here only for illustration purposes and may or may not match what you may want in yours, although it can be a good starting point to creating your own.

A,	*ARC	ED,	*EXTEND	PP	*PURGE
AA,	*ARRAY	EX,	*EXPLODE	Q	*QSAVE
B,	*BHATCH	EL,	*ELLIPSE	R	*REGEN
BR,	*BREAK	F,	*FILLET	R3	*ROTATE3D
BL,	*BLOCK	I,	*INSERT	RO	*ROTATE
C,	*COPY	ISO,	*LAYISO	RE	*RECTANG
CF,	*CHAMFER	L,	*LINE	RR	*RTZOOM
CH,	*CHANGE	LA,	*LAYER	RT	*RTPAN
CI,	*CIRCLE	LF,	*LAYFRZ	S	*SCALE
D,	*DTEXT	LW,	*LAYWALK	ST	*STRETCH
DD,	*DDEDIT	LI,	*LIST	T	*TRIM
MT,	*MTEXT	ISO,	*LAYISO	U	*UNDO
DI,	*DIST	M,	*MOVE	UU	*UCSICON
DD,	*DDEDIT	MM,	*MATCHPROP	W	*WBLOCK
DDC,	*PROPERTIES	MI,	*MIRROR	X	*EXTRUDE
DDO,	*DSETTINGS	MI3,	*MIRROR3D	Z	*ZOOM
DDS,	*DDSTYLE	O,	*OFFSET		
DDU,	*DDUNITS	P,	*PLOT		
DV,	*DVIEW	PE,	*PEDIT		
E,	*ERASE	PL,	*PLINE		

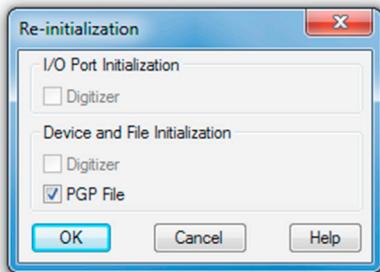
FIGURE 14.17 Sample acad.pgp file.

## Altering the ppg File

So, how do you find and alter the ppg file to suit your tastes? The long way is to find it via this path on your “C” drive: C:\Users\owner\AppData\Roaming\Autodesk\AutoCAD 2017\R21.0\enu\Support, but you really need not do this, and the shorter way is to access the file automatically through the drop-down menus as follows: Tools→Customize→Edit Program Parameter (acad.pgp). The ppg file then appears on your screen (opened as a Notepad file, which is just a simple ASCII text editor, if you never used it before). Scroll down the file until you see the rather lengthy built-in listing of shortcuts. At this point, you may do one of three things:

1. Leave the entire file as it is, and use the shortcuts without modification.
2. Erase or change the shortcuts for individual commands that you either do not use or would like to modify.
3. Erase the entire list and start fresh, entering the shortcuts as you would like them to be, one by one. If this is the case, be sure to follow the format given, where you enter the shortcut, then a comma, then a few spaces, and finally the command preceded by a \*, as seen in Fig. 14.17. You need not use all capital letters—that is just a preference.

When done, save the acad.pgp file and close Notepad. At this point, for the changes to take effect, you can either restart AutoCAD or (if you are in the middle of a drawing and do not want to do that) type in `reinit` and press Enter. The dialog box in Fig. 14.18 appears.



**FIGURE 14.18** Reinitialization of the acad.pgp file.

Check off the PGP File box and press OK. The pgp file is ready to go, and you can use it right away. To add or subtract commands, just repeat the steps at the beginning of this section, save the pgp file, and reinitialize.

It is strongly recommended that you at least try to modify and use the pgp file. It is almost always faster to type the shortcuts than to click on icons. You can eventually learn to type quickly and without even glancing at the keyboard (similar to a good secretary or court reporter), assuming you do not already type fast, as many students do. Another advantage is that, by typing commands, you free up space on your screen where toolbars and the Ribbon normally go.

### 14.3 CUSTOMIZE USER INTERFACE

The Customize User Interface dialog box (referred to from here on as just the CUI) is the next thing we examine in this chapter. The CUI has to do with changing the look and functionality of menus, toolbars, and other items and, as such, can be of importance to a small set of users who may need to do this for esthetic or functional reasons.

The CUI is an advanced and somewhat mysterious concept and one not taken advantage of by most users, as either they do not know much about it or do not wish to change their toolbars or menus. A few though find this customization ability of great interest and spend time customizing the look of AutoCAD to the point of almost having AutoCAD look like another program entirely.

We take the middle ground here and present some CUI basics, demonstrating the creation of a new custom toolbar and leaving the student with some CUI ideas to pursue further if he or she is interested in doing so.

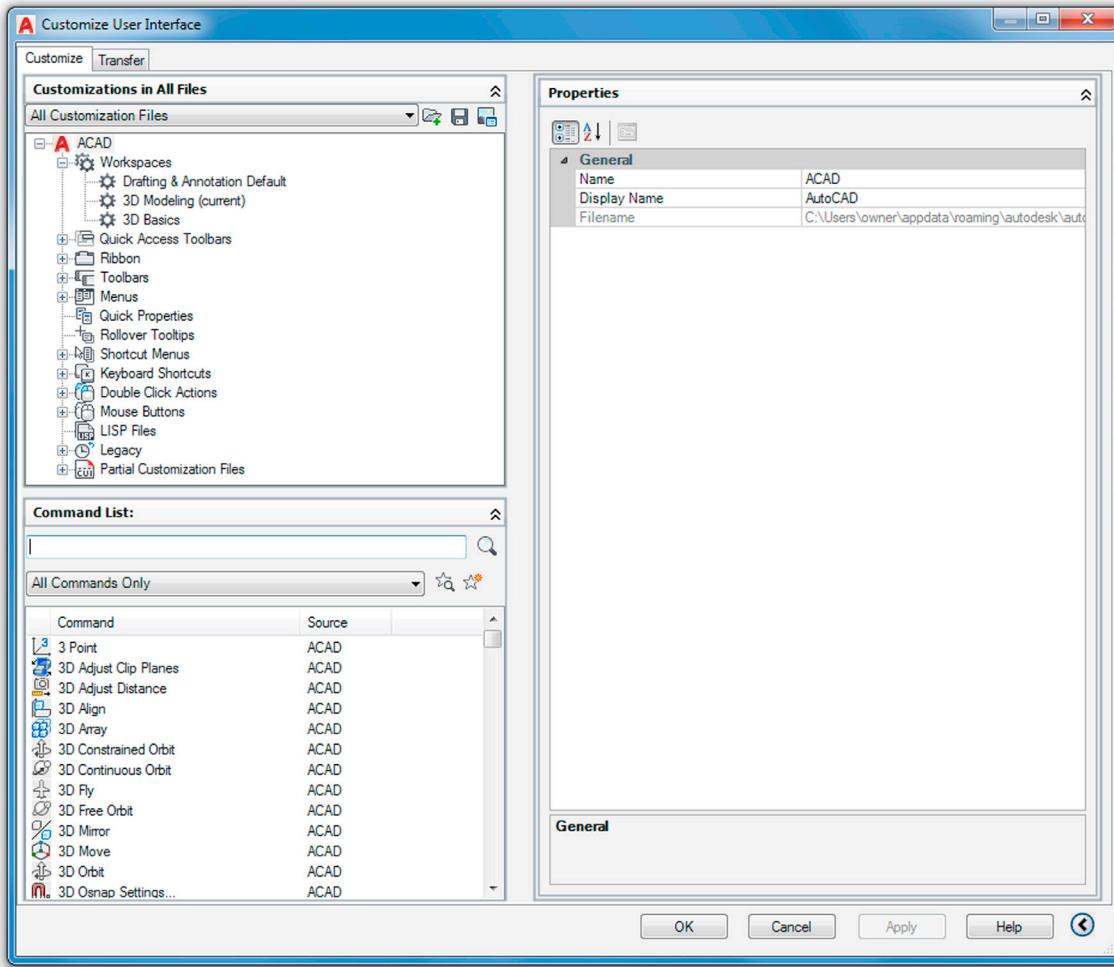
Let us introduce the basic CUI as it opens in default mode. Type in cui, press Enter (or alternatively use the Ribbon's Manage tab→User Interface), and after a few seconds, the dialog box in Fig. 14.19 opens up. Press the expansion button (small arrow, bottom right) to make it full size if it does not do this automatically.

In general, the CUI is your window into customizing virtually anything in AutoCAD that you can push, select, or type in. The full list of candidates is in the upper left of the CUI box: Workspaces, Toolbars, Menus, Dashboard Panels, and all the other choices. You may need to minimize the Workspace menu to see all the rest of them. Just to get your feet wet, let us create a custom toolbar that has only the buttons you want and none of the ones you never use. This is good idea for 3D, where toolbar use is more of a necessity than in 2D.

**Step 1.** In the upper left-hand corner, find the Toolbars expandable menu and right-click, selecting New Toolbar. Give your new toolbar a name in the name field (My\_New\_Toolbar, in this example). Once it is done, you can click on it and a Toolbar Preview Properties appears on the right of the CUI window, along with an expanded Properties palette.

**Step 2.** On the bottom left begin selecting the commands you want your new toolbar to have (you can filter the commands to find them more easily), and drag them into the new toolbar name on the upper left. As soon as you begin doing this, a toolbar preview and Button Image category appear on the right-hand side, as seen in Fig. 14.20, when Rectangle, Revcloud, Arc, and Spline were added in.

Interestingly, you can even modify the image itself by pressing Edit... in the Button Image category at the upper right, which takes you into the dialog box shown in Fig. 14.21. Here, you can use pixel-by-pixel editing tools to edit the image. You have some additional tools, such as a grid and a Preview window, to see what you have created. Finally, you can save your work and return to the CUI. You can draw some rather creative-looking buttons if you so desire (a few practical jokes of smiley-face icons from years gone by come to mind here). Admittedly, this is not done very often, as most users have better things to do with AutoCAD, or at least one would hope.



**FIGURE 14.19** The Customize User Interface (CUI) dialog box.

Finally, after adding a few more commands (Revcloud, Circle, and Spline) and pressing Apply and OK, the new toolbar is born, as shown in Fig. 14.22; this is certainly a good trick if you like toolbars and want to see only what you use on yours.

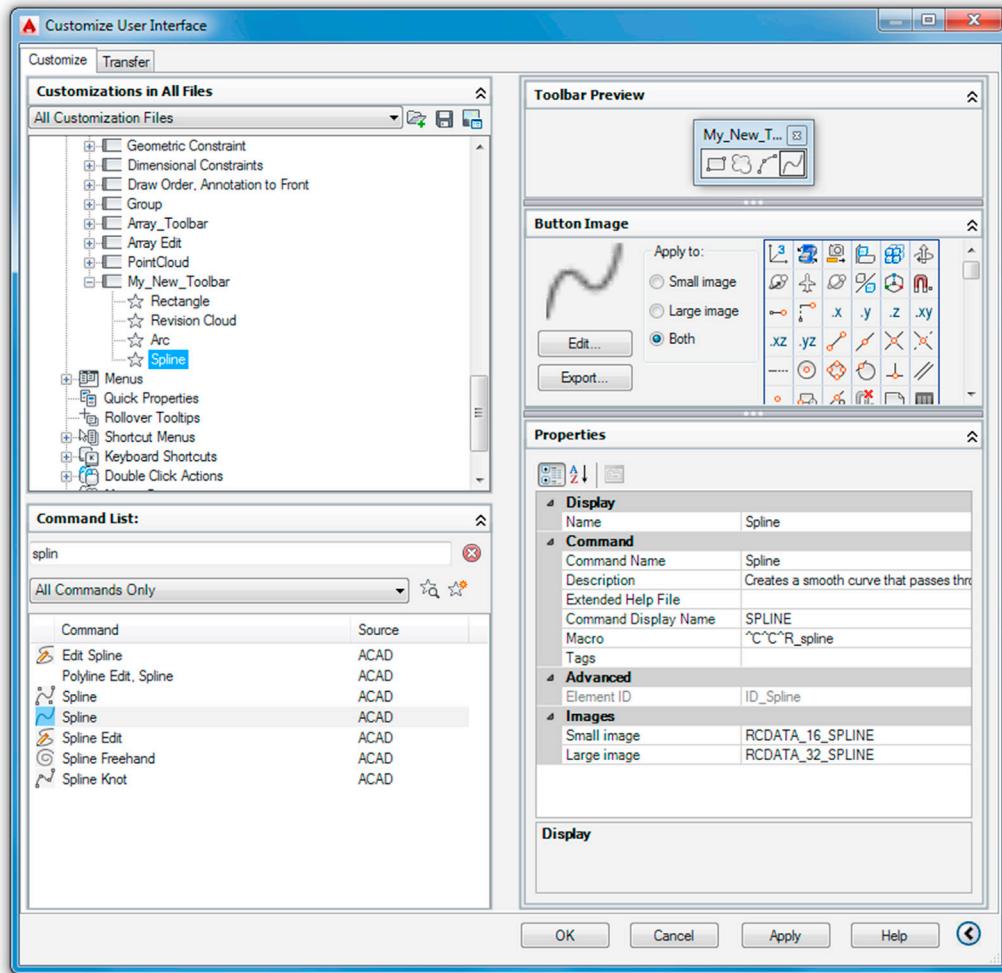
This is just the tip of the iceberg, of course. You can modify all the rest of the choices. Shortcut Keys under the Keyboard Shortcuts are quite useful. This refers to shortcuts such as Ctrl+C for Copy Clip (also known as *accelerator keys*). You can set up your keyboard to accelerate many commands. Just some of the preset ones are shown in Fig. 14.23 at the upper right of the CUI dialog box.

It may be worth your time to look through the Help files and investigate the CUI further; it really is a bottomless pit of customization, although be careful not to change something just for the sake of change but only if you feel it may help your productivity.

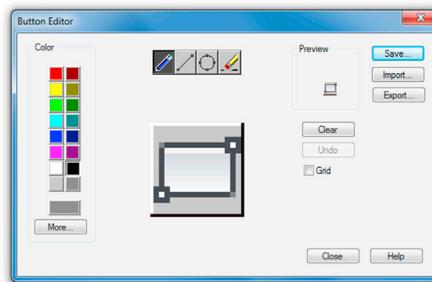
## 14.4 DESIGN CENTER

You can probably guess at one of the purposes of the Design Center (DC) as soon as you open it via the cascading menus Tools→Palettes→DesignCenter (also via typing in dc and pressing Enter, or Ctrl+2). Be sure to adjust all the window panes for good visibility, as shown in Fig. 14.24. The DC can also be docked to any side of the screen.

What you see in the far left window is basically the Windows Explorer used regularly to view files (such as when you click on My Computer). This is a big clue to the first of two functions of the DC, which are to view the contents of one



**FIGURE 14.20** My\_Toolbar—Add Rectangle, Revcloud, Arc, and Spline.



**FIGURE 14.21** Button Editor.



**FIGURE 14.22** The new My\_New\_Toolbar.

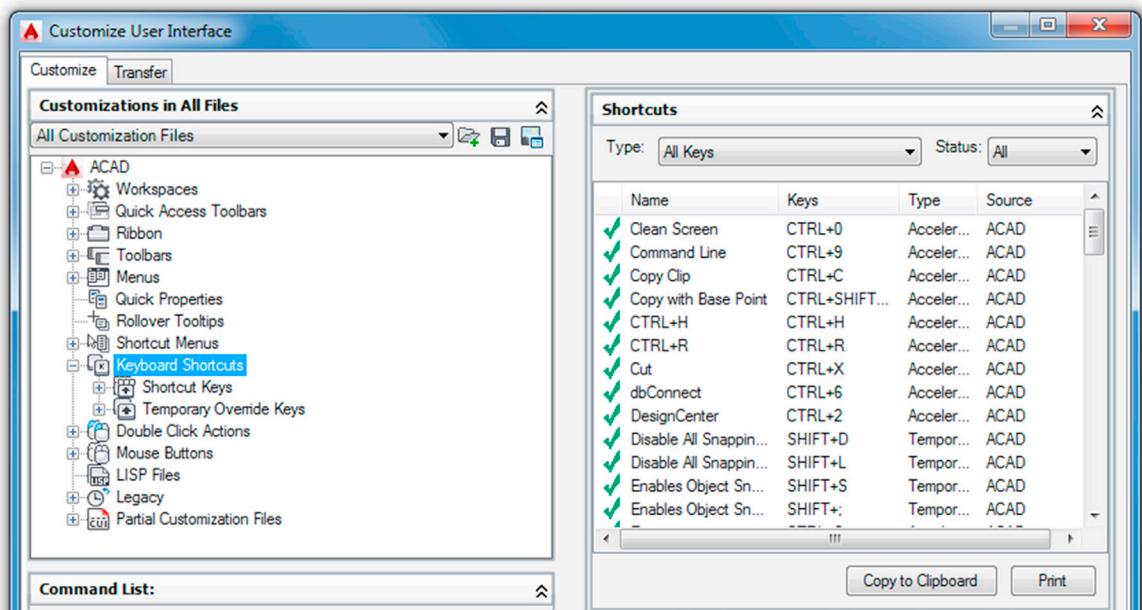


FIGURE 14.23 Accelerator keys.

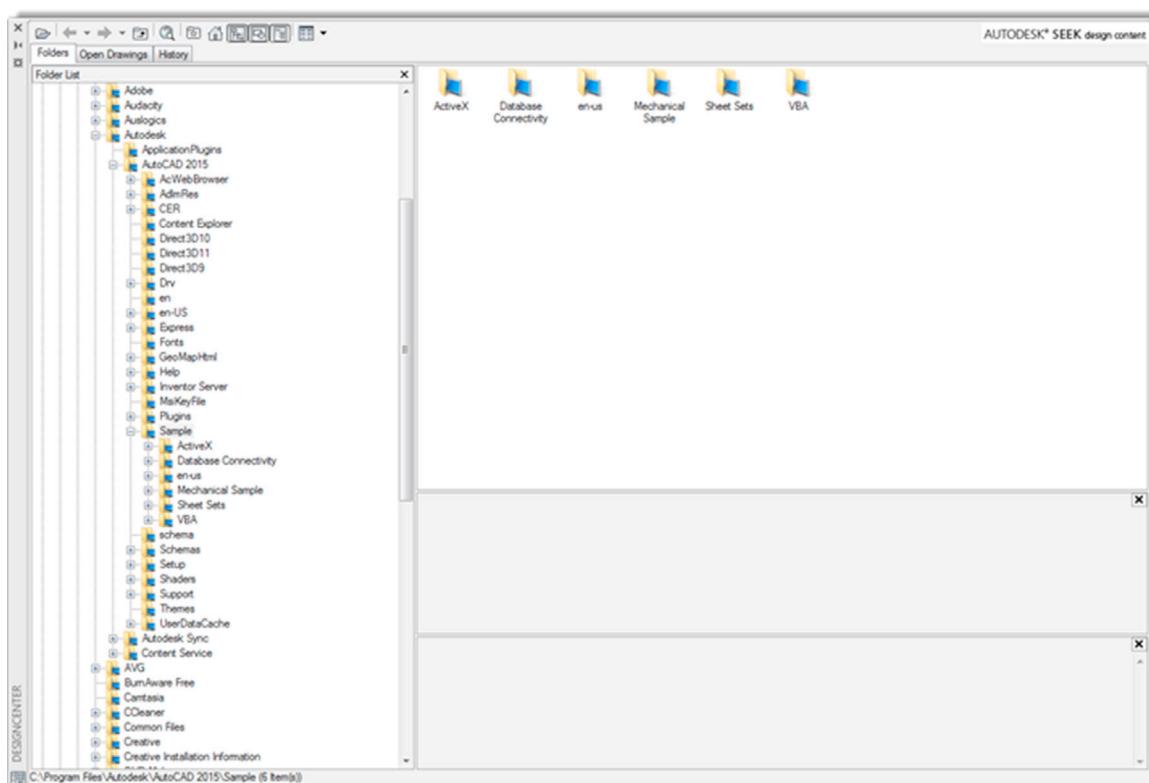
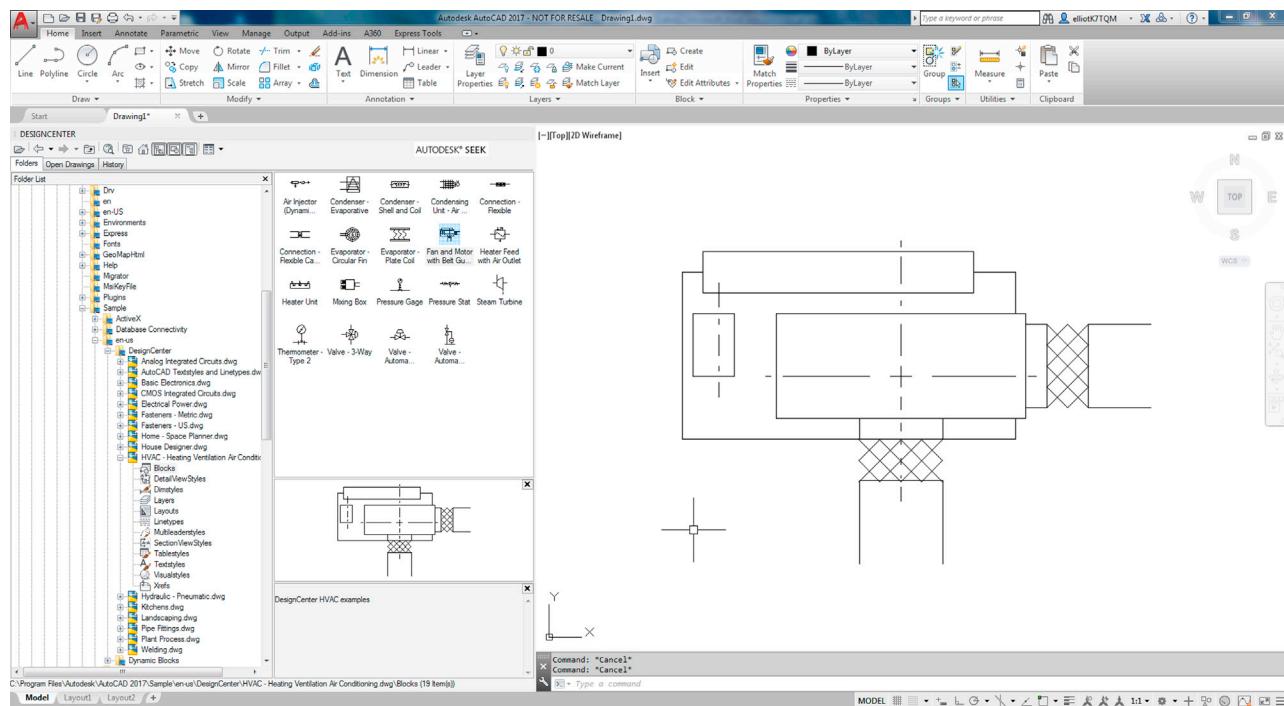


FIGURE 14.24 AutoCAD 2017 Design Center.

drawing on the left and, as we soon see, transfer parts of that drawing into the active drawing on the right. Let us give this a try using the process outlined next.

By default, the DC will likely open to the //AutoCAD 2017/sample file folder on the left. Go ahead open an additional few folders called *en-us*, followed by *Design Center*. There you see a sample drawing called HVAC – Heating Ventilation Air Conditioning.dwg. You can browse for and choose an actual work drawing you created, of course (that is the whole point, after all), but for our purposes right now, one of these sample drawings is just fine.

Click on the plus sign next to the HVAC file name and expand the folders, revealing a collection of useful data, such as Blocks, Dimstyles, Layers, and Layouts. Now click on a category, such as Blocks. A collection of blocks present in this drawing is revealed in the adjacent window. Click and drag any block from the choices given on the left into the drawing space on the right, as seen in Fig. 14.25 with a block called *Fan and Motor with Belt Guard*. Note that, in Fig. 14.25, the DC is fully docked to the left side of the screen and the window panels are adjusted to give equal spacing to the DC and the drawing area. The Toolbars are turned off to maximize the area.



**FIGURE 14.25** Design Center transfer of blocks (toolbars are turned off).

In the same manner, you can transfer layers and anything else lifted from one drawing to another. This is very useful when you need only a few items, as opposed to everything, and is a great visual alternative to the usual Copy/Paste (Ctrl+C and Ctrl+P).

The next two tabs of the DC are not all that significant. Open Drawings simply looks at the content of the current active drawing, and History is exactly that, the history of all the open drawings thus far in the drawing session. There is another function to the Design Center that we have yet to explore, however.

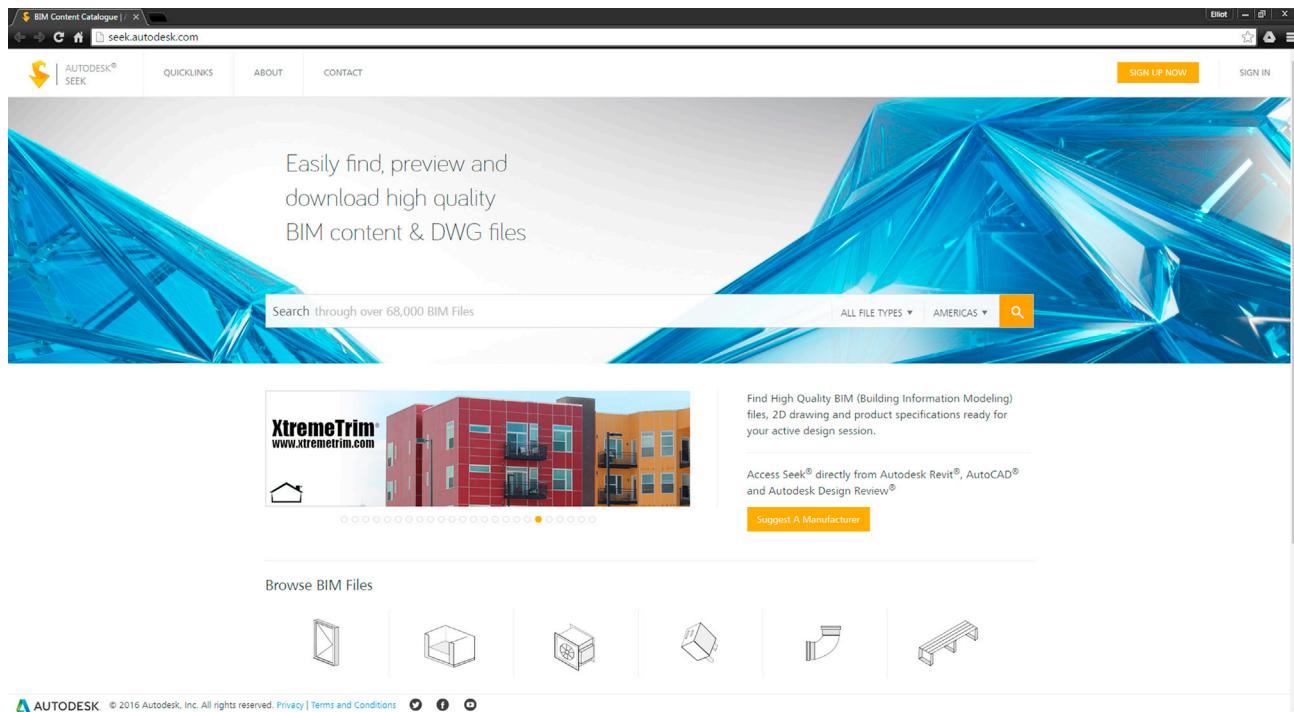
This function is the ability of the Design Center to present to you an extensive array of drawing blocks for you to use as generic items in your floor plan. As of AutoCAD 2011, you can access this database tool, called Autodesk Seek, online, as opposed to clicking on another tab that leads you to blocks built into AutoCAD and installed on your computer. This greatly expands the available library and allows Autodesk to update it in real time. This all continues with AutoCAD 2017.

Assuming you have internet access on your computer, you can access the database by clicking on the Autodesk Seek design content logo in the upper right of the Design Center (Fig. 14.26).

After a moment or two, this leads you to Autodesk's online database of product specs and design files. If you want to access the site without using the Design Center, here is the web address: <http://seek.autodesk.com/>. You then see the screen in Fig. 14.27.



**FIGURE 14.26** Autodesk Seek.



**FIGURE 14.27** Autodesk Seek web page (in Google Chrome).

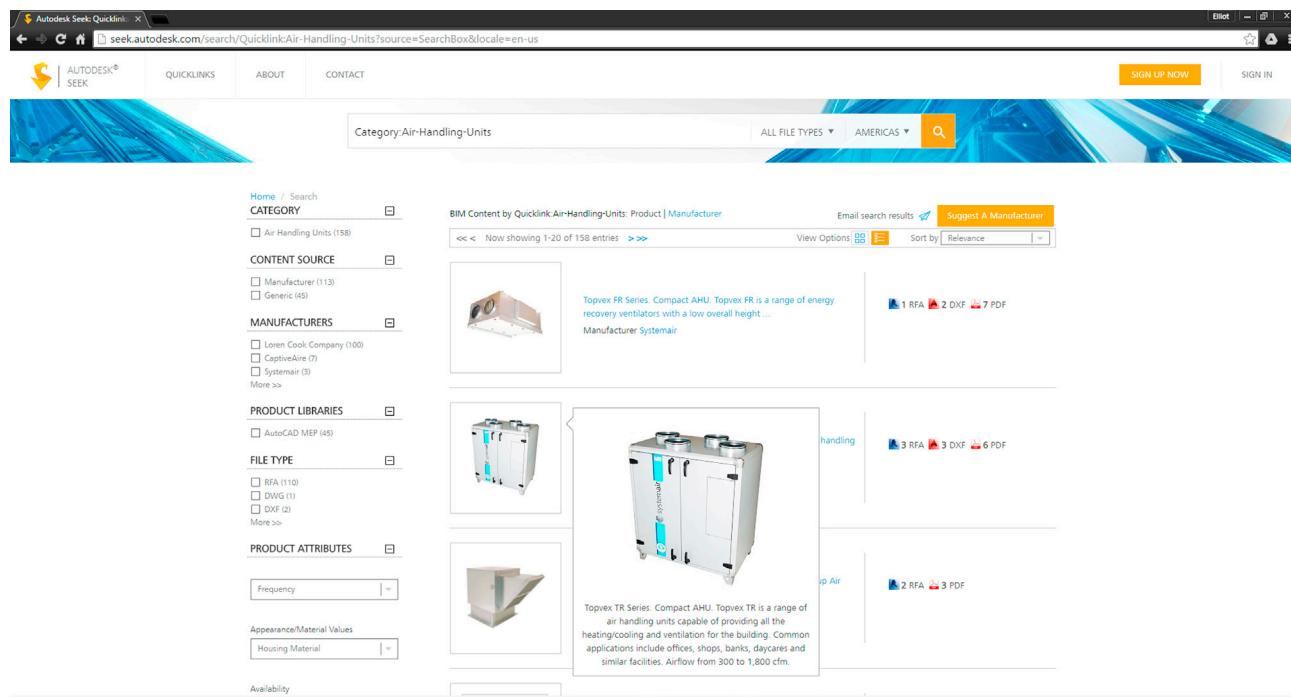
As you can see from inspecting the website, you can choose from a number of file types as well as an extensive suite of categories, such as Building, Interior, and Mechanical. Click around to see what is available. You can then choose by generic or manufacturer. If you go to Mechanical, Air Handler Units (for example), you get the screen shown in Fig. 14.28. You can then choose a file type on the right (many are available, not just AutoCAD drawings) and actually download the file. Explore this extensive website further; it is truly a great resource with 68,000 models available as of this writing.

## 14.5 EXPRESS TOOLS

Express Tools are a set of commands grouped together under the Express drop-down menus. These commands add extra functionality to AutoCAD, and while some of them are redundant or not that useful, others became so indispensable that they were later incorporated into regular AutoCAD menus and command sets. It really is a mixed bag, and our goal here is to highlight only the most useful ones, leaving the rest for you to explore if you so choose.

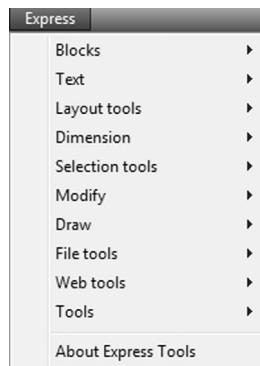
Express Tools, originally called *Bonus Tools*, got their start around Release 14 in the mid-1990s as a collection of useful routines and small programs. Where they originally came from is a matter of debate, but Autodesk likely acquired them from other third-party developers and possibly regular programming-savvy users who felt that AutoCAD just did not have that perfect command and developed their own as a “plug-in.”

However it happened, these tools found their way to Autodesk, and the company began to offer them as an “extra” to AutoCAD (not technically part of the core software). Sometimes, these tools were offered for sale; sometimes, they were free to VIP subscribers; and eventually they became free to all customers, although up until recently they often still needed to be installed in a separate and deliberate step while installing AutoCAD itself.



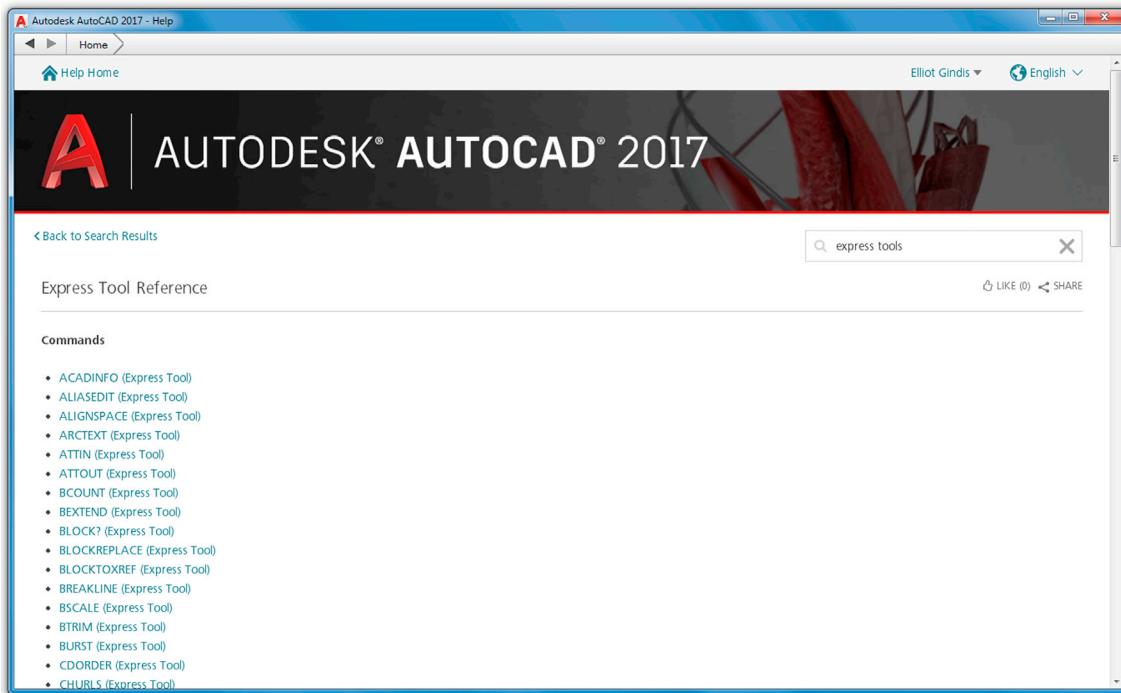
**FIGURE 14.28** First few choices in Air Handler Units category.

The first step in learning Express Tools is to check that you have them (you should with AutoCAD 2017), and we proceed from here on with the assumption that all is well and you are ready to go over them. Fig. 14.29 shows what the topmost listing looks like when dropped down from the top cascading menu. This is the easiest way to access these tools, although there are a few toolbars as well.



**FIGURE 14.29** AutoCAD 2017 Express Tools cascading menu.

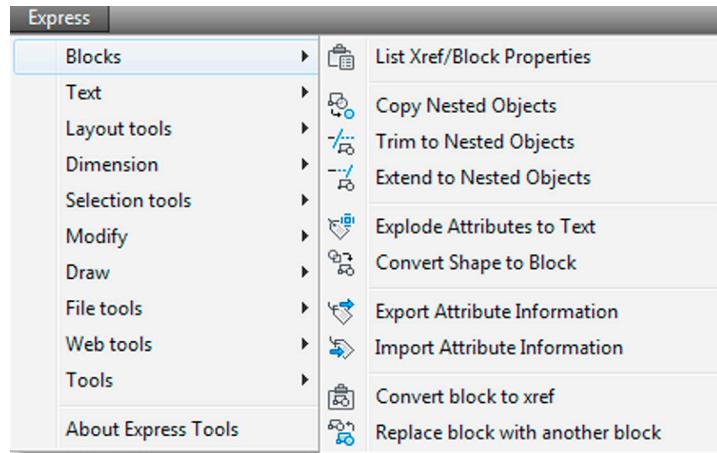
Next is a rundown of the most useful Express Tools. If you would like info on those commands that are not specifically covered, refer to the Express Tools Help files for detailed description of each one. The Help files for the Express Tools are the same as the regular AutoCAD Help files (first seen in Fig. 2.26). They are accessed via the usual F1 key, and then just do a search for “Express Tools Reference.” The Express Tools Help menu is shown in Fig. 14.30. Sometimes, you may find the functionality of an express tool already a part of AutoCAD in some other way, shape, or form. Occasionally, typed commands call up these tools as well. These are discussed as they come up.



**FIGURE 14.30** Express Tools Reference in the Help files.

## Blocks

The first category from the top is Blocks (Fig. 14.31). Here, you find ten menu choices, all having to do with blocks, nested objects, shapes, and attributes. Do explore all of them, but pay special attention to the ones described in more detail next.



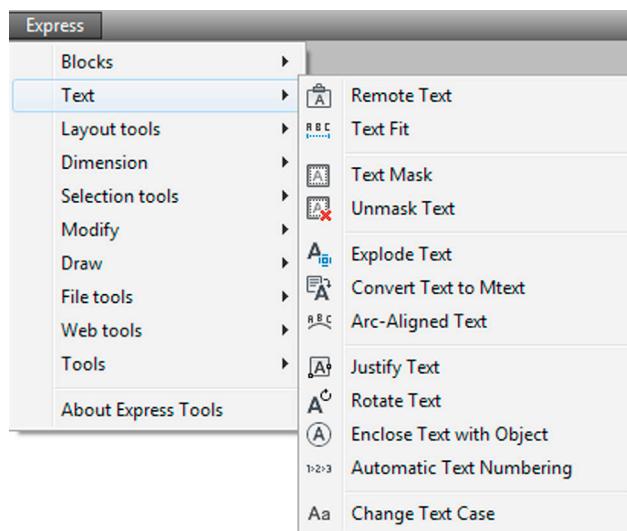
**FIGURE 14.31** Express Tools (Blocks).

- *Copy Nested Objects:* This command is useful for plucking out nested items, such as those embedded in xrefs (Chapter 17, External References (Xrefs) topic) or blocks. These objects are otherwise stuck inside and not easily accessible for copying. The command line equivalent for this is `ncopy` and does the same thing. Additional commands below this one allow you to trim and extend to these nested objects as well.

- *Explode Attributes to Text:* When you explode attributes (Chapter 19, Advanced Output and Pen Settings topic), they do not turn into regular text; instead they take the shape of attribute definitions. This useful tool forces them to revert to ordinary text so you need not retype anything.

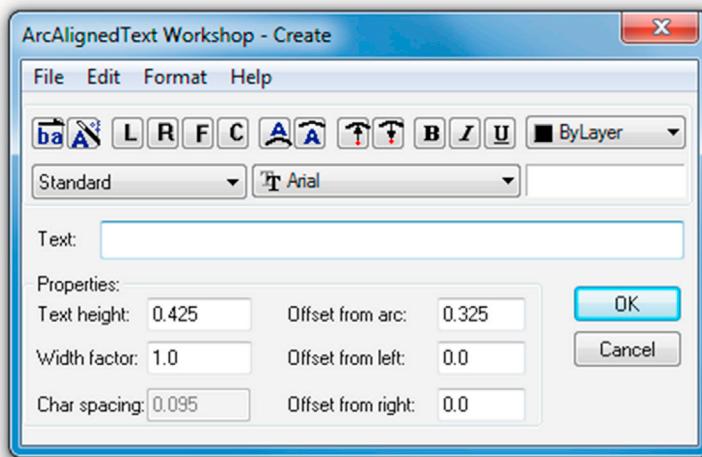
## Text

The second category from the top is Text (Fig. 14.32). Here, you find 12 menu choices, all having to do with text and mtext. Do explore all of them, but pay special attention to the ones described in more detail next.



**FIGURE 14.32** Express Tools (Text).

- *Convert Text to Mtext:* This command pretty much does what it advertises: It converts lines of text to a paragraph of mtext. It is faster and more efficient than copying the text one line at a time or redoing mtext completely. Simply activate the command, pick the lines of text you want to convert, and press Enter.
- *ArcAligned Text:* This command is used to tackle a problem that has never been addressed by AutoCAD prior to Express Tools's existence: How to create text that stretches around an arc. The procedure is to draw an arc and select this tool (or just type in arctext), then select the arc. The dialog box seen in Fig. 14.33 appears. Enter the actual text and adjust



**FIGURE 14.33** ArcAligned Text.

parameters such as fonts, size, and anything else you want (they all have explanatory tool tips if you float your mouse over them); finally, press OK when done. Your text should look similar to that shown in Fig. 14.34. If the text is too squeezed or spread out, adjust the sizing. Note that the text can be over or under the arc. Also remember that you need to type in `arctext` to go back and edit it. Regular `ddedit` or double-clicking does not work here.

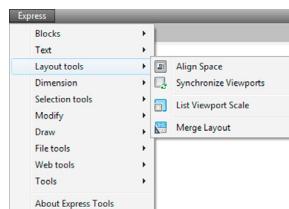
- **Enclose Text with Object:** This command encloses your text with rectangles, slots, or circles. Run through the menu options, setting offsets, shapes, and sizes.



**FIGURE 14.34** ArcAligned text sample.

## Layout Tools

The third category from the top is Layout tools (Fig. 14.35). Here, you find four menu choices, all having to do with Paper Space viewports. These commands are rarely used or are duplicates of existing commands, but do take a few minutes to briefly explore them. We do not go into further detail.

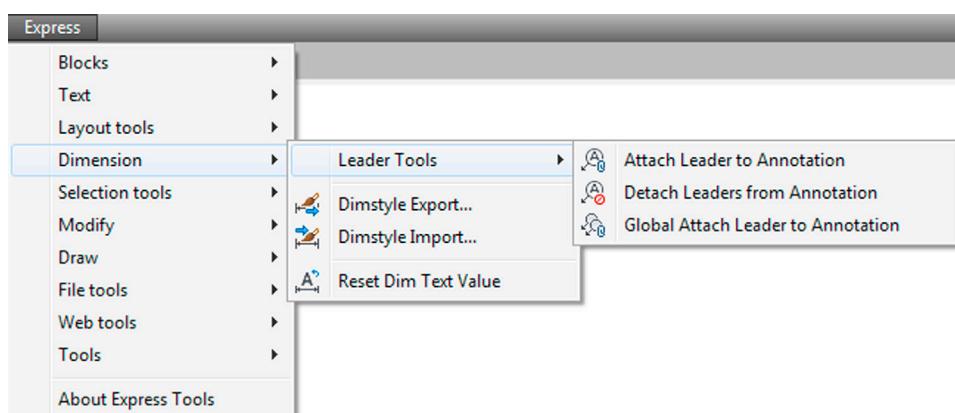


**FIGURE 14.35** Express Tools (Layout tools).

## Dimension

The fourth category from the top is Dimension (Fig. 14.36). Here, you find six relatively obscure dimstyle and leader tools.

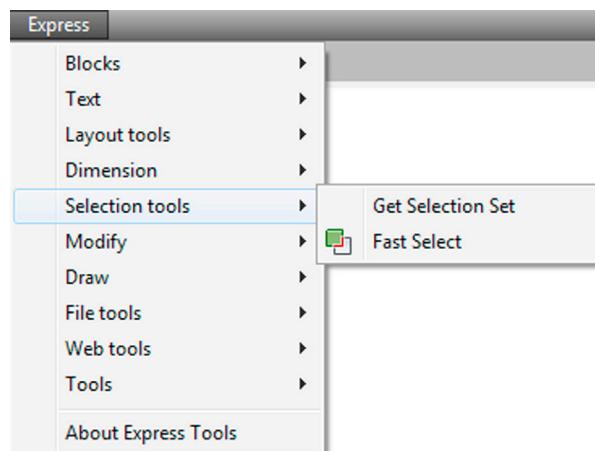
Take a few minutes to explore them, but we do not go into further detail.



**FIGURE 14.36** Express Tools (Dimension).

## Selection Tools

The fifth category from the top is Selection tools (Fig. 14.37). Here, you find two relatively obscure commands that have to do with selection sets. We do not go into further detail here.

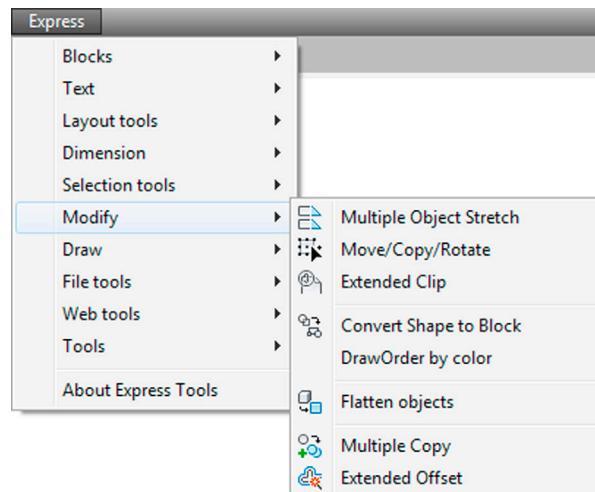


**FIGURE 14.37** Express Tools (Selection tools).

## Modify

The sixth category from the top is Modify (Fig. 14.38). Here, you find nine menu choices having to do with various move, copy, rotate, stretch, and other command variations. Several of them duplicate other commands (such as Multiple copy) or are of limited use (such as Move/Copy/Rotate). Do explore all of them, however, but pay special attention to the ones described in more detail next.

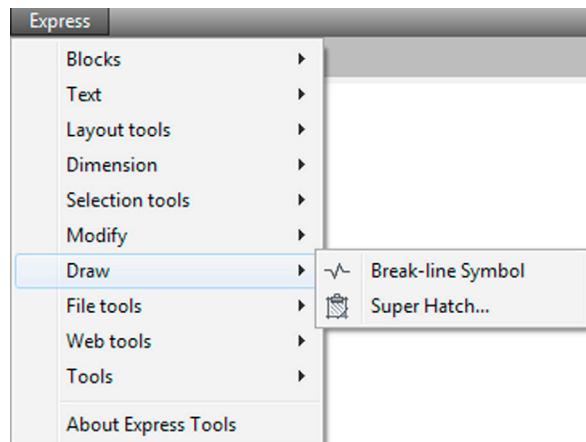
- *Delete Duplicate Objects:* This command is basically the overkill command, which we cover in the next chapter.
- *Flatten Objects:* If you go on to study 3D, this is a great tool for flattening (converting) a 3D image into a 2D one.



**FIGURE 14.38** Express Tools (Modify).

## Draw

The seventh category from the top is Draw (Fig. 14.39). Here, you find just two menu choices, Break-line Symbol and Super Hatch.... We go over both next.

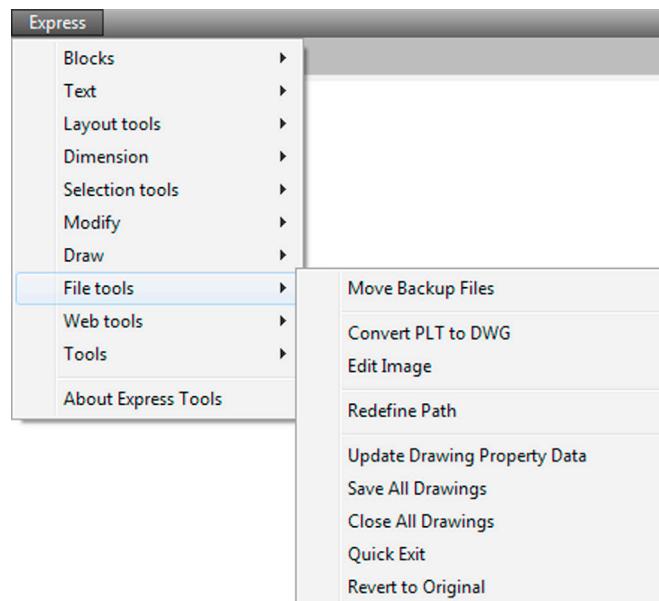


**FIGURE 14.39** Express Tools (Draw).

- *Break-line Symbol*: Students have found this command one of the most useful among the Express Tools, because it seems everyone would like to avoid drawing this symbol from scratch. Here, the process of making one is as easy as clicking two points and indicating a midpoint for the actual break line. Try it by selecting the command and specifying a first and second point along a line; then, using the MIDpoint OSNAP, place the break symbol in the middle. The Size option allows you to alter the break size.
- *Super Hatch...*: This command creates hatch patterns out of ordinary images by basically copying them many times over to fill an area. This looks interesting but really slows down the computer, as graphics are copied over and over. Give it a try but avoid selecting an overly complex image; you may have to wait a while.

## File Tools

The eighth category from the top is File tools (Fig. 14.40). Here, you find nine tools that deal mostly with file management. Much of what is here can be done manually in other ways, such as the numerous tools for opening, closing, and saving multiple drawings. We go over one tool in particular and do not go into depth with the rest.

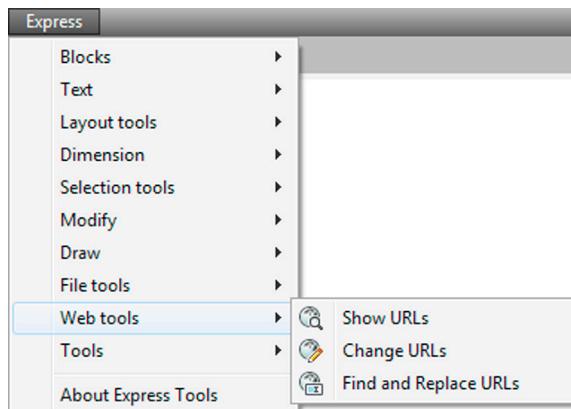


**FIGURE 14.40** Express Tools (File tools).

- *Convert PLT to DWG:* This converts plot files to useable drawing files. The `plt` files are printer-ready data files that allow a printer to print an AutoCAD drawing without AutoCAD being loaded. They are rarely used anymore, unless you take a file to a professional printer. If you find any stray `plt` files lying around from the old days, you can use this express tool to convert them back to see what you have.

## Web Tools

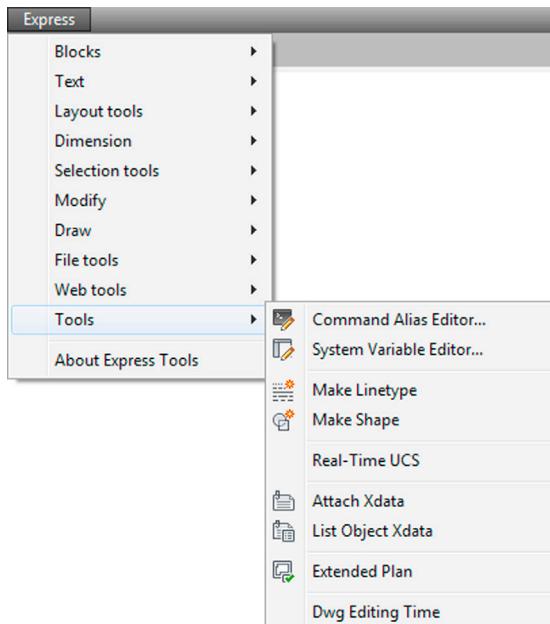
The ninth category from the top is Web tools (Fig. 14.41). Here, you find three URL/hyperlink-related tools. AutoCAD hyperlinks have not yet been discussed, so we do not go into further detail here. You see a bit more on these tools when hyperlinks are introduced in the next chapter.



**FIGURE 14.41** Express Tools (Web tools).

## Tools

The tenth and final category from the top is Tools (Fig. 14.42). Here, you find nine tools that serve a variety of functions, from editing aliases and variables (outdated—the `pgp` file and the CUI take care of those) to making shapes and linetypes. Look over the commands on your own, but we do not go into further detail here.



**FIGURE 14.42** Express Tools (Tools).

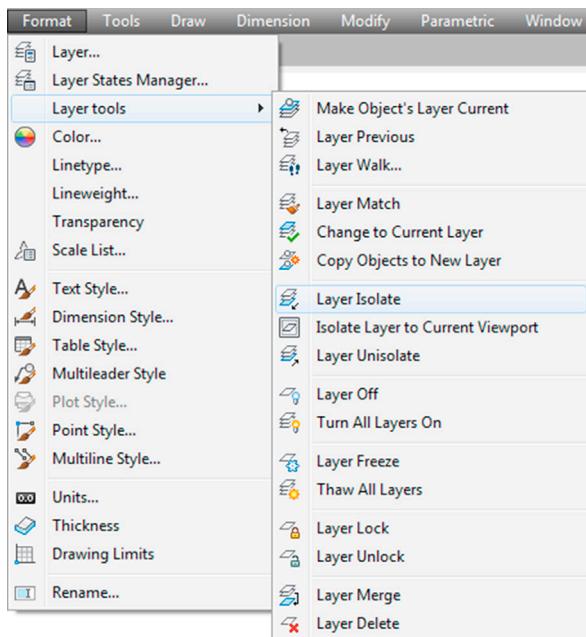
## Layer Express Tools

The Express Tools just covered are the most useful ones to the average designer and the ones typically used the most in many different professions. As you may have noticed, there is some overlap and redundancy between what is still in the Express Tools and what has been incorporated into regular AutoCAD. Autodesk does not like to throw much away.

The Express Tools are also missing something very important, perhaps the most important tools of all: the Layer tools. They were once part of the Express Tools gang, but their importance has been acknowledged by an upgrade to permanent status within regular AutoCAD menus. Although there are a bunch of them (many are redundant), we focus on the primary three that are of significant importance:

- Layer Freeze (command line: `layfrz`)
- Layer Isolate (command line: `layiso`)
- Layer Walk (command line: `laywalk`)

In addition to typing, these tools are accessible via the drop-down menus under Format→Layer tools, as seen in Fig. 14.43.



**FIGURE 14.43** Layer tools.

### Layer Freeze

In a complex drawing, layers may number in the dozens or even hundreds. Any tool that can simplify dealing with them is a welcome addition. Layer Freeze allows you to freeze a layer merely by selecting it. This bypasses the tedious process of finding out what layer an object is on (if not known), then freezing it manually via the LA dialog box or the toolbar. Simply type in `layfrz` and press Enter, or select Format→Layer tools→Layer Freeze.

- AutoCAD says: Select an object on the layer to be frozen or [Settings/Undo]:

Pick an object that represents the layer you want frozen, and it disappears. This can be repeated as often as needed and is a good way to clear a lot of junk from a busy, dense drawing.

### Layer Isolate

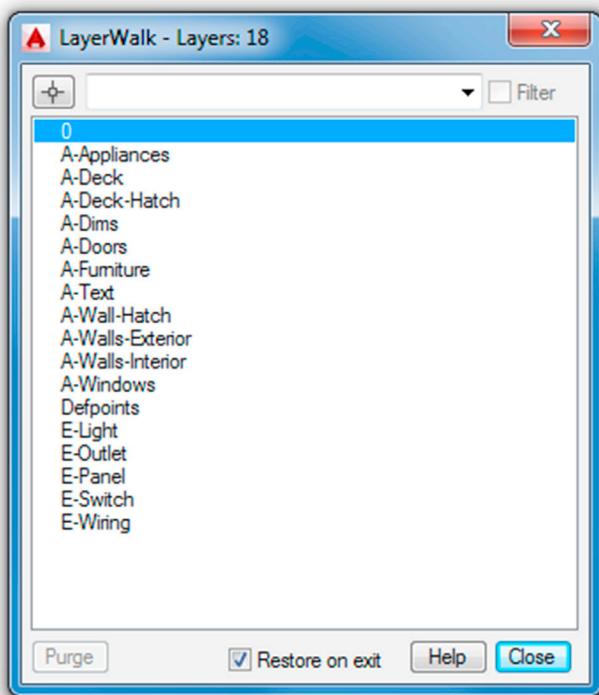
Layer Isolate allows you to isolate a layer merely by selecting it. The command turns off (not freezes in this case) all the other layers, leaving the selected one by itself. This bypasses the tedious process of doing it manually. Simply type in `layiso` and press Enter, or select Format→Layer tools→Layer Isolate.

- AutoCAD says: Current setting: Hide layers, Viewports = Vpfreeze  
Select objects on the layer(s) to be isolated or [Settings]:  
Pick an object that represents the layer you want isolated, press Enter, and all the others disappear. It is another good way to clear a dense drawing.

### Layer Walk

This is perhaps the most interesting of all the layer controls and a good way to shuffle through an entire drawing layer by layer. Layer Walk presents a list of layers and isolates one of them. Then, you use the arrow keys on your keyboard to select your way up or down the list. AutoCAD turns layers on or off in succession, allowing you to inspect each layer, one at a time (walk through them). To try this, open up any file that has a number of layers. Then, type in `laywalk` and press Enter or select Format→Layer tools→Layer Walk....

A dialog box appears, listing all the layers visible from layer 0 until the last one, as shown on a sample file (Level 2 project) in Fig. 14.44. Click on layer 0; it highlights that layer and all the rest disappear. Use the arrow keys to cycle down through each layer, and notice how each one appears and disappears as its turn comes up in the listing.



**FIGURE 14.44** Layer walk.

This is a great tool to review all the layering on an unfamiliar drawing as well as one of your own to ensure accuracy. Notice that, along the way, many AutoCAD designers let their layering accuracy slip as the project gains complexity, and by the end, layers are sloppy, with objects residing where they are not supposed to be.

After inspecting all the layers, you can stop on any one of them for editing; if the Restore on exit selection box is checked, then all the layers come back on when you press Close.

Most of the other layer commands are redundant, as you can already perform these functions in other familiar ways (via the LA dialog box or toolbar), so we do not discuss them further, but review them at your own pace.

## 14.6 LEVEL 2 DRAWING PROJECT (4 OF 10): ARCHITECTURAL FLOOR PLAN

For Part 4 of the drawing project, you add in electrical wiring, switches, lights, panels, and outlets. This design is similar in principle, if not in complexity, to a real electrical design.

**Step 1.** You need the following layers (with suggested colors) for the electrical pieces. The pieces are monochrome in Figs. 14.45 and 14.46.

- E-Light (Green)
- E-Outlet (Red)
- E-Panel (White)
- E-Switch (Magenta)
- E-Wiring (Blue)

**Step 2.** Create the electrical symbols as shown in Fig. 14.45. Make sure the layers and colors are appropriate. Finally, make a block out of each symbol, so you can just copy and rotate them into position. With switches and outlets, there are numerous types (dimmer, three-way, duplex outlet, GFI, etc.), so this only scratches the surface.

**Step 3.** Lay out the electrical symbols as seen in the floor plan in Fig. 14.46. Some of the wiring runs are splines and some are arcs.

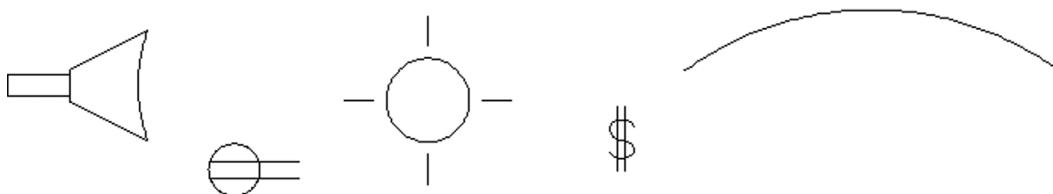


FIGURE 14.45 Various electrical symbols.

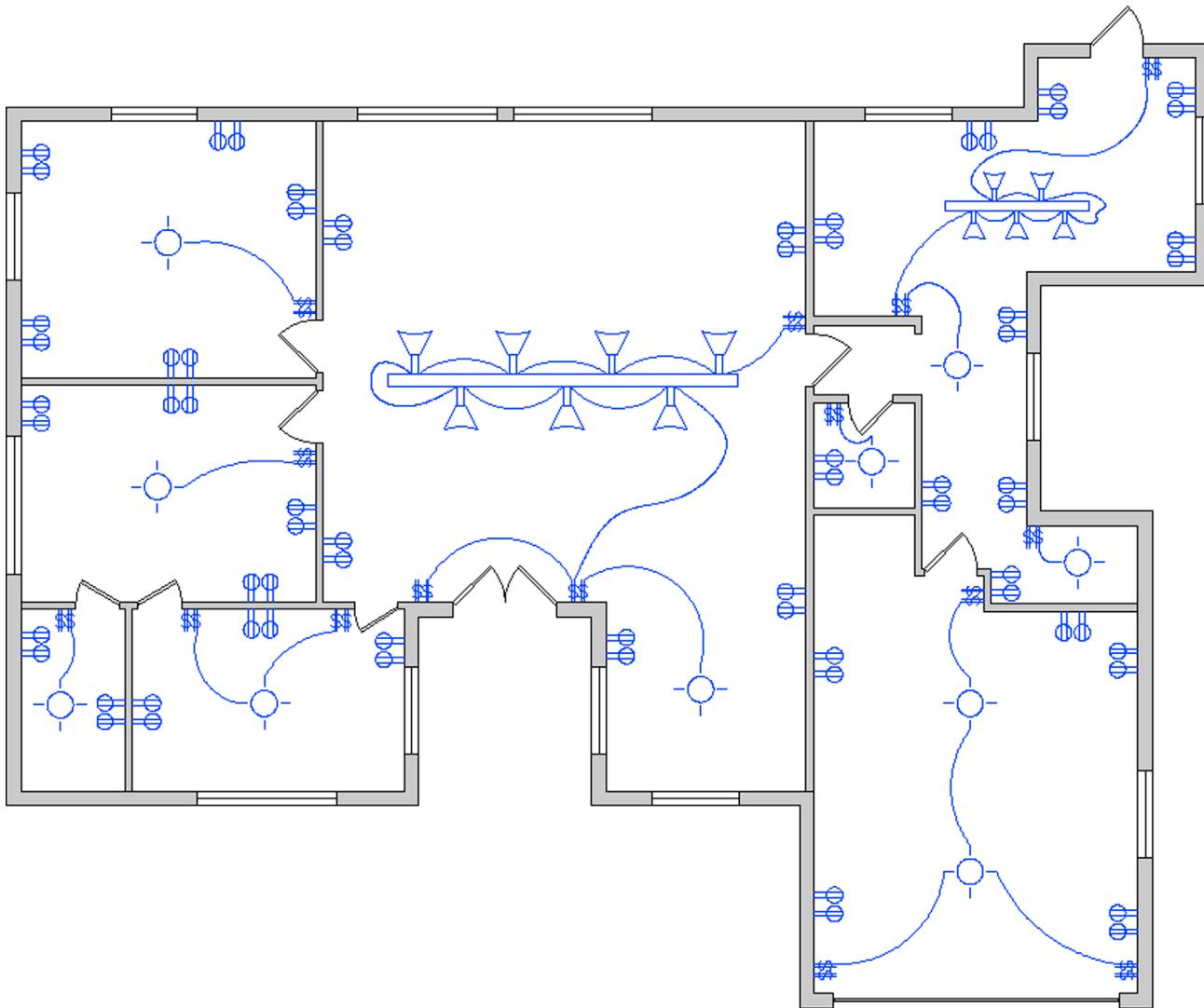


FIGURE 14.46 Electrical layout.

## 14.7 SUMMARY

You should understand and know how to use the following concepts and commands before moving on to [Chapter 15](#), Advanced Design and File Management Tools:

- Files tab
- Display tab
- Open and Save tab
- Plot and Publish tab
- System tab
- User Preferences tab
- Drafting tab
- 3D Modeling tab
- Selection tab
- Profiles tab
- Shortcuts
- pgp file
- CUI
- Design Center
- Express Tools

### Review Questions

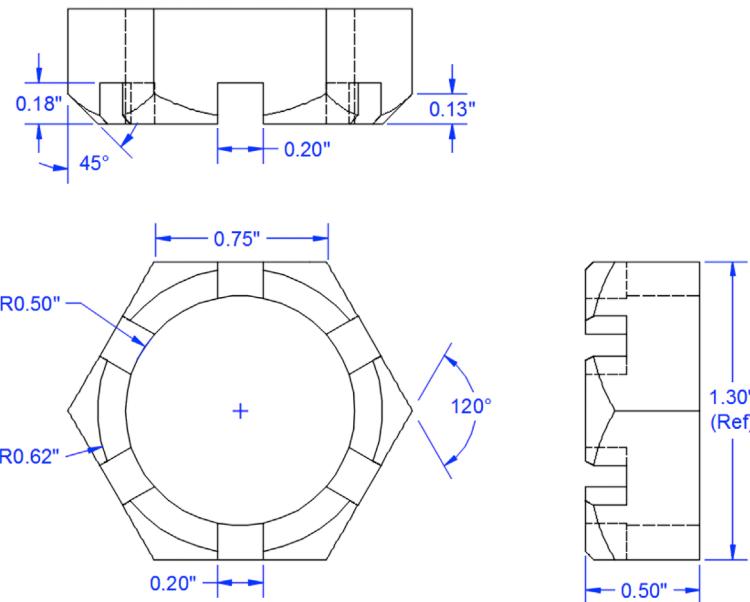
Answer the following based on what you learned in this chapter:

1. What is important under the Files tab?
2. What is important under the Display tab?
3. What is important under the Open and Save tab?
4. What is important under the Plot and Publish tab?
5. What is important under the System tab?
6. What is important under the User Preferences tab?
7. What is important under the Drafting tab?
8. What is important under the Selection tab?
9. What is important under the Profiles tab?
10. What is the pgp file? How do you access it?
11. Describe the overall purpose of the CUI.
12. Describe the purpose of the Design Center.
13. Describe the important Express Tools that are covered.

### Exercises

1. Based on what you learned about the Options dialog box, set up your own profile. Be sure to include or at least consider all the variables and settings discussed. Save the profile as `Profile_Your_Name`. (Difficulty level: Easy; Time to completion: <10 minutes.)
2. Based on what you learned about the pgp file, create your own based on whatever abbreviations you prefer. Be sure to utilize the commands shown in [Fig. 14.17](#) as well as add any of your own that you may want included. (Difficulty level: Easy; Time to completion: 20 minutes.)
3. Based on what you learned about CUI, create your own toolbar that features the following command icons:
  - Line
  - Circle
  - Rectangle
  - Move
  - Copy
  - Rotate
  - Offset
 (Difficulty level: Easy; Time to completion: 15 minutes.)

4. Review the Express Tools. Practice creating another arc-aligned text and break line. Open up any multilayer file and review the Layer tools: `layfrz`, `layslo`, and `laywalk`. (Difficulty level: Easy; Time to completion: 20 minutes.)
5. To keep your Level 1 drafting skills sharp, draw the following 3-view layout of a nut design. Make use of array as much as possible. (Difficulty level: Easy; Time to completion: 20–30 minutes.)



6. To keep your Level 1 drafting skills sharp, draw the following 2-view mechanical spindle layout. (Difficulty level: Easy; Time to completion: 20–30 minutes.)

