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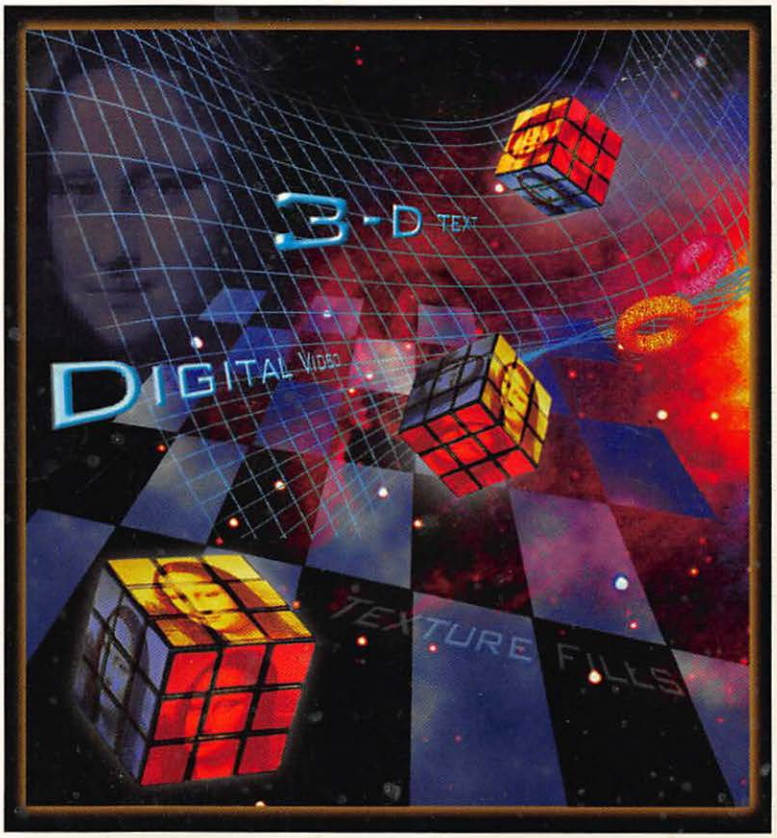

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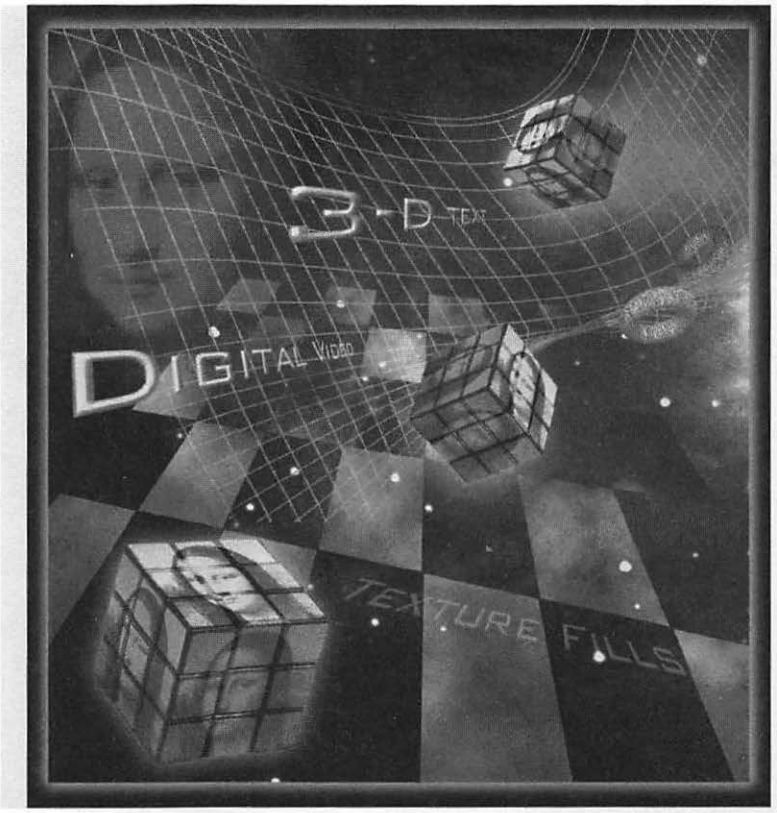

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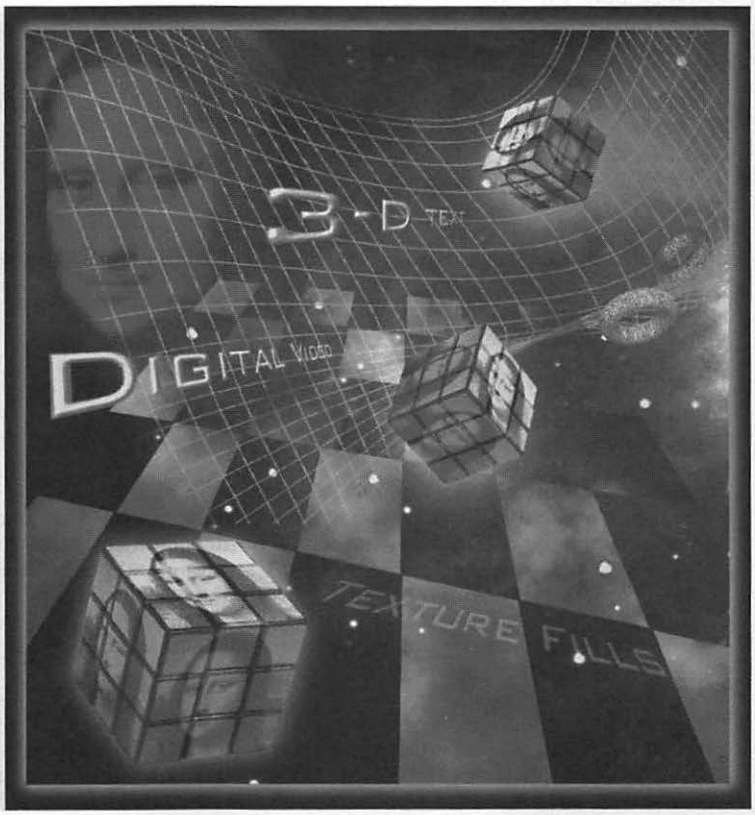

Create and Adapt Moving Images for Web Pages

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Mark L. Chambers has been an author, computer consultant, technical writer, BBS sysop, and game programmer for more than a decade. He spends entirely too much time on the Internet. A contributor to Ventana's bestselling *Official Netscape Navigator Book* and *Official Netscape Internet Starter Kit*, he wrote *Running a Perfect BBS* and also contributed to *Web Publishing Unleashed*. His favorite pastimes include LSU football, collecting gargoyles, playing his pinball machines, rendering 3D flights of fancy, and listening to just about every type of music imaginable. You can reach him on the Internet at **markc@computerland.net**.

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I'd also like to thank my technical editor, Wellington Fan—for his sharp eye and attention to detail proved invaluable!

Finally, as always, thanks to my wife Anne and my children, Erin and Chelsea, who continue to let me follow my dream.

Dedication

This book is dedicated to my favorite nomads, my sister Barb and her husband Vern.

Contents

Introduction

While writing this book, I frequently found myself overwhelmed by just how much the Internet has changed – and just how much the phenomenon of the World Wide Web has contributed to that change over the last few years.

When I made my first Internet connections about four or five years ago, Internet use was dominated by electronic mail, search tools—like Archie and Veronica—and ftp. You searched the documents and files on the Internet, found whatever it was you were looking for, and retrieved it. Practical, useful . . . and, for most non-computer types, it was boring. Incredibly boring.

My first encounter with the World Wide Web really didn't promise that much of a change, either: the first sites I visited were text-only, with the same dry technical information I had seen elsewhere on the Internet. The idea was neat, of course, but no one I knew could afford to run their own page, and this new technology seemed to be just another research tool. I promptly forgot about the Web for a few months.

Suddenly, I got the same tip from my editor, my friends, and the computer magazines I read (a simultaneous marvel, by the way, that has never happened since): a new browser had captured the attention of everyone on the Internet, and I was told I **had** to check out this new software. The URL was www.netscape.com, and like the rest of the planet I learned what the World Wide Web was really all about! Suddenly, the Web was alive, personal and corporate pages appeared like ants at a picnic, and here we are today with e-mail and Web addresses as important as your telephone number.

So, in retrospect, we all can see that the World Wide Web was the force behind today's popularity of the Internet . . . but what was the force behind the Web? What one aspect of the Web transformed it, and propelled it into success?

The answer is right before your eyes . . . **images**. Online images converted the Web into more than text, and they still provide the visual interest – the fun – that separates a winning Web site from a lackluster competitor. My favorite sites on the Internet are more than just "electronic billboards" where I find interesting content; their graphics make them unique! Some are works of fancy, others of humor, and some qualify as honest-to-goodness works of art. The images build the environment.

And the natural progression for images on the Web? From static image to action and motion... animation. There are a number of methods that can be used to create animation for your Web pages, and that's what this book is all about: I'll show you the tools and take you step-by-step through the process of building your own animation.

While writing this book, I also kept two important criteria in mind: First, we want animation now, not three months from now! That means **no** programming, **no** extensive art training, and **no** assumptions that you, the reader, have a degree in graphic design (or are the slightest bit interested in obtaining one). Secondly, I'd rather do the same job for 30 dollars than three thousand dollars... how about you? Our tools need to be kept as inexpensive as possible. If more sophisticated and complex tools are available, I'll mention them as well, but why pay a fortune for today's latest and greatest software behemoth, only to find out that a shareware tool can do the same job just as well?

With our two criteria in mind – *quick* and *cheap* – we're ready to add action and motion to **your** pages!

Who Can Use This Book

This book is aimed at anyone who is reasonably familiar with HTML and wants to add animation to Web pages. No prior experience with graphics is assumed.

If you're running Windows, here's what you need:

- A 486-66 or better PC with at least 16MB of RAM and Windows 95 or Windows NT installed.
- 24-bit color.
- Depending on the programs you install from the CD-ROM, anywhere from 5 to 40 megabytes of hard drive space.
- A CD-ROM drive.

If you're running a Macintosh, here's what you need:

- A Macintosh 68020 running System 7 or higher, or a more current Macintosh PowerPC or Power Macintosh, with at least 8MB of RAM.
- 24-bit color.
- Depending on the programs you install from the CD-ROM, anywhere from 5 to 40 megabytes of hard drive space.
- A CD-ROM drive.

How This Book Is Organized

Chapter 1, "Designing Graphics for Your Page" introduces you to the basics of animation for your Web page, including the pros and cons of animation and how to design both static and animated images for your page.

In **Chapter 2, "Finding Images to Animate,"** you will learn where to look for images for your pages and how to obtain them. We'll search the Internet, discuss image and video capture technology and resources for clip art.

Chapter 3, "Editing Images for Your Animations," introduces you to the basics of image editing with Paint Shop Pro and Adobe PhotoDeluxe.

In **Chapter 4, "Creating Simple Animated GIFs,"** you'll build your first animated GIF with GIF Construction Set or GifBuilder, and I'll also introduce you to other GIF animation programs that are currently available. I'll also show you how to test your animation and how to compress it for the shortest possible download time.

Chapter 5, "Advanced Image Editing," introduces you to the fun and advanced effects available within Adobe Photoshop. You'll also learn a sectional animation technique that can trim over 40 percent off the file size of your finished GIF animation.

We'll jump into one of my favorite hobbies in **Chapter 6, "Creating 3D Web Graphics,"** where I'll show you how to use programs like Pixel 3D and Sculpt 3D to create your own state-of-the-art 3D logos and objects for GIF animation!

Chapter 7, "Creating Morphing Web Graphics," helps you bring a bit of Hollywood special effects to your Web animation! You'll learn how to use tools like Kai's PowerGoo to turn one image into another.

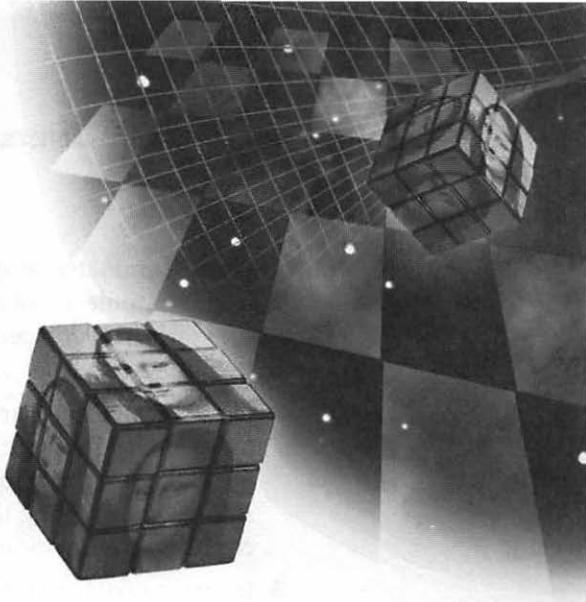
Chapter 8, "Java Animation 101" introduces you to the Java language and how you can use it to create animations – but instead of programming, you'll use applications that generate Java applets automatically.

Finally, in **Chapter 9, "The Ultimate Animation,"** I'll discuss three "leading edge" forms of advanced animation that you can add to your page: server push animation, digital video, and third party animation plug-ins.

Are you ready to animate? Then let's get in motion!

CHAPTER 1

Designing Graphics for Your Page



OK, admit it— you're hooked! Perhaps you first encountered the World Wide Web doing research, looking for a particular piece of information among the uncounted bytes of data on the Internet. You might have been sucked into Web surfing by the media, after innocently reading a computer magazine or idly watching television. Maybe a friend introduced you to the joys of Netscape navigating by letting you roam free for a few minutes on Yahoo! However you began, you've reached the advanced stage of Web consciousness, and now you're publishing your own pages on the Web, or you're running an entire site.

How can you add interest and fun to your pages? You've probably heard many times that the success of the World Wide Web is due to its graphical nature, and that's true; although the written content of a Web page is its heart and soul, images and graphics provide the personality that you find on the best-designed Web pages.

Why Animate?

Today's jaded Web surfer demands something more . . . static pictures can only take your page so far. Why settle for a simple picture when your title image can *move*—or, for that matter, dance or spin or even walk off the page?

That's where animated graphics come in, and that's the reason behind the explosion in popularity of animated images on the Web. Make no mistake about it, your site *will* receive more hits with animation, and you can use animated images to help:

- Draw the eye to a particular area, button, or section of text on your page; for example, if you're the Webmaster for a furniture store, and the store is holding a special sale, a spinning arrow might point to the hours the store is open during the sale. Although the sale is not your primary content, an animation will help your visitors notice it.
- Identify a part of your page for a specific target audience—for example, a bouncing apple might direct Macintosh visitors to a Mac-specific link.
- Entice your visitors to spread the word about what you have to offer—"I saw this great animated Web site for the furniture store downtown . . ."
- Create a unique design for your page that sets it apart from thousands of others on the Internet. After all, if your page is dull or boring, it simply becomes another billboard on the—you guessed it—Information Superhighway. (Shudder.)
- Take advantage of the powerful features available in today's browsers, like Netscape Navigator. After all, most Webmasters are addicted to technology—why not use some of those new HTML tags?
- Express your artistic side—or, if you're like me, "Mr. Stick Figure," you want to *pretend* you have an artistic side!

Whether you're creating them or viewing them, animated graphics are just plain fun! That's the entire idea behind this book: I'll show you how to add many different types of animated graphics to your Web pages as inexpensively and as quickly as possible.

What's Necessary for Animation?

Animation is no longer just the realm of Walt Disney—or, for that matter, those kids that used to sit behind you in junior high that drew pictures throughout every class. Instead, the tools that we have today allow anyone to create animation, without any talent as an artist or a cartoonist.

Most of the tools we'll use in this book are shareware or inexpensive commercial programs, and your raw material—the images themselves—can be drawn, extracted, scanned, or copied from all sorts of sources. As we begin to cover specific techniques and the different types of animation that you can produce for your page, I'll introduce you to my favorite software tool that's specifically designed for the task at hand, and in most of the chapters, I'll also mention other programs that can perform the same work.

I'll also discuss the computer hardware that will come in handy while creating your own animation, like scanners and digital cameras. Such equipment isn't a requirement for animating images, but you'll find they can help save you time and trouble.

Although this book was written for both Windows and Macintosh users, the Windows platform has somewhat of an advantage. Currently, there are more low-cost shareware and commercial tools for animation, rendering, and morphing available for Windows 95 than Macintosh. Where possible, however, I've used tools that can be obtained for either computer, or provided a second tutorial using a Macintosh program.

Pros & Cons of Animation

It's true, every silver lining does have its cloud, and animated images are no exception. There are disadvantages to using animation; knowing what they are before you start creating images or adding them to your page can make the difference between a work of art and a disaster of epic proportions.

Therefore, let's take a moment to review the good points and the bad points of animated graphics.

Appearance

As I mentioned, the addition of graphics can make the difference between a boring page and a page that really draws attention; however, like too much of a good thing, too much animated flash can draw your visitor's focus away from your message. For example, consider the page illustrated in Figure 1-1 that I encountered recently on the Web.

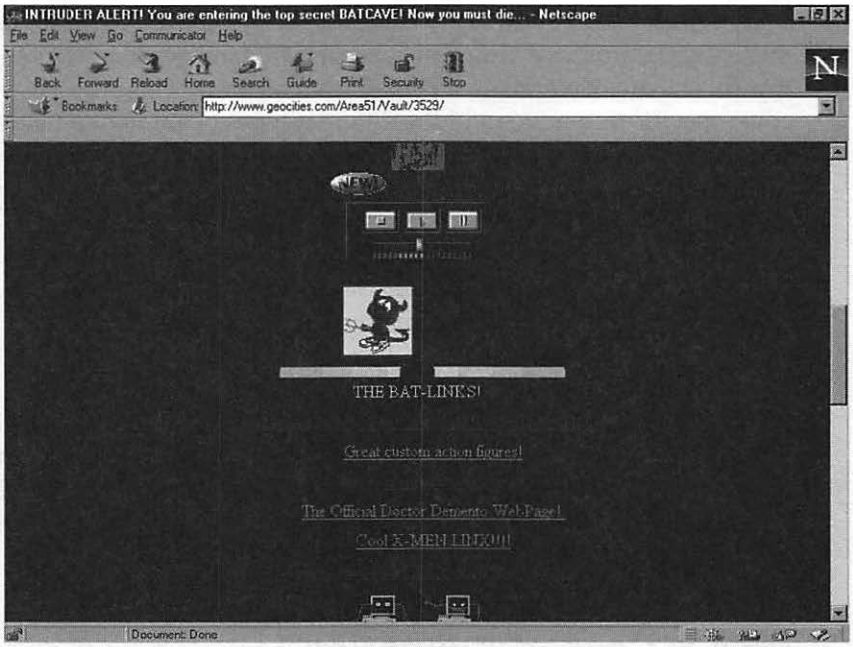


Figure 1-1: A Web page suffering from graphic overdose.

It's no coincidence that a good rule of thumb in print advertising usually applies just as well to Web publishing. For instance, if you're advertising a product or service that doesn't have tremendous name recognition like McDonald's or Coca-Cola, your reader is interested more in the features and benefits of your product, and if you don't present that information quickly, the reader moves on. With that in mind, is it easy to determine exactly what the purpose of this page is within five seconds or so?

Besides distracting your visitors from your message, a bad animation decision can have other effects:

- **Wrong tone or atmosphere.** Select the wrong image, and you can detract from the atmosphere you intended to create. One Webmaster might depict the theme "Christmas" by animating a single flickering candle, while another uses busy, blinking lights; the subject is the same, but the mood is quite different. Just because an animated image fits your topic does not mean that it also fits your page.
- **Sexism or racism.** I've actually seen animated graphics that illustrate either males or females or any one of a number of different races in a bad light—and in most cases, I don't think it was the Webmaster's intention to offend! Remember, you never know who is connecting to your Web

site. Whether accidental or intentional, your message will suffer if your graphics are personally offensive to your visitors.

- **Substitution for content.** A page like the one shown in Figure 1-1 often results if you don't have enough text content or material to create a substantial site. Unless the focus of your Web site is online graphics in one form or another, don't fall into the common trap of: "Well, it looks good, even if I don't have anything to say." Your visitors will pick that up in a heartbeat.

On the other hand, the restrained use of animated graphics underscores the message of your page and—depending on the placement—can draw attention directly to specific portions of your page. For example, Figure 1-2 illustrates a section of a page from my Web site, where I use a spinning movie reel to draw attention to the text. This animated reel "spins" around, in keeping with the subject of movies, and leads the reader's eye directly to the text. Many developers that distribute shareware or demonstration versions of their commercial software over the Internet use the same technique; your visitors want that file, and they want it *now*, so why not point to the link with a spinning arrow?

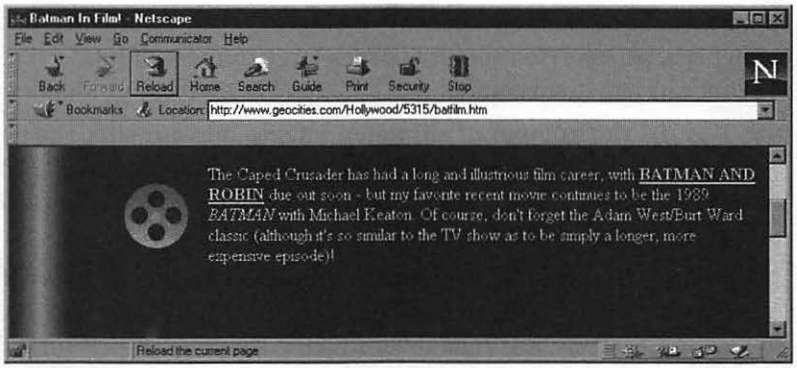


Figure 1-2: Animated images can attract attention to specific portions of your page!

Interaction is Everything

The moral of this story? If your page is overloaded with animated graphics or animated applets, you'll likely draw the eye away from the content on the page, or—in the worst case scenario—drive away more viewers than you attract. Remember, your visitor arrived at your page ready to interact, not to sit back and watch a visual light show.

As we cover all of the different images you can create in later chapters, keep this essential rule in mind: Pick and choose your images carefully when designing your page.

Speed

You've reached a few of "those" sites before; you know, the Web pages where time seems to stand still while the graphics are loading, and you eventually get up for a soda (or simply hit Stop and move on). Honestly, I can't understand why the person responsible for one of these pits of quicksand would assume that I have my own direct T1 connection to the Internet—I don't, by the way, but donations are gratefully accepted. The sad truth of today's World Wide Wait—whoops, sorry, I meant "Web"—is that you often spend more time waiting than you do reading because most of those who are creating Web pages these days have no idea how to reduce loading time.

No matter how wonderful an animated graphic, it's important to remember that it will take time to download, and the more complex it is, the longer your visitor will wait. The average Web surfer is still using a 14.4 bps modem over a dial-up connection, and it's impossible to tell at any time how many additional bottlenecks stand in the way of your page: an overloaded service provider, perhaps, or a Web server taking a large number of hits.

What can you do to combat this lethargy? Keep these guidelines in mind:

- **Restrict the number of animated images on your site.** The best use of animated graphics is as a seasoning, not a main ingredient. If a static image works, use it unless you have a real need for an animated image and you'll save download time.
- **Reduce the size of your animated images.** In Chapter 4, we'll discuss the complexity and the number of frames you'll use while designing an image; for now, just remember that the simplest animation is the fastest to download. In the case of static images, their physical size and color depth determine the time it will take to download them.
- **Provide a text mirror.** If your page must include a large number of graphics, a text mirror is a convenience that many of your visitors will really appreciate if they're using slower equipment or a slower connection. In essence, a text mirror is a separate set of HTML files that duplicates the contents of your site without graphics; if you must use a large number of images (animated or not), allow your visitor to easily "turn them off" by using the mirror instead. If you do offer a mirror, please make the link to it the first thing a visitor sees—I've actually loaded several flashy pages that stuck the link at the bottom.

- Figure 1-3 shows a favorite site of mine that features a large number of animated graphics and includes a text mirror; the text site link is where it should be, on the first line of the page.

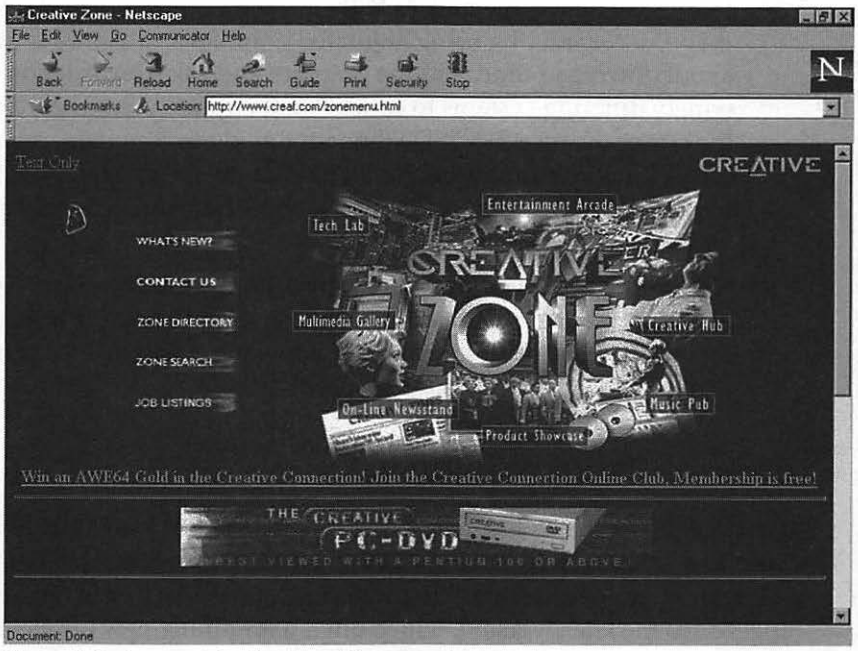


Figure 1-3: An example of a site with a separate text mirror.

TIP

In fact, there are certain applications where animated graphics should be actively avoided altogether. The most common example is an intranet file transfer or database query page, where the appearance of the page is much less important than fast access; if you're loading such a page, your interest lies not in fancy graphics that take time to load (or even reload), but in retrieving a specific company document or searching for specific data.

Striking the correct balance between your artistic flair and your visitors' load time is not an easy task, but there are tricks you can use to help develop a sense of the proper number of images:

- **Use your favorite pages as examples.** Take a cruise through your Navigator bookmark list and examine your favorite pages—you know, the ones that have the most to offer *and* load at the fastest speed. How many

graphics do they use on a single page? How many of those images are animated? As an example, try one of my favorite sites for the latest computer gaming news, www.gamesdomain.com (Games Domain).

- **Test your page.** Software developers use a technique called "usability testing" to determine how easy their interface is to use and understand. If you're considering using animated graphics and you're concerned about download time, add the graphics and ask a few friends with widely differing systems to connect and critique your page. Naturally, the person using a 56K ISDN line isn't going to complain about load times, but you can still ask for an opinion on the appearance of your page. The lucky friend using the 14.4 bps modem is a better candidate to quiz about speed.
- **Calculate download time.** We'll cover this process later in Chapter 4; it's also a part of the usability testing phase. Calculating download time will give you a good approximation of how long it will take your browser to load a graphic at any common speed.

Browser Compatibility

It's a fact of life: most of us who compute on a budget aren't always using the latest and greatest in technology. For me, it's utilities; I tend to continue using older, familiar versions of utility programs rather than buy an expensive upgrade to the latest version, which often has nothing new but fancier graphics. Unfortunately, for many visitors who will reach your site, their legacy software will be their browser program.

Although just about every browser I've seen that's been released in the last two years has support for animated graphics, earlier versions of the most popular browsers like Netscape Navigator did not support animation. This typically will not be much of a problem, unless the animated graphics that you've created contain information that's not available anywhere else on your page.

For example, a friend of mine using an older browser recently called me on the phone, complaining that he couldn't find the Web page download area for the sound card he had just bought. I fired up my Netscape Navigator 3.0, connected to the same site, and there it was: a big, animated button with a starburst graphic that cycled through the following words: "Click here for free software!" I told my friend (who was still on the phone) that I could see the download prompt with no problem, and it took us a few minutes to figure out that his browser was only displaying the word "click." Without support for animation, the rest of the message never appeared in his browser.

For this reason, it's a good idea to use your animated graphics only to attract attention and provide visual interest, not to communicate any critical information; that way, if your visitor is using an older browser, nothing important on your page is missed. This same rule also holds true for future graphic technology on the Web. Not everyone is on the leading edge of technology—in fact, most of us aren't, which is why it's an "edge" in the first place.

Designing Your Page & Images

Unfortunately, like most things in life we must start at the beginning. Most of the people creating personal Web pages today have no training in visual layout, and they have never created their own graphics especially for use on a Web page. What's worse, the same is true of many Webmasters who have been forced into creating pages for their company's commercial site. Of course, you can pick up a basic feel for Web design simply by surfing, but it may take quite a while—and you can't really learn how to create animated graphics without some knowledge of how images are effectively placed on a page.

In this section, I'll provide you with a quick refresher of the basics of designing graphics, both static and animated, to fit the content and style of your pages. Note that I didn't say graphic design; we're not going to be studying "white space" or "stark primitive late-twentieth-century angles," but rather how you can design both static and animated graphics to fit the content of your page.

Whoa! Are we crossing that neutral zone into graphic design? Not really, more like interior design; after all, a successful Web page involves the arrangement of content, too. Your choice of font attributes are like the colors you choose for your furniture, and your images on a Web page are like the pictures you hang on the walls of your home.

The Design Process

At this point, I'll assume that you've already determined the content of the page and any necessary HTML features that will be included, like links or a mailto statement. To drag my poor analogy just a little further before it keels over, you've already chosen your furniture and arranged it, and now you'd like to add visual interest to the walls. There are other books available that teach basic and advanced HTML—my favorite is *Official HTML Publishing for Netscape* (Ventana 1997). I'll take it for granted that you already know your way around an HTML editor, so that we can start the good stuff right now.

There are a number of considerations involved in designing a Web page and the images it will include, and I suppose you could consider them "steps"; they can, however, be performed in any order. Furthermore, it doesn't matter whether you draw the image you design yourself or find a suitable substitute somewhere on the Internet and simply download it. Planning the graphic makeup of your page is the process of determining:

- The number of graphics that belong on your page.
- The size of the graphics.
- Where they should be placed for maximum effectiveness.
- What colors they should use.
- The subject of your graphics and the theme you wish to enhance.
- The correct balance between complexity and download time.

Before we jump into designing your graphics, let's create a hypothetical Web page so that you can see how the process works. For this section, we'll assume you're working for a company that manufactures pianos, and you've been asked to design the company's home page. This page will include links to product descriptions, sound files of the various pianos, and a price list. However, your company's server is overworked, and your visitors may experience quite a few pauses, so you must design the page to transfer and load quickly as well as attract business.

If you're following along with your own project in mind, grab a notepad and pen—or, if you're in a symbiotic relationship with your computer like I am, open up your favorite text editor and jot down your choices as we move through the design steps. Keep the pad handy because by the time you're done, you'll have a complete sheet of specifications on your graphics.

Color & Palette

To demonstrate that these steps can be performed in any order, let's start with color and palette. The Internet began as a text-based system, so you'll find that there really is no set standard for colors other than the named colors recognized within HTML, as listed in Table 1-1. As a general rule, your graphics (including background graphics and text) should use these colors from the standard HTML palette whenever possible; this will help ensure that visitors still using 16-color systems will still be able to view correct colors. If you use custom colors that aren't directly supported within the standard 16- or 256-color drivers, your visitors might experience *dithering* (that awful grainy effect you often see when you display a 16-million color image on a 256-color system); dithering is caused by incompatibilities between palettes and color depth.

Standard HTML Colors
Black
White
Red
Green
Yellow
Blue
Cyan
Magenta

Table 1-1: Standard HTML color names.

How can you be certain you're using pure colors? Most paint programs either display a palette in which you can select standard colors, or you can reduce the color depth to simple colors through a menu command; for example, Paint Shop Pro includes both. Figure 1-4 illustrates the main window from this great program, and you can see the 256-color palette displayed along the right side. You'll learn much more about this program and all of its features in Chapter 3.

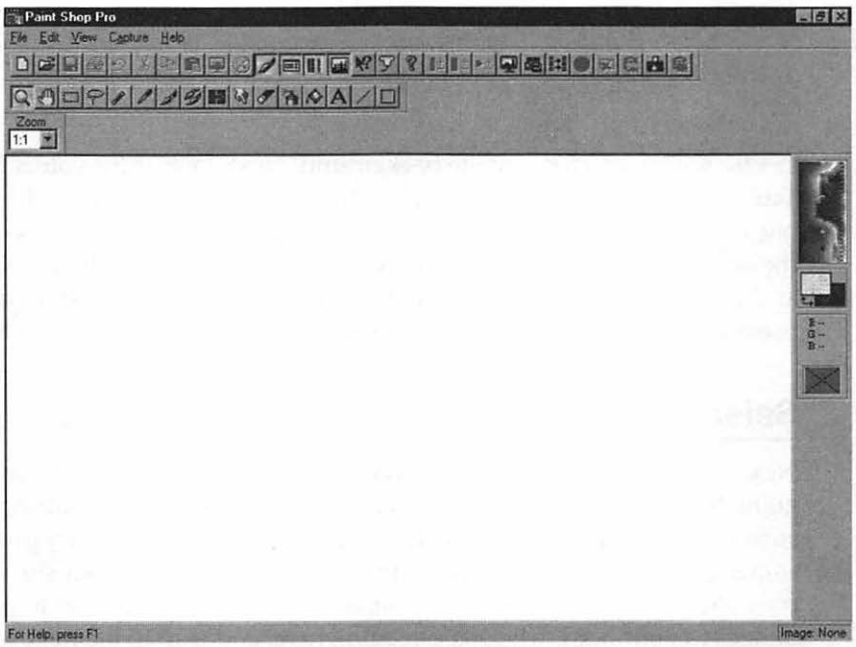


Figure 1-4: The Paint Shop Pro main window includes a full color palette.

Speaking of Color Depth

With the explosion of inexpensive, quality video cards and the dramatic drop in RAM prices over the last couple of years, it's now easier for most Web surfers to display 16 million colors, and more and more sites are now assuming that your system is capable of display at that color depth. The JPEG image standard, which is the primary image format on the Web, also provides 24-bit color at a very small size, but JPEG images are not currently used in animation.

However, 256 colors is still a better standard for now since the difference to the viewer is often slight, and you can practically guarantee that your viewers will be using at least a 256-color mode. Also, most animated GIF images are 256 color.

Since speed is of the essence here, I would recommend that you use a standard color background instead of a tiled background graphic because you'll save loading time. White is a natural choice; it makes a great background for our images and text looks clearer on white as well. Black would probably be our second choice, but text is a little harder to read.

TIP

If you look at a number of the successful pages on the Web, you'll see that many of them use a simple white background, like Yahoo! Although many people may consider white boring, it's still the best choice as a background for images, and simple white still has a classic appeal. After all, this book uses white paper for a reason.

OK, we've selected a white background. Next, look at the colors listed in Table 1-1 and select additional colors for your graphics; usually, there's at least one or two colors that are either included in a company's logo, associated with the subject, or just appeal to your eye. For our example, we'll add black, red, and yellow, which are complementary, and we'll use black text. Finally, we'll use a 256-color palette for all of our graphics for the best compatibility.

Selecting a Subject

Next on our design list is the subject of your graphics and what is actually going to appear in your Web image. If you've done any Web surfing at all, I'm sure you've encountered more than your share of shocking, inappropriate, and sometimes just plain puzzling graphics on the Internet. If your site will rely on pure shock value to attract attention, then please download the worst of these images to your hard drive, stop reading here, and skip to the next section. Your visitors have my pity.

Still here? Good! That means that you're interested in designing graphics that will enhance your page instead of overwhelm it. You're looking for visual interest, not visual chaos.

Depending on the theme of your page, the subject of your image may be obvious; in the case of our example page, it's a safe bet we'll use a piano itself, but there's no reason you can't design graphics that take a new angle on even the oldest of subjects. For example, consider these guidelines for your subject:

- If you're limited to your company's logo, consider a 3D version in motion; you'd be surprised how interesting that familiar 2D object is when it's rendered 3D. For example, check out Figure 1-5.

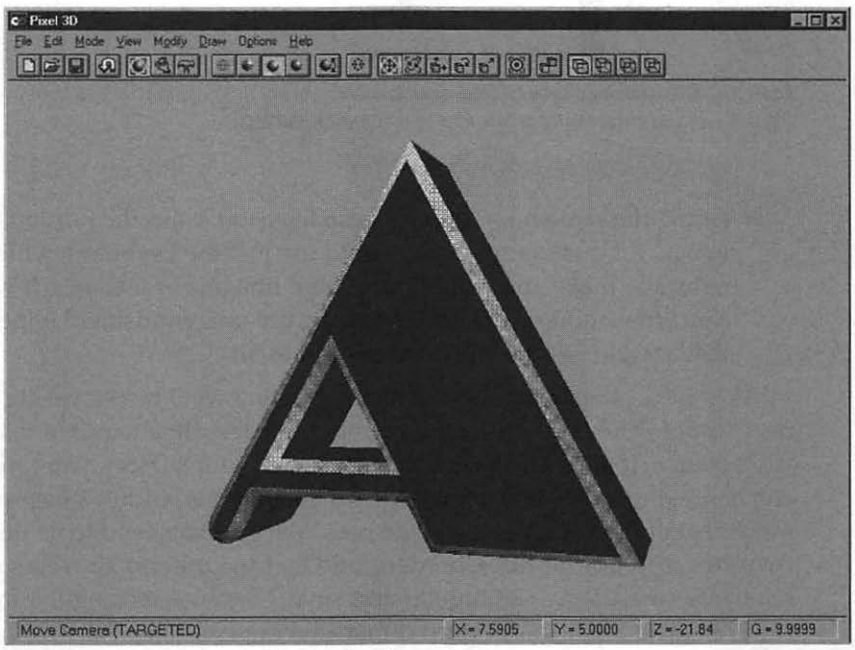


Figure 1-5: Rendering a subject makes it stand out.

- Use images of objects or symbols that are related to your subject; for instance, our page could use a G clef or quarter notes instead.
- If a subject isn't apparent, consider animated text.
- One trick I've used often is to cut several pieces from a familiar image and re-assemble them, as in Figure 1-6; you end up with a slightly skewed (yet attractive) image that really grabs the eye. There are all sorts of effects available in Adobe Photoshop that can accomplish the same task; we'll be using this great program later in the book.

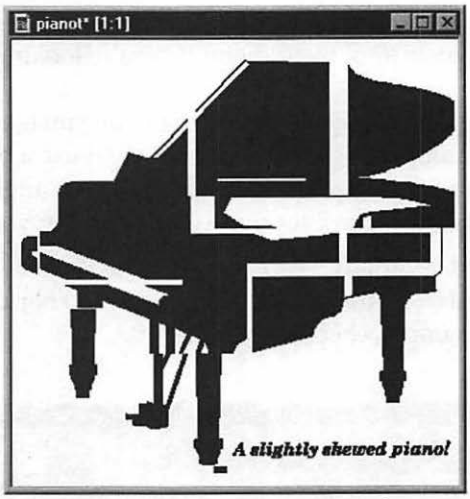


Figure 1-6: An interesting treatment of a common subject.

- Along the same lines, you can also focus on a specific portion of an image; for our example, you could use just the keyboard, which would naturally make an excellent animated image. For instance, if your site concerns automobiles, let a spinning tire or a windshield wiper carry all the "weight" of the entire car behind them.

As you consider your subject, remember that we'll be discussing size in the next section, and the smaller your subject, the less time required to download it. Of course, if you've selected an elephant as your subject, you can use a *small* elephant—I'm a nice guy, I'll let you do that—but wouldn't a *huge* peanut be more visually interesting? I feel the best Web graphics tend to be thin and long (which are perfect for titles, borders, and text separators), or rectangular and relatively small. Why rectangular and small? Because rectangular images are easier to resample to a standard dimension in pixels, like 320 X 200, and any text that wraps around your image will wrap more neatly around the straight edges of a rectangle. As for the smaller size, we mentioned that earlier: the smaller the graphic, the faster it loads.

What about availability? Naturally, the more common an image is, the easier it will be to find. If you're a flop as a freehand artist, you'll have to locate your image somewhere on the Internet or use a clip-art library; also, if you have rights to a printed image or a photo you've taken, you can scan it in and use it. This is why many Web design consultants pack a digital camera with them so that they

can capture images of a subject directly without worrying about copyright issues; we'll discuss copyright law a bit further in Chapter 2. Of course, if you are an electronic artist, then you have my sincere admiration, and it'll be much easier for you to entertain and create your wildest flights of fancy.

Also, if your graphic will be animated, consider how easy it will be to create the animation, and try to select a subject that moves naturally. Our keyboard will be a snap, since we can make the keys move up and down as they naturally do in real life.

We'll use a piano keyboard as the subject of our principal image, then, because it matches several of the characteristics of a good subject:

- It suggests the entire piano without requiring that your page be loaded down with an actual image of one.
- It's visually interesting.
- It's easily animated in a familiar motion.
- It's the right shape for use as a title or separator.
- Finally, it's a graphic that you can likely find on the Internet or in a clip art library.

Size, Placement & Number

"How many graphics should I place on my page, where should they go, and how big should they be?" As you might have guessed by my earlier comments on "chaotic" pages, I'm more of a minimalist when it comes to adding graphics to a page. My favorite designs usually feature:

- **A title graphic.** I strongly recommend you steer clear of a standard HTML text title unless you're interested in reducing loading time to a bare minimum. If your main page starts with a text heading, it'll fall short of the graphic punch that most of today's Web surfers are looking for, and many of your visitors will simply assume that you didn't take the time to create your page properly or that you're a novice with HTML. I know that sounds harsh and it may not be true, but today's Web is a fiercely competitive graphic medium, and your title helps create a first impression, good *or* bad. Figures 1-7 and 1-8 illustrate two good examples of title graphics; the first is a drawn image, while the second is the rendered 3D title from my site.

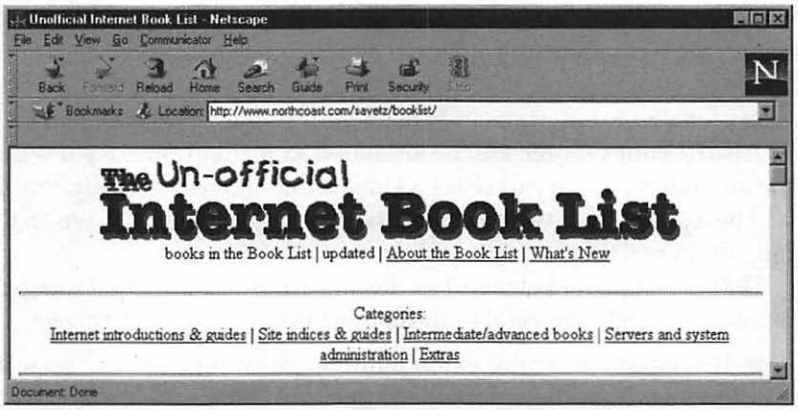


Figure 1-7: The title bar from one of my favorite sites on the Web.

Figure 1-8: The title bar from my site.

TIP

The next time you pick up a printed newspaper, consider what drew your eye first: I'll bet it was the paper's masthead. Just like the title graphic on your Web page, the signature name and the surrounding graphics at the top of a newspaper create a memorable first impression. For example, close your eyes and see if you can picture the masthead for USA Today, *the* Wall Street Journal, *and the* New York Times.

- **A pleasing background texture.** Please note that I said a *pleasing* texture; some of the backgrounds I've seen recently are so harsh they're like sandpaper to the eye! Your foreground text should be easy to read, muted in colors, and the image you use for your background should tile in a regular pattern.

There are exceptions to this rule; for example, on the page on my site devoted to the classic '60s TV series *Batman*, I use a tile background with an image from the show's title. Although this makes the text a little harder to read, the background represents the campy graphics of the TV show and it works. (I can only imagine what a site devoted to *Laugh-In* would look like!) If you do decide to use an image as a background, make sure that it tiles evenly, and try to use a highly contrasting color for your text.

In addition, I'd recommend using the same texture for every page on a specific site; this serves to tie your pages together into a cohesive whole and avoids the "eye shock" one experiences in moving from, say, a black background to a red one. My personal favorites include textured paper, a light marble, or granite.

TIP

As mentioned earlier, a solid color background works almost as well, and it will load faster.

- **Text separators.** Text separators enhance both the look and the readability of your page. However, it's a good design rule to stick to only one or two images for all of the separators throughout your site; if you use a different image for each separator, you're once again introducing too much visual feedback. For example, a computer software manual may use the same set of standard icons throughout to guide the reader and provide variety. Like the printed pages of such a book, using the same incidental graphics throughout your Web site will help to provide a visual "anchor" for the eye. You should also be careful to avoid adding too many separators, which can force your visitor to scroll when it's not really necessary.
- **Icon buttons.** Figure 1-9 illustrates the use of icon buttons down the left side of a page; another popular place to display icon buttons is directly under the page's title graphic. Wherever you decide to place them, it's standard practice to place the same icons at the same position on each

page on your site so your visitors will always know where the "navigation controls" are anywhere on your site. Icon buttons provide the same functionality as a text link; click on one to download a file, jump to another page, or activate a search, for instance, but they're much more interesting visually. The same rules we listed for text separators apply to icon buttons as well; in addition, it's very important to make certain that the meaning of each button will be clear to all of your visitors. Remember, your site is "on the air" around the world; if you're expecting a large number of foreign visitors, use a set of icon buttons that's suitable for international communications. Alternately, many large companies offer completely separate pages in different languages.

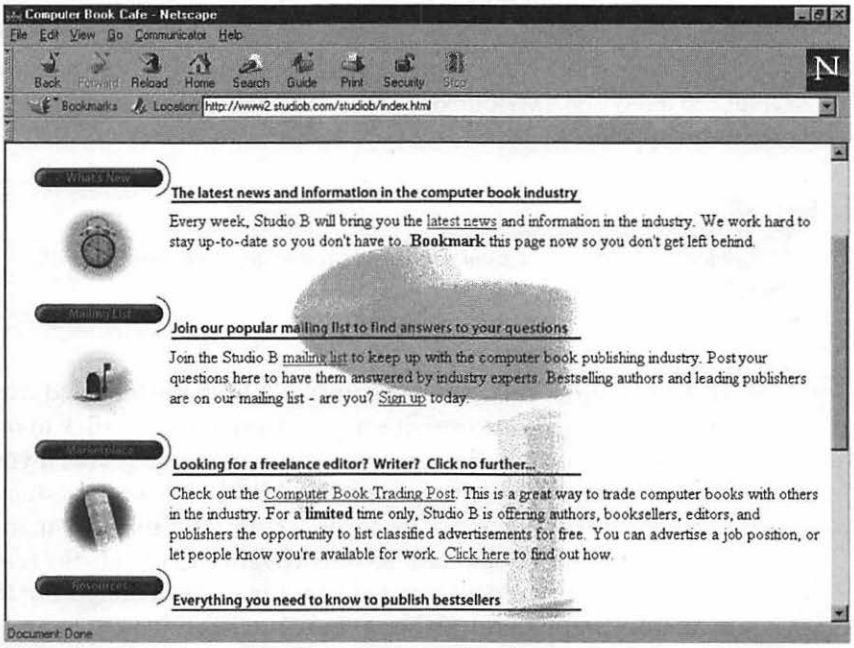


Figure 1-9: A good example of the proper use of icon buttons.

- **A footer graphic.** Although not as important as the good first impression provided by a title graphic, a footer graphic adds a professional touch to a page by ending it with a flair; often, the footer is a smaller version of the title graphic, or it's complementary in some fashion. It's also standard operating procedure to include items like your content copyright, a mailto link to the Webmaster, and any awards your page might have won as a part of the footer graphic. Figure 1-10 illustrates a footer graphic.

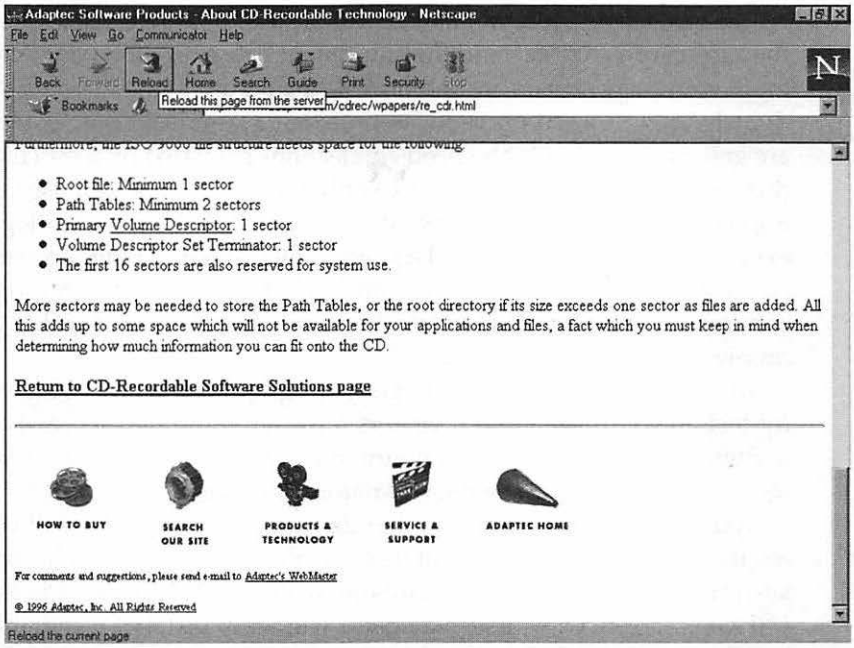


Figure 1-10: Adding a footer graphic lends a professional touch to your page.

TIP

Some page designers prefer to place their icon buttons for links in the footer graphic as well; however, if your page contains a lot of information, it's better to place your links at the top or along the side so that your visitors don't have to scroll through all of the contents to reach them.

Now let's consider the size of your graphics. Nothing personal, you understand, this is strictly in the interest of design—but most novice Web designers naturally believe that bigger is better. In some cases that's true; for example, a title graphic should certainly stretch across most of your page. If your company logo is well-recognized, it's to your benefit to display that image in a large size (perhaps in a watermark style, or as an image map with links to other pages); in fact, it could replace the title as a menu centered in the middle of the page. However, we immediately face that same familiar tradeoff between loading speed and our artistic sensibility.

The best way to determine the optimal size for your graphics is to consider the subject of your page and the equipment being used by your average visitor. If your page centers around professional multimedia, digital audio, or digital video, you can probably assume that a large percentage of your visitors are going to be using high-speed connections provided by their companies; in this case it would be appropriate to pull out all the stops and use large graphics, complex animation, and the latest in browser plug-in technology. If, however, your page centers around a special interest like cat juggling (thanks, Steve Martin!), your visitors are more likely to have that 14.4 bps dial-up connection I mentioned earlier, and you should place a reasonable limit on the number and size of your images.

Also, keep in mind that the larger your graphics, the less space you'll have for text on your page. If your visitors must scroll through successive screens of a single page to read a small amount of text sandwiched between large graphics, their interest in your topic will naturally decrease.

Your visitors also impose another limiting factor on the size of your graphics; those pesky surfers may not be using the same screen resolution on their system, and what looks wonderful onscreen at 1024 X 768 may not even fit in a 640 X 480 screen! Of course, Navigator will wrap text, but it certainly won't look like you intended.

The standard screen resolution these days is usually considered to be 800 X 600, but it's a good idea to connect to your page at 640 X 480; in fact, the 'usable' or 'viewable' area of your browser window can be considerably smaller than the screen resolution. At 800 X 600, a maximized Netscape window contains an area about 780 X 415. At 640 X 480 the area is about 615 X 300. If you're lucky enough to design your pages on a 17-inch monitor, make a mental note to check their appearance on a smaller 14-inch monitor as well; although the size of the monitor won't change the physical appearance, you may be surprised to see that your design simply "looks" better or worse on a smaller screen.

I use a simple rule of thumb on my pages; other than the title graphic, I limit the maximum size of my images to one-third of an 800 X 600 screen in both the vertical and horizontal dimensions. Remember, that's a maximum value for the size of an image; any graphic that takes up that amount of space on a page should be very important to your discussion. For example, a page that critiques a particular painting or photograph would probably use a graphic of that size, and perhaps even make it a download link for a larger, full-screen version of the same image. This rule holds for animated graphics as well, but remember that most animated images are considerably larger in file size than a static image of the same dimensions. We'll discuss more techniques on reducing the file size of your animated images later in the book.

TIP

If you must provide larger images online but you'd rather not slow down your page, consider adding image thumbnails. If your visitor can use the larger version of the image, a simple click on a thumbnail can download it directly to their computer at the fastest possible speed!

Let's apply all this for our example:

- Our graphics will center around a piano keyboard theme.
- The piano keyboard image will be integrated into the page's title graphic, footer graphic, and used as a text separator.
- Our graphics will be black, red, and yellow on a white background.
- We'll use a title graphic that includes our animated keyboard and the name of the page.
- We'll use a series of small icon buttons for links and place them under the title.
- We'll add a smaller footer at the bottom of the page that contains your e-mail address and copyright.
- Finally, we'll create our page at 800 X 600 resolution for compatibility with the browsing public.

As I said at the beginning of this field trip through page design, you've gained a good working knowledge of how images are selected for a page, and we even have a fairly complete specification for our graphics. Of course, we're not done yet; we'll use this same specification that we've just designed to search for images in Chapter 2, and we'll actually create the images in Chapter 4.

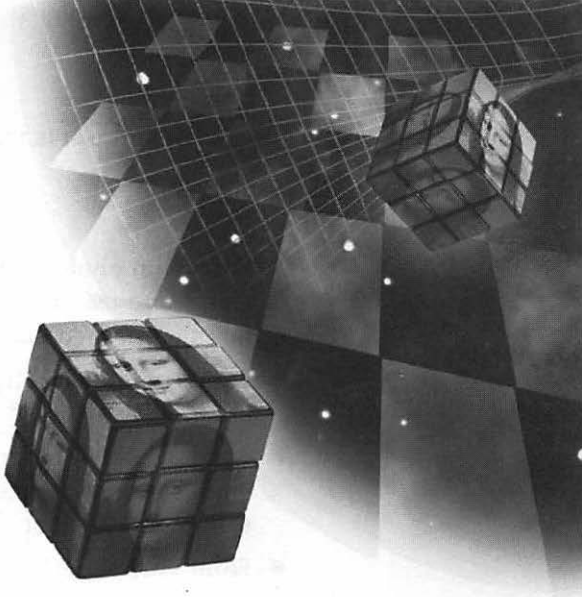
Moving On

In this chapter, you were introduced to the importance of graphics for your Web site, as well as the advantages and disadvantages of adding animation to your page. We also covered the design criteria that will allow you to find or create the graphics you need for your page.

In Chapter 2, you'll learn more about where to find suitable images for your page and how to obtain them.

CHAPTER 2

Finding Images to Animate



OK, so you've designed your graphics and you're ready to place them on the page—but where the heck do you *get* these images (besides drawing them by hand, of course)?

As I mentioned in the last chapter, I have all the artistic talent of a bottle of ketchup. However, this hasn't stopped me from creating my share of Web pages with spectacular graphics, including custom-animated images that I've built myself. How do I do it? It's not by hiring an expensive professional artist—although that is one method—nor do I spend hours in a drawing package.

Instead, like Radar O'Reilly in the classic TV series *M*A*S*H*, I'm a "master of acquisition"! There are so many image sources available today that I've never failed to find something that couldn't be edited to fit my requirements. I find my images in a number of places:

- **From other Web pages.** As long as you're not infringing a copyright held by another person, you can capture and save images from other pages that catch your eye. Copyright law applies to any image (including those that you create yourself), and I'll be mentioning it throughout this chapter.
- **From other programs.** You can capture full-screen graphics from other computer programs and edit them for use within your own pages.
- **From electronic documents.** Do you have a graphic you'd like to use from a report or a company document? If it's in electronic format, you can convert it for use in animation.

- **From film photographs.** If you own the rights to a photograph, you can scan it and feature the electronic version on your page. This is also true for other printed graphics.
- **From commercial clip art.** Royalty-free clip art can provide the perfect image for your page, including animated images.
- **From digital photographs.** If you own one of the new generation of digital cameras, you can capture your own images for your page without scanning them, just like snapping photos with a film camera!
- **From videotape.** If you have the copyright to the contents of a videotape, you can use one of several devices to create still images.

In this chapter, we'll cover everything you need to know to get started in the "acquisition" business yourself, including many examples of the most popular hardware devices and software programs used by professional Web designers. You'll learn how to search for specific images throughout the entire Internet as well. With a resource base so broad, you'll be surprised at the downright strange images you can find with a little digging! Finally, I'll touch on the legal side of copying images from the Internet.

Of course, you can also acquire animated images directly from the Internet, which would save you the time and trouble of the animation process, but if you're using a specific subject—such as your company's logo, for instance—it's usually next to impossible to find an animated image that matches it exactly (or, for that matter, even comes close). Keep in mind that all animated images are built from static images, so if you can't locate a suitable animated graphic, later chapters will teach you how to build your animated image using whatever static images you find.

Legal Issues

Before we dive into the image resources available to you, let's start this chapter by discussing some of the legal issues surrounding copyrighted material. First, I'd like to make it perfectly clear that I am *not* a lawyer, and what follows are common sense rules to help you stay on the right side of the law; if you have a specific question about the legality of copying a certain image, *consult your attorney!*

With that said, here are some general guidelines that may help you as you hunt through the electronic jungle for your images:

- Permission must be obtained for each and every image you use! Just because the artist has previously given you permission to use copyrighted images before is no guarantee you'll automatically receive permission to use that latest image as well.

- What constitutes "use"? Any duplication or distribution on your part is considered use, including the act of scanning an image or posting an image on a BBS, an Internet newsgroup, or your Web site.
- Availability is not permission! Even though you got an image from a newsgroup or found it on a Web site, that doesn't mean that it has been released into the public domain—explicit permission from the owner is required. Often an image that doesn't carry a copyright line is immediately assumed to be in the public domain; however, that assumption can be dead wrong, since copyright is automatically granted upon creation of the original.
- Non-profit use is no shield against a copyright violation. If you use a copyrighted graphic without permission, it doesn't matter whether you charged for access to your Web site or not.
- Distributing a "backup" copy is a contradiction in terms; archival copies cannot be distributed.
- Editing or altering an image—for example, cropping it, changing its size, or changing its color palette—does not invalidate the copyright nor does it result in a new original image. Your new image is still directly derived from an existing copyrighted image, and you're still in trouble.
- Copyright extends to both the electronic and printed form of an image, so you also don't "remove" the copyright from a printed image by scanning it.

You may ask, "So do I really need to copyright an original image that I create?" As I mentioned, copyright is granted upon the creation of the original, so technically you no longer need to add a copyright line to original images that you've created yourself. Many images are too small to carry a copyright line, and because the line must appear within the body of the image, this often isn't practical.

However, if your image is large enough and you're sufficiently proud of it, adding a copyright line reminds others of your legal right, and it reinforces your position should you ever have to defend that right! You can use Paint Shop Pro to add text to any image, so follow these steps:

1. First, open Paint Shop Pro and select Open from the File menu. Browse through your system and load your image.
2. Next, click the Text button on the toolbar under the menu (it's marked with a bold letter *A*). Your cursor turns into a crosshair.
3. Now move to the bottom left corner of your image and click the left mouse button. Paint Shop Pro displays the Add Text dialog, as shown in Figure 2-1. Select an easy-to-read font that you prefer and then select

a font size that's large enough to be easily read without spoiling the image. Your default text color is black. If you like, select the bold style, but avoid any text effects or italics, since these will diminish readability. Finally, enter the following text into the Enter text here box at the bottom of the dialog: **Copyright (year) by (your name or a business name), All Rights Reserved.**

Substitute the current year and your name or a business name as indicated, and then click on OK.

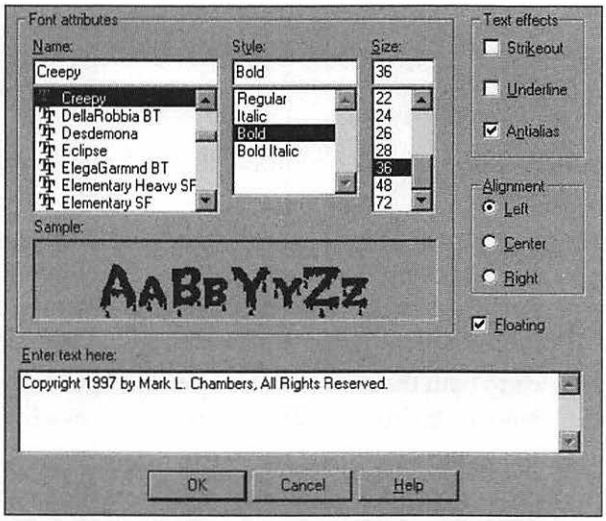


Figure 2-1: Selecting text attributes for our copyright line.

4. The text should appear in the area you specified, but it may not be aligned as you like; to change the position of the text, move your mouse cursor over the text until it changes shape into a movement cursor. Click and drag the text to the exact spot.
5. Save your image!

Figure 2-2 shows you how the finished copyright notice appears on one of my original works—remember, I *told* you I was no artist when we met!

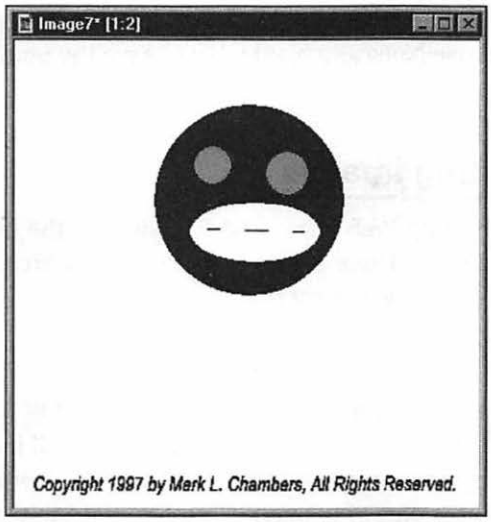


Figure 2-2: A finished copyright line (on an image that doesn't really need one).

Using Images From the Internet

The easiest method of acquiring images to animate is to take them directly from other Internet sources. Why?

- You won't need additional hardware or software to copy these graphics. Most can be downloaded directly using Netscape Navigator!
- These images will already be in the accepted GIF format, so you may be able to use them directly without any conversion.
- The sophisticated search engines available on the Internet make it easier to locate images related to a specific topic.
- Most pages offer links to related pages, making it easy to check for images. For example, if you don't find the right image of a yellow-bellied triple-crested sapsucker on one bird watcher's page, you can jump to other pages that are linked to it and continue your quest.
- Web surfing is generally more fun than traveling to your local library or digging through a collection of images on CD-ROM.

In this section, we'll search for the piano keyboard graphic we designed in the last chapter, and you'll use Netscape Navigator to save the image to your hard drive for later use.

Searching for Existing Images

Our first step is to locate existing Web pages and FTP sites on the Internet that might have graphics we can use. There are three methods of searching the Internet for graphics—we'll use the easiest first.

Searching on the Web

I personally think that searching on the Web is easy and fun—OK, so I'm a technoid, but after we're done I think you'll agree with me. We'll look for our image using my favorite Internet search engine, Yahoo! (As you probably know, the exclamation point is part of the name, but I do tend to wax enthusiastic about this service, so it works out!) Follow these steps:

1. First, open Netscape Navigator. If you're running MacOS or Windows 95 and using a dial-up connection, this should automatically dial your modem and connect you to your Internet service provider. Once the Navigator main window has appeared, click in the Location field, enter **www.yahoo.com** (the address for Yahoo!), and press Enter.
2. The Yahoo! home page will appear, as shown in Figure 2-3. Most of us old-timers are very familiar with this screen; I've started many a night's surfing with a single search on a single keyword. In this case, we're looking for a piano keyboard, so click in the text entry field next to the Search button and enter **piano graphic**. Click the Search button to begin the search process. (See Figure 2-4.)

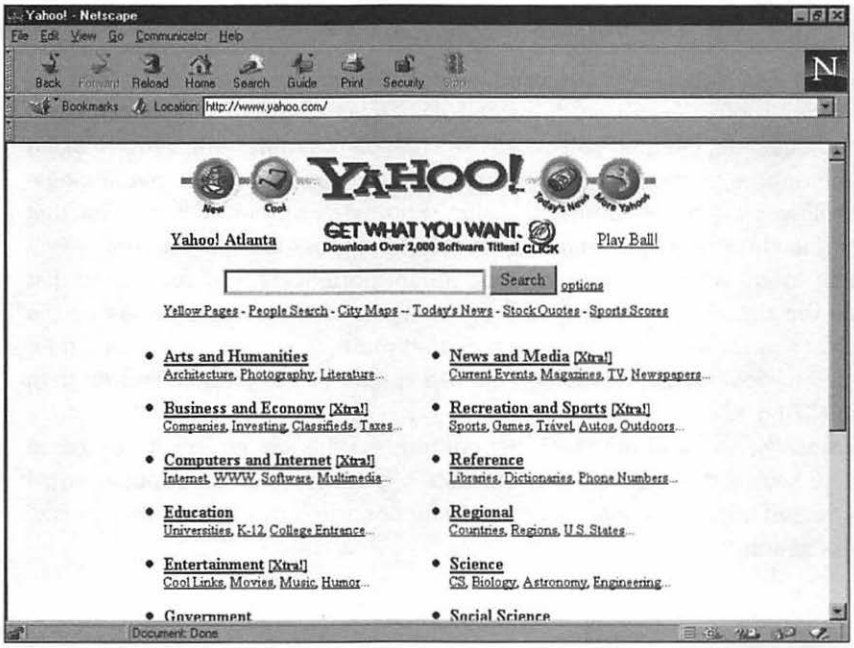


Figure 2-3: The Yahoo! home page, where you can search for subjects.

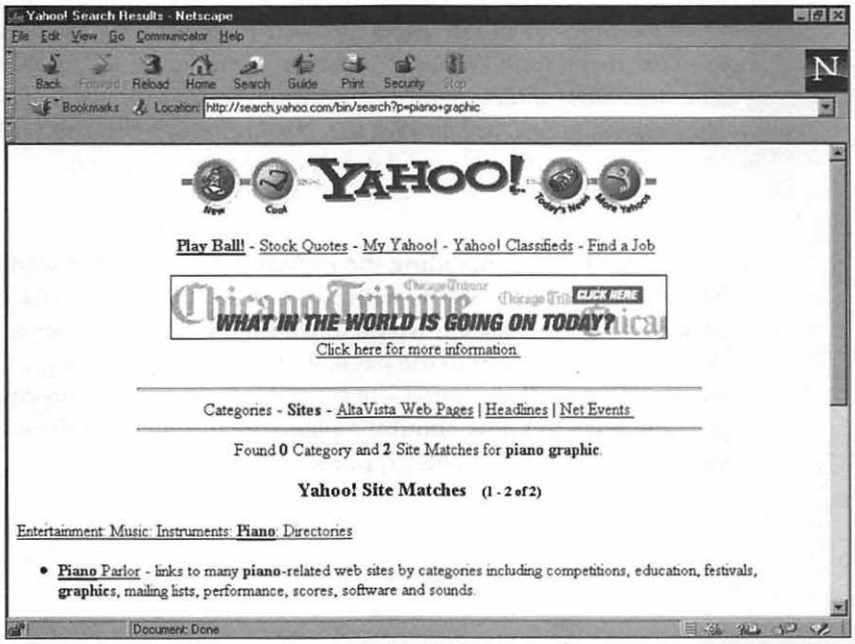


Figure 2-4: The site matches found for ***piano graphic.***

Narrowing Your Search

"Now wait a second, Mark...I've used Yahoo! a million times too, but I don't understand why you used two words instead of just searching on *piano*. What gives?"

Good question, I'm glad you asked! The reason is simple: when you're using a search engine on a resource as broad and complex as the Internet, a single word will return a huge number of "hits," and many of them will be sites that are completely unrelated to your subject. Whenever possible, narrow your search by using multiple words, and you'll be much more likely to display sites that contain the right information. You may want to check the search rules on the particular search page, just to make sure that multiple words are combined together to narrow the search by default, like "piano (AND) graphic" rather than "piano (OR) graphic".

Technically, you will get the most comprehensive search results by using only one keyword. However, if your subject is well-known or popular, you'll save yourself minutes or even hours of fruitless surfing by intelligently narrowing your search!

TIP

While we're on the subject, here's a trick I use whenever I'm searching specifically for a graphic: I first try a search that includes the keyword graphic, *as we did in our example. Since many Web pages specialize in graphics related to a specific topic—I like to call them Web page "libraries"—my search will usually return one of these sites. Some of these libraries are even dedicated to providing you with graphics especially designed for Web use. If your first search doesn't return a match, then try removing the word* graphic *and searching again.*

3. Bingo! Our trick of including the keyword *graphic* in our search string has paid off. Yahoo! returns with two entries, the first of which looks perfect for our needs. Off we go to the Piano Parlor—click on the title of the first entry to jump to the page. As you can tell from Figure 2-5, this is an attractive, well-designed site specializing in everything you might possibly wish to know about the piano, including an entire section devoted to piano clip art and graphics!

Figure 2-5: The home page of the Piano Parlor Web site.

We'll stop here and return to the Piano Parlor site later in the chapter.

Of course, you don't have to limit yourself to Yahoo! for Web-based searches. There are a number of other search engines that you can use as well. Table 2-1 is a list of the best-known and most popular search engines:

Mark's Favorite Search Engines
WebCrawler - www.webcrawler.com
Alta Vista - www.altavista.digital.com
Excite - www.excite.com
Lycos - www.lycos.com
The Open Text Index - index.opentext.net/

Table 2-1: Popular Web search engines.

These sites operate very similarly to the Yahoo! search engine, so you can follow the same steps. Although you can use an advanced search syntax on these sites, I don't think I've ever needed it; just enter your keywords separated by spaces.

Automating a Search

If I need a quick and simple search on a topic, I'll pull down my Bookmark list, jump to Yahoo!, and follow the procedure we just covered. But what if you'd like to use all of the search engines in Table 2-1 without retyping and jumping around from site to site?

I'm a big fan of automation whenever possible (read that "I'm lazy whenever possible") so for in-depth research I often use Quarterdeck's WebCompass, one of the new generation of automatic Web search programs. WebCompass will search all of the sites, summarize each in a paragraph or two, and even allow you to jump directly to the site using Navigator! Figure 2-6 shows the results of a search I did while researching an earlier book.

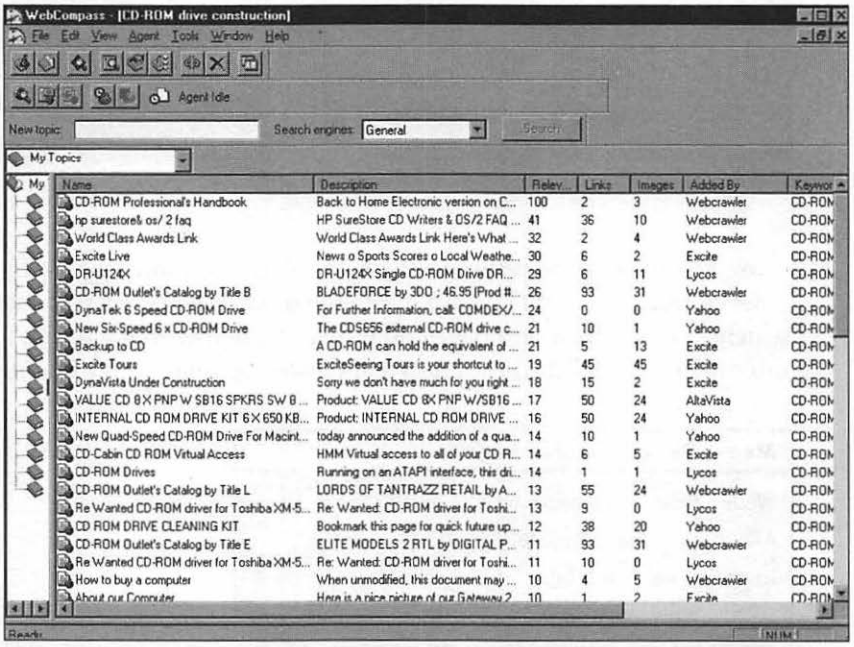


Figure 2-6: The results screen from a search made with WebCompass.

Searching With Archie

No, we're not talking the red-headed kid you know from the comic books who can never decide between Betty and Veronica! On the Internet, Archie is something else entirely; it's an index service you can use to search all of the anonymous

FTP sites for a particular file. Although searching for and acquiring images via FTP isn't as easy as it is on the Web, you have access to an incredible number of files around the world that you couldn't reach otherwise.

TIP

In the old days—I'm talking at least three years ago—Archie used to be one of the primary reasons why you'd use the Internet. With the explosion in popularity of the Web, it's taken a back seat, but millions interested in research and downloading still use Archie every day—it's one of my favorite Internet resources!

Unlike a Web search engine, Archie uses the filename as a search target instead of keywords. However, you can still use it to go "fishing" even if you don't know the exact name of an image file. To illustrate, let's perform the same search for a piano keyboard image through Archie. Follow these steps:

1. Open Netscape Navigator. Once the Navigator main window has appeared, click in the Location field, enter **www-ns.rutgers.edu/htbin/archie** and press Enter. The Archie Request Form appears; you've connected to Rutgers University. The Archie Request Form is shown in Figure 2-7.

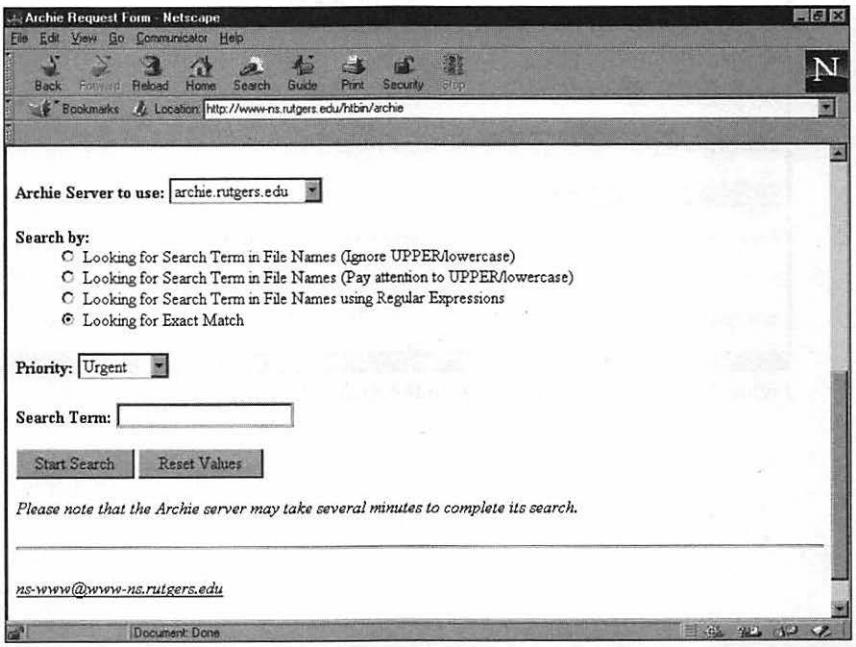


Figure 2-7: Ready to enter our Archie search form.

2. Scroll down the page until you see the Search by section. Select Looking for Search Term in File Names (ignore UPPER/lowercase).
3. Click in the Search Term box and enter the string **piano**. (See Figure 2-8.)
4. Now click the Start Search button. In a few moments, the Archie Search Results page appears (see Figure 2-9). Notice that while there are many FTP sites listed, no descriptions appear. Depending on how popular your subject is, you could scroll through and look for interesting filenames, or you can select Find from the Navigator Edit menu and look for the target strings GIF and JPG to jump directly to image files. You can download any file that has a link on the result page by clicking on the link, just as you would download a file from a Web page.

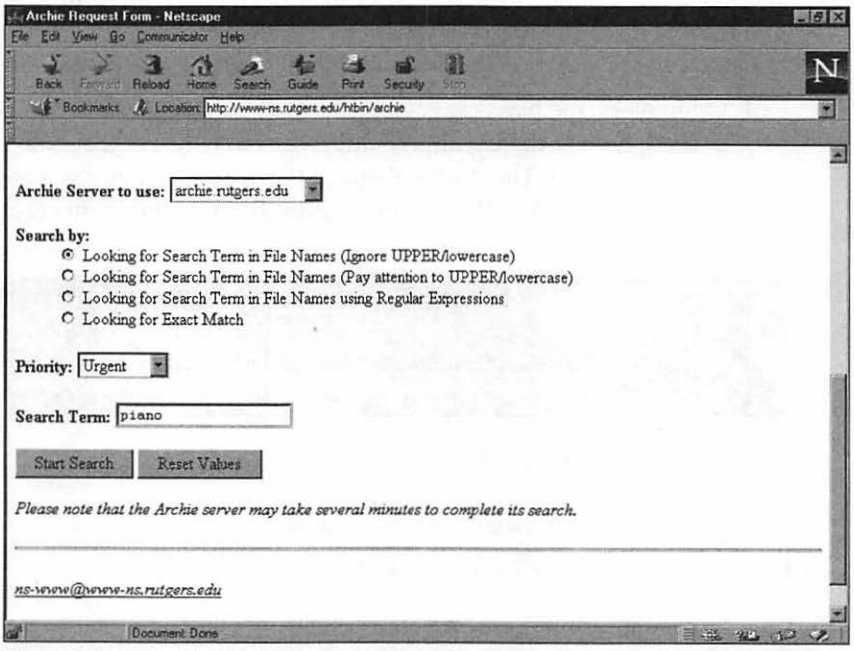


Figure 2-8: Using the Search Term on the Archie Request form.

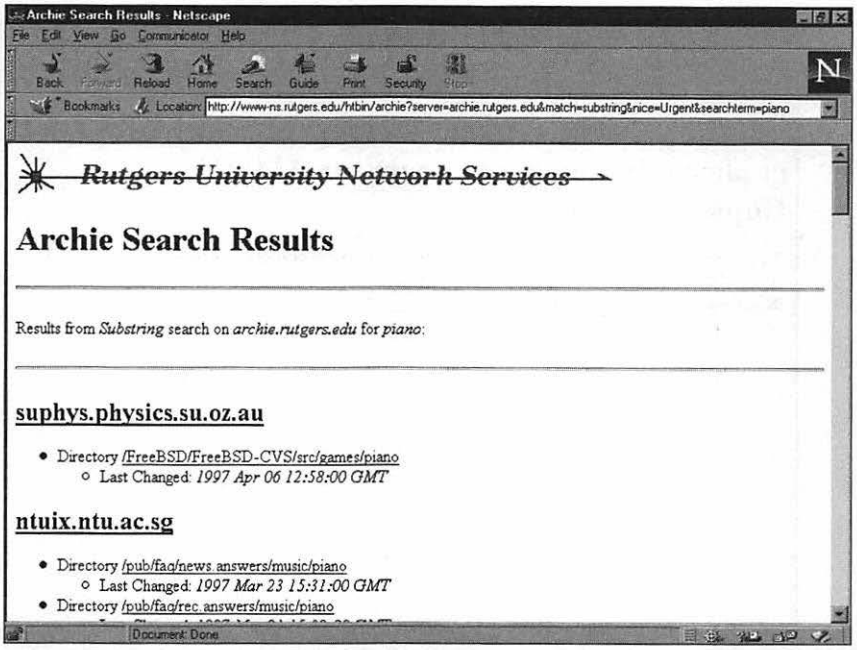


Figure 2-9: The Archie Search Results page.

Searching With Veronica

Yes, I understand you see a pattern developing here, but I promise you, there is no Jughead! Veronica is actually quite similar to Archie but to keep them separate in your mind, think of Veronica as a high-powered Archie search that delivers more information. Plus, you can limit your search to locate only graphic files!

To demonstrate, let's look around the Internet using the same file specification that we used before. Follow these steps:

1. Open Netscape Navigator. Once the Navigator main window has appeared, click in the Location field, enter **gopher://dragon.dgsca.unam.mx:2347/7/** and press Enter. The Veronica Search Form appears (see Figure 2-10).
2. Click in the keyword box and enter the string **piano -tIg** (your search form should look something like Figure 2-11). The argument following the keyword piano instructs Veronica to display only graphics files, which will save you a tremendous amount of scrolling! Press Enter to begin the search.

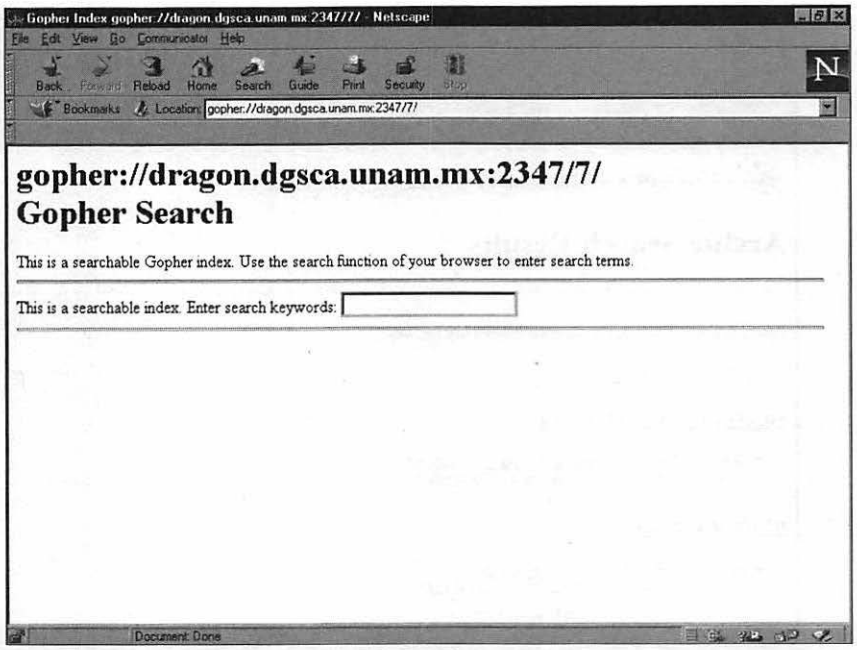


Figure 2-10: We're ready to search with Veronica.

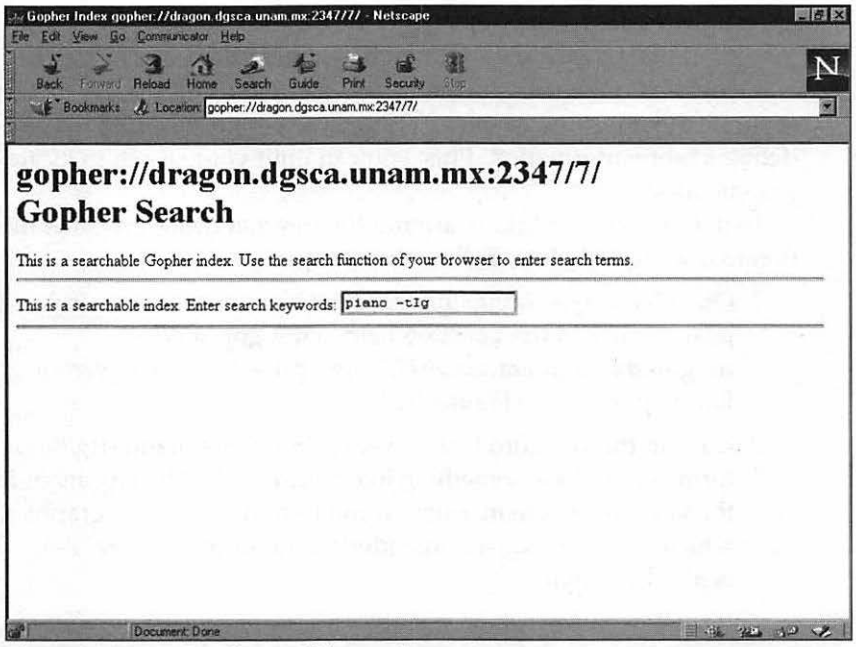


Figure 2-11: Entering the search keywords.

3. In a few moments, the results appear (see Figure 2-12). Notice that this page contains only graphic files because of the limiting keyword we added. Just as with an Archie search, you can download any file that has a link on the result page by clicking on the link.

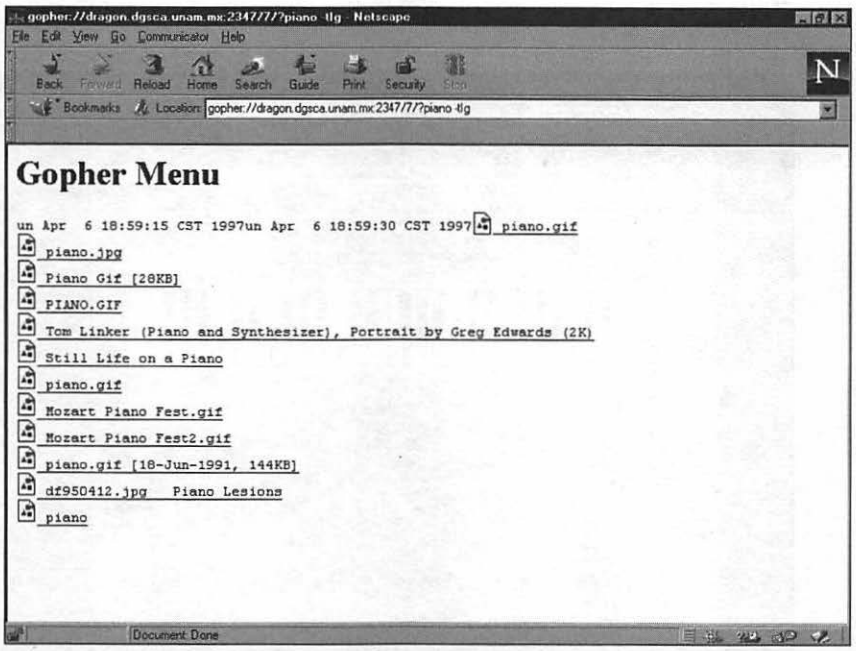


Figure 2-12: The results page, containing only graphic files.

Copying Images From Other Pages

Once you've located an image you'd like to use on a Web page, you can retrieve it in two different ways:

- If the page includes a download link for the image, you can simply click on it to retrieve the file; you're actually receiving the file as a download.
- If there is no download link for the image, you can use Navigator to save it to disk. In this case, you're not downloading the image—you're simply telling Navigator to make a copy of the image on your hard drive.

Either method works fine, but remember, no matter which method you use, you'll still require permission from the copyright owner to use the image on your own page!

Let's assume that we've looked through the Piano Parlor Web site for an image of a piano keyboard, and we've found it. As a matter of fact, I did find it, as you can see in Figure 2-13! As you can tell, the designer of this page has made it easy for me to download a copy of the image, piano.gif, by providing a link right underneath the image. Typically, these clip-art sites have a stated policy that grants you permission to use the artwork on your own page.

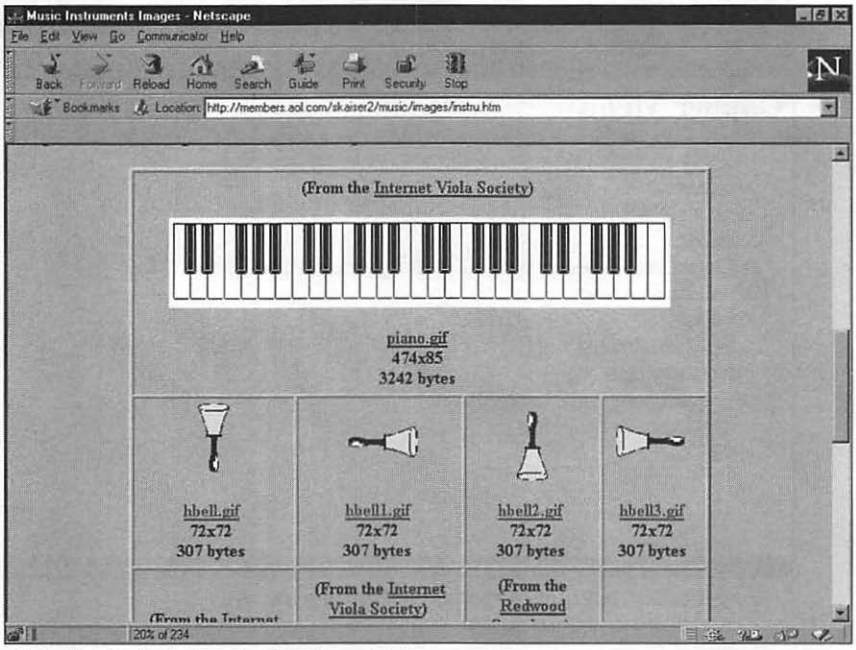


Figure 2-13: Our piano keyboard graphic.

However, what if there had been no convenient link? You can still copy an image from an existing Web page using Netscape Navigator. Follow these steps:

1. Move your mouse cursor over the image you'd like to capture and right-click. Navigator displays the menu shown in Figure 2-14.
2. Select the Save Image As item from the menu.

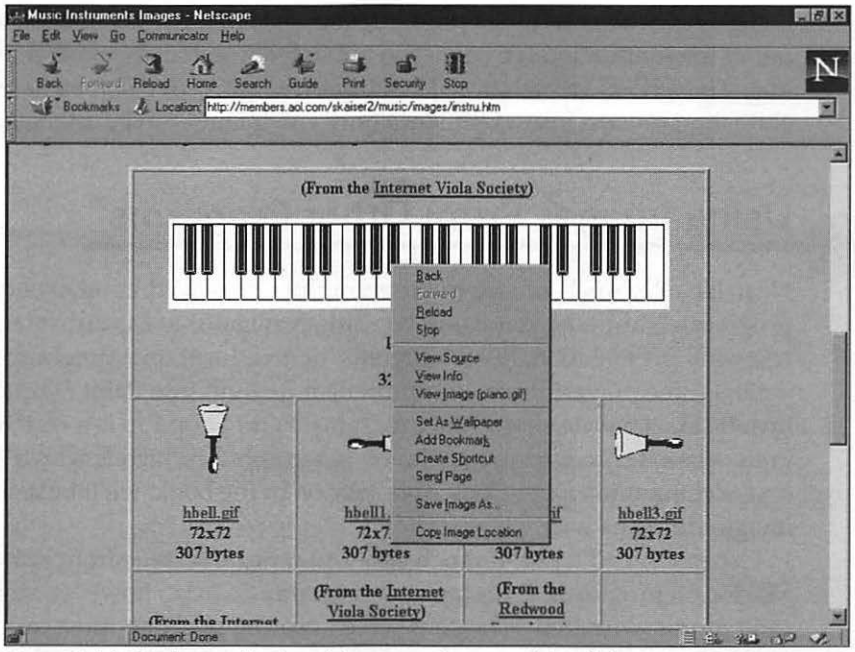


Figure 2-14: Navigator displays this menu when you right-click on an image.

3. Navigator displays a standard Save As file dialog; the Windows version is shown in Figure 2-15. Move to the folder where you would like to store the file and enter a filename into the File name edit field. If your operating system recognizes the file as an image, the correct format should already be displayed in the Save as type field, so leave it as it is. Click Save to complete the process and save the image to your hard drive.

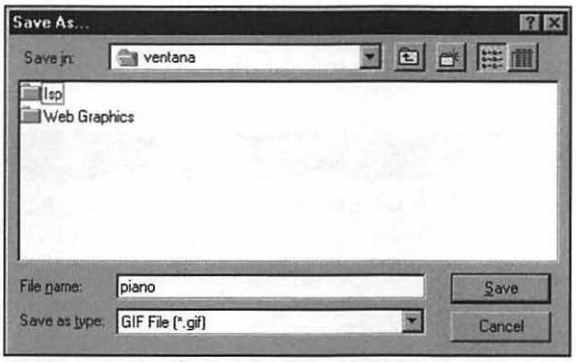


Figure 2-15: This dialog allows you to save an image anywhere on your system.

That's it! You're now the proud owner of a GIF or JPEG image that you can use as the foundation for your own animated graphic. Remember, if your image is in JPEG format, it will eventually be converted somewhere in the animation process into a GIF, since only GIF images can be animated.

Using Images From Other Programs

Next, let's discuss how you can use graphics displayed in other computer programs. Naturally, you won't be using Navigator to capture images from a company presentation, the latest game, or an educational program; instead, we'll use the powerful screen capture feature built into Paint Shop Pro, one of my all-time favorite shareware programs! Paint Shop Pro is a real Swiss Army knife when it comes to any job involving graphics, which is why it's included on the companion CD-ROM. And later on in the book, we'll be using it for image editing as well.

Generally, you'll find it much easier to capture screens from Windows or Macintosh programs. DOS capture programs do exist; however, since you can't multitask under DOS, your screen capture program must reside in memory as a *TSR* (or *Terminate and Stay Resident*) program, which often leads to incompatibilities that prevent them from coexisting with the other program. If you must use a DOS screen capture program, you'll probably be able to find one on the Internet if you search the larger shareware library pages; as a rule, though, always capture graphics from a Windows program whenever possible.

As an example, let's suppose that you need to capture the image of the back of a playing card. Remember those time-gobbling Solitaire games? It's part of a world-wide conspiracy, you know; these programs are mind-numbing, insidious exercises in brainwashing, and I'm hopelessly addicted to them! However, they **do** feature some very nice playing card backs—see where I'm going with this? We'll use the Solitaire game that comes with Windows, but Macintosh owners can use any card game on their system.

Bill, Don't Sue!

We're only capturing a graphic from Windows Solitaire as an example! The card images supplied with the game are, of course, copyrighted—remember how I told you that you must be eternally vigilant against copyright infringement? We wouldn't be able to use the captured graphic on a Web page without permission. Luckily, a playing card back is a common image, and you'd probably find a royalty-free clip art image easily on the Internet.

To capture a graphic with Paint Shop Pro, follow these steps:

1. First, run Paint Shop Pro and select Setup from the Capture menu. The Capture Setup dialog appears, as shown in Figure 2-16.

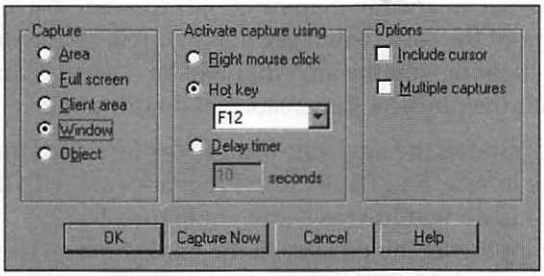


Figure 2-16: The Paint Shop Pro screen capture setup dialog.

Since you'll likely use this powerful feature often in the future, let's take a moment to discuss all of the settings you see:

- **Capture.** The Capture setting determines what portion of the screen you wish to record; I typically use either Full screen or Window to capture the entire screen or just the active window, respectively. You can also select Area, which will let you draw a rectangular box around the desired part of the screen; Client Area, to capture just an input area; or Object, to capture a part of the interface like the toolbar.
- **Activate capture using.** This setting determines how you will trigger the capture. You can capture with a right mouse click, with a hot key that you specify, or a delay timer that will trigger the capture after the specified time has elapsed.
- **Options.** Under Options, you can choose to include the cursor in your screen capture with the Include cursor check box. You can also specify whether to redisplay the Paint Shop Pro window after a single screen capture, or whether to keep it minimized so that you can continue capturing screens.

2. In this case, we'll select Area for the Capture setting, set a hot key of F12 and disable the Multiple captures checkbox under Options. Once you've made those selections on the Setup dialog, click Capture Now. Paint Shop Pro automatically minimizes so that you can use the other program, but it's waiting for you to press the F12 key.

3. Open the program containing the graphic—in this case, Windows Solitaire. Once the image you want to capture has appeared, press F12. You'll notice that the mouse cursor changes into a crosshair.
4. Move the crosshair to the top left corner of a playing card back and click the mouse once to set an anchor, then drag the crosshair down to the lower right corner of the card. You'll see that Paint Shop Pro draws a rectangular box showing you the area that will be captured, and it also provides you with the physical dimensions of the rectangle in pixels.
5. Once you've surrounded the area you want to capture with the rectangle, click again on the mouse, and Paint Shop Pro reappears with the captured image in its main window, as shown in Figure 2-17.

   We'll cover cropping an image later in the book; for now, let's just save the image to disk, even if there's a little extraneous material surrounding the card back.

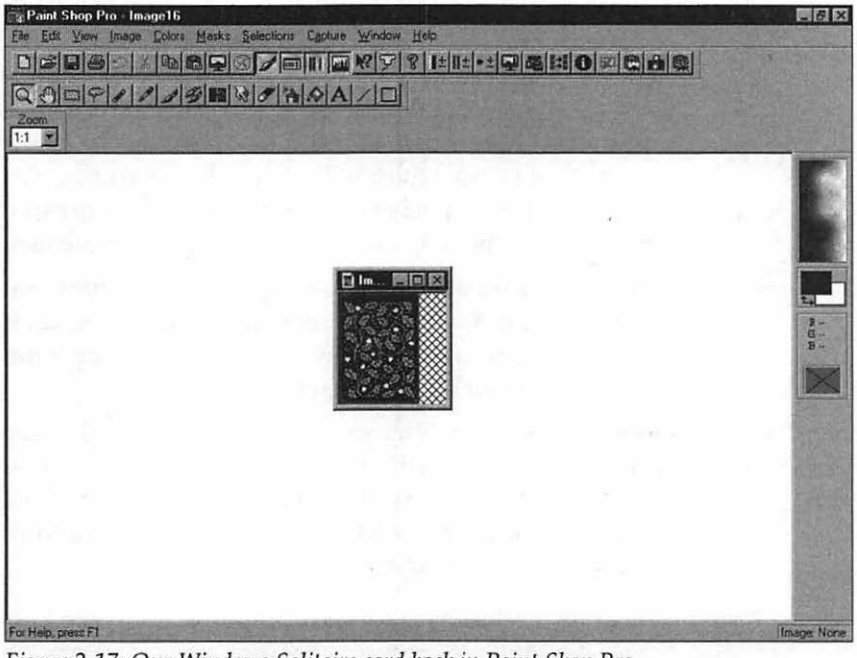


Figure 2-17: Our Windows Solitaire card back in Paint Shop Pro.

6. Select the Save As item from the File menu. Paint Shop Pro displays the Save As dialog shown in Figure 2-18. Give your image a name in the File name field, or use the default name supplied by the program. In the Save

as type field, select GIF - CompuServe, and in the Sub type field, select Version 89a - Noninterlaced. Click on Save to save the image to your hard drive.

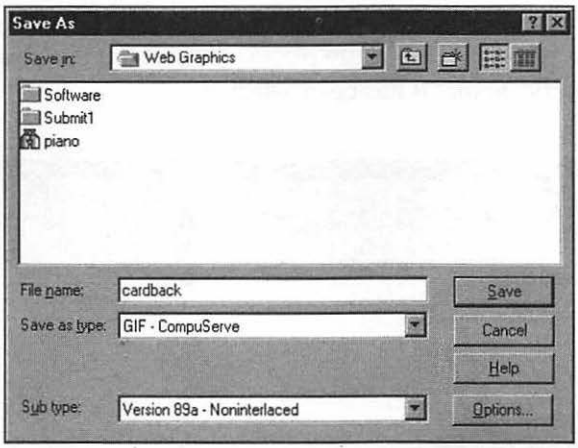


Figure 2-18: The Paint Shop Pro Save As dialog.

Well done! You've captured an image, and it's ready to animate.

Using Images From Electronic Documents

If you'll be creating animated images for a company Web site, you'll probably be handed a floppy disk one day and told to "put the chart that appears in this report on our Web site." Other images that often show up on company intranets include organizational charts, logos, pictures of products, and photos of employees. How do you extract those images from an existing document so that you can use them?

There are a number of possible methods, and the one you pick depends on the program in which the document was originally created. I'll cover the two that work with most of the programs I've used, and remember, if all else fails, you can always use the screen capture method that you learned in the previous section to make a copy of the image!

The Clipboard Method

Both Windows and Macintosh owners can cut and paste images between applications. First, let's use the Windows Clipboard to temporarily hold an image until we can paste it into Paint Shop Pro. For this example, we'll use

Microsoft Word, which fully supports the Windows Clipboard; if you're using the Macintosh version of Word, the steps are basically the same.

1. First, open Paint Shop Pro and minimize it.
2. Next, open the document using the parent application and display the image you need to extract. Click on the image to select it; as you can see in Figure 2-19, Word automatically places a frame and handles around the image to indicate that it has been selected.

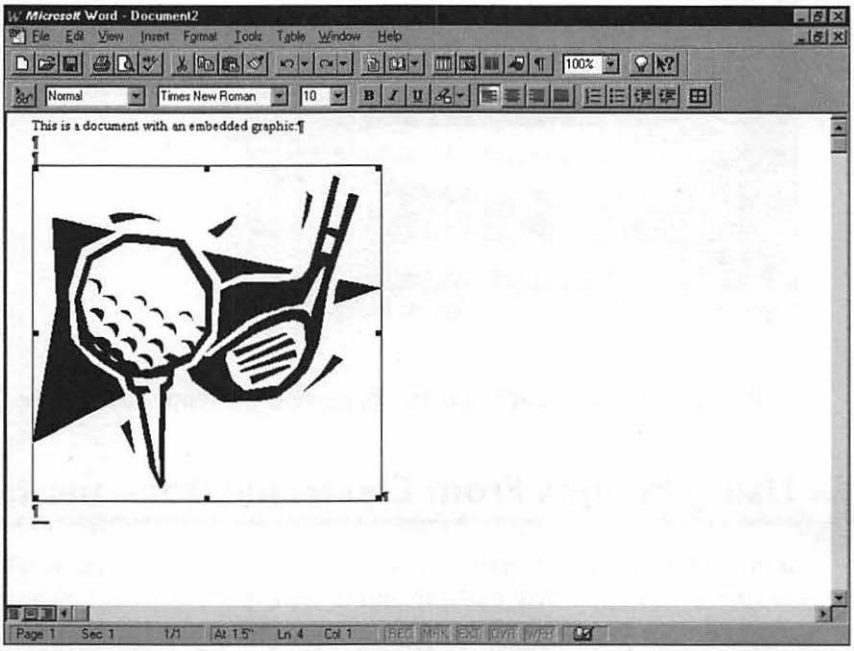


Figure 2-19: Selecting an image to extract in Word.

3. Select Copy from the Edit menu to copy the selected graphic to the Windows Clipboard.
4. Use the standard Alt-Tab sequence to switch to Paint Shop Pro and select Paste from the Edit menu. The graphic appears within the Paint Shop Pro main window, as shown in Figure 2-20, where you can edit it and save it in any form you like.

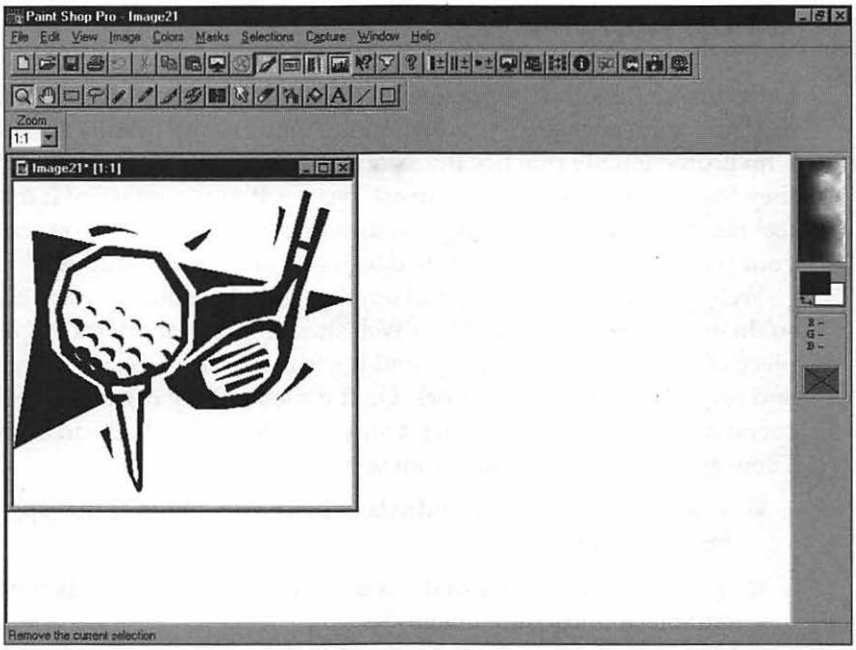


Figure 2-20: Copying our extracted image into Paint Shop Pro.

The Separate Save Method

Many Windows programs don't fully support the Windows Clipboard, so the first method won't work. However, if you can select the image, you may be able to save it separately from a menu command or by using the drag and drop standard.

1. First, open the document using the parent application and display the image you need to extract. Click on the image to select it, which should either frame the image or highlight it.
2. Next, check the File menu to see if the program can export the selected graphic. Look for a command like Export Image or Save Image; if you can export the image, you should be able to save it either as a Windows bitmap or a GIF image file.
3. If there is no command to export the image, run Paint Shop Pro and try dragging the selected image from the program window to the Paint Shop Pro main window. This sometimes works if the program supports drag and drop.

Using Clip Art

Let's consider another popular source of static images. I've observed a strong disdain for prepackaged artwork among many of my friends and associates who professionally practice the arcane magic of graphic design—"Face it," they tell me, "even the term 'clip art' has a rotten connotation! It makes you feel cheap for just considering it as a source of images, and everyone who sees your work will know that you had to resort to—(gasp)—clip art."

Well, partner, I'm here to proclaim the truth: I absolutely *adore* clip art, and so do many designers of the best Web sites around the Internet! If a particular piece of clip art fits your design and it's truly royalty-free, slap it on your page and save yourself a night's work. Or, if it's something close to what you need, spend a few minutes modifying it and consider yourself ahead of the game. There are tons of free images from several sources:

- The Internet features hundreds of huge Web libraries that specialize in free Web graphics.
- You can purchase one of dozens of CD-ROMs that are filled with color and black-and-white images.
- Professional Web-ready art collections can be purchased online.
- Many programs used by artists and Web designers are accompanied by their own clip art libraries.

Don't Be Fooled!

Most of us think the phrase "royalty-free" means that we can use clip art in any of our own work without worrying about copyright or asking permission. It's important to note that this phrase can be misleading, so take a second to examine the documentation or legal license that came with your clip art. If you're creating an image with clip art that's labeled royalty-free, you should always determine whether or not you're allowed to use those images through an electronic medium. Remember how easy it was to copy graphics from another page?

Generally, if you're not allowed to redistribute royalty-free material or you're not given permission to use the images in electronic form, you should avoid using material from that clip-art library on your Web page. Many clip-art collections that have appeared recently are meant especially for the Web or give you specific permission to use them on the Web, so naturally these collections are ideal!

Is there actually any reason not to use clip art? Not really, but keep these guidelines in mind if you do:

- Don't settle for the first piece of artwork that matches your subject. There is a practically endless selection of clip art available from these sources, and you're likely to find several pieces of similar artwork if you continue digging.
- Avoid mixing artwork styles on your page! Nothing looks worse than a cartoon pencil on the same page as a serious business silhouette of a meeting in a conference room. If you're looking for only one graphic for a page, this is no problem, but if you'll be adding more than one piece of artwork, try and take them from the same collection by the same artist.
- Avoid the "heady rush" of clip art! Just because you found twenty images of people eating watermelon, don't add all twenty to your page!

Finding Clip Art on the Web

Locating free clip art on the Web is essentially the same as locating an individual image; you'll use the same Internet search engines that I described earlier, but enter a broader set of keywords. As an example, try these search strings on Yahoo! the next time you're surfing:

- Web graphics clip art
- Computer clip art
- Cartoon clip art

You get the idea! Of course, you can also add keywords to limit the search to just about any subject, as we discussed earlier. Remember, some search engines match **any** of the search terms instead of combining them, so check the online instructions for your favorite search page.

Get Coordinated!

During my research for this book, I stumbled onto the track of one of the best free graphics pages on the Internet: Jelane Johnson's Free Web Graphics site (www.erinet.com/jelane/families/). What makes Jelane's site so wonderful? It's because all of the graphics on the site are coordinated into *families*, just like the expensive Web clip-art collections you can buy elsewhere on the Web. A family of Web graphics on Jelane's page includes an edge background, bullets, a horizontal rule, and various buttons, all matching and ready to add to your page! Their

➥

appearance and design are as professional as the work I've seen on major corporate sites. As you might guess, it takes much less time to add an image family to your page than it does to hunt down individual graphics on ten different Web library sites and then match their palettes and add transparency! Figure 2-21 illustrates a family Jelane designed for a white background.

There's much more to this great site, though: 256 color families, families designed especially for white or dark backgrounds, experimental images of all kinds, and even hints and tips on Web design to help you learn to achieve the same effects. I give my highest rating to Jelane's Free Web Graphics site!

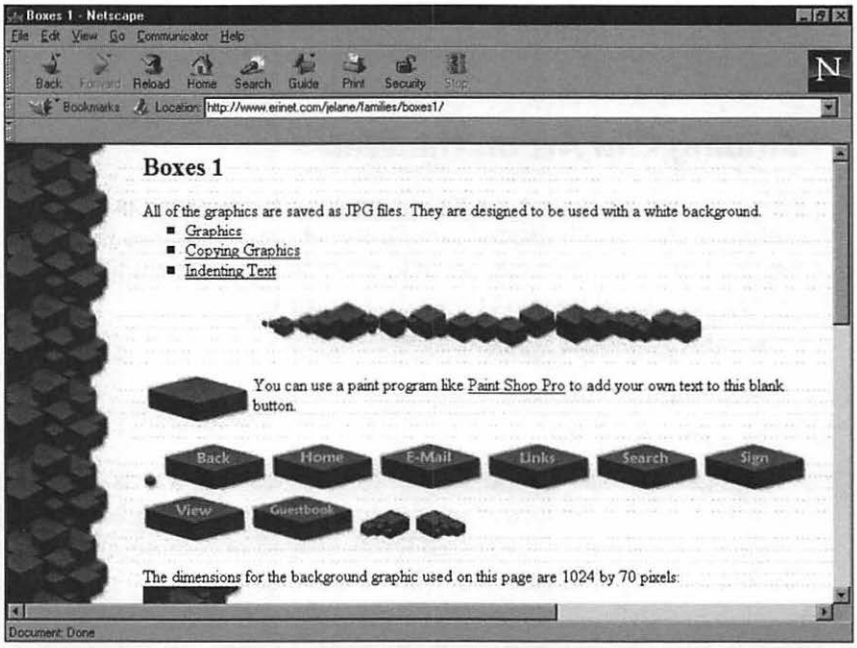


Figure 2-21: One of the great free clip art families available from Jelane's Free Web Graphics site.

Most of these free online clip art libraries simply display as many images as possible on a single page; to download a specific image using Netscape Navigator, follow the procedure I outlined earlier in this chapter in the section titled "Copying Images from Other Pages." Figure 2-22 illustrates a typical online Web library containing a number of beautiful balls for use as buttons or bullets. Two fine examples of online libraries with Web-ready graphics free for the downloading are Over the Rainbow (www.geocities.com/SiliconValley/

Heights/1272/rainbow.html) and Langley Computer Services (www.langley.co.uk/web_free.htm). I also recommend the Clip Art Connection (www.ist.net/clipart/index.html), which includes dozens of links to the best clip art pages on the Internet.

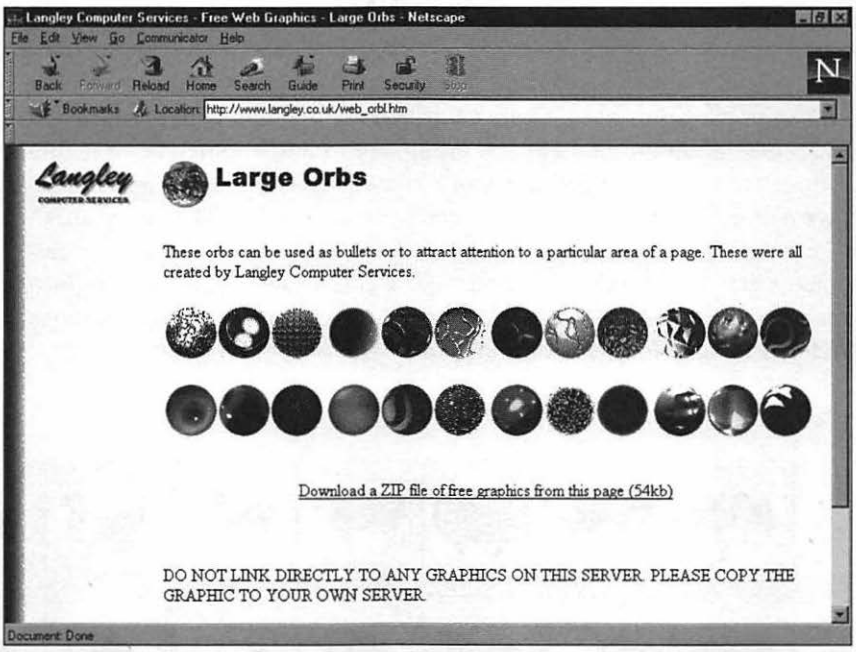


Figure 2-22: A typical Web page clip art library.

Who provides these free library pages? Friendly graphic artists and Webmasters who appreciate that all of us can use a graphical "helping hand" from clip art. To show your appreciation, feel free to leave the Webmaster a "thank you" email message! Some sites also offer inexpensive collections of their clip art, which can save you considerable time in downloading all of those images.

Using Clip Art on CD-ROM

Speaking of saving time and clip art collections, there are CD-ROMs full of clip art available at most computer stores, and a little comparison shopping can usually supply you with a "ready-made" clip art collection that you don't even have to be online to use. When you're shopping for a clip art CD-ROM, make sure that the images it contains can be saved as Windows bitmap, GIF, or JPEG

format. Many of these collections are intended only for printed material, and the images are in Windows metafile format or Macintosh .TIF format. Metafile images are much harder to edit and convert to a form that can be used on the Web, so steer clear of them.

Needle in a Haystack

I also recommend that you avoid buying a clip art collection that doesn't include some sort of preview interface. Many collections come only with a thumbnail index, and they're not arranged in any order—try to find an image of a sports car among ten thousand images, and you'll know what I mean! The best collections have a program that acts as a front end; with an interface like this, you can search for a specific image by its description or view all of the images in a particular category to look for the right one. Figure 2-23 shows a preview interface from one popular clip art CD-ROM, showing a directory of more animal images than I'm likely to need for the rest of my life!

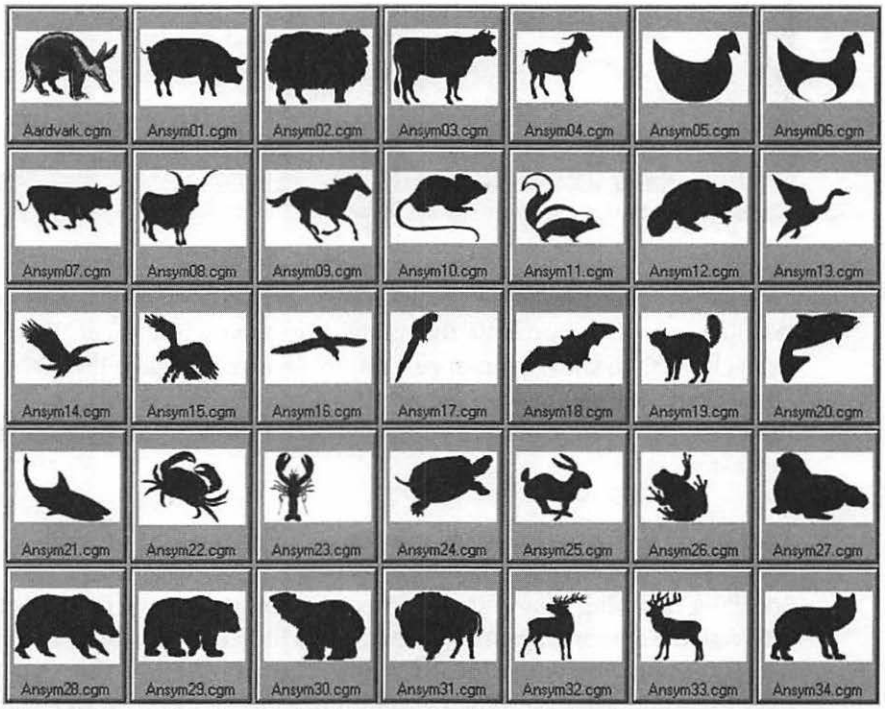


Figure 2-23: Looking for an animal image on a clip art CD-ROM.

Using Professional Web Clip Art

Although it's much more expensive than searching for a particular image in the free online libraries, there's certainly something to be said for buying a professionally made collection of clip art that's been created especially for Web pages. As I said, you can often order a complete collection from some of the free Web image libraries; these complete collections often arrive as one gigantic ZIP file in your e-mail or on a number of floppy disks sent to your home. Some commercial clip art collections are even maintained online; once you've paid the purchase price, you're given a user ID and password to access the full site and all the graphics!

When buying a professional art collection, keep these guidelines in mind:

- Look for a complete collection that has all the elements you'll need to create a page, including bullets, separator bars, backgrounds, titles, and buttons.
- Make sure that all of the graphics included in the collection are indeed actually "Web-ready"! Buttons should already be transparent, for example—we'll talk about transparency later in the book—and background texture tiles should flow seamlessly to create a smooth visual effect. After all, part of the value of a professional clip art collection is that you can begin using the images immediately, with no editing required.
- Remember that most of the professional Web clip art collections available today are *not* designed around a specific subject—in other words, don't expect a huge selection of sports images in a Web collection! Instead, Web clip art collections tend to center around the image design elements we covered in the last chapter, such as backgrounds, separator bars, buttons, and icons. There are exceptions to this rule, however, most of which center around cartoon and business images.

Figure 2-24 displays a sampling of the contents of a typical professional Web collection—this one is from Little Men Studios (members.aol.com/lmenstudio/index.html), who specialize in Web-ready and *EPS* (short for *encapsulated PostScript*) graphics. You can download the entire collection from their Web site; once you've purchased the collection, you receive a password to unlock the protection.

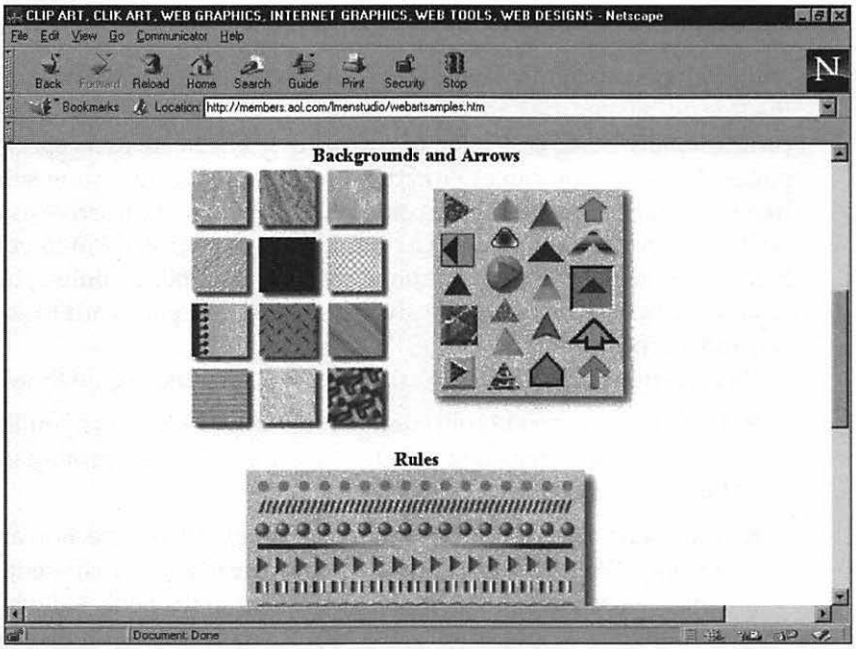


Figure 2-24: Sample images from one of the Web-ready clip art collections available from Little Men Studios.

Using Application Clip Art

Our final source of clip art may be sitting on top of your desk: it's the artwork that's often included with applications! If you've recently bought a commercial Web design package, check and see if the manufacturer included any clip art (often, free artwork is added to CD-ROMs to "fill out" the disc, but it's not mentioned on the box). Other candidates for application clip art include word processors, desktop publishing packages, and even banner and greeting card software. As an example, Corel's Web.Graphics Suite comes with some of the professional clip art you see in Figure 2-25.

Speaking of Corel, I'm a big fan of their Professional Photos CD-ROM series, and they make a great source for stock photos (otherwise known in the "biz" as clip art) on a particular subject. Each disc holds 100 huge, high-resolution color images on a subject; for example, Figure 2-26 shows a sample image from their WWII Aircraft disc. Other subjects include everything from insects to windsurfing to Hollywood models. If you're lucky enough to find a Professional Photos disc that covers the same subject as your site, you've discovered a gold mine!

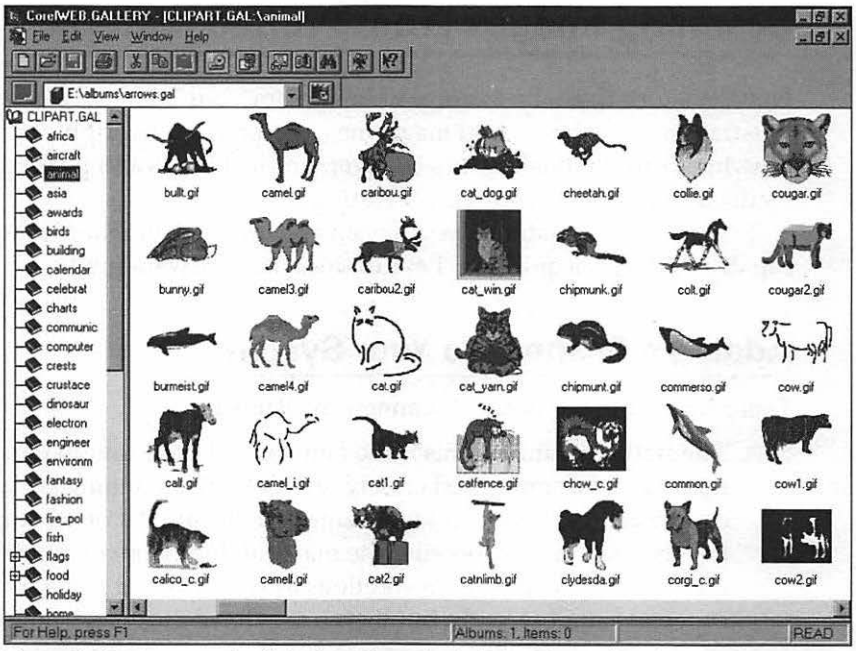


Figure 2-25: An example of the free clip art included with Corel Web.Graphics Suite.

Figure 2-26: This Corel Professional Photo disc includes 100 images of World War II fighter aircraft.

Scanning Images From Printed Material

Now let's turn to another source of images for your Web site: the printed page. Illustrations from books and magazines, personal photographs, technical drawings, promotional materials—even product boxes and packaging—can be scanned directly into your PC for editing.

To scan printed material, you'll need a scanning device and a program capable of image acquisition. Let's discuss the hardware first!

Adding a Scanner to Your System

There are four major types of scanners available today:

- **The flatbed scanner.** This is the familiar full-page unit that most people think of; its scanning bed closely resembles the scanning surface of a copy machine. Books and magazines can be laid flat on its surface, and it's very easy to use. Because the material doesn't move, flatbed scanners can handle much higher resolutions as well. Flatbed scanners were very expensive until recently, but their prices have dropped below $500.
- **The hand scanner.** Once an inexpensive alternative to a flatbed scanner, hand scanners have all but disappeared due to the drop in flatbed prices. A hand scanner must be rolled slowly over the material to be scanned, which often results in distortion; the scanner head should be rolled forward in one smooth motion, and that's often a problem with a book. Since most hand scanners only have about a four inch scanning width, you must often make multiple passes over a book or magazine page, and the software automatically "stitches" the separate passes together into a single image. This has worked for me in the past, but many people have told me that they've never been able to successfully graft separate scans into a seamless, complete image.
- **The sheetfed scanner.** A sheetfed scanner most closely resembles a fax machine, and it operates something like one as well; you feed a single sheet of paper through, and the scanner draws it in and scans the contents automatically. This is a little less than perfect, however, if you're trying to scan a photograph or another image that's less than 8.5 inches wide; typically, you must tape the photo on a piece of paper and feed the entire sheet of paper through to make it work. Also, you're limited to a single page, so be prepared to start tearing pages from your books and magazines!

- **The photo scanner.** The ultimate in scanner specialization! A photo scanner can accept only photographs developed from a film camera, but it handles them automatically and the results are usually very good. If your material is larger than a standard photograph, forget it: you'll have better luck scanning anything else with a waffle iron.

TIP

Are you in the market for a scanner? I would highly recommend a standard flatbed model; it's the most versatile, and now that prices have fallen so dramatically, most of us can afford one!

Color Depth & DPI

If you're shopping for a color scanner, there are two other criteria that will help you make a decision: the scanner's *color depth* support and its *dpi rating*. Simply put, a scanner's color depth refers to the number of bits used to store color data for each pixel, and the more bits the better. Most color scanners today offer 24-bit color, and the better, more expensive models offer 30-bit color.

On the other hand, the dpi rating indicates the resolution of the scanner in dots per inch—again, the higher the dpi rating, the better. You should note that some scanner manufacturers actually use two different numbers when describing dpi; always look for the "raw" scanning quality, not an "optimized" value that may be a result of software.

Today's scanners also use one of two interfaces:

- **Parallel Port.** These are the easiest scanners to connect. No need to remove your computer's case or install additional adapter cards; the scanner simply plugs into your PC's standard parallel printer port. If you already have a printer, it usually plugs into the scanner—a system that computer old-timers like me (who not only remember the Atari 400/800 line of home computers, but still have one or two!) call *daisy-chaining*.

TIP

The vast majority of printers work well connected to parallel port devices, but it's still a good idea to contact the manufacturer of your printer to make sure you can use it with a parallel port scanner. The company's technical support group should be able to advise you on compatibility.

- **SCSI.** Scanners that use the SCSI interface are much faster than their parallel port cousins, and if you already have a SCSI adapter card in your system, you probably won't have to open your computer. Macintosh owners can simply skip to the next section, since Macs have always used SCSI! However, if you don't already have SCSI on your PC, even the simplest SCSI installation is roughly akin to running barefoot across hot lava. First, make sure that the scanner comes with its own SCSI card; if a card isn't included, you'll have to buy one separately. Also, check the instructions: the manual should lead you through the installation step-by-step. If you've never installed an adapter card, you can also take your PC to a local computer shop and pay them to install and test the equipment.

At the time of this writing, the street price for a 600 dpi, 24-bit parallel-port flatbed scanner was about $250, while a 1200 dpi, 30-bit SCSI scanner typically started at about $600.

Using Scanning Software

Now let's consider the scanning software you'll use. Every scanner worth its salt should come equipped with at least two pieces of software:

- **A driver program.** Since the Macintosh has always used SCSI and Windows 95 now has direct support for SCSI devices, it's much easier to install a scanner these days — but your scanner must still be able to communicate with your acquisition software, which is the task performed by your scanner's driver software. For this reason, all good scanners today conform to a driver standard called TWAIN, which applies equally to Windows and Macintosh computers. If your scanner uses TWAIN, all you need to do to make certain that any software you buy will work with your scanner is to make sure that it's TWAIN-compliant.
- **An image acquisition program.** You must also be able to configure and control your scanner from your computer, and in turn your computer must be able to display and store the images you scan; your image acquisition program will take care of this job.

Both of these pieces of software should be included with any scanner you buy, but most manufacturers also throw in goodies like image editing software and an OCR program (short for Optical Character Recognition).

The best solution to the headaches caused by all these separate programs? How about combining the image acquisition and editing programs together? Guess who comes to the rescue again . . . our familiar Swiss Army knife, Paint Shop Pro! Yes, you can acquire images from TWAIN-compatible scanners

directly into Paint Shop Pro, where they can be edited to your heart's content and saved in any format the program supports. Figure 2-27 shows an image acquired within Paint Shop Pro.

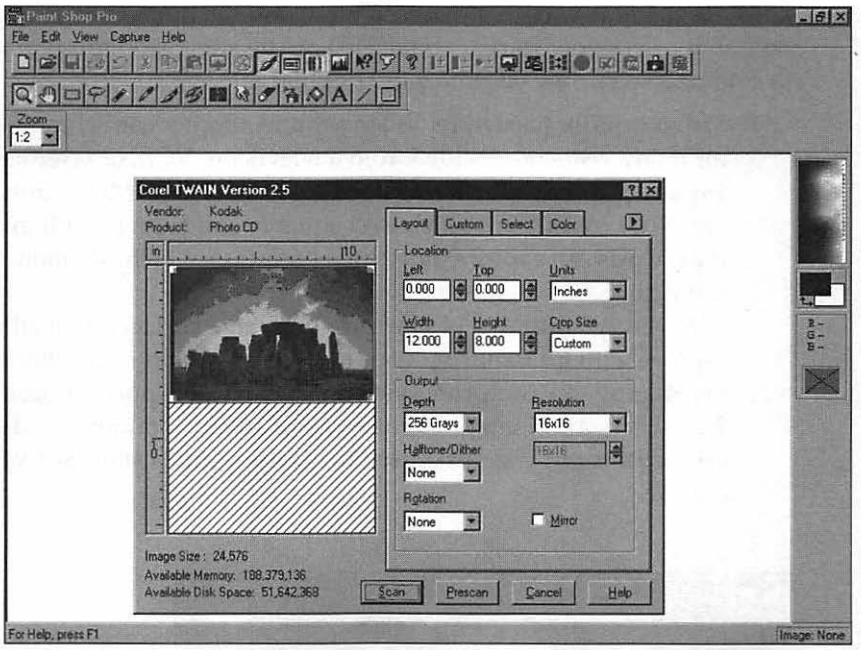


Figure 2-27: Images can be read directly from a scanner using Paint Shop Pro!

Capturing Video

There's one last source for graphics you can use on your page that we need to cover: digital imaging. Just like image scanners, the technology behind digital imaging has become more commonplace, and prices have dropped for this equipment in a similar fashion.

There are two sources for digital images:

- **Digital cameras.** If you're interested in image editing and graphics, the digital camera is probably the most useful piece of hardware to arrive in the last 5 years! Imagine a camera that looks something like a "point and shoot" film camera, but it contains no film. Instead, a tiny video camera inside the unit takes the "snapshot," which is then stored in the camera's RAM until it can be downloaded to your computer. Most of these cam-

eras also feature a built-in LCD viewing screen, so you can actually see your pictures immediately after you take them. If you find yourself running low on digital "film," you can delete any selected image from memory to free up the RAM for another picture.

These cameras vary in video resolution and the number of images they can hold, but prices now start at about $400 on the street, and those prices are sure to come down as they become more popular.

- **Video capture hardware.** Video capture adapter cards have been around for many years now. Video from a television, VCR, or laserdisc player is fed into the card, which transforms it into .AVI or .MOV format digitized video. Of course, live video isn't suitable as a basis for still images, but these cards can capture individual "frames," which can then be saved as static images.

  Recently, a number of new products have surfaced that allow video capture without requiring you to install an adapter card. For example, the Snappy video capture system uses a parallel port connection! Figure 2-28 shows a still image captured from an old commercial advertising the classic *Batman* TV series; I used the Snappy and a standard VHS VCR as a source.

Figure 2-28: A still image digitized from a TV commercial using the Snappy parallel port device.

Neither of these digital sources will provide you with the same quality image as a flatbed scanner, but if your subject material centers around photography, film, or television, you'll still appreciate the chance to add digital images to your Web page!

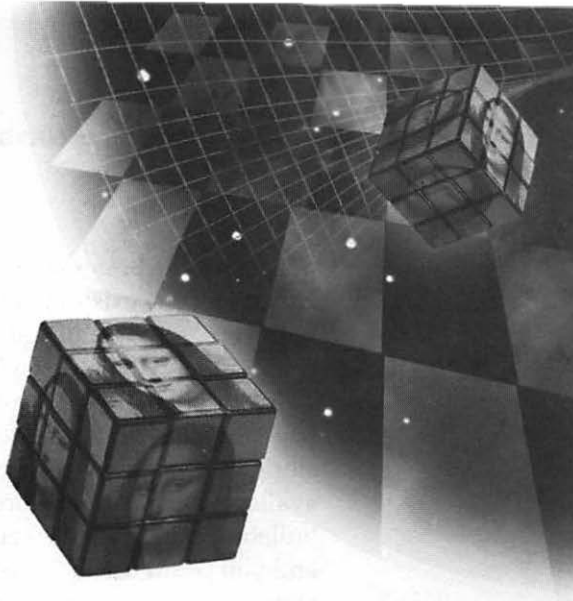
Moving On

In this chapter, you learned where to look for images for your Web page and how to obtain them. I started the chapter with some warnings about copyright law and an example of how you can add a copyright notice to your own original work. We searched the Internet, captured screens from other programs, used clip art, scanned images, and even explored the newest in video capture technology!

Coming up in Chapter 3, I'll introduce you to the basics of image editing using a program that's rapidly becoming an old friend of yours: Paint Shop Pro.

CHAPTER 3

Editing Images for Your Animations



So, now you find yourself sitting on top of a gold mine of images . . . but before you animate your first pixel, I have a quotable quote you should remember: *There is no such thing as a perfect image!*

That may not seem like an earthshaking proclamation, but it provides the solid foundation upon which the rest of this chapter squarely sits. Let me explain: in our last chapter, you learned how to acquire images from a wide variety of sources, and of those sources the Internet proved to be the easiest to use. However, whether you find an image on the Internet for free or you buy an expensive clip art package, the images you'll end up with are rarely exactly what you need. Something is missing, or something needs to be altered before you can use it.

This is especially true for animated images, which are built from individual frames—each image frame in your animation must be subtly different from the others to create the illusion of movement, so you'll find yourself adding or subtracting details in each image. We'll cover the animation process in the next chapter.

Since animated images are larger in file size—the actual number of bytes in the image file—than their static counterparts, I also typically resample or crop my images to a smaller size before I begin the animation process so that the finished image doesn't take minutes to load.

In general, the modification of a picture to correct shortcomings or to make it fit a particular use is called *image editing*, and if you look at any recent mail order software catalog, you'll see that many companies charge hundreds of

dollars for the best image editors. You've probably done some image editing already for the existing graphics on your pages, but even if you're an old hand with your editing application I'm sure you'll find new techniques in this chapter that will help you in the future.

In this chapter, and throughout much of the book, we'll be relying on the Paint Shop Pro image editor. Paint Shop Pro is one of those classic success stories of the shareware world; in fact, in the beginning, the program was available only as shareware. You could download it from any BBS (remember, bulletin board systems were around for ten years before the Internet arrived), and you could use all of its features without encountering a slew of crippled features and then register it if you liked the program. Today, Paint Shop Pro is one of the best-known image display, image editing, screen capture, and painting programs around, and it's still available as shareware. However, you can also find it on retail shelves as well.

Paint Shop Pro is distributed by JASC Inc. and the shareware version is included on the companion CD-ROM; you can also check their Web site at www.jasc.com for the latest version of the program. If you like what you see and all the powerful functions it offers, help support its continued development by registering it online. If you're a registered owner of Paint Shop Pro, you can also download updates from the JASC Web site.

Since Paint Shop Pro is not available for the Macintosh, I've also included a section later in the chapter on basic image editing using Adobe PhotoDeluxe, which can perform most of the same functions. In this chapter you'll see how to use Paint Shop Pro to put your "raw" images through one or more modifications so that they can be used as animations on your Web pages. I've arranged these techniques in alphabetical order as a quick reference to make it easier for you to locate a particular editing function.

- **Borders.** If you'd like to add a finishing touch to an image and help it to stand out on a page, add a border.
- **Brightness/contrast.** Unless you like the images on your page too dark and hard to identify—or too washed out—you may have to make changes to the brightness and contrast ratio.
- **Colors.** "OK, how can I give this image that cool Andy Warhol look?" With Paint Shop Pro, you can change the color levels in your image and add just a hint of Pop Art!
- **Color depth.** As I mentioned earlier in previous chapters, a 16 million color image can be reduced to 256 colors, making it more attractive for more of your visitors. The image's palette may also need to be changed to use Windows standard colors.

- **Crop.** This is an old journalism term for removing extraneous material from a photograph. If you only need one section of an image or you need to separate one object, you'll crop it.
- **Cut/Copy/Paste.** With the Cut, Copy, and Paste commands, Paint Shop Pro allows you to selectively move or remove portions of an image or add objects from other images.
- **File conversion.** You've got the perfect image, but it's in something called "PCX" format. Help! Paint Shop Pro can convert individual images, or you can convert an entire directory of images automatically in batch mode.
- **Flip/mirror.** If an image isn't "pointing" in the right direction, it may need to be flipped, or you may need to create a mirror image copy.
- **Gray Scale.** Paint Shop Pro makes it easy to remove all colors from an image to create a gray scale graphic.
- **Image Compression.** Both the GIF and the JPEG image standards used most often on the Web include compression—you'll save your visitors loading time by compressing the images you use on your pages. You can alter the compression level of JPEG images within Paint Shop Pro.
- **Interlacing.** By adding interlacing to your GIFs, your visitors can watch as the images on your page are slowly "built" right before their eyes—it's a neat effect you've seen many times. Although interlaced GIFs are rarely used in animation, they are useful in reducing the perceived load time for a GIF image.
- **Resize/resample.** Resizing involves changing the entire size of the image; this can either alter the appearance of the image or simply enlarge or shrink it. Resampling is a more sophisticated method of resizing that usually produces better results.
- **Rotate.** Often you can add a tremendous visual appeal to an image by simply rotating it!
- **Transparency.** There's nothing more aggravating than finding that the image you want to use on a white background has a black square surrounding it! By adding transparency to an image, it can be made to appear as if it were floating above any color background.

In this chapter, I'll show you how to apply all of these finishing touches to your images. Once you're experienced in image editing, you will actually be able to say that you have the perfect image for your page—and *mean* it!

Borders

A common image editing chore is the addition of a border to a graphic that deserves special attention. Typically, the border will be a complementary color to your background, but, then again, neon green or shocking pink does make a statement.

The important thing to remember about borders is that they actually become a part of the image, and therefore contribute to the total file size. If you're adding a border to a Windows bitmap file, take note: the larger a border you add to an image, the more time it will take to download. However, if you stay away from bitmaps, there's no need to be quite so vigilant. Paint Shop Pro creates a border of a solid color, so compressed GIF and JPEG format images won't grow significantly in size.

Paint Shop Pro can produce two types of borders: a symmetrical border that's equal on all sides or a border with custom dimensions that you specify. To add a border to an image, follow these steps:

1. Select Open from the File menu, browse through your system, and load your image.
2. We need to specify the color to use for our border. Move the mouse cursor over the color palette display at the far right side of the window; you'll see that the cursor changes into an eyedropper, and the color display changes to reflect the color that's underneath the eyedropper. When the display contains the desired color, right-click to pick up that color.
3. Select Add Borders from the Image menu to display the Add Borders dialog, as shown in Figure 3-1.

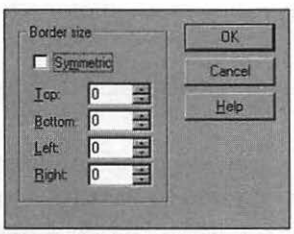


Figure 3-1:The Add Borders dialog.

4. If you need a symmetrical border, enable the Symmetric check box.

5. Use the scroll buttons at the right side of the Top field to select a positive value in pixels; if you selected a symmetric border, you'll see that all of the other fields automatically take the same value. You can also double-click on the current figure and type a new number directly into the field. If you're not creating a symmetrical border, enter the values for the bottom, left, and right edge of the border as well.
6. Click OK to make the change or click Cancel to back out without changing anything.

Figure 3-2 illustrates our piano keyboard with a 50 pixel symmetrical border.

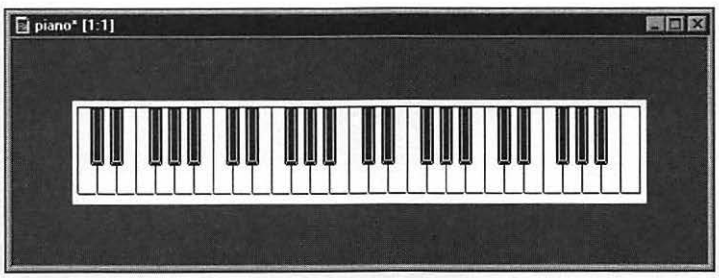


Figure 3-2: The addition of a border will help draw attention to our image.

Borders & Icon Bars

As I mentioned earlier in the book, many sites use an icon bar image map as their navigation controls. Such a bar might include a Home button, a button for each page, and a button for a search engine. You can use the Add Borders command to create the background for an icon bar by creating a custom border around a single icon.

To do this, load one of the icons you'll use, disable the symmetric feature, and specify 5 or 10 pixels for the Top and Bottom values, then specify 200 pixels for both the Left and the Right values. Figure 3-3 shows the result: a long, thin bar background that's just the right size, and it already includes one of your icon buttons! Once you've saved this new image, you can place the other icons on top of the bar with Paint Shop Pro, and voilà! a custom icon bar. Of course, you can use different values for the Left and Right fields if you need a longer or shorter background bar.

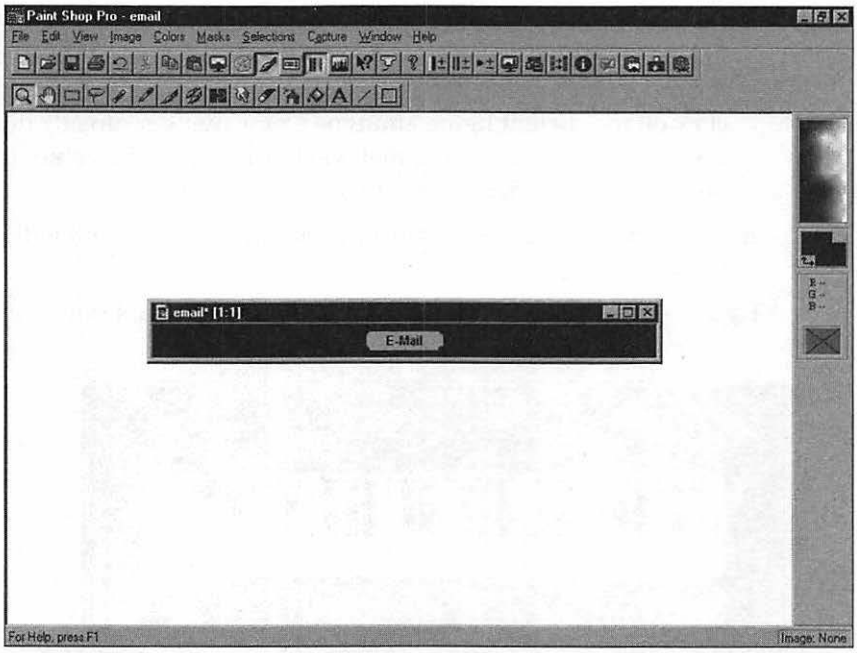


Figure 3-3: A custom icon bar built with the Paint Shop Pro Add Borders command.

Brightness/Contrast

Often you'll find graphics that will work well on your page, but you can't really make out the detail you'd like to see in the image. For example, our piano keyboard image in Figure 3-4 is too dark to see, while the same image in Figure 3-5 is too washed out. This is a problem that occurs often with images you've scanned from a magazine or book.

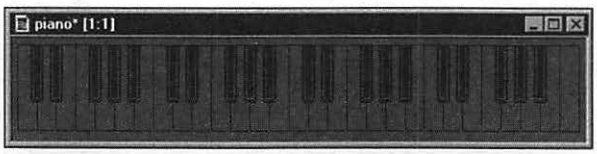


Figure 3-4: An example of a brightness problem.

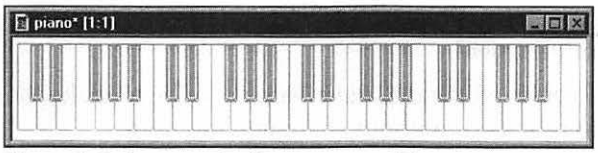


Figure 3-5: An example of a contrast problem.

Paint Shop Pro allows you to adjust the brightness and contrast for a specific image, much like you'd adjust your computer's monitor for the best picture under new lighting conditions. Follow these steps:

1. Select Open from the File menu, browse through your system, and load your image.
2. Select Adjust from the Colors menu and then select Brightness/Contrast from the submenu, or use the Shift+B key sequence. Paint Shop Pro displays the Brightness/Contrast dialog, as shown in Figure 3-6. When you first display the dialog, both values are set at 0%, and either value can be set to a positive or negative percentage.

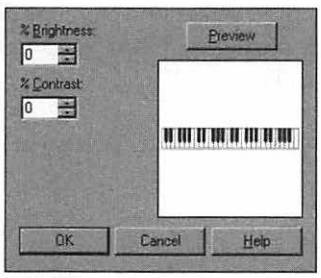


Figure 3-6: The Brightness/Contrast dialog.

3. If you'd like to brighten or darken the image, use the scroll buttons at the right side of the % Brightness field to select a positive (brighten) or negative (darken) value. You can also double-click on the current figure and type a new number directly into the field. The maximum value is 100%, while the minimum is –100%. You'll see that the thumbnail image changes automatically to give you some idea of how your change will affect the image. If you'd like to apply the change to test it, click the Preview button and the actual image will be changed. However, you can undo the effect of your preview by clicking Cancel to exit this dialog. As I mentioned before, you can also select Undo from the Edit menu if you accidentally accept a change.

4. You can change the contrast of the image in a similar manner by changing the % Contrast field.
5. Once you've achieved the desired effect, click OK to make the change or click Cancel to back out without changing anything.

Colors

This function will come in handy if you'd like to modify the three primary color levels that appear in an image; *color level* refers to the amount of red, green, and blue color in an image (as you may know, these three colors are combined together to form different colors of projected light). You can easily increase or decrease the level of red, green, or blue throughout an entire image to create a very interesting effect. Nothing quite like a purple sky to attract attention!

To adjust the red, green, or blue levels in an image, follow these steps:

1. In Paint Shop Pro, select Open from the File menu, browse through your system and load the image.
2. Select Adjust from the Colors menu, then select Red/Green/Blue from the submenu—or use the Shift-U key sequence. Paint Shop Pro displays the Red/Green/Blue dialog shown in Figure 3-7.

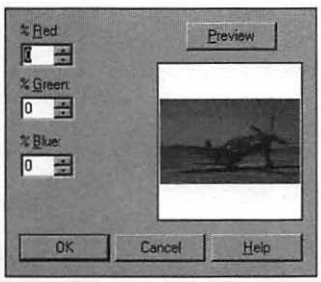


Figure 3-7: The Red/Green/Blue dialog.

3. If you'd like to increase or decrease one of the color levels in the image, use the scroll buttons at the right side of the corresponding % field to select more or less of the color value. You can also double-click on the

current figure and type a new number directly into the field. The maximum value is 100%, while the minimum is –100%. You'll see that the thumbnail image changes automatically to give you some idea of how your change will affect the image. If you'd like to apply the change to test it, click the Preview button and the actual image will be changed. However, you can undo the effect of your preview by clicking Cancel to exit this dialog.

4. Once you've achieved the desired effect, click OK to make the change or click Cancel to back out without changing anything.

Just the Facts

If you need the facts about an image, select Image Information from the View menu or use the Shift-I key sequence to display a dialog with complete information about the current picture. This includes the color level, the file type, and the subtype. Figure 3-8 illustrates the data for a JPEG image. If you've loaded an image into Paint Shop Pro, the program also provides the image size and color level at the lower right corner of its window in the status bar.

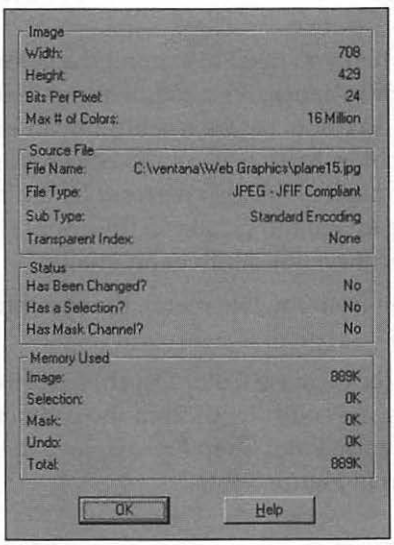


Figure 3-8: Image information for a JPEG graphic.

Color Depth

Color depth is a term you're likely to encounter often in discussions of computer graphics, so let me define it here; the color depth of an image refers to the maximum number of individual colors that can be represented in an image. For example, an image with a color depth of 16 can include a maximum of 16 different colors, while an image with a color depth of 256 can include a much wider variety of colors. Generally, the larger the maximum number of colors, the better-looking the image.

"If I have the capability to display 16 million colors, then why not use them?" As I mentioned earlier in the book, you should certainly take advantage of today's advances in displaying true photographic color on your monitor. For a Web page, though, 16 million colors is usually not a smart move because many of your visitors will not be able to display 16 million colors. This is a color depth known as *True Color*—and True Color images take much longer to download.

For example, let's consider the transfer of a standard 640 x 480 Windows bitmap image using 16 million colors over an average 28.8 kbps connection. It's likely to be more than a megabyte in size, and since Windows bitmap files aren't compressed, the download will take over 8 minutes. If we reduce the number of colors in the image to 256, the file size drops by over 50 percent to a little over 350K, and the same image will take less than 4 minutes to download over the same connection!

There will be times, however, when you need to expand the color depth of an image rather than decrease it; for instance, it's a requirement that you increase the color depth to 16 million colors before resampling an image. Typically, you'll also decrease the color depth back to 256 colors after the resampling process is over. Some image filters also perform better in 24-bit (or 16 million) color (we'll be covering image filters later in the book).

Follow these instructions to alter the color depth of an image:

1. In Paint Shop Pro, select Open from the File menu, browse through your system, and load your image.
2. Select Decrease Color Depth (or Increase Color Depth) from the Colors menu, and then select the desired color depth from the submenu. If you're decreasing the color depth, Paint Shop Pro displays the Decrease Color Depth dialog, as shown in Figure 3-9.

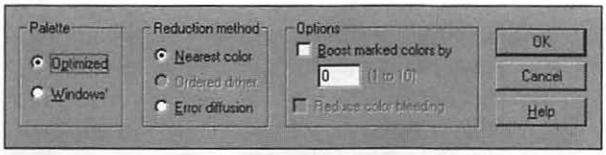


Figure 3-9: The Decrease Color Depth dialog.

3. Paint Shop Pro gives you the option of an optimized or standard palette. I always use the Optimized palette because it usually results in a better-looking image (especially when you're drastically cutting the number of colors in the image).
4. Next, always select Nearest color as your Reduction method. If you select Error diffusion, your image may be dithered and grainy in appearance, so avoid this for Web pages.
5. Finally, always select Include Windows' colors, which will ensure that Paint Shop Pro includes the standard Windows colors in the image's palette. This will allow any visitor to your Web site to view your images using a standard 256-color driver.
6. Click OK to make the change or click Cancel to back out without changing anything. If you choose OK, Paint Shop Pro will display a progress bar within the status line at the bottom of the window to let you know that it's working.
7. Don't forget to save your image or, if you'd like to keep the original image unchanged, select Save As from the File menu.

To increase the color depth of an image, follow the first two steps above. As soon as you indicate the new depth for the image, Paint Shop Pro will immediately process the image.

Count the Colors

It's time to clear up a common misconception that I've read many, many times on the Internet—the idea that a 16-million-color JPEG image actually has 16 million distinct colors. It just isn't so—the common color depths of 16, 256, 32,000, 64,000, and 16 million indicate the *maximum number* of colors the image can contain at that color depth, and most images rarely reach even a fraction of those larger numbers.

➥

For example, I selected a typical JPEG image with a color depth of 16 million from my collection, but the actual number of distinct colors in the image turned out to be only 29,501. What a rip-off! Now of course, there are images out there on the Internet that actually reach several million distinct colors, but they're several megabytes long, and you'll probably never see one unless you actually dig through some of the fine art libraries on the Web. In fact, most Web surfers are still more than satisfied with a measly 256 colors.

How do I know exactly how many colors are in an image? Easy! Load the image you'd like to check in Paint Shop Pro, and then select Count Colors Used from the Colors menu. As shown in Figure 3-10, the program will return in a few seconds with a dialog displaying the exact color count.

So, the next time you overhear someone boasting about color depth at a party, you can claim a social coup with a simple correction. Sure, it could happen . . .

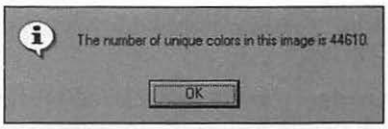


Figure 3-10: Paint Shop Pro can count the number of colors in an image.

As a general rule, then, it's best to reduce the color depth of all your Web images to 256 colors using this process. Your visitors will thank you.

Crop

Figure 3-11 shows an image that will make a perfect example for several tasks within this chapter—just pretend that it's your Uncle Milton, crazy vacuum cleaner salesman, from last month's family reunion! Good thing you had that digital camera with you.

Suppose you really like the face in this image, and you'd like to place it at the corner of your page dedicated to famous salespeople in your family, but you don't need the vacuum cleaner he's holding. Also, you like the white background, but you'd like to center the attention on his face, and that door hinge at the right side of the picture has got to go. Resizing or resampling the image won't help; how can you reduce the image to just his face?

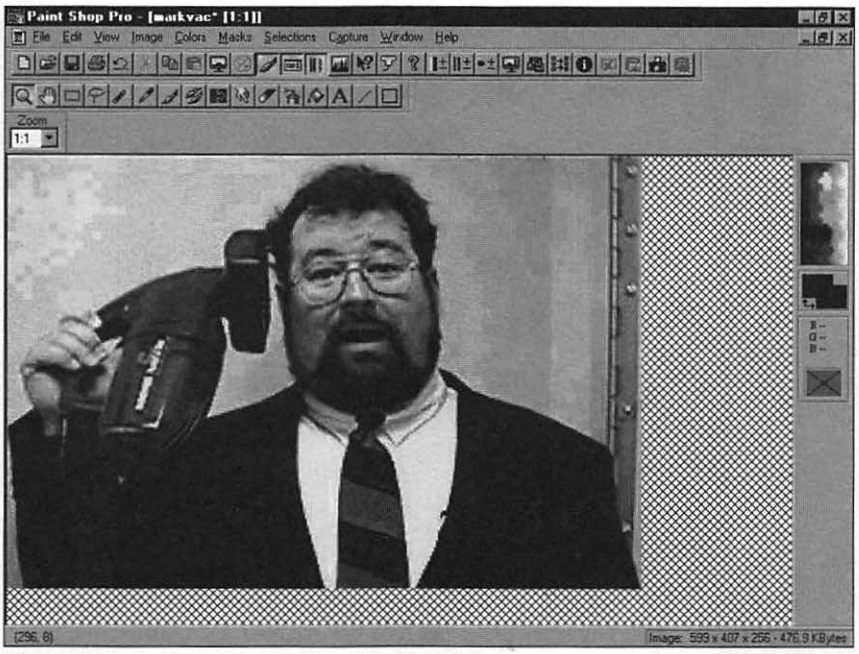


Figure 3-11: An image that needs to be cropped to remove unneeded material.

Time to crop the image. Follow these steps:

1. In Paint Shop Pro, select Open from the File menu, browse through your system, and load your image.
2. Click the Selection icon on the toolbar; it looks like a rectangle made of dotted lines. You'll notice that your mouse cursor becomes a cross-hair with a tiny rectangle attached to indicate that you're in Select mode.
3. Move your mouse cursor to the top left corner of what will become your new image; for example, I would start at the top of the graphic to the left of the face.
4. Now click your mouse button and drag the selection frame to the lower right corner of what will be your new image; you'll notice that the frame follows your cursor. Once you've reached the lower right corner, release your mouse button, and the solid frame turns into a snazzy animated dotted line, as shown in Figure 3-12. At this point, you've indicated to Paint Shop Pro the portion of the image that you want to keep.

Figure 3-12: A portion of the image has been selected, and it's ready to crop.

5. To perform the actual cropping, select Crop from the Image menu, or use the Shift-R key sequence. The result is shown in Figure 3-13.

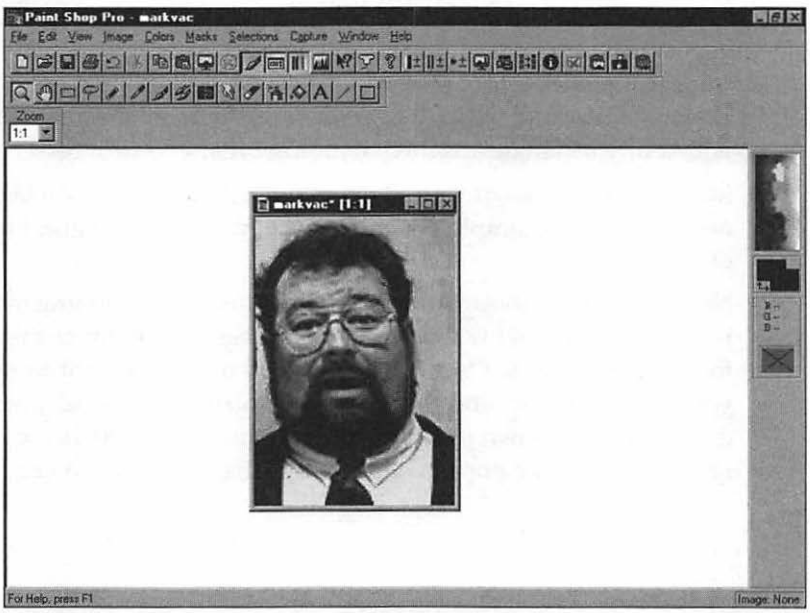


Figure 3-13: After cropping, you're left with a new image that you can save under a new name.

TIP

I've always found it a good idea to save a cropped image separately from the original, since there's no telling when you might need that full image. After you've cropped the image to your satisfaction, select Save As (or press F12) from the File menu and save it under another name. Do not *simply select Save; remember, the cropped version still has the same name, so you could overwrite the original image!*

Cut/Copy/Paste

Of course, you're probably familiar with the Three Stooges of Windows applications—after all, without the cut, copy, and paste commands, I can guarantee you that this book could never have been finished. I just don't have the patience for a typewriter anymore!

However, we're going to cover some of the specific differences between these commands in a standard Windows application and their implementation within Paint Shop Pro. I think you'll be pleasantly surprised by the flexibility this program offers in selecting objects within your images.

For a complete discussion of the selection modes available within Paint Shop Pro, see the next section, "Selections."

Using the Cut Command

The Cut command removes the selected portion of your image and stores that portion in the Windows Clipboard for later use. The area that was occupied by the cut portion is automatically filled with the current background color.

You can cut a selected area by selecting Cut from the Edit menu, clicking the Cut icon in the toolbar, or by pressing the Ctrl-X key sequence.

Using the Copy Command

The Copy command copies the selected area to the Windows Clipboard for later use. The image remains unchanged.

You can copy a selected area by selecting Copy from the Edit menu, clicking the Copy icon in the toolbar, or by pressing the Ctrl-C key sequence.

Using the Paste Command

The Paste command copies the contents of the Windows Clipboard to the Paint Shop Pro window. The contents can be used in four different ways:

- As a new image in a separate window.
- As a new selection within the current image.
- As a transparent selection within the current image. In this mode, the pixels of the image in the Windows Clipboard that match the background color are automatically made transparent.
- As a replacement for the current selection within the current image. In this mode, the contents of the Clipboard replace the area currently selected within the image.

You can paste by selecting Paste from the Edit menu, clicking the Paste icon in the toolbar, or by pressing the Ctrl-V key sequence.

Selections

Paint Shop Pro has a number of tools for selecting the portion of an image to which you wish to apply a command; most of the commands mentioned in this chapter can be applied to both the image as a whole or the portion that's currently selected.

Using the Select Shape Tool

Paint Shop Pro provides a Select Shape tool that allows you to select one of four types of geometric shapes: a rectangle, a square, an ellipsis, or a circle.

To use the Select Shape tool:

1. Click the dotted square on the toolbar; your mouse cursor will turn into a crosshair with a tiny rectangle attached.
2. Move the crosshair to the edge of the desired area.
3. Click and drag the mouse to enlarge the shape until it covers the area you wish to select.
4. Once you've encircled the selection, release the mouse button, and choose the action you want to perform.

To change the shape of the selection tool, choose the desired shape from the Selections type drop-down list box on the Style Bar. If the Style Bar is not displayed, you can toggle it on by selecting the Style Bar item on the View menu.

Using the Lasso

The Paint Shop Pro Lasso is more formally called the *Freehand Selection tool*, and it's used to select an area of the screen by drawing around it. Of course, the larger the object or screen area, the less attractive this is, but if you only need to crop, copy, or cut a small portion of an image, then the freehand method often proves the best.

To use the Freehand Selection tool:

1. Click the lasso on the toolbar; your mouse cursor will turn into a crosshair with a tiny lasso attached.
2. Move the crosshair to the edge of the desired area.
3. Click and drag the mouse to draw the selection line around the area, just as if you were drawing in a painting program.
4. Once you've encircled the selection, release the mouse button and choose the action you want to perform.
5. Figure 3-14 illustrates a completed Freehand selection—in this case, your Uncle Milton's head from the reunion picture. Believe me, this kind of work is much, much easier with an artist's computer drawing pad—for freehand selection, a mouse or a trackball just doesn't cut it.

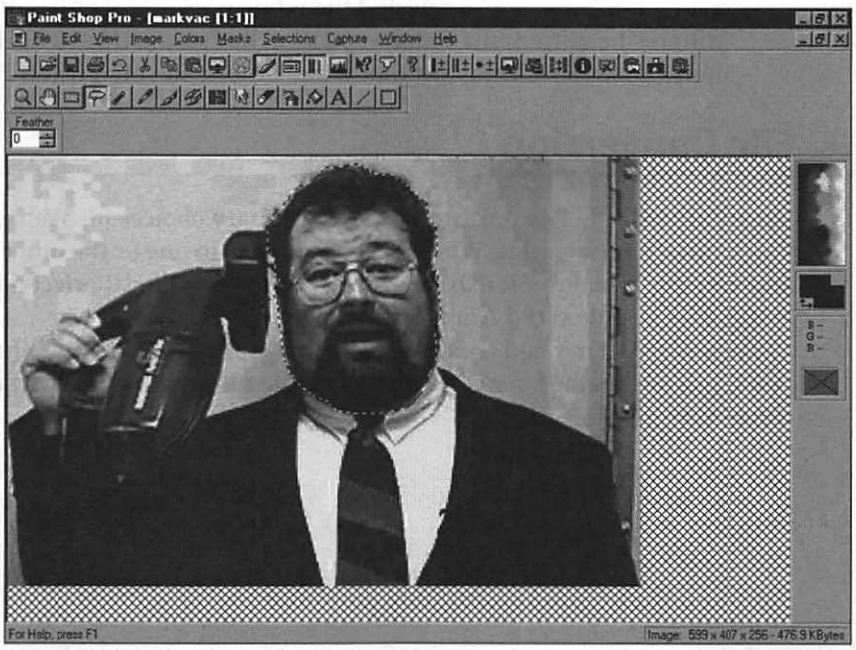


Figure 3-14: A selection made with the Freehand tool.

Using the Magic Wand

What could be better than a lasso? How about a magic wand? The Paint Shop Pro Magic Wand tool is used to select regions within an image that match a color, a specific hue, or a brightness level. This makes it easier to select an object that stands out from the background or other objects in the image without having to "draw" around it with the Lasso tool. When you use the magic wand, Paint Shop Pro will automatically select as much of the object as it can.

To use the Magic Wand tool:

1. Click the wand icon on the toolbar; your mouse cursor will turn into a crosshair with a tiny wand attached.
2. Move the crosshair to the edge of the desired area.
3. Click the mouse on the area you'd like to select. This generally takes a little experimentation, especially if you're working with a 16 million color image. If necessary, you can adjust the match tolerance or choose between color, hue, or brightness matching from the Style Bar. To display the Style Bar, toggle it on from the View menu.
4. Once you've selected the proper portion of the image, choose the action you want to perform.
5. Figure 3-15 illustrates a completed Magic Wand selection based upon color—this time, we've selected the white portions of your Uncle Milton's head from the reunion picture. Rather a ghostly effect, don't you think? Imagine adding just that white outline to your site on Halloween!

File Conversion

Since GIF and JPEG images are your two primary choices for Web graphics, you'll often be converting Windows bitmap files to one or the other format, and you can even import existing clip art from your WordPerfect days or image files from that old Amiga system you just threw out!

There are two methods of converting image files within Paint Shop Pro—you'll use one method for converting a single file and the second method for converting multiple files.

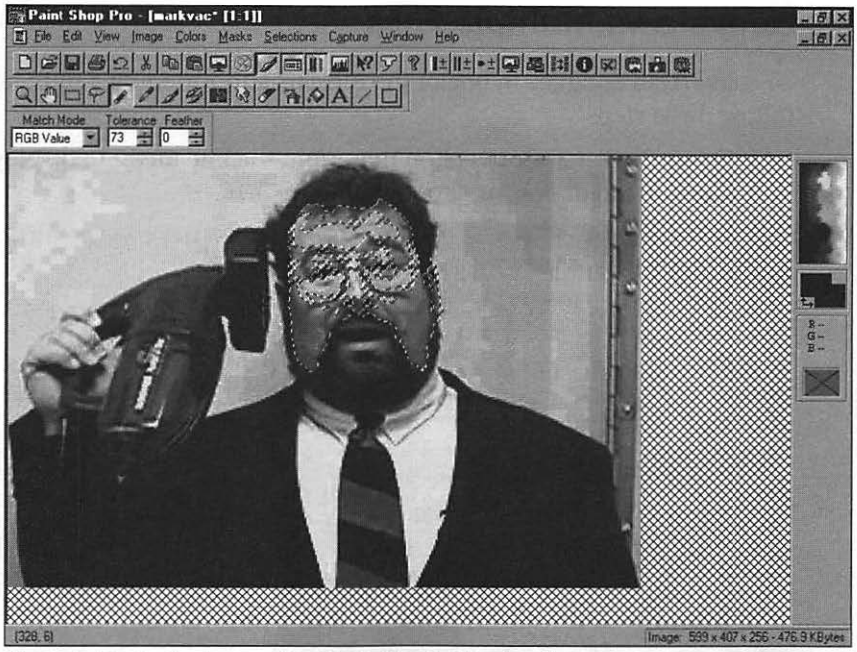


Figure 3-15: A selection made with the Magic Wand tool.

Converting a Single File

To convert an existing image file in one of the formats supported by Paint Shop Pro, follow these steps:

1. Select Open from the File menu, browse through your system, and load the image. Remember, your file will not appear in the list unless you've selected the proper file type or if you've selected the All Files type to display everything.
2. Select Save As from the File menu and select the desired file type. Usually the default file subtype is correct, so you'll rarely have to change it.
3. If you'd like to save the converted file in a new directory, select it now by navigating through your system with the standard browse controls.
4. As I've demonstrated with earlier functions, you can also set a number of options for most file types by clicking the Options button. Again, the default settings are fine for most applications, so this usually isn't necessary.
5. Click Save to save the image to your hard drive.

Converting Multiple Files

To convert several files in one of the formats supported by Paint Shop Pro, follow these steps:

1. Select the Batch Conversion item from the File menu to display the Batch Conversion dialog, as shown in Figure 3-16.

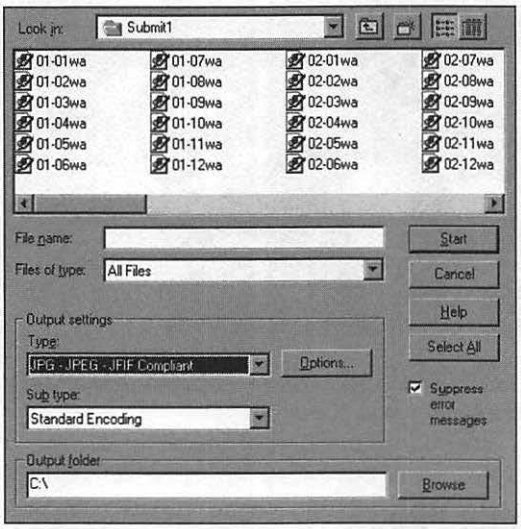


Figure 3-16: The Paint Shop Pro Batch Conversion dialog.

2. Within the Output settings section of the dialog, set the file type and subtype for the finished files, and select any format-specific options that may apply by clicking the Options button. For example, you may want to select a JPG file type with a compression level of 25, and all of the finished files will be in that format with that compression level.
3. Next, type in the destination path for the new files in the Output folder field at the bottom of the dialog. You can also navigate to the desired directory by clicking the Browse button (where you can also create a new directory to hold the files).
4. Now select the directory containing the files to be converted in the list box at the top of the dialog.

5. Select the files that will be converted. You can select files by clicking on them in the standard Windows fashion (don't forget to hold down Shift to select ranges of files or Ctrl to select non-contiguous files).

TIP

*If you're like me, you'll be converting several files of one type to another type. To do this quickly, enter a DOS wildcard in the File name field, like *.BMP or *.TIF. If you select a specific file type, you can also use the Select All button to select all files of that format automatically.*

6. Click Start to begin the conversion!

Flip & Mirror

Flip and Mirror are close relatives of the Rotate function (see "Rotate" in this chapter). As shown in Figure 3-17, selecting Flip from the Image menu (or pressing Ctrl-I) will turn your image upside down. As shown in Figure 3-18, selecting Mirror from the Image menu (or pressing Ctrl-M) will create a mirror image of your graphic. These commands come in handy when you need to change the direction of an arrow graphic or some other image that has a definite direction to it.

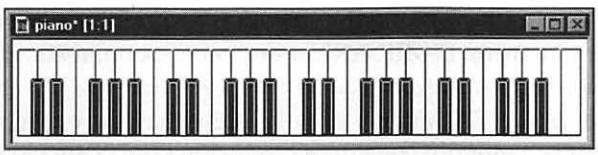


Figure 3-17: The effects of the Flip menu command.

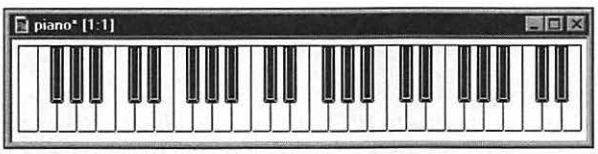


Figure 3-18: The effects of the Mirror menu command.

Gray Scale Conversion

Strangely enough, another method of drawing attention to your favorite 24-bit color image is to remove the colors! Just like many photographers who prefer black and white for portraits, some Webmasters appreciate the impact of gray scale images. Using Paint Shop Pro, you can easily convert images to 256 levels of gray without losing detail. Follow these steps:

1. Select Open from the File menu, browse through your system, and load your image.
2. Select Gray Scale from the Colors menu. Paint Shop Pro displays a progress bar in the status line at the bottom of the window.
3. Once the image has been converted, select the Save As command under the File menu and save it under another name.

Image Compression

Luckily, there's another trick that can help you save downloading time and reduce the length of your images: several picture formats that are popular on the Internet allow you to compress the data in your image without losing too much detail!

For example, the standard GIF 89a format is already compressed at an average of 3:5 to 4:1, depending on the variance in color and detail. This is one reason why GIFs have been the standard for Internet and Web use since the beginning—and it's also the reason why they don't compress as well as text or programs when you're using PKZIP, ARJ, or any other popular compression scheme. In fact, the overhead introduced by trying to compress GIF images even further usually makes the .ZIP archive slightly larger than the original GIF.

The JPEG format is generally considered to be the king of image compression, since it was designed from the very beginning to produce highly compressed, 24-bit images with little loss in detail. Paint Shop Pro allows you to control the compression rate when you save a file in JPEG format.

TIP

An "up-and-coming" alternative to JPEG and GIF has been getting quite a bit of attention on the Internet lately. .PNG *format, short for* Portable Network Graphics, *has a number of advantages that may make it a formidable contender for future Web images. .PNG images allow progressive display (much like interlaced GIFs), lossless compression on the order of JPEG quality, and more control over gamma correction, but they do not support animation.*

To adjust compression on a JPEG image, follow these steps:

1. Select Open from the File menu, browse through your system, and load the image.
2. Select Save As from the File menu. Again, make sure you've selected the JPG - JPEG - JFIF compliant file type, with a sub type of Standard encoding, then click the Options button to display the JPEG File Preferences dialog shown in Figure 3-19.

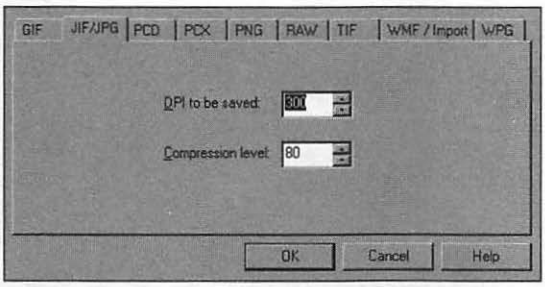


Figure 3-19: The JPEG File Preferences dialog.

TIP

Be careful—you can easily get the JPG file type mixed up in Paint Shop Pro with another format called JIF (they're right next to each other in the File Type drop-down list box). JIF is significantly different from JPEG, and it's not handled by most browsers.

3. The first option, DPI to be saved, is typically used in desktop publishing and word processing programs, and I usually leave it at the default value of 300.
4. The default compression level is 15. Setting this value higher will increase the compression and shrink the file length at the expense of detail; for example, Figure 3-20 shows a typical JPEG image at the standard compression, while Figure 3-21 shows the same image at a compression level of 80—not really all that much different in detail, are they? In file sizes, though, there's a major difference: the image saved with the compression level of 15 is 37,287 bytes long, while the image saved with the compression level of 80 is only 10,680 bytes long! In my experience, most Web surfers would be content with an image with a compression level of 60 or below. Click OK to save the new compression value.

5. Finally, specify a new filename for the file, and click Save to save it to your hard drive.

Figure 3-20: A JPEG image at compression level 15.

Figure 3-21: The same JPEG image at compression level 80.

What's Progressive Encoding?

There are two subtypes for JPEG images: one of them, *progressive encoding*, allows JPEG images to "fade in" much like an interlaced GIF. Since JPEG images are typically compressed to a smaller size, showing a hazy version of the picture that grows in detail isn't as much of an advantage as it is with GIF images—also, older browsers will stubbornly refuse to load progressive JPEGs. For these reasons, I currently avoid progressive encoding to ensure compatibility and use the standard encoding instead.

Interlacing

Interlacing is one of the oldest tricks in the Webmaster's collection, but it only works with GIF images. By storing the data that makes up the image in alternating lines instead of in sequence, interlaced GIFs appear to "fade in." First you see the outline of the image and a suggestion of the detail, then another layer of detail and so on. From your visitor's standpoint, this is definitely preferable to waiting for the full image to inch downwards . . . "Is it a dolphin? That looks like a fin . . . no, it's a . . . well, actually, it might be a periscope . . .". You get the idea.

The slower the connection to the Internet, the better interlaced GIFs become. A visitor connecting to your page via a direct T1 line or a fast 33.6 kbps dial-up connection can endure the wait for non-interlaced images to load, but the visitor with a 14.4 dial-up connection will probably stick around much longer watching your interlaced images appear. Actually, the two images take the same amount of time to load over the same connection, but at least interlaced images give you something to look at while you wait!

To add interlacing to a GIF file, follow these steps:

1. Select Open from the File menu, browse through your system, and load your image.
2. Select the Save As command under the File menu. To add interlacing, make sure the File type is set to GIF, with a sub type of Version 89a - Interlaced.
3. Finally, specify a new filename for the file, and click Save to save it to your hard drive.

Resizing/Resampling

Probably the most common image editing task is resizing, which involves shrinking or expanding the physical size of the image to match the size you need for your design. Since it's very rare that you happen upon an image that fits that space you've set aside, I end up resizing just about every graphic I use on my Web pages. When you resize an image with Paint Shop Pro, the program copies or deletes pixels (a *pixel* is one individual dot that makes up the image); this expands or shrinks the image, respectively.

TIP

As I mentioned in Chapter 1, resizing an image to a smaller size will reduce its length and the time required to download it. There's a reason why most pages don't display huge, full-page images—would you be willing to wait three or four minutes for a Web page to load?

But wait—there's an even better alternative to resizing! Think of resampling as resizing's "smarter brother," and use resampling whenever possible. Although the two are quite similar—they even use the same dialog—resampling uses a smart interpolation algorithm to reduce the chunky, blocky look you sometimes get with resizing. Images almost always look better at their new size if you resample; as a rule, the larger the change in size, the more benefit you'll receive from resampling over resizing.

TIP

Unlike resizing, however, resampling can only be applied to images with more than 256 colors (or shades of gray for grayscale). If your image is only 16 or 256 colors, I suggest that you temporarily increase the color depth to 16 million colors (see "Color Depth" in this chapter), perform the resampling, and then decrease the color depth back to its original state.

To resample an image with Paint Shop Pro, follow these steps:

1. Select Open from the File menu, browse through your system, and load your image.
2. Select Resample from the Image menu to display the Resample dialog, as shown in Figure 3-22.

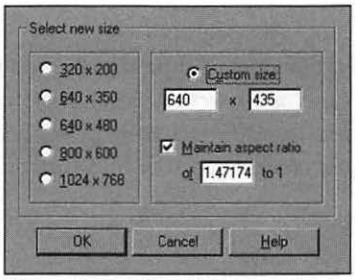


Figure 3-22: The Paint Shop Pro Resample dialog.

3. The column of radio button options down the left side of this dialog is a "quick pick" list of the most common image sizes. For example, 800 pixels horizontally by 600 pixels vertically, which is a standard desktop size. If your image should be resampled to one of these standard resolutions, click the desired size.

   If you'd like to set a custom size, click the Custom size radio button, and enter the horizontal and vertical dimensions for your image.

4. The Maintain aspect ratio field is very important when resampling an image. If you leave this feature enabled, Paint Shop Pro will make sure that your new image is not distorted by using the same aspect ratio. If you disable this feature and make a dramatic change in the horizontal-to-vertical ratio of your image (for example, custom resampling an image from 800 x 600 to 400 x 700) you're going to create an unusual look indeed, and you probably won't even be able to recognize the subject! Figure 3-23 gives you some idea of what turning off the Maintain aspect ratio field can do; this poor image used to be an image of the U.S. flag with an aspect ratio of 1 to 1, until I forced it to 700 x 100!

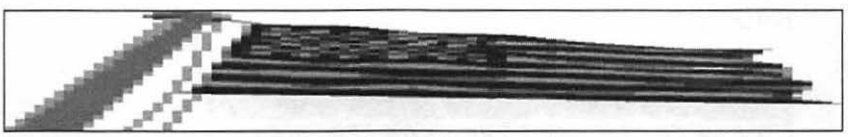


Figure 3-23: An image resampled without maintaining the correct aspect ratio.

Many professionals use this trick to create wonderful images—for instance, a skinny elephant or a **real** stretch limousine! Unless this is the effect you're looking for, leave the Maintain aspect ratio field enabled.

TIP

If you've resampled to a custom size and you maintain the aspect ratio for your image, Paint Shop Pro can calculate either the correct vertical or horizontal dimension for you! Enter the value you do know into the custom size field and press Tab. The program will automatically fill in the other dimension to maintain the correct aspect ratio.

5. Click OK to make the change or click Cancel to back out without changing anything.

Let's Talk Undo!

This is probably a good time to mention that Paint Shop Pro features an Undo command that will reverse the effect of your last action; if you make a grave mistake while editing an image, select Undo from the Edit menu immediately afterwards and try again.

Several dialogs also display the effects of the change to a thumbnail copy of your image automatically (which is both really nifty and a real convenience).You can also click the Preview button to apply the change to the image itself; if you don't like the appearance of the change, you can click Cancel and exit the dialog, which also cancels the effect of whatever change you made.

Rotate

Now let's return to our piano keyboard, as shown in Figure 3-24; it's currently a horizontal graphic, so it's well-suited for use as part of a page title or as a horizontal separator.

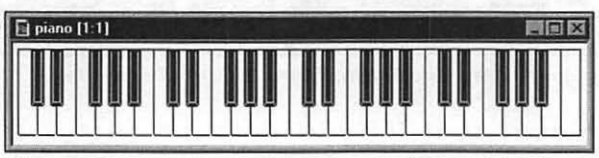


Figure 3-24: Our piano keyboard graphic in its original horizontal alignment.

But wait—a sudden flash of inspiration hits! How would it look if you were to run the keyboard as an edge graphic down the left side of the page? This produces a seamless "border" for your page—in fact, some of the best-designed pages on the Web use this trick. Unfortunately, you couldn't use your keyboard for this effect in its current alignment, since these edge graphics are vertical.

How can you change the alignment of an image? Follow these steps:

1. In Paint Shop Pro, select Open from the File menu, browse through your system, and load your image.
2. Select Rotate from the Image menu or use the Ctrl-R key sequence. Paint Shop Pro displays the Rotate dialog, as shown in Figure 3-25.

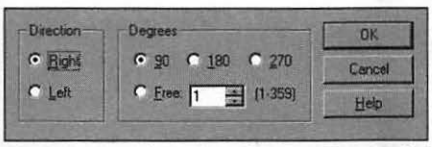


Figure 3-25: The Paint Shop Pro Rotate dialog.

3. First, select whether your rotation should be toward the right or left. In this case, we're looking for a left edge border, so choose the Left radio button.
4. Next, choose the degree of rotation. The most common alignments have their own radio buttons, but you can also choose the Free option and enter a specific degree of rotation. For our edge example, we'll pick 90 degrees for a vertical alignment.
5. Click OK to make the change or click Cancel to back out without changing anything.

Figure 3-26 illustrates the new image, which you can save separately for later experiments!

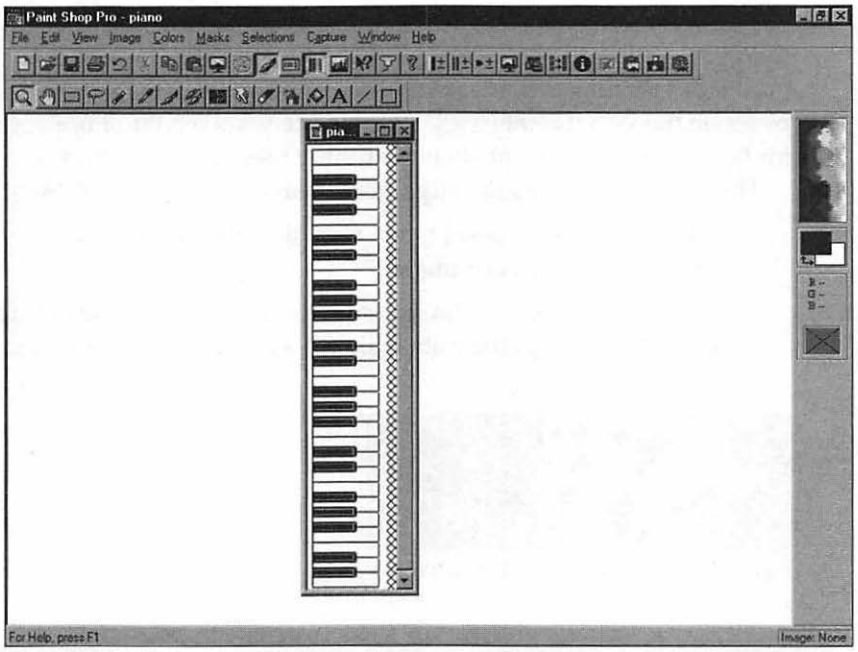


Figure 3-26: The image with its new alignment, ready for use as an edge border!

Transparency

You've probably noticed that I mention transparency quite a bit throughout this book because it really is that important to the proper display of your image on your Web page. Transparency will allow you to "float" GIF format images above just about any background by specifying one color within the GIF as transparent. Figure 3-27 illustrates an image that could benefit from transparency on a white background—it's that spinning animated movie reel from my Web site.

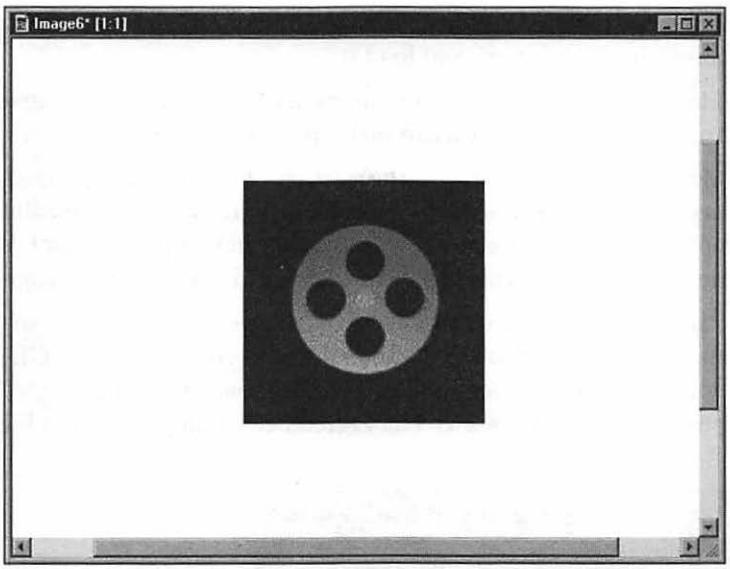


Figure 3-27: Without transparency, the black border on this image stands out like a sore thumb.

Unfortunately, the word on transparency really hasn't made it to everyone yet. In fact, many Webmasters seem to covet the entire process of adding transparency like it was some sort of magic trick. "If we tell them how we did this, then it won't be magic anymore."

Well, I've got sad news for these "Web magicians"—adding transparency to any GIF file is not hard to do. Follow these steps and learn a little magic for yourself:

1. Before we begin, make sure your image is a GIF file, with a sub type of Version 89a - Noninterlaced. If your image isn't in this format, use the Save As command under the File menu to convert the file into this format and save it under another name.

TIP

Normally, I'm a fan of interlaced GIFs on Web pages, as you remember from the section titled "Interlacing" in this chapter—but some older browsers don't handle interlaced GIFs with transparency very well. Therefore, for the best compatibility, make sure your transparent GIFs are non-interlaced.

2. Once your image is ready, select Open from the File menu, browse through your system, and load it.
3. Click the Eyedropper button on the toolbar; your mouse cursor becomes an eyedropper, and you can pick up colors directly from your image.
4. Move the eyedropper over the portion of the image that needs to disappear. In this case, it's the black background, which is typically the reason why you apply transparency and right-click to pick up that color. You've now selected that color as the background color for the image.
5. Paint Shop Pro sets transparency from the Save As dialog, so select Save As from the File menu. Again, make sure you've selected GIF file type, with a sub type of Version 89a - Noninterlaced, then click the Options button to display the GIF File Preferences dialog shown in Figure 3-28.

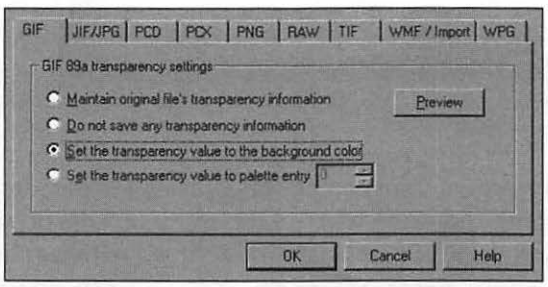


Figure 3-28: The GIF File Preferences dialog.

6. Select the third option, Set the transparency value to the background color, and click OK.
7. Finally, specify a new filename for the file and click Save to save it to your hard drive.

Figure 3-29 shows our image on the same background after adding transparency—quite a difference!

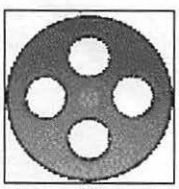


Figure 3-29: With transparency added, our image looks much better on a white background.

You can also paste the contents of the Windows Clipboard into the current image and automatically force transparency on the pasted image. From the Edit menu, select Paste, and then select As Transparent selection from the submenu; the pixels that match the background color of the image in the Windows Clipboard are automatically made transparent.

Image Editing With Adobe PhotoDeluxe

PhotoDeluxe can be considered the "younger brother" of Adobe's Photoshop. The Macintosh version requires a minimum of a 68040 processor with 8 megabytes of RAM (or a Power Macintosh with a minimum of 12 megabytes of RAM) and 45 megabytes of hard drive real estate. Figure 3-30 shows the PhotoDeluxe main window.

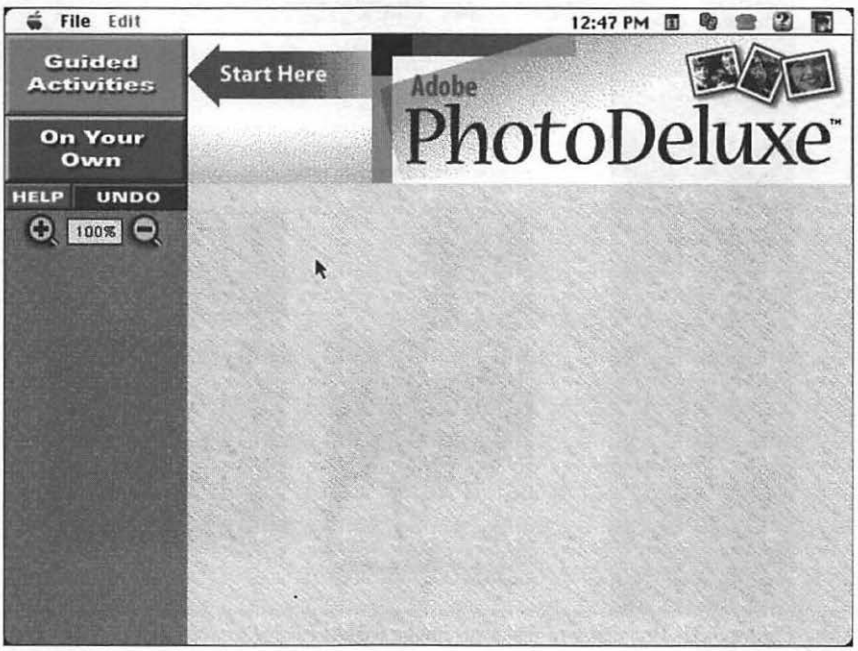


Figure 3-30: The Adobe PhotoDeluxe main window.

To load or acquire your image, select Get Photo. PhotoDeluxe can import pictures from a wide range of sources, including hard drive, Kodak PhotoCD, a digital camera, and a scanner. If you use a camera or scanner, it must either

be TWAIN-compatible or you must install an Adobe Photoshop-compatible plug-in to support it.

PhotoDeluxe provides a large number of Guided Activities which will lead you step-by-step through most of the tasks we performed manually with Paint Shop Pro—they correspond to the Wizards available in many Windows programs. For example, to resize an image, rotate it, or flip it, you would select the Guided Activities button from the main window, click the Touch Up Photo button and then click the Size/Orientation icon from the Touch Up tab. PhotoDeluxe displays an example and a number of numbered tabs that correspond to the steps in the process, as shown in Figure 3-31. To begin, click on the Step 1 tab and follow the onscreen directions; once you've completed it, continue to Step 2 and so on. The onscreen help is both well-written and comprehensive, making this program a great choice for the graphics novice.

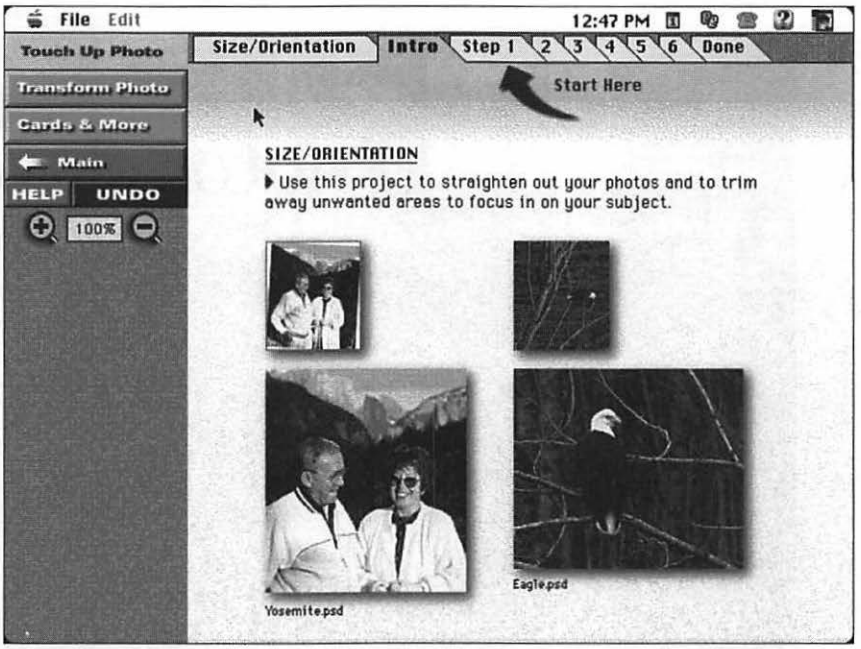


Figure 3-31: Preparing to resize an image within PhotoDeluxe.

You'll also use this tab menu system when you modify an image manually. Instead of clicking Guided Activities, click the On Your Own button, and then select Modify to display all of the command buttons. The commands are grouped into four major types: Orientation, Size, Quality, and Effects, and you can access any tab or command button in any order.

TIP

So you'd rather work with traditional menus than the default tab menu system? No problem—from the File menu, choose Preferences and then select Long Menus. PhotoDeluxe will display a standard pull-down menu. If you need to use a Guided Activity, however, you'll need to return to the tab menu system by selecting the Short Menus item from the File menu.

PhotoDeluxe uses a set of selection tools similar to Paint Shop Pro. To choose a selection tool for manual work, click the On Your Own button from the main window and load your image. Next, choose Modify. Finally, under the Select tab, choose the selection tool you want to use and click New.

Selection tools include geometric shapes (square, rectangle, oval, and circle), the Color Wand, the Polygon, and the Trace tool.

To save your finished image within a Guided Activity, select the Save tab; from the On Your Own area, click the Save button, and then pick the Save command button. PhotoDeluxe displays a File Save dialog; type a name for the file, select a location, and click Save. Note that this command saves your file in Adobe PhotoDeluxe format.

If you need to save the image in another format, you should select Export from the File menu. PhotoDeluxe can export files in PICT format, which is probably the best choice for use in GifBuilder; select PICT, type a name for the file, select a location, and click Save.

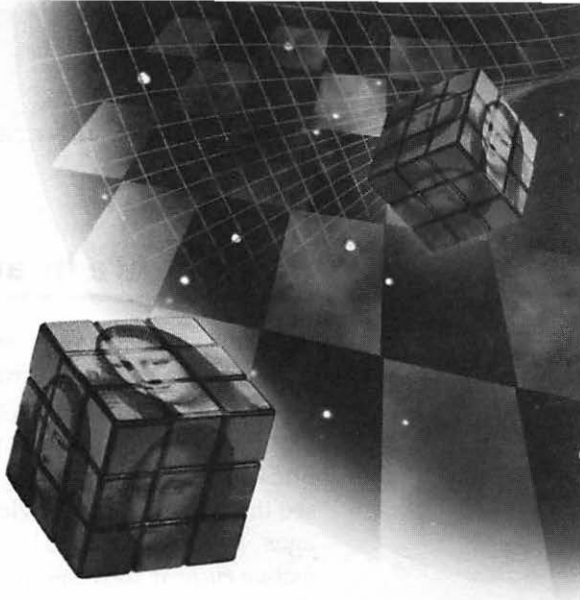
Moving On

In this chapter, you learned all of the basic skills necessary for image editing, and we practically memorized the insides of Paint Shop Pro! You probably noticed that Paint Shop Pro has a number of other tools designed to add image effects. If you like, you can explore these effects on your own, but we'll be using Photoshop in Chapter 5 to achieve many of the same results. We also discussed PhotoDeluxe, an image editing program popular on the Macintosh.

Coming up in Chapter 4, we turn our attention to creating simple animated GIFs using a number of tools that are . . . well . . . just plain **fun**!

CHAPTER 4

Creating Simple Animated GIFs



Saturday morning cartoons—that's what all this World Wide Web hubbub over animated GIFs boils down to. Whether it was Daffy Duck, Scooby Doo, or Jonny Quest, we all grew up with Saturday morning cartoons. As a society, we want our images to run and jump and fly. After all, once you've spent a few formative years watching the Pink Panther saunter around getting into trouble, a static picture will never be quite as interesting as something that *moves*!

In this chapter you'll be using the same techniques still used by many cartoon animators to add animated life. To begin, I'll explain what's involved in creating an animated GIF. Next, I'll introduce another favorite program of mine, GIF Construction Set from Alchemy Mindworks. Next you'll learn to use GIF Construction Set to create your first simple animated GIF both the easy way (using the Animation Wizard) and the hard way (manually). We'll use the latest version of GifBuilder by Yves Piguet to create animated GIFs on the Macintosh. I'll also cover other programs that have recently appeared that can automate the animation process and save time to boot. We'll cover the idea of "usability testing" and how it can help you in fine-tuning your animated images. Finally, we'll end the chapter by discussing how you can save loading time by optimizing your new animated GIF.

So How Are Images Animated?

Before we animate your GIF images, you've got to learn how the process works so let's take a moment or two and discuss the basics of the art of animation.

At one time or another, you've probably seen the familiar series of pictures that illustrate how a horse gallops. Just to make things a little tougher on the line artist for this book, I'll illustrate the same effect in Figure 4-1, where you'll see the wings of a gargoyle move up and down in a series of thumbnail images. The path covered by the wings as they travel up and down is called the *motion cycle;* it starts as the wings start to travel and ends when they've returned to their original point.

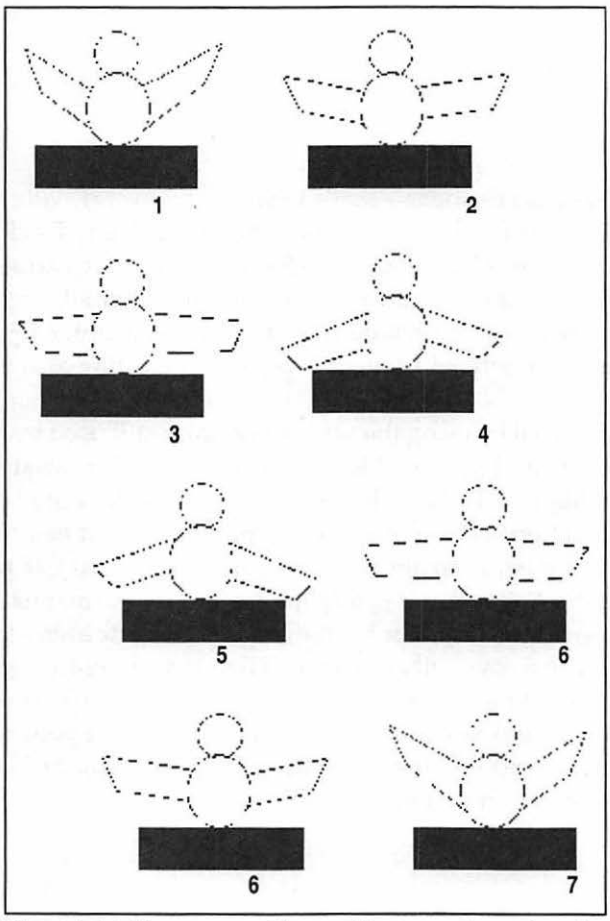


Figure 4-1: This sequence of images illustrates the motion of a gargoyle's wings. It also illustrates my exceptional skills an artist!

To create an animated cartoon of the same gargoyle flapping its wings, the animator would place each of these images in this sequence on top of each other (rather like the old "flip books" we all used to enjoy as kids). Each image, or animation *cel*, is actually a slice of the entire motion cycle. Since most animation is done for film or video, the cel is created by placing the image on a transparent piece of glass or plastic and taking a photograph of it. Depending on how long the subject is to stay in that pose relative to the rest of the action, the image is photographed a particular number of times, and each photograph becomes a distinct *frame* in a movie film strip.

When this strip is viewed by the human eye, the separate distinct images of the motion cycle blur together to form a continuous motion, and voilà!—we've created a simple animated cartoon.

TIP

The larger the number of frames in the animation, the smoother it appears; animators express this number as frame rate, *and it's usually written as frames per second. Since frame rate has less meaning when animating GIFs, we'll simply refer to the total number of frames.*

Web images are animated in the same fashion except that our raw materials are separate GIF images, and they're bundled up into a single GIF animation file. The ability to add simple animation by layering multiple images within a single GIF has been a part of the GIF specification for almost 10 years now, but until the arrival of the Web, animated GIFs were quite rare (you might have seen perhaps one or two in a year of traveling between bulletin board systems). In just a couple of years, though, those animated GIFs have been transformed from simple oddities to the most popular visual elements on today's Web pages.

Building the Movement Cycle

If you remember our design from Chapter 1, our animated graphic will be a piano keyboard in motion, and we were able to locate an excellent clip art image from our Internet search. But now we run into the same problem that often faces the best cartoon animators: what type of movement should we add to this static picture? As I mentioned earlier, many images "suggest" their own simple movement cycle: a ball might rotate or bounce, a bird might flap its wings, a car's wheels might move. Other simple movements are based upon film techniques; for example, when a GIF image fades in to sharp focus and fades out until it disappears. Although it doesn't look like movement, this sort of action is a movement cycle.

While I'm at it, several other film techniques that are popular in Web animation should be mentioned:

- **Cross Fade.** One of your images slowly fades in until it has completely appeared, then it fades out, only to fade in again with a different image. Figure 4-2 illustrates an example of this that would be appropriate for a Web page covering the stock market: a clip art image of a bull fades into view, fades out, and is replaced by a clip art image of a bear, which also fades in and out. This sort of animated GIF would likely *loop*, meaning that it would replay over and over.

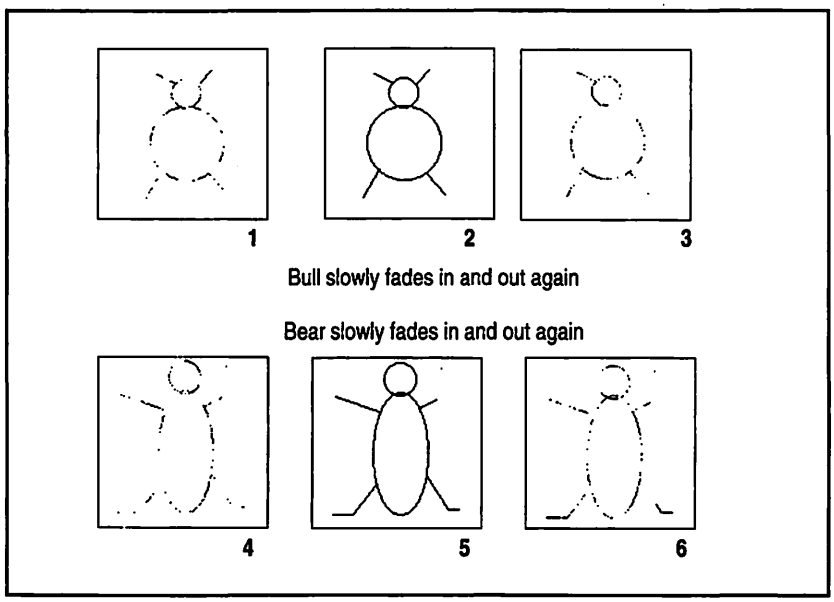


Figure 4-2: A storyboard for a simple animated GIF movement cycle. Again, my true drawing skills shine through!

- **Dissolve.** You've seen dissolve animation on the Web a thousand times over. An image gradually disappears as random segments of the image fade away (thus the name of this technique). These images are built by creating a number of frames, each of which includes a larger and larger transparent area; they take a considerable amount of time to do by hand, but they're fascinating to watch!
- **Wipe.** Wipes are another common technique where a geometric shape of some kind moves across the image, seeming to drag a new image into

place over the old one; shapes can include circles, logos, or any other object that touches the top and bottom edge of the image. The simplest wipe is a vertical line that travels from one end of the image to the other, changing the image "behind" it as it moves. Wipes were often used in silent films, and they were also a staple in classic TV shows like *Batman* and *The Addams Family*. Again, the frames necessary to produce a wipe take work, but it's a very effective movement cycle.

- **Color Change.** Another animation movement cycle that's simple and straightforward, yet magic to the eye is a *color change*. In this technique, a color within your image changes to another color. For example, one of the most attractive animated GIFs I've encountered in all my surfing started as a simple set of black and white lines that crossed the page—I was singularly unimpressed, until the plain lines suddenly burst into colors and became a rainbow! This effect is often combined with a wipe, so that the color change seems to move in a wave across the image. A color change movement cycle is quick, easy to create, and usually loads much faster than more complex animated GIFs where a portion of the image actually moves.
- **Morph.** This animation movement cycle has been very popular in recent years on television and in the movies—one image or object appears to change shape into another. For example, a woman's face might turn into a cat's face. Chapter 7 is devoted to morphing, but no fair skipping ahead—we'll get there soon enough!

Once you've selected an appropriate image, you need to determine an appropriate movement cycle. These guidelines will help you select a cycle that suits your image:

- **Pick a natural cycle.** As I mentioned earlier, if a portion of your animated GIF must actually move through space, try to select an action or a movement that's naturally attributed to your subject. For example, a cat could twitch its tail, which is an excellent choice—the only portion of the image that moves is the tail, which reduces the size of the finished GIF, and it would be easy to build the individual frames. A movement cycle can also express the subject matter, whether it is natural to the actual image or not; for example, a dollar sign might shrink and grow on a page that gives tips on investing.
- **Limit the range of motion.** It's always a good idea to avoid movement cycles that will travel more than an inch or so onscreen, especially if the original image is large or complex to start. For instance, it would certainly be visually impressive to see an animated chimpanzee jumping

from tree to tree across the top of your browser, but I'd hate to be the poor surfer who has to download that image! Instead, pick a motion that will have the best visual impact on the viewer with the least distance to travel—why not have your chimpanzee hang from a vine and move up and down next to your page title? This is especially true for cycles that will cross the full length of your image, where the entire image changes; if you select a wipe for an image with large dimensions, for example, be prepared to pay the price in download time.

- **Limit the number of frames.** Here's a very common mistake that's often made by novices designing Web graphics. It's certainly true that a larger number of frames will create a smoother, more lifelike movement in the finished image, but usually that image grows exponentially in size. Remember, each frame you create adds an additional layer to your GIF image, and it requires additional work on your part. For example, take a look at Table 4-1. I picked an animation from my collection, an inch-square globe that spins. Although the image only measures an inch on each side, nearly the entire area is animated. To experiment, I added frames to the animation in increments of 10. You can see the result in the final image size. Think of the additional time that image will take to load with a 14.4 kbps modem if you only double the amount of frames to 20. Also, remember that the source for this animated image wasn't particularly complex or large; if I had increased the size or detail of the source file, these file sizes would have been even larger. As a general rule, I try to use a maximum of 20 frames to animate an image of an inch or more (especially if the movement cycle includes a large portion of the image).

Number of Frames:	10	20	30	40
Size of Finished GIF:	82K	161K	245K	330K

Table 4-1: The effects of additional frames on final file sizes.

TIP

There are, of course, exceptions to almost every rule, and this one is no different. If your source image is very detailed or you really need a smooth effect—for example, a ballet dancer twirling in place—go ahead and pump up the frame rate. However, you should still keep in mind the cost in file size, and you might want to use the SuperCompressor option offered by GIF Construction Set, which we'll be talking about later in this chapter.

- **Use sectional animation.** If different parts of your image are moving in different ways—for example, your camel is walking while the rider is bouncing up and down, or your campfire is burning while a marshmallow turns brown—save as much loading time as possible by using *sectional* animation. We'll discuss this advanced technique in the next chapter.

Our piano keyboard example is very well suited to animation because the keys on the keyboard have only two positions, up and down, and it will be easy for us to modify the image to create the different layers. In fact, we could animate this keyboard with only two frames, but it would get very repetitious quickly. Therefore, I'll use four different frames, each of which will feature a different pattern of keys in the down position.

Our next step in the process of creating a simple GIF animation is the preparation of the individual images, which will make up the animation frames.

Preparing Your Images

Every animation motion cycle has a beginning and an ending point, and if you're designing a cycle that will loop, the ending image is often the same as the first frame. I prefer to use our old friend Paint Shop Pro to create the separate images that will make up the remainder of the frames, but you can use just about any image editor to perform the same job.

Use a Single Source Image

I strongly recommend that you use a single image as a foundation for your frames rather than a separate beginning and ending image. Doing so will help you avoid problems with palette matching, dramatic differences in brightness and contrast, different image sizes, and the dreaded "Transparency Terror" (where some of your image sources use transparency and others don't). Once you've created your first frame using your original image as a foundation, use the new frame as a basis for the next frame, and so on. This ensures that all of your finished frames will look seamless after they've been animated. Mixing image sources—or even just starting and ending images—almost always introduces some sort of problem that you'll have to take care of later. As always, there are exceptions to this rule (like morphing, which typically requires a different starting and ending image).

Using the piano keyboard as an example, we need an additional three frames; the original image will act as the opening frame. You first need to open PIANO.GIF into your image editor—this will be your first frame.

If you're using another image editor besides Paint Shop Pro, here are the general steps you need to follow to build these example image frames:

1. Open your editor and load the first frame; in this case, PIANO.GIF.
2. Select a light gray color as your fill color.
3. Fill the third key with the gray color so it looks as if it's being pressed down.
4. Select another two or three keys to "depress" using this same process, and repeat steps 2 through 3 for each key.
5. Save the new image to disk as PIANO1.GIF and reload the original PIANO.GIF.
6. Select a different set of three keys to "depress," and repeat steps 2 through 3 for each key. Save PIANO2.GIF and PIANO3.GIF using the same method.

If you're using Paint Shop Pro as your image editor, follow these steps to build the images:

1. Open Paint Shop Pro and load the first frame, PIANO.GIF, as shown in Figure 4-3.

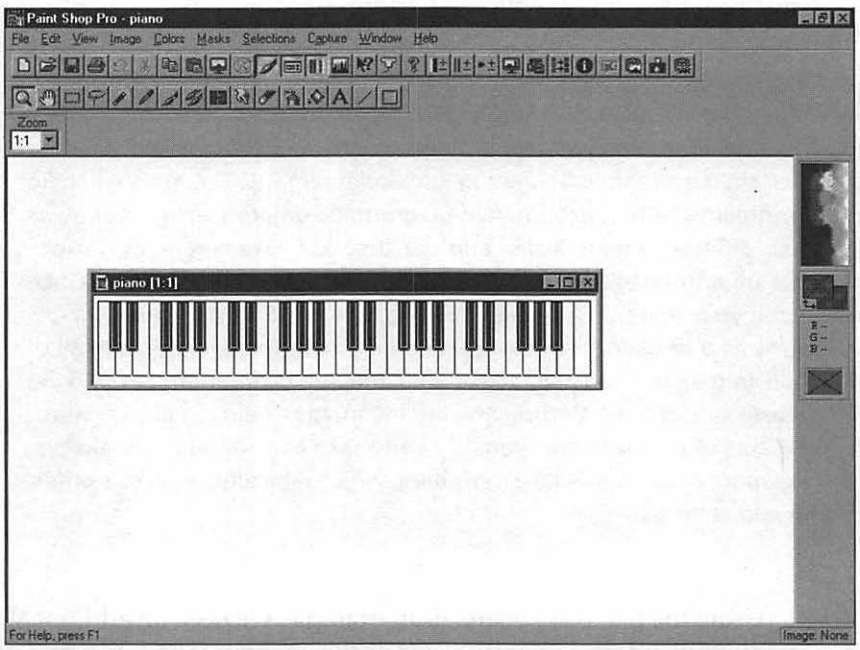


Figure 4-3: Our first frame loaded in Paint Shop Pro.

2. Click on the magnifying glass at the far left of the toolbar to activate the Zoom function. Move your magnifying glass cursor over a white key on the keyboard and click until the key fills the screen, as in Figure 4-4. As you can tell from the Zoom counter, we're now at 5:1 magnification.

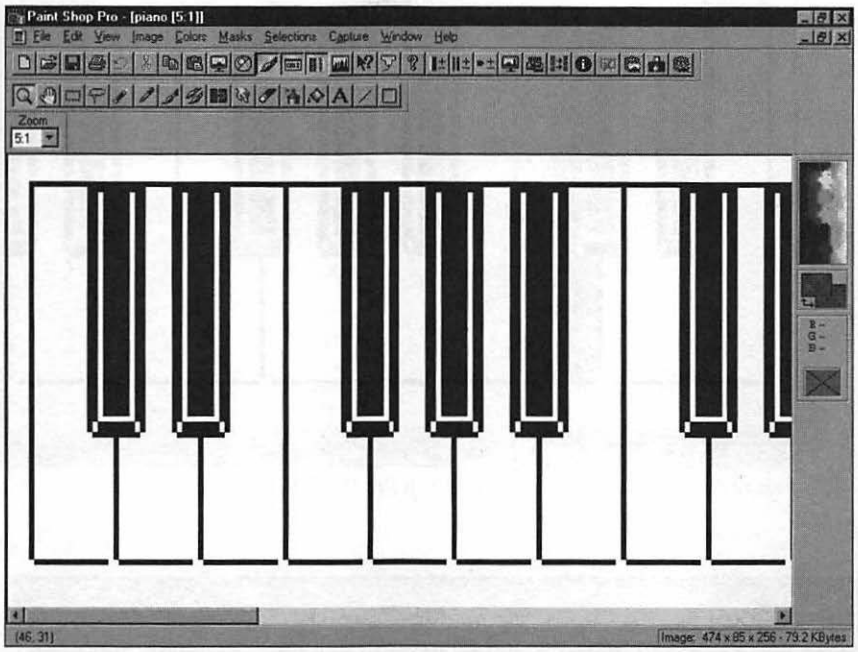


Figure 4-4: Zooming in to edit our piano keyboard image.

3. Now move your cursor over to the color palette on the right side of the window; Paint Shop Pro changes the cursor to an eyedropper. Move the eyedropper cursor over a light shade of gray, and click the left mouse button to select it as your foreground color.
4. Next, we'll fill the third key with the gray color so it looks as if it's being pressed down. Click on the dripping paint can on the toolbar to activate the Fill function. Move your paint can cursor over the third white key on the keyboard and click; Paint Shop Pro automatically fills the black outline of the key with the gray color, as in Figure 4-5.

   At this point, we'll move on to the other keys on the keyboard to continue our demonstration, but you could just as easily add a highlighted line to one side of the key to emphasize the movement.

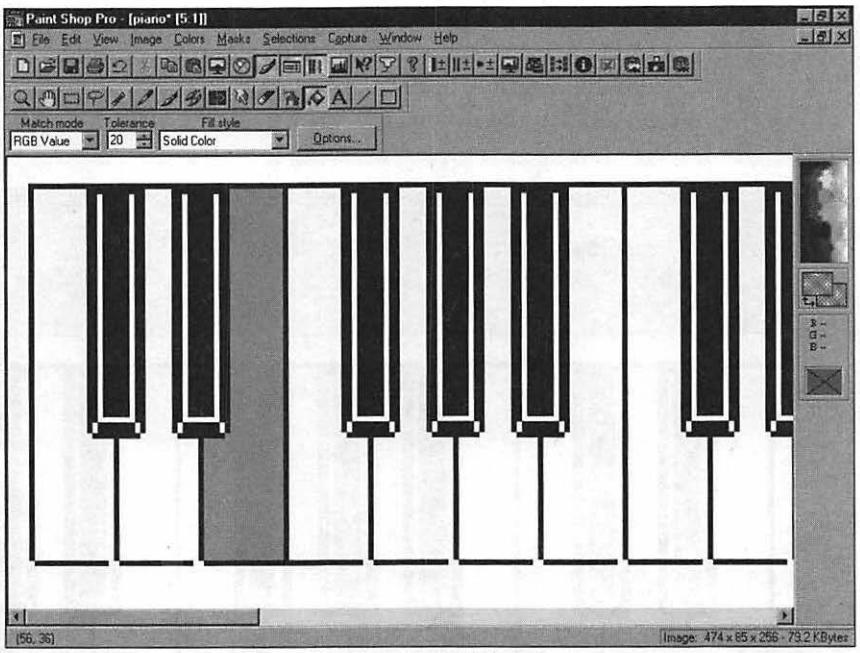


Figure 4-5: The results of the Paint Shop Pro Fill function.

Have Fun!

As long as you save your work often, feel free to have fun and experiment. The movement within your animation is only limited by your artistic and image editing talents (which is another reason why I recommend that you use a program like Paint Shop Pro often until you know it inside-out). For example, use the editing functions within Paint Shop Pro to incrementally move your subject, for example. If you make a mistake, simply use the Undo command on the Edit menu to reverse your last action. Remember that you're creating an individual frame of an animation, so avoid moving something dramatically; for example, if we were adding a twitch to a cat's tail, we would redraw the tip of the tail slightly higher than the existing tail.

Even if you don't add movement, you can still animate everything from an apple to a zebra by simply changing colors, as we've done here.

5. Select another two or three keys to "depress" using this same process, and repeat steps 2 through 4. Figure 4-6 shows our completed second frame.

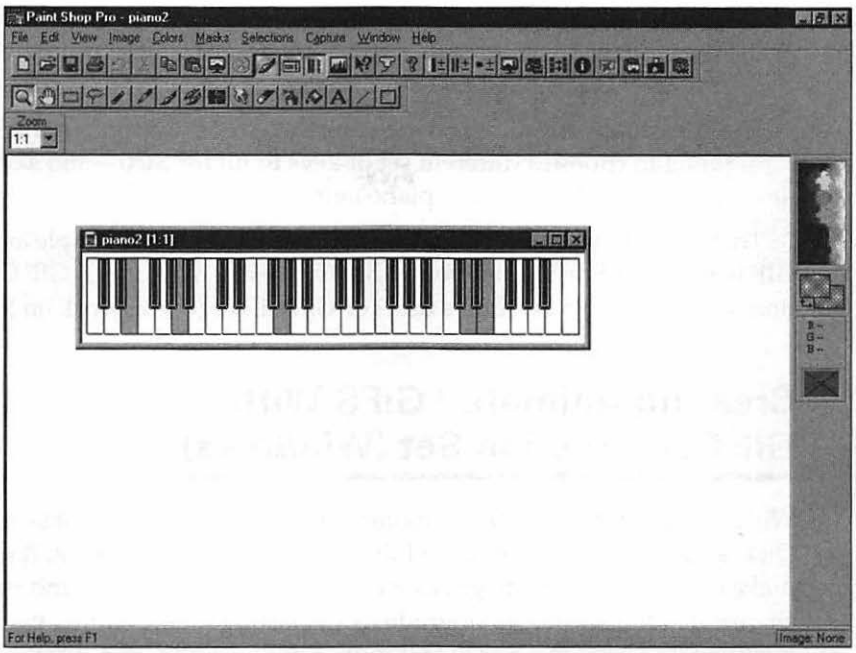


Figure 4-6: Our second animation frame, ready to save to disk.

6. Now let's save our second animation frame to your hard drive. From the File menu, select the Save As item. Select GIF - CompuServe as the file type, and select Version 89a - Noninterlaced as the sub type, as shown in Figure 4-7. As a general rule, I like to save the frame number as part of the filename to avoid confusion so let's name this frame piano2. Click Save to save the new image to your hard drive.

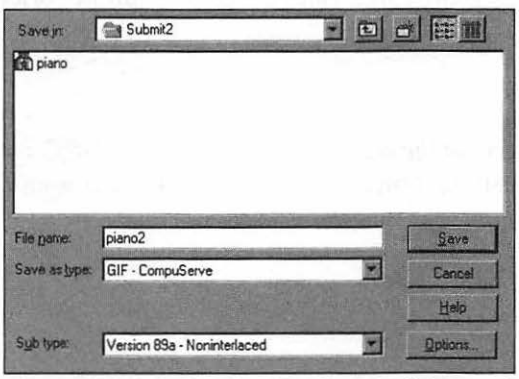


Figure 4-7: The Paint Shop Pro Save As dialog, ready to save our second frame image.

1. Time to reload our original image so that we can create frame number 3. Since the piano2.gif image is still loaded, select Close from the File menu, and open the original piano.gif image.
2. Repeat steps 2 through 6 twice more to create two more frames—don't forget to choose a different set of keys to fill for each—and save the images as piano3.gif and piano4.gif.

That's it! You've successfully saved all four frames of a simple animated GIF to your hard drive, and you're ready to work magic with GIF Construction Set (if you are a Windows user) or GifBuilder (if you work on the Mac).

Creating Animated GIFS With GIF Construction Set (Windows)

With the popularity of GIF animation on the Web, it seems that every Tom, Dick, and Harriet has announced the arrival of the *only* tool you'll need to make those pesky GIF images move and dance. If it's not a brand new shareware offering, it's an upgrade to an existing image editing package that'll likely set you back three or four hundred dollars and take a degree in rocket science to learn.

I'm here to set the record straight. Although I'll mention several excellent programs that show promise later in this chapter, for several years now the undisputed best tool for GIF animation has been GIF Construction Set by Alchemy Mindworks, and you'll only pay twenty dollars to register this jewel of a shareware classic. Currently, GIF Construction Set is available only for Windows; I'll describe GIFBuilder, a similar program for the Macintosh, in a separate section.

The Windows shareware version of GIF Construction Set can be downloaded from the Alchemy Mindworks Web site at www.mindworkshop.com/alchemy/alchemy.html.

TIP

For a quick preview of some of the magic you can create with GIF Construction Set, check out the demonstration page at www.mindworkshop.com/alchemy/gcsdemo.html.

Before we go any further, go ahead and install either the 16-bit or 32-bit version of GIF Construction Set. Using the 32-bit version under Windows 95, here are the steps to run it:

1. Click on the Start button.
2. Select the Programs submenu.
3. Select the GIF Construction Set 32 folder.
4. Select the GIF Construction Set 32 icon to run the program.

When you first run GIF Construction Set, it presents a rather plain-looking interface, as shown in Figure 4-8. Although the program has a standard menu system, common program functions are displayed in a row of convenient buttons along the top. The scrolling box on the left contains a list of all of the directories and GIF files available from your current directory; to move to a directory, double-click on it. To move one directory up, click on the [..] symbol at the top of the list. You can also jump to another drive by scrolling to the bottom of the list, where you'll see the drive letters on your system arranged in alphabetical order.

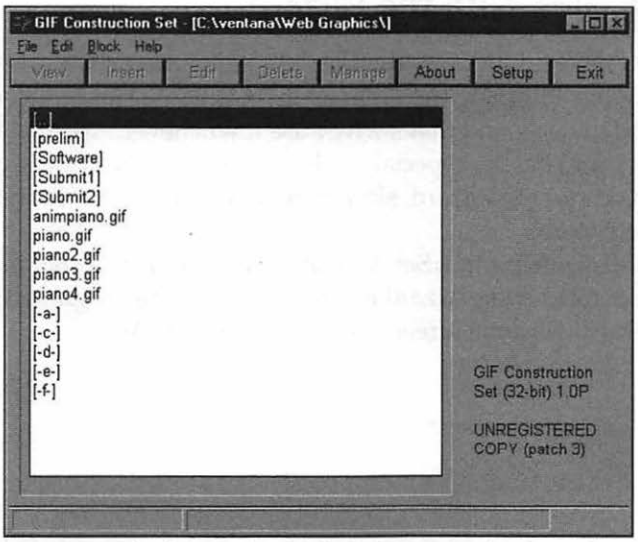


Figure 4-8: The deceptively simple GIF Construction Set main window.

TIP

Although GIF Construction Set only displays GIF files and the existing directories on each drive within the scrolling list on the main screen, you can also load image files of other types without converting them first. Select the Open item from the File command to navigate through your system, and change the Files of type field to All files. Now you can import several different image files: BMP, JPG, TIF, PNG, and PCX pictures.

We'll be covering the functions of most of these menu items and buttons later in this section, so I won't describe each of them here. Just keep in mind that GIF Construction Set operates in two modes: manually, where you can customize and create without any help, and automatically, where you can choose one of the creative tools or the Animation Wizard to perform most of the work for you.

Now that you've been introduced to our animation tool of choice, it's time to move to the first step of creating GIF animation: building the movement cycle.

Animating GIFs With the Wizard

As I mentioned before, GIF Construction Set's Animation Wizard is the "lazy man's method" of combining the separate images you've just created into a single animated image—and that's why I use it whenever possible. Why not save some work and hassle, especially when the results are typically just as good? Before you run the Wizard, simply make sure that your individual frames are ready to go.

To run the GIF Construction Set Animation Wizard, pull down the File menu and select Animation Wizard or press Ctrl+A. The program displays the Animation Wizard welcome screen, as shown in Figure 4-9.

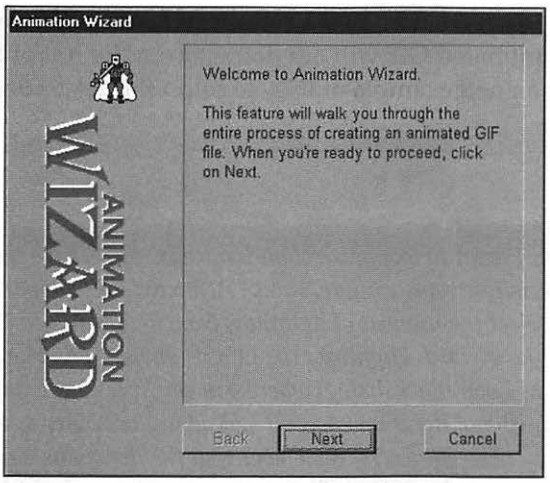


Figure 4-9: The Animation Wizard welcome screen.

Follow these steps to create your animated GIF:

1. Click Next to advance to the next dialog, as shown in Figure 4-10. Naturally, we do want the final image for use on a Web page, so select Yes and click Next to continue.

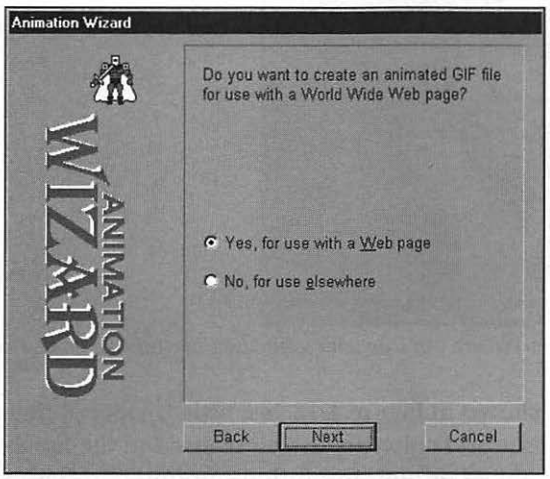


Figure 4-10: Selecting Web-ready output within the Animation Wizard.

2. From the next dialog shown in Figure 4-11, you'll specify whether the finished GIF should loop endlessly or animate a single time. I typically add a loop to the image, since your visitors might miss the animation if it

only plays once. If you've designed a simple and natural movement cycle, a looping animated GIF will not detract from the rest of the page. Our keyboard is a good example of this, so select the Yes option and click Next to continue.

TIP

"Hey, Mark—what if I want to loop my animation twice, or perhaps three times?" You would be the inquisitive type, wouldn't you? Although GIF Construction Set doesn't allow you to select the number of iterations from here, you can do it after we've finished using the Wizard. Highlight the LOOP image command and click Edit to display the Edit Loop Block dialog, where you can specify the number of iterations. Adding additional iterations doesn't add additional bytes to the file size, so have at it! For many older browsers, remember that the iterations value has no effect; it's infinite loops or no looping at all.

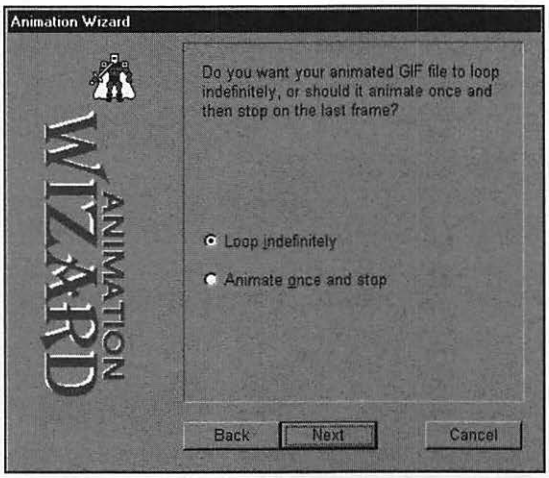


Figure 4-11: The Animation Wizard can loop your animation indefinitely if you like.

3. The next dialog, shown in Figure 4-12, is a little trickier; it determines what palette scheme and color depth will be used in the finished image. If you're using scanned or high-resolution computer art with at least 256 colors (or shades of gray) as image frames, select the Photorealistic option. If you're using text or line drawings, select the Drawn option. If your line art or text uses only a 16-color palette, then choose the "Drawn in sixteen colours" option (love that King's English). Or select the default, "Matched

to first palette," if you used the first frame as the foundation for all succeeding frames; since that's what we did, that's what we'll pick. Select this and click Next to continue.

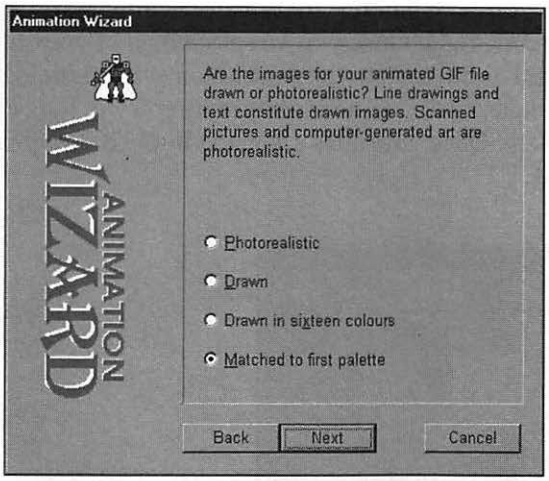


Figure 4-12: Specifying a color palette and color depth setting.

4. In our next Animation Wizard dialog, illustrated in Figure 4-13, you're asked to specify a delay to be added between frames. Achieving the best results sometimes involves a little experimentation, but you can try the default level of 100 hundredths for simple animations like ours. Select the Yes option and click Next to continue.

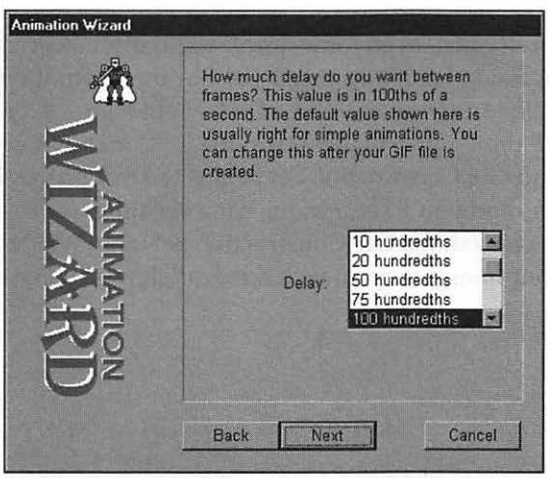


Figure 4-13: Specifying a delay between frames in hundredths of a second.

5. Now the Animation Wizard is ready to accept the filenames for each image frame, as shown in Figure 4-14. Click Select and then navigate to the directory where you saved the images. Holding down the Ctrl key, click on each of the four frame images in order: piano.gif, piano2.gif, piano3.gif, and so on. You'll notice that each filename is added automatically to the File name field. Once you've selected all of your files, click on Open to load them and return to the Animation Wizard dialog. If you add a file by mistake, click on it to highlight its entry in the Selected files list and click Delete. Once your files are listed in the correct order, click Next to continue.

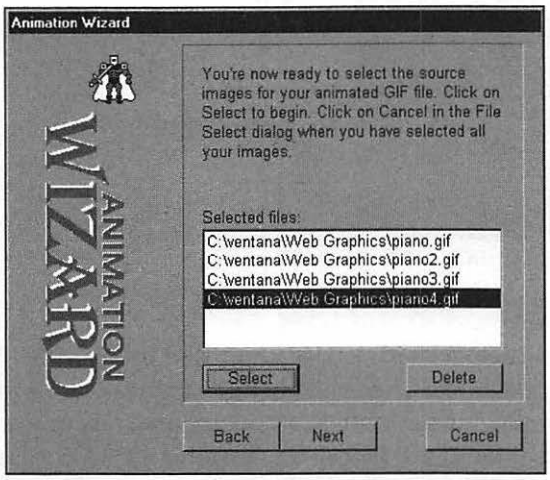


Figure 4-14: The Animation Wizard file selection screen.

6. Wow, that was pretty fast, even for a simple animation like ours! Actually, the real processing hasn't occurred yet, but the Animation Wizard displays its completion screen anyway, as shown in Figure 4-15. You won't see your new GIF until you actually return to GIF Construction Set. To do so, click Done, and GIF Construction Set begins the real processing to create your image, and you'll see a status bar indicating its progress. Once the GIF has been created, the GIF Construction Set main window will reappear with your image commands loaded, as shown in Figure 4-16.

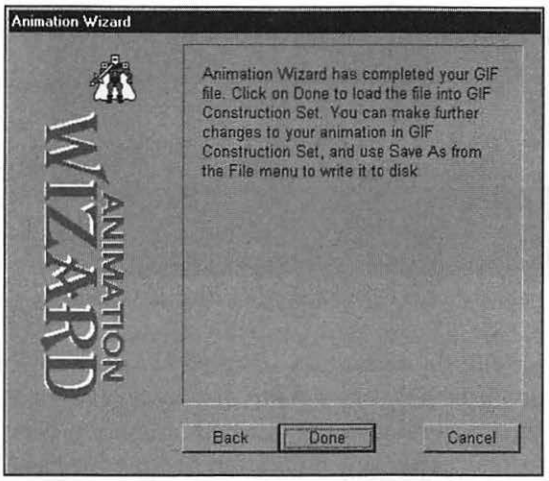


Figure 4-15: Success! The Animation Wizard has completed your image.

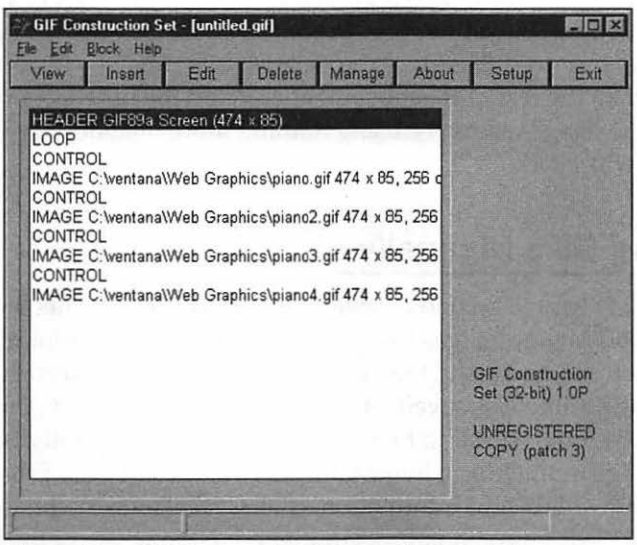


Figure 4-16: GIF Construction Set now displays the image commands for your new GIF.

7. Would you like to view your finished GIF before you save it to disk? Then click View on the GIF Construction Set toolbar. The program plays your animated GIF against a black background, as shown in Figure 4-17. To return to the GIF Construction Set main window, click the right mouse button.

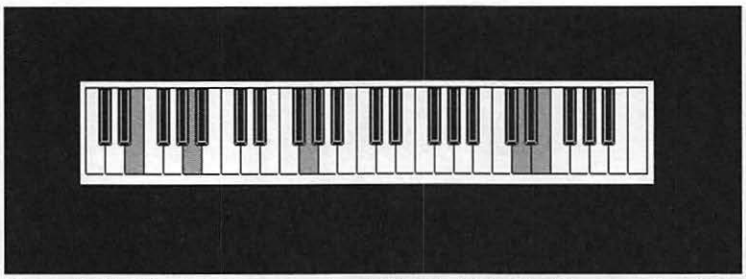


Figure 4-17: Viewing our new animated GIF within GIF Construction Set.

8. If you're satisfied with the animation, it's time to save it to your hard drive for later use. Select File | Save As to display a Save As dialog. Select GIF files as the file type and give the finished animation file its own name. Click Save to save the new animation file to your hard drive.

No matter how many frames you've added or how large your source image, that's all there is to it. The process is the same, and the Animation Wizard will help make sure that everything is set correctly throughout GIF Construction Set.

But what if you'd like more control over the entire process? Perhaps there's a special effect you need to add, or the delay between one or two frames needs to be longer than the rest of the movement cycle. In the next section, we'll create the same image manually, using nothing more than our bare hands and our superior willpower.

Animating GIFs Manually

Ready to go? Hang on a second . . . before we get started, we need to get some information about your images that you'll enter during the animation process. Run Paint Shop Pro and select File | Open. Navigate to the directory where your first image frame was saved—for our example, we'd load piano.gif—and click once on the image itself to highlight it. Paint Shop Pro will display the size of the image in the Image information area at the bottom of the dialog; jot down the width and height information, click Cancel to exit without loading the image and close Paint Shop Pro. For piano.gif, the width of the image is 474 and the height is 85; and, as I mentioned before, since we used the same image as the basis for all of our frames, there's no troublesome difference in image size halfway through our movement cycle!

TIP

If you have images of more than one size in your animation, write down the dimensions of the largest width and the largest height.

To build the same image as we did in the previous section without the Wizard, follow these steps:

1. From the GIF Construction Set menu, select File | New. The program creates a new image called untitled.gif and inserts the first image command in the list, as you can see in Figure 4-18. You'll use these image commands to build your animation. GIF Construction Set calls these commands *blocks*. In this case, this first block identifies the image as a GIF file of the GIF89a subtype, and a default size of 640 X 480 is automatically assigned.

   There are five distinct types of command blocks:

- **IMAGE**. This block represents an image frame you've loaded from your hard drive.
- **CONTROL**. This block allows you to manipulate characteristics of images such as transparency and delay. They're placed in front of the IMAGE block they control.
- **COMMENT**. This block contains text that can be displayed from within most GIF viewer programs. Comment text does not appear in the animation.
- **PLAIN TEXT**. This block displays text within the animation itself.
- **LOOP**. This block allows your animation to repeat for a specified number of times.

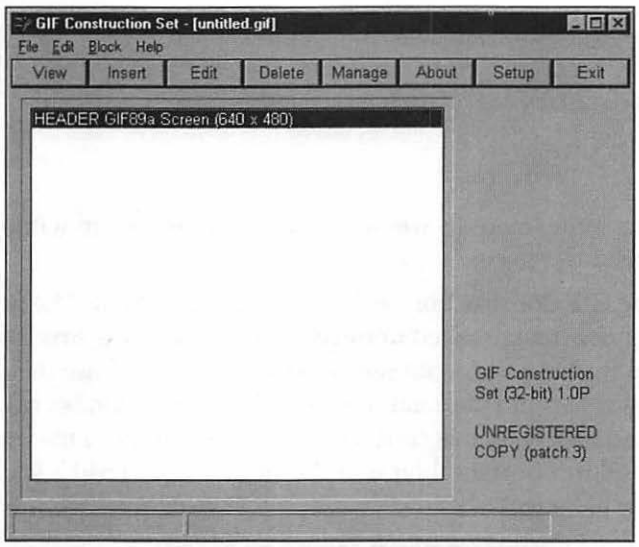


Figure 4-18: The first block we'll use to build an animation.

2. Whoops! As I said, GIF Construction Set has automatically assigned this image the dimensions of 640 X 480, and the dimensions of our actual image are only 474 X 85. We've got to fix that if we don't want a large blank border surrounding our GIF. Highlight the HEADER image command and click the Edit button on the toolbar; GIF Construction Set displays the Edit Header dialog, as shown in Figure 4-19. Use the scroll buttons at the left side of the Screen width field to specify 474, you can also double-click on 640 and enter **474** directly into the field. Next, enter **85** for the Screen depth in the same manner. To confirm your changes and return to the main window, click OK.

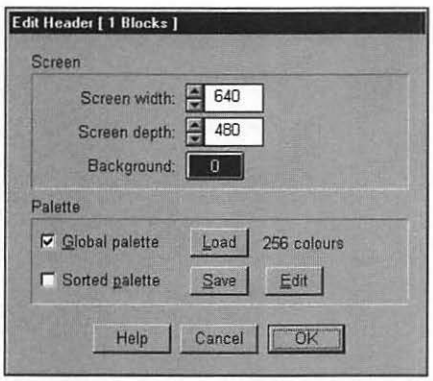


Figure 4-19: Specifying the exact width and depth of our first image.

3. From the toolbar, click on the Insert button. GIF Construction Set displays the floating Insert Object toolbar, as shown in Figure 4-20, where you can select which type of block to add to the image. Click the Image button. Select the first frame of your animation (in our case, piano.gif) and click Open to load it.

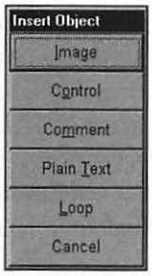


Figure 4-20: The floating Insert Object toolbar.

4. Depending on the palette used in your first image, GIF Construction Set may display the dialog shown in Figure 4-21; this indicates that there are differences between the default, or *global*, palette used by GIF Construction Set and the palette used in your image. You'll either have to change the color palette for your images or modify the default palette used by the program. Your options are:
   - **Use this image as the global palette**. This is the option I usually select, since I want to preserve the palette used by the images, and (as in our example) all of my images are usually from the same source. This option is only available if you're adding the first image in a new animation.
   - **Remap this image to the global palette**. A good selection for line drawings and simple graphics, but avoid this option if you're working with photographs or 256-color images. Some of the colors in your images might change slightly.
   - **Use a local palette for this image**. Avoid this option if your animation includes frames from more than one source. In addition, if your finished animation will appear on your page with other 256-color images, you might experience a color shift that will detract from the appearance of your page. I recommend you avoid this option altogether!
   - **Use a local grey palette for this image**. Although GIF Construction Set converts the image to grayscale, it still suffers from the same local palette problems as the previous option.

- **Dither this image to the global palette**. A good choice for photographs and 256-color images that have been taken from multiple sources, but (as you already know) I'm not a big fan of dithering. You're likely to lose some image quality and detail this way.

TIP

Remember how I mentioned earlier in the book that dithering is a taboo word? That still holds true here. Although dithering does help produce a more pleasing effect when you're adding several images to a single Web page, it increases your final image size, and it may not produce attractive results at a lower color depth. Whenever possible, use the same palette for all of your images by converting their color depth to 256 in your image editor, as we discussed earlier. Use the same options while reducing color depth, and make sure you include Windows colors.

- **Use it as is**. Generally not a good idea if your images come from mixed sources, but if you know that the palettes are complementary and contain the same colors, this option will work.

  Select Use this image as the global palette. Click OK to continue, and you'll notice that GIF Construction Set has added the image block command for piano.gif after the HEADER block, as shown in Figure 4-22.

Figure 4-21: Time to adjust the global palette to match your image.

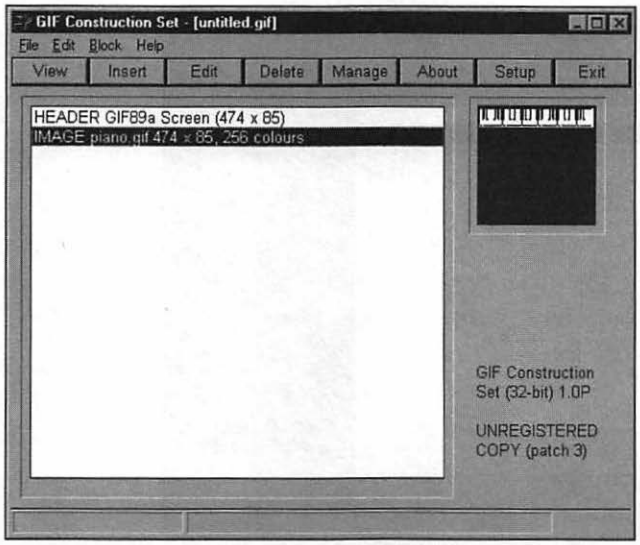


Figure 4-22: Your first image has been added to the animation.

5. In most cases, you'll want to add transparency to your animation because you'll use it on top of a different colored background on your Web page. To start this procedure, we have to add a CONTROL block, and the CONTROL block must appear just before the IMAGE block. GIF Construction Set inserts commands just after the highlighted command. So, in this case, click on the HEADER block to highlight it. Then click Insert to display the Insert Object toolbar and click Control. A CONTROL block now appears, as shown in Figure 4-23.

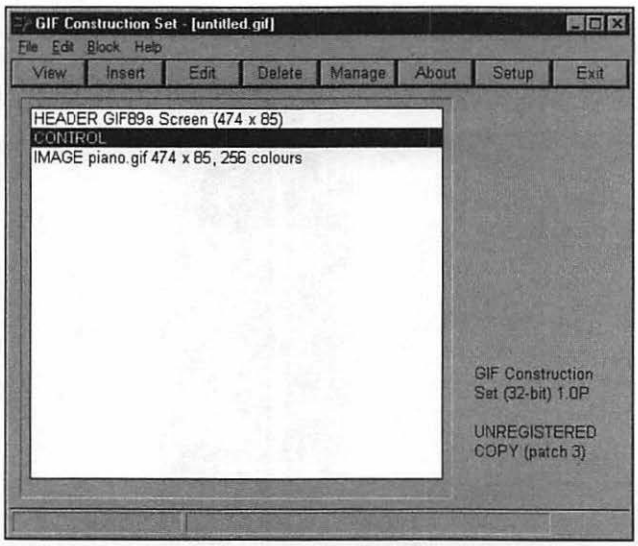


Figure 4-23: We've added a CONTROL block to our animation.

TIP

If you make a mistake and need to remove a block command from the animation, click to highlight the command and click Delete on the toolbar. GIF Construction Set also features some of the best online help around, which you can always reach by selecting the Help command from the menu. Most dialogs in the program also include a Help button.

6. Now we must edit the CONTROL block to specify transparency. It's already highlighted, so click Edit to display the Edit Control Block dialog, as shown in Figure 4-24. Enable the Transparent Colour check box and click the eyedropper button; we need to specify to the program which color should become transparent. GIF Construction Set displays the image; click on the color that should become transparent, and the program will return you to the dialog with that color already specified. Now *that* is neat! As a final step, set the Remove by drop-down list box to Background, and click OK to save your changes.

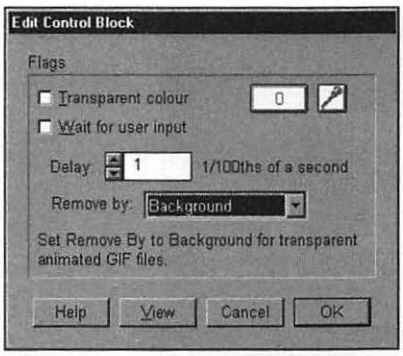


Figure 4-24: The Edit Control Block dialog.

7. That's the entire procedure for one frame, so simply repeat steps 3 through 6 for each image in your animation. Don't forget that the images need to be added in order!
8. Remember how the Animation Wizard asked if we wanted our animation to loop? If you would like your image to loop, that's the last block command you need to add. Click Insert and then click Loop. No matter which command was highlighted, GIF Construction Set adds the LOOP block command as the second command in the animation.
9. You're ready to go! First, though, you can view your finished GIF before you save it to disk, just like we did after using the Animation Wizard. Click View. The program displays your animated GIF against a black background. To return to the GIF Construction Set main window, click the right mouse button or hit ESC. Figure 4-25 shows the commands that make up our finished animation.

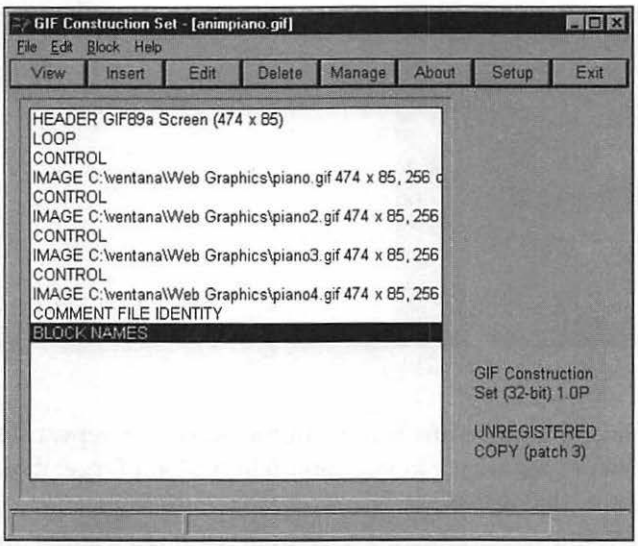


Figure 4-25: Our animation is ready to save to disk.

10. Finally, save your image. Select Save As from the File menu and select GIF files as the file type, and enter a new filename for the completed animation. Click Save to save the animation to your hard drive.

The Wizard vs. the Manual Technique

Now that you've done the same animation in two different ways—using the Animation Wizard and creating the animation manually—I think you'll agree with me that the Animation Wizard requires much less work and provides just about the same results!

However, the Wizard does not allow you to specify a number of settings, such as the number of iterations an animation should loop, and it also doesn't allow you to add comments or plain text to your finished animation. The Wizard creates the simplest of animated GIFs, but GIF Construction Set has many additional features.

If you like, however, you can always make manual changes to your animation after the Animation Wizard has completed, but before you save your new image to disk. This way, you get both convenience and fine control. The best of both worlds!

Other GIF Construction Set Features

That's basically all there is to the creation of a simple animated GIF with GIF Construction Set; however, we haven't closed the goody bag quite yet. I'd like to take a few moments to cover a few features we didn't encounter while building our sample animated GIF.

Adding Delays

Many animated GIF images look better when you apply a slight delay somewhere in the movement cycle; for example, an animated image of a baseball pitcher might pause for a second or two before the ball is thrown, or a rotating ball with a logo might pause to make the logo easier to see. Although GIF Construction Set adds a default delay of 100 hundredths of a second, you can add to this number to create a longer delay. You can add delays to your animation by following these steps:

1. First, add a CONTROL block in front of the IMAGE block where you want the delay to occur. Click on the preceding block in the list to highlight it, click on the Insert button, and then click the Control button.
2. Highlight the CONTROL block and click the Edit button to display the Edit Control Block dialog.
3. Add the delay by specifying a number in hundredths of a second.
4. Click OK to save your changes.

This may take a little experimentation on your part, so use the View feature to check out your animation with different delay values, and edit the CONTROL block until you're satisfied.

Creating Banners

You've probably been on at least one Web site recently that has featured a moving text banner; I've used several on pages I've created, and they can really add visual impact. Also, banners are well-suited as announcements for new products or new features on your Web page: they draw the eye, and I think we all pause just a second to see what message will eventually scroll across the page. GIF Construction Set includes everything you need to easily create these moving banners from a single dialog.

First, make sure that you're starting from scratch by selecting the New item from the File menu; this will make sure that you can save the banner as a separate image when we're done. From the Edit menu, select Banner to display the Edit Banner dialog, as shown in Figure 4-26.

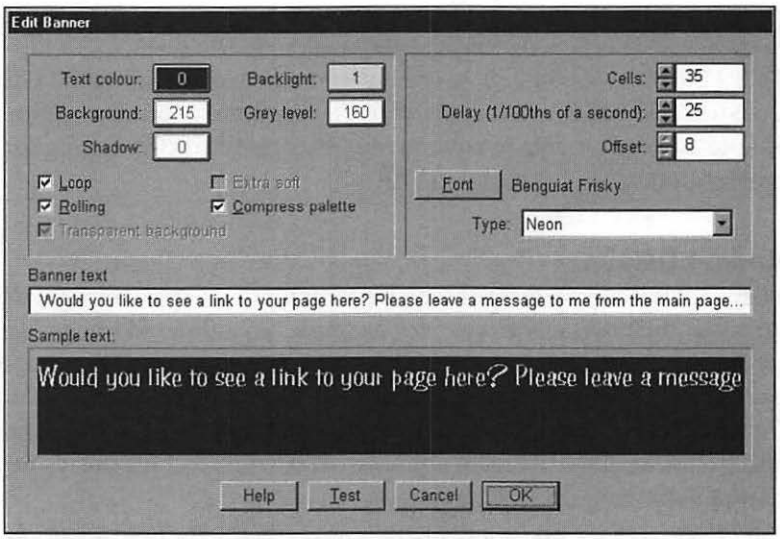


Figure 4-26: You can create moving text banners from this dialog in GIF Construction Set.

Now follow these steps:

1. First, click the Font button in the right section of the dialog. The program displays a font selection dialog, as shown in Figure 4-27. Keep in mind that the larger the font size you use, the larger your final animated image will be; I try to use a font size of less than 20. Since you're creating an animation, the font you choose doesn't need to exist on your visitor's computer, so feel free to pick whichever font you like! Once you've chosen your font, click OK to continue.

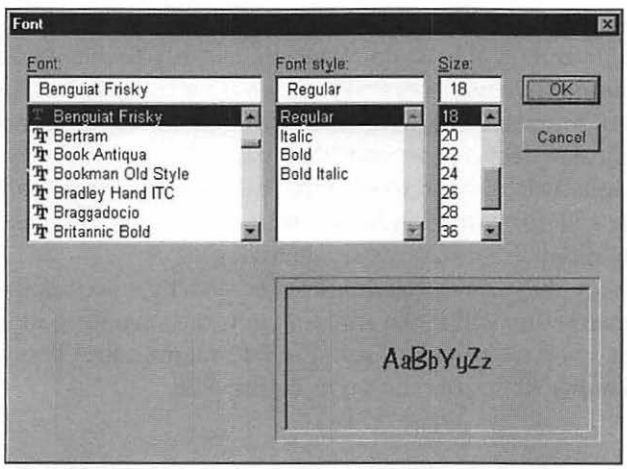


Figure 4-27: Selecting a font for a text banner.

2. Click within the Banner text field and enter your message; in this example, I entered "Would you like to see a link to your page here? Please leave a message to me from the main page . . .". Naturally, the longer your message, the larger the final image.
3. Specify the total number of frames in the Cels field. If your message is short, you can safely kick this value up to 50 frames or so without creating a gargantuan image, but otherwise I wouldn't recommend more than 30 frames. Of course, the more frames you use, the smoother your text will scroll.

TIP

There are no "right" values for the number of cels in a rolling banner and the delay between them; it all depends on the length of the message and the size of the font. Always try several different combinations to make sure you've got just the right effect!

4. Add the delay between frames by specifying a number in hundredths of a second. Although a smaller number will result in scrolling text that stays visible for less time, it will make the text scroll more smoothly; I usually use a value of around 25 hundredths of a second.
5. Now select an effect with the Type field; each value here will yield a different appearance to your banner. My favorites are drop shadow, backlight, and neon.
6. Next, select your colors for the text, the background, and any shadow and backlighting you may have chosen. When you click on the appropriate button, a color palette appears and you can click to select your color.
7. If you would like your animation to repeat, enable the Loop check box. For a scrolling banner, enable the Rolling check box; if you disable this option, your banner will be a static image with no movement. Also, I recommend that you enable the Compress palette check box which will reduce the color depth for your finished image to the smallest value possible. You can set a transparent background for most of the effects.
8. Ready to see the animation? GIF Construction Set provides a convenient Test button at the bottom of the dialog, so click away! After you've watched your animation, right-click to return to the dialog. If something isn't quite right, you can change the settings and test the image as often as you like. Figure 4-28 shows my banner from the Test screen.

Figure 4-28: Testing my animated banner within GIF Construction Set.

9. Once your banner is ready to save, click OK. The GIF Construction Set main window will return, but it will take a few moments for the program to build the commands for your image. Once the process is complete, you can save your banner just like any other animated image using File | Save As.

Give this feature a try, and I'll bet you'll consider adding a banner to every page on your site . . . but remember the basic rules we discussed at the beginning of the book, and don't slow down your page traffic with too many graphics.

Creating LED Signs

When's the last time you stood in a line and watched one of those animated LED (short for *Light Emitting Diode*) signs at the supermarket—or, even worse, the bank—while the guy in front paid in pennies? Time to take your revenge! Like banners, LED signs are scrolling displays, and they're excellent for highlighting special features and hot news. GIF Construction Set comes through again in style, providing everything you need to create these popular animated displays for your pages. You can create these signs with Java as well, but animated GIFs are recognized by many more older browsers than are Java applets (and they tend to load faster than applets), so I prefer to use this method.

To begin, select File | New; this will make sure that you can save the LED sign as a separate image when we're done. From the Edit menu, select LED Sign to display the Edit LED Sign dialog, as shown in Figure 4-29.

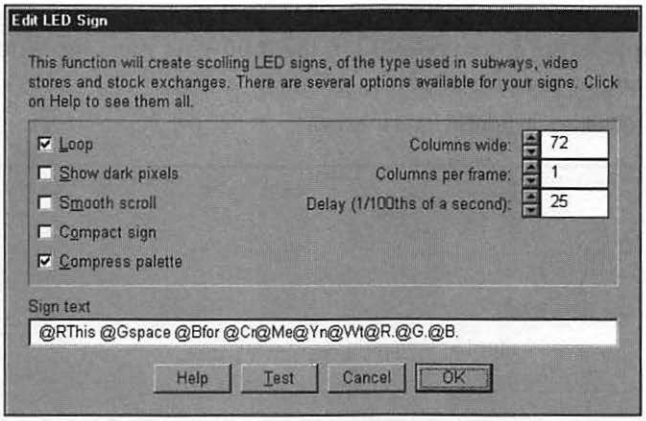


Figure 4-29: This dialog allows you to create moving LED signs in GIF Construction Set.

Now follow these steps:

1. Select the width of your sign in columns; naturally, the wider the sign, the larger the finished GIF. I usually leave the Columns per frame field set to 1 since this setting helps to keep the size of the final animation to a minimum, but if you enable smooth scrolling, you may have to change this value. You can also set the delay, and it functions the same as it did for text banners.
2. Next, enable the Loop check box if you'd like the animation to repeat; if you decide not to loop the image, the message will scroll once and the sign will remain dark thereafter. The Show dark pixels check box determines whether the unlit pixels will be visible; enabling this results in a neat look, but it can greatly increase the size of the GIF, so I leave it turned off.
3. If you need the smoothest possible scrolling motion, enable the Smooth scroll check box, but expect the size of your final image to reach gargantuan proportions. I generally leave this off. The Compact sign allows you to specify whether your sign will use a small or larger frame; again, the larger the frame, the larger the final file. Finally, I recommend you leave the Compress palette option enabled; as with animated banners, this reduces the color depth to a minimum.
4. Now you're ready to enter your text, which can consist of ASCII text and the space character; however, you're limited to a total of 260 characters and that includes color codes. Oh, did I fail to mention that you can select from seven colors? You can embed color codes in your message in the form @? in which the ? is replaced by the appropriate color character.

Table 4-2 illustrates the different colors and their corresponding codes. For example, the color code @G in the following message would turn everything appearing after it to green:

```
From @Ghere, everything is green!
```

@G	green
@R	red
@B	blue
@C	cyan
@M	magenta
@Y	yellow
@W	white

Table 4-2: The codes used to specify colors in your LED message.

5. As usual, GIF Construction Set allows you to test the appearance of your image from the safety of this dialog. Click Test to display your animation. After you've watched your image, right-click to return to the dialog. Feel free to experiment; you can change the settings and test the image as often as you like. Figure 4-30 shows the results of a simple LED sign.

Figure 4-30: Testing an LED sign.

6. Once your sign is ready to save, click OK. The GIF Construction Set main window will return, but it will take a few moments for the program to build the commands for your image. Once the process is complete, you can save your sign just like any other animated image using File | Save As.

Adding Custom Transitions

Our final advanced feature within GIF Construction Set is the Transition function, which operates a little differently from the scrolling banners and LED signs you've just created. Transition effects are applied only to a single image, so they are not multi-frame animations; however, they move, appear, and disappear in motion, so they can still be called animated images, and you have the same type of control over their characteristics. In fact, if you'd rather

not spend the time to create the separate frames for a full animated GIF but you'd still like to add an interesting visual effect to the display of an image, a transition may be the perfect solution. We'll mention transitional animation at other points in the book as well.

From the Edit menu, select the Transition item to display the Edit Transition dialog, as shown in Figure 4-31.

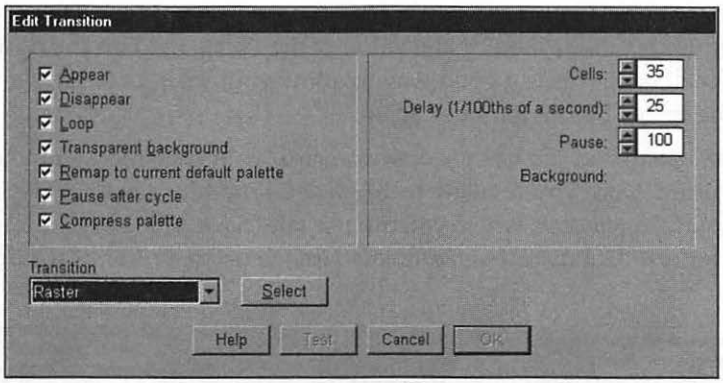


Figure 4-31: GIF Construction Set can add a transition effect to a single image if you like.

Now follow these steps:

1. First, click Select and then select a source image from the dialog. Keep in mind that many of these transition effects can more than double the size of your image file, so choose your source image carefully. Click OK to continue.
2. Next, in the Transition drop-down text box, choose the desired transition effect. Effects include the Adam Seven Interlace (which fades your image into view in order, one pixel at a time), vertical and horizontal splits (with two halves joining in the center), sandstorm (which fades your image into view randomly, one pixel at a time), raster (two halves "interlace" into one), tile (the image appears in small squares), and a number of wipes (where the image rolls in from one side).
3. Specify the total number of frames in the Cells field. As usual, the more frames you use, the smoother your transition will appear, but it will become correspondingly larger. You can also set the delay, and it functions the same as it did for text banners. The Pause field determines how long the image will pause after the movement cycle in hundredths of a second.
4. Now specify whether your image will appear or disappear, and whether the transition will loop; naturally, if you don't choose both an appear and disappear transition, a looping movement cycle will appear a bit strange!

5. If you like, enable the Transparent background for your image. I generally leave "Remap to current default palette" enabled since this makes your completed images look better with other text and graphics on the page, but it may result in some dithering. As usual, you should also enable the Compress palette check box, which will reduce the color depth for your finished image to the smallest value possible.
6. Finally, if you want your animation to pause after completing the movement cycle, enable the Pause after cycle check box. The length of this pause is determined by the value of the Pause field on the right side of the dialog. This is a good way to allow your visitors to get a good look at the image before it moves again.
7. As usual, you can test the appearance of your transition with the Test button. Once you're ready to go, click OK to return to the GIF Construction Set main window, where you can use File | Save As to save your image. Figure 4-32 illustrates an animated image using a raster transition effect.

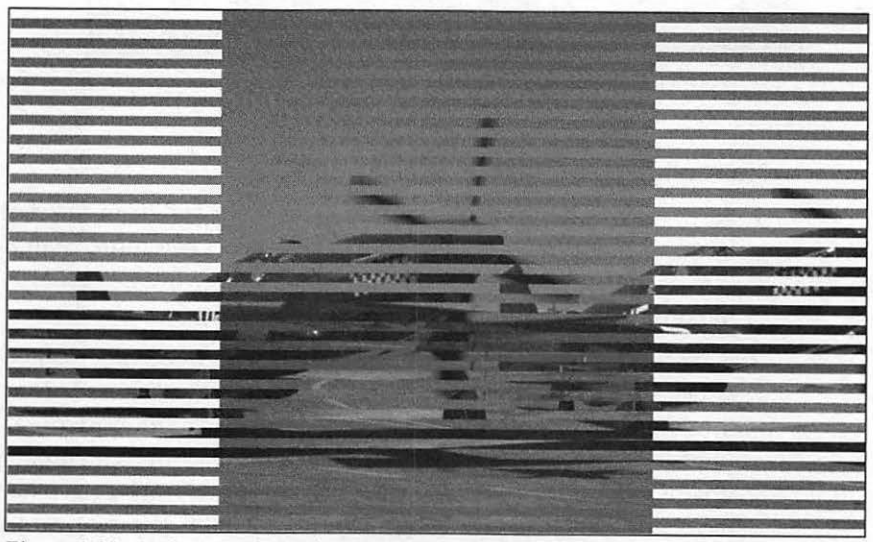


Figure 4-32: An image enhanced with a raster transition effect.

With that, we bid a fond farewell to GIF Construction Set for the moment. Of course, I didn't cover every single feature of this great program, but we'll return once more in this chapter to discuss the SuperCompress option. I strongly encourage you to register your copy and experiment with every command--let your curiosity get the better of you with this program, and I promise that you won't be sorry.

Creating Animated GIFs With GifBuilder (Macintosh)

GifBuilder is the best-known and most widely used "pure" GIF animation application for the Macintosh, and—surprise—it's freeware, and you'll find it on the CD-ROM accompanying this book! GifBuilder can import a wide variety of files, including images in GIF, PICT, TIFF, QuickTime movies, Adobe FilmStrip, and even RGB and grayscale PhotoShop files, but it only outputs standard GIF89a images. It fully supports scripting, so it works seamlessly with other AppleScript applications. The latest version includes a frame display, an Add Matte function, and the ability to crop animation frames. The program also offers an expanded selection of special effects, including four different types of transitions (dissolve, slide push, wipe, and peel). Color selection is easy as well, featuring direct drag and drop from a full palette. Unfortunately, the program doesn't have a wizard, but it's still easy to use. Figure 4-33 shows the GifBuilder interface.

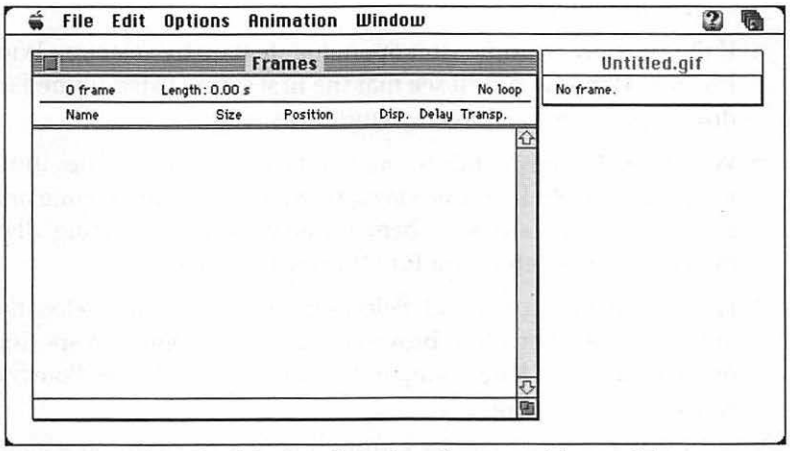


Figure 4-33: The GifBuilder interface takes advantage of drag and drop.

TIP

If your final animation takes longer to download than you originally wished, GifBuilder includes a Frame Optimization feature that can save you a considerable amount of download time. Frame Optimization is a variant of dirty rectangle compression, which we'll discuss at the end of this chapter in the section titled, "Optimizing Through Compression."

Animating a GIF

Remember how we manually created our animation using GIF Construction Set? Let's create a similar simple animation using GifBuilder, and you'll see how the program takes full advantage of the Macintosh system interface. Follow these steps:

1. Create your animation frames using an image editor as we discussed earlier in this chapter. GifBuilder can import GIF, PICT, or TIF. For convenience, save these images in the same folder. In fact, for this example you can use the same four GIF frames we prepared for use with GIF Construction Set (see "Preparing Your Images" earlier in this chapter).
2. From the GifBuilder menu, select File | New. You should see the Frames window, ready to receive your images; if it's not open, toggle it on by selecting Window | Frames Window.
3. Open the folder where you stored your images and drag them from the Finder into the Frames window. If you're not using Drag Manager under MacOS 7.5 or higher, you can add each frame individually by selecting File | Add Frame.
4. If the Preview window isn't open, toggle it on by selecting Window | Preview Window. You'll see that the first frame listed in the Frame window appears in the Preview window as well.
5. Within the Frames window, drag and drop the image files until they're in the proper order. If you've saved them with the same name and a unique number, you can also sort them automatically by selecting all of the images and then choosing Edit | Sort Selection.
6. Let's add a loop command. Select Options | Loop, and select the Forever option. Remember, older browsers may not recognize a specific number of iterations for a loop command, so I generally choose Forever. Click OK to accept your changes.
7. As in GIF Construction Set, GifBuilder allows you to set delays between specific frames of your animation. To do this, select the frame (or frames) that require the delay and then select Options | Interframe Delay. GifBuilder allows you to set a delay in one hundredths of a second. Click OK to accept your changes.

TIP

Although you can select your own palette for use in GifBuilder, I recommend the 6x6x6 Palette option because it will prevent dithering for most browsers under both Windows and Macintosh. To use this palette, select Options | Colors and pick it from the submenu.

8. That should do it. Time to save our animation. Select File | Save and enter a new name for your animated GIF, then click OK.

Adding a Transition

GifBuilder also provides four types of transitions, the most exotic of which is the Peel transition—it appears as if layers of each frame are being peeled back in the direction you specify. To add a Peel transition, follow these steps:

1. Within the Frames window, select two adjacent frames as the starting and ending frames for the transition; generally, this is the first two or last two frames, depending on where in the animation you would like the transition to appear.
2. Open the Effects menu, select Transitions, and then select Peel.
3. From the Peel dialog, specify the total number of frames to use for the transition in the Number of steps field. Click on the option buttons arranged in a square to indicate which direction the peel will move.
4. Click the Color button to select a color for the back of the peeled layers.
5. Click OK to accept your changes and generate the transition frames.

Other GIF Animation Tools

In this section, I'd like to discuss a number of other popular programs that are available for animating GIF images; some of these applications are newcomers, while others already have a dedicated following. I'm happy to report that the most you'll pay for any program in this section is a whopping thirty dollars, once again proving that you can create the best animated GIFs for your Web site without spending a fortune!

Each of these applications offers something that stands out from the others, so if you're especially interested in a particular feature, you may want to install the trial version of that program and try it out for yourself.

PhotoImpact GIF Animator

You may already be familiar with the PhotoImpact image editor by Ulead, which is the "big brother" of GIF Animator. PhotoImpact ranks along with Paint Shop Pro as another very popular Windows shareware image editor widely used by Web artists. GIF Animator can be registered separately or purchased along with PhotoImpact.

Like the GIF Construction Set interface, the GIF Animator main window includes a command and image list on the left, but the design similarities end there. As illustrated in Figure 4-34, the program also features a preview window on the right that displays the selected image, and all of the settings that are included in dialogs in GIF Construction Set can be reached in GIF Animator from a single window. This layout makes it very easy to build a GIF animation in the smallest amount of time. GIF Animator also features a standard Windows toolbar, which many users will probably prefer over the simple button bar in GIF Construction Set.

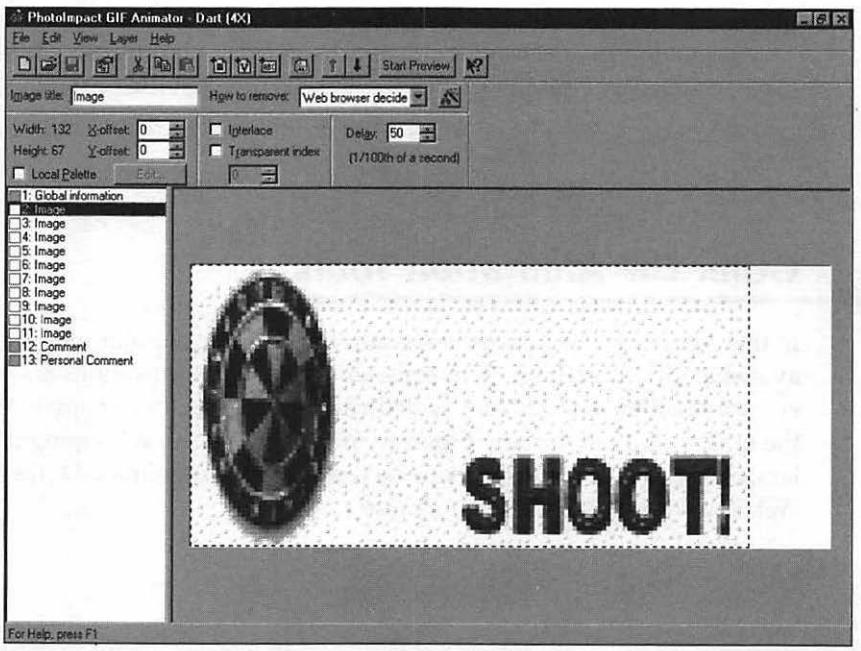


Figure 4-34: The GIF Animator main window.

The GIF Animator banner feature allows you to add borders and shadows to your banner to give the finished animation a more 3D look, and you can include an image within the banner. GIF Animator also includes its own set of transition effects like horizontal and vertical blinds, wipes, and a particularly nifty spiral transition, and unlike GIF Construction Set the effect is previewed on a thumbnail before you create it so you can see what the transition will look like. GIF Animator also offers a spinning effect that really looks great on a Web page; the image (see the example in Figure 4-35) appears to "tumble" in the direction you specify.

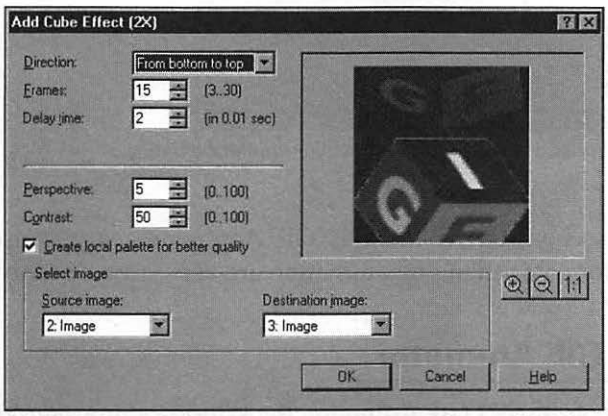


Figure 4-35: Creating a spinning cube animation within GIF Animator.

Adding image frames within GIF Animator is as simple as dragging them from the Windows Explorer window and dropping them into the program's workspace, or you can browse for them as well. You can zoom the display of images in or out, and GIF Animator allows you to move forward or backward through an entire movement cycle, frame by frame. Once you've completed your animation, you can use the GIF Optimization feature, which operates in much the same way as the SuperCompress option within GIF Construction Set.

And here's a real treat: GIF Animator also makes it incredibly easy to add color change animation to an image. With the unique palette display shown in Figure 4-36, you can select individual colors or an entire range of colors within your image and animate them in any order, all by simply pointing and clicking. Like GIF Construction Set, you can also preview the effect from within the dialog. If you prefer color change animation, this is the most intuitive interface I've seen.

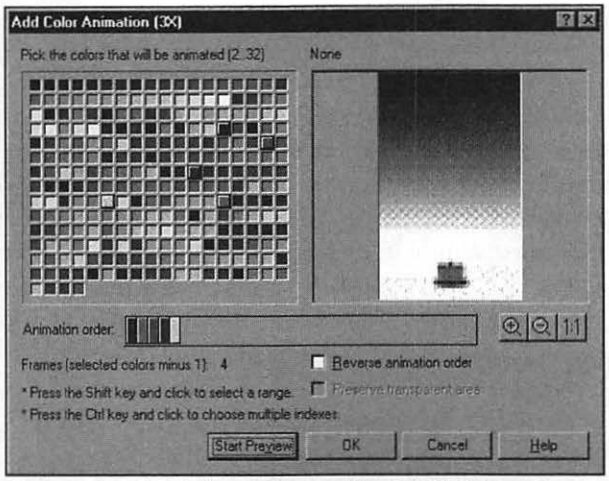


Figure 4-36: GIF Animator's exceptional Add Color animation dialog.

Although it lacks one or two features, GIF Animator's easy-to-use interface and its support for color changing animation are very strong positives indeed!

VideoCraft GIF Animator

Much like the PhotoImpact GIF Animator, the Windows program VideoCraft GIF Animator from Andover Advanced Technologies is a direct descendent of an older graphics program—in this case, PhotoMorph—and it's the only animation application in our lineup with native support for morphing. I'll be talking about this technique in greater detail later in the book in Chapter 7, but for now, a quick definition is sufficient. *Morphing* is a form of animation where one image turns into another by slowly changing the shape and color of the objects in the first image to match the second. You've seen this technique in a number of big budget films; for example, if a human actor "melts" into a dragon, the effect was probably achieved through morphing (more practical than the alternative, which involves a great deal of "Dragon Chow" and a huge birdcage).

Depending on how you look at it, the VideoCraft GIF Animator interface either benefits or suffers from its ties to PhotoMorph. It uses a specialized editor that's typically used in morphing programs and multimedia authoring

packages, as shown in Figure 4-37, where you have a start frame and an end frame. If you're primarily interested in GIF animation using the morphing technique, that's a big advantage (as you'll see in Chapter 7). However, this start and end frame interface can be confusing to the novice and it's much harder to structure, view, and edit all the frames in a larger animation. Personally, I prefer the GIF Construction Set interface, or perhaps the convenience of the PhotoImpact GIF Animator toolbar; this program uses a widely different approach, looking more like a specialized digital editing program than a GIF animation application. There's also no built-in preview mode, so you have to save your animation and load it in your browser.

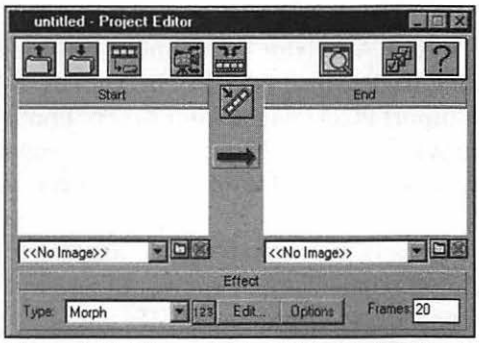


Figure 4-37: The specialized VideoCraft GIF animation project editor.

As you might imagine, the VideoCraft GIF Animator excels at special effects; besides morphing, you can choose from a large number of image filters like colorizing, blurring, and embossing. Transition effects include curtain (a standard wipe), explode (the image seems to "shatter"), meltdown (progressively darker areas of the image fade away), and slide (the image simply slides out of view). The program provides complete control over each of these effects, and most have more than one variant—make no mistake about it, this is a very powerful effects program with its own built-in image editing tools! Figure 4-38 illustrates the Transition Editor—compare this with the transition dialog within GIF Construction Set.

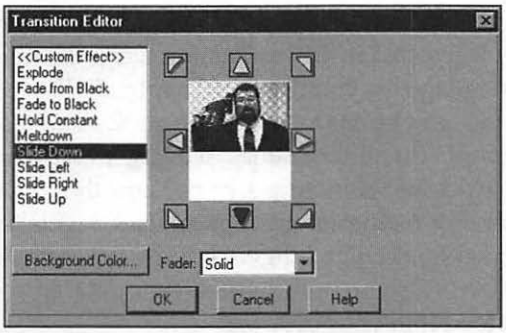


Figure 4-38: The Transition Editor provides complete control over transition effects.

Another plus for VideoCraft GIF Animator is its almost terrifying support for imported images, including BMP, GIF, JPEG, DIB, PCX, TGA, RAS, and TFF formats—you can even import PCD images from Kodak PhotoCDs and WordPerfect graphics. AVI movies can also be imported. If you need to pull your source frames from a wide variety of platforms and sources, you'll appreciate this program.

If we were discussing power tools, VideoCraft GIF Animator would be that complex bandsaw that only professional carpenters would use, but if you're willing to learn it, this program can create animated GIFs with effects that not even GIF Construction Set can touch.

Animagic GIF

The last program in our review of GIF animation software is probably the simplest to use, and for a good reason: Animagic GIF for Windows offers the minimum features required for GIF animation. That's not to say that this is a bad program; in fact, it offers a few functions that aren't provided in any other application I've used, but it's definitely not a "power user's" application.

Figure 4-39 illustrates one of the sample animations provided with the program—an alligator twitches its tail and opens its eyes. As you can see, the frame list on the right is a no-nonsense list of images, but Animagic GIF does provide a palette window that you can use to manipulate colors. If Animagic GIF excels at any particular function, it's probably in the control it gives you over the individual palette in each of your images and the global palette used

by the entire animation. You can load and store custom palettes and apply them, reduce the color depth of your images (saving you the step of loading them in an external image editor), convert frames to grayscale, and set transparency; there are a number of color optimization features as well. In fact, Animagic GIF provides more methods of optimizing GIFs than any other program I've used.

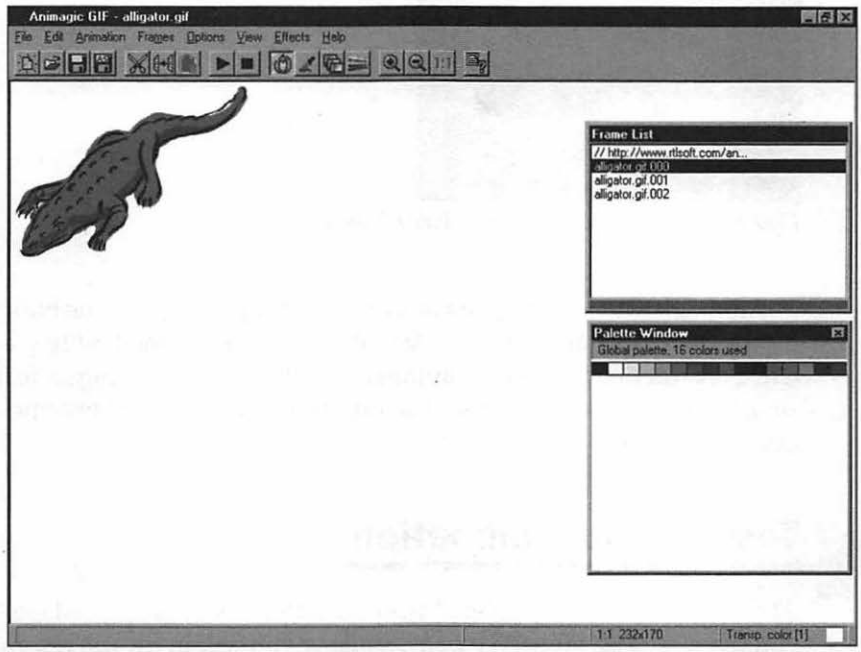


Figure 4-39: A sample GIF loaded in Animagic GIF.

Animagic GIF also provides you with a number of standard transition effects like fade in and out, dissolve, wipe, and spiral, and as shown in Figure 4-40 each effect can be modified. However, none of them offer the level of control provided by GIF Construction Set, much less VideoCraft GIF Animator. You also won't be creating any banners or LED signs with this program. If you're looking for those special features, you'll have to choose another application.

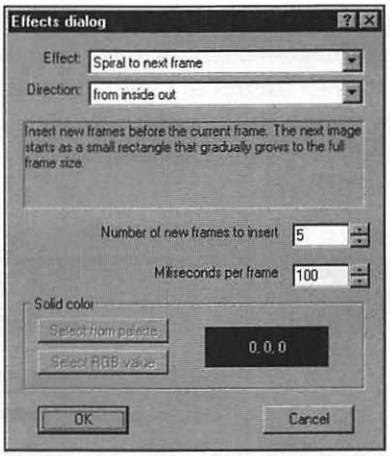


Figure 4-40: The Transition Effects dialog from Animagic GIF.

Animagic GIF is a relative newcomer, but it provides all the basic features necessary for GIF animation; in fact, it reminds me of the first few versions of GIF Construction Set. With continued development and a larger feature list, its simple commands and easy-to-use interface may very well become its strongest advantage!

Testing Your Animation

At this point, you've completed your animated image and saved it to disk. Now you can slap it on your Web page, smile at yourself in the mirror, and let the teeming millions of Netscape owners out there enjoy your handiwork. Right? *Wrong*. In fact, quite the opposite. Although novice and amateur Webmasters can build animated GIFs, a true professional who cares about the appearance and load time of his site would never simply dump a large animated image onto a page and walk away. If you've created a spinning bullet that's 6K long, you can probably get by with a quick test using your own browser. On the other hand, the larger the image, the more important it is to test your animation. And remember, what looks good within your animation program or on your local computer may not immediately work well on your page. Only a round of proper testing can ensure that your animated GIF is really ready for the general public.

In this section, we'll discuss a proven procedure called *usability testing* that you can follow to evaluate everything from a new animated GIF to an entire site. Most major software developers are already familiar with usability test-

ing, as it helps determine whether a program is easy or difficult to master under real-world conditions. In our case, "real-world conditions" means everything from:

- a 14.4 kbps modem to a T1 line.
- a 16-color driver to a 16-million color driver.
- the latest browser to a version that's three years old.

Step 1: Creating a Test Page

Your first step in testing your animation involves the creation of an invisible test page on your site. My test page is not connected with any other page on my site and carries a somewhat unusual name. It includes a color palette and three different background blocks of black, white, and neutral gray so that I can try the image on different backgrounds if necessary.

I use a test page because I often complete animated images before the final page content is ready; of course, if you've already completed the full page, you should use that for testing instead.

TIP

If the final page will feature several animated GIFs, static images, sound files, or Java applets, make sure your test page reflects this. Add an equal number of similar images so that your load times will more accurately reflect the final page.

Step 2: Selecting Test Machines

Next, pull out your trusty address book and call a few friends that also surf the Web and are willing to spend a few minutes online to help you. You're looking for a range of test machines that are running a wide variety of processors, video drivers, modems, and browsers. Table 4-3 gives you some idea of three machines I would look for to help me test.

Machine 1	486-33	256-color display	ISDN or T1
Machine 2	386-33	16-color display	14.4 modem
Machine 3	PowerMac	16-million color display	33.6 modem

Table 4-3: Three recommendations for testing machines.

TIP

In an office environment, you may be tempted to find a number of different machines with different capabilities, but remember that if they're all running through the same T1 connection to the Internet you're not going to get a credible result.

Step 3: Running the Test

Once you've added your new animated image on the test page, you're ready to run your test. For the worst possible stress-test scenario, have your friends connect with your site during your busiest hour. Make sure they write down the following information:

- **Total loading time.** How long did the entire page take to download from the moment the connection was made to your server?
- **Loading time for the image.** How long did the image itself take to download? This figure may be harder to determine on some browsers, but you can usually get an estimate by watching the program's status bar.
- **Quality of the animation.** Did your image correctly follow its movement cycle, including any delays you might have included? Was the frame rate acceptable?
- **Positioning.** Did your image appear in the proper position?
- **First impressions.** Was your animation fun to watch? Could it have been improved in some way?
- **Potential problems.** Was the image dithered? Did it fail to animate at all? Was the transparency correct?

Of course, only you can determine the "optimal" load time. As I mentioned earlier, if your site offers animated clip art or your company specializes in digital video and Web special effects, an image that takes over a minute to load probably wouldn't bother your visitors; they're expecting your site to take longer. On the other hand, if you find yourself with an image that didn't animate smoothly on at least two of your test machines, it's probably time to add or modify frames. Likewise, if you're offering a simple personal home page to the public and your new animated image took 3 minutes to load on a 14.4 kbps connection, it's back to the drawing board!

Testing may not be a requirement for every image, audio clip, or plug-in that you add to your page, but I've found time after time that it never hurts to check your site if you add anything substantial.

Optimizing the Results

"OK, Mark, I tested my new animated GIF of the Titanic sinking and it's too doggone big. Does that mean I have to start over?" I suppose you could if you like, but there are steps you can take to reduce the size of your image without losing all of that work—why not try *optimizing* your GIF animation? Before you start over at frame 1, consider the alternatives in this section.

TIP

In fact, optimizing all of your animated images—no matter what their size—can dramatically speed up the overall loading time for your page. I generally optimize all of my animated GIFs immediately after they're created.

Optimizing Through Compression

Several of the GIF animation programs we've discussed in this chapter include built-in optimizing functions. For example, GIF Construction Set offers the SuperCompress feature shown in Figure 4-41, PhotoImpact GIF Animator has a multi-stage GIF optimization feature, GifBuilder offers Frame Optimization, and Animagic GIF has several types of optimization that can be applied while you're saving your image to disk.

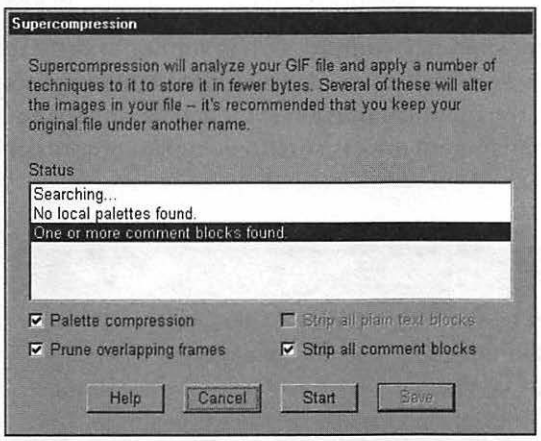


Figure 4-41: The GIF Construction Set SuperCompress dialog.

In general, these optimization functions use one or more of these methods to shrink the size of your image:

- **Palette compression.** The program will examine each of the individual frames in your image and determine which colors from the palette are not being used and remove those unused colors. This can have the same effect as reducing the color depth of your image so each pixel requires fewer bits for storage, and yet when properly done, your visitors will be unable to see the difference.
- **Drop comment and plain text blocks.** The program strips all of the comment and plain text blocks in your file. The image is unaffected, but you'll lose the information that was stored in these blocks. Copyright information is often stored in comment blocks, so be careful and check the contents before you optimize the image to avoid removing the copyright notice.
- **Dirty rectangle compression.** This function is the specialty of Animagic GIF and GifBuilder, but it doesn't work well with animated GIFs that use transparency, and all of the frames in your image must have the same border. As an example, a human figure running in a blue rectangle would be a good candidate for dirty rectangle compression. If a frame has the same pixels as the frame underneath it, the identical portions of the image are cropped and the cropped image is aligned over the previous frame; in effect, the background from the previous image "shows through" the current layer. To the human eye, there's no difference, but significant savings can result if your animation contains a large number of frames.
- **Transparency.** Transparency compression is similar to dirty rectangle compression; however, instead of cropping the identical portion of the frame altogether, the identical portion is tagged as transparent. The image with the transparent area is sure to be more compressible than the original image.

Is Compression Worth It?

How well does compression work? Here's an example: GIF Construction Set was able to reduce a monster 515K animated GIF in my collection to 495K using the SuperCompress feature. Figure 4-43 shows the results from PhotoImpact GIF Animator after I used its GIF Compression feature on the same image. That may not sound like a tremendous amount, but this was a very large animation built from an AVI movie with over 40 frames, and the frames were not suitable for the dirty rectangle technique. Other images I tested lost anywhere from 10 to 25 percent of their total length after compression.

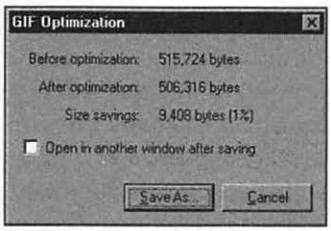


Figure 4-42: Optimization results from PhotoImpact GIF Animator.

You can even compress your images without one of these GIF animation applications! All you need is Netscape and an Internet connection. Simply enter the URL www.webreference.com/services/gw/ and you'll arrive at one of the neatest Web utilities available: the GIF Wizard online compression page, as shown in Figure 4-43. This service is provided by webreference.com, a fantastic site especially devoted to Webmasters.

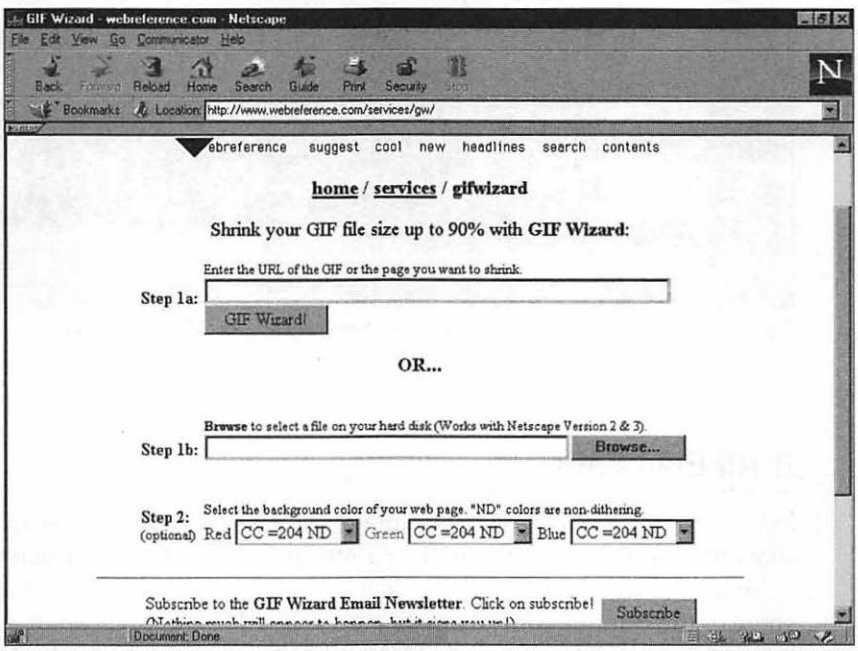


Figure 4-43: The GIF Wizard page.

To use GIF Wizard, you can either enter the URL that corresponds to your image (if it's online), or you can browse your hard drive if you're using Netscape and upload the image. Figure 4-44 shows an image from my page that was compressed automatically by GIF Wizard; notice that it provides you several choices, and once you decide which level of compression you want you can download the image directly from the results page. Life is definitely good!

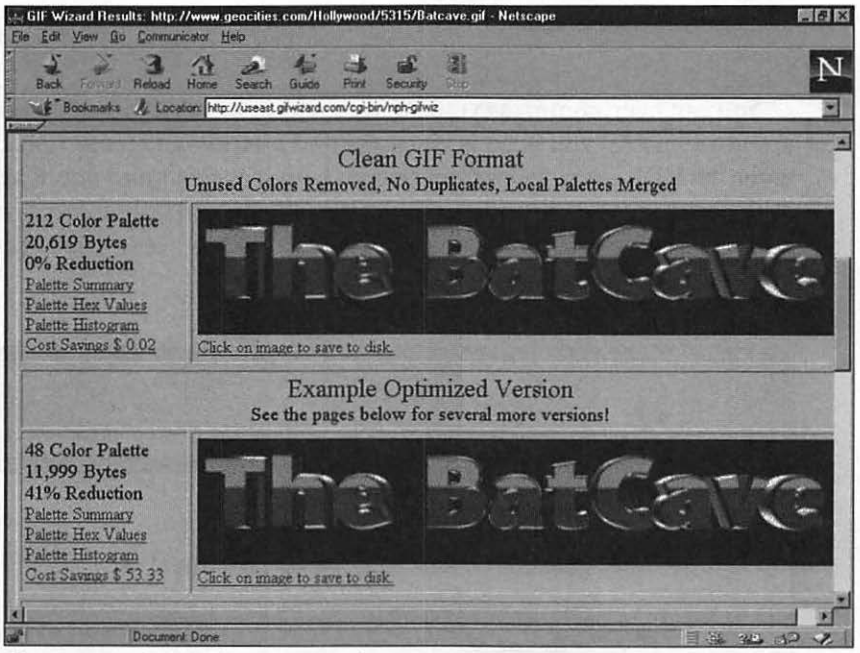


Figure 4-44: The title from my site after compression on the GIF Wizard page.

If All Else Fails...

Many programs also provide a function called *posterizing*, where unique colors that are close to each other on the palette are dropped in favor of one specific color for that entire range; if you're in a desperate fix, you can always sacrifice some of the color in your image to gain space. For example, an image that might have had 200 colors would drop to 125 colors. Unlike color reduction, posterizing will result in a visible reduction of detail within your image, and it's generally considered inferior due to the reduction of color depth as we discussed in Chapter 3. You'll learn more about this technique in our discussion of Photoshop in the next chapter.

Naturally, you can also reload your image and reduce the number of frames by pulling some of them out of your animation; this is probably the right method to use after your animation has been compressed and you still need to save additional loading time (I prefer it to posterizing because your images will keep their same detail and color depth). Often you can remove a number of frames without significantly affecting the appearance of your animation.

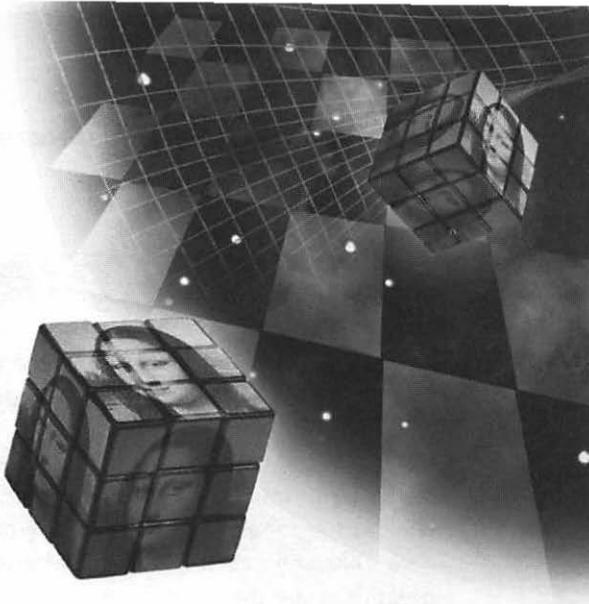
Moving On

In this chapter, you built your first animated GIF images using GIF Construction Set, and we tried a number of other great features offered by this program. Then I introduced you to the other best-known GIF animators available on the Internet. We also used GifBuilder to create animation on the Macintosh. You also learned how to test your finished images on a wide variety of machines and how to compress your finished GIF animations for the best possible loading speed.

In Chapter 5, we'll use Photoshop to create animated GIFs with more advanced effects.

CHAPTER 5

Advanced Image Editing



In Chapter 3, you were introduced to the basics of image editing, including resizing, cropping, transparency, and a number of other techniques. These tools are the bread and butter of computer image editing; nothing fancy, but once you've finished with basic image editing, you've corrected any imperfections and your image is ready to become a single frame of animation. Since you now know the steps involved in combining image frames together to form animated GIFs, you're ready to start building your own animated Web pages—so why should we return to image editing again?

I can sum up the answer in a single question: what if you want to go *crazy* with your image?

What if you want to create an animation that will light up the imagination or perhaps portray something ordinary from a totally different angle? If basic image editing is akin to bread and butter, the advanced image editing ideas I'll show you in this chapter are seafood gumbo and strawberry cheesecake! Instead of just manipulating the image or correcting problems, you'll actually be changing the entire look of the image . . . you can take off in a dramatically different direction and allow your creative side to shine.

To begin, I'll introduce you to one of the best-known advanced image editors ever written—Adobe Photoshop. Keeping in mind the simple animation techniques you've learned, we'll discuss all of the spectacular image effects this program can produce, including image adjustments and filters, distortion, and layering. You can then use these effects to enhance the frames that combine together to form your animated image. At the end of this chapter, I'll also lead you through a technique that may help you shave 20–30 percent off of the size of your animations.

Hey! Wait a Second!

The entire idea behind this book is to produce the best animated images for the Web in the least amount of time and do it as *cheaply* as possible . . . and it's true that Photoshop is an expensive package that costs several hundred dollars. Why did I pick Photoshop?

In part, because Photoshop is so well-known. This program has been in use for so long now by so many people that it's practically become the de facto standard among Windows and Macintosh owners alike. Also, Photoshop is a comprehensive package that covers the entire range of effects, so it makes a great program to use for demonstrating all of these techniques.

However, if you'd rather not march to your local software dealer and shell out that kind of money for this juggernaut of a program, there is another choice: for Windows 95 users, it's Paint Shop Pro to the rescue yet again! Paint Shop Pro can perform many of the same tasks that we'll cover in this chapter, and it even supports both Adobe- and Aldus-compatible image filters. So rest easy, and register Paint Shop Pro—you'll still be able to follow along, and you'll be supporting shareware to boot. If you're running a Macintosh, you'll also find many of these same effects supported within Adobe PhotoDeluxe.

Introducing Adobe Photoshop

Time to take charge of your creative energy with another tool! Adobe Photoshop contains just about every image enhancement feature known to modern man. As you can see from the main window, shown in Figure 5-1, the program interface relies on three sets of controls:

- **The Menu system.** This is a standard Windows menu system with a huge number of selections, most of which are disabled until you've loaded your image.
- **The Toolbox.** Initially, the Photoshop Toolbox is positioned at the upper left corner of the window, but you can move it anywhere you like. As you might guess from the name, this icon bar allows you to control most of the drawing and editing tools at your disposal.
- **The Palettes.** These control windows are not to be mistaken for the color palettes that are common in image editing programs (although one of them does actually control the color palette). In Photoshop, a palette is

one of those stacked windows on the right side of the screen; each window contains a different set of controls, and you can arrange them any way you like. You'll also notice that some palettes have more than one tab, so you can display different information depending on the tab you've selected.

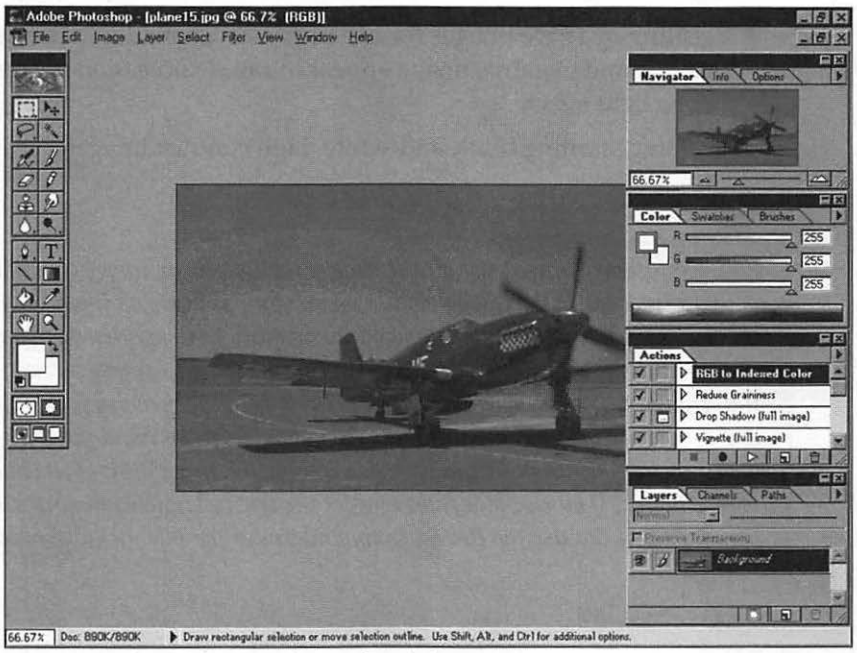


Figure 5-1: The Adobe Photoshop main window.

As you might imagine, there's much more you can do with Photoshop—enough, in fact, to fill several books bigger than this one. I'm not even going to attempt to teach you how to use it all in a single chapter. In fact, many of the effects that we'll cover are available in other image editors like Paint Shop Pro and Adobe PhotoDeluxe, so you can use the same techniques with another application.

Instead, my goal in this chapter is to provide you with ideas for your own creative imagination, no matter which tool you use. Concentrate on the result rather than the steps involved—that way, if you don't have Photoshop you can still enjoy yourself.

Enough talk . . . let's rock!

Image Adjustment Effects

First, let's cover some of the effects available under Image | Adjust. I typically use these effects for:

- Creating strange-looking background tiles from familiar textures. These backgrounds are later used for Web pages or animated images.
- Creating negative images for use in "flash" animation, where a positive and negative image appear in rapid succession to create a strobe light effect.
- Creating startling black-and-white, high contrast images.

TIP

One Photoshop feature I use all the time is the Duplicate Image command, which you can find under the Image menu. When you duplicate an image in Photoshop, you effectively copy the entire image into memory with another filename, where you can try all sorts of effects and experiment to your heart's content without modifying the original image on your hard drive. If you have the memory to use this feature—and I personally wouldn't run Photoshop on MacOS or Windows with less than 32 megabytes of memory—it can save you a tremendous amount of time in reloading a source image! If all else fails, don't forget the trusty Undo command under the Edit menu, or you can use the Revert command under the File menu to reload the image.

Inverting an Image

The Inversion command produces an effect like a photographic negative, as shown with the still life in Figure 5-2. If you experiment somewhat with this command, you can create an inverse background for a familiar object. For example, an inverse leaf would be an intriguing background for an animated worm or butterfly. As a friend of mine is fond of saying, "That's weirdness."

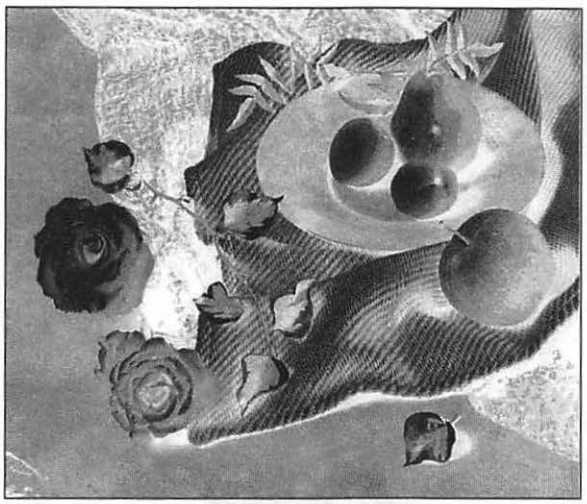


Figure 5-2: Flowers and fruit take a macabre look with the Inverse command.

To invert an image, follow these steps:

1. Select Open from the File menu, browse through your system, and load your image.
2. Select Adjust from the Image menu and then select Invert.

As you might guess, a series of frames that alternate back and forth between a normal image and its inverted version can produce a very effective animation! I wouldn't loop this one, however, since it would distract from the rest of your page after a few seconds.

Creating a High-Contrast Image

Photoshop's Threshold command is one of my favorites, and you see high contrast images created with this technique everywhere on the Web these days. In effect, the Threshold process converts all the pixels in your image to either black or white, based upon a luminance threshold (hence the name). Figure 5-3 illustrates the effect on our still life, while Figure 5-4 demonstrates it on that picture of your Uncle Milton—imagine an animation built from frames like these! For example, your animation might open with a regular color image, then switch to a low luminance threshold and slowly increase the threshold over ten frames or so. The effect will remind you of a camera flash suddenly turning everything to stark black and white. I wouldn't loop a high contrast animation, however; it would probably be too distracting to the user.

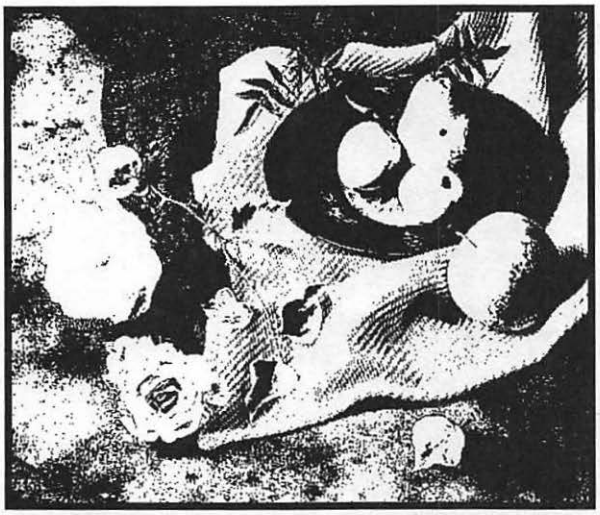


Figure 5-3: Our still life after treatment with the threshold function.

Figure 5-4: Uncle Milton in stark black and white.

To create a high contrast image, follow these steps:

1. Select File | Open, browse through your system, and load your image.
2. Select Image | Adjust and then select Threshold. Photoshop displays the Threshold dialog shown in Figure 5-5.

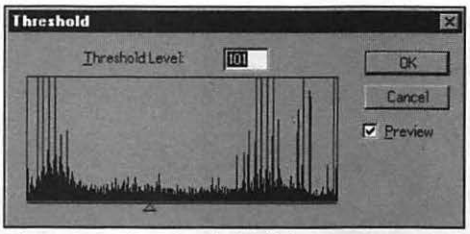


Figure 5-5: The Threshold dialog.

3. The dialog displays a "cross-section" (commonly called a *histogram*) of the luminance levels within the image of Uncle Milton; each line in the histogram graphically displays how many pixels in the image match each specific luminance value. The Threshold Level represents the minimum luminance value that determines whether a pixel will be black or white. If you'd rather not mess with all these image design terms, then just do what I do and experiment! Click the sliding pointer to move the threshold left and right; if you've enabled the Preview check box, you'll be able to see the effects of different levels reflected in the image, in real time. You can also click in the Threshold Level field and enter a luminance value directly.
4. Once you've achieved the desired effect, click OK to confirm the change.

Posterizing an Image

Many Photoshop users are familiar with the Posterize function as an alternative method of reducing the color depth in an image for display on a Web page, but its main purpose is to alter the look of an image. Generally, when I'm reducing the color depth of an image for Web page use, I don't want the viewer to be able to tell any difference between the original and the converted image.

The Posterize function allows you to reduce the brightness levels in your image to the number of levels that you specify. Photoshop will alter the brightness level of each pixel in the image to match the closest level. In Figure 5-6, you can see the "banding" effect produced on an image by posterizing it down to 3 brightness levels; values can range from 2 to 255.

Figure 5-6: The Posterize function can be used to reduce color depth.

To posterize an image, follow these steps:

1. Select Open from the File menu, browse through your system, and load your image.
2. Select Adjust from the Image menu and then select Posterize. Photoshop displays the Posterize dialog shown in Figure 5-7.

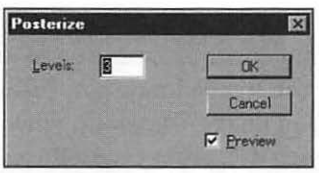


Figure 5-7: The Posterize dialog.

3. Click in the Levels field and enter a value directly for the total number of brightness levels for the image; if you've enabled the Preview check box, you'll be able to see the effects of different levels reflected in the image, in real time.
4. Once you've achieved the desired effect, click OK to confirm the change. Click Cancel to exit the Posterize dialog without saving your changes.

Using Image Filters

Adobe Photoshop is well-known for its filter support. That statement is roughly akin to "Those Ferrari cars are fun to drive." In fact, image filters are such a popular function in Photoshop that many small companies make a decent profit just selling custom filters to layout and publishing professionals, and often you'll find a professional graphic designer has just as many plug-ins for Photoshop as different fonts!

But what is an image filter? The technical answer is that a filter is a "plug-in" code module that extends Photoshop with one or more new effects; the simple answer is that at least one more magical effect is added to your toolbox every time you install a new image filter. Once installed, filters are displayed in the menu system just like the original filters included with the program.

The standard image filters available within Photoshop are divided into the following major groups shown in Table 5-1, each of which appears as a submenu under the Filter menu.

Artistic
Blur
Brush Strokes
Distort
Noise
Pixelate
Render
Sharpen
Sketch
Stylize
Texture
Video
Other

Table 5-1: The major image filter groups available in Photoshop.

Unfortunately, these groups are somewhat arbitrary; for example, don't automatically assume that the effect of one Texture image filter is similar to another. If you don't know the effect you're looking for, I recommend that you check the Photoshop Filter Sample Gallery in the online help system; it takes a

lot less time to display the different effects there than actually applying each one to your image. The longer you use Photoshop, however, the more familiar you'll be with these effects—many of the Web professionals that I know have most of them memorized!

Installing a New Filter?

In this chapter, all the image filters I'll mention are included as standard equipment with version 4.0 of Photoshop, but if you have a third-party filter you'd like to try out, it's very simple to install it within Photoshop.

If you're using Windows, use the Windows Explorer to copy the module into the Plugins subdirectory in the Photoshop directory.

If you're using a Macintosh, copy the module by dragging it into the Plug-ins folder in the Adobe Photoshop folder.

Applying Filters

All image filters within Photoshop are generally applied in the same manner:

1. Select Open from the File menu, browse through your system, and load your image.
2. If you're going to apply the filter to a portion of the entire image, use one of the selection tools at the top of the Toolbox icon bar to select the desired area.

It's a Reunion!

You may be saying "Geez, Mark, I've already learned how to select different areas in Paint Shop Pro . . . do I have to learn a different set of controls?" Negative! Welcome back your old friends, the rectangular selection tool (called the Marquee selection tool in Photoshop), the Lasso, and the Magic Wand! They all work very similar to their counterparts in Paint Shop Pro, so if you're used to them in one application, they'll be familiar in the other one as well.

3. Pull down the Filter menu, select the desired submenu, and click on the effect name. If further user input is required, Photoshop will display a dialog prompting you for whatever choices or data are needed. For example, Figure 5-8 shows the dialog from the Accented Edges filter, complete with preview image.

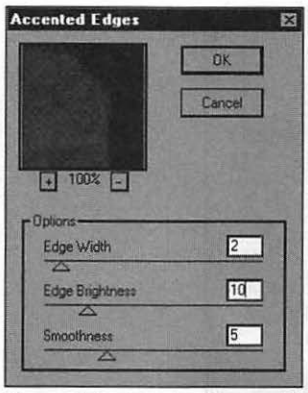


Figure 5-8: A typical image filter dialog.

Notice the "+" and "-" keys under the preview image; these are Zoom In and Zoom Out keys, respectively, and they allow you to move closer to your image or pull back. If you move your mouse cursor inside the preview window, it turns into a hand; you can click and drag this hand to move the preview window over any specific part of the image.

Some filter effects also have Preview buttons; you can click the Preview button to view the effect on the full image, but it may take some time, depending on the size of the image and the complexity of the filter's operation.

4. Click OK to start the process. You'll see a progress meter in the status bar at the bottom of the Photoshop window.

Mark's Filters of Choice

Although we don't have the space to talk about every filter available within Photoshop, I've found some of them especially helpful in creating Web graphics. In this section, I'll demonstrate six of my absolute favorites, each of which is ideal for a specific task.

Paint Daubs

I like to call this Artistic filter my "instant Van Gogh processor" because it's perfect for creating a convincing oil painting from any image. Naturally, the still life image I've been using as an example really shows this one off—check out Figure 5-9!

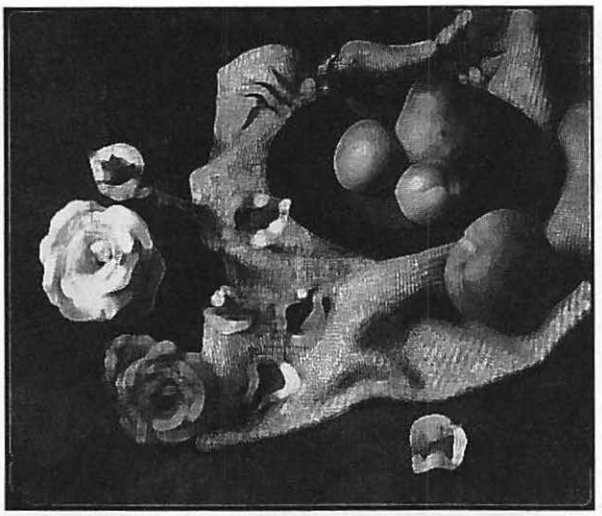


Figure 5-9: With the Paint Daubs filter, I suddenly have artistic talent.

As illustrated in Figure 5-10, the Paint Daubs dialog allows you to modify the brush size and the image sharpness. You can also choose from a number of different brushes. One nice animation you can create with this filter is to add sharpness with each frame which produces a "living painting" effect and ends your movement cycle with the untouched original.

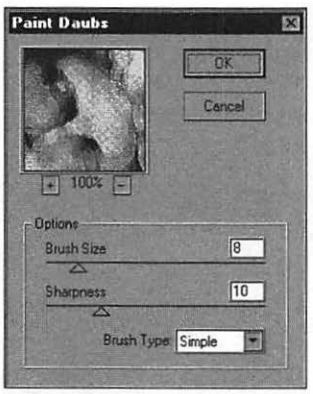


Figure 5-10: The Paint Daubs dialog.

Motion Blur

What better effect for an animated GIF than motion blur, which naturally you'll find under the Blur group. I've seen animated banners on Web pages that use this filter for everything from moving baseballs to accelerating cars (and even a flying hamburger)! Figure 5-11 shows a great example of an airplane that's suddenly been propelled into overdrive thanks to this filter.

Figure 5-11: An airplane accelerates with help from the Motion Blur filter.

Figure 5-12, which illustrates the Motion Blur dialog, gives you some idea of the real power of image filters. Notice that both the angle and distance of your motion blur can be "moving" in any direction, and the larger the distance value, the faster the apparent "speed" of the object.

Figure 5-12: The Motion Blur dialog.

Crystallize

This great Pixelate filter is most often used for custom-made animated transitions, with each frame in the animation using a smaller cell size ("cell" refers to a group of pixels with nearly the same color values). This filter divides the image into a number of individual cells. Such an animation would resemble a stained-glass image fading away. In Figure 5-13, you can see the effect of the Crystallize filter on our still life image.

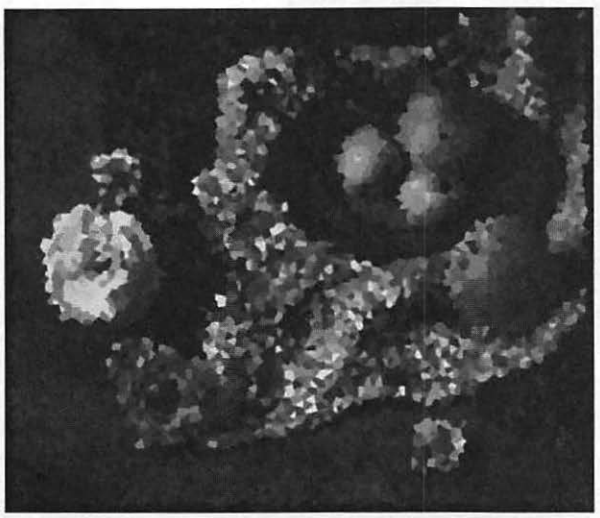


Figure 5-13: The Crystallize filter preserves a surprising amount of detail.

Sharpen Edges

You'll find the Sharpen Edges filter in the Sharpen group—no great surprise there—but this filter will definitely surprise you with its ability to rescue blurry, out-of-focus original images! I don't use this filter to create a motion cycle, but if you'd like to enhance the detail in your images before creating animation frames, I highly recommend this process. The Sharpen Edges filter works by increasing the contrast of your image at the pixel level. Figure 5-14 illustrates the effect of the Sharpen Edges filter on a grayscale JPEG image; notice how the duplicate image in the foreground seems to contain more detail than the original image in the background. The texture of the stone is easier to see and the outline of the hands are much clearer.

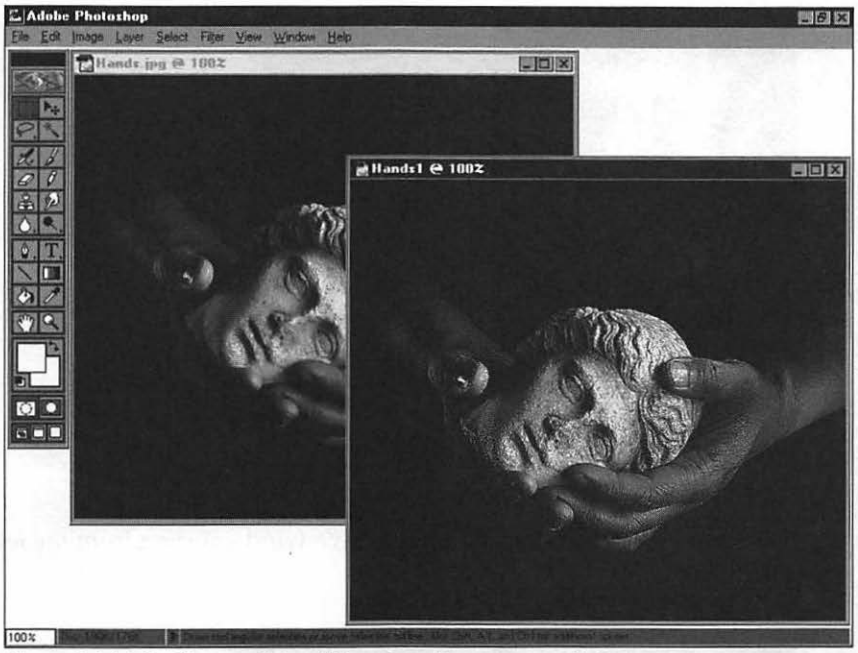


Figure 5-14: The Sharpen Edges filter at work on a grayscale image.

Wind

Another great filter for simulating motion is the Wind filter, which you'll find under the Stylize menu. As you can see in Figure 5-15, you can choose from three wind "strengths," and you can specify whether the Wind effect should originate from the left or right side of the image. However, since the effect cannot be controlled as precisely as motion blur, the Wind effect is better used as a constant effect throughout a motion cycle.

For example, if you have a cartoon racehorse that will speed across the top of your page without stopping or varying its speed, Wind is probably the better effect to use. On the other hand, if your animated horse starts the animation standing still and then starts running, you'll need the gradual control offered by the Motion Blur filter.

TIP

Remember that the Wind effect can only be controlled in a left or right direction (90 or 270 degrees), while the Motion Blur effect can "move" an image at any angle.

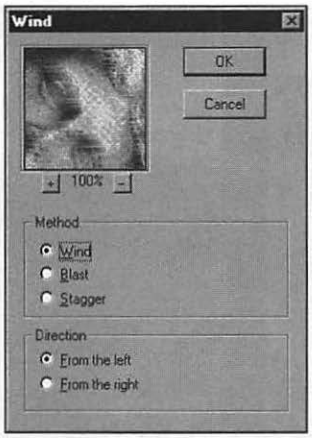


Figure 5-15: The Wind dialog and its controls.

Figure 5-16 illustrates an image with a wind entering from the left side of the dialog.

Figure 5-16: A Wind effect can also suggest motion.

Texturizer

The final effect I'll mention is the Texturizer, which you'll find under the Texture submenu. This is the perfect effect if you'd like to simulate a texture

underneath your image—for example, if the frames of your animation should look as if they're taking place on a piece of cloth or burlap.

Let's suppose you'd like to animate a piece of graffiti on the side of a building coming to life—no problem, as you can see in Figure 5-17. Use the Brick texture and specify Top for the Light Direction field in the Texturizer dialog, as shown in Figure 5-18. Other textures include burlap, canvas, and sandstone, or you can select a custom texture.

Figure 5-17: And you thought you needed a spray can for graffiti!

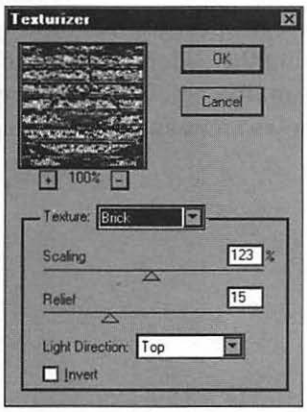


Figure 5-18: The Texturizer dialog settings I used.

Distorting Images for Animation

If you're interested in animation—and I think we can safely assume that—one particular group of Photoshop image filters deserves special coverage. The Distort family of image filter effects are very popular tools for creating animated GIFs; they're roughly akin to the old "circus mirrors" that you can still find tucked away in one section of every traveling carnival. All of these effects perform some sort of geometric contortion on your image, which often becomes a unique and very eye-catching movement cycle.

I generally separate these distortion effects into two categories:

- **Object distortion.** This type of distortion changes the shape of the image (usually it's an object that's being changed; for example, a car is pinched in the middle, or a computer floppy disk is sucked down a drain).
- **Surface distortion.** Unlike object distortion, the surface of the image itself seems to be changed, as if you're viewing the image through a specific texture.

I'll cover both categories in this section by discussing several Distort filters that are especially well-suited for animation, as well as examples of how each can be applied.

Pinch

You've seen this object distortion effect a thousand times on the Web; an animated object seems to bulge toward you in three dimensions, or perhaps it appears to be pulled backward like it's being sucked into a vacuum cleaner. The Pinch filter can create both effects! You can specify a maximum "bulge" of –100 and a maximum "pinch" of 100 using the slider in the Pinch dialog, as shown in Figure 5-19; the 3D wireframe matrix below the slider gives you a visual preview of the effect. Figure 5-20 shows an image that has encountered an unexpected pinch!

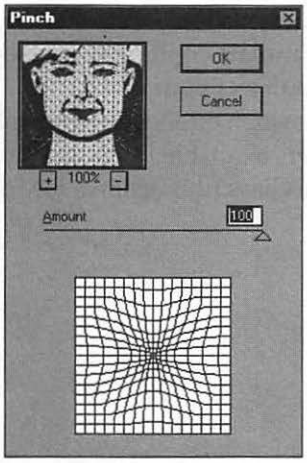


Figure 5-19: The Pinch dialog with its 3D wireframe model.

Figure 5-20: An image after it's been pinched.

I've found that the Pinch filter produces the best results on less complex images, especially if they have a single-color area. A good example for animation would be a person wearing a solid color T-shirt; each frame would apply an increasing amount of bulge to the model's stomach, ending in an animated fitness nightmare.

Glass, Ripple & Ocean Ripple

I'll combine these three separate surface distortion effects into one discussion for our purposes, since their effects are very similar. These filters overlay a specific transparent texture on top of your image. (This differs from the

Texturizer filter we discussed in the previous section, which placed the specified texture **under** your image). You can simulate rippling water, several different kinds of glass, and even load textures of your own.

Figure 5-21 illustrates the Glass dialog, which offers more control over this distortion filter than most of the other filters available in Photoshop. Figure 5-22 is a good example of the effects of the Glass filter using a low distortion level and the Frosted texture.

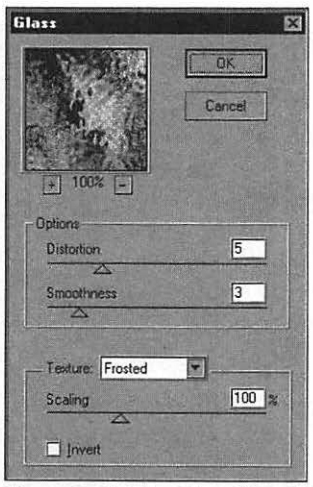


Figure 5-21: The Glass filter dialog offers a number of controls.

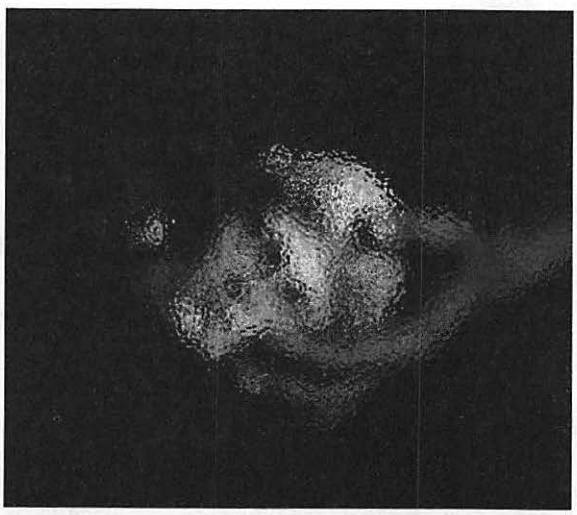


Figure 5-22: An interesting effect obtained with the Glass filter.

The Glass filter can be used to create a sophisticated rippling dissolve by increasing the distortion and smoothness levels by a value of 1 for each successive frame; the best way to describe this effect in print is by saying it will remind you of a bowl of Jell-O beaming aboard the Enterprise in an episode of *Star Trek*!

Shear

Speaking of Jell-O, you've seen the Shear effect often on both TV and the Web—an object can be bent, twisted, and elongated with this filter, pulling your image around as if it were a piece of taffy or a rubber band. To control this effect from the Shear dialog, you click anywhere on the vertical center of your image to add a handle, and then drag that handle anywhere in the control box to perform the same distortion on your image. The farther away from center you drag your handle, the greater the distortion, and you can move the handle up or down to distort the image at an angle. For an animation movement cycle—a cartoon image on a black background, for example—I usually select Repeat Edge Pixels for the Undefined Areas field. This prevents your image from "wrapping around," which would ruin the effect of motion.

TIP

If you decide the effect isn't quite what you wanted, click the Defaults button to return the preview image to its original position.

You can select multiple handles as well, so your Shear effect can even take off in multiple directions! Figure 5-23 illustrates the Shear dialog with two handles selected, while Figure 5-24 shows the result of two Shear points moving in opposite directions.

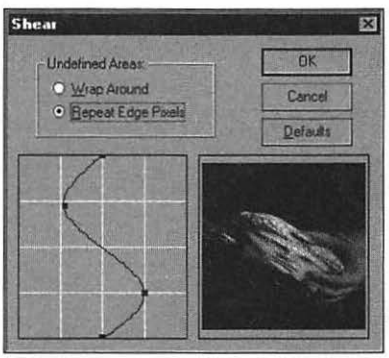


Figure 5-23: Selecting multiple directions for a Shear effect.

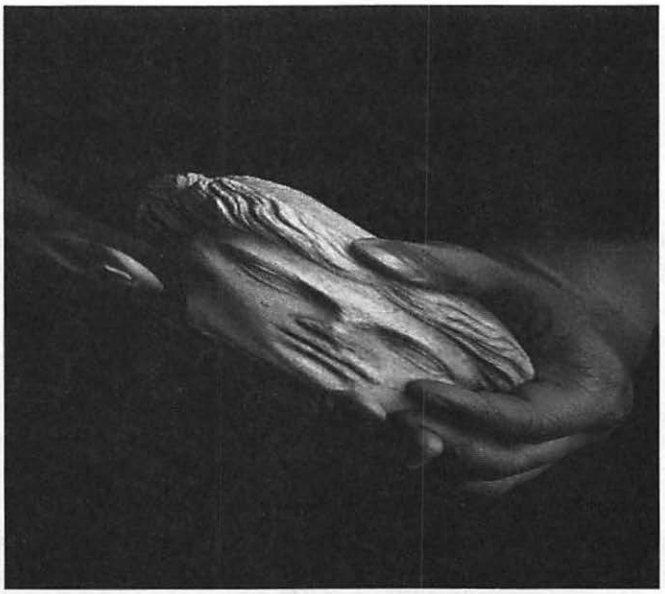


Figure 5-24: A typical result of a Shear filter.

ZigZag

Now here's a great object distortion filter effect that's just crying out, "Animate me! Animate me!" And, in fact, Web artists have heard that call, and you've seen animation using ZigZag on everything from banners to buttons. This filter can produce three different styles using the same controls: Around Center, Out from Center, and Pond Ripples. To tell you the truth, I personally consider Out from Center to look just as much like the ripples in a pond as the Pond Ripples style; for example, Figure 5-25 illustrates an image distorted in this style.

Figure 5-25: Doesn't this look like the ripples in a pond to you?

However, I didn't write the program, so I don't get to name the effects. All three of these effects can be set to anything from a hardly noticeable smudge to a full-fledged trip back to the '60s, so you have great control over the level of distortion. Figure 5-26 illustrates the ZigZag dialog, which also features a 3D wireframe preview.

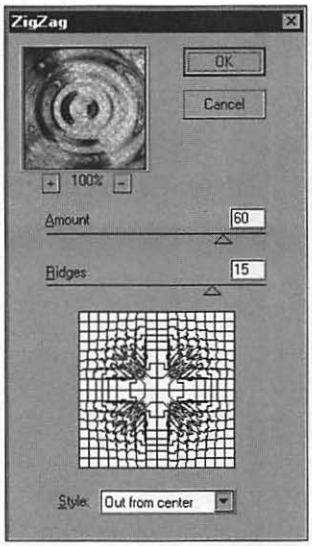


Figure 5-26: The ZigZag dialog.

Twirl

Our final distortion effect is perfect for that work that belongs "down the drain"—or, for that matter, down the black hole! If you look at Figure 5-27, you get the idea; the Twirl effect is especially good for a "twist-untwist" animation for a logo or a word you've rendered in 3D. The more detail, the better the effect; add a loop and you've built an animation that can glue your visitor to your page, watching your image twirl back and forth. In fact, a warning about the dangers of hypnotism might be in order.

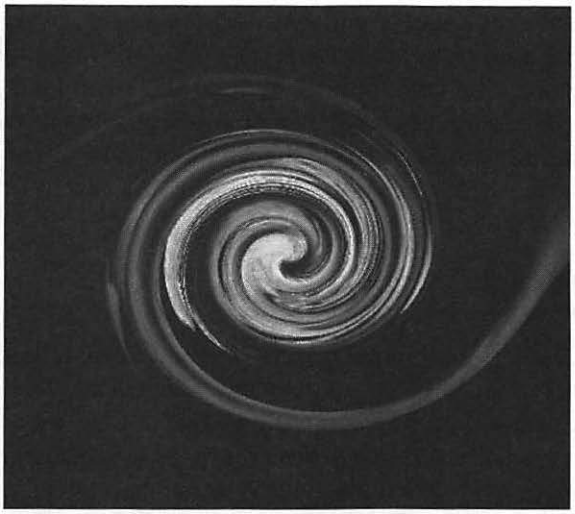


Figure 5-27: The Twirl filter produces an outstanding effect!

Figure 5-28 illustrates the Twirl dialog. Although you only have one control to work with, you still have all you need to gradually increase the twirl angle for successive frames of your animation.

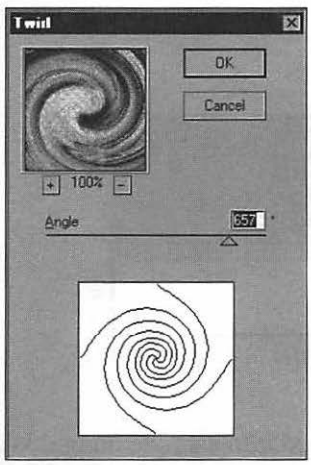


Figure 5-28: You only need one control to do the twirl!

Now it's time to move on—there's much more ground we must cover in Photoshop that will be valuable to you as an animator! I'll close this section by again offering my best advice on image filters, no matter what editing soft-

ware you use: experiment! Try each and every filter you can get your hands on. Of course, they're all nifty for creative work with static images, but while you're trying out a new filter, ask yourself, "Would this effect look good animated?" The more experience you gain using these filters, the faster you'll be able to produce mind-blowing animation that will draw visitors to your Web site like bears to honey.

Layering Images

As we learned in Chapter 4, animated images are built from individual frames, each of which holds a "slice" of the movement cycle. When combined, your eye sees these frames as a single moving image. In Chapter 4, our piano keyboard example was animated in a series of four images using Paint Shop Pro, and each of those images was saved with a separate filename.

You can perform these same steps in Photoshop as well, using its support for *layered images*. In effect, a layered image has "depth" as well. Depending on the total memory available to Photoshop within your system, up to 100 successive layers can be added to a background, and you can alter the characteristics of any layer without changing the other layers in the image. Figure 5-29 illustrates a cross-section of a layered image. Photoshop also provides an adjustment layer, which is a special layer rather like a control block in an animated image—you can use an adjustment layer to add some specific effects to all the layers below it.

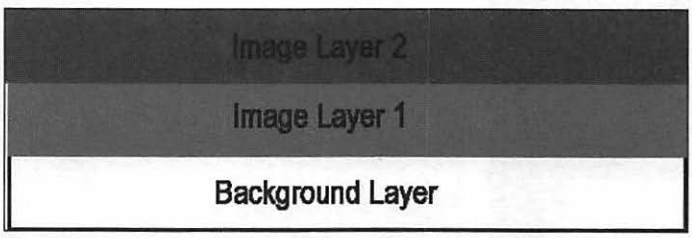


Figure 5-29: A cross-section of a layered image created in Photoshop.

So how are these layers finally combined into a single image? When you're satisfied with the final appearance of your image, you can use the Merge Layers command to lock everything together, and then you can save your completed image to your hard drive.

In this section, I'll show you how the layer support within PhotoShop makes it an ideal tool for creating animation frames. In fact, we'll re-create the frames necessary for our animated keyboard, so you can compare the process against the steps we took in Paint Shop Pro.

Which Is Better?

"OK, if the techniques for creating animation frames I learned in Chapter 4 work fine, why should I use Photoshop instead?" Actually, you don't have to but you may find the Photoshop method faster. If you create animation frames completely within Photoshop, you'll avoid loading other programs, and you can apply any of the image effects we discussed earlier directly to a layer. Also, creating your animation in layers allows you to "preview" the finished effect one layer at a time.

To answer the question, there really is no "better" image editing program. As long as your editor supplies the filters and features that you use most often, select the one with the interface that you like the most!

To build a layered image for animation, follow these steps:

1. Select Open from the File menu, browse through your system, and load your image; in our case, we'll be loading our old friend piano.gif.
2. We need to convert piano.gif to grayscale or RGB Color to add layers, so select Mode from the Image menu and then select Grayscale from the submenu that appears. Photoshop will prompt you for confirmation that you wish to discard color information from your image. Since our keyboard is strictly black and white, we can do that and save bytes to boot!
3. Next, add a layer to your original image by selecting Duplicate Layer from the Layer menu. Photoshop displays the Duplicate Layer dialog, as shown in Figure 5-30.

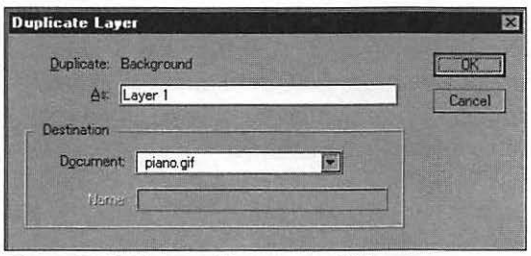


Figure 5-30: The Duplicate Layer dialog.

Enter **Layer 1** in the Duplicate As field and click OK to continue. You'll notice that your new layer now appears in the Layers palette at the right side of the screen, as shown in Figure 5-31. Your original image has become the background, but it doesn't get a layer number.

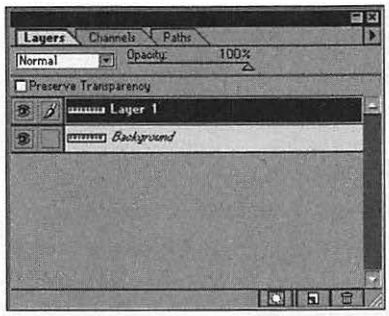


Figure 5-31: A new layer appears in the Layers palette.

New Layer vs. Duplicate Layer

You may be wondering why we didn't create a brand new layer instead of duplicating the existing layer . . . good point! I usually select New Layer whenever I need to draw or import a different image as a basis for each frame (for example, the flames of a fire or a door opening and closing). Since a brand new layer starts as a blank, I can add only the part that moves (the flame or just the door), while the background stays the same (the fireplace or the door's frame).

However, each frame of our piano keyboard is based upon the same image as the background, and the movement cycle is based on color changes rather than motion; so, therefore, we can save ourselves quite a bit of work by simply duplicating the background and making our changes!

If you do need to create a brand new layer, select New from the Layer menu and then select Layer from the submenu that appears. Alternatively, you can click the New Layer button at the bottom of the Layers palette (Windows users should Alt-click, while Mac users should Option-click). The New Layer dialog will appear; you'll notice that the default values are fine for animation. In most cases, you'll want full opacity, and most frames should be created in normal mode. Click OK to continue, and you've created a new frame.

4. Now we'll add the gray keys to Layer 1 as we did in Paint Shop Pro. Select the Eyedropper tool from the Toolbox, and move your cursor over one of the shades of gray in the Swatches palette. Click to pick up the color as your foreground, and then select the Paint Bucket from the Toolbox. Click inside one or two keys at random, just as we did in Chapter 4, to fill them with the color.

   That finishes Layer 1! Next, let's add Layer 2. Select Duplicate Layer from the Layer menu. Photoshop displays the Duplicate Layer dialog; enter Layer 2 in the Duplicate As field and click OK to continue.

6. Select the Eyedropper tool from the Toolbox, and move your cursor over one of the shades of gray in the Swatches palette. Click to pick up the color as your foreground, and then select the Paint Bucket from the Toolbox. Click inside one or two keys at random to fill them with the color—different keys, of course, than you picked for Layer 1.

7. OK, Layers 1 and 2 are done. Now repeat steps 5 through 8 once more to create a total of four layers, including the background. Make sure that you click the Background layer on the Layers palette first, so that you're creating a duplicate of the original image instead of the last layer you made. Select different keys and specify Layer 3.

TIP

It's a common enough scenario with any graphics application, including Photoshop. Let's say you've assembled an image with twenty layers, each of which will be a frame of animation, and you suddenly discover that you forgot to add some detail to layer 12. Don't panic—it's easy to edit an individual layer in Photoshop.

8. If you'd like to try one of the image effects we covered earlier in this chapter, go ahead and apply the filter you'd like to try to one of your layers! Let's try adding a Crystallize effect to Layer 2, and I can show you how to edit an individual layer.

9. Click the Layer 2 section on the Layers palette. Photoshop automatically displays that image layer. This activates the layer, and any change that you make is applied directly to this layer.

10. Pull down the Filter menu, select the Pixelate submenu, and click Crystallize. Photoshop displays a dialog prompting you for the cell size, complete with preview image. Select a cell size and click OK to apply the effect.

11. To add a different amount of Crystallize to another layer, click to select the layer from the Layers palette.

Setting Layer Options

You can also set a number of options for the active layer by selecting the Layer Options item from the Layer menu. As shown in Figure 5-32, you can change the layer name, its opacity, and how it handles the display of pixels in layers underneath it.

Most of these need no adjustment, but I do use the opacity control from time to time. Although we won't need to vary opacity with our piano keyboard, you can lower the opacity percentage to allow other image layers beneath to show through during your animation. This is especially convenient for frames with fog or smoke, where you want your movement cycle to include a swirling mist effect.

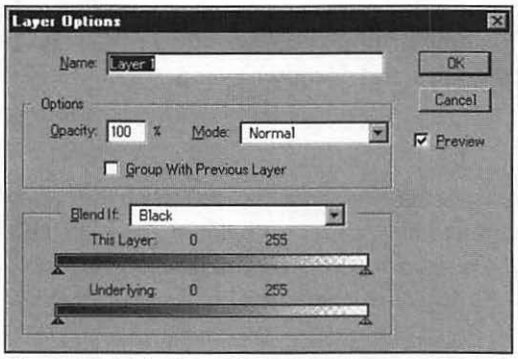


Figure 5-32: The Layer Options dialog.

12. At this point, you've built an entire image that—if we merged it—would show all of the gray keys at once. However, we can't actually animate these four different layers within Photoshop, so we need to save them as separate GIF images for use with GIF Construction Set. To do this, highlight each of the layers you've created one at a time (except for the background, which is actually just piano.gif), and select Save a Copy from the File menu. Photoshop displays the dialog shown in Figure 5-33; select BMP format in the Save As field, enter a new unique name (usually with a number to indicate sequence) for this frame, and click OK to save it to a disk as a bitmap. Since our background remains piano.gif, there's no need to save it.

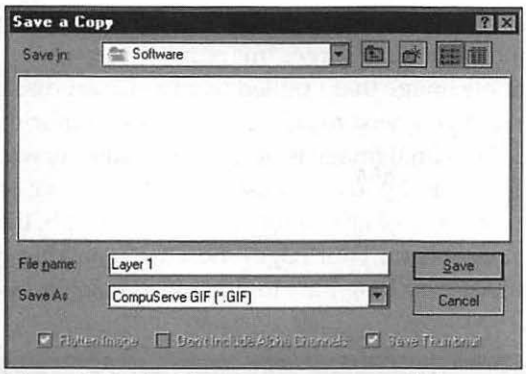


Figure 5-33: The Photoshop Save a Copy dialog.

Now you have the same four images you had in Chapter 4, ready for GIF Construction Set (which can import bitmap files as well)!

If you're like me, the method you choose to create animated frames will depend on the editing required for each frame; for example, if I'm animating a simple cartoon bird from a piece of clip art that needs to flap its wings, then I might use Paint Shop Pro. If I'm developing the title image for a Web page that includes more than one animation and I'd like to use one of the advanced filters I've mentioned, the choice is clearly Photoshop! If you have access to both programs, try animating an image under both applications and see which you prefer.

Sectional Animation With Photoshop

While we're here, I'd like to cover one more animation technique that Photoshop helps to simplify: *sectional animation*. In Chapter 4, you learned a number of rules, tips, and tricks that will help cut down the final size of your animated GIF images to a bare minimum—consider this to be a more advanced method of compression!

In section removal, a portion of the animation that does not change from frame to frame is removed—this is typically the background or some large portion of the image. I've also heard this technique called "keyhole" animation as well, since only the portion of the animation that changes is saved to each frame; in essence, this is the same technique as the dirty rectangle compression I mentioned in the last chapter.

This technique can save a tremendous amount of space in your finished image, but it does take additional work, and it doesn't contribute at all to the final appearance of the image. Therefore, I use it only if an animation has

grown so large that it needs major surgery to correct. For me, that threshold occurs somewhere around 50-60K for larger images.

Figure 5-34 shows a single image that I pulled from a clip art disc in my collection. Let's suppose that you need to animate the eyes on this image; we'd like for the lady to blink. If the final image is only an inch square, we're not talking a tremendous file size, and you could use the technique we covered in Chapter 4 to create several frames of animation. Suppose, though, that you need this image in a 4-inch square size for your page—now we're talking one huge animated GIF that will take a very long time to download using a 14.4k modem!

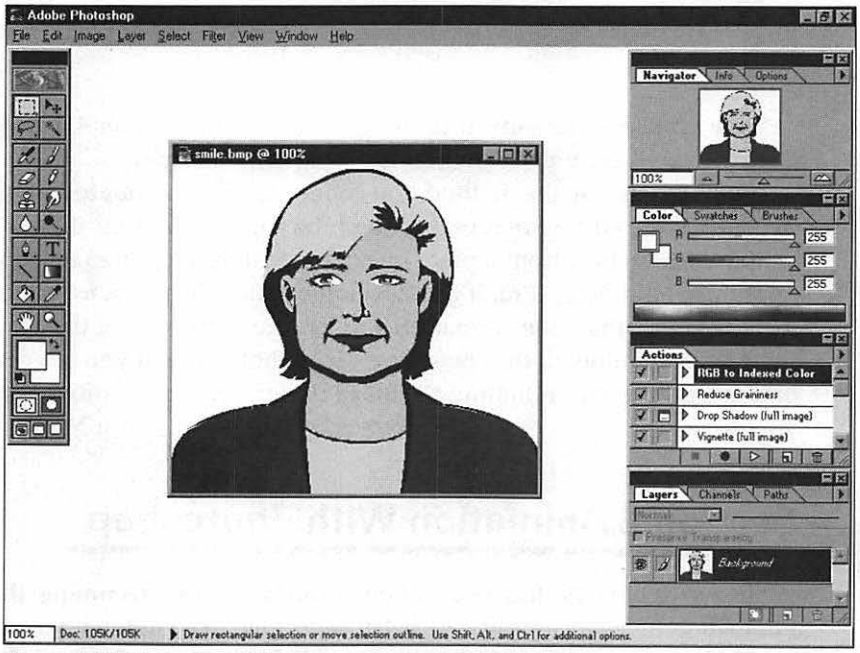


Figure 5-34: Our original image.

Hang on a second—let's look at this image again. If all we're going to animate is her eyes, we can use the sectional animation technique. After all, the rest of the image won't change at all, so we can trick the eye by using transparency. We can do it with a combination of Photoshop and GIF Construction Set!

Here's the steps we would follow:

1. Select Open from the File menu, browse through your system, and load smile.gif. Convert it to RGB by selecting Mode from the Image menu and then selecting RGB from the submenu that appears.

2. Next, add a layer to your original image by selecting Duplicate Layer from the Layer menu. Enter **Layer 1** in the Duplicate As field and click OK to continue. Your original image has become the background.
3. Use the Zoom tool from the Toolbar to zoom in on our subject's eyes. Select the Eyedropper tool from the Toolbox, and move your cursor over her face. Click to pick up her skin color as your foreground, and then use the drawing tools to draw her lids as they start to close, as shown in Figure 5-35.
4. Now for a very important step: expand the image to full size, and use the Marquee selection tool to grab just the top part of the image that includes her eyes. Once the right section is selected, use the Crop command on the Image menu to reduce this image to just her head and eyes, as shown in Figure 5-36.

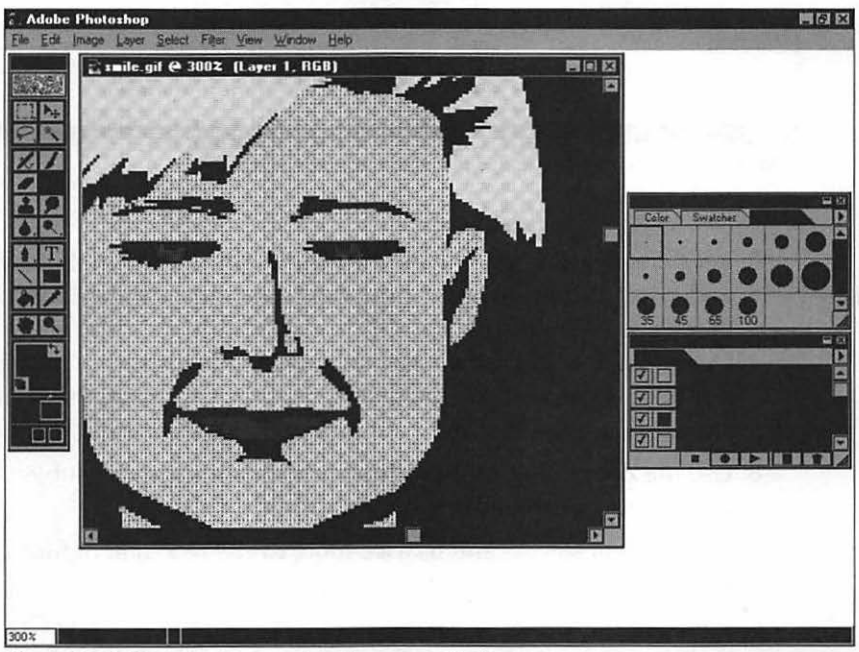


Figure 5-35: Zooming in to animating our subject's eyes.

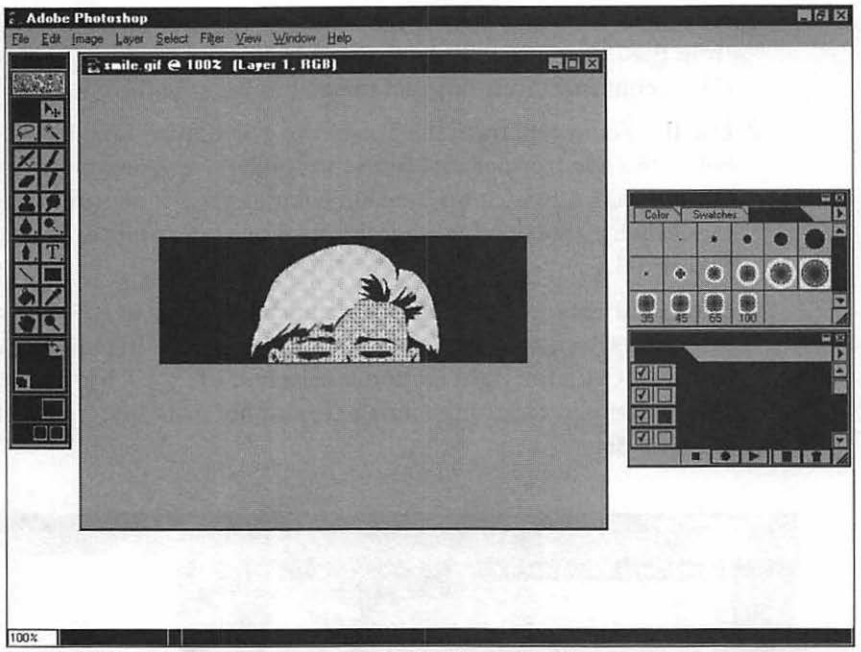


Figure 5-36: Cropping our image to a small animated section.

5. Let's create the second layer now. Highlight Layer 1 in the Layers palette, and select Duplicate Layer from the Layer menu. Enter **Layer 2** in the Duplicate As field and click OK to continue. Notice that we're now creating a duplicate of the last layer we made instead of the background; this allows you to draw the details necessary to create the animation as smoothly as possible, and your cropped area stays exactly the same size.
6. Use the Zoom tool from the Toolbar to zoom in on our subject's eyes. Use the drawing tools to draw her lids down a bit farther.
7. Next, repeat steps 5 and 6 twice more to create a total of four layers, including the background.
8. Time to save the top three layers of this image as separate GIF images so that we can use GIF Construction Set to build the final animation. To do this, highlight each of the layers you've created one at a time (remember, the background is smile.gif, so no need to save it), and select Save a Copy from the File menu. Select BMP format in the Save As field, enter a new unique name (usually with a number to indicate sequence) for this frame, and click OK to save it to a disk as a bitmap.

Now, exit Photoshop, fire up GIF Construction Set, and follow these instructions:

1. From the GIF Construction Set menu, select New from the File menu.
2. Highlight the HEADER image command and click the Edit button on the toolbar; GIF Construction Set displays the Edit Header dialog. Use the scroll buttons at the right side of the Screen width field to specify the width and depth for the background image.
3. From the toolbar, click the Insert button; GIF Construction Set displays the floating Insert Object toolbar. Click the Image button. The program displays a standard Windows File Open dialog. Select the first frame of your animation that includes the entire background (in our case, that's the original image, smile.gif) and click OK to load it.

   If necessary, you can position your smaller image in a specific location so that it's aligned with the larger image; for our example, this isn't necessary since the top sections of both images naturally match. However, if you need to adjust the position of your cropped image, highlight the IMAGE block for each of your cropped frames and click Edit. From the Edit Image dialog, you can set the top and left side positions relative to the largest frame in your animation.
4. If your image frames are using a palette that doesn't match your current global palette, it will be necessary to change the palette as we fully described in the section "Using the Animation Wizard" in Chapter 4. Select Use this image as the global palette and enable the Use this selection for subsequent images check box, so you won't have to go through this step for each image in your animation. Click OK to continue.
5. For each frame *after* the first frame (which, if you remember, is our background image smile.gif), add a CONTROL block in front of the IMAGE block. Click the preceding block in the list to highlight it (in this case, the HEADER block), click the Insert button, and then click the Control button. The CONTROL block must appear right in front of the IMAGE block, and GIF Construction Set inserts blocks after the highlighted command.

   Next, we must edit the CONTROL block to allow the lower portion of the head, neck, and shoulders from the first frame to remain visible. It's already highlighted, so click the toolbar Edit button to display the Edit Control Block dialog, as shown in Figure 5-37. There's no need to set transparency here or give it a value, since it's actually not necessary for sectional animation. Instead of transparency, sectional animation depends upon the Remove by drop-down list box, which we'll set to Background. Click OK to save your changes.

When this frame is displayed, any areas that stick out beyond the borders of the cropped boundary remain visible which, in this case, means that the lower part of the first image, smile.gif, will be visible throughout!

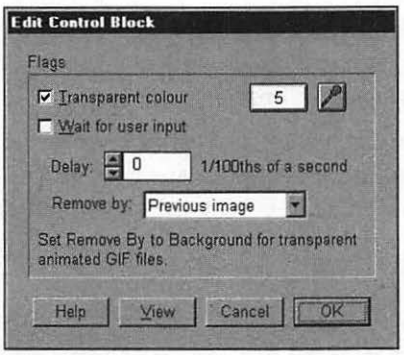


Figure 5-37: Specifying our Remove by settings in the Edit Control Block dialog.

6. Now simply repeat steps 3 through 5 for each frame in your animation, loading each of them in order.
7. If you would like your animation to loop indefinitely, click Insert from the toolbar, and then click the Loop button; no matter which command was highlighted, GIF Construction Set adds the LOOP block command as the second command in the animation.
8. That's it! If you like, you can view your sectional GIF animation before you save it to a disk. Click the View button on the toolbar. The program displays your GIF and plays it for you. To return to the GIF Construction Set main window, click the right mouse button.
9. Finally, save your image. Select Save As from the File menu to display a standard Windows Save As dialog. Select GIF files as the file type. Don't forget to use a completely new name for your new animated GIF to avoid overwriting any of the existing components. Click Save to save the new image to your hard drive.

How much download time will this technique save you? Of course, it depends on the size of the original image and the cropped section and the number of frames, but I've reduced some GIFs a third or more in total file size with sectional animation.

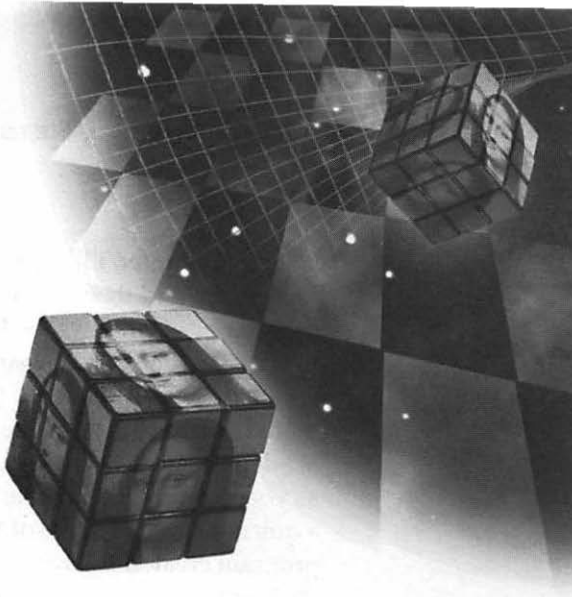
Moving On

This chapter was all fun, as we explored some of the unique creative effects you can add to your animation frames with Photoshop. I discussed those commands and image filters which are commonly used for animated GIFs, and you learned more about how to use layers in Photoshop to create animation frames. Finally, we used the sectional animation technique to dramatically reduce the size of an animated image using Photoshop and GIF Construction Set.

In Chapter 6, "Creating 3D Web Graphics," you'll enter a favorite world of mine, where your animated graphics will suddenly occupy three dimensions!

CHAPTER 6

Creating 3D Web Graphics



Most of the pages I saw when I first started moving around the Web two or three years ago were static, and a great many were plain text. After all, the Internet was a research tool, and the Web at that time was a very, very small part of the network. Now, however, the standards for a professional looking page have advanced. To keep up with the rest of the Web community, you'll have to entertain with images. . . and naturally, the more animation, the better.

At this point, you've learned how to edit and animate images, and even add sophisticated image effects to your animation. Now we're going to enter another brand new world—a creative environment once populated only by Hollywood special effects wizards and owners of high-powered graphic workstations. We're going to create animated images that will impress even the most jaded Web surfer. Ladies and gentlemen, welcome to the world of three-dimensional animation, much like that used in the films *Toy Story* and *Tron*!

"But wait...I thought I needed a Sun workstation to handle that kind of work, or a rendering package that'll set me back a thousand dollars!" Just a few years ago, you probably would have been right. With today's more powerful PowerMac and Pentium-based personal computers, though, you've got the power you need to produce the best results, and you can find inexpensive rendering and raytracing software—even shareware and freeware—for both MacOS and Windows 95. I first started rendering 3D images on an Atari ST, and even a 68040-based Macintosh or 486-33 PC can do the job (although it will take considerably longer).

In this chapter, I'll explain what you need to know about rendering and raytracing, and then I'll introduce you to my favorite shareware rendering program for Windows 95: Pixel 3D from Forward Design, which you'll also find on this book's Companion CD-ROM. I'll provide you with a few pointers on what 3D features work (and which don't) when you're creating an animated GIF for the Web. We'll discuss a number of important elements in any 3D design, such as texture and lighting. Next, you'll dive into the world of 3D as you use Pixel 3D to animate your name with the Logo Wizard. I'll give you a quick tutorial of some of the advanced features you'll find in Sculpt 3D, a program created by Byte by Byte for the Macintosh. Finally, we'll draw this chapter to a close with a discussion of several rendering programs for both the Mac and the PC that won't set you back a fortune.

What Is Rendering, Anyway?

At your first encounter with the term "rendering," you probably conjured up a visual image of a particularly busy tiger in the middle of a meal. Sorry. If that's what you're looking for, I would suggest a good wildlife documentary! In this chapter, the term describes the process of modeling a 3D object on your computer screen and applying a surface texture to achieve a realistic appearance.

Notice that I used the word "modeling" there—unlike other methods of producing a frame of animation that we've discussed earlier in the book, rendering involves the creation of a model—typically a wireframe shape—that you can save to a disk and load whenever you like. Unlike two-dimensional animations, you're not simply changing the position or color of some part of the image; instead, applications like Pixel 3D store the shape of the model, and your animation frames are actually snapshots taken of this model as it moves! Figure 6-1 shows a wireframe model of an Egyptian pharaoh's mask, and Figure 6-2 shows the mask as a rendered solid object.

Some rendering programs show you this model and allow you to modify it onscreen, whereas other programs simply store a sequence of points in space that represent the physical shape of the model. I've always preferred the former method, since I'm very much a WYSIWYG ("what you see is what you get") kind of guy. Regardless of how you manipulate the model, after you've gained experience with a rendering program, you can envision the object in your mind, and making changes to your model becomes second nature.

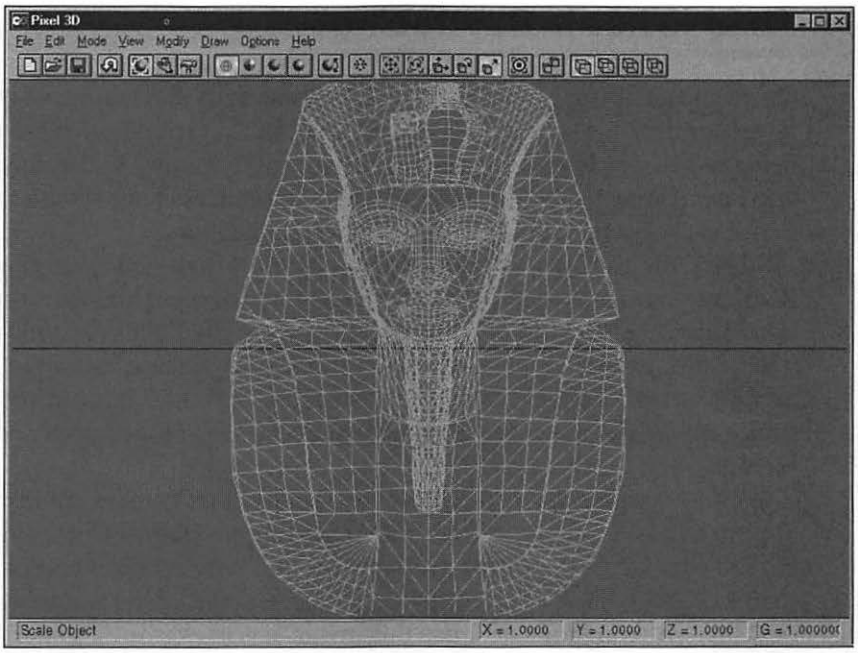


Figure 6-1: A wireframe model as it appears within Pixel 3D.

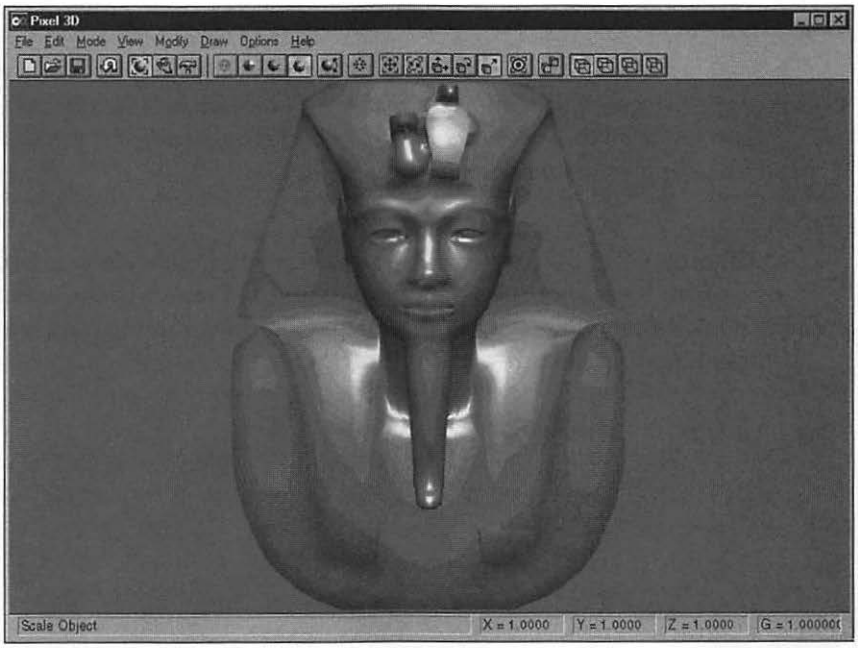


Figure 6-2: The same wireframe model after it's been rendered.

Then What Is Raytracing?

One common misconception about 3D modeling is that *raytracing* is the same as rendering. This is definitely not the case, but you often see these terms being used interchangeably on Internet newsgroups and in the news. So, if you hear someone talking about a new raytracing package on the market, he or she is probably talking about a rendering program.

In fact, raytracing is a feature offered by most high-end rendering packages. It allows your computer to actually trace the path of virtual light rays through (and reflecting off) your 3D model (hence, the name). This capability allows you to add incredible realism to your images. Raytracing is used to generate accurate shadow effects, transparent surfaces, and reflections in your final image, and it can make the difference between "Isn't that a pretty computer picture?" and "Is that real? That *is* real, isn't it?"

As an example, Figure 6-3 shows a 3D object that I created in Pixar's Typestry, one of my all-time favorite rendering programs. Unfortunately, this superb program is no longer available for purchase, so we won't be covering it in this chapter. Pixar's *Toy Story* was so successful that the company no longer develops software for sale. I use this image as a background under Windows 95. If you saw this image elsewhere, you might be fooled into thinking that it was a picture of a metal sculpture!

TIP

Some of my best rendering work includes highly reflective gold, silver, and chrome company logos. If your animated images will include metallic surfaces, precise lighting, shadows, or reflected light, you're cheating yourself if you don't use a rendering program that supports raytracing!

Although Pixel 3D doesn't support raytracing in this version, Sculpt 3D does—and I've also created a number of original sample images especially for this book's Companion CD-ROM. These examples demonstrate the effects of different lighting, textures, and raytracing.

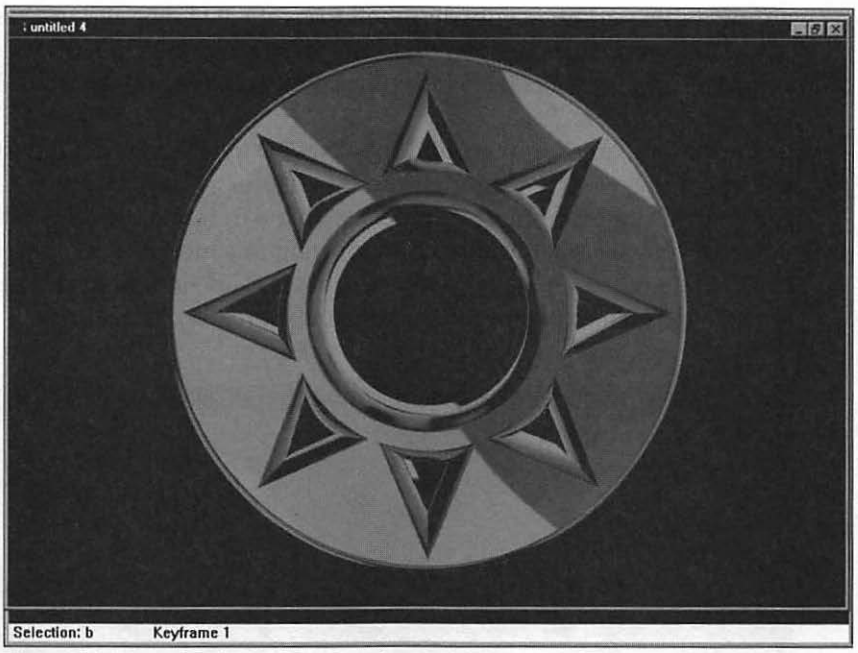


Figure 6-3: A rendered 3D object that demonstrates raytracing.

Rendering for GIF Animation With Pixel 3D

Time to introduce you to another of my favorite animation tools: Pixel 3D is a Windows 95 shareware rendering program that includes all the basic functions we'll need in this chapter, and you can use it to create images for animation.

TIP

Macintosh owners, don't go away! We'll also cover a number of basic rendering terms and concepts that apply to all programs, no matter what platform, so you should read this section as well.

Although not as powerful as some of its counterparts, Pixel 3D is also much easier to learn than most of these other programs. Some of the more expensive programs don't even have a standard toolbar, and one very powerful freeware rendering program doesn't even have a menu system at all! Most important, Pixel 3D has something unique that should appeal to every GIF animator

around: a Wizard especially designed to create 3D logos and impressive 3D text! Most companies demand that the pages on their Web sites feature the company logo, and Pixel 3D recognizes this need by calling itself "3D Object and Logo software."

Let's take a quick tour around the Pixel 3D interface, and I'll introduce you to some terms we'll use throughout this chapter as well. Figure 6-4 illustrates the Pixel 3D main window, complete with a wireframe model of a train engine. As you can see, the surface supporting this model—I suppose you could call it a "floor"—is actually a grid of squares. This floor helps to maintain a sense of depth and perspective while you're creating your model.

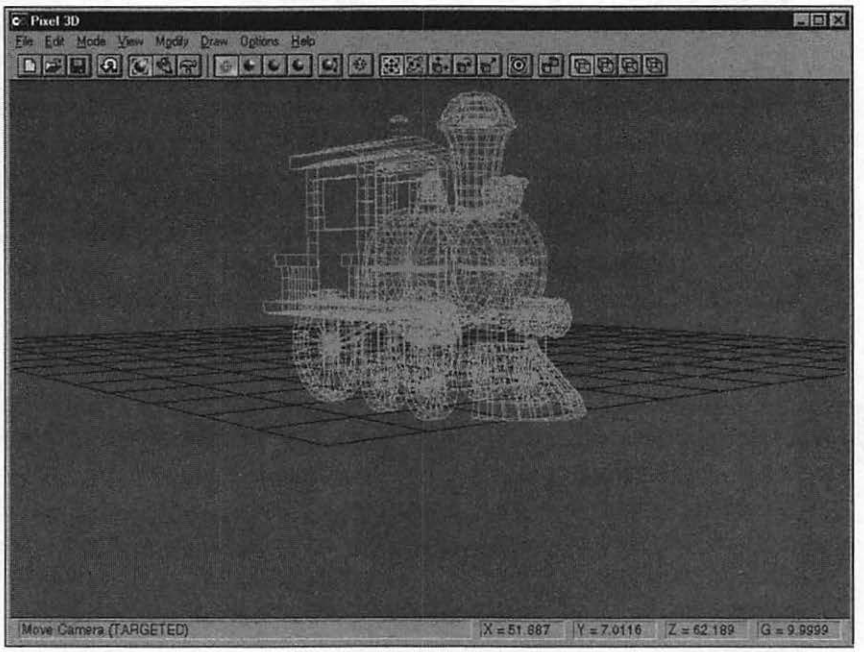


Figure 6-4: A wireframe model loaded in Pixel 3D.

After you've loaded or created your model, you can actually "move" around it by using your mouse. Most rendering programs assign you one or more cameras, which you can position at different angles and distances away from the subject. If this sounds very similar to still or motion picture photography, you're definitely barking up the right tree. All the basic elements are here: lighting, camera angle, and position—even different color masks and gel filters are available on some rendering programs!

With an image-editing program such as Paint Shop Pro or Photoshop, you create or modify images by drawing with a virtual pencil, paintbrush, or spray can. In a rendering program, however, you build your model instead. For example, under the Edit menu in Pixel 3D, you'll find three different sets of basic building blocks for any image: low, medium, and high-resolution geometric shapes. These simple shapes are typically called *primitives* in rendering applications. Figure 6-5 shows three of these common shapes: a sphere, a cylinder, and a torus (the fancy rendering name for a doughnut).

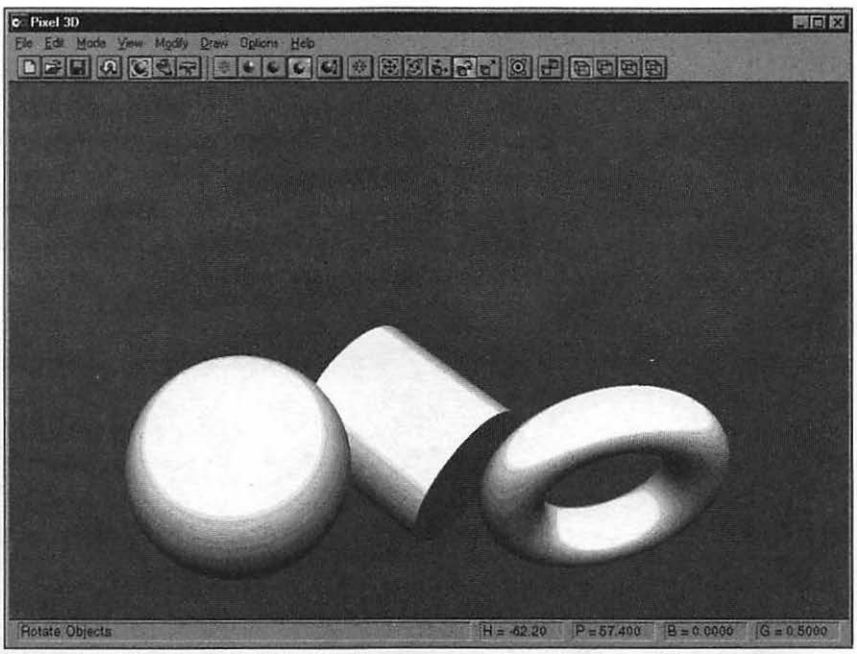


Figure 6-5: Three basic building blocks you can use to make 3D models.

Sometimes, you can create an entire project out of primitives without any extra work, but usually you will need to make changes to the surface of a primitive to add something; for example, you might add windows or an antenna array to a 3D model of a satellite. Some rendering programs also allow you to manipulate specific points of the model, which means you can twist, sculpt, and add detail to your model in countless ways.

TIP

Before you decide to become a Master Renderer and toss away your Paint Shop Pro or Photoshop, remember that the final output of a rendering program is, in most cases—you guessed it—an image! You'll still need your image-editing software for the techniques you learned earlier, just as you still need GIF Construction Set or GIFBuilder to create your animated images. Consider your rendering program as another tool in your animation toolbox—rendered animation is certainly not appropriate for every occasion.

As you can tell from the basic shapes in Figure 6-5, we're still missing something important: none of these objects *look* like anything, except perhaps pieces of white plastic. At this point, *textures* enter the picture. A texture is actually a picture of a surface that can be applied to your objects in your rendered scene. Common textures that you see used all the time include chrome, wood, several different types of marble and granite, and metallic finishes such as gold and silver. Let's work a little magic with textures. As you can see in Figure 6-6, now we have wood, marble, and metal objects!

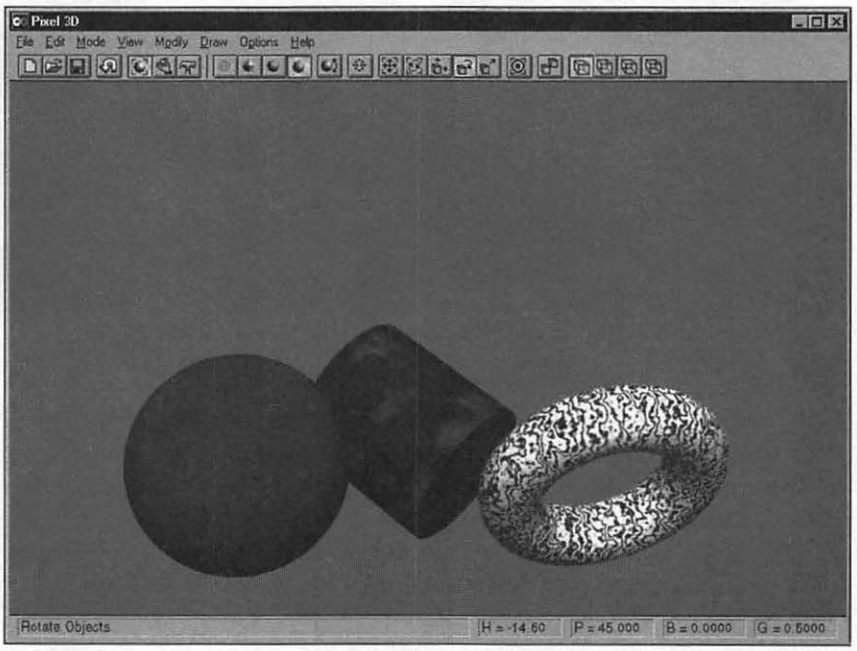


Figure 6-6: With the addition of textures, our objects look much better.

You can also add detail to the surface of your objects, too—rather like the brick or ripple effects we added to images with Photoshop in the previous chapter. For example, with Pixel 3D you can add a rough, wrinkled, or eroded finish to the surface of your objects. Generally, the larger the object, the easier you can see a surface finish. You can also enhance the appearance of a surface finish by carefully positioning a spotlight.

Speaking of spotlights, let's not forget the importance of lighting in 3D images! Lighting can add realism, depth, and drama to a rendered object. Pixel 3D allows you only a single light source, but you can move it to any one of nine different positions. Other rendering programs provide you with multiple lights of different luminance levels, so you can achieve the precise shadow effect you need.

Finally, Pixel 3D allows you to add a background to the final image. I almost never use this function while creating rendered objects for animated GIFs. Usually, I want to create a specific rendered object like a logo or a word with a transparent background rather than create an entire scene, which would create an animated GIF of monstrous proportions. Use backgrounds for static scenes you render, but avoid them when building image frames for GIF animations!

Now you've completed your "two-page training" in basic rendering concepts! Next, let's turn our attention to selecting the proper material for 3D GIF animation.

Rendering for GIF Animation

Now that you're more familiar with what rendering is, let's take a minute to identify the design elements of 3D objects and what features and materials are best-suited for rendering them for use in GIF animation. As a basic rule, avoid most of the bells and whistles offered by your rendering program. As you might expect, a number of features available on most rendering programs can actually do more harm to your animation frames than good.

In particular, avoid rendering image effects. Many high-end rendering programs can add special image effects like motion blur, but I generally avoid actually rendering image effects as part of an animation frame. As you learned in the preceding chapter, Photoshop can do an impressive job of adding motion blur, and by adding the effect there, you have more control over the amount and direction of blur for each frame in your animation than you would if you rendered that same effect. Also, the amount of time it takes to render image effects like fog or blur is roughly equivalent to a mile's worth of glacier movement! Therefore, create your animation frames without image effects, and then add them later on a frame-by-frame basis in Photoshop. This way, you'll save lots of time and a few gray hairs to boot.

If your rendering software supports anti-aliasing, always use it! Anti-aliasing is a common technique for smoothing the jagged edges of corners and straight lines within your image by mixing colors along the edge. In fact, your computer probably uses it to make your screen fonts easier to read. Using anti-aliasing will lend a cleaner, sharper look to your final animation frames, which, in turn, will result in a better-looking GIF animation. I can think of only one drawback to anti-aliasing. Like most good things in life, rendering your image with anti-aliasing turned on takes considerably longer, since your computer must redraw the image multiple times; however, the visitor who eventually views the image incurs no extra time.

Once again, consider the finished size of your image when creating 3D objects for GIF animation, and don't render your model to fill the entire screen! Notice, however, that I did not say "reduce the detail." In fact, the more detail in your model, the better it will look, no matter what the finished size. If you're creating a giant walking robot, add all the nifty details you like, but reduce the scale of the final rendered image down to two or three inches. That way, you keep the detail, but you don't end up with an animated GIF the size of New Orleans.

TIP

"Couldn't I just resample the image down to a smaller size later?" You could, but you'll get better results if you render the image at the actual size you need it. Resampling is a powerful tool, but it can't match an image that was rendered at the proper size!

Design Elements of 3D Objects

In this section, I'll discuss four important design elements of a rendered object:

- Object
- Angle
- Lighting
- Texture

Each of these elements can be modified or selected for the express purpose of producing a better animated GIF. For our sample 3D logo, we'll use your

first name. If any of these elements are completely off-base, then your 3D image will be useless, so it pays to design your objects before you spend a lot of time rendering them.

Selecting an Object

Primitives are the basis for most of the advanced rendering work you've seen, but you can also use individual characters or a word from a standard font. Let's look at both of these approaches to selecting an object for rendering.

Objects Built From Primitives

Building an object from primitives is closely akin to those games you probably played as a child where you had to create as many objects as you could from a box of simple shapes; for example, a circle on the end of a long, thin cylinder became a lollipop, and two triangles placed together at the tip became a butterfly, and so on. However, in a rendering program, your shapes are not static; you can stretch or mold primitives to change their size or alter their form. In this way, you can form joints between pieces or extrude a simple triangle into a long triangular tube.

Although every rendering program uses a different method of altering primitives, the idea of building an object remains the same: copy the basic shape of the object using several primitives and then make changes to the individual primitives to bring them more closely in line with the form of the actual object. Within Pixel 3D, for example, a cone with a sphere balanced on its tip becomes a world globe.

Unless you're trying to model something that's extremely simple in design or has actual facets—for example, a baby's rattle or a big diamond—I recommend you use high-resolution primitives whenever possible. Although high-resolution primitives do require more time for rendering, colors and textures will always look their best on a high-resolution shape because the surface of the primitive is much smoother, and your object will animate much more smoothly. Of course, if I were rendering a lighted disco ball from my high-school years, a medium resolution sphere would be perfect. . . and I could add a tiny John Travolta. On second thought, forget it. Anyway, Figure 6-7 illustrates a low-resolution primitive on the left and a higher-resolution primitive on the right for comparison.

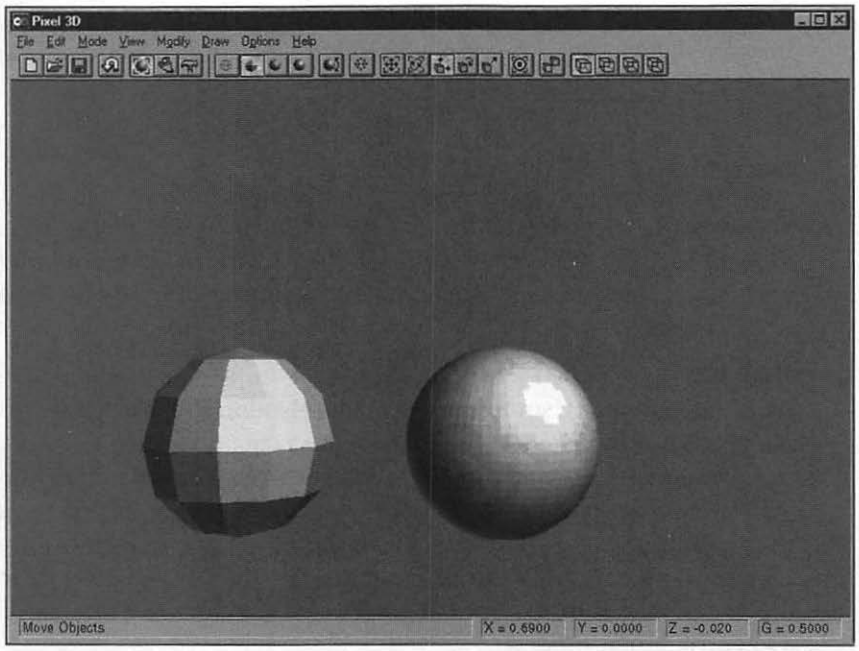


Figure 6-7: A comparison between low-resolution (left) and high-resolution (right) rendering primitives.

Objects Built From Fonts

If you do quite a bit of publishing work, writing, or graphic design, you probably have hundreds of fonts on your computer. I admit it—I'm a font pack rat! You probably wonder which one of these fonts is best-suited for rendering and GIF animation?

Often, if you're rendering a logo, selecting a font isn't an issue. Perhaps your company already has a logo available in several formats. (I know of some companies that even have logo wireframes already prepared for rendering.) Or, if you're creating a logo from scratch, your company may require a specific font for use on company communications. . . no decision necessary there!

However, if you're building a text object from scratch, and you have the leeway to select any font you like, you can still consider a number of criteria to help you choose the right font:

- **Readability.** When you're creating a 3D font for GIF animation, remember that your visitor may have only a second or two to read your logo if it's spinning or moving across the Web page, so the choice of font is very important to make sure your message gets through. I generally avoid "handwriting" or "script" fonts for GIF animation, as the front of each character is too thin to be easily read while moving. For the same reason, even the best textures tend to "disappear" on letters with thin faces. Likewise, you should avoid complex fonts like Old English if your image will be animated.

  For example, look at the two fonts I've used for rendering in Figures 6-8 and 6-9. Which would you consider easier to read, especially if both of them were spinning around in a circle?

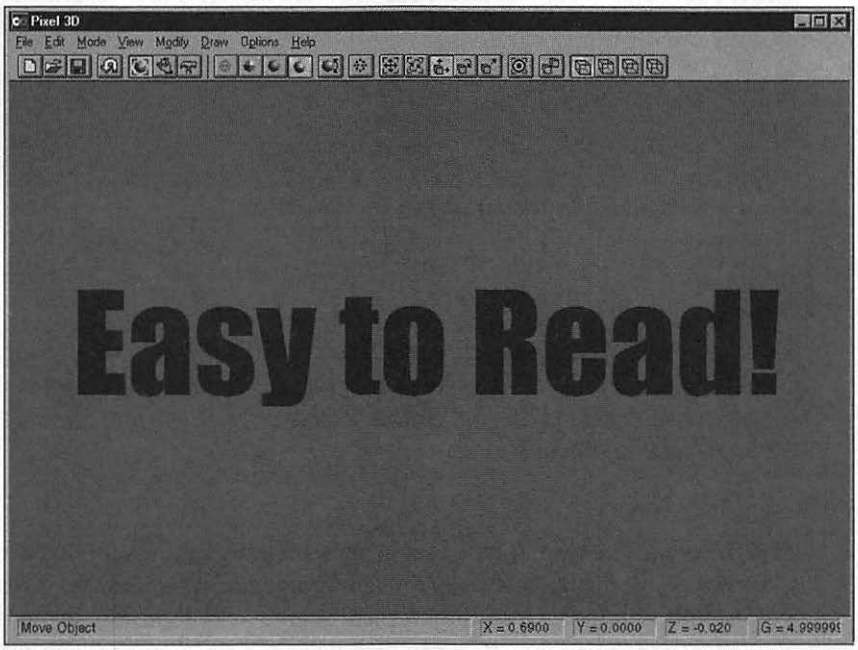


Figure 6-8: A font suitable for an animated logo.

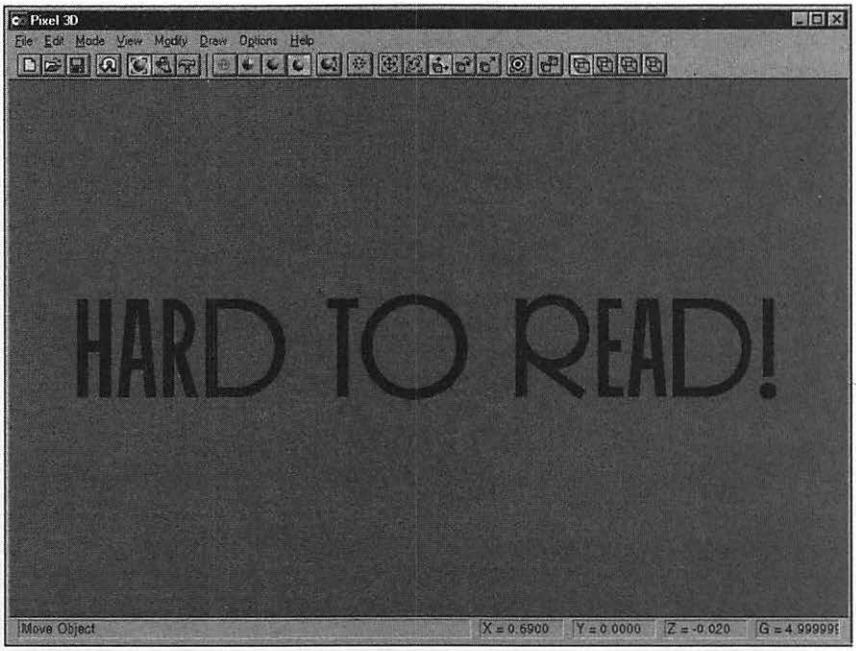


Figure 6-9: A font far from suitable for an animated logo.

TIP

Avoiding special attributes like bold, italic, or strikethrough when designing 3D text is generally a good idea. Fonts are designed for readability with normal attributes, and you'll often find that italicizing or bolding a font will actually reduce the readability of a font.

- **Impact.** The best 3D logos you've seen have real visual impact, and that generally means a strong, thick character. I prefer sans serif fonts for rendered logos, since they typically appear bolder and stronger to the eye than serif fonts. You can also use a special font that suggests a theme—for example, a stencil font for military use or a varsity font for a college alumni logo. Even the Optical Character Recognition font used for computer scanning can work well as a logo font for a computer firm.
- **Symbols.** Some of the best fonts I've ever used for creating objects in Pixel 3D don't even include characters from the alphabet! They are symbol fonts, such as Wingdings and Dingbats, or specialized character

fonts such as PC Keys (which resemble the keys on a keyboard). These symbol fonts are great time-savers—after all, would you rather assemble a 3D model of a telephone icon by hand or press a single key in a symbol font? Generally, you can simply *extrude* a symbol character to give it depth. "Extrusion" is a rendering term for extending the back of a primitive to enhance the illusion of depth. Figure 6-10 shows a good example of extruded text.

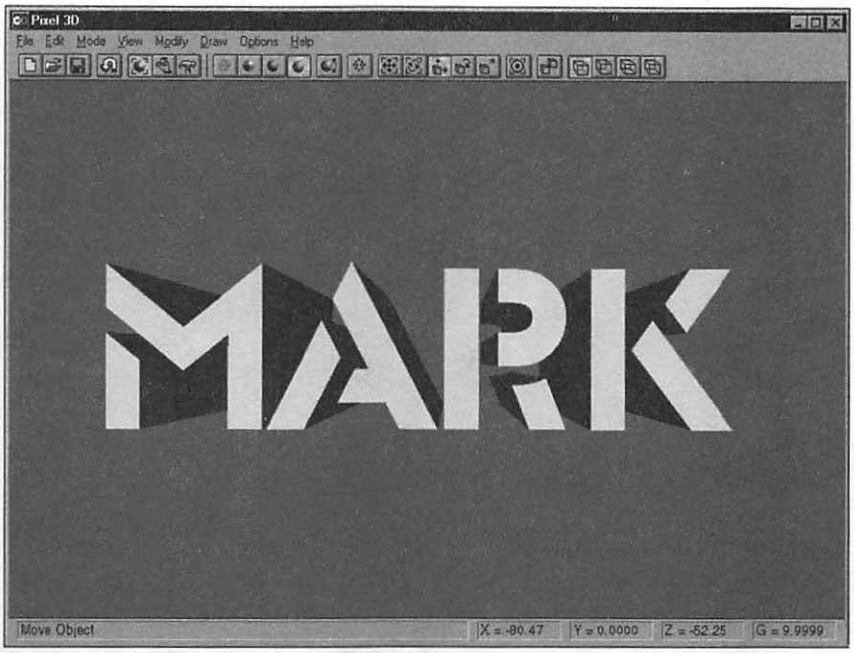


Figure 6-10: By using extrusion, these characters suddenly seem huge!

Selecting Angle

Once again, we'll dip slightly into graphic design to discuss proportion and angle as they relate to rendered objects. Most rendering programs allow you to set any viewing angle between your 3D model and the camera, which enables you to create impressive effects with proportion easily. Remember the grid that Pixel 3D uses as a floor for objects? One of the reasons that it's there is to help you determine proportion; however, proportion typically isn't as important when you're creating frames for an animated GIF, since you'll usually have only one object with no background. Proportion brings more of a sense of realism to an entire scene.

What's more important for us in creating animation frames is the viewing angle. For example, in Figure 6-11, we're viewing this rendering from the left, and the text is almost parallel to the direction of the camera. If you're as big a fan of the classic British TV series *Monty Python's Flying Circus* as I am, you'll recognize this camera angle as the "Mighty Stone Letter Effect"! It is one of my favorite effects for static Web page titles, but as you can imagine, it's not quite as effective for animation—the title is so long that moving this entire image smoothly in any direction will involve a large number of frames and a huge movement cycle.

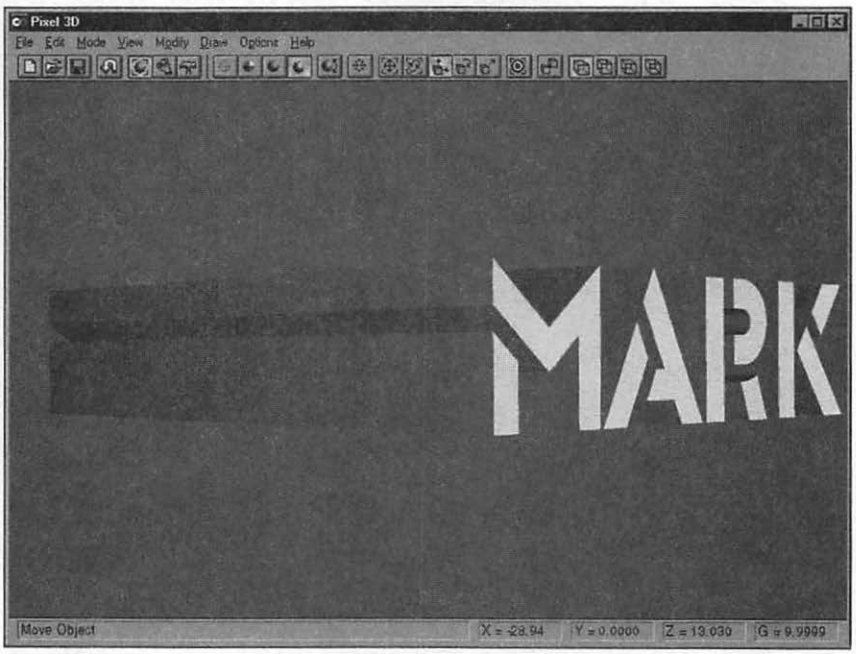


Figure 6-11: A gorgeous visual effect, but don't try to animate this image!

Generally, the most popular camera angle for 3D GIF animation is a centered camera pointed directly at the object. From time to time, I'll vary this angle by moving the camera slightly to the left or right for an entire animation. This way, I can display more of the extrusion, which can include some very interesting detail if your object has a jagged edge. However, the farther you arrange your camera angle to the side, the harder it will be to distinguish details at the "other end" of your model. Remember, the movement cycle is usually a function of the object, so your camera will be stationary. A motionless camera lends stability to your finished animation, instead of the camera

moving around a moving object. I know it's a temptation for experienced artists to render entire scenes with a moving camera, but imagine George Lucas re-creating *Star Wars* in a 40K GIF file, and you can appreciate the simplicity of a motionless camera!

However, proportion also comes into play if you have more than one rendered object in your animated GIF—not something that happens often, but I have seen effective GIF animation in which one shape rotates around another (much like an electron around a proton). If they don't have visual cues, those people viewing your GIF animation are likely to become confused as to which object is in the foreground or which object is larger. Again, this problem crops up when your camera is shooting from an extreme angle. Probably the best way to counteract this problem is to use the familiar centered camera pointed directly between the objects. Your eyes naturally provide proportion at this angle.

Selecting a Realism Level

Often, the only way to find the proper combination of font, proportion, lighting, and texture for a 3D object is through experimentation. Unfortunately, each experimental rendering you run can take several minutes if you use the highest realism level available. On slower machines, you could be waiting half an hour for a full scene! Fortunately, all rendering programs have different levels of realism, and the lower the level, the shorter the rendering time. For example, Pixel 3D has three different levels of realism: Flat shading, Gouraud shading, and Phong shading, in order of increasing realism.

For your finished work, you'll almost certainly want to invest the time to use Phong shading. But for experimenting with lighting, proportion, font, and texture, I strongly recommend that you use one of the lower levels of realism. For example, I use Gouraud shading when I'm building an image; it takes half as much time (or less) to render. If you like, you can also speed the process by turning off anti-aliasing until you're ready to create the final image.

Selecting Lighting

Ahh, lighting. . . if Mozart had been as passionate about 3D rendering as he was about music, he would have found his greatest joy in selecting lighting! As I said earlier, raytracing produces the best lighting effects; although it requires much more time for your computer to process an image, I definitely recommend that you use it if your rendering software supports this feature. For example, look at the atmosphere created from these three different types of raytraced lighting:

- In Figure 6-12, which was taken from one of my personal Web sites, rendered text is highlighted with a bright backlight using a blue filter. In color, this effect produces an eerie blue glow from behind each character—unsettling, mysterious, and dark.

Figure 6-12: An example of backlighting with a blue filter.

- In Figure 6-13, we take a different approach. A gold metallic object is rendered with two small white spotlights at the left and right edges of the image. These raytraced spots bring out the detail at the same time they provide strong front lighting. Plus, your eye can distinguish between the two light sources, so the image frame has extra realism and visual interest. The end result is a strong, vibrant image, perfect for use as a logo (except, of course, for the fact that no one uses 360K floppy disks anymore).

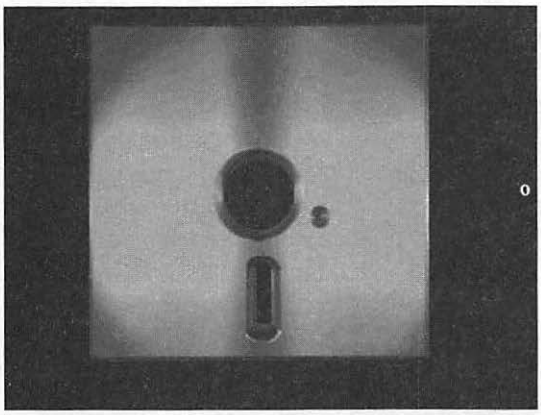


Figure 6-13: Two spots in front really show off this gold texture.

- Our final illustration, Figure 6-14, includes a *shadow mask*, which exactly corresponds to the cardboard masks that still photographers place in front of their spotlights to create shadow effects. This feature is harder to

find than simple spotlighting in less expensive rendering software, but as you can see it's well worth the search! This time, our ancient floppy disk object was shot with a bright top left spot through a lattice mask.

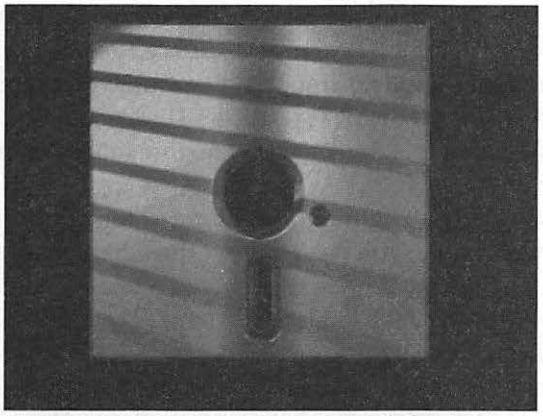


Figure 6-14: A lattice mask on our spotlight adds a neat shadow to the image.

TIP

Naturally, the shadow will not move even if the object moves, so you suddenly have another opportunity to animate another type of movement cycle! Simply turn your object the same amount for each frame image and put GIF Construction Set to work. Your final image will feature a rotating logo with an eye-catching, realistic shadow.

As you can see, lighting can produce a seemingly infinite number of effects, but here are a few guidelines for using lighting on objects destined for GIF animation:

- **Use strong lighting.** Dim lighting works great when you're rendering an entire scene or a light source is actually rendered within the image (for example, a lamp on a table). When you're rendering an object for use in animation, however, it has to stand out and be easy to see on its own, and often you won't know exactly whether you'll have a solid color or tiled image background on the finished page. In most cases, using strong lighting is best. You can always use multiple spots, as we did earlier in Figure 6-13, but their combined luminance must be enough.
- **Use colored filters.** Talk about a neat effect! If your 3D object is made of shiny silver, don't just experiment with white spots; if your rendering

package supports them, try out a complementary colored filter such as red or blue. Unlike a white spot, a spot with a colored filter highlights with a mood!

- **Angled or head-on lighting?** I always make this decision after I've completed the 3D model, since the correct choice depends on the model. As I mentioned earlier, if your object has a surface finish—for example, pits or ridges—angled lighting is important because you want to bring out as much of that surface detail as possible. The same holds true for some textures; for example, I think a wood texture looks better with angled lighting.

  However, if you'd like to light a wider object or logo uniformly, angled lighting won't do it; you need at least three light sources, placed at the two outside edges and one in the center. Figure 6-15 illustrates an object incorrectly lit by a single angled spot, and Figure 6-16 illustrates the same object lit by three light sources. You can tell that the logo lit by multiple spots looks better and will be easier to read no matter what motion cycle is used for your animation. Unfortunately, Pixel 3D doesn't support multiple light sources at this time, but you can still position your light at the center to cut down on the shadows. Sculpt 3D, however, does support multiple light sources.

Figure 6-15: Incorrect lighting makes it hard to read this 3D object.

Figure 6-16: The same object lit by three spots.

- **Use static lighting.** As you'll learn later in this chapter, lighting your model correctly to bring out the detail in the final image is very important; however, avoid using "traveling" or "panning" light sources that move while creating frames for GIF animation. For full-screen Windows AVI (short for *Audio Video Interleave*) or AutoCAD FLI animation against a background that serves to anchor it, traveling lights can add incredible realism to an entire scene. For example, a spaceship can fly past a comet or a sun, and you'll see the play of shadows and light along the surface of the hull. For an animated GIF without a background, though, this effect can be quite disorienting, and it tends to make the motion of your final animated image seem choppy or unnatural.

Me and My Shadow

The correct use of static lighting can also create realistic, moving shadows that look great on a Web page with a white background!

For this trick, you'll need to select a pure white background for your 3D model. Position your virtual lights either in front or above the model—at the top of its arc of motion—so that the shadows will fall behind or directly under it. Then roughly crop the image frames to encompass the range of the shadow's movement through the cycle. When you generate the animated GIF, be sure transparency is turned off; this ensures that the shadow will be visible. The animation's white background will blend seamlessly with the white background of the page.

For a border that looks good with a white inset, consider a TV set clip art border. Use your image editor to paste each frame of the animation into the center of the TV border, and voilà—you've got an animated television!

Selecting Texture

Avoid the use of complex textures and surfaces when rendering frames for animated GIFs. Believe me, I know how tempting it is to dive into an entire CD-ROM's worth of exotic textures and find that exact pattern that you've been dreaming about. My rendering dreams revolve around complex textures like mosaic tile and stained glass, but at other times, nothing works better than brass or airplane aluminum.

Remember, though, that your final animation will use no more than 256 colors. So a Grecian Marble texture that looks so good in your rendering program at 16 million colors might not measure up in 256 colors. I generally use simple shiny surfaces such as brass, silver, or gold and simple natural textures such as wood for objects I know are destined to become animated

GIFs. If you have the time, try generating single animation frames using different surface textures and reduce them to 256 colors to see which looks best at a reduced color depth. For example, if you're creating a logo for a bank, you can certainly use marble, but avoid a texture with heavy striations or flecks of color. For an animated GIF of an inch square, texture details like these are going to be too small to notice, but they will take longer to render.

Although you can wait until the object has been rendered before you choose between angled and direct lighting, you must decide on any texture you use before you finalize the frames for your animation. If you've already designed your graphic—as we did in the first two chapters—you already know what color you'll be using for your background. A black logo spinning on a black background will do nothing for your rendering reputation, but a reflective copper logo lit by several spots spinning on that same black background may just get you a favorable mention at the next board meeting!

TIP

Most rendering programs allow you to use a default background of solid white or solid black, which usually means that you needn't worry about adding transparency if you'll be using the same color background for your Web page. For example, if you're creating a Web page with a white background, and you're using a white background for rendering, creating your image frames for animation is typically as easy as resampling each image frame down to the proper size—no transparency or image editing required. Any shadows you've created immediately around your object are captured intact by this process, lending a true photorealistic quality to your animated GIF!

If your rendering program doesn't come equipped with a large number of textures, you can usually import simple bitmaps and store them as textures. This includes those GIF and JPEG background tiles you've been collecting while surfing the Web! Another great source of textures is your own photographs, which you can scan and save as bitmaps. My collection of textures for TrueSpace, my favorite rendering program, is now so large I've recorded it onto a CD-ROM.

Creating a 3D Logo With Pixel 3D

Time to get our hands dirty! In this section, we'll use the Windows shareware rendering program Pixel 3D to create a logo for GIF animation. Much like GIF Construction Set, Pixel 3D includes a Wizard. In this case, the Wizard helps automate the entire procedure of creating a font using characters from any font on your computer.

Note: If you're using a Macintosh, you may wish to skip to the section titled "Rendering With Sculpt 3D."

To run the Logo Wizard from within Pixel 3D, follow these steps:

1. Pull down the File menu and select the Logo Wizard... command. The program displays the Build Text dialog box, as shown in Figure 6-17. Before the rest of the Logo Wizard can run, we need to specify our font and build the 3D model within Pixel 3D.

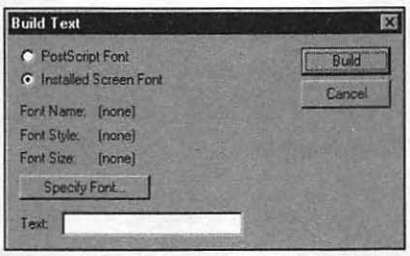


Figure 6-17: The Build Text dialog box.

2. Typically, you'll select the Installed Screen Font, which allows you to select from any TrueType font on your computer. Next, enter the text for your logo in the Text field. For our example, enter your first name.
3. Click the Specify Font... button to display the Font dialog box shown in Figure 6-18. For our example, select a strong, distinctive font—Braggadocio—with a regular style and a size of 20. Click OK to continue.

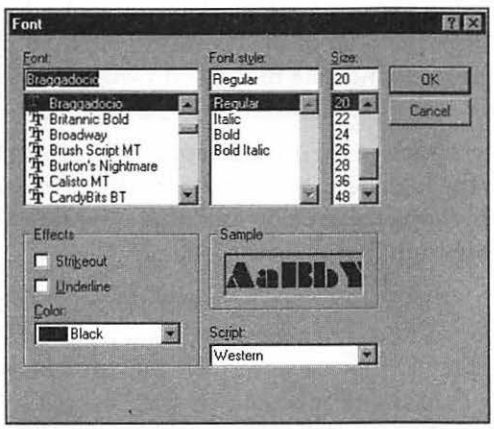


Figure 6-18: Selecting the font we'll use for our 3D model.

4. Click the Build button to create your basic 3D model. Pixel 3D takes a second to calculate the outlines of your font, and then you'll see the model displayed on the grid, as shown in Figure 6-19.

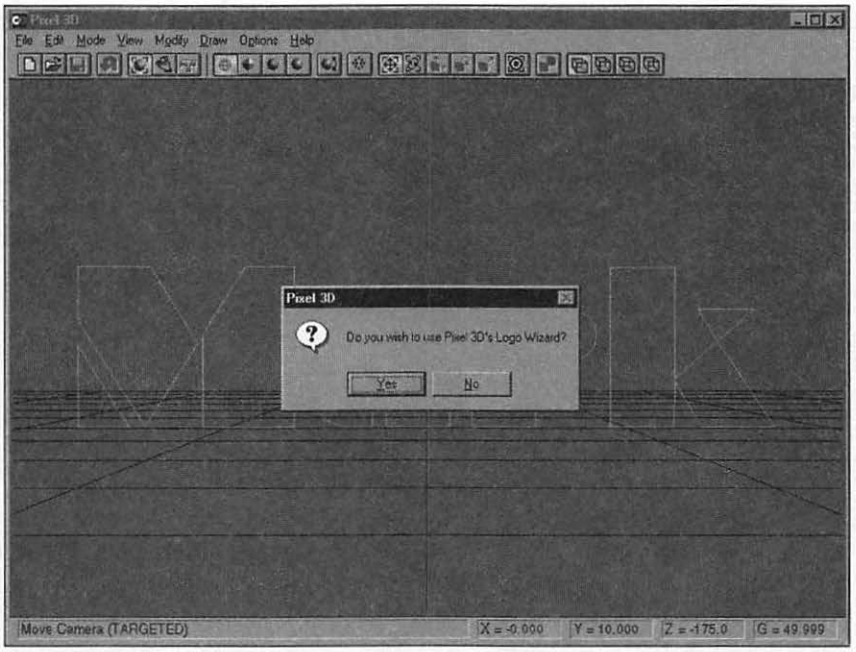


Figure 6-19: Pixel 3D displays your logo model.

5. If you like, you could stop here and handle everything else manually, but I prefer to automate the remainder of the process (we'll do it manually in the next section). Click Yes to indicate that you do wish to use the Wizard to complete the logo.
6. The Build Logo dialog shown in Figure 6-20 appears; I make the majority of my adjustments to the logo here. We'll start with the Extrusion option. As I said earlier in this chapter, extrusion looks great with text and logo objects, so select the Medium Extrusion option.

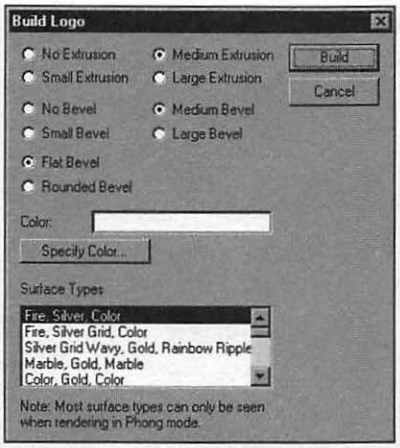


Figure 6-20: The Logo Wizard displays the Build Logo dialog box.

7. Select a bevel type and size for the edge of each character. Generally speaking, I use a flat, small bevel so that each character has a large face—this helps to maximize the appearance of the texture and makes the character more readable.
8. Select a color by clicking the Specify Color button. You'll see in the next step that most of the surface textures offered by the Logo Wizard include the color you select here. The Logo Wizard displays a standard palette; for this example, pick neon green from the palette.
9. Select the surface type. As you can tell from the variety of choices, you can pick a combination of three textures or a single texture for all surfaces. If you pick a combination surface type, the first texture listed appears on the face of the letters, and the other two appear on the bevel and extruded surfaces. If you pick a single texture, that texture appears in the color you've selected across the entire model. For this example, pick a favorite combination of mine: Marble, Gold, Marble. Finally, click Build to confirm your selections.

   As you can see in Figure 6-21, the Logo Wizard has finished its job and handed control back to Pixel 3D, and the extrusions and bevels have been added to your model.

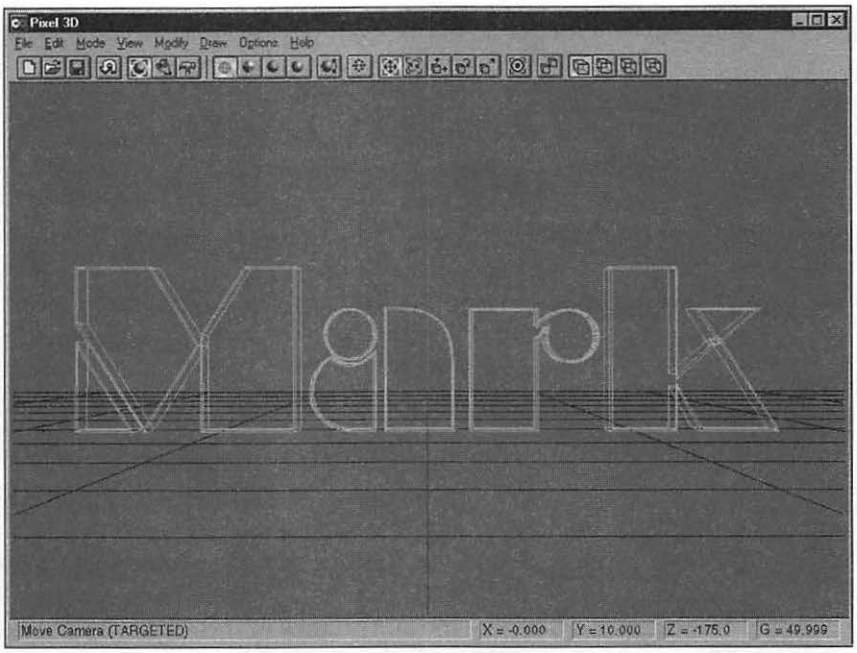


Figure 6-21: The model for your 3D logo is automatically generated in Pixel 3D.

10. Now all that remains is to actually render the image. First, however, let's make sure that the most important rendering options are correctly set for the best results. Under the Draw menu, select the Anti-Aliasing item and then pick Medium Anti-Aliasing from the submenu (this level will take significantly less time than the highest level). Next, under the Draw menu, select the Light Position item and then select Center from the submenu. Last, enable Threshold Smoothing under the Draw menu.
11. Let's do it! Under the Draw menu, select Phong Rendering—the highest level of realism—and sit back and enjoy! Pixel 3D will display the status of the rendering process in the status line at the bottom of the window. Your logo is divided into a number of "strips," and the rendering is performed in passes—this makes the procedure easier for the program to handle. The current strip number and the current pass are shown on the status line, as well as the elapsed time so far. Figure 6-22 shows the rendering of my example logo in progress.

Figure 6-22: Pixel 3D caught in the act of rendering a text logo!

12. Once the rendering has finished—as illustrated in Figure 6-23—the message displayed in the status bar at the bottom of the window reads "Move Camera (TARGETED)", which means that you can now move your camera angle by clicking and dragging the 3D model. Alternatively, you can select Save As from the File menu to save this first rendered version of your logo. We're going to have a little more fun, so don't save your image yet!

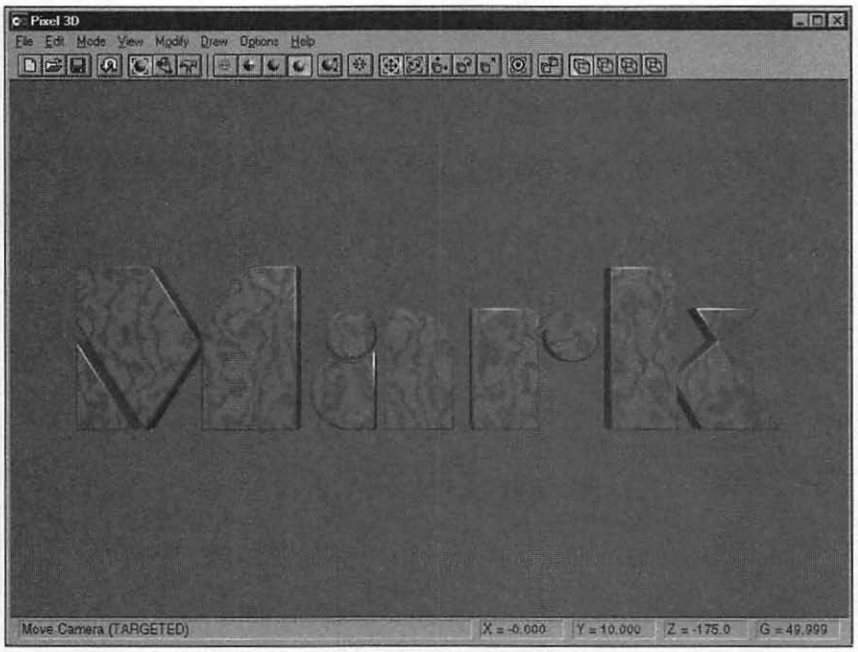


Figure 6-23: Our initial rendering is complete.

TIP

Before we continue, I suggest you pull down the Draw menu and select Gouraud shading—a lower level of realism—which will allow your computer to redraw the object much faster. You need to take the time with Phong Rendering only when you're sure that everything's perfect and you want to perform a final rendering.

13. Position your mouse cursor over the center of your model, click, and move the mouse slowly to the right. Pixel 3D temporarily changes the image to a wireframe rectangle so that you can smoothly rotate the model, zoom in, or zoom out. After you release the button, the program will redraw your model, as shown in Figure 6-24.

Figure 6-24: The 3D logo example rotated to the right.

14. To save a finished frame for animation, select Save As from the File menu to display the Save dialog box you see in Figure 6-25. Since you'll typically be rendering a single object for GIF animation, the defaults of All Objects and Single File Save will usually be correct. Select a Save Format of JPEG Image, and click OK to save the frame.

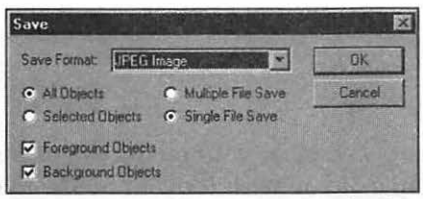


Figure 6-25: The Pixel 3D Save dialog box.

That's all there is to it! The Logo Wizard and the simplicity of Pixel 3D really do make the process much easier.

Creating Multiple Animation Frames

"But how do I take multiple images for my animation?" Most logo animation involves the object spinning around, and we already started the process with step 13 in the preceding section. Every rendering program I've ever used included some method of indicating the amount of rotation you apply to your model; some programs even feature separate controls to allow precise measurement. Pixel 3D provides three measurements at the right corner of the status bar marked X, Y, and Z. In order, these three figures represent the horizontal axis, the vertical axis, and the forward axis (which you might term "zoom in" and "zoom out"). You can use these measurements to move or rotate your image in equal amounts between each rendering, and then each rendering will be saved to a disk as a separate image.

You may be wondering how you can rotate your model in exact increments along the X or Y axis. If you've tried moving your mouse, you've probably noticed that Pixel 3D initially allows you to move in any direction. Of course, we'd rather "lock down" the object so that it can only be moved in the desired direction. To do so, select the Axes item from the Options menu to display the Specify Axes dialog box, as shown in Figure 6-26.

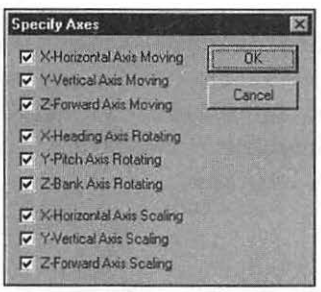


Figure 6-26: The Pixel 3D Specify Axes dialog box.

Each of these check boxes controls whether your model can be moved along the corresponding axis. For example, if you wish for your model to rotate only around the center X axis, you would disable the Y and Z controls to restrict movement or rotation in those directions.

Depending on which rendering program you use, you may have more features to aid you in rotating or moving your model, but the creation of multiple animation frames remains the same: move your model a predetermined distance, render, save to a disk, and then move it again.

Loading External Objects

Another feature of most rendering programs is a wide range of rendering and wireframe file types that you can import as 3D models, including AutoCAD .DXF files, VistaPro .DEM files, and even encapsulated PostScript .EPS files.

But what if you don't have a wireframe version of your object especially made for rendering? You can always create sophisticated objects by combining primitives, but Pixel 3D offers a truly neat method of importing straight bitmap image files and automatically tracing them to create a basic 3D copy of the image. That's right—you can take 2D bitmap images that you've created in other programs and load them into Pixel 3D to build frames for GIF animation, complete with the original colors! Life is good!

As an example of how to perform this process, let's take the clip art image of the smiling woman that we used in the preceding chapter and make her into a spiffy 3D object for a magazine Web site, just as you might do with any 2D drawing:

1. Pull down the File menu and select the Open command to load your bitmap file. If you've forgotten what our image looked like from the preceding chapter, she appears again in her original bitmap form in Figure 6-27.

Figure 6-27: A familiar bitmap portrait, ready to be made into a 3D object.

Can I Use Any Bitmap Image?

Figure 6-27 has a number of characteristics that make it a good choice for tracing. In fact, they're the same characteristics you used to look for as a kid when searching for a picture to trace:

- **A bold, black outline.** A tiny, detailed multicolor border isn't going to trace well. Look for well-defined edges in a solid black or dark color.
- **A solid, simple color scheme.** Again, too much color will "confuse" the tracing algorithm, so fill your images with a solid color. If you're filling more than one portion of the image, use one or two colors, and the larger the area, the better.
- **A simple subject.** This tool is not the one to use to render an image by Escher!

Since most simple objects and logos that you'll want to animate for a Web page already fit this description, you're probably still happy. However, if you have an image that needs to be simplified in order to trace better, fire up your image editor and reduce some of the detail.

2. Pixel 3D displays the Select Bitmap Background Color dialog box, as shown in Figure 6-28. In this dialog box, you can select the color that will be treated as the background in the image. The background will not be rendered because generally the background for a converted image is a square or rectangle that surrounds the actual image. Typically, Pixel 3D will select the correct background color by default (which it did for this image), but just in case you'd like to select another color, the program displays the number of pixels of that color that appear in the image. After you've selected the color, click Convert.

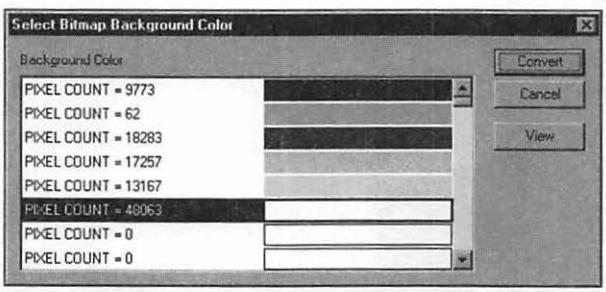


Figure 6-28: Since the bitmap background is not rendered, you can select the background color.

3. Next, you'll see the Smooth Converted Bitmap Object dialog box, as shown in Figure 6-29. From this dialog box, you can remove details and segments from your image; this can both help speed up the rendering process and create a "cleaner," more stylized 3D object. Once again, I've always used the default values that Pixel 3D selects here—we don't want to remove detail within our animation frames. However, I did enable the Spline Fitting option to make sure that the areas where separate splines join together are handled correctly. If you haven't heard the term before, a "spline" is an individual section of the image with at least one edge that meets another section. Click Smooth to continue.

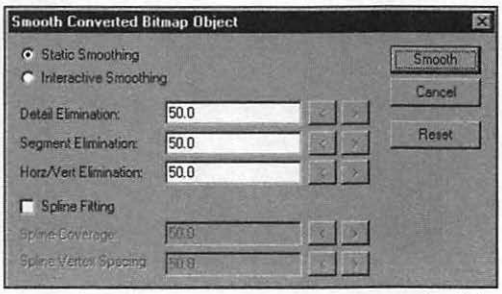


Figure 6-29: You can remove unnecessary detail from your image to smooth it.

4. As you can see in Figure 6-30, Pixel 3D has drawn the outline of our 3D object, and you're asked whether you'd like to continue by using the Logo Wizard. If you do, simply follow the instructions in the preceding section starting with step 5. Since we used the Wizard last time, let's do it manually this time. Click No.

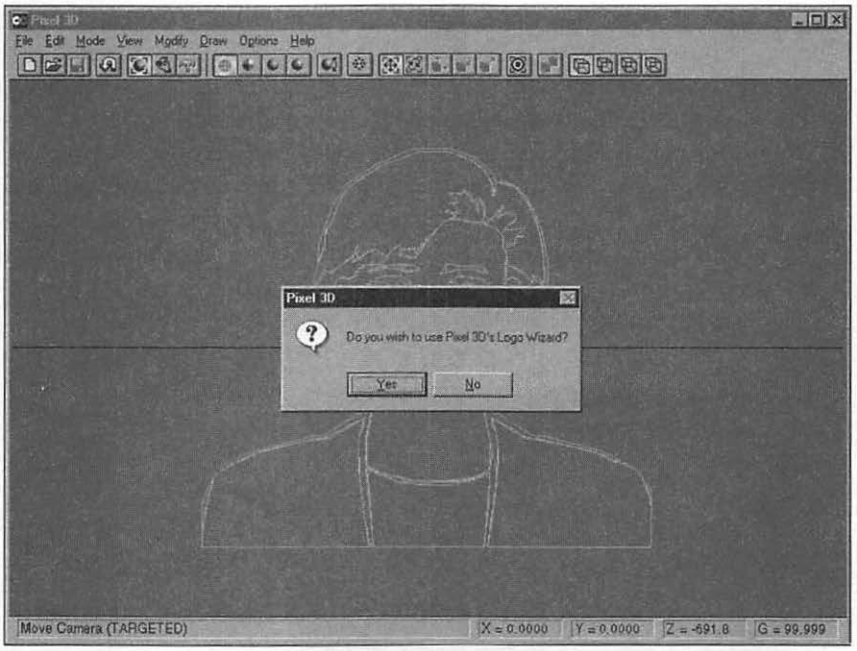


Figure 6-30: Our bitmap has been converted to a basic, flat 3D model.

5. Time to add extrusion to our model to enhance the 3D depth of the object. Select Extrude from the Modify menu to display the Extrude Polygons dialog box shown in Figure 6-31. For most objects, you'll keep the default values, but you can extend the extrusion if you like. For this example, let's experiment! The value is in pixels, so type **75** into the Extrude Distance field and click Extrude. The results of the extrusion on our 3D object are shown in Figure 6-32. As you can see, the object now has a real appearance of depth. If you want to extrude an entire object, select All Polygons as we did here; to extrude only the selected portion of your object, choose Selected Polygons.

TIP

The Static vs. Interactive option does not affect the image.

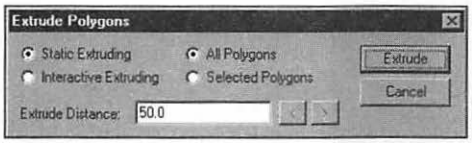


Figure 6-31: Adding extrusion to our 3D object.

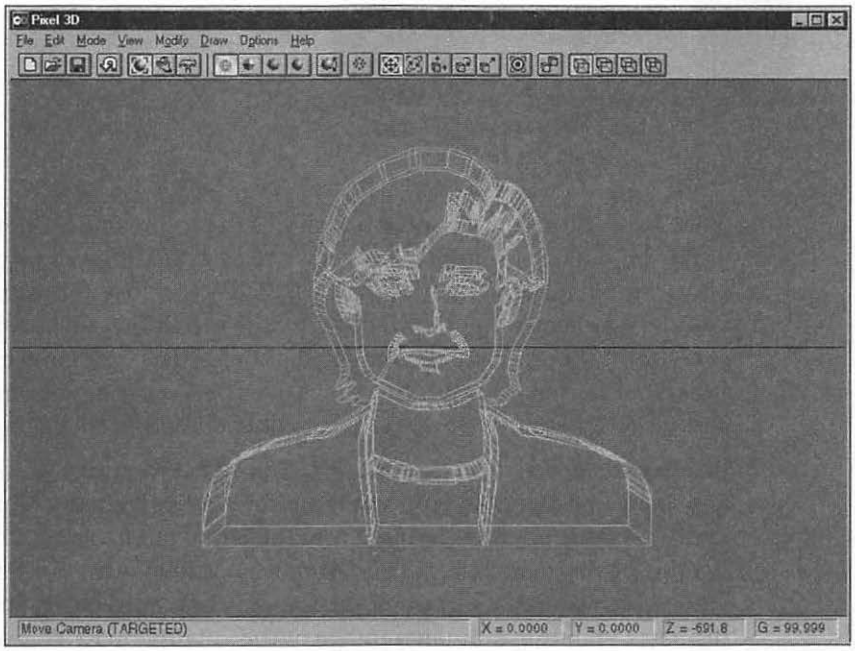


Figure 6-32: The completed extrusion as seen in wireframe mode.

6. Our next step is to add a bevel. It isn't a necessity, but I personally think that a 3D logo looks better with a beveled face. Select Bevel from the Modify menu to display the Bevel Polygons dialog box shown in Figure 6-33. Again, the defaults will work fine for almost any object, so click Bevel to continue.

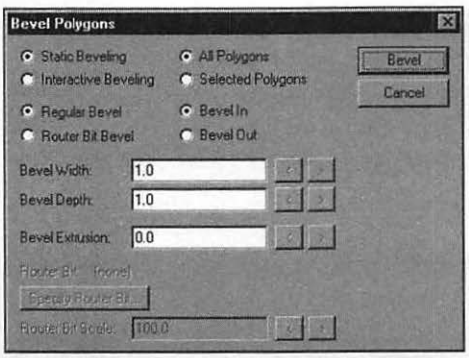


Figure 6-33: Adding a bevel to our 3D object.

7. Since Pixel 3D's sketch function includes the colors of the original image as part of the object, you'll rarely have to select a different texture for your completed image—it's already in full color! Just to illustrate the wonderful effect of depth provided by the extrusion and beveling, however, let's turn our smiling woman slightly so that you can see her from the side. Position your mouse cursor over the center of your model, click, and move the mouse slowly to the right to smoothly rotate the model.
8. Just in case, check to make sure you've selected Medium Anti-Aliasing and enabled Threshold Smoothing under the Draw menu. Now you're ready for your final rendering. From the Draw menu, select Phong Rendering and watch! Figure 6-34 shows a side view of our finished logo, which started as a bitmap image. Any company would be proud to display a spinning animated image of this quality on its Web site!

Now you're ready to render as many frames as you need for your animation; remember to turn the object in equal increments for each new frame if you're spinning it.

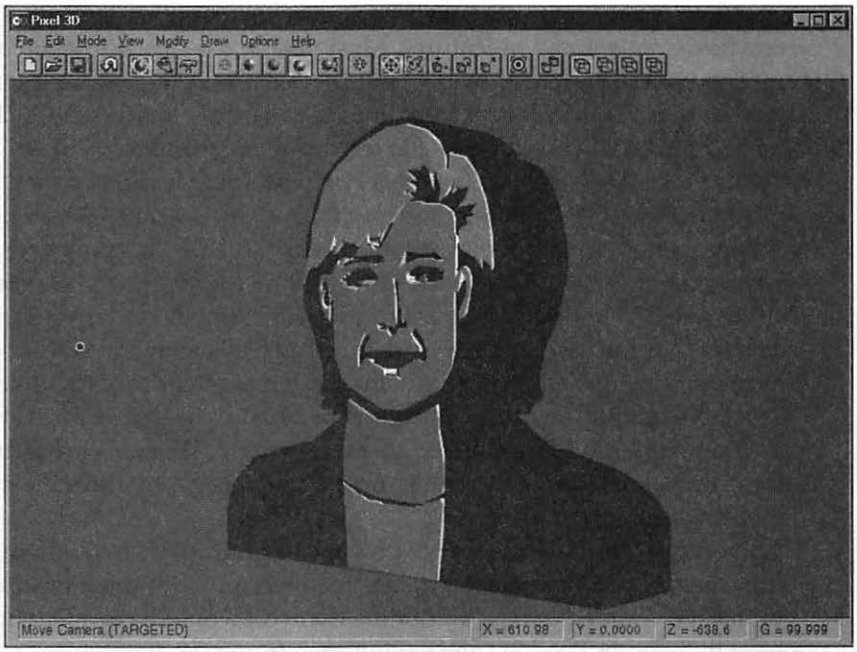


Figure 6-34: Our final product, created from a bitmap image.

Of course, we didn't even touch a number of other features within Pixel 3D, but as you can see now, you don't need a degree in rocket science to build your own 3D images, and you don't need an incredibly expensive graphics workstation either! Today's entry-level rendering software like Pixel 3D is designed to be easy-to-use for today's home and office computers. Little or no knowledge of complex mathematics or previous computer-aided drafting experience is required.

Rendering With Sculpt 3D

One of the best-known rendering programs for the Macintosh, Byte by Byte's Sculpt 3D, is a professional rendering package that provides many more features than Pixel 3D. It costs considerably more as well. If you're not running a PowerPC, Sculpt 3D requires a floating-point unit, and it also requires a minimum of 16 megabytes of RAM. Your Mac must be running System 7.1 or higher to use Sculpt 3D.

Sculpt 3D can create 3D terrain as well as text, but the real star of the show is its powerful animation features. Most people use this animation support for creating QuickTime digital video, but the program can generate numbered frames for GIF animation as well. Images can be exported as PICT, TIF, QuickTime, or several different 3D rendering file formats.

Like Pixel 3D, Sculpt 3D includes Phong shading, extrusion, and bevels, but it also offers a full raytracing mode, with five levels of anti-aliasing. An unlimited number of lights can be used in a project, each with its own color. In fact, the program even features a virtual "Exposure Meter," just like a film photographer uses! As you might expect from a professional rendering package, you can choose from a huge range of textures, as well as several surface effects and sky generation. Objects can be cut and pasted together to form linked *hierarchies*. For example, an arm may consist of a hand linked to a forearm linked to an elbow, which is in turn linked to an upper arm. Whenever that arm moves, all the linked objects move with it, unless they are given a specific movement path as well.

If you can afford it, this sort of power can produce incredible results. Plus, with the ability to generate the frames required for GIF animation automatically, you'll save yourself quite a bit of time that you would have spent moving an object by hand in Pixel 3D and saving each frame separately!

In Sculpt 3D, you first build your model, set up your lights, and then you add surface color and texture in a separate step. If you haven't already installed Sculpt 3D from the Companion CD-ROM, take a few minutes and do so now. Then double-click the Sculpt 3D application icon to run the program.

To render a 3D object, follow these steps:

1. Pull down the File menu and select New Scene. The program interface appears, as shown in Figure 6-35. Notice that Sculpt 3D uses multiple windows to allow you to view your object from more than one angle at a time; if you're familiar with most computer-aided drafting (usually shortened to CAD) applications, they typically display an object this way as well. Sculpt 3D calls this a *Tri-View* window interface. On the left side of the screen, you'll see a familiar Tool Palette that contains all the selection and drawing commands available in the program.

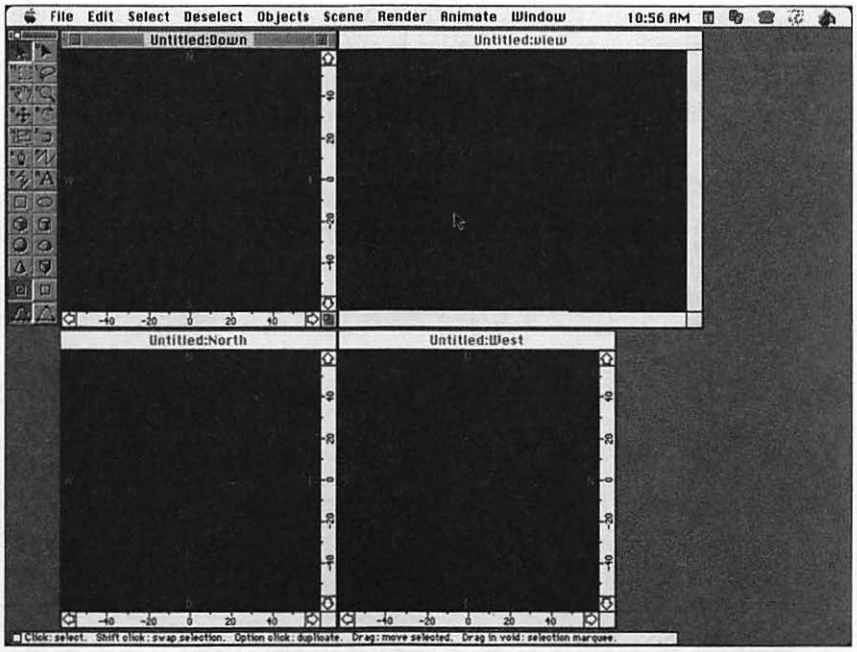


Figure 6-35: The Sculpt 3D interface, showing its multiple windows.

2. Click on the Block icon on the Tool Palette to select the Block tool. Click your mouse cursor in the middle of the North view window, and drag to create the object. In the 3D world, you're looking "down" on the object. After you've created a rough block of about two inches on a side, release the mouse button.
3. Add lighting. Select the Vertex pointer icon on the Tool Palette (it looks like a mouse cursor without a tail), and click in the North view to set a location near the object. Next, click in the West view to set a location close to the object from the side. The combination of these two points yields a three-dimensional location near our object. By default, Sculpt 3D will automatically add a blue sky.
4. Select Add from the Objects menu, and select Lamp from the submenu. The lamp object will appear, and you can move it with your vertex pointer.
5. Time to add a color to our object! Select the Object pointer icon on the Tool Palette (it looks like a regular mouse cursor), and click the block object to select it. From the Render menu, select Apply Color & Texture to display the Color, Texture and Surface dialog box, as shown in Figure 6-36. The fields on the right side of the dialog apply to the selected object,

so we'll use them. Click the Color square at the top right side of the dialog box to select a color for your block from a standard color palette. Click OK to accept the color and return to the Color, Texture and Surface dialog, where you'll see your selected color displayed.

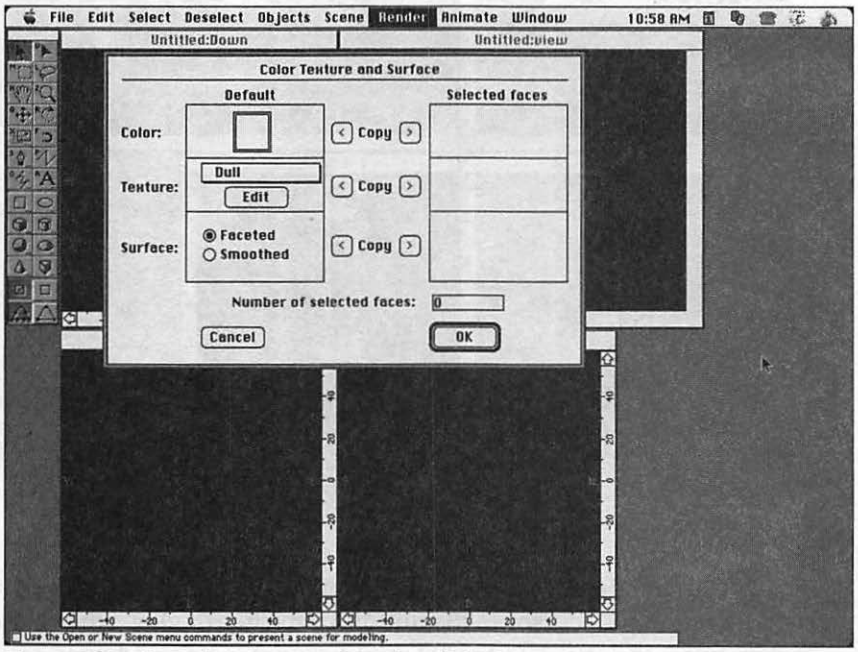


Figure 6-36: The Color Texture and Surface dialog box.

6. We also need to add a surface texture—how about a metallic look? Click the Texture drop-down list at the middle right side of the dialog box to select a texture. Click metallic to select it, and click OK to return to the main interface.
7. One final step before we render: a powerful package like Sculpt 3D will provide you with a number of settings that will control the final quality of the rendering. To display these settings, select Image Settings from the Render menu to display the dialog box shown in Figure 6-37. Make sure that you've selected Shaded as your Image Type, and set Anti-alias to Low. Click Set to return.

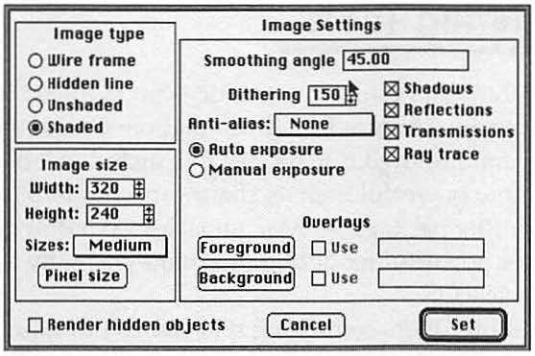


Figure 6-37: The Image Settings dialog box.

TIP

On the right side of the Image Settings dialog box, you'll see a number of fields that can greatly increase the realism of your scenes. For example, Sculpt 3D can generate correct shadows and reflections because it supports true raytracing, as I discussed earlier. However, don't enable these check boxes unless you have hours to spend because they'll take considerable time (even on the fastest Power PC Macs)! Of course, the image size you select on this dialog box also helps determine how long your rendering will take; the larger the image, the more time it will take to produce. Also, note that the demonstration version of Sculpt 3D included on the Companion CD-ROM cannot render an image larger than 640 x 480 pixels.

8. Let's rock! From the Render menu, select Render Image. A standard Macintosh file save dialog box will appear so that you can name the image. Sculpt 3D will display a small dialog box with a progress bar and a thumbnail displaying the image as it's created. Once the rendering has completed, the program will display the full-size image.

Let's draw this discussion of rendering to a close with a section on other rendering packages available these days.

Other 3D Rendering Tools

Welcome to Rendering Central! I'd like to introduce you to three other rendering programs that can produce frames for GIF animation. One of these programs will cost you several hundred dollars, but I've included it because—like Sculpt 3D—it's much more powerful than its shareware counterparts. I'll also discuss a freeware rendering package for Macintosh and Windows that is probably one of the most powerful rendering programs currently available for standard Windows and MacOS.

Each of these applications offers something that stands out from the others, so if you're especially interested in a particular feature, you may want to install the program and try it out for yourself.

Font F/X (Windows 95)

Font F/X from DCSI is another shareware package, and it's very similar in output to Pixel 3D. Its primary job is the creation of 3D font images. The program runs under Windows 95.

However, as you can see from Figure 6-38, Font F/X sports a much more integrated interface, more akin to Sculpt 3D. Everything is available from the design screen, including the positioning of multiple light sources and the camera lens controls, which Pixel 3D doesn't offer. Textures and colors are displayed onscreen for your selection, too, so you can experiment more easily with different texture settings for your text. Font F/X comes with a much wider variety of textures, too. Although Font F/X doesn't include a Wizard, the creation of a new font model is very simple, and—as you can see in Figure 6-39—selecting characteristics for your completed model is all handled through a set of simple tabbed dialog boxes.

Font F/X can export both bitmap and GIF format files, with or without transparency, at up to 24-bit color.

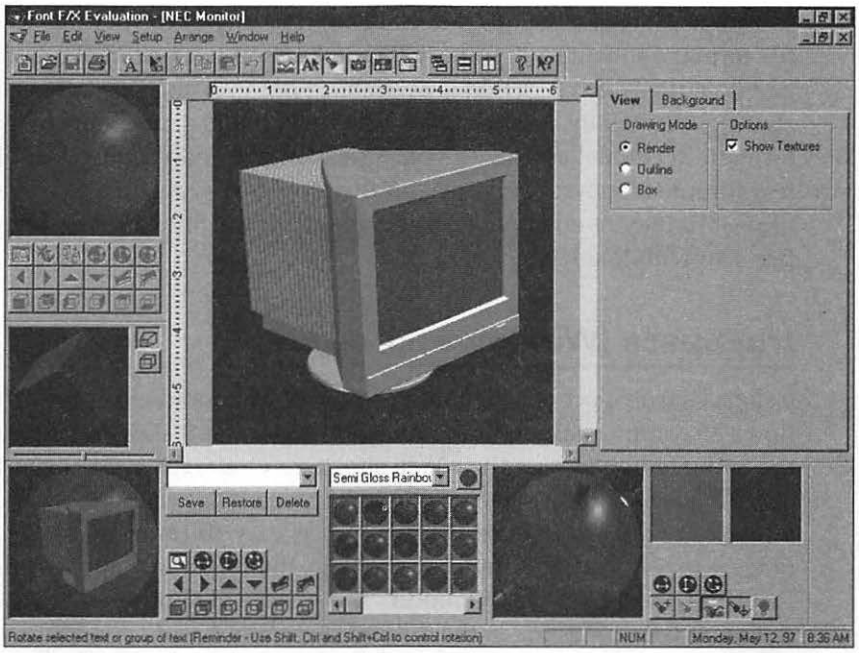


Figure 6-38: The Font F/X main window.

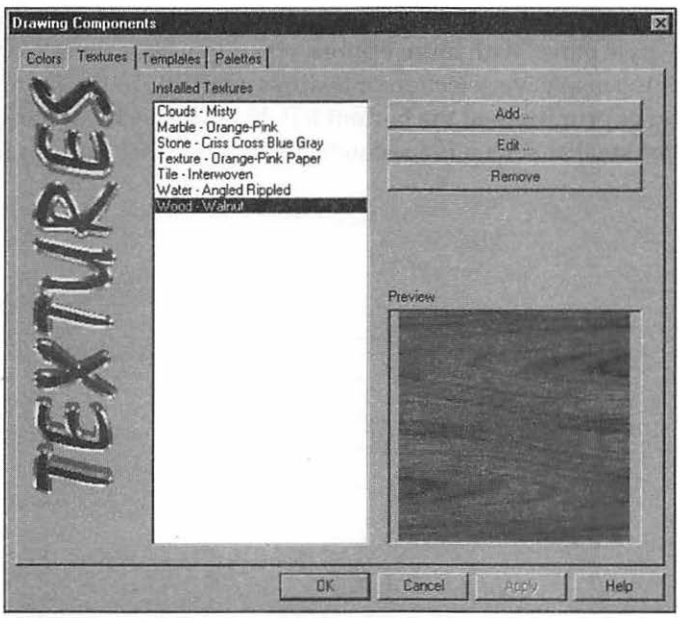


Figure 6-39: Creating a 3D font object in Font F/X.

Unlike Pixel 3D, Font F/X doesn't support any of the popular 3D rendering file formats, so you can't import 3D models you've created in other programs, and no auto-sketch function is available. Font F/X also doesn't perform anti-aliasing. Personally, I prefer Pixel 3D, which offers a much larger workspace for your 3D model and saves you a great amount of scrolling. Font F/X uses a less complex rendering engine and therefore takes less time to create image files—but they're nowhere near the quality of the Phong rendering you can perform with Pixel 3D.

trueSpace (Windows 95)

Caligari's trueSpace is probably the most popular and most powerful Windows 95 commercial rendering program for under $1000, and judging from the animated images on their Web site, they've already recognized the value of 3D GIF animation! I've been using trueSpace since version 1, when I was first attracted to the program by its easy-to-use, easy-to-understand 3D object view (a view that is actually similar to the large main window and its grid floor in Pixel 3D). In trueSpace, you modify the surface of your model by clicking and dragging the wireframe in the desired direction.

As you can tell in Figure 6-40, the trueSpace 3D view is familiar, but its menu system and interface are radical indeed! By default, both the complex-looking toolbox and the small menu system appear at the bottom of the screen, and many of the buttons on the toolbox tend to explode into additional Photoshop-style panes with more options when you click them. You can also see some of the extensive selection of textures available in the figure, as well as the selection of primitives at the bottom left. Finally, check out the giant walking robot; the smaller screen is a second camera view that you can manipulate separately.

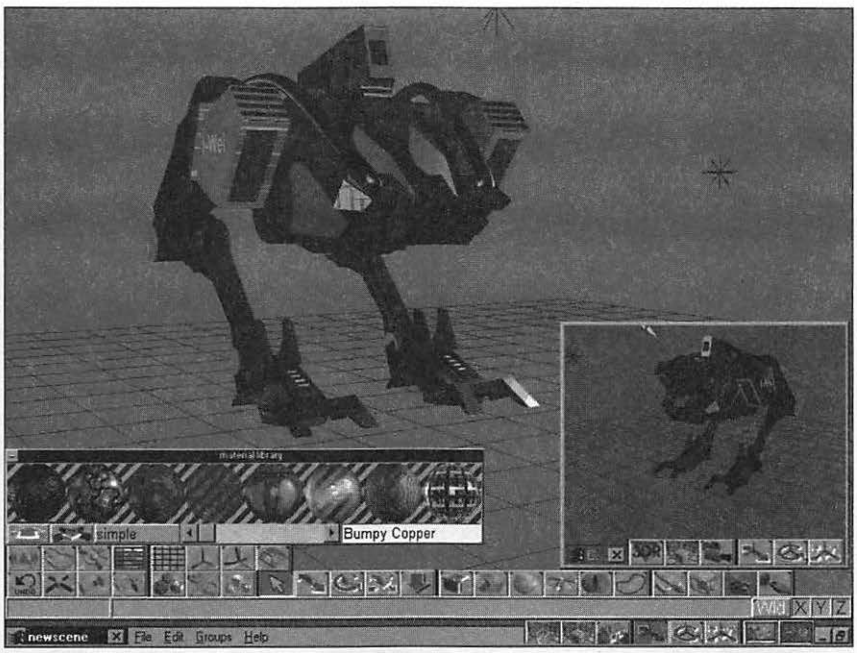


Figure 6-40: The trueSpace interface.

Just like Sculpt 3D, trueSpace is fully capable of producing television quality animation, and it can automatically export slides for your GIF animation. The program also has full support for font objects, with beveling and extrusion similar to Pixel 3D, so it can produce logos and rendered text. trueSpace is capable of both Phong rendering and true raytracing. Unlike other packages, trueSpace supports Adobe Photoshop plug-ins, so you can render some effects directly. trueSpace also recognizes an impressive number of 3D object formats, and you can save images in bitmap or TGA format.

Although Pixel 3D provides a great subset of rendering features especially suited to animated GIFs, trueSpace is a complete 3D modeling environment! If you need more horsepower and additional features, and you don't mind spending a few hundred dollars more, I can heartily recommend trueSpace!

Persistence of Vision (Macintosh/Windows)

Our last rendering program is not only powerful, it's *free*—and it's available for Macintosh, Windows, UNIX, and yes, even DOS! The Persistence Of Vision program (popularly known as POV or POV-Ray) has been around now for several

years; it's a group project, and the source code is freely available to anyone for the downloading. The official distribution Web site (www.povray.org) is well-designed and a pleasure to visit, as you can see in Figure 6-41.

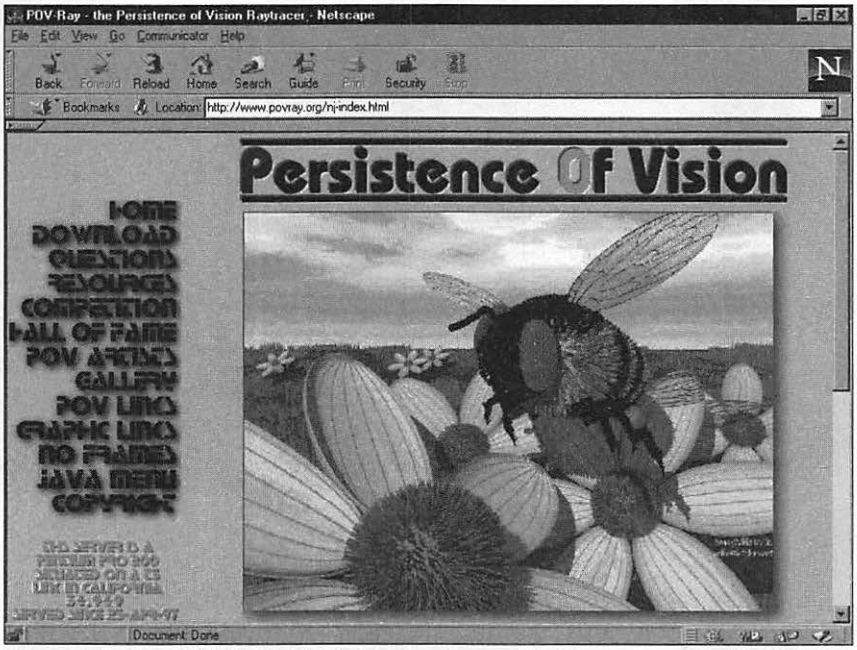


Figure 6-41: The official POV Web site, showing a typical image created with POV.

However, unlike any other rendering software I've mentioned, POV does not use 3D models, nor can you modify them within the program! Instead, you'll have to use one of the many shareware modeling programs that have been written to act as design "front ends" for POV. POV simply provides the rendering and raytracing engine, and you provide the program with a text "script" file written in the POV language that tells it what to do and which files to use for input.

In fact, even the latest 3.0 version of POV still doesn't feature a fancy graphical interface—and this complexity has both a good and a bad side. Take my word for it, this program is nowhere near as easy as Pixel 3D; you're not going to produce anything but the sample images for the first several times you run the program. However, if you take the time to master POV, you can produce images that can put even trueSpace to shame! You'll have to learn the POV language—but once you're done, you'll have a tremendous grasp of how rendering works and what effects you can produce.

Is POV really suitable for quickly producing image frames for GIF animation? The latest version of POV does include support for multiple frame output, so it has suddenly become a real possibility for creating GIF animation. Until you're really good with this package, however, you won't be able to turn out a rendered object as quickly as Pixel 3D, and POV has no support for tracing a bitmap image.

My recommendation is to try POV—after all, it's the best rendering software available that's completely free! If you're daunted by the excellent manual rather than intrigued, put it aside and return to shareware and commercial rendering programs. . . but you may find yourself addicted to POV, or perhaps using it as your rendering engine of choice for future projects.

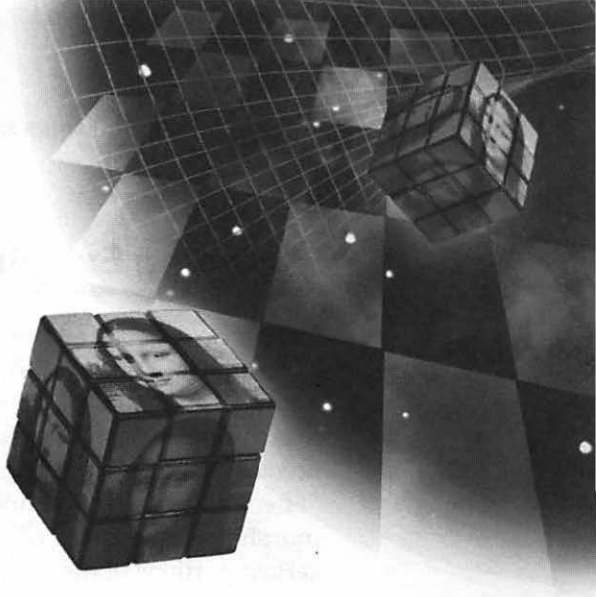
Moving On

In this chapter, I showed you how to create 3D frames for use in your animated GIFs! First, we discussed how you can choose the right options for your 3D model, including tips for selecting texture, lighting, and fonts. We used the fine shareware program Pixel 3D to build a 3D object, and we even created a 3D object from a simple bitmap image. We rendered a basic 3D object using the Macintosh program Sculpt 3D. Finally, you learned more about some of the other freeware, shareware, and commercial rendering programs available today.

In Chapter 7, you'll learn more about the sophisticated technique that Hollywood calls morphing, and we'll produce yet another type of advanced animated GIF!

CHAPTER 7

Creating Morphing Web Graphics



In the last chapter, you learned how to animate images in three dimensions. Just like the special effects wizards in Hollywood, you can now create convincing images of objects that have never actually existed and make them move. You can now populate your Web page with spinning text, floating logos, and even an occasional solar system, complete with fiery sun and orbiting planets!

Now let's change direction and explore a new type of animation that has also been used to create special effects for films and television: morphologic transformation (or, if you want to lead a normal life, *morphing*). Using this relatively new technology, you'll be able to mutate one image or object into another on your Web page or manipulate objects like they were clay or putty. Morphing is another magical effect that will draw the eye to your page and your visitors to your message.

We'll begin this chapter with a quick discussion of two different varieties of morphing. I'll explain the characteristics of a good image for morphing animation. Then we'll take a look at two very different programs: HiJaak Morph, a good program for creating transitional morphing, and Power Goo, a very popular program that creates images through alteration morphing. Finally, we'll create both of these two different types of morph animation, step by step, so that you'll be able to choose the type that you prefer. Once you've had fun with these programs, you may find yourself recalling the days when alchemists said they could change lead into gold—or, in this case, turn your boss into a Mercedes!

Morphing Explained

Transitional morphing involves the transformation of one image (called the *source* image) into a completely different image (called the *target* image). You've seen this effect when a character seems to magically change its form into something else, like a cat changing into a dog. Transitional morphing is accomplished by identifying similar characteristics in both the "before" and "after" images—for example, outlining the eyes or noses of two faces. Your morphing application will use these common points and lines to "anchor" certain portions of the image together while all the other features of the two images are changing shape.

In *alteration morphing*, you change features of a single object by pushing, pulling, or smearing the image; when you're finished, your object might look superficially like another object, but only one original source image is used. If you're experienced with the image effects available in Photoshop, you might consider this procedure just another image effect, but I prefer to consider it a morphing action because you usually have much more control over the changes you make to an image than you do with a simple filter, and you also have a wider variety of tools to produce movement effects.

How can you use this technique for animating GIFs? By using the same technique we used in 3D animation: taking individual frame images at regular points during the movement cycle, which we can plug into GifBuilder or GIF Construction Set. In fact, transitional morphing also requires you to build a "wireframe" of sorts, just like the 3D models in the previous chapter, and you'll have to wait for your computer to process the images before viewing your morph animation.

With alteration morphing, however, we're once again making manual changes to the image with a selection of tools. I think you'll find the process somewhat akin to shaping clay . . . and, best of all, you can see the result of your changes immediately rather than having to wait for the animated image frames to be created!

If all this seems a little confusing, let me reassure you that the programs you'll be using will take care of all of the sophisticated calculations necessary to build your animations—all you need to do is concentrate on the creative design. I'll discuss each type of morphing step by step later in this chapter; first, though, let's discuss the guidelines for selecting images for morphing.

Selecting Images to Morph

Just like the 3D animation we discussed in Chapter 6, morphing can produce outstanding effects that can add tremendous visual interest to your Web page; however, there are guidelines that you should follow to help ensure that your final GIF animation is as small as possible and animates smoothly.

For example, in film and television morphing usually involves altering an object while keeping the background of the object intact so that it seems to transform only the object. Building a GIF animation from a morphing sequence with a background is certainly possible, but once again we run into the same problem as we did in the previous chapter: the more background you include while creating your morphing sequence, the larger your animated GIF will be, and the longer it will take to load. This is especially true if your background is heavily detailed or includes separate movement of its own.

This is just one possible problem area. To avoid these pitfalls, I urge you to select source and target images with the following characteristics:

- **Use plain backgrounds.** I prefer plain black or white backgrounds for my images but whatever color or level of detail you select, make sure that both images share the same color background or that the colors are as close as possible. Even the two images in Figures 7-1 and 7-2 have this problem; one has a green background of trees and bushes and the other has a blue sky background—and they're included with HiJaak Morph as samples! If necessary, your object can certainly change color, but your background should remain as stable as possible; this focuses attention on the morphing object and helps enhance the illusion that it, and not the entire scene, is changing. Also, if your images share the same background, you should be able to compress the final GIF animation using GIF Construction Set's SuperCompress option.

Figure 7-1: A sample source image with a green background.

Figure 7-2: A sample target image with a blue background.

TIP

If you are forced to use two images that have different backgrounds, there are ways you can minimize the distraction of a changing background. One way is to crop as much of the background from the finished animation frames as possible. Alternatively, you can create new source and target images: crop just the objects out of the original images and paste them onto identical white, black, or single-color backgrounds using your image editor.

- **Include details.** When it comes to morphing, the more detail the better! Greater detail in both the starting and ending image gives you additional points to map, and the more points you map, the smoother and more realistic your morphing animation will be! No need to worry about what I mean by mapping points just yet—just remember that detail is your friend.
- **Limit colors.** Although you can morph images with a 24-bit color depth, we've already mentioned that 256-color frames are better for GIF animation. You should reduce both your source and target images to the same palette using the same standard colors to avoid palette changes and dithering during the morphing process or during the GIF animation process that will follow.
- **Use similar angles.** Look again at the two cars in Figures 7-1 and 7-2; do you notice that they were photographed from similar angles and distances? This similarity is no accident—for the best morphing results, your objects should be close to each other in orientation and size. If your source image is a woman's face, for example, don't try to morph her into a full-length target image of a woman standing up—unless, of course, you want the source's chin to morph into the target's feet!

TIP

In our upcoming example, I'll be using two women's faces—one looking straight into the camera, while the other is looking at the camera with her head tilted. This sort of slight change in orientation is OK. In fact, I like the slight illusion of movement you get in watching the morph, as the woman's head moves into a tilt.

- **Use large images.** For most morphing software, the larger the source and target images, the easier it is to determine details, map points, and curves in both images. It's easy to resize or resample the finished image frames to a smaller size later, if necessary, using your image editing program. Of course, you're not going to want any GIF animation on your page that's 640 x 480 but trying to map points and lines on images the size of thumbnails is more trouble than resampling later.

Now it's time to introduce you to HiJaak Morph, the tool I'll be using to demonstrate transitional morphing.

Introducing HiJaak Morph

My favorite program for transitional morphing under Windows 95 is HiJaak Morph from Quarterdeck. Although there are more complex and powerful morphing applications available, this program offers a good balance between ease-of-use and professional features, plus it allows you to generate a single frame anywhere in your morphing sequence, which makes it ideal for creating images for use in GIF animation. To cap it all off, the file save options in HiJaak Morph are practically designed for GIF animation, as you'll see in our tutorial, so the finished images require little conversion or editing. If you're using a Macintosh, the most popular transitional morphing program is Elastic Reality from Avid Technology (www.avid.com).

As you can see in Figure 7-3, the HiJaak Morph interface wastes no space. As a matter of fact, it's probably one of the smallest application windows I've ever seen! The only menu items required are the various file loading and saving commands and the online help system.

The remainder of the commands are accessed through icon buttons so once you know your way around Morph, you can generate images quickly. Plus, if you leave your cursor over an icon button for a few seconds, the function of the button will be displayed in a tool tip—a feature that really helps to remind you what everything is until you're experienced with the program.

Figure 7-3: The HiJaak Morph main window.

At the top of the screen, you'll see two windows that will display thumbnails of your source and target images, as well as fields where you can specify the total number of frames in your morph sequence. Remember, you can reduce the size of your finished GIF animation by reducing the number of frames, so I try to keep this number as low as possible without affecting the smoothness of the transition.

I'll explain the other buttons and their functions while we create a transitional morphing animation.

Creating Transitional Animation With HiJaak Morph

In this tutorial, I'll turn a familiar face—the smiling woman we used in the last chapter—into another person! No, there's nothing up my sleeve; instead, I'll use HiJaak Morph to demonstrate this visual magic.

To morph two images with HiJaak Morph, follow these steps:

1. Open the File menu and select the Open Source item, or click within the empty square that holds the source thumbnail. From the File Open dialog, select your image and click OK. HiJaak Morph supports all of the common image file formats, so you probably won't need to convert your source and target images before you start. Once you've selected your source image, the program will display it in a thumbnail view at the top of the window.
2. Now load the target image. Open the File menu and select the Open Target item or click within the empty square that holds the target thumbnail. Figure 7-4 shows both of our images loaded within HiJaak Morph.

Figure 7-4: Our images are loaded.

3. Next, display both of your images at their full size by clicking the thumbnails. If you need to increase or reduce magnification within these working windows, select the Zoom command to display the Set Zooming Scales dialog, as shown in Figure 7-5. If your images are particularly small, you'll appreciate this feature because you'll be able to zoom into your graphics to pick out small details. To reduce the zoom factor, enter a number lower than the current value; to zoom in closer, add to the current value.

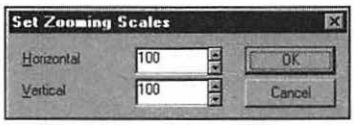


Figure 7-5: You can set the zoom factor for your images from this dialog.

4. The real fun begins! It's time to map the similar points and lines within our two images. Click the Toggle Preview button at the top right (the first in the Lines section of the HiJaak Morph main screen, shown in Figure 7-3) to toggle it on. Move your cursor to a portion of the source image that has a corresponding point in the target image as well; for example, if you're morphing a tomcat into a tiger, you could select the tip of the nose (which exists on both animals). It's also a good practice to "border" the object within both images with points, which helps create the smoothest possible morphing effect. For our women, we'll select the tip of the chin—this is a definite location you can easily find in both images. Once you're positioned on similar points in both images, hold down the Shift key and click.

5. A green dot will appear on the source image. This is your first point, as shown in Figure 7-6. However, look at Figure 7-7: the same point in the target image is located on the woman's lower lip! We need to indicate to HiJaak Morph the correct point on the target's chin so that when the two images are merged, the program knows where the same spot is on the target image. To do this, move your cursor to the Target window on top of the green dot until it changes shape, then click and drag it to the corresponding spot (in this case, the tip of her chin).

Figure 7-6: We've set our first point on the source image.

Figure 7-7: The corresponding point must be moved to the same area on the target.

6. Now we'll repeat Steps 4 and 5 a number of times, matching ear to ear, the same spots on the nose, the eyes, and any other features that the two images share. Remember, mark as much of the border of the object as possible (in this case, the face and hair). Each time you mark a point on the source image, don't forget to drag the green point in the Target window to the corresponding location! Once you've added a new point, all the older points will turn blue—you can always tell the current point you're working with because it will be green. If you need to delete a point, move your cursor over it, and press the Delete key. The more points you are able to match between images, the smoother and more professional your morphing will be.

TIP

Important note: A corresponding portion of either image need not be visible to be marked with a point! For example, the upper left part of the face in our source image is hidden by hair, but we can still place a point there that corresponds with the same spot on the target's face. As long as you can safely estimate the proper position for a point, it will help your finished animation.

7. You can also draw a line that follows a path between two points. For example, the mouths of both of these images are fairly straight, and because I've placed points at both sides of the mouth, I can draw between them. To draw a line, position your cursor over an existing point, hold down the Ctrl key and click, then drag the line that appears to the ending point, and release the mouse button. Lines aren't required, but they do help outline major sections of both images that should move together.

Whoops—Doorbell!

Doesn't it always work that way? You sit down, ready to design the latest morphing frames for your new GIF animation, and you've only been working 5 minutes or so when the doorbell rings and your friends show up to drag you to dinner! You can't say no—especially if they're paying—so how do you save all those points you've been plotting?

➥

Don't panic! You can save all of your points and lines within a file and overlay them onto the same two images later. Typically, all of the lines and points taken together are called a *mesh*. Click the Save Lines button on the right side of the HiJaak Morph main screen which looks like an arrow pointing to a floppy disk, and save it to disk under a unique name. When you're ready to resume your work, load the same two images as source and target, then click on the Load Lines button, which looks like an arrow pointing away from the same disk. If you like, you can even experiment with multiple mesh files on the same two images to see which creates the better effect.

8. Once you're done adding points, you're ready to experiment with your first morphing animation. To be safe, save your mesh (the lines and points you've mapped) in case you need to load it later. Click the Save Lines button on the right side of the HiJaak Morph main screen (that looks like an arrow pointing to a floppy disk), and save it to disk under a unique name. You certainly don't want to lose all that work! Our finished mesh for the source side of our morph looks like Figure 7-8. Now set the Number of images in morph field to at least 10; any less would result in a jerky, unrealistic animation, while a number much larger than 15 or 20 will usually result in a final GIF animation that takes too long to load.

Figure 7-8: Our finished mesh of lines and points maps the face in this source image with the target image.

9. Next, set the Number to begin with field to 1, and type a new name of 8 characters or less into the Name field—for our example, we'll use the name SMILE. You'll also want to see the frames as they're generated, so click on the Create Images button at the bottom center of the window. The button will remain depressed to indicate that it's on.
10. As I said before, HiJaak Morph conveniently saves each individual frame of your morph to disk; however, we have to set up this feature before you morph. First, click on the Create Files button at the bottom of the window to enable it; a small checkmark appears on the icon, and the button will remain depressed to indicate that it's on. Next, click on the Save Options button to display the dialog shown in Figure 7-9. We need to save our output as images, so select GIF files (*.GIF) in the Save To field, and—voilà!

Figure 7-9: The HiJaak Morph Save Options dialog.

Now here's a great set of features for GIF animation; check out these save options: HiJaak Morph allows us to select an 8-bit color depth, which will produce the 256-color frames we like to use, and it will build images with a common palette. And we can even optimize the palette by selecting our own maximum number of colors. Let's save ourselves some work: under Bits Per Pixel, select the 8 bits option and enable the Make common palette check box. Finally, click on Browse to select the location where the image frames will be saved; don't forget to select GIF files as the File type. Click OK when you're done to save your choices and return to the main window.

11. Next, click on the Output Options button to display the dialog shown in Figure 7-10. From here, we can determine the size of the output frames and their width-to-height proportion (or *aspect ratio*, as it's called in Paint Shop Pro); the default is generally as close to 320 x 200 as possible, and HiJaak Morph will keep the proportions of the source image. The Quality field is very important as well because it determines the speed of the morphing process and how good the quality of the final frames will be. I always use the Best setting and give the program the time it needs to do the job well! Finally, always enable the Interpolate option which provides anti-aliasing like our 3D applications used in the last chapter. Click OK when you're done to save your choices and return to the main window.

TIP

Although you can select a larger size for your output images, I strongly recommend you allow HiJaak Morph to generate them at the 320 x 200 default. Why? As I mentioned in earlier chapters, the smaller your finished GIF animation, the faster it will load. I can't imagine anyone ever creating an animated GIF with a finished size of 640 x 480! In fact, you may decide to generate your images at a smaller size than the default if your object need only be an inch square on your Web page.

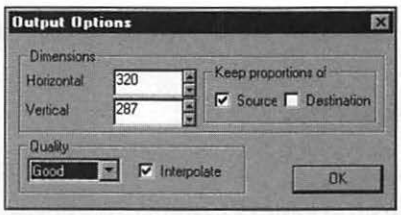


Figure 7-10: The HiJaak Morph Output Options dialog.

12. All that remains is to click Go on the main screen. HiJaak Morph will display each image in a window as soon as it has been processed, and it will also save the images to disk as we requested. Figures 7-11 and 7-12 are two representative frames from the Smiling Ladies morph.

Figure 7-11: The source image has just begun to morph into the target.

Figure 7-12: Another image from the morph, this time toward the end of the animation.

If At First...

Don't be disappointed if your first morphing attempt with a new set of images doesn't work quite as you imagined! Here are the most common methods of improving your morph animation to produce the results you need:

Alter the number of frames. I would recommend 20 as a maximum for the number of frames. However, if you reduce the size of your object, you can take the additional space you save and add extra frames. As a rule, your morph animation will always benefit from additional frames.

Add lines or points to your mesh. The more detailed your mesh, the better the appearance of your final morph! I typically add anywhere from 40 to 100 points to the source image, with lines added wherever possible.

Increase the default quality setting. To save time, HiJaak Morph uses a default quality setting of Good—change this to Best to improve your animation.

Use interpolation. Although Interpolation takes additional time, the anti-aliasing it provides will enhance the appearance of your animation.

Change one or two of these settings to experiment and try again. It usually takes me two or three attempts before I end up with the right look.

Personally, I enjoy both 3D rendering and morphing so much they've become hobbies on their own—no need to limit your creative urges to just Web animation frames!

Next, we'll ruthlessly turn the most well-respected lady in the art world into a clown, using nothing more than the considerable power of Kai's Power Goo.

Introducing Kai's Power Goo

Now here's a program that was designed for fun from the ground up! I use Kai's Power Goo by MetaCreations Corp. (formerly MetaTools) exclusively for alteration morphing, and since its release I haven't yet had to turn to another program to produce frames for a funny morphing animated GIF. It's no surprise that this great program was an instant hit.

Power Goo is available for both the Macintosh and Windows platforms, but it needs ample horsepower to run; a Power Macintosh running System 7.5 or a Pentium running Windows 95 is recommended, with 24-bit color and at least 8 megabytes of RAM.

This program features one of the easiest interfaces I've ever seen: it's fast, simple enough for a child to use, allows complete control over your editing, and it's even attractive to the eye. Changes that you make to your image are automatically displayed in real-time, and you have a wide variety of different morphing and transforming tools that you can use to apply just about any movement cycle you like to a static image.

Menus within the program are presented as a series of nesting screens: for example, Figure 7-13 shows the main menu, while Figure 7-14 shows the main viewing and editing screen. The two palette icons at the upper left display two different sets of image and transition tools, while sliders allow you to display the animation frame-by-frame at whatever speed you like. The words *In* and *Out* represent your import and export commands, respectively.

Figure 7-13: The Kai's Power Goo main window.

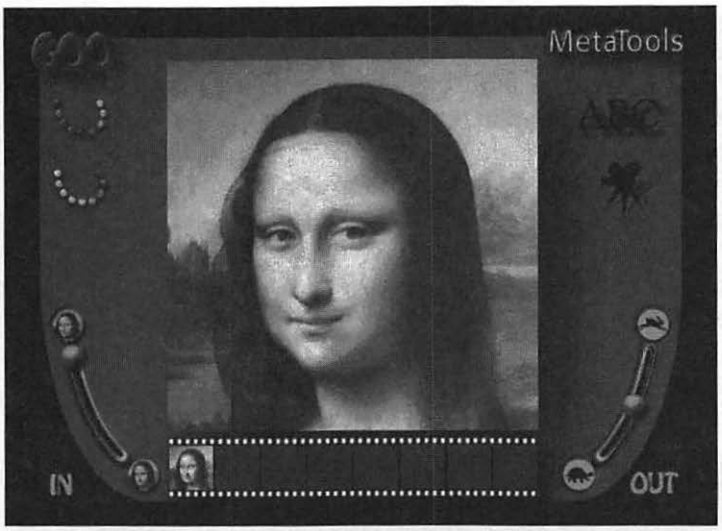


Figure 7-14: Mona Lisa, prepare to be morphed!

At the bottom center of the screen, a filmstrip holds thumbnails of each image that you can add to movies you produce; we won't be using this function, though, since we're going to save individual frame images as usual.

Let's see what visual mischief we can perform with Power Goo!

Creating Alteration Animation With Kai's Power Goo

In this tutorial, we'll use alteration morphing to turn the Grand Dame herself—the Mona Lisa, who automatically appears—into a smiling clown (among many other things), and then back to her original beautiful self.

Altering Your Image

To morph an image with Kai's Power Goo, follow these steps:

1. From the main map, click on the In Room to display the screen shown in Figure 7-15. If you're going to work with an image from your hard drive, click on Get Image from File (but notice that you can also import images from a digital camera or the Snappy video capture device, two pieces of hardware we discussed in Chapter 2). From the File Open dialog, select your image, and click OK. Once you've selected your source image, the program will move to the Goo screen, as seen in Figure 7-16. If you don't select a source image, the program automatically displays an image of the Mona Lisa.

TIP

If you're running a Macintosh, Power Goo imports PICT, Photoshop 3, TIF, and PhotoCD formats. If you're running under Windows, you can load BMP, TIF, PSD, and PhotoCD formats.

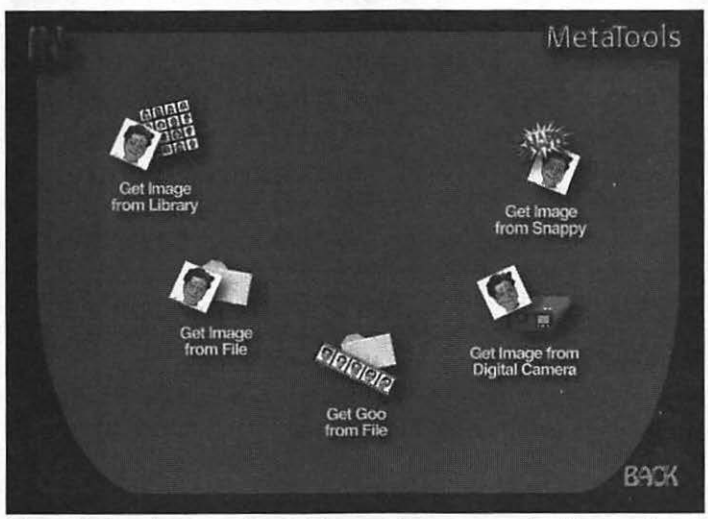


Figure 7-15: The Power Goo In Room, where you can load images for morphing.

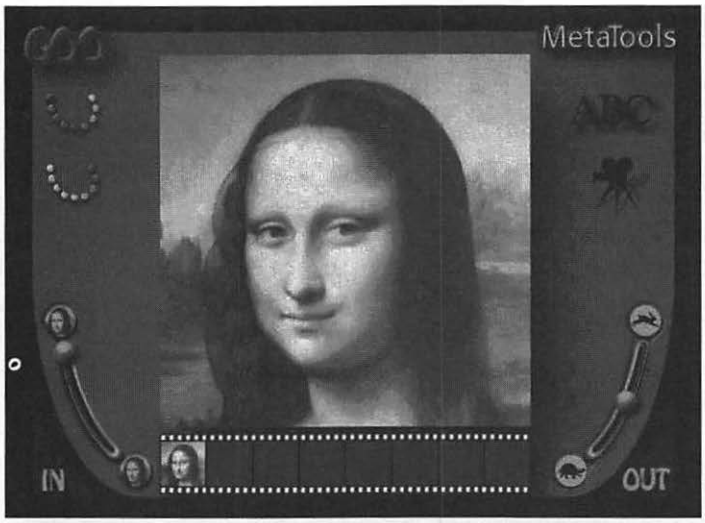


Figure 7-16: The Mona Lisa, ready to undergo plastic surgery with Power Goo!

Hey! What Happened?

Let me guess—you loaded your prized full-length image of your pet snake Rollo taken with your panoramic digital camera, only to find that all you got was his midsection! That's because Power Goo's working window is a square shape, and any image that isn't close to a square shape is automatically cropped to fit within the window.

The easiest way to fix this problem is to load your picture into an image editor like Photoshop or Paint Shop Pro and crop any unnecessary material until the original image has a square shape; however, this doesn't work on long rectangular pictures, like your snapshot of Rollo. Alternately, you can add a plain border around your image to give it a square shape and then remove the extraneous border from each animation frame afterward.

By the way, Power Goo also resizes the image automatically if it's too big to fit within the window, but this usually isn't much of a problem.

2. Forgive us, Mona Lisa! Let's load the standard morphing command palette, which appears in icon form directly under the word "GOO" in the upper left corner of the screen. Click the first semicircular palette icon, and Power Goo displays the buttons shown in Figure 7-17. Take special note of the Reset button at the top left; if you make a mistake, you

can always click this button to reset your image and start over. In a similar fashion, the UnGoo button at the top right removes the changes you've made to just the area under the cursor, so you can selectively restore parts of the image to their original appearance.

We'll take you on a very quick tour of these buttons and show you their individual effects. Like any paint program, you can use different commands in any order you choose, but this way you can see what each does by itself. If you're following along, don't forget to click the Reset button at the top left to return the image to its original appearance after using each button!

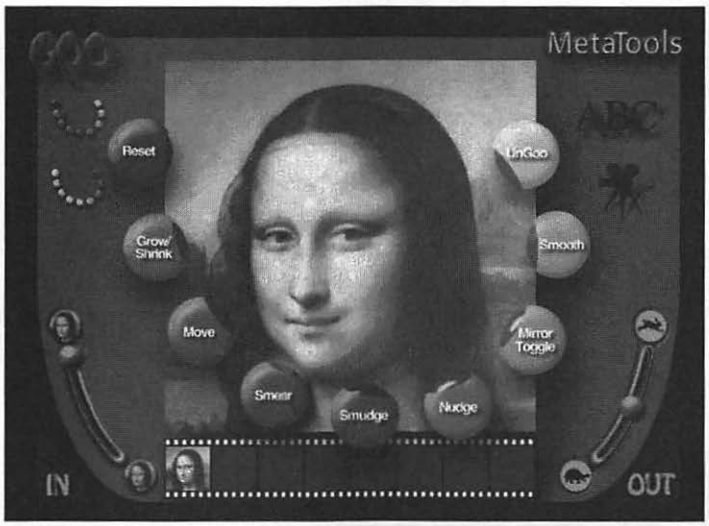


Figure 7-17: The standard Power Goo morphing palette.

TIP

Remember that each illustration here shows only one part of the movement cycle. If you create a looping animated GIF using frames from the entire cycle, the effect will be even better.

3. First, we'll use the Grow/Shrink button. Click on it to illuminate it, then click and hold the mouse button while moving your cursor in a circular motion around the good lady's nose. You'll notice that this portion of her face shrinks in proportion, so you end up with an image like the one shown in Figure 7-18.

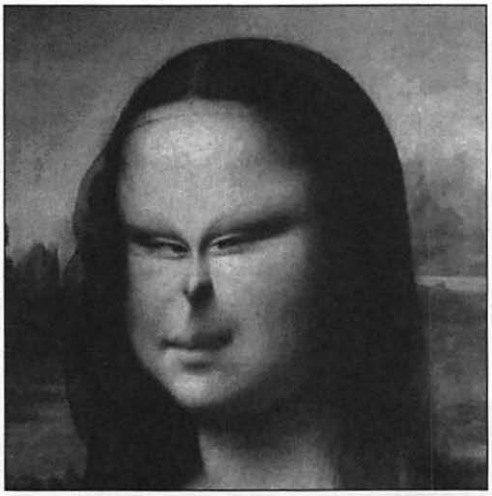


Figure 7-18: The effects of the Grow/Shrink button.

4. Next, try the Move button. Click on it to illuminate it, then click and hold the mouse button while moving your cursor up and down several times along Mona's nose—the result is what I like to call "the Easter Island effect" illustrated in Figure 7-19, as portions of the image are moved in the direction of your mouse. Click the Reset button at the top left to return the image to its original appearance.

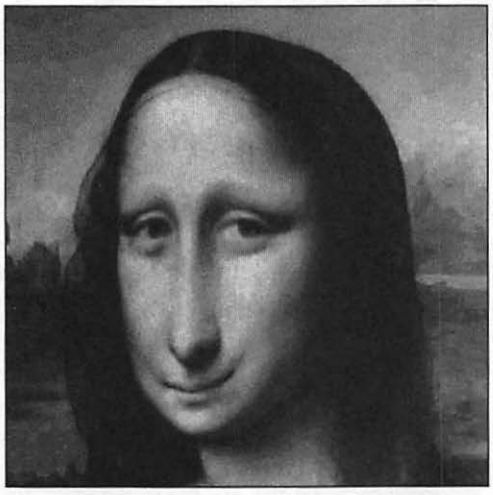


Figure 7-19: The effects of the Move button.

5. The Smear and Smudge buttons are similar, although the Smear button has a more pronounced effect; both commands "pull" the image underneath in the direction of the mouse movement. Unlike Move, however, each pixel will leave a trail behind it so that it appears you're stretching the existing image. Figure 7-20 shows the results of a Smear.

Figure 7-20: The effects of the Smear button.

6. The Nudge button is probably my favorite, as it allows you to make small changes to a part of your image without producing dramatic changes elsewhere. This makes it a good tool for creating animation frames as well. The command moves the pixels underneath in the direction of the mouse movement. Figure 7-21 shows the results of a Nudge . . . suddenly, Mona's trademark smile is much more noticeable!

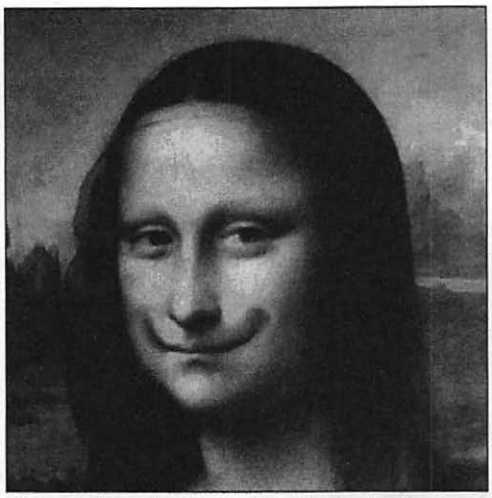


Figure 7-21: The effects of the Nudge button.

7. The Mirror Toggle button produces an equal mirror image motion for the selected command. For example, a Nudge to the left using the Mirror Toggle would result in an equal motion in two opposing directions, to the left and to the right. Mirror Toggle is especially effective when you want to create a balanced effect. This button remains ON or OFF until you toggle it by clicking it.
8. Finally, the Smooth button probably has the least apparent effect, but I typically use it after I've created another masterpiece; it smoothes surface detail, blending the colors and lines somewhat under the cursor. One or two quick moves with the Smooth button, and your image will usually look a little more lifelike.

That completes the first command palette. Now click on the second palette icon underneath the first and Power Goo will display the second command palette. These commands are more similar to simple image effects, as you have no control over them. Also, they don't seem to have any direct effect on your image when you select one because your original image becomes the exact center of the movement cycle for the effect you choose. To step through the cycle frame-by-frame, click and drag the slider bar at the lower left part of the screen.

9. Figure 7-22 illustrates the Bulge transition at its maximum setting. At the other end of the movement cycle, it looks much like the Grow/Shrink effect from the first command palette.

Figure 7-22: The Bulge transition.

10. The Twirl transition is shown in Figure 7-23. Not only is it disorienting, it's very popular as a GIF animation!

Figure 7-23: The Twirl transition.

11. The Rotate transition causes the image to "disappear" for a second or two, but it will reappear upside down. Figure 7-24 shows the results of a Rotate transition.

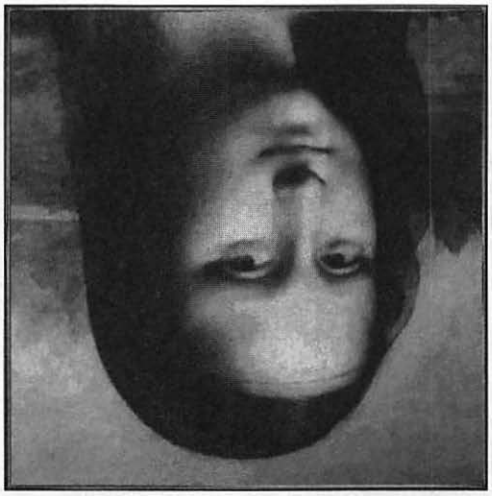


Figure 7-24: The Rotate transition.

12. The Stretch transition is probably the simplest—it stretches the image from opposing sides.
13. The Squeeze transition in Figure 7-25 can create the famous "Mona Ape" image!

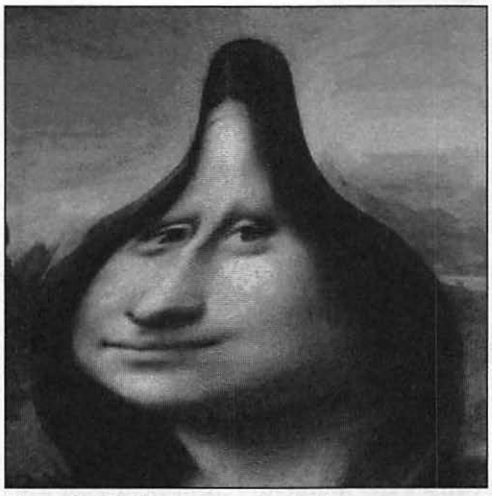


Figure 7-25: The Squeeze transition.

14. The Spike and Static transitions are similar, differing only in the amount of distortion they create. Spike results in large, jagged spikes, while static is a shimmering, translucent effect. Figure 7-26 illustrates the Static transition.

Figure 7-26: The Static transition.

That's a quick overview of the available commands within Power Goo. If you've used this program before, you'll notice that I didn't mention *Goovies*, the animated movies you can create, or the AVI and MOV digital video output you can produce. Since these extra features have no connection to the single frame output we need for GIF animation, I decided to skip them, but I encourage you to explore the other features of this great program at your leisure.

Creating Animation Frames

OK, now we know how to alter an image in Power Goo, but how do we create the image frames we need for GIF animation? Good question, I'm glad I asked it! To save the current image within Power Goo, follow these steps:

1. Once you've completed your image, click the word "OUT" in the lower right corner of the standard Power Goo Morphing command palette (Figure 7-17) which displays the Out Room, as shown in Figure 7-27. Click the Save Image icon.

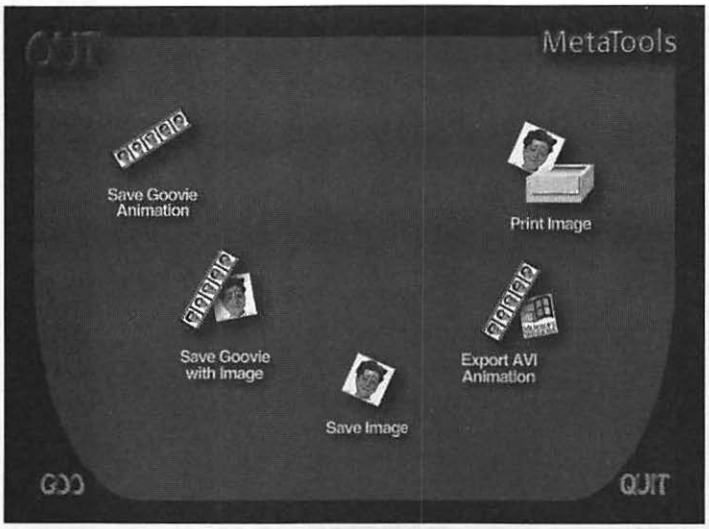


Figure 7-27: The Power Goo Out Room, where you can save images after morphing.

2. The program displays the Goo Image Output Size dialog seen in Figure 7-28, allowing you to set the size of your image. By default, this size is 360 x 360, but you can move the slider to figures over 4,000 x 4,000 if you have the memory! Set the desired output size and click the checkmark to continue.

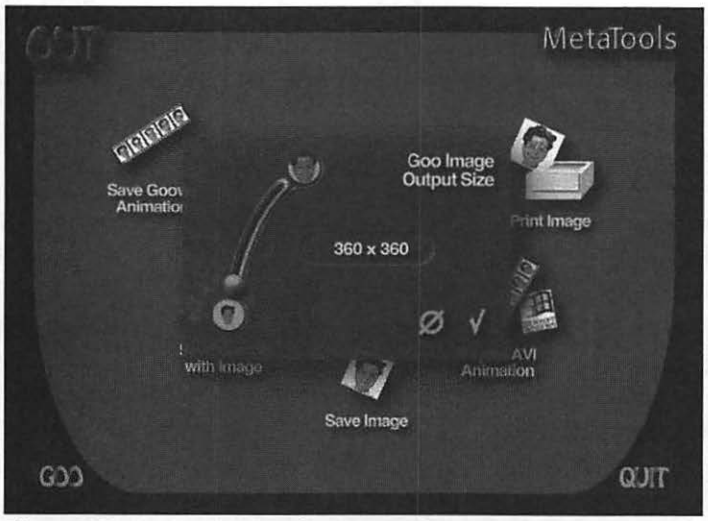


Figure 7-28: Setting the size of our output image.

The Output Size Dialog

Power Goo will not display the Output Size dialog unless you set Power Goo for high-resolution. To do this, follow these steps:

1. From the main map, click on the Options icon to display the screen shown in Figure 7-29. Under Output, click the High Resolution check box to enable it.
2. Click on the checkmark icon to save your new settings to disk.

The High Resolution setting is available only on the full retail version of Power Goo.

The maximum size for your image depends upon the amount of RAM set aside for the program; if you're using a Macintosh, you can allocate additional RAM to the program. Follow these steps:

1. Click on your Power Goo icon to highlight it, and select Get Info from the File menu.
2. Under Memory Requirements, allocate additional memory to the Preferred Size field.

The maximum output size of 4,128 x 4,128 requires approximately 70 megabytes of RAM, so if you need to create a really large picture, consider resampling a smaller size image within your image editor!

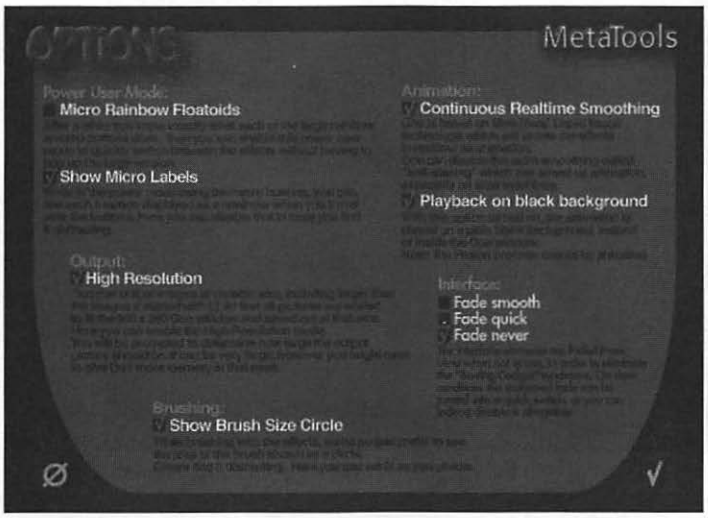


Figure 7-29: The Power Goo Options screen.

3. From the File Save dialog, enter a name and select BMP format, and then click on Save to copy the image frame to disk.

Unfortunately, this version of Power Goo has no support for saving multiple separate image frames from a morph. However, since most GIF animation uses a maximum of 10 to 15 frames, it's no big hassle to take the individual images. For the excellent visual results you can obtain from Power Goo, it's well worth the extra effort!

Combining Two Images

Before we leave the Power Goo premises, there's one other feature I'd like to show you: the program includes a Fusion Room, where you can select parts of one image and "graft" them onto another to create a brand new image! This doesn't result in a movement cycle, though, so it can't be directly processed into a GIF animation. However, you can use the image you create as the basis for more work within Power Goo, or you can save it for morphing use with HiJaak Morph.

To combine elements of two images with Kai's Power Goo, follow these steps:

1. From the main map, click on the Fusion Room to display the screen shown in Figure 7-30.

Figure 7-30: The Power Goo Fusion screen, where features can be combined.

2. Next, we need to load our own images. To load an image from your hard drive into either window, click on the In button below the window; Power Goo displays a File Open dialog. Select your image and click OK.
3. If you need to flip the image upside-down, click the upside-down F button. To reverse the image, click the backwards F button.
4. Time to load one of the images into the center frame. Click on the arrow pointing from the image you want to use to the center window and Power Goo will load a full-size image. You'll use this image as the basis for your final picture. I'll use the program default, a man's portrait, as the base for this example.
5. From the other image, select a feature you'd like to add to your main image. In our example, we'll graft one of the young girl's ponytails onto the man's head! Click your mouse cursor on the base of the young girl's right ponytail; you'll see it turn into a crosshair, as in Figure 7-31, indicating that you've selected the area around it.

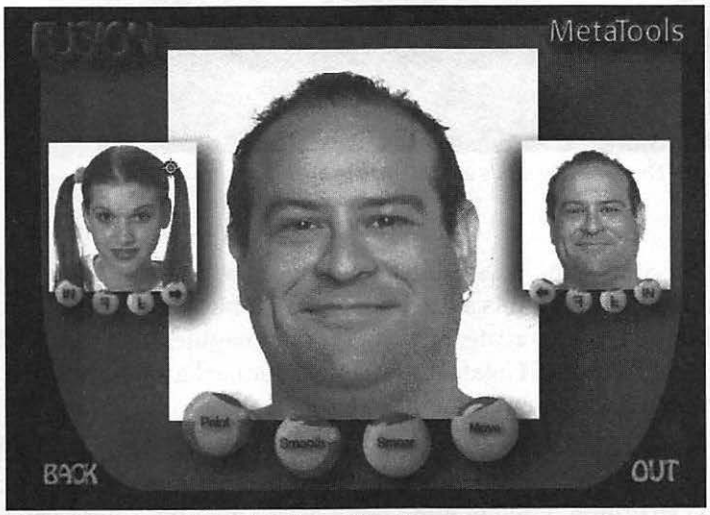


Figure 7-31: Selecting a face for grafting!

6. Next, move your cursor over to the right side of the man's head. Click and hold your mouse button while you slowly move the cursor around in a small circle, and—voilà! You'll see the young girl's hair literally being "painted" directly onto the man's image! Figure 7-32 illustrates our new creation.

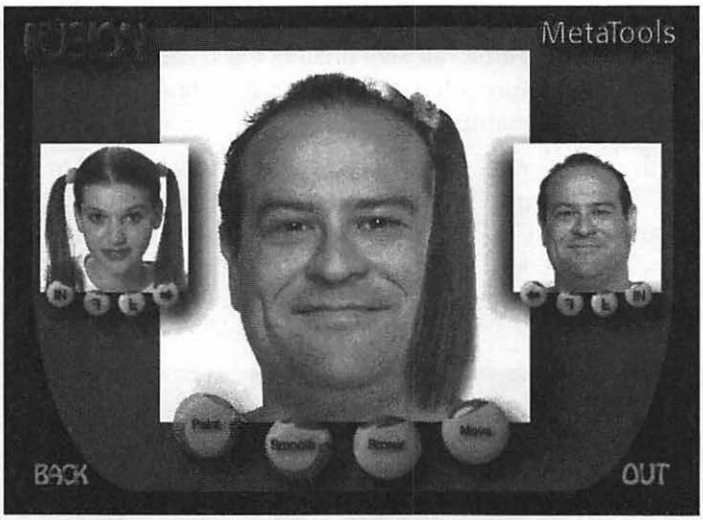


Figure 7-32: They say two heads are better than one!

Of course, the possibilities for humor are endless! After you've experimented with this a little while, you'll be able to control how precise a boundary you create, but, as you can imagine, it helps if both subjects are photographed against the same color background and the images are saved (or cropped) to the same size.

7. To smooth any jagged edges or blend the boundaries of a grafted section, click the Smooth button to illuminate it, then click and hold the mouse button while moving your cursor over the boundary. This button works just like its counterpart on the first command palette.
8. You can also adjust the boundaries of a grafted section with the Smear button. Move your cursor over the area that needs expansion, click and hold the mouse button while moving your cursor slowly in the desired direction.
9. Finally, click the Move button to adjust the position of an entire grafted

area. For example, click on the man's ponytail, hold the mouse button down, and drag a person's entire head of hair to a new location . . . now **that**, my friends, is power!

10. I think it's time to save this work of art! Once you've completed your image, click on the word "OUT" in the lower right corner of the screen to display a subset of the Out Room. Click Save Image.
11. From the File Save dialog, enter a name and select BMP format, and then click on Save to copy the image frame to disk.

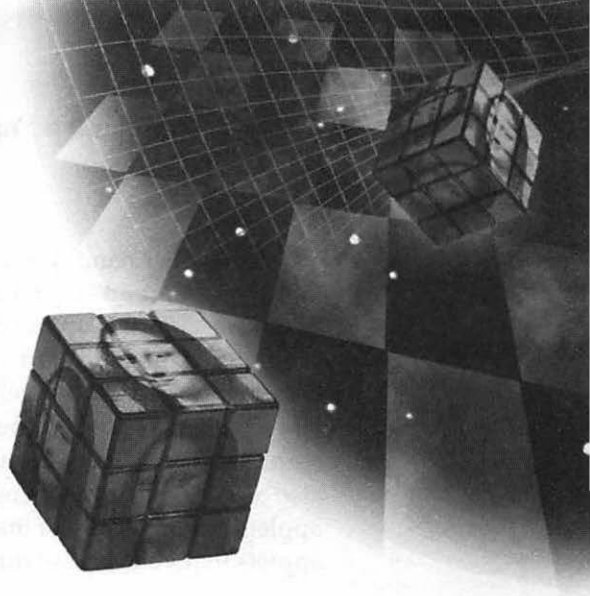
Moving On

In this chapter, you took your first steps into the world of morphing, where images are elastic putty at your disposal. You learned the basics of transitional morphing, where a mesh of points and lines links two images; in turn, this mesh allowed us to change an object in one image into another object by using HiJaak Morph. Then we used alteration morphing to reshape an image in a wide variety of ways in Kai's Power Goo. Finally, you learned how to combine features from two images to create a new object, once again using Power Goo.

In Chapter 8, "Java Animation 101," you'll learn how to create Java applets that can enhance your Web page with animated graphics—**without learning one single line of the Java programming language!**

CHAPTER 8

Java Animation 101



Wait! Before you jump to the next chapter by reflex, this is **not** your average chapter on writing Java.

In fact, this chapter is designed to teach you how to add animation to your Web pages using *applets*: small, portable programs written in Java that run inside the user's browser. There are a number of advantages if you use applets rather than animated GIFs—well-written applets take only a fraction of the time to download compared to larger animated GIFs, and they can take advantage of sound. Most important, Java applets can respond to user actions like a mouse movement or a click.

Do you have to know Java in order to write applets? Not in this chapter. We're going to "sidestep" the entire issue of Java and JavaScript; you'll enjoy all the benefits of adding applets to your Web pages, with none of the programming. I won't include a single line of code, and we won't be discussing the merits of different programming environments. You won't have to "declare" or "initialize" a thing. Instead, you'll use a shareware program that will write and compile various custom-animated Java applets to your specifications.

This is not to say that I don't enjoy programming, but this book is designed to avoid time-consuming chores and expensive commercial software. And teaching yourself a new programming language from scratch involves both a considerable investment in time and at least a few hundred dollars for the required software tools. There are so many Java books in print now that you can hear the shelves creaking at your local bookstore, so if you decide to teach yourself the language, you'll have no problems locating the resources you'll need—we'll see you in a month or two (or more).

On the other hand, you can follow along with the step-by-step instructions in this chapter and add Java animation to your page in 15 minutes—*quick* and *cheap*. The choice is up to you!

In this chapter, I'll start with a short introduction to Java and JavaScript, what they are and why you would use them in animation. Next, I'll introduce Hot Chilli, a Java code generator for Windows 95 that will serve as our example, and we'll create a number of professional applets for your page (I'll also discuss other programs for Mac and Windows that can generate Java applets automatically). Finally, I'll mention a number of sources for Java applets that you can use directly on your Web pages, free of charge.

Why Use Java?

Before we jump in and create a Java applet, let's take a few moments to review the language behind the myth; why has Java been such a success on the Web?

Java was developed by Sun Microsystems in the early 1990s, and it has become one of the two or three required tools for developers of Internet software. However, Java was not directly designed as an Internet- or Web-specific language; its popularity on the Internet is due to a number of important advantages it has over the older workhorse languages like C and C++. For example:

- Java is a platform-independent language, meaning that your Java programs can run on just about any popular computer and operating system available today with little or no modification.
- The language is significantly easier to learn and use, with fewer commands and more automation.
- Java requires fewer resources than most programming languages, including a small fraction of the memory and hard drive space requirements you've grown used to in today's graphical operating systems.
- Java is a modular, object-oriented language, which makes it easier and faster to create and edit stand-alone applications.

JavaScript was developed jointly by both Netscape and Sun Microsystems specifically as an integrated tool for use within HTML pages, and it cannot operate outside of a Web page. Although similar in most respects, JavaScript is much less complex than Java, with fewer commands to learn, and it is designed to allow client computers to handle some of the tasks that used to be assigned to the Web server. For example, rather than bog down a Web server with a CGI script that performs mutual fund calculations, you can write a

JavaScript applet that allows your visitors' computers to handle the same function on their end—this frees up the server's resources. For this reason, most of the simple applets that you see on the Internet these days are written in JavaScript.

End of the course: you passed with flying colors! Seriously, that's about all the background we need in Java and JavaScript; the applications I'll be discussing throughout the rest of this chapter generate applets without any programming. The resources I'll list offer Java or JavaScript applets as freeware or public domain, so you won't have to write a single line of code.

Using Hot Chilli

It's time for me to introduce you to our shareware Java development program for Windows 95, Hot Chilli from Peter Zmijewski. Hot Chilli can create the following types of Java applets:

- **Scrolling LED messages.** These look similar to the scrolling LED signs we created in GIF Construction Set, but this time they're fueled by Java instead of GIF animation.
- **Status Scroll messages.** This neat effect scrolls a moving line of text across the status bar within any Java-capable browser.
- **Fading Scroll messages.** The name of this effect is somewhat of a misnomer; these messages fade smoothly in and out of view, but they don't actually move across your screen.
- **Super Scroll messages.** How about a spectacular text message that explodes as it scrolls? Or perhaps you'd like something in a sinuous sine wave? Hot Chilli can create these effects in seconds.
- **Pull menus.** You've used a drop-down list box before, but imagine if you could add a drop-down list box to your Web page? Each entry in the list was a link to another Web site or resource, and selecting that entry would automatically jump to that resource?
- **Custom cool buttons.** Hot Chilli can create a button with whatever text you specify that will display a message in your browser's status bar when the mouse cursor moves over it; for example, the button face may read "File Library 1," but when the cursor moves over it the message "Browse through files from A to M!" will appear in the status bar.

Each of these applets can be previewed before you create the finished Java code, and the program includes a simple HTML listing window where you can insert and edit your new applet.

You can download Hot Chilli from the support Web site at **www.ozramp.net.au/~maxzmije/index.htm**. When you first install it, the program prompts you to select a browser that it will use for the Preview function; browse through your system to the directory that holds your Netscape executable and click on it to select it. The program then displays its main window, shown in Figure 8-1.

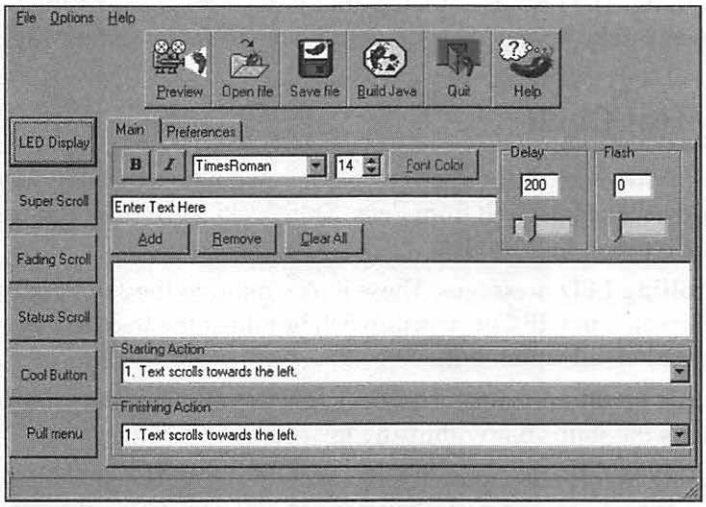


Figure 8-1: The Hot Chilli main window.

You select which of the six Java applets you wish to create by clicking on the 6 buttons on the left side of the window, and the center tabbed dialogs will change to match the applet you chose. The large button bar across the top of the window allows you to preview the look of your finished applet, open or save an applet file, or build the Java applet and insert it into your HTML file.

Let's create one of each of these applets, starting with the LED display.

Creating an LED Display

To create an LED display with Hot Chilli, follow these steps:

1. Click the LED Display button; the LED Display Main panel appears.
2. Select a font from the drop-down list box and specify the font size in points in the field next to it; you can also add bold or italic attributes by clicking the **B** or *I* buttons. To choose the color of the text, click the Font

Color button and click on the desired color, then click OK to accept your selection. You'll see that the Font Color button changes to reflect the color you've chosen.

3. Now we'll specify a starting and finishing action for our display; an action is similar to the transitional effects we've discussed before. As you might have guessed, the starting action determines how the animation will begin, and the finishing action determines the last animation you'll see. To see your choices, click on the Starting Action drop-down list box; I'll pick the default in which Text scrolls toward the left. For a Finishing Action, we'll do something a little more exotic—I'll select Text scrolls from the center toward the edges in a vertical direction. Hot Chilli automatically loops the animation endlessly. Our animation will scroll from right to left, pause in between actions, and then the top half of the message will scroll off the top of the display, and the lower half will scroll off the bottom!
4. Now we should set the Delay and Flash sliders in the upper right corner of the window. The Delay value determines the delay between the starting and finishing action; in other words, the pause in the middle. A longer delay comes in handy if you would like your message to pause so that it can be easily read. I usually use the default of 200. The Flash slider, on the other hand, determines how often your message should blink on and off as it scrolls. The higher the value, the longer a Delay value you must set, so I generally either leave Flash set to 0, 1, or 2 (at the most).
5. Next, let's add the text for our display. Click in the text box under the font that reads "Enter Text Here" and do exactly that. Use your Delete key to delete the default message text, and then type your own into the field. For our example, I'll enter "Who Needs to Program?" Once your message is complete, click the Add button to copy the text to the display window; you'll notice that Hot Chilli automatically adds a number of variables and values that will be interpreted later by your Java applet.
6. Here comes the really neat thing about Java LED displays as compared to animated GIF LED displays: you can repeat steps 2 through 5 several times! An animated GIF display with multiple messages would be far too large to download, but with a Java applet, you can build a sign that will cycle through multiple messages in multiple colors, each of which has its own starting and finishing action. To remove a message line, highlight it in the display window and click Remove; to clear all of the messages and start over, click Clear All.

7. You can also specify a number of options for the entire display; click the Preferences tab to display the panel shown in Figure 8-2. To set the overall speed of the scrolling, type a number directly into the Speed field or move the sliding control. To specify the color for the LED background or the display border, click on the corresponding button and select the desired color from the color palette that appears. Finally, you can specify the size of each LED (each individual dot that makes up the letters in the sign) in pixels and the border width surrounding the display in pixels. To return to the Main panel, click on the Main tab.

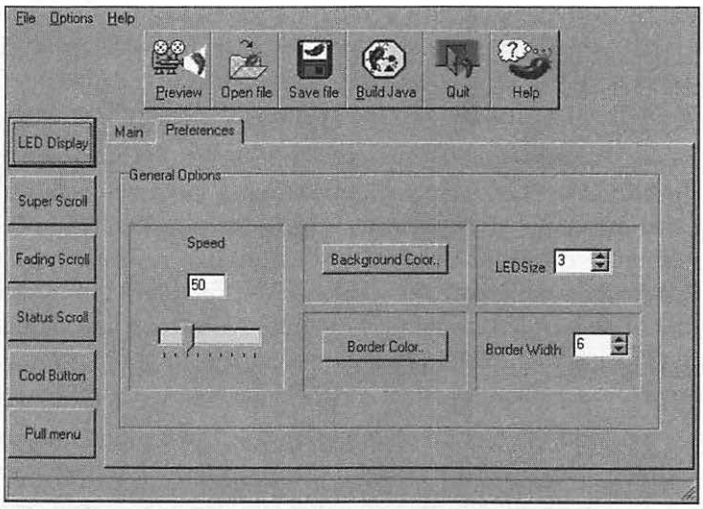


Figure 8-2: The LED Display Preferences panel.

8. Time to preview your work. Click the Preview button at the top of the window. Hot Chilli will load Netscape, compile your Java applet dynamically, and show it to you within the Navigator window. Figure 8-3 shows you our example LED display.

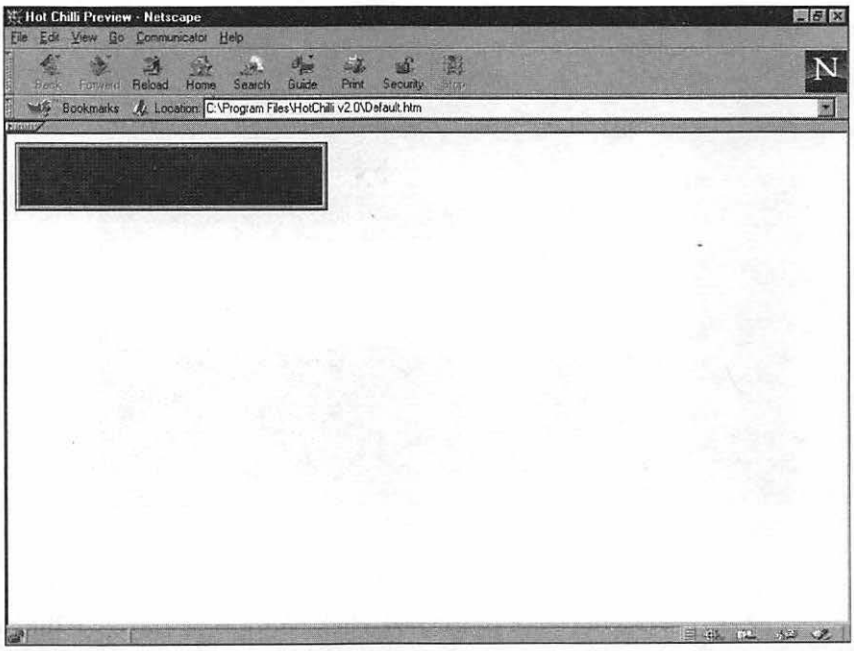


Figure 8-3: Previewing our finished LED display.

At this point, you can build the Java applet and insert it into your HTML file. We'll discuss this option in the section "Adding Your Applet to Your Page" after we've covered the other effects you can produce.

Creating a Super Scroll Message

To create a Super Scroll Message display with Hot Chilli, follow these steps:

1. Click on the Super Scroll button; the Super Scroll Main panel appears, as shown in Figure 8-4.

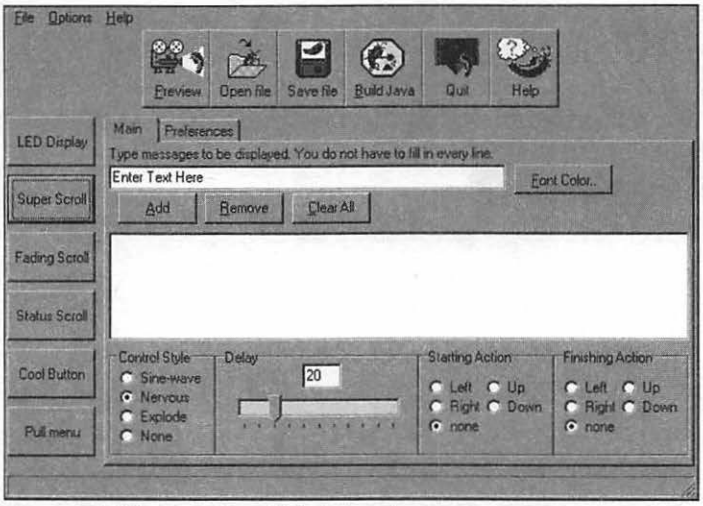


Figure 8-4: The Super Scroll Main panel.

2. To choose the color of the text, click Font Color and click the desired color from the palette, then click OK to accept your selection. You'll see that the Font Color button changes to reflect the color you've chosen.
3. Next, select a style for the display: you can choose Sine-wave, Nervous, Explode, or None. The style you pick controls the independent movement of the characters as they scroll across your screen.
4. Now set the Delay slider, which determines the delay between the starting and finishing action. The default of 20 usually works pretty well under most circumstances.
5. As before, you should specify a starting and finishing action for our display. As you might have guessed, the starting action determines how the animation will begin, and the finishing action determines the last animation you'll see. In the case of this applet, you can only specify a movement direction and a style; for example, you could have a sine wave style applet with a starting action to the left and a finishing action to the right. The scrolling message for such an applet would have a "wavy" motion as it moved to the left, then it would reverse direction and move off the display to the right.

6. Next, let's add the text for our display. As before, click the field under the font that reads "Enter Text Here," use your Delete key to delete the default message text, and then type your own into the field. Once your message is complete, click the Add button to copy the text to the display window; you'll notice that Hot Chilli automatically adds a number of variables and values that will be interpreted later by your Java applet.
7. Once again, unlike a scrolling message in animated GIF format, you can add multiple scrolling messages in the same applet, so repeat steps 2-6 if you like. To remove a message line, highlight it in the display window and click Remove; to clear all of the messages and start over, click Clear All.
8. You can also specify a number of options for the entire display; click the Preferences tab to display the panel shown in Figure 8-5. Select a font from the drop-down list box and specify the font size in points; you can also add bold or italic attributes from the Style drop-down list box. To specify the height and width of the display window, enter new values in the fields at the right of the panel. You can also choose the color of the background; click the Background Color button and click on the desired color from the palette, then click OK to accept your selection. To return to the Main panel, click on the Main tab.

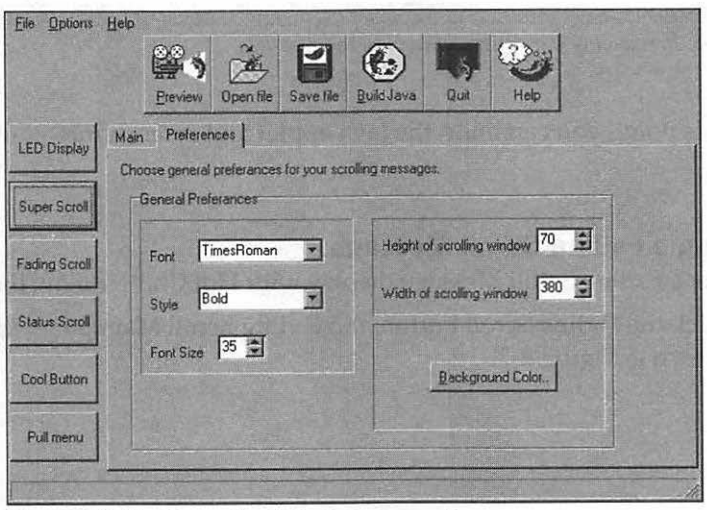


Figure 8-5: The Super Scroll Preferences panel.

9. To preview your display, click the Preview button at the top of the window. Figure 8-6 shows you our example Super Scroll message.

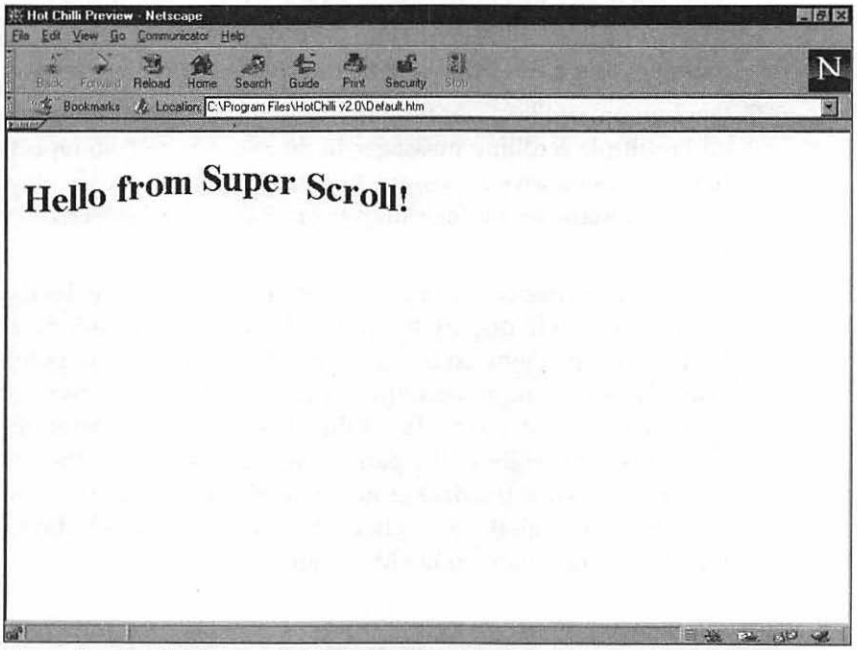


Figure 8-6: Previewing our finished Super Scroll message.

At this point, you can build the Java applet and insert it into your HTML file.

Creating a Fading Scroll Message

To create a Fading Scroll Message display with Hot Chilli, follow these steps:

1. Click the Fading Scroll button; the Fading Scroll Main panel appears, as shown in Figure 8-7.

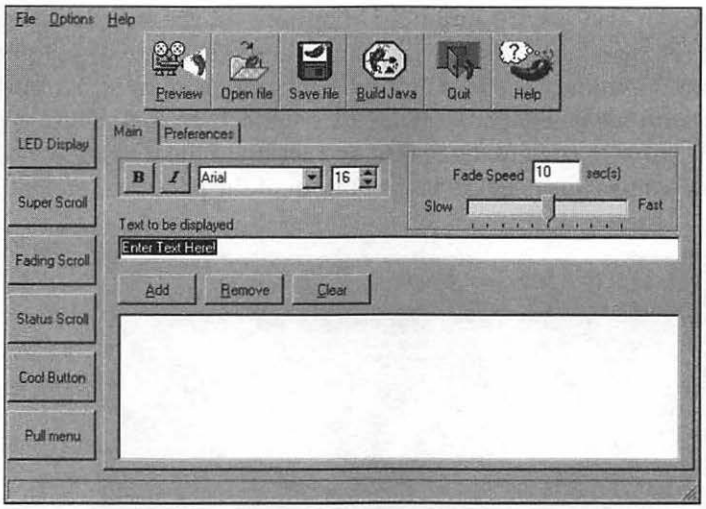


Figure 8-7: The Fading Scroll Main panel.

2. Select a font from the drop-down list box and specify the font size in points in the field next to it; you can also add bold or italic attributes by clicking the B or I buttons. To choose the color of the text, click the Font Color button and click on the desired color, then click OK to accept your selection. You'll see that the Font Color button changes to reflect the color you've chosen.
3. Now set the Fade Speed slider in the upper right corner of the window. The Fade Speed value determines the amount of time it takes for your message to fade in and out, in seconds.
4. Next, let's add the message text. As before, click the field under the font that reads "Enter Text Here," use your Delete key to delete the default message text, and then type your own message into the field. Click Add to copy the text to the display window.
5. If you like, add multiple messages by repeating steps 2–4. To remove a message line, highlight it in the display window and click Remove; to clear all of the messages and start over, click Clear.

6. You can also specify a number of options for the entire display; click the Preferences tab to display the panel shown in Figure 8-8. You can choose both the color of the font and the background; click either button and click on the desired color from the palette, then click OK to accept your selection. To specify the height and width of the display window, enter new values in the fields at the bottom of the panel.

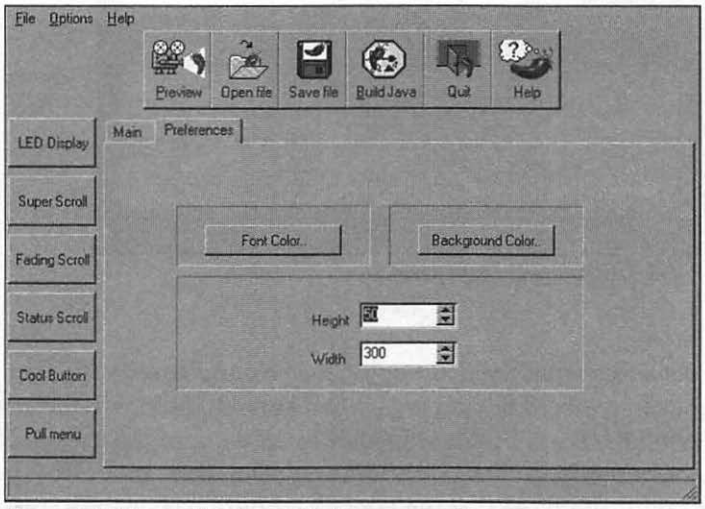


Figure 8-8: The Fading Scroll Preferences panel.

7. To preview your display, click the Preview button at the top of the window.

At this point, you can build the Java applet and insert it into your HTML file.

Creating a Status Scroll Message

To create a Status Scroll message display with Hot Chilli, follow these steps:

1. Click the Status Scroll button to access the Main panel, as shown in Figure 8-9.

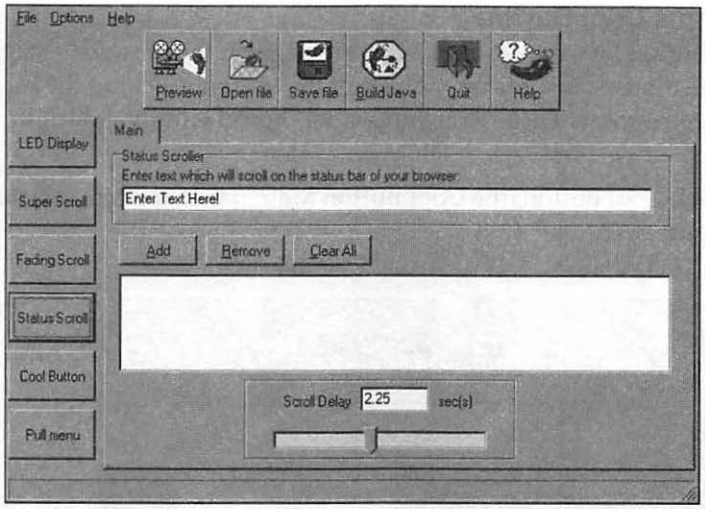


Figure 8-9: The Status Scroll Main panel.

2. Now set the Scroll Delay slider at the bottom of the panel. The Scroll Delay value specifies the delay in seconds between each display of the status line message.
3. Next, let's add the message text. As before, click the field under the font that reads "Enter Text Here," use your Delete key to delete the default message text, and then type your own into the field. Once your message is complete, click Add to copy the text to the display window.
4. If you like, add multiple messages by repeating steps 2 and 3. To remove a message line, highlight it in the display window and click Remove; to clear all of the messages and start over, click Clear All.
5. To preview your display, click the Preview button at the top of the window. Your scrolling message appears within the Netscape browser status line window, as shown in Figure 8-10.

Figure 8-10: Previewing our finished Status Scroll message.

At this point, you can build the Java applet and insert it into your HTML file.

Creating a Cool Button

A Cool Button Java applet displays a message on the browser's status bar when the mouse cursor is on the face of the button. Clicking the button will take you to another URL. To create a Cool Button within Hot Chilli, follow these steps:

1. Click Cool Button; the Cool Button Main panel appears, as shown in Figure 8-11.

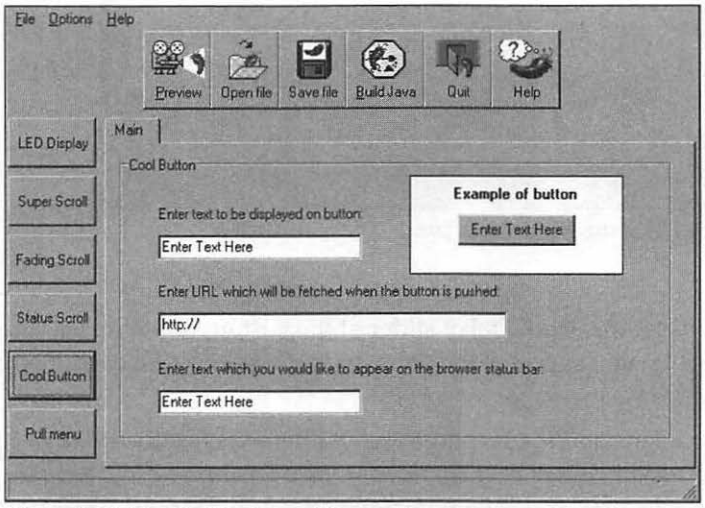


Figure 8-11: The Cool Button Main panel.

2. Enter the text you'll see on the face of the button. Erase the contents of the Enter text to be displayed on button field and type the text for the button. Hot Chilli provides a preview window that will show you how the button will appear; make sure your text for the button face is shorter than the button itself!
3. Next, click in the Enter URL field. After the http:// prefix, type the Web URL that this button should access when it's clicked.
4. Finally, move to the third field and enter the message that should appear in the browser's status line when the cursor moves over this button.

5. To preview your button, click the Preview button at the top of the window. Your finished button appears within the Netscape browser status line window, as shown in Figure 8-12.

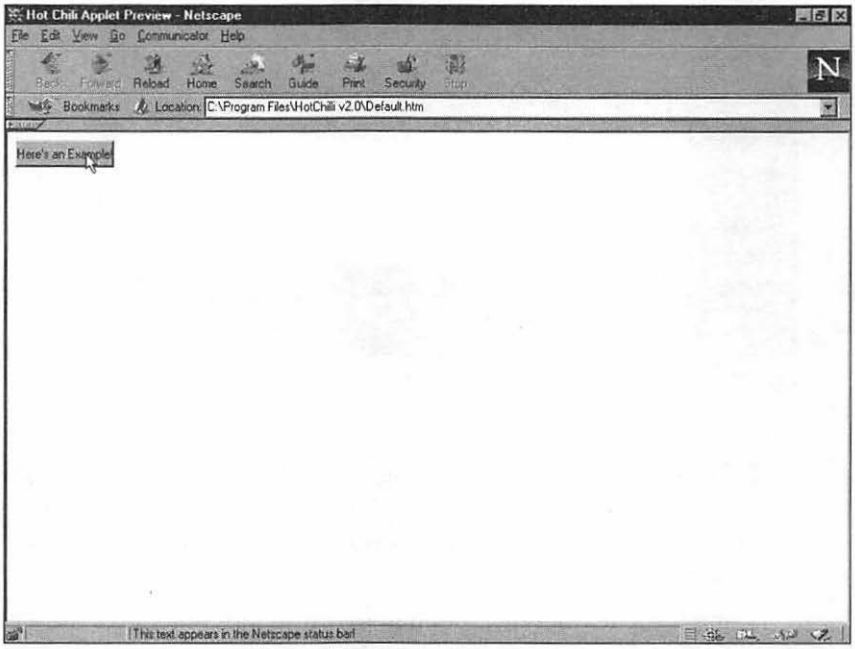


Figure 8-12: Previewing our finished Cool Button.

At this point, you can build the Java applet and insert it into your HTML file.

Creating a Pull Menu

To create a Pull Menu applet within Hot Chilli, follow these steps:

1. First, click Pull Menu; the Pull Menu Main panel appears, as shown in Figure 8-13.

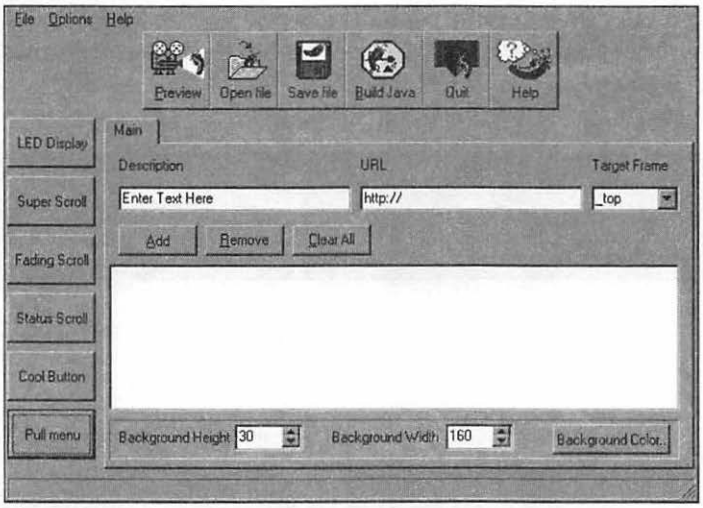


Figure 8-13: The Pull Menu Main panel.

2. Next, set the background height and width for your applet in pixels. You can specify a color for the applet background by clicking the Background Color button—click on the desired color from the palette, then click OK to accept your selection.
3. Enter the text for one menu item. Erase the contents of the Description field and type the text to identify the entry.
4. Next, click in the URL field. After the http:// prefix, type the Web URL that this menu item should access when it's selected.
5. Now move to the third field, Target Frame, and select the frame value. This field is only required if you're using frames on your Web site; otherwise, the value is ignored. If you are using Frames, indicate which frame should be targeted: _top, _self or _blank.
6. Once your item is complete, click the Add button to copy it to the display window.
7. If you like, add multiple items by repeating steps 2 through 6. To remove an item, highlight it in the display window and click Remove; to clear all of the items and start over, click Clear All.
8. To preview your display, click the Preview button at the top of the window. Your pull menu appears within the Netscape browser window, as shown in Figure 8-14.

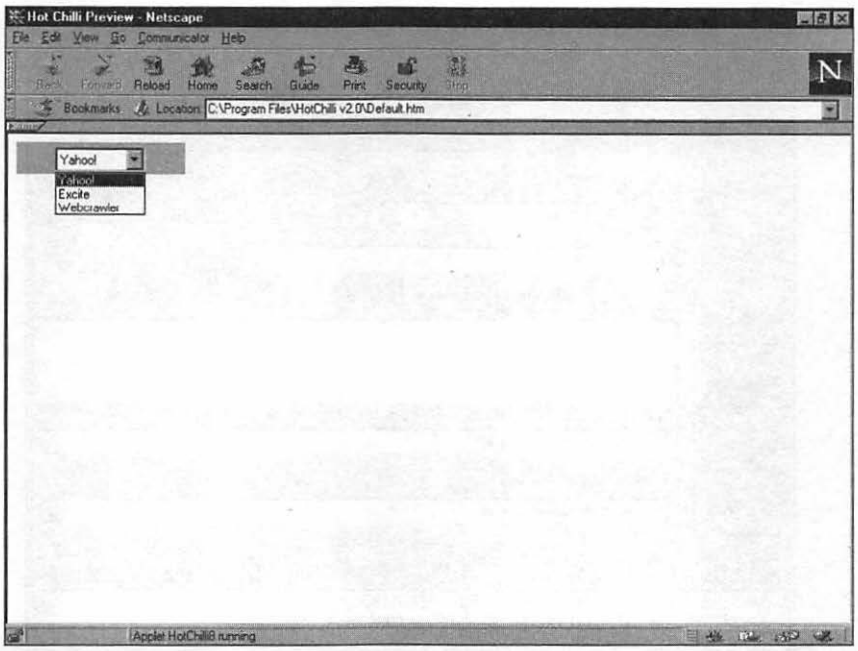


Figure 8-14: Previewing our finished Pull Menu applet.

At this point, you can build the Java applet and insert it into your HTML file.

Adding Your Applet to Your Page

Now that you've created each of the six types of Java applets available within Hot Chilli, let's add an example to your page. Follow these steps:

1. Click Open File on the toolbar. From the Open File dialog, browse your system and select the HTML file that should use the applet.
2. The HTML file is displayed at the bottom of the Hot Chilli window, as shown in Figure 8-15. To display the entire editor window instead of the small scrolling box, click the Up button; to return to the Hot Chilli window from within the full-size editor, click on the Down button.

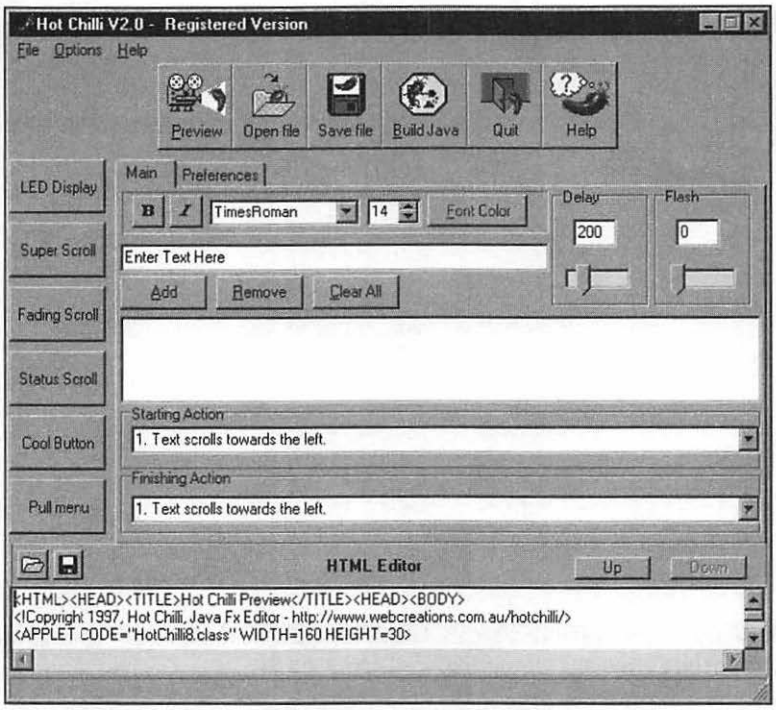


Figure 8-15: Displaying HTML code within Hot Chilli.

3. In the editor window, indicate the insertion point where the applet code should appear by moving the cursor to that point in your HTML file and clicking.
4. To build and automatically add the applet code, click the Build Java button on the toolbar.
5. Click Save File on the toolbar and save your modified HTML file to disk.

That's it! You've just added Java functionality to your Web page. Now you can throw a party and announce to the world that you're an official Java developer, create your own start-up company, and make a billion dollars overnight. Or you can just enjoy those complimentary e-mail messages from the visitors to your page!

Now that you've seen how easy it is to generate Java applets without coding, let's look at three other programs that can help you create Java animation.

Other Java Animation Tools

There's more than one way to generate a Java applet, and the commercial packages described in this section provide you with powerful tools to create more sophisticated animation (complete with sound).

Each of these applications offers something that stands out from the others, so if you're especially interested in a particular feature you may want to install the trial version of that program and try it out for yourself (if a trial version is available).

Egor Animator (Win95)

Egor Animator runs under Windows 95, and its interface is so simple that you might be fooled into thinking you're using the tutorial. The program's mascot, a silly little mad scientist, is everywhere—and, I have to admit, I liked him and I can definitely see how he would make a beginner feel more comfortable. Every control and procedure within the program is described at length onscreen, so you'll never find yourself lost within Animator.

There's plenty of power to spare here, though; you can assign actions, sound files, and even Web URLs to each frame of your animation. The program includes a number of transition effects, and you can completely control the movement cycle. Like Hot Chilli, you can preview your image in a Netscape window before you save it to disk, and the program compiles your Java applet for you. Like Hot Chilli, Animator is also limited to producing only Java output.

If you experiment with Hot Chilli and you find that you like the easy interface, but you'd like to do more sophisticated animation using your own images, I can highly recommend Egor Animator.

WebBurst (Mac/Win95/WinNT)

Originally available only for Macintosh, WebBurst from PowerProduction Software (www.powerproduction.com) is also available now for Windows 95 and Windows NT. It offers basic functionality similar to Egor Animator; a frame from your Java animation can be linked to a sound file, for example, or automatically jump to a specific URL. Your animated objects can follow preset paths, complete with delays.

WebBurst goes farther, though, in terms of providing you with what I consider true drag and drop functionality: it can grab an image from a wide variety of supported formats (including sounds and animated GIF files) or pull in an entire library of sample graphics that ship with the program. You can build your own libraries of sounds and images as well. An easy-to-use Action Control panel lets you assign events and actions by simply clicking away. WebBurst can export compiled Java applets, static GIF images with transparency, and PICT files, and any sound files that you use in your Java animations are automatically converted to .AU format for you. The program also provides a basic set of drawing tools in case you have to add something to your frame, and you can even use WebBurst to create your own image maps with Java.

If you do have some experience programming with Java, WebBurst has a number of features that will especially appeal to you. Since WebBurst applets can invoke other Java programs or classes, you can call on other applets and extend the functionality of your existing code. WebBurst also includes a series of simple programming features like variables, math commands like add and subtract, and IF/THEN, greater than/less than functions. Your Java applets can display text fields and accept information.

WebBurst takes Java applet generation a leap beyond Egor Animator without adding a serious learning curve, yet professional Java developers can use it as well. I highly recommend it for Webmasters of every experience level.

WebPainter (Mac/Win95)

Totally Hip Software's WebPainter, available for both Macintosh and Windows 95 at **www.totallyhip.com**, offers a wide range of output formats so you can consider it almost as much of a conversion tool as you can a Java generator. As you can see in Figure 8-16, the interface consists of a menu bar and a number of floating palettes that you can arrange any way you like, including a very familiar frame-by-frame storyboard editor. A little harder to understand and use for some novices, but experienced animators will find themselves right at home with this interface, and WebPainter features the most comprehensive online help of the programs I've covered. Since you can create standard animated GIFs with WebPainter, you may find that this program can replace GIF Construction Set for many tasks.

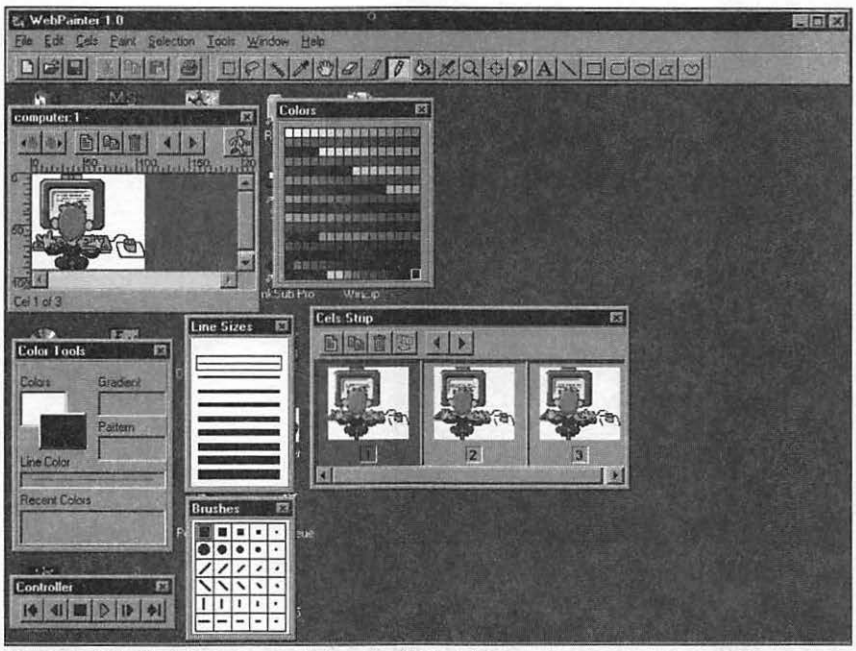


Figure 8-16: Working on a project using WebPainter.

Like WebBurst, this program includes a number of drawing and painting tools, so you can draw new images or modify existing images from within the program. Animation cels can be added or deleted at any time, and you can also add transparency or text to your image. The real star of the show, however, is the output; you can select the company's Sizzler proprietary animation format as a Java applet (as shown in Figure 8-17), produce AVI and QuickTime movies, or build animated GIFs directly. Single frames can be output as GIF or Windows bitmap under Windows 95, while the Macintosh version can export image frames in PICT format. I also very much liked the Onion Skin feature, where light outlines of the previous and next frame allow you to more correctly measure the movement cycle—it's very similar to the technique used in the older animated cartoons.

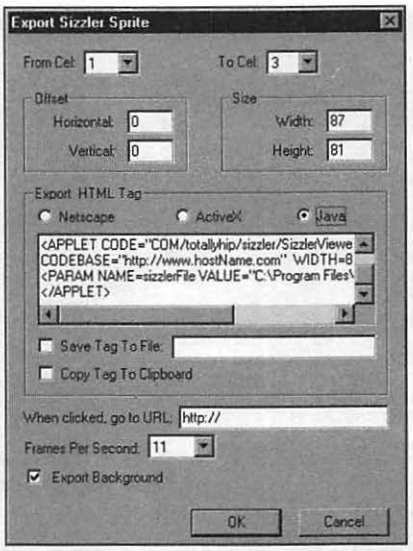


Figure 8-17: Creating a Sizzler applet with WebPainter.

This is a powerful program, but it's not for programmers. Instead, WebPainter will appeal to those more interested in the animation process than how the final result is displayed on the Web. This is not a program for those who thrive on linking Java code or building extensive links and IF/THEN statements into a Java applet. In fact, as I mentioned earlier, you may just find yourself deciding that the classic animated GIF is a better medium for your work. And, if you're using WebPainter, you can actually take your pick of which type of animation you produce.

Finding Free Java Animation

Finally, I'd like to wrap this chapter up with a listing of my favorite sites on the Web for obtaining Java and JavaScript information, animation, and applets.

- **Netscape (www.netscape.com).** If you're looking for the latest news on JavaScript, visit the Netscape home page. You'll also find developer information and technical data.

- **Sun's Java Source (java.sun.com/).** The official home of Java. Heavy with promotion and aimed primarily at developers, but you can still browse for freeware applets.
- **The Java Boutique (javaboutique.internet.com/).** A very professional site with the latest freeware Java applets and extensive links to other Java resources. Figure 8-18 illustrates this fine site.

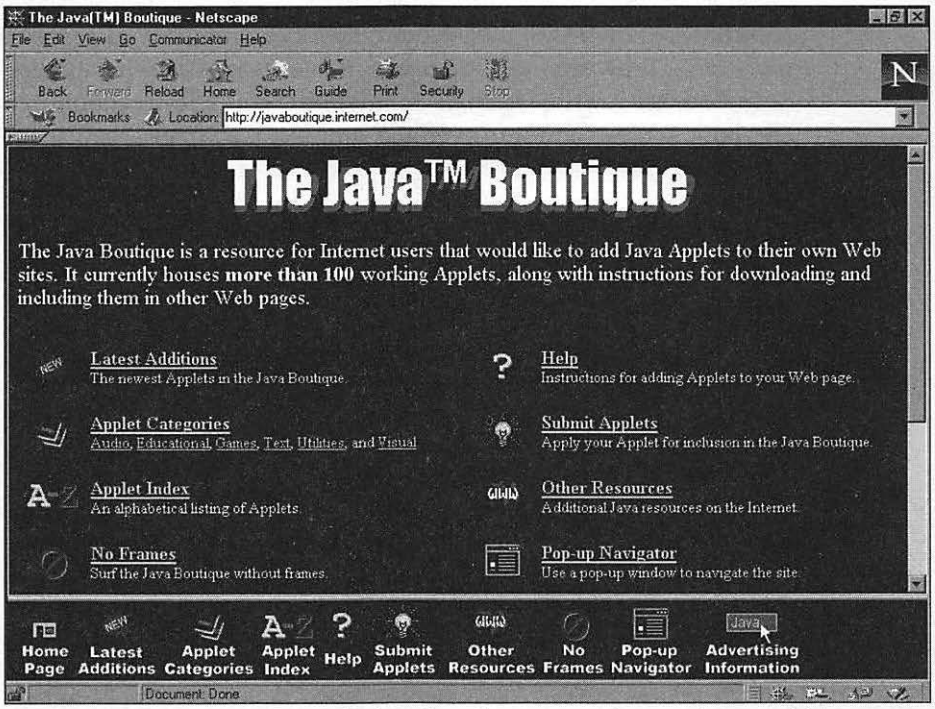


Figure 8-18: The Java Boutique Web site, where the newest applets are always waiting.

- **Gamelan (www.gamelan.com/).** Gamelan advertises itself as the "Official Directory for Java." I believe it. You can search this repository of resources for specific keywords, or simply dive in—the featured applet is usually extraordinary (for example, at this writing you can try the Deep Blue Chess Viewer applet, which allows you to review the Kasparov vs. Deep Blue matches played in May of 1997, complete with expert commentary).

Moving On

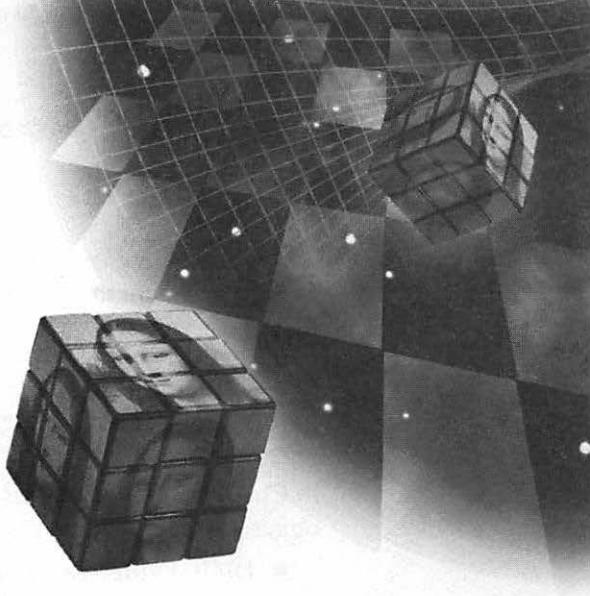
In this chapter, we built custom Java applets step-by-step without writing a single line of code, using the shareware program Hot Chilli. I also discussed three other commercial programs which offer more features and power (and require more experience and more work). Finally, I mentioned Web sites you can visit for free applets, code, and programming information.

Whichever Java generation tool you pick, you can create professional results on your own Web page—but remember, animated GIFs are accepted by more older browsers, so I still prefer an animated GIF whenever possible.

In Chapter 9, "The Ultimate Animation," you'll learn about digital video and how you can add it to even the simplest Web page.

CHAPTER 9

The Ultimate Animation



Throughout the earlier chapters of this book, you learned how to add life to your Web pages with GIF animation. We've also explored how you can build animation using sophisticated image filters, 3D objects, and morphing, as well as applications that will build custom animated Java applets for you with no programming required!

In this last chapter, however, I'd like to take you beyond the current forms of animation that are common on the Web to the leading edge, into a new world of "ultimate" animation: digital video, server push, and an ever-growing number of third-party Netscape plug-ins. Each of these Web technologies promises something different from the GIF- and Java-based animation that you're familiar with, but these technologies still offer the same advantages to your Web site: they draw visitors to your pages and showcase your content!

However, as you move closer and closer to the "leading edge" of Web development, you also move further away from broad compatibility with current browsers and modem speeds. So, to be fair, I'll also mention some of the disadvantages of each of these new developments along with the "gee whiz" side.

Unlike the animation methods we've discussed in earlier chapters, these new technologies also tend to require considerable resources—in technical experience, time, and money—to implement on your site. So rather than provide tutorials for a specific software package, I'll introduce you to the basics of each of these Web technologies and point you to sources for more information on the Web.

Are these new Web technologies strictly "animation"? They do bring automatic movement to your page, including sound and interaction. I'll let you decide for yourself!

Digital Video Basics

In Chapter 2, we discussed a number of methods that you can use to create or obtain raw digital video footage. These methods include the following:

- **Digital video cameras.** These cameras are available for Internet video conferencing in both black and white and color models.
- **Video capture boards.** A video capture board can digitize incoming full-motion video from a standard video camera, VCR, or video disc player.
- **Video export.** Many of the programs I've discussed throughout this book support the export of animation in digital video format (usually Windows .AVI format or Macintosh QuickTime format), so you can create your own video even if you don't have a camera or capture board handy. For example, you can generate digital video with trueSpace or Sculpt 3D using 3D objects you've created.
- **Video clip art.** You can use a number of sources for royalty-free video as "video clip art" for your site; check the popular Web-related magazines on the newsstands these days for more information.

Common Video Standards

Although obtaining digital video is easy enough, not all digital video is created equal! Three popular video formats are currently being used on the Web, and before you add a video clip to your page, you should be familiar with each of them:

- **Microsoft .AVI.** Short for Audio Video Interleave, this format is the Microsoft standard format for digital video, supported throughout Windows 3.1, Windows 95, and Windows NT. Within Netscape Navigator, .AVI video has a MIME type of Video and a MIME subtype of msvideo or x-msvideo.
- **Macintosh QuickTime.** The Macintosh standard for digital video, also well-supported in the PC world through cross-platform programs. QuickTime video clips carry the extension .MOV. Within Netscape Navigator, QuickTime video clips have a MIME type of Video and a MIME subtype of QuickTime.

- **MPEG.** Short for Moving Pictures Experts Group. An international video standard, MPEG video is used throughout the Internet and on commercial CD-ROM games and educational titles. MPEG video clips carry the extension .MPG. They have a Netscape MIME type of video and a MIME subtype of MPEG. For everything you ever wanted to know about MPEG, visit the MPEG Archive at **www.mpeg1.de/intro.html** and jump into their FAQ files, video clip archives, and MPEG CD-ROM listings!

The latest release of Netscape Navigator, version 4.0, has built-in plug-in support for both Microsoft .AVI and QuickTime .MOV video clips. Earlier versions of Navigator also support all three of these digital video formats, but you'll have to download the plug-ins manually. I'll list the Web sites for some of the popular digital video plug-ins later in this chapter.

The Downside

Since Netscape Navigator now supports embedded video, why doesn't everyone's site feature digital video? Of course, the biggest disadvantage to digital video over the Web is the sheer size of a video clip; even at 33.6 bps (the current throughput top speed for most dial-up connections), a mere 30 seconds of average-quality digital video with mono sound will leave you staring at a download progress bar for 15 minutes. A direct network or ISDN connection helps—as will the new crop of 56 bps modems—but even these high-speed links can't deliver the bytes fast enough to provide a decent frame rate for full-motion video.

Also, many Webmasters are less than enthusiastic about requiring their visitors using older browsers to download a plug-in application to allow the display of digital video. Most plug-ins are several hundred kilobytes long, and downloading the plug-in can take longer than downloading the video itself!

Finally, older hardware will not be able to display digital video, especially higher-quality video recorded in more than 256 colors. Displaying digital video properly (at a high color depth, with well-synchronized sound and no dropped frames) takes a more powerful computer than most Web surfers are using today, which is another reason that I almost always turn to GIF or Java animation rather than digital video.

Compression & Streaming

The download time for digital video can be reduced using two different methods, and just about every site that offers digital video will make use of them.

The first is *compression*. Most digital video is compressed using a *codec* (short for *co*mpress/*dec*ompress). In essence, a codec is a software algorithm

that compresses digital video while it's being recorded and then automatically decompresses it while you watch the clip. Some codecs are also licensed for use in hardware devices, which allows much faster processing than their software-only counterparts; however, you naturally need a computer with the same hardware support to decode the compressed video on the receiving end.

Popular codecs available today for Macintosh and Windows include the following:

- **Indeo.** Developed by Intel, Indeo is a popular royalty-free software codec often used for commercial CD-ROMs.
- **Cinepak.** The codec in most common use today, Cinepak provides excellent compression with little loss of color and detail.
- **MPEG.** The international standard MPEG codec is available in two flavors: MPEG-1 and MPEG-2. The latter has been receiving a lot of press lately as the codec of choice for the new DVD (Digital Video Disc) format due by the end of 1997. DVD is the "second generation" of CD-ROM technology; a single disc can hold several gigabytes of data, and it is slated to replace VHS videotape movies eventually. Many of today's better video cards have built-in hardware support for MPEG-1, allowing full-screen playback of digital video. MPEG-1 provides the best compression rate.

Naturally, the better the compression, the better-suited a video clip is for transmission over the Web, so it's no wonder that MPEG is such a popular format/codec combination on the Internet! Most digital recording software supports one or more of these compression formats, and typically you can specify the color depth and compression rate for your finished video clip.

Inline vs. External Video?

How else can you reduce the wait time for a video clip on your Web page? The other solution is to provide support for *streaming* video, in which the video actually begins to play before it has finished downloading! Naturally, this solution reduces the wait time, but there is no standard solution for overloaded sites with poor transfer rates and slow response times. Once that video clip begins to play, your page must be able to deliver the rest of the file as fast as possible. Several companies have released plug-ins that support streaming video in AVI and MPEG format. Although this technology is nowhere near perfect yet, it's in a constant state of improvement. Figure 9-1 shows an inline, streaming MPEG video clip displayed by a Java viewer.

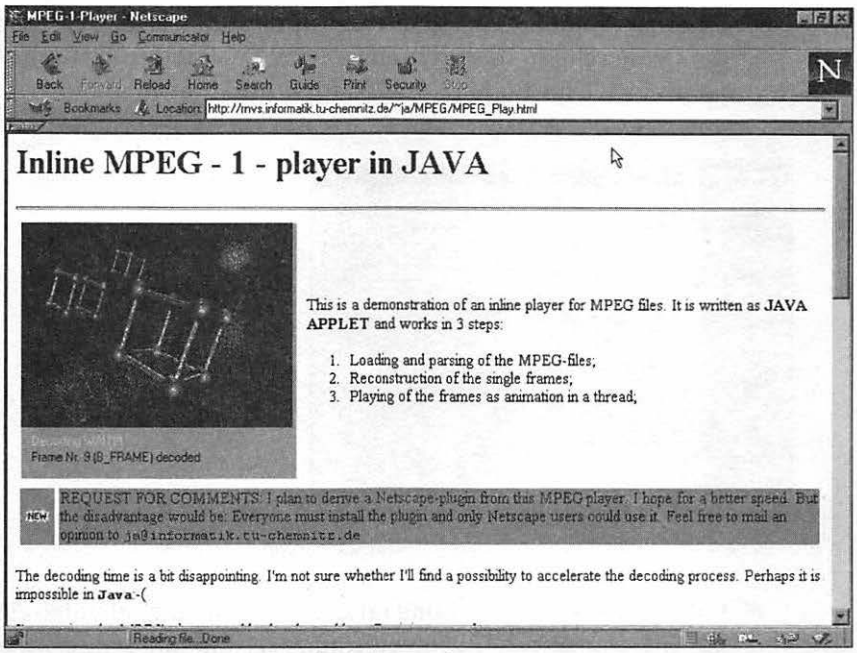


Figure 9-1: A streaming video clip in MPEG format.

"Rather than force my visitors to watch inline video, wouldn't it be better to allow them to download what they want?" This argument is certainly valid, and most sites on the Web still offer digital video as a download file rather than a plug-in. In most cases, you can determine which is more valuable to your visitors—viewing the file online with streaming technology (perhaps after waiting for the plug-in to download first) or simply downloading the video clip as a file for later viewing.

Adding Video to a Web Page

Although editing and shooting a video production is far beyond the scope of this chapter, you can keep a number of general guidelines in mind when saving digital video for use on the Web:

- **Minimize frame size.** This tip may seem obvious, but it bears repeating: as with animated GIFs, the smaller the frame size, the smaller the file size for the finished clip, and the less time it will take to download. Figure 9-2 illustrates the Movie options dialog box from Personal AVI

Editor, a Windows 95 digital video application. Note that the default size for a video clip in this program is 160 x 120. I recommend that you keep your video clips under 200 x 200 for fastest transmission.

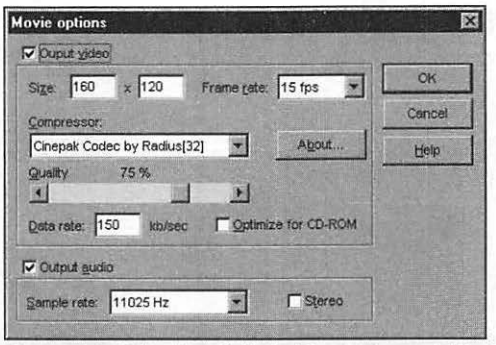


Figure 9-2: Selecting digital video options within Personal AVI Editor.

- **Carefully select your frame rate.** Once again, digital video closely parallels GIF animation. The lowest frame/second rate is rarely the best choice, so experiment with different frame rates for the same clip. Try them online, and stick with the minimum number of frames that provides a smooth display. I suggest a maximum of 10 frames per second for video to be used on a Web page.
- **Use compression!** Unless your Web visitors are frozen in cryogenic sleep, never use uncompressed video on a Web site! At a minimum, select Indeo or Cinepak compression; if your software supports it, select MPEG for the best possible compression.
- **Reduce color depth.** If your video recording or editing software allows you to set a color depth, avoid 24-bit color unless the quality of the video clip is essential. The fewer colors in your video, the more likely it will look better on older hardware.
- **Use sound sparingly.** Most editors give you a choice of whether to include sound with the video. If your Web site doesn't require the sound, you can save yourself a considerable number of bytes if you drop all sound within your video clip. If your clip does require sound, I strongly suggest that you avoid adding stereo, and keep the quality of your sound files at 11025 Hz.

Using Server Push

Here's a hot subject for Webmasters everywhere. Although your average Cyberspace John Smith may not be familiar with server push, it's likely to have just as much of an effect on the Web as the development of Java and JavaScript. In fact, this concept will change the way your browser receives content from Web sites over the next few years. But would I recommend it for simple animation? Read on!

What exactly is server push? Put simply, server push is a method of transmitting content to your Web browser and updating it automatically, without requiring you to request the transfer by selecting a link or clicking a button. The connection between your browser and the server is never broken, as it is when you're surfing in the usual way and you move on to the next site. Instead, the server periodically sends new material to your browser to update the information on your screen; typically, the time interval depends on a CGI (short for *common gateway interface*) script running on the server.

What Is Client Pull?

Client pull is somewhat similar to server push, in that it automatically retrieves and updates the information displayed in your browser. However, unlike server push, the browser running on your computer must automatically connect, poll the server to check for new information, and then disconnect. You can consider client pull to be more of an automatic connection and update feature for your browser; all the server knows is that your browser connects, retrieves information, and disconnects, so on the server end, you're just another visitor.

Server push and client pull have both been hailed as the technology that will transform the Web into a medium similar to television, with favorite Web sites "broadcasting" new content—for example, news and sports information, stock quotes, and other timely data that needs to be updated on a regular basis.

"OK, now I know what server push is . . . ut what does it have to do with animation?" The answer is actually pretty simple; you can add an inline image to your page with a URL pointing to a CGI script on the server, as in the following HTML statement:

```
<IMG WIDTH=320 HEIGHT=200 SRC="http://animate.cgi">
```

This image statement would normally call an inline image from the server, but instead, we're calling a CGI script. The CGI script will use the same image frames we would use to create the animation, but they're simply read on the

server side and sent in sequence to the visitor's browser using server push. The text content on the page doesn't change at all, but the inline image is automatically updated by the CGI script.

The entire server push process is controlled by the server side, which is a definite plus for those Webmasters who wish to monitor and direct the distribution of content.

The Downside

As I mentioned earlier, server push requires a constant connection between the server and the visitor's browser—and, as you might imagine, this connection can lead to a significant drain on a Web server. The more open connections, the less responsive the server. For this reason, larger companies that plan "broadcast" sessions on the Web using server push tend to use multiple servers connected together with a local area network.

Server push also requires knowledge of the CGI scripting language. Although it's certainly not difficult, many ISPs do not support CGI scripting for the Web pages hosted on their sites, so unless you're running a dedicated server, you may not be able to provide server push.

Finally, I believe that server push is perfect for the delivery of content, but I also think that this technology is definitely overkill if you're simply looking for a way to provide animation for your Web page! The time-honored GIF animation we've built in earlier chapters is just as good as the animation created by server push, and you don't need CGI scripts.

For additional information on server push and how you can implement it on your site, check out the discussion of this process on the Netscape home site at **http://home.netscape.com/assist/net_sites/pushpull.html.**

Using Third-Party Plug-ins

Finally, let's talk about one other advanced method of bringing animation to your Web page: third-party plug-ins that enhance Netscape Navigator and provide you with additional features. With the latest version of Navigator, plug-in installation has become about as automatic as possible, and you will rarely have to exit Navigator to take advantage of the new plug-in!

Here's a listing of the most popular plug-ins currently available to add animation and digital video to your page:

- **Shockwave**. A product of Macromedia, Shockwave has probably attracted the most attention in the last year or so as the best-supported third-party animation plug-in for Netscape. Shockwave animations, movies, and content are created with the company's Director program, or you can also use Flash or Authorware from the same company. The newest version of Shockwave supports streaming transfer, so you can start watching an animation or a movie before it has been entirely downloaded. Many of the best Web sites around now feature arcade games, custom animated controls, animated backgrounds, and titles that use Shockwave. The plug-in is provided free at **www.macromedia.com/shockwave/download/** (as shown in Figure 9-3), but it takes quite awhile to download, and some of the nonstreaming Shockwave animations I've encountered will take several minutes to download as well! Versions are available for both Windows 95 and Macintosh.

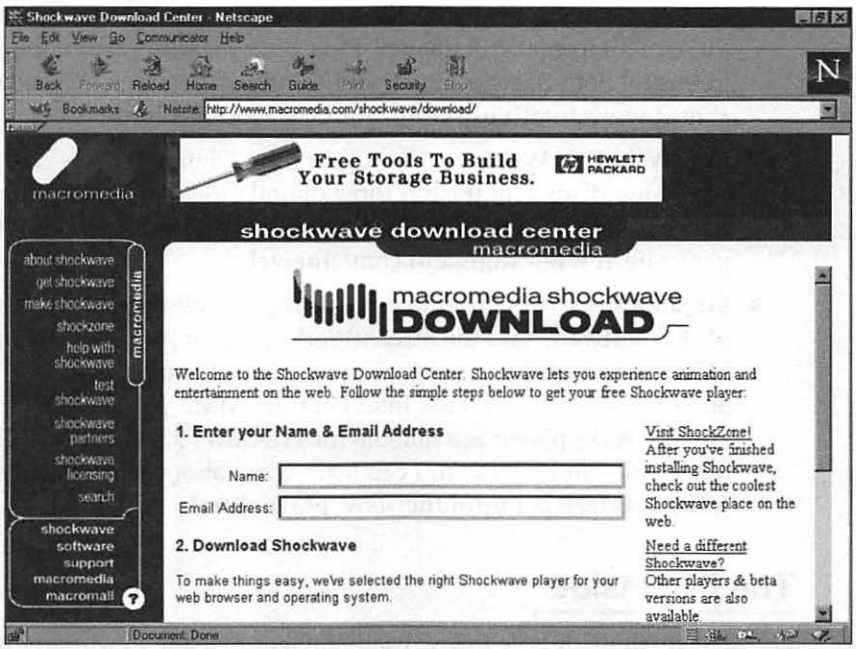


Figure 9-3: The Shockwave plug-in download page at the Macromedia site.

- **Flash**. Flash is another Macromedia product. In fact, most Webmasters view Flash as a subset of Shockwave, although it uses a different technology for drawing images. Flash is suited to creating animated buttons,

advertising banners, cartoons, and interactive interfaces with Windows WAV and Macintosh AIFF sound support; you can even add simple color transitions like fading. Depending on the size of the image and the complexity of the animation, Flash files often download faster than an equivalent animated GIF—and, since they're streaming, the animation begins to display before it has been fully downloaded. The Flash plug-in is much smaller than the Shockwave plug-in as well. Versions are available for both Windows 95 and Macintosh. At this point, Flash is still in its infancy, but Webmasters who don't require the power of Shockwave have great expectations for it. You'll find complete information on Flash at **www.macromedia.com/software/flash/**.

- **Sizzler**. If you remember Totally Hip Software's WebPainter from Chapter 8, you'll also remember that I mentioned the program would output animation in the company's Sizzler format. Sizzler is well-suited for simple animation, and it supports both sound and streaming transmission. You can import QuickTime movies or AVI digital video, as well as PIC or DIB format still images. Plus, both the plug-in and the editor are freeware! Both the Macintosh and Windows versions of Sizzler are available at **www.totallyhip.com/Products/Products.html**.
- **CineWeb**. This Windows 95 plug-in from Digigami takes care of the streaming display of the top three digital video formats on the Web: QuickTime, AVI, and MPEG. More information is available at the company site at **www.digigami.com/cineweb/**.
- **StreamWorks**. Xing Technology is already well-known as a leader in MPEG software, and the StreamWorks plug-in provides streaming MPEG-1 and MPEG-2 video display with CD-quality audio. StreamWorks supports the Intel Pentium MMX processor. The StreamWorks player is available for Windows 95, Windows NT, Macintosh, and UNIX. You can learn more about StreamWorks at **www.xingtech.com/products/sw_player.html**.

The Downside

I can't really think of very many disadvantages to using third-party plug-ins to provide animation—but the two that I have encountered can be intimidating.

One drawback is the cost and time involved in providing your own custom Shockwave animation. Director is a very expensive program, and even Flash will cost you somewhat more than the shareware and freeware utilities we've used to create GIF animation. Make no mistake about it: these programs are

fully featured, and learning them will take a considerable amount of time—and you'll spend much more time developing a Shockwave animation than you would a GIF animation. If you're looking for a way to add plug-in animation to your page quickly and as inexpensively as possible, I highly recommend the Sizzler format.

Second, plug-ins must be downloaded separately, and many Web surfers are growing tired of proprietary plug-in technology. GIF and Java animation, on the other hand, is supported within Navigator, so you don't need to spend time waiting for a plug-in to download before you can really enjoy a site.

Moving On

In this final chapter, you learned more about digital video, server push, and third-party plug-in technology—three types of animation that are currently leading edge and beyond the reach of most Webmasters. But as time passes, we may see them become as common as animated GIFs.

And there's a good phrase to draw this book to a close: "as time passes"! In six months, who knows what technology may appear to provide Web surfers with new forms of animation? Perhaps you'll be able to interact with others, playing a game, designing a cartoon, or lending a hand in a full graphic adventure in cyberspace. Or maybe the next advancement will be practical live action video from a personal Web page or your own news service with video contributed from sites around the globe! GIF animation will remain popular for years to come because of its simplicity, and Java will continue to grow with the popularity of the Web, but the future rests with new ideas that haven't even appeared yet.

Whatever the advancement, whatever new tools await you, here's one piece of advice I can give that will never grow outdated: Always make your next Web animation project better than your last!

APPENDIX

A

About the Companion CD-ROM

The CD-ROM included with your copy of the *Official Netscape Guide to Web Animation* contains valuable software, including modeling, rendering, and animation tools. Author, Mark Chambers, has also included inspirational JPEG images from his extensive portfolio.

To View the CD-ROM:

- Macintosh PPC —Double-click the "Launch Mac PPC" file.
- Macintosh 68K — Double-click the "Launch Mac 68K" file.
- WINDOWS 95/NT — If Windows "autorun" is not enabled, double-click the LAUNCH32.EXE file. Or, go to START | RUN and type d:\(where d is the name of your CD-ROM drive) launch.exe in the space provided.
- WINDOWS 3.1x — Double-click the LAUNCH16.EXE file in File Manager, or go to FILE | RUN and type d:\(where d is the name of your CD-ROM drive)launch16.exe in the space provided.

You will see a small menu screen offering several choices. They include quitting the CD-ROM, viewing the readme, or launching the installers. For more detailed instructions on how to use the author example files, consult both the vreadme View_Me.htm files in the root directory.

Software on the CD-ROM

A complete listing of the products in the Software Folder on the companion CD-ROM follows in Table A-1.

Program	Description
Adobe Acrobat Reader	The Adobe Acrobat Reader allows you to view, navigate, and print PDF files across all major computing platforms. Acrobat Reader is the free viewing companion to Adobe Acrobat 3.0 and to Acrobat Capture software. For more information, visit http://www.adobe.com.
Cel Assembler	Cel Assembler 1.2 for Windows 95 is a graphical tool for building and animating GIFs. The interface allows the user to view all the image frames at once and to move/copy/paste them intuitively. The user can also easily set delays/palettes/erasure methods as well as optimize the animation to reduce file size. A full-featured preview shows the animation in real time or a frame at a time, and can be viewed while the animation is being edited for immediate feedback. Cel Assembler makes animation building easy. To find out more, visit http://www.gamani.com.
Egor	Egor is the world's first commercial Java animator application. Use Egor's simple frame-by-frame assembler lets you create your own Java animations, add sounds, and associate URLs with each frame or with the whole animation. Egor is the simplest and most effective way to get your page moving and shaking with Java. For more information, visit http://www.sausage.com.
Font F/X	With Font F/X - 3D Font Rendering Software, anyone can add dramatic 3D graphic impact with unbelievable photo-realism to Web pages, documents, and business presentations in minutes. Unlike difficult, expensive, and hard-to-learn 3D graphics programs, Font F/X is easy to use, renders quickly, and utilizes all of your existing TrueType fonts to create fantastic text images. This demo includes the main program, online documentation, extensive help, a step-by-step tutorial, and the Font F/X Template and Texture Pack I, which includes over 20 additional fonts and symbols, 29 pre-built 3D templates, and over 80 textures. For more information, check out http://www.dcsifx.com.

Program	Description
GIFBuilder	GIFBuilder is a Macintosh utility to create GIF files. Animated GIF files are standard GIF files that contain several images and timing information; they can be used as inline movies in Web pages. GIFBuilder supports drag and drop, transparency, any disposal method, interlacing, custom color palettes, and the looping extension block defined by Netscape. It can open animated GIF files and QuickTime movies, and play animations. It is native and scriptable. Go to http://iawww.epfl.ch/Staff/Yves.Piguet.
Graphic Converter	This application will convert files between most formats. It can also be used to read, save, and prepare graphic files for distribution over the Web. Detailed user instructions for Graphic Converter are available on the Web at http://www.pen.k12.va.us/Anthology/Help/Mac/graphic.converter.html.
Hot Chilli	Hot Chilli creates Java applets quickly by using a simple point-and-click interface which guides you through the creation process, writing all the code for you. Hot Chilli contains cool effects which can be used to jazz up your Web pages. For more information about Hot Chilli, visit http://www.webcreations.com.au/hotchilli.
Jasc Media Center	Jasc Media Center offers complete multimedia file management! Just a few mouse clicks will catalog the sounds, animations, and images on your hard disk, removable storage media, network, or CDs. Works with video, photo, image, sound, and music files. Includes slide show presentation features, image format conversion, and batch image manipulation. Visit http://www.jasc.com for more information about this and other Jasc products.
Kai's Power Tools	A demonstration version of MetaTools, Inc.'s Kai's Power Tools 3.0. KPT 3.0 is available as a 32-bit native application extension for the Intel-based Windows 95/NT platforms, as well as for the Apple Macintosh/Power Macintosh platforms. Kai's Power Tools 3.0 is a unique and powerful collection of extensions that expand the power of image-editing applications which support the Adobe plug-in specifications. Visit http://www.metatools.com.

➥

Program	Description
Paint Shop Pro	16- and 32-bit versions of Paint Shop Pro, a powerful and easy-to-use image viewing, editing, and conversion program that supports over 30 image formats. With numerous drawing and painting tools, this may be the only graphics program you will ever need! Visit http://www.jasc.com for more information about this and other Jasc products.
PhotoImpact GIF Animator	An award-winning 32-bit GIF animation composition tool that provides an intuitive workspace for producing compact GIF89a animations. PhotoImpact GIF Animator features advanced color palette and optimization controls, powerful design features, and special effects. GIF Animator offers nine transition effects, including blind, split, and spiral, which give you variations for starting and closing your animations. An Add Banner text dialog box lets you create scrolling text banners anywhere within your animation. Smart frame comparison chooses the best options for reducing frame sizes, and auto palette optimization converts any local palettes and reduces the global palette to only the needed colors.
PhotoImpact GIF Optimizer	A Web imaging tool, PhotoImpact GIF Optimizer batch optimizes GIF files to produce savable reports listing before/after file sizes for each file optimized, plus the total savings per folder. Eliminates duplicate colors, pixels, and non-essential elements to ensure foolproof optimization of the exact same image quality. Only redundant pixels and colors are deleted. No need for an image editing application, GIF Optimizer automatically goes through an entire list of GIF files at the click of a button. Works on single files, folders, or entire Web sites to reduce bandwidth, lower storage, and improve Web site performance.
Pixel 3D	Pixel 3D offers a wide variety of 3D capabilities including 3D rendering, 3D file format translation, 3D logo creation, and 3D object optimization. Pixel 3D requires a Win32s environment on Windows 3.11. To find out more about this and other products from Forward Design, visit http://www2.wavetech.net/~pixelboy.
Sculpt 3D	Sculpt 3D is a complete, integrated 3D modeling, rendering and animation environment for Macintosh and Power Macintosh. It features an extensive suite of modeling tools, powerful texturing and lighting controls,

Program	Description
	and a super-fast raytracing engine that produces superb images and fly-through animations. In order to use this Sculpt 3D demo, you must have Apple's QuickTime™ extension, which you can download directly from Apple at http://quicktime.apple.com. For more information about this product, go to http://www.bytebybyte.com.
SiteFX	SiteFX is a collection of compact JavaTM-based applications, each of which performs its "specialty" very well. Thanks to the intuitive interface and superb built-in Help files, SiteFX is very user-friendly. In one handy bundle, SiteFX provides efficient tools that are all you need to bring your Web pages to life. Go to http://www.sausage.com.
SoftF/X Pro	SoftF/X Pro is an integrated 3D modeling, rendering, and animation system for Windows 95/NT4. For more information, visit http://www.bytebybyte.com.
The Ultimate Texture Collection	A demo version of Auto F/X's Photoshop plug-in compatible graphic design product, including three sample textures and an example of a lighting tile. This is a full working demo and will fuse a texture like the full version, but it will only work with demo version textures. The full version will work with any texture file. Visit http://www.autofx.com for more information.
trueSpace3	Like its predecessor, Caligari Corp.'s trueSpace3 is a fully integrated, intuitive, modeless interface that makes it easier to learn and become proficient in 3D graphics and animation. This new version of trueSpace includes an exciting array of new animation, rendering, human engineering, and Internet tools. This application requires Microsoft DirectX to function. Visit http://www.caligari.com for more information and to acquire Microsoft DirectX.
VideoCraft GIF Animator	VideoCraft GIF Animator features seven powerful effects editors to create stunning Web animations and video special effects. Besides animated effects such as morphing and distorting, VideoCraft can be used to convert existing files to GIF animations. Please note: Windows 3.x users will need Video for Windows (available from Microsoft) for VideoCraft GIF Animator to function. Check out http://www.andatech.com for more information.

Table A-1: Software on the Companion CD-ROM.

The JPEG files in the CD-ROM Resource folder illustrate a wide range of graphics techniques, from lighting and shading, to font manipulation and cool special effects. Copyright © Mark Chambers 1997, All Rights Reserved.

Technical Support

Technical support is available for installation-related problems only. The technical support office is open from 8:00 A.M. to 6:00 P.M. (EST), Monday through Friday, and can be reached via the following methods:

- Phone: (919) 544-9404 ext. 81
- Faxback Answer System: (919) 544-9404 ext. 85
- E-mail: help@vmedia.com
- FAX: (919) 544-9472
- World Wide Web: http://www.vmedia.com/support
- America Online: keyword *Ventana*

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The author and publisher of this book have used their best efforts in preparing the CD-ROM and the programs contained in it. These efforts include the development, research, and testing of the theories and programs to determine their effectiveness. The author and publisher make no warranty of any kind expressed or implied, with regard to these programs or the documentation contained in this book.

The author and publisher shall not be liable in the event of incidental or consequential damages in connection with, or arising out of, the furnishing, performance, or use of the programs, associated instructions, and/or claims of productivity gains.

Some of the software on this CD-ROM is shareware; there may be additional charges (owed to the software authors/makers) incurred for their registration and continued use. See individual program's README or VREADME.TXT files for more information.

Glossary

access privileges A user's rights on a host. Typically users are allowed to create or edit files only in their home directories and its subdirectories, though they can run programs from public directories.

account An agreement with an organization allowing you to take advantage of various services. For instance, an account on an e-mail server lets you log on to send and receive e-mail. Accounts are often protected by *authentication*, requiring that you type in a user name and a password.

activate To make a window the active one by clicking on it.

active window The window with the highlighted title bar, where the user is currently interacting with a program.

ACU *Automatic Call Unit.* Fancy name for a modem.

address area The area in Messenger's New Message window where you can edit your list of e-mail addresses.

Address Book A Communicator feature that lets you store individual e-mail addresses and address lists.

Address Book Card An electronic record of an individual's name, e-mail address, etc., often used in e-mail. Also known as a vCard.

address list A list of e-mail addresses. The address list lets you send e-mail to many individuals at once without entering each address.

addressing The assignment of unique names or numbers to every node on a network so that information doesn't get misdelivered.

agents Search tool that automatically seeks out online information based on your queries. Also called intelligent agents, knowbots, and droids.

algorithm The step-by-step process a software program uses to produce its results.

alias An alternate name used in place of a "real" one. Rather than using your real name to log in to a system, you probably use a shorter alias. Commands can also have aliases. For instance, you can create command files on a UNIX system so that instead of typing **ls -al** to see all the files in your directory, you could just type **dir**.

American Standard Code for Information Interchange *See* **ASCII**.

anchor In HTML, the target of a link, usually in the same document. It is sometimes also used to mean any link.

application protocol A **protocol** that "sits on top of" the underlying transport layer of a communications system. For example, **FTP** and **Telnet** are application protocols that format data in particular ways and use the services of the lower-level **TCP/IP** transport layer.

Archie A network service used for locating files available at **FTP** sites that accept anonymous logins.

ARP *Address Resolution Protocol.* Protocol used on a network for mapping Ethernet addresses to IP addresses.

ARPAnet A wide area network developed in the 1960s by the Advanced Research Projects Agency of the U.S. Department of Defense. It links government and academic networks around the world.

ASCII *American Standard Code for Information Interchange.* This standard assigns a binary value to common text and control characters. ASCII is used for manipulating text in a program and for transmitting text to other devices or systems.

ASCII file A human-readable file made up only of letters, numbers, and symbols. An ASCII file contains no formatting except tabs, linefeeds, and carriage returns. Also known as a *text file.*

assigned numbers The usual port numbers for well-known Internet services such as **Telnet, FTP,** and so on. For instance, hosts usually wait for Telnet connections on TCP port 23, for World Wide Web connections on port 80, and for Usenet news connections on port 119. These assigned port numbers are how the host knows what kind of connection is being requested.

asynchronous transmission The transmission of data without special timing information. Each character you transmit is made up of several bits of information. In asynchronous communications, the characters are "packaged," usually by special start and stop bits, so that the receiving hardware or software knows when it has received an entire character. This way, the interval *between* characters doesn't have to be fixed, and information can arrive at any time. *See also* **synchronous transmission.**

Attachment A text or binary file included with an e-mail message.

attachment encoding The method used to encode an attached binary file so that it can be delivered to the recipient via any intermediary systems without being corrupted.

attachments list The list of attached files that will be sent along with an e-mail message.

attribute (text) The display characteristics of text. Text attributes include bold, italic, underlined, and so on. In **World Wide Web** documents, text may be tagged with a wide variety of attributes using **HTML.**

AU sound Audio format developed by Sun and used for sound files on the Web. Netscape browsers play AU files using the helper program NAPLAYER.

authentication The process of identifying a user to determine if he or she should have access to a particular computer system. Name and password prompts are a form of authentication.

authoring software Any software that lets you create HTML or other multimedia documents.

AVI Video format developed by Microsoft and often used for digital video on the Web. The latest version of Netscape Navigator comes with support for AVI video.

bandwidth The range of frequencies that can be transmitted over a network, limited by the hardware. Higher bandwidth allows more information on the network at one time.

baud rate The number of signal changes per second as data is transmitted from one device to another. For instance, 110 transitions per second from a high frequency to a low frequency on a phone line would be 110 baud. Each signal change may signify one bit of data (for instance, high frequency to low could signify 1, low to high could signify 0); if a signal changes in multiple ways (frequency, amplitude, etc.), it may signify multiple bits of data. In the first case, baud rate would equal **bits per second**; in the second case, bits per second would

be higher than the baud rate. The difference between baud rate and bits per second is a common icebreaker at nerd parties.

BBS *See* **bulletin board system.**

BCC Short for *blind carbon copy.* A copy of an e-mail message that does not include information about who the other recipients are.

binary Numbers composed of combinations of two different digits, specifically 1 and 0. In the context of this book, binary data means information that may contain the full range of combinations of binary digits in a **byte**, as opposed to information that contains only the limited range of information that is displayable as text. Bytes of **ASCII** text contain only seven significant **data bits**, as in 1011001, while programs, graphics, spreadsheet files, and so on, contain eight significant data bits per byte, as in 10011011.

binary file Any file, such as an executable or graphic, that cannot be read as text, usually containing characters that have eight rather than seven significant data bits and are therefore beyond the range of **ASCII**. In some cases binary files need to be encoded as seven-bit files in order to be transmitted across certain systems (*see* **attachment encoding**).

BIND *Berkeley Internet Name Domain* server. This is the DNS server on BSD and related UNIX systems. *See also* **DNS**.

BinHex A file format, used mainly in the Macintosh world, for storing and transmitting binary data as **ASCII** text. This format is useful for transferring 8-bit data over 7-bit networks or data paths, or for including binary files as part of mail messages. Among UNIX and PC users, **UUENCODING** is more common.

bit A *bi*nary dig*it*, the smallest piece of information that a computer can hold. A bit is always one of two values, written as 1 or 0 and corresponding to the on/off state of a digital switch or the high/low state of electrical impulses. Combinations of bits are used to represent more complex information, such as **ASCII** text or commands to the computer.

bitmap A representation of an image as an array of bits.

bit rate The rate at which bits are transmitted, usually expressed as a certain number of **bits per second**, or bps. *See also* **baud rate**.

bits per second *See* **bit rate.**

bookmarks In Netscape browsers, a means of permanently storing the **URLs** for sites you want to revisit.

bridge (1) A device, or a combination of hardware and software, for connecting networks together. (2) Something that goes over troubled water. *See also* **internet.**

browser A software program, such as Netscape Navigator 4, that is designed for accessing documents on the World Wide Web, or HTML documents on an intranet.

bulk cipher An **encryption** method used to encrypt large quantities of information.

bulletin board system (BBS) An electronic version of the old cork bulletin board—a place to leave and collect messages and files. A modern BBS is really like a whole collection of bulletin boards, with different sections covering different areas of interest. Users can generally exchange public as well as private messages, and many BBSes include extensive areas for distributing shareware or public domain software.

byte A combination of **bits** used to represent a single character. In the world of personal computers, a byte is eight bits long.

cable A bundle of wires or fiber strands wrapped with insulation and used to connect devices.

cache An area of memory or a file used to store frequently accessed instructions or data. A memory cache is used to reduce hard disk access time. Memory and file caches are also used by Web browsers and other online programs to store images or data that rarely change; thus, a large home page does not have to be re-sent each time a connection is established.

carrier A steady background signal on a communication channel used to indicate that the system is ready for the transmission of data. The carrier is then modified to represent the data transmitted.

CC Short for *carbon copy.* A copy of a message sent to secondary or additional recipients.

category In the context of Netsape Collabra discussion groups, a subdirectory used to organize similar groups.

CCITT *Consultive Committee on International Telegraphy and Telephony.* This is an international standards-setting body that makes recommendations for international communications technologies.

certificate *See* **digital certificate.**

Certifying Authorities Organizations that distribute **digital certificates.**

CGI *Common Gateway Interface.* A standardized technique that lets Web clients pass information to Web servers, and then on to other programs that process the information. When a Web site accepts the information you enter into a form, it is using CGI.

channels Collections of information, usually including multimedia files, that are downloaded and then stored locally on your system. Subscribed-to channels may be updated on a regular basis so that they contain the latest information available from the provider. In Communicator, the **Netcaster** component is used to subscribe to, view, and configure channels.

Channel Finder A Netcaster feature that lets you preview selected **channels,** which you may then subscribe to.

character entities In HTML, special symbols that stand for other characters. Character entities begin with an ampersand (&) and end with a semicolon (;). For example, *>* in an HTML document would appear on your screen as > (greater than).

character set encoding The encoding methods that enable software to properly interpret characters and symbols from a variety of languages. To view Web pages that use the standard English alphabet, for instance, you choose the Latin1 character set.

check box A Windows 95 and Windows NT control that lets you choose a particular option by clicking. Once you click, an X or checkmark appears in the check box; click again and it is cleared.

CIX *Commercial Internet Exchange.* CIX is an agreement among Internet service providers allowing them to make the Internet available to commercial traffic.

Clear To Send A signal from a **DCE** to a **DTE** indicating that circuits are ready for data transmission. *See also* **DCE; DTE.**

clickable image In a Web page, an image you can click in order to access a different URL. *See also* **image map.**

client A computer or a software program that can access particular services on a network. The machine or the software that provides the service for a client is called a **server.** For instance, an e-mail client would request received mail from an e-mail server.

client pull A method specific to Netscape products whereby a Web client can request that the Web server send it a particular set of data. *See also* **server push.**

client/server architecture A system in which a **client** program establishes a connection with a **server** and then requests information or services. *See also* **client; server.**

client write key The software key used to encrypt data written or transmitted by the client in a **client/server** system.

Clipboard or clipboard An area of memory where objects (data) are placed when a user carries out a Cut or Copy command or chooses a menu option. This data can then be passed to another program.

Collabra The component of Netscape Communicator that lets you view and respond to intranet discussion groups as well as **Usenet** newsgroups.

column heading A Windows 95 and Windows NT control that displays data in a multicolumn list.

combo box A standard Windows 95 and Windows NT control that combines a text box and a list box.

command button A control used to initiate a command; also known as a push button.

command prompt A set of characters or a symbol that indicates where you type in commands. The DOS C:\ prompt is an example of a command prompt.

Communicator The Netscape software suite that currently includes **Navigator** for Web browsing, **Messenger** for e-mail, **Collabra** for reading or participating in discussion groups, **Composer** for creating HTML documents, and **Conference** for interacting in real time with other individuals on the Net or on an intranet.

Component bar The Communicator control that lets you access the various components of the program (**Navigator, Collabra,** etc.) by clicking on icons. The Component Bar may be anchored to the status line of the various Netscape programs, or it may "float" on your desktop.

Composer The Communicator component that lets you create and edit HTML files.

Conference The Communicator component that lets you interact in real time with other individuals across the Net or on an intranet. Features include full-duplex voice communication, chat, file transfer, a special graphical whiteboard for collaborative design and planning, and collaborative Web browsing.

computer name On Microsoft networks, a unique name of up to 15 characters that identifies a particular computer on the network.

configuration registry In Windows 95 and Windows NT, a database that stores information about a computer's configuration as well as the configuration of various software. The registry may be edited by using the program *regedit* in Windows 95 or *regedt32* in Windows NT.

connect time The amount of time you're connected to a host or to a service provider.

connection A link between two computers for the purpose of transferring or sharing information.

container Any screen object that holds other objects; for instance, a folder.

content-type The MIME name for particular types of files to be transferred by e-mail or the Web. For instance, the content-type for a GIF file is **image/gif**. *See also* **MIME**.

control Any window object that lets you interact with a program by selecting an action, inputting data, and so on.

Control menu The menu that pops up when you click the icon at the top left of a program's main window. It contains commands such as Move, Size, Maximize, Minimize, and Close.

cookie A piece of system or configuration information transmitted between a Web server and the browser software and then often stored on the client machine. Cookies enable a Web page to adjust its display or other configuration options for particular clients that connect.

cross-platform Describes software that can be used on more than one operating system, such as Windows, Macintosh, and UNIX.

CSLIP A common variant of the SLIP protocol that uses compressed IP headers. *See also* **SLIP**.

cyberspace A slightly dated term referring to the entire world of online information and services. It was originally coined by the writer William Gibson.

daemon UNIX-speak for a program that's always running on a server machine, waiting for requests for a particular service. For instance, an FTP server daemon sits and waits for an FTP client to connect and request files.

data Information used or processed by a software program.

data bits Bits that carry information as opposed to control information. For example, the bits in the middle of a **byte** might signify a text character and are, therefore, data bits, while the bits at the beginning and end of the byte merely mark the beginning and end of the data.

Data Carrier Detect (DCD or CD) A signal from a **DCE**, such as a modem, to a **DTE**, such as a PC, indicating that a communication channel has been established with a remote device. *See also* **DCE; DTE.**

data-file object An object representing a data file (spreadsheet, document, image, sound clip, etc.) in the file system.

Data Terminal Ready (DTR) A signal from a DTE to a DCE indicating that it's ready to receive and transmit data. Usually, a modem keeps DTR high as long as it's turned on. *See also* **DCE; DTE.**

DCE *Data Communication Equipment.* A device used by a **DTE** to transmit and receive information. Your modem is a DCE.

DDE *See* **dynamic data exchange.**

decode To translate electronic information back into its original form. Unlike decrypting, decoding does not need any special key. *See* **encoding.**

decrypt To translate electronic information back to its original form through the use of a special electronic key that insures privacy or security. *See* **encryption.**

default In software, the "out of the box" value of a configuration option. The software will use this value unless the user explicitly indicates a different one in a setup program, property sheet, or .INI file.

desktop The visual work area that fills your screen and holds the objects you interact with, such as icons, the task bar, and so on. The desktop is a container (or folder) that can also be used as a convenient place to access files.

destination directory The directory to which you copy, move, or download a file or files.

device driver A program used by the system to access devices such as video cards, printers, and mice.

dialog box In Windows 95 and Windows NT, a box that appears on your screen requesting your input; it engages you in a *dialogue* with the software. It may contain edit fields, check boxes, list boxes, radio buttons, and so on, and it stays on your screen until you click its Cancel or OK button.

dial-up networking A facility built into Windows 95 that allows users to link to a network or to the Internet using phone lines. Similar to **Remote Access Dialer** in Windows NT.

digital certificate A unique electronic key that identifies you and authorizes you to access secure Web sites. Also, a digital certificate may be included with an

e-mail message, identifying the originator of the message and allowing it to be encrypted. *See also* **personal certificate, site certificate.**

digital signature The inclusion of a digital certificate (for instance with an e-mail message) that matches a key you hold, allowing decryption.

dimmed A button, menu item, or other control is dimmed or *grayed* (displayed in light gray instead of black) to indicate it represents an option or command that is not currently available.

dithered Images with a color depth greater than your display palette are dithered, resulting in a grainy effect.

direct connection A permanent connection between a computer and the Internet as opposed to a temporary dial-up or **SLIP/PPP** connection.

directory 1. A structure on a disk that contains files or other subdirectories. Also sometimes referred to as a folder. 2. A collection of names, addresses, and other contact information stored as part of a directory service, useful for looking up individuals for e-mail.

directory service An Internet or intranet service used for looking up e-mail addresses or other contact information.

directory tree A hierarchical display of a disk's directories and subdirectories.

DLS server *Dynamic Lookup Service* server. A server that provides the e-mail addresses of, and other information for, people who want to be included in the list—in other words, a server that acts as a sort of phonebook.

DNS *Domain Name Service*, an Internet service that returns the appropriate **IP address** when queried with a **domain-name address.**

dock To configure a toolbar so that it no longer floats, but lines up with the edge of a window or pane.

document (World Wide Web) On the **World Wide Web**, a file or set of related files that can be transferred from a Web **server** to a Web **client.** The document may contain text, graphics, sound, or hyperlinks to other documents.

document encoding *See* **encoding.**

document window A window that lets you view the contents of a document.

domain A collection of associated computers on the Internet, given a specific domain name that is used as part of the Internet address. For Windows NT

Server, a domain is also a uniquely named collection of computers that share a domain database and security policy.

domain-name address The "plain English" address of a computer on the Internet, as opposed to its numeric **IP address**. For instance, www.echonyc.com is a domain-name address.

download To get a file or files from a remote computer; the opposite of **upload**.

draft A message that you're still working on, that is stored in a special holding area (the drafts folder in Netscape Messenger, for instance) until you're ready to send it.

drag To move a mouse while pressing and holding one of its buttons. Dragging is used to move or resize objects on the screen. (Also known as "drag-and-drop.")

droids *See* **agents.**

drop-down combo box A Windows 95 and Windows NT control that combines a text box with a drop-down list box.

drop-down list box A Windows 95 and Windows NT control that displays a current text selection, but that can be opened to display the entire list of choices.

drop-down menu A menu that is displayed from a menu bar.

DSU *Digital Services Unit*. The piece of equipment that enables transmission of data in synchronous digital connections to the Net.

DTE *Data Terminal Equipment*. A device that serves as the originating point or the final destination of information. Typically, a computer or a terminal is a DTE.

dynamic data exchange (DDE) The exchange of data between programs such that any change in the data in one program affects that same data in the other program. For instance, if spreadsheet data are shared via DDE by Word and Excel, any changes made to the data in Excel will also appear in the Word document.

edit field *See* **text box.**

electronic mail A network service for transmitting messages from one computer to another. Also called *e-mail*.

ellipsis The "..." added to a menu item or button label to show that the command needs more information to be completed. When you choose a command with an ellipsis, a dialog box appears so you can enter additional information.

encoding The technique used for storing or expressing data. For instance, text may be stored via ASCII encoding or some form of encoding that uses compression (such as ZIP). In Web browsers, document encoding refers to the translation of incoming characters into display fonts. For instance, you may set Netscape browsers to Japanese encoding so that information in a Japanese HTML document will be correctly displayed.

encryption A method of **encoding** information for secure transmission. The data can be read in its original form only after it has been decoded. *See also* **public-key encryption**.

environment variable A symbolic name associated with a string of characters used by an operating system or programs for its own informational purposes. For instance, the environment variable GIF_DIRECTORY could be set to C:\GIF so that a graphics program knows where to look for GIF files. Typically, you set an environment variable by using the Set command at a command prompt or in a batch file. In Windows NT, you can use the System option in the Control Panel to define environment variables.

Ethernet A hardware system and a protocol that is commonly used to connect computers on a LAN.

external viewer A separate program used by a **World Wide Web** browser to display graphics or to play sound or video files. After downloading a particular media file, the Web browser launches the external viewer program appropriate to the type of file. In order for this to work, you must configure your Web browser with the names of the external viewer programs you have on your system. Another term for external viewer is **helper application**.

extension The period and characters at the end of a file or directory name, often used to indicate the type of file or directory. For instance, INDEX.HTML includes the .HTML extension to indicate it is an HTML document.

extranet A TCP/IP network that links businesses to customers, suppliers, etc.; part of an enterprise intranet that is made available to the outside world for marketing or other specific purposes.

extrusion A term used in 3D rendering, especially 3D text. Adding an extrusion makes a 3D object thicker, which typically enhances the 3D look of the finished object.

e-zine A zine, or small non-mass-market magazine in electronic format. Some e-zines are text files distributed via electronic mail or posted on a BBS; others are Web pages with extensive graphics and even sounds.

FAQ Abbreviation for *frequently asked question*. FAQs are lists of frequently asked questions (and their answers) in a particular topic area. For instance, a Windows NT FAQ would help users understand the basics of using Windows NT by providing answers to common questions. Most mailing lists and network newsgroups regularly provide updated FAQs. It is important to read the FAQ for a particular newsgroup before beginning to post messages.

file A named collection of **ASCII** or **binary** information stored on a disk or other storage device. Files include text, programs, databases, spreadsheets, graphics, and so on.

file server A computer that provides storage space for files and applications that may be shared by network users.

file system In an operating system such as Windows 95 or Windows NT, the structure used for storing, organizing, and naming files.

file transfer protocol Any **protocol** for transferring files from one computer to another. A file transfer protocol usually includes provisions for making sure the data was transferred without errors and for resending any blocks of information that were corrupt.

filter A facility for automatically organizing your received e-mail into separate folders. When your e-mail program retrieves messages that match criteria you've specified in a filter (for instance a particular name in the From header), it can automatically store those messages in a particular folder instead of your **inbox**. It can also delete the messages immediately.

finger A UNIX program that lets you retrieve basic information about an Internet user or host. Finger is available via the Web at various sites.

firewall Software and/or hardware that places an electronic barrier between an internal network and the Net, allowing only controlled access. This protects the network from access by the outside world and may also be used to monitor or limit the Internet activities of employees in an organization.

flag A characteristic of a file that may restrict its use in particular ways. A file may be flagged read-only, for instance. Also, a special designation for an e-mail message. Flagged messages may be found quickly in a list of messages.

folder A container that holds and organizes objects, typically files or other folders. On the desktop, a folder may represent a directory in the file system; other folders within it are equivalent to subdirectories.

font A particular style for displayed or printed characters, including the shape, weight, slant, and so on.

font size The size of a **font**; typically represented in units of measurement called *points*.

FQDN *Fully Qualified Domain Name.* The full domain name of a computer on the Internet, including both the host name and the domain name. *See also* **domain-name address**.

frame A single image produced in a drawing package for use in animation; the subtle changes between frames create the movement in an animated GIF.

frameset An HTML page that contains several **frames**.

FTP Abbreviation for *File Transfer Protocol.* A particular file transfer protocol that is common on the Internet. It is also used as a verb, as in, "FTP me that file, wouldya?"

full duplex A communications link in which both ends can transmit data simultaneously, as in a telephone conversation. In situations where you are working interactively online, full duplex communication lets a remote host echo back to you each character you type so that you can see what you're writing as you work. *See also* **half duplex**.

FYI *For Your Information.* A series of technical documents on various Internet-related topics, available at many public FTP sites. *See also* **RFC**.

gateway A device or the software that links networks that use different protocols. For instance, a Novell network might have an Internet gateway that "packages" information into the **TCP/IP** packets required for Internet communication. The term *gateway* is also used in a very specialized sense to mean a program on a **World Wide Web** host that accepts and processes information sent by a Web client. For instance, a document on a **Web server** might display a form in which you can type your name; the gateway program would then enter your name in a database.

GIF (Pronounced "jiff.") Abbreviation for *Graphic Interchange Format.* This is a format for compressed graphic files developed by CompuServe and Unisys.

Gopher A menu-based client/server system for exploring information resources on the Internet. A Gopher client is seamlessly built into Web browsers, so you don't need a separate Gopher client program.

GopherSpace All of the information presented by a **Gopher** server, in the form of directory and file menus.

grayed *See* **dimmed**.

half duplex A communications link in which both ends can transmit and receive data, but not at the same time. Half duplex communication is like two-way radio or CB, where only one person speaks at a time. In situations where you are working interactively online in half duplex, you will not see characters you type echoed to the screen unless you set your communications program to echo them locally. *See also* **full duplex.**

handle An interface element added to an object to enable the user to move, resize, or reshape it.

handshaking The initial negotiation and the exchange of control information between a **DCE** and a **DTE** or between two DTEs in a communications link. Handshaking is necessary to make sure both devices are ready to transfer data and can "understand" each other. *See also* **Data Carrier Detect; Data Terminal Ready; XOFF; XON.**

hardware handshake A protocol whereby a **DTE** tells the connected computer to start or stop sending data. Typically hardware handshaking is implemented by raising and lowering the voltage on the DTR **(Data Terminal Ready)** line in the cable that connects the **DTE** and **DCE.** *See also* **XOFF; XON.**

header Text within a Web page that indicates the main point of the document or of a section within it. Headers often use the specific HTML heading styles. *See also* **message header.**

helper applications Programs that a Web browser such as Netscape Navigator 3.0 uses to perform tasks such as displaying particular types of graphics, playing sounds, or initiating Telnet sessions.

history list In Netscape Navigator 3.0, the list of Web documents you've displayed during the current session.

home page The **HTML** document you choose to display when you open a **Web browser** such as Netscape Navigator 3.0. It may be located on your own hard drive or on a remote **Web server.** Home page can also refer to the top-level document at a particular Web site.

host computer A computer that a user can connect to in order to access information or run programs. A user may log in locally using a **terminal** or remotely using a computer and phone lines or the Internet.

host b image map A graphic in a Web document that lets you click on certain portions in order to activate particular **URLs.** It has an associated map file that identifies these hot spots. *See also* **clickable image.**

IMAP *Internet Message Access Protocol.* A protocol that lets you access your e-mail messages on a remote server machine instead of retrieving them and viewing them on your own computer. The most common implementation of IMAP is IMAP4. It provides an alternative to **POP3** e-mail servers.

inactive window A window with which you are not currently interacting. Its title bar is not highlighted, and it receives no keyboard or mouse input. *See also* **active window.**

inbox In Netscape Messenger, the folder where new e-mail messages are stored by default after retrieval from a POP3 or IMAP server.

inline images Graphic images contained within **World Wide Web** documents. An inline image displays automatically as part of a document when it is retrieved; a non-inline image must be retrieved by clicking on a **link.**

intelligent agents *See* **agents.**

internet A larger network made up of two or more connected LANs **(local area networks)** or WANs **(wide area networks).**

Internet The huge worldwide Internet made up of cooperative networks and using **TCP/IP** protocols to offer a variety of services.

Internet access provider A business or organization that provides Internet access to consumers, often via dial-up **SLIP** or **PPP** connections. Also known as an **ISP,** or Internet service provider.

Internet address *See* **IP address.**

Internet presence provider An Internet-connected business that provides equipment and services to customers without equipment or technical expertise.

intranet A network of connected computers that uses the same protocols and provides many of the same services as the **Internet,** but which cannot be accessed by the public. For instance, a corporation may have an intranet for its employees.

IP address Also called *Internet address.* The unique address for each computer on the Internet. The IP address appears as a set of four numbers separated by periods.

ISDN *Integrated Services Digital Network.* The telecommunications standard that supports digital transmission of voice, video, and data over phone lines.

ISOC *Internet Society.* Organization that was formed to support a worldwide information network.

ISP *Internet Service Provider.* Another term for an **Internet access provider.**

IPP *See* **Internet Presence Provider.**

Java An object-oriented programming language developed by Sun Microsystems. It allows developers to create applications that may be run from within Web browsers such as Netscape Navigator 3.0.

JavaScript A set of commands that can be added to HTML files to add functionality to Web documents. JavaScript is useful for scrolling text, data validation in forms, etc.

JPEG A format for compressed graphics files. JPEG graphics are commonly used as part of **World Wide Web** documents.

kbyte *See* **kilobyte.**

kilobyte (K) 1024 (2^{10}) **bytes** of data. Thus, a 64K file consists of 65,536 bytes.

LAN *See* **local area network.**

LDAP *Lightweight Directory Access Protocol.* A protocol that lets individuals search directories on the Net or an intranet. *See also* **directory service.**

link A special hidden **tag** in an HTML document on the Web. It includes the **URL** for another file or document, or for another anchor point within the same document. When you click a word, phrase, or graphic that's tagged as a link, Netscape Navigator 3.0 automatically retrieves the appropriate target.

list box A control that displays a scrollable list of choices.

Live3D Netscape's **VRML** technology.

LiveConnect Netscape technology that allows Navigator plug-ins, Java applets, and JavaScript to communicate with each other.

local area network (LAN) A group of computers connected together by cable or wireless transceivers so that users can share resources such as database files, programs, printers, and so on. *See also* **wide area network.**

log file A file that is automatically generated by software, indicating events that occurred such as errors, attempts to access your server, etc.

log in To identify yourself to a remote system or network by typing in your login name and password.

login name The name you use for security verification when you call into a remote system.

login prompt The prompt (usually *login:* or *name:*) a remote host uses to tell you it's ready for you to type in your login name.

logon script A file containing simple commands that automate the process of logging on to a server, **SLIP** or **PPP** account, or other computer. In Windows NT, the files SWITCH.INF and MODEM.INF are logon scripts that automate the process of logging on to a remote machine using the **Remote Access Dialer**. In Windows 95, logon scripts generally have a .SCP extension and are associated with particular **Dial-Up Networking** connections using Microsoft's Dial-Up Scripting utility.

log off To tell a remote host system or a network, using the appropriate commands, that you are terminating interaction. In many cases, logging off will also break the communications link to the remote machine.

log on To tell a remote system or network, using the appropriate commands, that you are initiating a session.

mail headers The informational fields at the beginning of every e-mail message, indicating sender, recipient, time and date sent, etc. Mail headers may not be visible in an e-mail program, but they are used by the program to organize messages.

mail host An Internet or intranet server that sends e-mail for you and/or temporarily stores your incoming messages. A client program like Messenger sends e-mail via a mail host and retrieves new e-mail from a mail host.

mailing list A list of e-mail addresses. Messages sent to the list are actually sent to every member of the list individually. Mailing lists are useful for disseminating information to established groups of individuals, or to subscribers who want ongoing information in a particular area of interest.

mailto link A special kind of HTML **link** whose URL includes an e-mail address. When you click a mailto link, Communicator pops up a New Message window with the recipient's address already filled in. Mailto links are useful for soliciting response to a Web page.

maximize To expand a window to its maximum size. *See also* **minimize**.

maximize button The button used to maximize a window. In Windows 95 and Windows NT 4.0, it is the second button from the right in the title bar.

megabyte (MB) 1024 **kilobytes**, or 1,048,576 bytes.

menu bar A horizontal bar at the top of a window (between the title bar and the rest of the window) that contains menu choices. *See also* **drop-down menu**.

menu button A command button that displays a menu.

menu item A choice on a menu.

message box A window that appears to inform you of something, for instance that a connection has been established or that an error has occurred.

message area The part of the main Messenger window that displays the actual contents of the currently selected e-mail message.

message body The main content portion of an e-mail message, distinguished from the **mail headers**.

Message Center In Communicator, the window that displays a list of e-mail and discussion group folders.

message flag *See* **flag**.

Message List window In Communicator, the window that displays a list of received e-mail and discussion group messages.

message status How a message has been handled so far by the e-mail software and an individual recipient. For instance, a message's status may be new, unread, read, replied to, or forwarded.

message thread *See* **thread**.

Message window In Netscape Messenger and Collabra, the window that displays the actual contents of an e-mail or discussion message.

Messenger The Communicator component that lets you send, retrieve, and organize e-mail messages.

MIME *Multipurpose Internet Mail Extensions*. MIME is a convention for identifying different types of **binary** information, such as images or sounds, and thereby indicating the appropriate programs for viewing or playing this information. MIME is used in attaching binary files to e-mail messages so that they can be displayed or played automatically when received.

minimize To minimize the size of a window; in some cases, this means to hide the window. *See also* **maximize**.

minimize button The button used to minimize a window.

modem Short for *mo*dulator/*dem*odulator. A hardware device that connects your computer to other computers using analog telephone lines.

modem command An instruction, typed from the keyboard or transmitted automatically by a software program, that tells a modem to perform some action. For instance, the command ATH0 tells a modem to hang up the line.

moderator An individual responsible for viewing and approving discussion group postings before they are made available to the group as a whole.

morph A computer visual effect where one image appears to gradually change into another.

MOV QuickTime video format developed by Apple and often used for digital video on the Web. Most Netscape browsers require a plugin to view QuickTime movies.

Mozilla This word stands for "Mosaic meets Godzilla." It is the name for the early Netscape products and for the Security Advisor.

MPEG *Moving Pictures Expert Group.* MPEG is a standard format for compressed video files, sometimes known as "desktop movies." MPEG files may be part of **World Wide Web** documents, but they require a special **helper application** for viewing.

multiple selection list box A special list box that's used for multiple independent selections.

multiuser system An operating system, such as UNIX, that lets more than one user at a time access services.

My Computer A Windows 95 and Windows NT 4.0 object (icon) that represents all of your local data storage.

Navigator The Communicator component that lets you browse the Web or HTML documents on an intranet.

NCSA *National Center for Supercomputing Applications.* NCSA is the department of the University of Illinois where the Web browser Mosaic was developed. Mosaic was the forerunner of all modern graphically based Web browsers.

Netcaster The Communicator component that lets you display and configure **channels**.

netiquette Proper behavior on the Net (derived from etiquette).

Netscape Security Advisor A Communicator feature that helps you maintain and organize your digital keys and certificates, as well as showing you the security status of documents you access.

Netsite The label for Navigator's Netsite/Location field when you are accessing a Web site that uses one of Netscape's server programs.

network A collection of interconnected computers. Each attached computer runs its own software processes, whereas in an unnetworked **multiuser system**, users run all processes on the central host computer and use terminals simply to interact. A network lets users share information as well as devices such as printers, disks, and modems.

network administrator In an organization, the individual who is responsible for configuring and maintaining the network. This is the person to talk to if you have problems with a direct "hard-wired" connection to the Internet.

Network Neighborhood A Windows 95 and Windows NT 4.0 folder that includes objects stored on a network file system.

New Message window In Messenger, the window that lets you compose, edit, and send e-mail and Collabra discussion group messages.

newsgroup A special forum that allows users to exchange messages (postings) in a particular area of interest. These messages are accessible by all members of the group. Some newsgroups, like the Usenet newsgroups, are accessible to the public; others, like those on Collabra servers, may be private.

news host The computer that stores discussion group messages and makes them available to all memebers of the group.

NFS *Network File System.* NFS is a set of protocols developed by Sun Microsystems for allowing computers running different operating systems to share files and disk storage.

NIC *Network Information Center.* The organization responsible for supplying information about the Internet.

NNTP *Network News Transport Protocol.* The protocol used by news hosts and client programs like Collabra to transfer discussion group messages over the Net or an intranet.

NNTP host *See* **news host**.

NOC *Network Operations Center.* The organization in charge of the day-to-day operations of a network on the Internet.

node Any computer or other device on a network that has its own unique network address.

NTFS A **file system** that can be used under Windows NT. It supports a variety of advanced features including system recovery.

object An entity that you manipulate in some way to perform a task. (Is that vague enough?) Typical objects are **icons** or **folders** on the **desktop**.

offline Not currently connected to a remote computer or a network; not currently on the Internet or an office intranet.

online Currently connected to a remote computer or network.

option button A control that allows a user to select one choice from a set of mutually exclusive choices (also known as a *radio button*). *Compare* **check box**.

outbox In Messenger and similar e-mail client programs, the folder that stores outgoing messages before they are actually delivered. For instance, when you work **offline** any messages you compose are stored in the outbox until you go **online**.

packet A block of information that has been "packaged" with address information, error-checking information, and so on, for transmission on a **network** or on the **Internet**.

parameter A variable that affects the results of a command. For instance, in the command *dir /p*, /p is a parameter.

parity A crude system of error-checking used in data communications. For most scenarios these days, your communications software should be set to "no parity."

parsed HTML HTML files that are read and manipulated by separate software on a server machine after the server software has answered a client request for the document. Using parsed HTML, for instance, a program could customize a Web document based on who requested it. Parsed HTML is also known as server-parsed HTML and SHTML. Often HTML files that will be parsed end with the extension .SHTML instead of .HTML.

personal certificate A digital **encryption** certificate for which only you hold the decryption key. If you "sign" an e-mail message with your personal certificate, the recipient can then encrypt messages he or she sends you. *See also* **digital certificate, site certificate**.

pixel The smallest unit of graphic information on a computer screen. Graphic images are usually measured in pixels, and a pair of pixel coordinates can indicate an exact point within an image.

plain text Text that doesn't contain any special formatting such as HTML tags.

plain-text message In Messenger, an e-mail message that contains HTML tags and that hasn't been encrypted or encoded.

plug-in Software program that extends the capabilities of Netscape Navigator. For instance, a plug-in may let you view PostScript files right within the browser window.

PNG *Portable Network Graphics.* A standard for highly compressed graphics files that may include trillions of colors, multiple layers of transparency, and searchable text information.

POP *Point of Presence.* The local dial-up node an Internet access provider makes available for its customers.

POP3 *Post Office Protocol, version 3.* The protocol used by Netscape Navigator 3.0 and other e-mail programs to retrieve messages from your e-mail server. *See also* **SMTP, IMAP.**

pop-up menu A menu that appears right at the location of a selected object (sometimes called a *shortcut menu*). The menu contains items related to the selection.

pop-up window A window with no title bar that appears next to an object and provides information about that object.

port (1) A hardware connector on the back panel of a computer where you can plug in a serial, parallel, or network **cable.** (2) A unique number assigned to a particular Internet **service** on a host machine. For instance, most MUDs and MOOs require that you Telnet to a host using a specific port different from the standard Telnet port number. You can usually specify a port number as part of an Internet address, as in *lambda.parc.xerox.com 8888.*

POTS *Plain Old Telephone Service.* What it sounds like; the current analog phone system, as distinguished from ISDN and other digital technologies.

PPP *Point-to-Point Protocol.* This is a protocol that lets a computer link to the **Internet** by calling in to a service provider using a modem and a standard telephone line.

properties Characteristics of an object defining its state, appearance, or value. Often used to mean a program's settings.

property inspector A viewer that displays the properties of the current selection.

protocol A set of rules for interaction between software programs on a network. Protocols may include requirements for formatting data, for passing control information back and forth, and for error checking.

proxy A server that allows communication with the outside world (for instance the Internet) through a **firewall**. When a client behind a firewall requests a specific Internet service, the request actually goes to the proxy, which then relays it on.

public-key encryption An **encryption** method that requires two unique software keys (one public and one private) for decrypting the data, making it secure across public networks. Pretty Good Privacy (PGP) is a well-known public-key encryption system.

query string The word or phrase you pass to a Web search engine.

QuickTime A multimedia file format developed by Apple. It is often used for video clips or "movies."

quoted-printable A **MIME** type for binary data that has been specially encoded to seven-bit ASCII text so it can be transmitted across a variety of networks. The recipient's software must then decode it back to binary data.

radio button *See* **option button**.

random access memory (RAM) Computer memory that temporarily stores information; for instance, software code that you've loaded by launching a program or data that you're processing. Generally, the more of it, the better!

raytracing An advanced feature offered by some 3D rendering programs where the path of light rays are accurately calculated. Raytracing is used to add shadows, mist, and other lighting effects to a rendered image.

read-only memory (ROM) Computer memory containing data that cannot be changed by the user and that remains even when the computer is turned off. ROM is used for storing your computer's BIOS, for instance, which is the code that lets you boot up and that performs a variety of low-level functions.

refresh In Netscape Web browsers such as Navigator 3.0, the command that reloads a document into the browser window from a disk or memory **cache**.

regedit A program in Windows 95 for editing the **configuration registry**. In Windows NT this program is called regedt32.

registry *See* **configuration registry**.

reload In Netscape Web browsers such as Navigator 3.0, the command that reloads a document into the browser window from its original local or remote source.

remote Any system that you can connect to by using only communications devices rather than just local wiring.

Remote Access Dialer A Windows NT program for connecting via ordinary phone lines or **ISDN** to a remote computer, often used for **SLIP** or **PPP** connectivity.

remote computer A computer you link to via telephone lines, satellite, or other communication links.

rendering The creation of a 3D image on a computer, usually from a 3D model.

resolution The density of an image, expressed in dots per inch.

restore button The button that replaces the maximize button once a window has been maximized. It lets you return the window to the size it was before maximizing.

reverse lookup The process of looking up the domain name of an Internet-connected computer when all that's known is the numeric IP address. For instance, you may have a numeric IP address assigned by a **SLIP** or **PPP** access provider, but no associated domain name. When you try to log in to certain security-conscious FTP sites, the host software looks up your domain name via DNS reverse lookup. If it can't find one, you are not allowed on the system. *See also* **domain-name address**.

RFC *Request for Comments*. An RFC is a proposal or report electronically distributed via the Internet, usually for the purpose of elucidating or helping to define a new Internet technical standard.

rich text Text that contains HTML or other special formatting. *See also* **plain text**.

rich-text message A message that includes encoded, encrypted, or HTML-formatted content. *See also* **plain text message**.

root directory The top-level **directory** on a disk such as your hard drive. For example, C:\ would be the root directory of your C: drive.

RS-232 The standard used by your serial port. RS-232 lines are the individual pins and wires that make up the hardware interface, such as the send data line,

the receive data line, and the various hardware handshaking (or hardware flow control) lines.

RTF *Rich Text Format.* A file format that can be read by many word processing programs across all platforms.

RTS/CTS *Ready to Send/Clear to Send.* In an RS-232 serial port, the two lines that allow two devices to signal each other when they are ready to send or receive data. This process is known as **hardware handshaking** or hardware flow control. *See also* **RS-232.**

script A software program that doesn't need to be compiled. It is run by another program "as is," in human-readable form. *See also* **logon script.**

scroll bar The control that lets you move the image or text within a window either horizontally or vertically to view data that is not currently visible.

search engine A program on the Net that lets users search for online information. Typical search engines include Infoseek and Alta Vista, both available from Netscape's Search page.

security key A special file that is needed in order to access a secure document. *See also* **public key encryption.**

server A computer or a program that provides a particular service on a network or on the Internet. Typical services include file access, printing, e-mail, **FTP**, and so on. The computers and software that access servers are called **clients.**

server push A technique specific to Netscape products whereby a Web server can initiate the transmission of data to the Web **client.** Server push is often used for animation or sound. *See also* **client pull.**

server write key The software key used to encrypt data written or transmitted by the server in a **client/server** system. *See also* **client write key.**

service A specialized function or utility provided by a **server.**

service provider An organization, usually commercial, that provides connections to the Internet.

session A connection between two machines on a network or on the Internet.

SGML *Standard Generalized Markup Language.* A high-level standard for the electronic publication of information. **HTML** is a subset of SGML.

shell account An account with an access provider that lets you access a text-based system for performing routine Internet tasks. You connect to a shell ac-

count via Telnet or a dial-up terminal emulation program. Some Internet access providers let you put your own Web pages on their server using a shell account.

shortcut A desktop icon that can be used as a quick way to launch a program or document. Another word for *hotlink* in a WWW document.

SHTML *See* **parsed HTML.**

signature A text file that contains any information that you want to attach regularly to your e-mail messages and network news posts. A signature is usually less than five lines long and contains contact information.

single selection list box A list box that lets you choose only a single item from a list.

site certificate A **digital certificate** that lets you send an encrypted message to all recipients at a particular site. *See* **digital certificate, personal certificate.**

slider A control that displays a continuous range of values and lets you choose one.

SLIP *Serial Line Internet Protocol.* Like **PPP,** this is a protocol that lets a computer link to the Internet by calling in to a service provider using a modem and a standard telephone line.

S-MIME *Secure Multipurpose Internet Mail Extension.* A secure version of **MIME,** useful for insuring e-mail privacy.

SMTP *Simple Mail Transfer Protocol.* The most common protocol for sending e-mail messages over the Internet. *See also* **POP3.**

snail mail A form of messaging that utilizes carbon-based materials to create and address human-readable data, which is then transmitted over a complex network of streets and air routes by human entities known as "postal employees."

snews Part of a domain address indicating a secure news (discussion group) server. For example, snews.whatever.com would be a secure news server, while messages on news.whatever.com would not be automatically encrypted.

sockets A software mechanism that allows programs to communicate locally or remotely by setting up endpoints for sending and receiving data. The application programmer does not have to worry about the nuts-and-bolts details of how the data travels from one point to the other, as that is taken care of by the operating system or other resident software. The Windows Sockets API (**Winsock**) uses this concept.

SOCKS A protocol that lets a host server on an internal network access the Web through a **firewall**.

spam Unsolicited messages that are sent to many e-mail recipients or posted in several discussion groups. Spam is an aggressive electronic version of junk mail and is considered an egregious violation of **netiquette**.

spin box A control that displays a limited range of values and lets you choose one.

SSL *Secure Sockets Layer.* A version of the **HTTP** protocol that includes encryption. SSL allows for the secure transfer of sensitive information across the Net, as in financial transactions.

string Geek-speak for a set of characters. Your name, for instance, is a string.

symbolic link A name that does not refer to an actual object but points to another name. For instance, on an FTP site, a directory list might include the entry WINDOWS, even though there is no WINDOWS directory at this level. The WINDOWS entry could be a symbolic link to a directory buried much deeper in the file system, such as /pub/micro/pc/GUI/windows. Symbolic links provide convenient shortcuts to actual objects.

synchronous transmission A method of transmitting data that uses a special timing signal to ensure a set time interval between any two characters. *See also* **asynchronous transmission**.

tag A special code used in an **HTML** document to indicate how a piece of text or a graphic should be displayed by a Web browser; it may also establish a **link** to another document.

target The reference the browser "jumps to" when a user clicks on a link. The word is usually used for references within the same document.

TCP/IP *Transmission Control Protocol/Internet Protocol.* TCP/IP is a set of protocols that applications use for communicating across networks or over the Internet. These protocols specify how packets of data should be constructed, addressed, checked for errors, and so on.

Telnet A program that lets you log in to a remote **host computer** and access its data and services as if you were using a text-based **terminal** attached locally.

terminal A keyboard and display screen used to access a **host computer**.

terminal emulation A software program that lets you use a personal computer to communicate with a **host computer**. It transmits special commands and interprets incoming data as if it were a terminal directly connected to the host.

text box A control that lets you enter and edit text.

text file *See* **ASCII file.**

text-only Containing no visual information other than human-readable **ASCII** text. When you **Telnet** into a UNIX system, for instance, your user interface is text-only, as distinguished from the graphical user interface of systems like Windows.

thread A software process or task. Operating systems like Windows 95 and Windows NT allow for many threads to occur simultaneously.

title bar The horizontal bar at the top of a window that includes the window name. The title bar also acts as a handle that can be used to drag the window.

title bar icon The small icon at the top-left corner of the title bar. You can use it to display the pop-up menu. Double-clicking this icon closes the program.

toolbar A control that provides a defined area for a set of other controls such as icon buttons, drop-down list boxes, and so on.

traffic Data traveling across a network or across the Internet.

tree control A control that lets you display a set of hierarchical objects in an expandable outline format.

upload To send a file to a remote system; the opposite of **download**.

URL *Uniform Resource Locator.* A URL is a specially formatted address that a Web browser uses to locate, retrieve, and display a document. The URL includes the Internet address of the data, where it is located on the Web server machine, and what kind of transport protocol is required to retrieve it. URLs are contained in the hotlinks within **HTML** documents; they may also be specified by the user of a Web browser "on the fly."

Usenet A large collection of networked users who communicate using the UNIX-to-UNIX Copy Protocol (UUCP) rather than **TCP/IP**. Usenet is connected to the Internet by gateways, and many Internet users are familiar with its broad range of discussion forums known as newsgroups.

UUCP *UNIX to UNIX Copy.* An older set of network commands for sending and receiving data on dial-up networks.

Uuencoding A standard for encoding binary data that allows it to be transmitted as 7-bit ASCII information; it is then *uudecoded* into its original binary form.

VCard *See* **Address Book Card.**

virtual server A server that appears like a separate server to clients, but which actually runs on the same machine and uses the same server software as other servers. For instance, the Netscape FastTrack server lets you set up www.server1.com, www.server2.com, and www.server3.com all at once. Somebody logging onto www.server2.com would access different information from somebody logging onto www.server1.com.

VRML *Virtual Reality Modeling Language.* VRML is a specialized language that allows for the creation of three-dimensional user interfaces that can be accessed via Web browsers such as Netscape Navigator 3.0.

WAIS *Wide-Area Information Server.* WAIS is a specialized Internet client/server system for researching information in Internet databases.

WAN *See* **wide area network.**

Web Short for **World Wide Web.**

Web browser A program for retrieving and viewing **HTML** documents on the **World Wide Web.** Also known as a Web **client.**

Web document Any document available on the **World Wide Web.**

Webmaster The individual in charge of developing or administering a Web site.

Web server A computer that stores Web documents and allows **Web browsers** to retrieve them over the Internet using the **HTTP** protocol. Also, the software that makes this possible.

Webtop A Netcaster **channel** that's anchored to the desktop and often used as a primary user interface. Other channels may appear within the Webtop.

wide area network A group of computers and/or networks connected to one another by means of long-distance communication devices, such as telephone lines and satellites, rather than just through local wiring. *See also* **local area network.**

widget In HTML geek-speak, an object in a Web document that accepts user input. Examples are check boxes, radio buttons, drop-down lists, and so on.

wildcard character A character used when you specify a filename; it is a variable that stands for any other valid character or characters. The question mark (?) stands for a single character, while the asterisk (*) stands for any string of characters in the filename. For instance, **.txt* means "any file that has the .TXT extension"; *??.txt* means "any file that has a two-letter name and the .TXT extension."

Windows NT Server The version of the Windows NT operating system that provides centralized network management and security as well as additional connectivity options.

Windows NT Workstation The version of the Windows NT operating system that provides operating and networking functionality, but without centralized management.

Winsock *Windows Sockets API.* A software "toolkit" that lets Windows programmers access **TCP/IP** services using a standard interface. Any Internet programs that use this standard, such as e-mail clients, Web browsers, and so on, will work under Windows 95 and Windows NT.

workgroup On Microsoft networks, a collection of grouped computers with a unique name.

workstation In Windows NT, a computer running the **Windows NT Workstation** software.

World Wide Web (WWW) An Internet service used for browsing hypermedia documents; the "Internet within the Internet" formed by all the Web servers and **HTML** documents currently online.

WYSIWYG *What You See Is What You Get.* A description of data that already looks like the final output as you work on it. For instance, a WYSIWYG HTML editor like Composer lets you move graphic elements around the page rather than typing in HTML code.

XOFF A special character that's used to control the flow of information between a **DCE** and a **DTE**. When one device receives an XOFF character from the other, it stops transmitting until it receives an **XON**.

XON A special character used to control the flow of data between a **DCE** and a **DTE**. *See also* **XOFF**.

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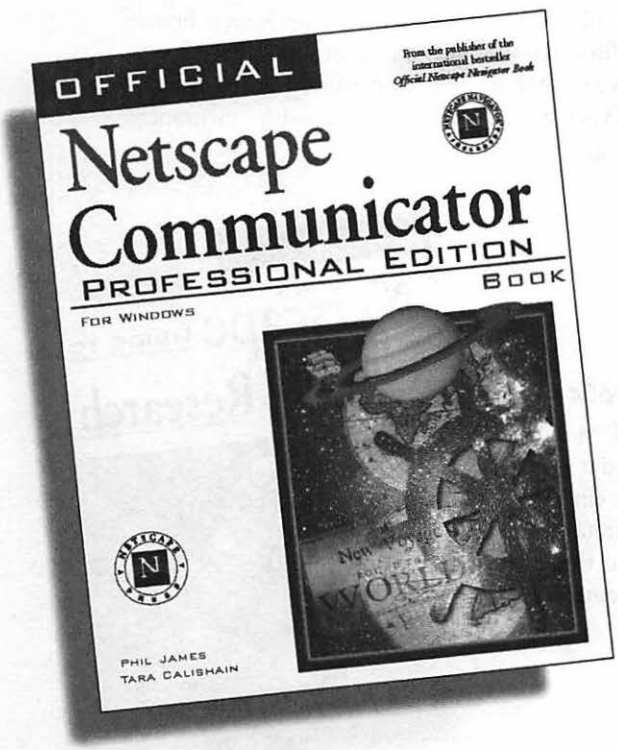

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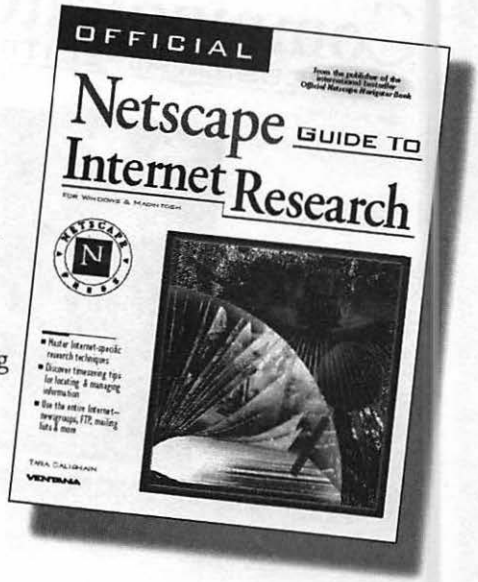

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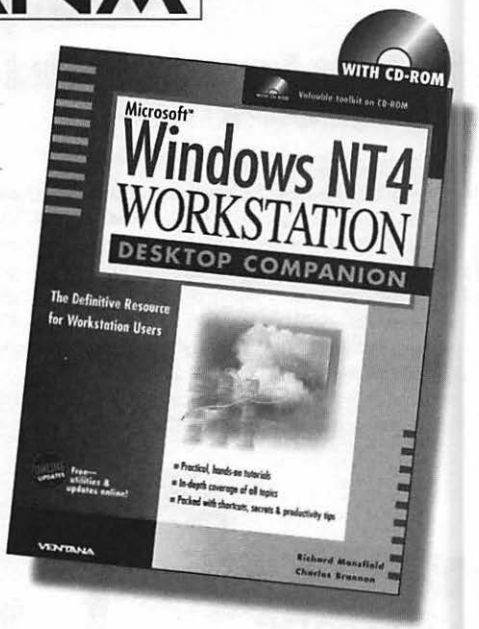

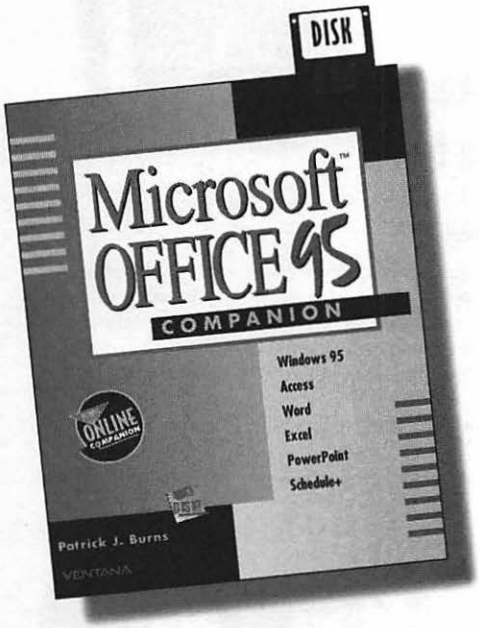

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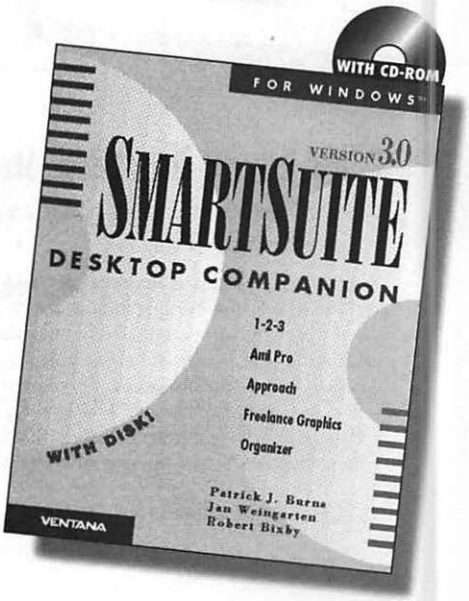

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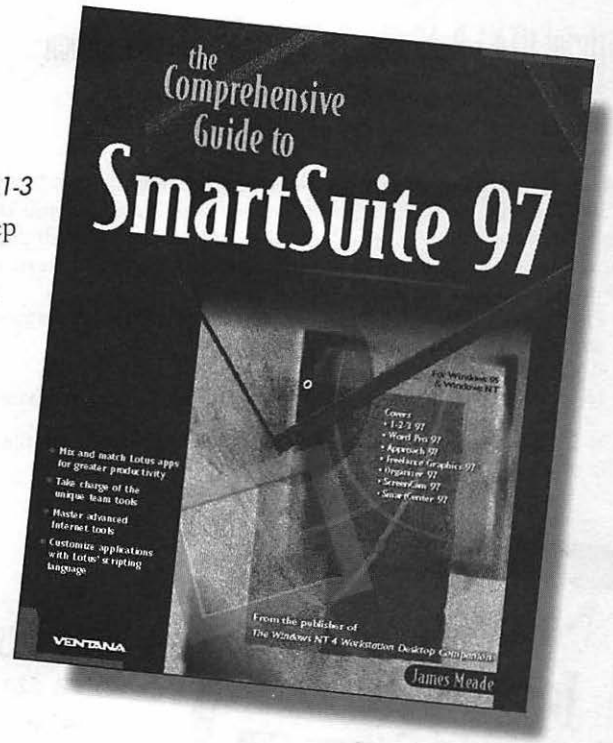

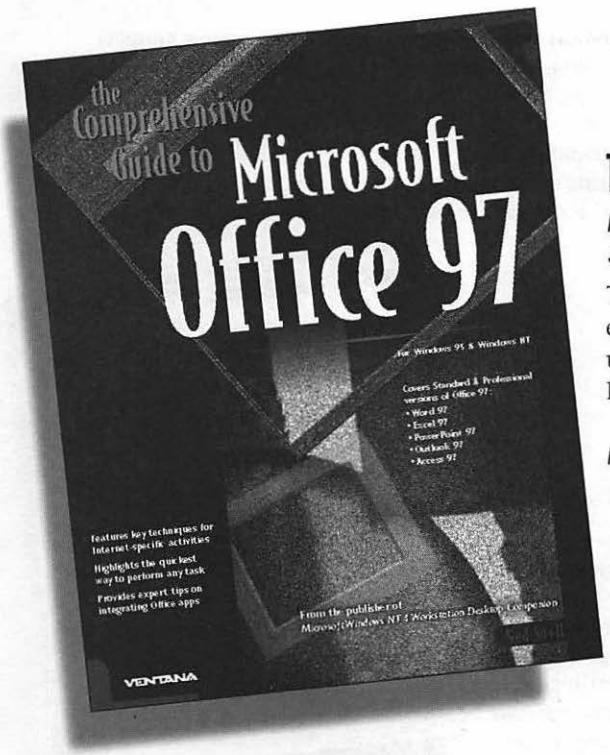

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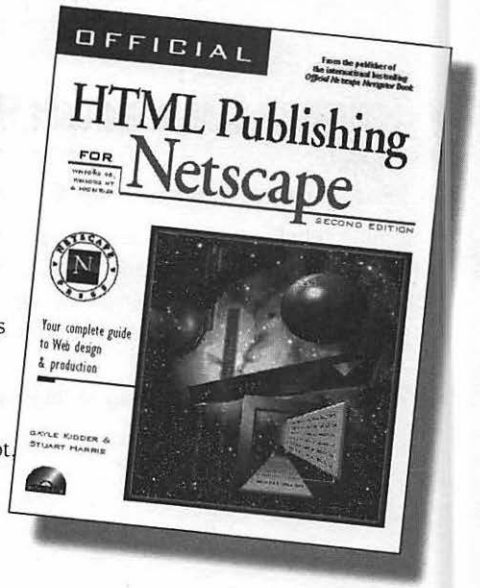

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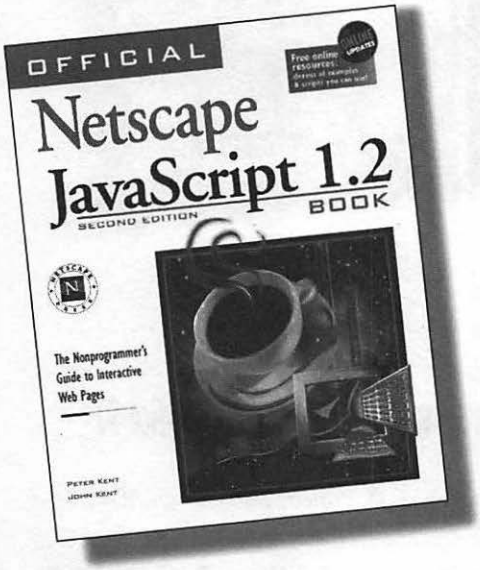

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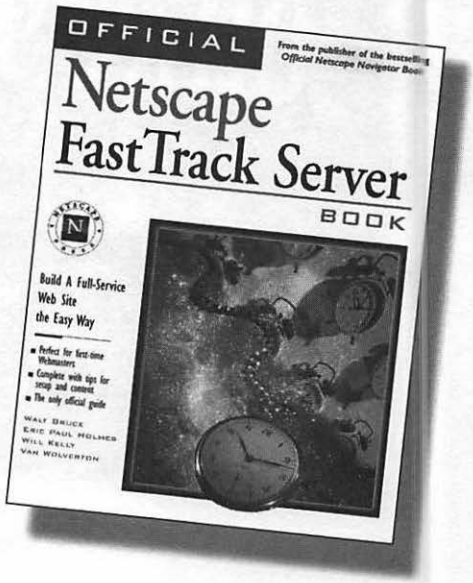

Official Netscape FastTrack Server Book

$39.99, 600 pages, part #: 1-56604-483-9

Windows NT • Intermediate to Advanced

Turn your PC into an Internet/intranet powerhouse!
This step-by-step guide to the hottest server software on the Net provides all the instructions you need to launch your Internet or intranet site, from technical requirements to content creation and administration. Learn how to exploit FastTrack Server's high-performance server architecture to easily create and manage customized web sites. Plus, enhance your site with FTP and Telnet; ensure security for online transactions; and import and convert documents.

Technical support for installation related issues only provided by Ventana. The Ventana technical support office is open from 8:00 A.M. to 6:00 P.M. (EST) Monday through Friday and can be reached via the following methods:

World Wide Web: http://www.netscapepress.com/support

E-mail: help@vmedia.com

Phone: (919) 544-9404 extension 81

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Dozens of software demos and shareware utilities!

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Make Your Web Site a Moving Experience!

To attract more visitors to your site or spice up your home page, animation offers fresh, compelling opportunities. But effective animation requires a solid basis in graphic design. This step-by-step guide offers it: a quick course in image editing, graphics formats, and page layout—along with instructions for using the tools on the CD-ROM.

Learn to:

- **Start with the right image**—use Paint Shop Pro (Windows) or PhotoDeluxe (Mac) to capture screens and copy images from other sources, such as Web pages, clip art, and videos; learn basic image-editing techniques, including resizing, re-coloring, compression, and adding transparency.
- **Create animated GIFs quickly and easily**—master GIF Construction Set (Windows) or GifBuilder (Mac) for preparing images properly, building a movement cycle, inserting delays, and testing and optimizing animations.
- **Master advanced techniques**—get to know Adobe Photoshop's image filters and special effects tools; learn about Push & Pull animation; feature digital video on your Web page.
- **Add a new dimension to your animations**—master the basics of creating 3D Web graphics, including proportion, lighting, and texture; use 3D objects in your animations; generate multiple frames; use PowerGOO to create morphing animations.
- **Take a taste of Java**—find out what's so hot about Java; add Java and JavaScript effects without programming; use HotChilli to create moving banners, button effects, and status line effects.

For more than a decade, **Mark L. Chambers** has been an author, computer consultant, technical writer, BBS sysop, and game programmer. A contributor to Ventana's bestselling *Official Netscape Navigator Book* and *Official Netscape Internet Starter Kit*, he wrote *Running a Perfect BBS* and contributed to *Web Publishing Unleashed*, *Microsoft Internet Explorer Unleashed*, and *FrontPage 97 Unleashed*.

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