

Bonus Chapter 1

Exporting to CAD, Illustration, and Other Modeling Software

In This Chapter

- ▶ Finding out about vector graphics
 - ▶ Generating 2D files for CAD and illustration software
 - ▶ Exporting your model to other 3D software
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Don't you hate how airlines make you walk through the first-class section to get to your seat? I think the economy section is bad enough without having to see how much better some people have it — the big, cushy seats, the dinner entrees made with real meat — I'm usually in a bad mood by the time I sit down. But what does this have to do with export formats in SketchUp Pro? It's all about knowing what you're not getting.

If you don't have the Pro version of SketchUp, don't bother reading this chapter. The stuff I talk about applies only to those folks who have sprung for the bells-and-whistles version of SketchUp. Now, if you're using Google SketchUp (free) and you're wondering what's in Pro, you might find it useful to peruse these pages to see what you're missing. Unlike the flight attendant on the last plane I was on, I won't yell at you for sticking your head through the curtain to take a look around.

SketchUp Pro users have access to a few file export formats that aren't available in the free version of SketchUp. These file formats let you share your work with other pro-grade software programs like Illustrator, AutoCAD, and 3ds Max. Most people who design things for a living use a number of different pieces of software to get their work done, and they need the ability to move their data between them. That's where SketchUp Pro's exporters come in.

I divide this chapter into two halves: The first part talks about SketchUp's 2D export formats, and the second part deals with the 3D ones. For each file format that SketchUp exports, I provide a description of what the settings do, and in some cases, why you might need them. Which format (or formats) you choose depends entirely on what other software you use.

Exporting Drawings in 2D

It's all fine and well to have a 3D model in SketchUp Pro, but most people who design 3D objects (toasters, buildings, or Volvos) eventually need to create 2D views of their designs. Sometimes these views are for presentations, and sometimes you need to import a 2D view into other software programs, where you can continue to work on it. You can use SketchUp Pro's 2D export formats to do both.

Sizing up the export formats

You can find a lot of other software out there, and luckily, SketchUp Pro provides enough export formats that you can interact with most of it. On the 2D export side, here's a brief rundown on what SketchUp Pro has to offer:

- ✓ **PDF:** Lately, you can't swing a cat (not that I ever would, Mom) without hitting a Portable Document Format file. On top of the fact that almost anyone can read them, PDF files are great for sending information to vector-illustration programs like Adobe Illustrator.
- ✓ **EPS:** Encapsulated PostScript files are what folks *used* to use to transfer vector information, but these days, more and more people use PDFs.
- ✓ **DWG:** This is AutoCAD's native file format, and it's the best one to use for transferring information to that program and other pieces of CAD software. DWG can also contain 3D information, so I talk about it in the second part of this chapter, too.
- ✓ **DXF:** Document Exchange Format is another "flavor" of DWG. Autodesk developed DXF to be the file format that other pieces of software use to transfer data into AutoCAD because they weren't supposed to be able to create DWGs. Trouble is, DWG has been *reverse-engineered* (taken apart, figured out, unlocked, and put back together again), so now most CAD programs can exchange both DXF and DWG files to their hearts' content.
- ✓ **EPIX:** You may have never heard of *Piranesi*, but you should know about it. It's a piece of software that lets you "paint" on top of 2D views of your model, but it's much cooler than that. Anyway, EPIX lets you open 2D views of your SketchUp model in Piranesi, if you have it.

In the sections that follow, I discuss each of the formats in more detail.

Exporting a 2D drawing

Regardless of which 2D format you choose to export, the procedure is always the same. Follow these steps to export a 2D image from SketchUp Pro:

1. Adjust your model view until you have the view you want to export.

2. Choose File⇨Export⇨2D Graphic.

The File Export dialog box opens.

3. Choose the file format you want to use from the Format drop-down list.

I describe each format in a fair amount of detail later in this chapter.

4. Choose a name and a location on your computer for your exported image.

5. Click the Options button.

The Export Options dialog box opens for the file format you chose in Step 3. The options are unique to each file format, so check out the section on the one you're using for details on that particular format.

6. Adjust the settings in the Export Options dialog box and then click OK.

The Export Options dialog box closes.

7. Click the Export button to export your 2D image file.

Getting to know PDF and EPS

Here's what you need to know about these two common *vector* file formats. (Have a look at the sidebar "Vectors: Pictures made of math," later in this chapter, to find out what vectors are all about.)

Portable Document Format (PDF)

You've probably already heard of PDF files. Back in the old days (a few years ago), it was hard to send someone a digital graphics file because so many kinds were available and the person to whom you were sending the file had to have the right kind of software to open it. If I made a brochure in QuarkXPress and wanted to send it to you to review, you had to have QuarkXPress, too — and chances were, you didn't (QuarkXPress cost \$1,000).

Adobe developed PDF to solve this problem, and it's been wildly successful. Because PDF reader software is already installed on hundreds of millions of computers, anyone can open and view a PDF file created by anyone else. Lots of programs (including SketchUp Pro) can export PDFs, so now there's an easy way for people to share graphics files.

Here are some things to consider about PDF and SketchUp:



- ✓ **PDF is universal.** Anyone with Adobe Reader (which is free from Adobe's Web site: www.adobe.com) can open and view a PDF you create with SketchUp. In fact, anyone with a Mac can open a PDF just by double-clicking it; the picture-viewing software that comes with the Mac operating system uses PDF as its native format.
- ✓ **PDF is consistent.** When you send someone a PDF file, you can be 99 percent sure that it will look just like it looks on your computer. The colors, line weights, and text will all stay the same, which is important if you're showing someone a design.
- ✓ **When you need to send a vector graphic file, use PDF unless someone specifically requests an EPS file.** Here's the thing — just about every piece of software I can think of handles PDFs with no problem. If you or someone else needs a vector export from SketchUp, PDF works just about every time.

Encapsulated PostScript (EPS)

PostScript is a computer language that was developed to describe graphical objects. EPS is an *encapsulated* PostScript file, meaning that it's a self-contained bundle of instructions for a how to draw an image. Before PDFs existed, this was the best way to move vector information. The key here is "before PDFs existed" — nowadays, you don't have much reason to use EPS when you could export a PDF file instead. Here are some things you need to know about the EPS file format:

- ✓ **EPS is complicated.** Without boring you with all the details, EPS files are different depending on what software and what operating system made them. What's more, you won't find any free, commonly used programs that can open them. You need something like Illustrator or a layout program like InDesign, which most people don't have.
- ✓ **Use EPS if your other graphics software is more than a couple versions old.** PDF support has been widely incorporated only in the last few years, so if you use older image-editing, illustration, or layout software, you might need to use EPS.
- ✓ **If someone you're working with insists on EPS, go ahead and send an EPS file.** Some workflows have been designed with EPS files in mind, which is why SketchUp exports EPS in the first place. It's good to know that EPS is there if you need it.

Navigating the PDF/EPS Options dialog box

Figure BC1-1 shows what this dialog box looks like. Careful — it's ugly. Luckily, it's the same for both PDF and EPS exports so that's something, I guess.

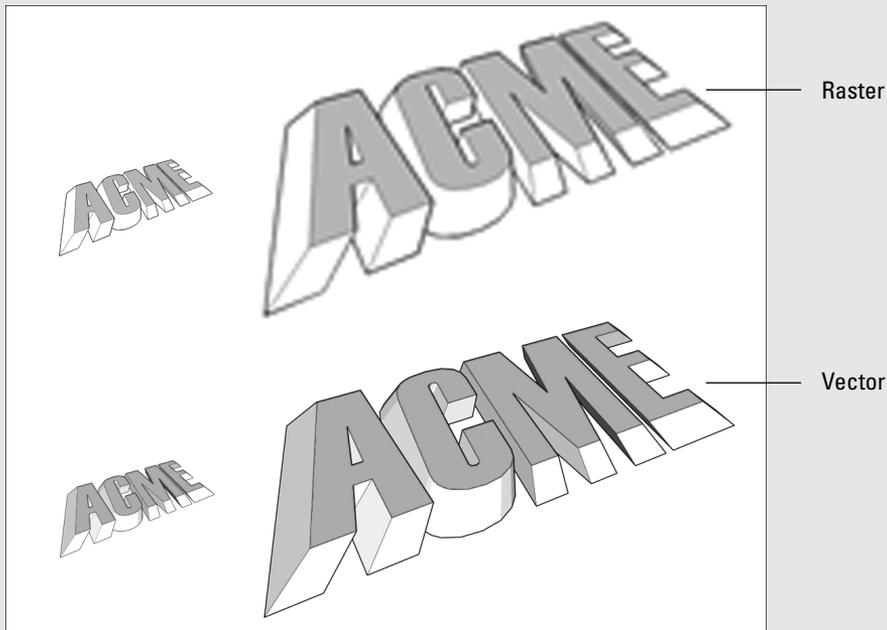
Vectors: Pictures made of math

Remembering the location and color of millions of tiny dots isn't the only way that computers save images; it just happens to be the most common. The alternative to raster imaging is *vector graphics*, or *vectors* for short. In a vector, lines, shapes, and colors are described by mathematical functions. Before you run screaming off into the distance, it's not as scary as it sounds. You don't need to do any math to create a vector. Your hardware and software do it for you. Here are some things to think about when it comes to vectors:

✔ **Vectors don't take up much space.** Imagine a straight line drawn using pixels. To draw the line, your computer has to be told where to put each and every pixel. In a vector image (which doesn't use pixels), a mathematical function is used to tell your computer how to draw that same line. Instead of providing details for every single pixel, only two instructions are needed: the function

that defines the line and its color. Of course, actual vector graphics programming is a zillion times more complicated than this, but you get the general idea. Vector files are much smaller than raster files.

✔ **Vectors are scalable.** With a raster, you're limited by the number of pixels you have in your image. If you don't have enough, you might not be able to print or otherwise display your image very big. If you have a large number of pixels, your image might look terrific, but your file might be too huge to work with. Because vectors are math-based instructions that tell your software how to draw an image, there's no size limit to how big — or small — your image can be. With the same vector file, you could print your company logo on your business card and on the side of a blimp, and they would both look great. The figure that follows shows what I mean.



Setting up for scaled drawings

To export a scaled drawing from SketchUp Pro, you have to set up your model view properly. It's pretty simple — just follow these steps:

- 1. Before you go anywhere near the 2D Graphic dialog box, switch from Perspective to Parallel Projection view.**

Do so by choosing Camera ⇨ Parallel Projection. In case you're wondering, it's impossible to make a scaled perspective view — drawings just don't work that way.

- 2. Switch to one of the standard views.**

Choose Camera ⇨ Standard and pick a view from the submenu to see a straight-on top, side, or other view of your model.

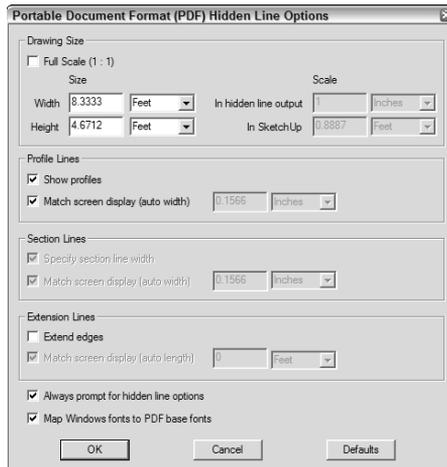
- 3. Use the Pan and Zoom tools to make sure that you can see everything you want to export.**

Whatever you do, don't orbit! If you do, you can always repeat Step 2.



In Windows, the name of this dialog box, as written in its title bar, is PDF (or EPS) Hidden Line Options, but that makes no sense. I think it's probably a remnant from when SketchUp could only export vectors in the Hidden Line Face style, but those days are over. The folks who make SketchUp are sharp as tacks, but everybody makes mistakes sometimes.

Figure BC1-1:
The PDF/
EPS Options
dialog
box for
Windows
(left) and
the Mac.



Drawing (Image) Size

Use these settings to control the physical dimensions of your exported image. If you want to produce a PDF that's a particular size, do so here. You have these options:

- ✔ **Width and Height:** These controls tell SketchUp how big you want your exported image to be. Because the proportions of your image will be the same as those of your modeling window, you can enter a width or a height, but not both.

If you're on a Mac, you can click the Maintain Aspect Ratio button (it looks like a chain). Doing so allows you to enter both width and height, which is useful for exporting to common document sizes like letter and tabloid.
- ✔ **Match View Size:** (Mac only) Sometimes certain features just don't work; it's not even worth explaining what the Match View Size check box is supposed to do. *Always* leave Match View Size deselected — that's all you need to know.
- ✔ **Full Scale (1:1):** (Windows only) Selecting this check box tells SketchUp to export a drawing that's the same size as your model. You can use this option if you want a full-scale image of something relatively small, such as a teapot or a piggy bank. If you end up using Full Scale, remember to follow Steps 1–3 in the nearby sidebar, "Setting up for scaled drawings," to make sure that your drawing exports the way you want it to.

Drawing (Image) Scale

Perhaps you're designing a deck for your neighbor's house and you want to export a scaled PDF file so that the lumberyard can take measurements right off the printed drawing. You want your drawing scale to be $\frac{1}{8}$ inch = 1 foot, and this is how to specify that:

1. Enter 1" into the In Hidden Line Output (In Image) box.
2. Enter 8' into the In SketchUp (In Model) box.



If you want to export a scaled drawing from SketchUp Pro, you have to set up your model view a certain way. See the nearby sidebar, "Setting up for scaled drawings," for details. If you're not set up properly, the Scale controls are grayed out.



I should probably point out that you can choose to set the Drawing (Image) Size or Scale, but not both. You can't, for instance, tell SketchUp to export a $\frac{1}{8}$ -inch drawing as an 8 $\frac{1}{2}$ -x-11-inch PDF file.



If you have SketchUp Pro 8, you also have a terrific companion app you can (and should) use: LayOut's main purpose in life is to make it easier to produce scaled PDFs from your 3D models. Before you slog through the process of exporting a PDF from SketchUp, you owe it to yourself to spend a couple minutes thumbing through Chapter 14 of this book.

What you see isn't always what you get

With a vector image's ability to scale without losing detail and their (relatively) tiny file sizes, vector images seem like a panacea, but unfortunately, there's more to the story. Whereas exported raster images look just like they do onscreen, vector images don't. Most of SketchUp's spiffy graphic effects can't be exported as vector information. Here's a list of what you give up with PDF and EPS:

- ✔ Photo textures and transparency on faces
- ✔ Edge effects like depth cue, endpoints, and jitter
- ✔ NPR (Sketchy Edges) styles
- ✔ Shadows and fog
- ✔ Background, ground, and sky colors
- ✔ Watermarks

Profile Lines (Windows only)

I don't think profiles end up exporting very well to PDF and EPS, so I only use this option if I'm going to tweak my image in a vector drawing program like Illustrator or FreeHand. You have the following options:

- ✔ **Show Profiles:** Select this check box to export profile lines in your image, assuming that you're using them in your model.
- ✔ **Match Screen Display (Auto Width):** Selecting this check box tells SketchUp to make the exported profiles look as thick, relative to other edges, as they do in your modeling window. If this check box isn't selected, you can type a line width (thickness).

Section Lines (Windows only)

If you have section cut lines in your model view, these options become available:

- ✔ **Specify Section Line Width:** I'm not entirely sure why this option even exists because *not* selecting it is the same as choosing Match Screen Display (see the next point). Software's funny sometimes.
- ✔ **Match Screen Display (Auto Width):** Select this check box to export section cut lines that look like they do on your screen. If you have another thickness in mind, don't select this check box; just enter a width right beside it.

Extension Lines (Windows only)

As the only edge-rendering effect (besides profiles) that SketchUp can export to PDF and EPS, extensions are pretty special; this is where you control them. You have the following options:

- ✔ **Extend Edges:** Even if you have edge extensions turned on in your model, you can choose not to export them by deselecting this check box.
- ✔ **Match Screen Display (Auto Length):** Select this check box to let SketchUp make your extensions look like they do on your computer screen. To put in a custom length, type one into the box on the right.



Line Quality (Mac only)

Whereas Windows users get to be very specific if they want to, Mac users have only one point of control over exported line thickness, or weight. For very detailed models, knock the Line Weight setting down to 0.5 or 0.75 points; otherwise, leave it at 1.00 and see whether you like it. This setting depends on the complexity of your model and your personal taste.

Other Windows-only controls

You have a couple other options in this dialog box; both can be very helpful:

- ✔ **Always Prompt for Hidden Line Options:** Do yourself a favor and select this check box; it never hurts to look over your options before you do an export.
- ✔ **Map Windows Fonts to PDF Base Fonts:** Even though PDF almost always preserves the original appearance of your image, fonts are tricky. For this reason, the PDF file format comes with a set of “safe” fonts that will work on any computer, anywhere. Choosing this option tells SketchUp to *map* — or substitute — PDF-safe fonts for the ones in your SketchUp file. Unless you’re really in love with the fonts you originally chose, it’s not a bad idea to select this check box. Better safe than sorry.

Coming to terms with DXF and DWG (in 2D)

What can you say about these file formats? When it comes to CAD, DXF and DWG are the 800-pound gorillas; they’re also the only 2D CAD formats that SketchUp can export. Just about every CAD program in existence can do *something* with either DXF or DWG, so your bases should be covered, no matter what you’re using. Here are some things to keep in mind:



- ✔ **DWG is more capable than DXF.** Because the former is AutoCAD’s *native* (private) file format and DXF was developed by Autodesk to be an *exchange* (public) file format, DWG has more bells and whistles. For exporting 2D drawings from SketchUp to use in other CAD applications, using DWG usually yields better results.

- ✔ **Don't be afraid to experiment.** I say this a couple more times in this chapter. Data export from *any* program is kind of a hit-or-miss endeavor, and you never know what you're going to get until you try. Whenever I send my information from one piece of software to another, I leave myself an extra hour for troubleshooting. I fiddle with settings until things work.
- ✔ **Don't get confused by all the version numbers.** Which version of DWG or DXF you decide to export depends on what CAD software you use. In general, it's a good idea to use the most recent version available, which is DWG/DXF 2010 in SketchUp Pro 8. As long as your CAD program isn't older than that, you should be fine. If it is, try exporting an earlier version.



This is a chapter about exporting and not importing, but I thought I'd slip this in anyway: The most recent version of DXF or DWG that SketchUp Pro 8 can *import* is 2010. If you're working in AutoCAD 2011, save your file as version 2010 (or older) to bring it into SketchUp.

Take a gander at Figure BC1-2; this is what the DWG/DXF Hidden Line Options dialog box look like, which contains your export options. Blessedly, the options are the same for both DWG and DXF, so the following explanation (the figure and the text), does double duty.

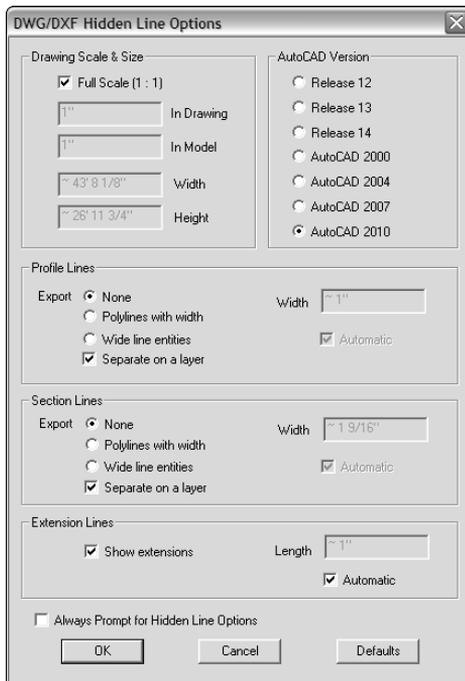


Figure BC1-2:
The DWG/
DXF Hidden
Line Options
dialog box.

Drawing scale and size

These settings let you control the final physical size of your exported drawing. If you're in Parallel Projection view, you can assign a scale; if you're in Perspective view, scale doesn't apply. You have the following options:



- ✓ **Full Scale (1:1):** Most people use SketchUp Pro's DXF/DWG Export feature to produce nonperspectival, orthographic views of their models that they can use in their CAD programs. If that's what you're trying to do, select this check box; it makes opening your exported file in another program that much easier.

To export a scaled view of your model, you need to set up things properly in your modeling window before you begin the export process. You need to be in Parallel Projection view, and you have to use one of the standard views from the Camera menu. I talk all about this in the sidebar "Setting up for scaled drawings," earlier in this chapter. Keep in mind that unless you're set up properly, this option is grayed out.

- ✓ **In Drawing and In Model:** If you're exporting a scaled drawing and you haven't chosen the Full Scale option (see the preceding point), you can set your drawing's scale using these controls. If you're not set up to export at scale, these settings aren't available. As an example, for a drawing at $\frac{1}{16}$ -inch scale, do the following:
 - Enter **1"** in the In Drawing box.
 - Enter **16'** in the In Model box.
- ✓ **Width and Height:** You can use these settings to determine the dimensions of your exported drawing, as long as you're not printing to scale.

Profile lines

This is where you control how profile lines in your SketchUp model view are exported. You have the following options:

- ✓ **None:** Exports profiles the same thickness as all your other edges.
- ✓ **Polylines with Width:** Exports profiles as polylines, which are a different kind of line object in CAD programs.
- ✓ **Wide Line Entities:** Exports profiles as thicker lines.
- ✓ **Width:** You can enter your own line thickness for exported profiles, or you can select the Automatic check box to tell SketchUp to match what you see in your modeling window.
- ✓ **Separate on a Layer:** Puts your profiles on a separate layer in the exported file. This is handy for being able to quickly select all your profiles and give them a line weight when you open your exported file in a CAD program.

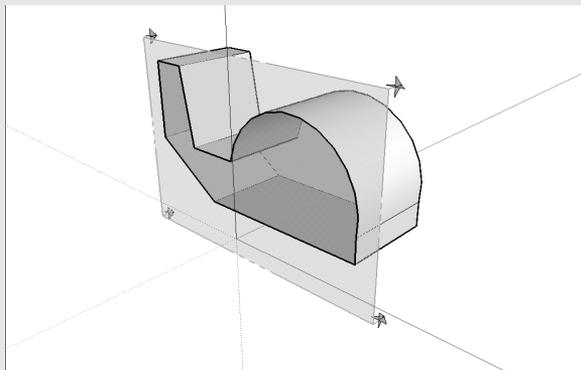
It slices, it dices . . .

SketchUp's Section Plane tool is pretty neat. If you don't know much about it, check out Chapter 10. If you have a section cut in your model that you want to export to a CAD program, you're in luck; just follow these steps:

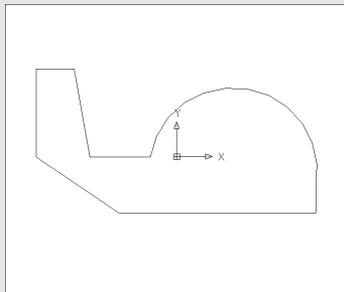
1. **Make sure that the section cut you want to export is active.**
2. **Choose File → Export → Section Slice.**
3. **Click the Options button to open the Section Slice Export Options dialog box.**
4. **Set the export options the way you want them and then click OK.**
5. **Click the Export button.**

The most important part of the Export Options dialog box is right at the top: You need to choose either True Section or Screen Projection. Have a look at the following figure to see what happens when you choose each. Chances are you want to pick True Section; it yields the most useful information. The top image is a screen shot of my modeling window in SketchUp. The lower-left image shows what a file export as a true section looks like in AutoCAD. The lower-right image is an AutoCAD view of the same file exported as a screen projection. For a description of the controls in the rest of this dialog box, see the section "Coming to terms with DXF and DWG (in 2D)," earlier in this chapter.

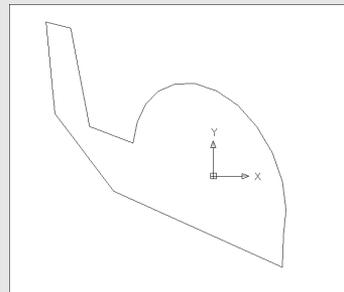
SketchUp modeling window



True section



Screen projection



Section lines

Section lines occur where section planes create section cuts in your model. Traditionally, these lines are thick, which is why SketchUp gives you special control over how they export. The options in this section are identical to those for exporting section lines in the PDF/EPS Export Options dialog box. Have a look at the section “Section Lines (Windows only),” earlier in this chapter, for information on what everything in this part of the dialog box means.

Extension lines

Extensions are the little line overruns you can choose to display in the Styles dialog box. If you want to include them in your exported file, you can. Just select the Show Extensions check box, and then either enter a length or select the Automatic check box to let SketchUp try to match how they look on your screen. Just so you know, extension lines are exported as lots and lots of tiny, individual edge segments.



If you use the Windows version of SketchUp, you have an extra option in this dialog box: Always Prompt for Hidden Line Options. This just means “Do you always want to see this dialog box when you export to DXF or DWG?” Selecting this check box reminds you to look at these settings every time you export, so I’d go ahead and do it.

Peeking at EPIX

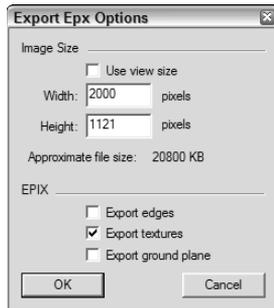
You only need to use the EPIX file format if you’re using Piranesi, a great artistic rendering program that you can buy. Basically, EPIX is kind of a hybrid, strange-o raster format that keeps track of pixels, just like other raster formats. But it also remembers another piece of information: the *depth* of each pixel in your scene. If you have a tree in the foreground, the pixels that make up that tree “know” they’re, say, three feet away. Cool stuff, to be sure.

Figure BC1-3 shows the Export Epx Options dialog box in living, um, black and white. (**Note:** Epx and EPIX are the same thing.) Here’s what all the doo-hickeys do:

- ✓ **Image Size:** This part of the Export Epx Options dialog box is just like the Export Options dialog boxes you use for exporting 2D raster images (such as JPEG, TIFF, and PNG). I give a full rundown on what everything means, and how to set things up properly, in Chapter 13.
- ✓ **Export Edges check box:** Choose this option to export the edge-rendering settings you currently have applied to your model.

- ✔ **Export Textures check box:** Piranesi can do some pretty terrific things with the textures you apply in SketchUp; select this check box to export those textures as part of your EPIX file. **Note:** You need to have a style applied to your model that displays textures for those textures to be exported properly.
- ✔ **Export Ground Plane check box:** Exports a ground plane in your model view, regardless of whether a ground plane is in your currently applied style.

Figure BC1-3:
The Export Epx Options dialog box.



Exporting 3D Data for Other Software

To be perfectly frank, I've been dreading writing this part of this book since I started. The process of exporting 3D data from *any* program to *any* program is fraught with equal parts mystery and despair. There are so many pieces of software, with so many versions, and so many different file types that finding a step-by-step recipe for success is practically impossible. The simple truth is that 3D file export from SketchUp Pro is about 50 percent knowing where to start and 90 percent trial and error after that.

Gathering your marbles (So that you don't lose them later)

I focus on the “knowing where to start” part. First, I provide a list of 3D file types that you can export with SketchUp Pro — I hope you can use it to make some decisions about which format you should use. Second, I lay out a general procedure for how to export a 3D model from SketchUp Pro.

Examining your 3D file format options

Alphabet soup is how some people describe the world of file types that exist for 3D models. Here's a bit of information about the 3D file formats that SketchUp Pro 8 can export:

- ✔ **DAE (COLLADA):** Every couple years or so, a new 3D file format comes out that promises to be “the one.” More capable than 3DS (which is getting on in years), COLLADA is being adopted all over the place by 3D software and gaming companies; Google has even chosen COLLADA as the file format for the 3D buildings in Google Earth. If you're using a recent version of any of the most popular 3D modeling programs, you might well be able to deal with COLLADA files; try it and find out.
- ✔ **DWG/DXF:** “But aren't these 2D formats?” I hear you asking. Yep, they are. But ever since AutoCAD went 3D a few versions ago, its formats have gone 3D, too. These are a pretty safe bet for most of the CAD-type programs out there, but not as safe a bet as 3DS. You need to know that, given the choice between the DXF and DWG, usually pick the latter.
- ✔ **3DS:** This has become one of the few standard 3D file formats in the industry. When in doubt, export a 3DS file and see whether your program can open it. SketchUp Pro's options for 3DS export are kind of complicated, so be sure to have a look at the section about it later in this chapter.
- ✔ **OBJ:** OBJ is probably your best option for sending your data to Maya, which is now owned by Autodesk. Although it doesn't offer some important things that 3DS does, it's still a pretty common 3D format.
- ✔ **XSI:** The folks at SketchUp built XSI export into SketchUp Pro so that it'd be more useful to people who use *Softimage*, a nifty modeling/rendering/animation program from Canada that's also now owned by Autodesk.
- ✔ **VRML:** Though it's a bit of an old-timer, plenty of people still use VRML to exchange 3D information.
- ✔ **FBX:** The FBX format is used primarily by people in the entertainment industry who use Maya, 3ds Max, or Autodesk VIZ. Depending on what you're doing, you might want to use it instead of DAE (COLLADA), 3DS, or OBJ; try it and see whether you like it.
- ✔ **KMZ:** This is the Google Earth file format. Technically, the ability to export KMZ files isn't restricted to the Pro version of SketchUp; anyone with regular, old free SketchUp can export them, too.

Exporting your 3D model

The process of exporting your 3D data from SketchUp Pro is the same no matter what file format you choose. Follow these steps to export a 3D model from SketchUp Pro:

1. Choose File⇨Export⇨3D Model.

The File Export dialog box opens.

2. Choose the file format you want to use from the Format drop-down list.

3. Choose a name and a location on your computer for your exported image.

Whenever you export a 3D model from SketchUp, it's a *very good* idea to create a new folder for your exported file. A lot of the file formats that SketchUp Pro exports save the textures in your model as separate files alongside your model. If you don't have everything in a single folder, you can end up with a big mess.

4. Click the Options button.

The Export Options dialog box opens for the file format you chose in Step 2. Check out the sections in the rest of this chapter for more information about all the controls in the Export Options dialog box — they're anything but intuitive.

5. Adjust the settings in the Options dialog box and then click OK.

The Export Options dialog box closes.

6. Click the Export button to export your 3D model file.



Getting a handle on OBJ, FBX, XSI, and DAE (COLLADA)

I am pleased to report that the Export Options dialog boxes for each of the aforementioned file formats are almost identical, even if the file formats themselves aren't — this means that I lump them together into one section. Here are a few reminders about using OBJ, FBX, XSI, and DAE (COLLADA):

- ✓ **Try using COLLADA first.** Because it's relatively new, not all 3D programs support it yet, but you never know — your software might.
- ✓ **If COLLADA doesn't work, use OBJ for Maya, XSI for Softimage, and FBX if someone you respect tells you to.** I'm sorry I can't be more specific, but the sheer number of programs and versions out there means that it's impossible to give hard-and-fast rules.
- ✓ **Experiment.** Leave yourself some time to try exporting your model in more than one format. Then open each one in your other piece of software and see what works best.

Figure BC1-4 shows the Export Options dialog boxes for all four file formats. Here's some help with what everything does:

- ✓ **Export Only Current Selection:** Tells SketchUp Pro to export only the geometry you currently have selected in your model.
- ✓ **Triangulate All Faces:** Some programs don't support faces with cutouts in them, so selecting this check box carves things into triangles so that you don't end up with any holes. Experimentation tells you whether you need to use this; don't choose this option if you don't have to.
- ✓ **Export Two-Sided Faces:** SketchUp's faces are two-sided, but not all 3D programs' faces are. Choose this option if you've spent a lot of time *texture-mapping* (painting with textures) your model in SketchUp and you want it to look the same in the program you're sending it to. If you plan to use another piece of software to add textures to your model, don't select this check box.
- ✓ **Export Edges:** SketchUp models *must* include edges and faces, but some programs' models support only the latter. Select this check box if you want to export the edges in your model; leave it deselected if you don't. Programs that don't support edges (and that includes most of them) will leave them out, anyway. The Export Edges option isn't available for FBX files.
- ✓ **Export Texture Maps:** Includes the textures you used in your SketchUp model in the exported file. If you plan to "paint" your model in another program, deselect this check box.
- ✓ **Generate Cameras from Pages (Scenes):** The COLLADA file format can store information about different views of your model. Selecting this check box exports each of your scenes (if you have any) as a separate camera object. Note that this option doesn't exist for OBJ, FBX, or XSI.
- ✓ **Swap YZ Coordinates (Y Is Up):** If your model ends up oriented the wrong way when you open it in another piece of software, try selecting this check box and exporting it again. Some programs set up their axes differently. This option isn't available for COLLADA.
- ✓ **Units:** Leave this option on Model Units unless something is wrong when you open your model in another program. If it is, make an adjustment and export again.



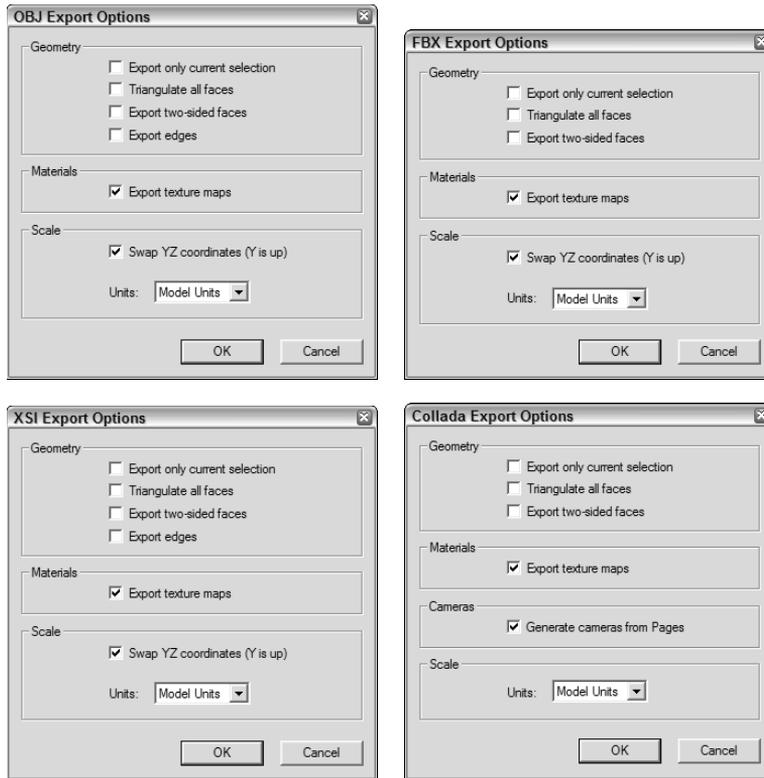


Figure BC1-4: The Export Options dialog boxes for OBJ, FBX, XSI, and DAE (COLLADA).

Wrapping your head around 3DS

Ah, *3DS* — the Old Faithful of 3D modeling file formats. 3DS is almost a shoo-in to work with just about any other piece of 3D software you're using, which is good. What's bad is that this flexibility comes at (what I perceive to be) a terrible price: a seemingly infinite number of options. Here are some things to know about the 3DS file format:

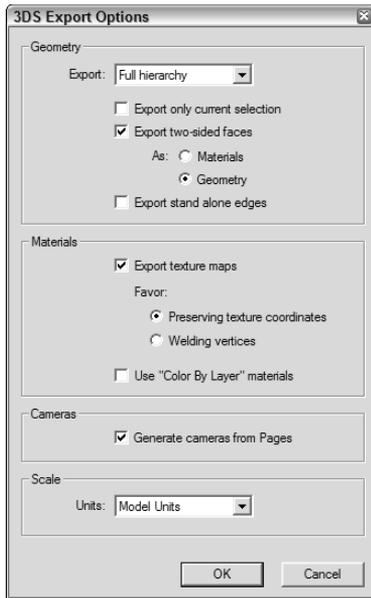
- ✓ **You lose your layers.** 3DS doesn't support 'em, so you might be better off exporting a DWG file (if your other software can open it and you aren't using textures). Another option is to use the Color by Layers option, which I describe in a moment.
- ✓ **You lose your edges, too.** You can always choose Export Stand Alone Edges, but few people recommend doing that.

- ✔ **Only visible faces get exported.** None of your hidden faces, or faces on hidden layers, will go along for the 3DS ride, so make sure that you can see everything you want to export before you reach for the File menu.
- ✔ **Make sure that you paint the correct side of your faces.** Faces (or the equivalent) in 3DS are one-sided, so only materials you apply to the front side of your faces in SketchUp get exported. I talk a little bit about making sure that you're working on the fronts of your faces in Chapter 11 because Google Earth sometimes has the same issues. If you have materials on both sides of your faces, consider choosing the Export Two-Sided Faces option, described later in this section.

Figure BC1-5 shows the 3DS Export Options dialog box in all its complicated glory. Your options are as follows:

- ✔ **Export:** You have four choices here:
 - *Full Hierarchy:* This option tells the 3DS exporter to make separate *meshes* (surfaces made out of triangles) for each chunk of geometry in your SketchUp model. *Chunks* are things like groups, components, and groupings of connected faces.
 - *By Layer:* This option tells the exporter to create separate meshes based on two things: chunks of geometry and what layer things are on. If a bunch of faces are connected and they're on the same layer, they get exported as a single mesh.
 - *By Material:* When you choose this option, you get a separate mesh for each grouping of connected geometry that shares the same material.
 - *Single Object:* Choosing this option exports all your geometry as one, big 3DS mesh.
- ✔ **Export Only Current Selection:** Only exports the geometry you've selected in your SketchUp model.
- ✔ **Export Two-Sided Faces:** Selecting this check box exports two faces (back to back) for every face you have in your SketchUp model. Because 3DS supports only single-sided faces, this is necessary to preserve the appearance of your textures in your exported model. If you don't care about preserving your SketchUp textures, or if you didn't apply any in the first place, don't bother choosing this option:
 - *As Materials:* Choose this option to export your back-side materials as 3DS materials without corresponding geometry.
 - *As Geometry:* Choose this option to export your extra set of faces as actual geometry. Folks I know who do this a lot recommend that you choose this option if you're wondering what to do.

Figure BC1-5: The 3DS Export Options dialog box. Better get out your hip waders. . .



- ✔ **Export Stand Alone Edges:** 3DS doesn't support edges the way SketchUp does — you don't have a good way to export edges as “lines” to 3DS. When you select this check box, the exporter substitutes a long, thin rectangle for every edge in your model. The appearance is (sort of) the same, but this can cause major problems in your file. I don't recommend selecting this check box. If you really need to see your edges, try another export format altogether.
- ✔ **Export Texture Maps:** If you have photo textures in your model (this includes the photo textures from the Materials dialog box), you might want to include them in your exported model file. 3DS handles these textures very differently than SketchUp does, so you have to decide on an export method:
 - *Favor Preserving Texture Coordinates:* Choose this option if you've spent a lot of time getting the texture maps right in your SketchUp model.
 - *Favor Welding Vertices:* Choose this option if it's more important that your geometry export as accurately as possible. In some cases, your textures won't look right, but your geometry will be correctly *welded* (stuck together) and smoothed.
- ✔ **Use Color by Layer Materials:** Because the 3DS file format doesn't support layers, you can choose to export your model with different colors assigned to the faces on each layer in SketchUp.

- ✔ **Generate Cameras from Pages (Scenes):** Select this check box to export your file with a different camera position saved for each scene in your SketchUp file. An extra scene — Default Scene — is also exported to reflect your current model view.
- ✔ **Units:** If you leave this set to Model Units, most other 3D programs understand what you mean — your geometry will appear the right size when you open your exported 3DS file. In some cases, it won't, and the best thing to do is to manually choose the units that you'll use in the other program. Sometimes this doesn't work either, and you just have to fiddle around until something works. Hooray for 3DS!

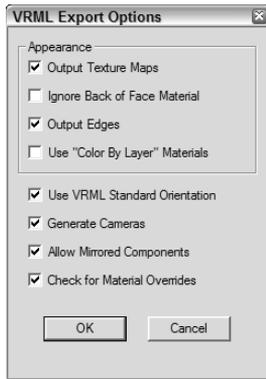
Dealing with VRML

The VRML file format is pronounced *vermal*, which ties it with COLLADA for the title of Hardest Format to Use in Everyday Conversation without Giving Away the Fact That You're Nerdy Enough to Know What VRML and COLLADA Mean. Virtual Reality Modeling Language is used by a large number of people around the world. There are newer, arguably better, formats out there, but VRML's been around long enough that it's tightly integrated into lots of professional workflows.

Figure BC1-6 shows the VRML Export Options dialog box; what follows is some help with all the controls:

- ✔ **Output Texture Maps:** If you don't select this check box, you get colors instead of textures in your exported VRML file.
- ✔ **Ignore Back of Face Material:** Go ahead and select this check box unless your faces have different materials painted on either sides of them.
- ✔ **Output Edges:** VRML supports edges, so select this check box if you want to export your edges (along with your faces) as part of your VRML file.
- ✔ **Use Color by Layer Materials:** VRML doesn't do layers, so if your layers are important to you, consider selecting this check box. All the faces in your exported model will be painted with the colors in the Layers dialog box (Chapter 7 has more information on assigning colors to layers).
- ✔ **Use VRML Standard Orientation:** Select this check box to convert your model's "up" axis to match VRML's "up" axis.
- ✔ **Generate Cameras:** If you have scenes in your SketchUp model, you might want to select this check box. It tells the exporter to create a separate camera view for every one of your scenes, and an extra one for your current view.

Figure BC1-6:
The VRML Export Options dialog box.



- ✔ **Allow Mirrored Components:** If you have components in your model whose instances you've *mirrored* (flipped over), select this check box. Because this is a standard technique for building symmetrical things like vehicles (as I talk about in Chapter 5), this might apply to your model.
- ✔ **Check for Material Overrides:** This option makes sure that the materials in your exported model look like they do in your SketchUp model.

Handling DWG and DXF (in 3D)

As 3D file formats go, these two are a little anemic. Use them if you need to export your 3D data to AutoCAD. Here are a couple tidbits about DXF and DWG:

- ✔ **Say goodbye to materials.** Your materials won't export to DXF/DWG, so pick another format if they're important to you.
- ✔ **You always have layers.** The one great thing about exporting to DXF/DWG is that you get to keep your layers.
- ✔ **Go with DWG.** If you can, pick DWG instead of DXF; it's more robust, which means that it saves more of your data.

Figure BC1-7 is a screenshot of the AutoCAD Export Options dialog box; it's an oasis of blissful simplicity compared to the one for 3DS. In fact, it's so self-explanatory that I don't bother going through the options one at a time. Just select the kinds of things you want to export and then click OK.

**Figure
BC1-7:**
The
AutoCAD
Export
Options
dialog box.

