




1

Creating an Organized System



When photographers were mostly shooting film, their filing systems weren't very complicated. They labeled and stored sets of slides or negatives and proofs in places like boxes and filing cabinets. Though some photographers were more organized than others, the system was intuitive because it was similar to the way other important documents are organized and stored. As photographers began to capture digital files, this organizational system became less intuitive due to the virtual nature of the image files. This problem was compounded by the large number of original files generated by digital shooters, as well as the ease of creating derivative files that are nearly identical the original photo. In this chapter you learn about the different kinds of files digital photographers use and some of the strategies used to organize them. By the time you finish this chapter you'll be ready to create an organizational system that makes sense.

Understanding File Formats

Think of file formats as different languages. When a book is printed in a particular language, only someone who reads the language can understand it. If the reader knows a second language, he can translate the book into that other language, making it available to other people. This is similar to the way file formats work in Photoshop. Certain file languages are used for different purposes. As an image moves through the digital workflow, it's translated into the language that's most appropriate for that particular portion of the workflow.

When discussing how file formats fit into the workflow, it's useful to divide them into three groups — image capture formats, editing formats, and output formats. Image capture file formats are the file types that come directly out of a digital camera. Editing formats are file types that are created during the editing process in Photoshop. Output formats are used for specific output purposes such as printing or Web display.

Image capture formats

Digital photographers tend to capture images in one of these two file formats: JPEG and camera raw. The decision about which file format you use can have a huge impact on the possibilities of what you can do during the editing process.

JPEG

The JPEG file type (JPG when used as a file extension) was designed to be a space-saving file format. It was created in 1992 by a committee called the Joint Photographic Experts Group (JPEG). The committee's goal was to establish a portable standard for compressing photographic files that would be universal for all kinds of editing software. This compression results in smaller, more portable files.

File compression is a system of analyzing a file and looking for common strings of data. When several identical strings are located, they're replaced by a single representative string with references to all the places where it appears in the image. Compression can substantially reduce file size, especially when images contain lots of the same tones, such as solid backgrounds.

There is a downside to JPEG compression. Though very small files can be created with high compression, JPEG compression is lossy, meaning that information is lost during the compression process. The amount of loss depends on the amount of compression. Additionally, whenever a file is resaved and compressed again, more data is lost. Eventually this cumulative data loss begins to affect the quality of the photo. The key is to limit the total loss by compressing a JPEG file as little as possible — not editing and resaving the file later on. That's why the JPEG file format is not considered an editing format.

To understand the effects of file compression, it helps to look at what happens to a JPEG file when it's saved in Photoshop. When saving a JPEG file in Photoshop, you're presented with the option to determine the amount of compression that's applied to the file. Greater amounts of compression yield smaller files sizes.

Take a look at this example to see it in action. Figure 1.1 shows the JPEG Options dialog box that appears when saving a JPEG file in Photoshop. In this case, an image that is 24.8MB becomes a 3.2MB JPEG with a compression quality of 12. If the compression on this file is lowered by two, to 10 instead of 12, the file size is reduced by two-thirds to 1.0MB without adversely affecting the image quality. However, if this file is repeatedly reopened and resaved with a level of 10, the quality of the photo is affected.

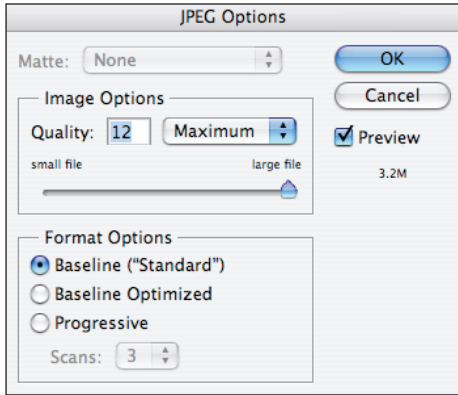


Figure 1.1

Figure 1.2 shows a photo of the beach. This photo was saved as a JPEG with a quality setting of 10. It's nearly indistinguishable from the original file JPEG file that was captured with the camera.

Figure 1.3 shows the same photo after opening and resaving it several times with a JPEG compression of 10. Notice that the gradient in the sky now shows what's called banding. This is caused by over-compression that has

eliminated many of the intermediate tones in the sky, causing tonal variations to show up as bands rather than gentle tonal graduations.

When you use JPEG as a capture format in your camera you have the option of choosing the level of compression for the photos as they're saved to the camera's media card. Oftentimes this is presented as a quality setting or a size setting. In both cases you want to choose the higher number—higher quality, or larger size. This reduces the number of images that can be saved to the media card, but it insures that the files have the highest quality with the least amount of compression.

JPEG is one of the most widely used file formats for digital imaging. Virtually any software that can open an image file can open a JPEG. What's more, nearly all the photographs you see on the Internet are JPEG files — at least the ones that look good. That's because JPEGs can be compressed to very small sizes, which is perfect for online delivery or e-mail where quality isn't as noticeable.



Figure 1.2



Figure 1.3

note

The JPEG file type is a capture file type and an output file type. The same is true for TIFF (Tagged Image File Format).

Camera raw

Camera raw (raw) files can be created with digital single lens reflex (dSLR) cameras and some high-end point-and-shoot cameras. These files get their name from the kind of information they contain.

To understand raw files it's useful to compare them to the JPEG capture format. When you point your camera at a scene and press the shutter button, the camera's image sensor captures a huge amount of information. If you have the camera set to capture JPEG files, the camera's onboard processor processes all that information into a JPEG file. The processor looks at all the settings you have set on your camera — sharpness, white balance, color

space, contrast, and so on. Then it applies all these settings and creates the JPEG file from a small sliver of the data that the camera's sensor recorded. The rest of the information — most of what was captured — is ignored and deleted. Even if the JPEG is of the highest quality (meaning the least compression), it represents only a fraction of what the camera actually saw.

JPEG capture is easy because it allows the camera to make lots of decisions very quickly, based on the settings you have dialed into your camera. If you're working in a very controlled environment, or under extreme deadlines, this can be a fast way to get things done. The problem is that you don't get to look at all the information before it gets thrown away. You have to live with the data the camera selected to create the JPEG files.

Shooting in raw is the solution to this problem. It allows you to save most of the information that a camera's sensor is capable of capturing. After you have this information in a file, you can selectively choose which information becomes

part of the editing file by converting the data from the raw file into an editing file format that Photoshop can use. This adds an additional step to the workflow because you have to make some decisions that the camera would normally make when shooting JPEG, but the flexibility is worth the added step.

see also

Raw files are covered in detail in Chapter 4.

Editing formats

As I mentioned earlier, the JPEG file format isn't the best choice for editing because of the destructive nature of lossy compression. Another reason the JPEG format isn't a useful editing format is the inability to save layers in a JPEG file. A layer is just that — a segment of image information that's stacked on top of the original image. This ability to isolate different aspects of the image allows a great deal of control over the image as a whole. Because of that, the two primary file formats for editing are TIFF and PSD.

TIFF

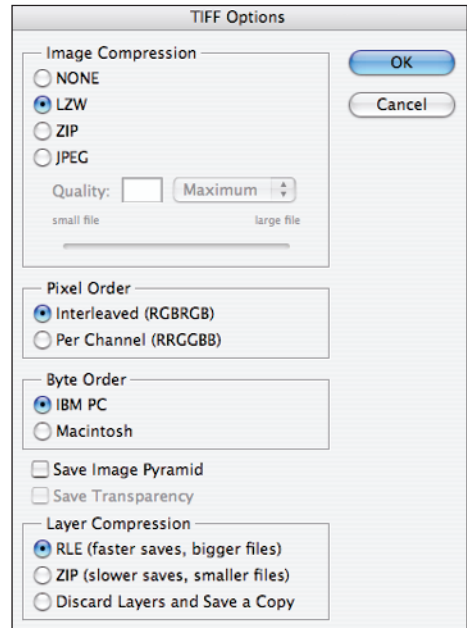
TIFF (or TIF when used as a file extension) stands for Tagged Image File Format. TIFF is a flexible format that's supported by most image-editing and graphics software.

Normally, a TIFF file is larger than a PSD file (Photoshop's native format) that's saved from the same image. That's because PSD files are compressed a bit by default to make them smaller when they're saved. However, compression can also be applied to a TIFF file. This compression results in much smaller files size than PSD files. Just be aware that compressed TIFF files take longer to save and to open.

With a TIFF file, compression doesn't happen automatically; it's an option. You must select it in the TIFF Options dialog box, as shown in

Figure 1.4, when the TIFF file format is chosen in the File→Save As dialog box. Photoshop offers three different types of TIFF file compression: LZW, ZIP, and JPEG. The main difference among these three compression methods is that LZW and ZIP are lossless compression methods (no data is lost during compression), and JPEG is a lossy method of compression similar to the compression used on JPEG files that was discussed earlier.

Figure 1.4



When compressing a TIFF file, stick with lossless compression by selecting LZW or ZIP. They're fairly equal in performance, and Photoshop opens either of them. However, be aware that ZIP is not supported in older software. I compress TIFF files only when I'm planning to e-mail or transfer them electronically to someone and I want to save space. Many people also compress all TIFF files to save room on their drives.

As mentioned earlier, an option with TIFF files in Photoshop is the ability to save layers. This seems pretty cool, except that few image-editing applications can open all the layers of a layered TIFF file. If I'm saving a layered file and planning to use Photoshop to edit it — even if it began as a TIFF — I save it as a PSD file. If you're worried about hard drive space, go ahead and save your layered files in the compressed TIFF format.

see also

Layers are discussed in Chapter 6.

PSD

PSD is Photoshop's proprietary default file format (and stands for Photoshop document). It supports more Photoshop features than TIFF. One advantage of working with PSD is that Adobe products such as Illustrator can open PSD files and access all the saved features. This makes life easier for people who move among Adobe software applications.

Another advantage to using PSD is that all layer information is preserved and stored. When the image is opened, it goes to the state that it was in when it was last saved. All the layers are there, and the last active layer is still active. When you work extensively with layers, saving them becomes important.

Output file formats

After you have done all the editing work, you need to generate some kind of file for output. This output often takes the form of a slide show, a print, or display on the Web. The JPEG file format is the most common file type for these uses. In fact, when it's time to have prints made, you'll find that most photolabs only accept JPEG files because the compressed files take up less room on their servers and move through their workflow faster. To create these output files, you'll need to save a version of your editing files as JPEGs using Photoshop's Save As command.

note

If you print with an inkjet printer, you can print from any of the editing file formats.

Sometimes a TIFF is preferred when a file is being prepared for publication. This is because the publication workflow takes place in a CMYK (cyan, magenta, yellow, and black) color space, which cannot be used with the JPEG file format. When saving a layered TIFF file for this use, be sure to flatten it (Layer → Flatten Image) unless you have specific instructions from the graphic artist handling the project. Otherwise, she may not be able to see all layers of the image in her layout software.

Organizing Different Kinds of Files

When you first get interested in digital imaging, you may not realize just how quickly the digital dream can become an organizational nightmare. In the days of shooting film, organization was just as important, but with digital photography, organization is more complicated for a couple of reasons. For one thing, if you aren't careful, the place where image files are stored isn't quite so intuitive. Sometimes, files end up in cryptic

places requiring three software engineers to find them. For another, working with digital images tends to create lots and lots of derivative files, as well as output files, from some original files. When so many similar yet different files are created, organization takes on a whole new meaning. If all of these files are stored in the same folder it becomes difficult to identify a particular version of the image.

Considering the non-destructive workflow

Earlier I mentioned that layers are used to keep your editing options open. This is the first step in creating a non-destructive workflow. The idea behind a non-destructive workflow is to keep your options open at all times so that it's easy to change individual elements of the editing process. Another way to limit the destructiveness of image editing is to avoid cropping and image-size adjustments in Photoshop whenever possible. If you make these changes and close the file, they become permanent.

The problem with this is that you need to flatten and crop files at some point. You usually do this when you're giving someone else a copy of the file, taking it to a lab to be printed, or uploading it to a Web site. To solve this problem in a non-destructive way, you save two separate files: an editing file (PSD) that retains all the flexibility possible in a PSD, and an output file (JPEG or TIFF) that has been sized, cropped, prepared for output, and flattened. Often, you'll prepare multiple output files from the same original image for different uses. These versions begin to add up, creating a level of complexity that was never a problem when shooting film.

Three kinds of workflow files

When creating a non-destructive workflow it becomes necessary to organize three different kinds of files: originals files from the camera, edited master file that contain as much information as possible (usually in layers), and final files for printing or display. Both a master file and any related final files are derivatives of the same original file. Look more closely at these three kinds of workflow files:

- **Original files.** These are the capture files from your camera that should never be overwritten. Original files need to remain pristine so you can go back to them when necessary — for example, when you learn a new technique.
- **Master files.** These editing files contain all the flexibility and options that are built into the file as it's edited in Photoshop. These files are almost always saved as PSD files, though they can be saved as layered TIFF files.
- **Final files.** These output files have been prepared for some final usage, such as for print, Web, or e-mail. They have been cropped and sized to a final size and sharpened for output.

When all these different files from the same image are stored in the same place, they become difficult to manage. They all look similar in Bridge, (Photoshop's file browser), so you spend time sorting through them. To minimize confusion, these three file types need to be organized in two ways: They need to have unique names based on the original file's name, and they need to be in special folders.

see also

Bridge is discussed in detail in Chapter 2.

Creating a virtual filing cabinet

Imagine a filing cabinet for a moment. Your filing cabinet has three drawers. Each of those drawers is used to store folders that contain specific information. Sometimes a folder contains subfolders inside of it. If you think about it, this is much the same way filing occurs on a computer. Images are placed inside of folders and those folders are often placed inside of larger folders.

Figure 1.5 shows a typical filing strategy with the following file path: Photos → 2008 → Alice → individual files of Alice. The folder named Photos (in the first column) is my filing cabinet. It has three drawers named 2006, 2007, and 2008. Each of those drawers has a bunch of folders in it. The third column shows the folders inside of the 2008 drawer. The last column shows the individual images inside of the folder named Alice.

The previous example uses three levels of organization:

- **One main folder contains all images in subfolders.** This is incredibly useful when it comes to backing up photos because only one folder — with its subfolders — needs to be backed up.
- **Subfolders are created for each individual year.** This level of organization prevents you from having to sort through folders from previous years unless you want to.
- **Shoot/job folders are used to hold the files from an individual photo shoot.** This folder is often divided into subfolders containing different kinds of non-destructive workflow files: original, master, and final files.

Creating a filing system like this is the first step to becoming organized. The next step is to begin using a folder and file naming system that complements the kind of photography you do.

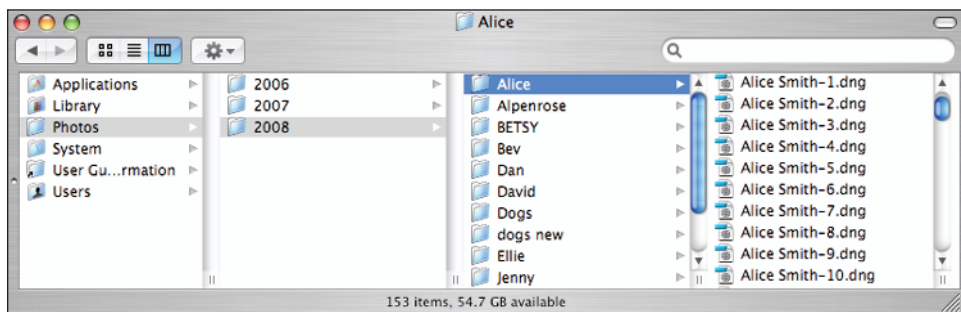
Naming your folders and files

When it comes to naming folders — and the files stored inside them — there are two predominant lines of thought. One is to name folders with pertinent dates and the other is to use descriptive names that describe the photos in the folder. Take a look at both of these strategies to determine which is best for you.

Using dates to name folders

Some photographers prefer to name all shoot/job folders with the date they were shot, or in some cases uploaded. That way every folder is listed in chronological order. The key to using this naming strategy is to use the right date format so that folders are sorted in the correct order. The preferred method is Year_Month_Day. This way every file is sorted in the correct order, beginning with the year, then the month, then the day. Some people like to make life easier by adding a descriptive name to the end of the date. For example, if I shoot some photos at the Oregon coast, I name my folder 2008_08_21_Oregon_Coast.

Figure 1.5



note

I use an underscore (`_`), (`Shift+←`) to separate the numbers in the dates. This is better than leaving a space, especially when you plan to upload photos to the Web because most Web servers replace a space with `%20`. Some won't even accept files with a space in the name. You can also use a hyphen (`-`) or you can run the numbers together.

One of the main drawbacks to using this Year_Month_Day system is that it tends to spread out similar images too much. In its purest form, all photos are placed into dated folders that represent the day they were created. If I take a trip to Europe for two weeks and then download all my photos using the date naming system, I end up with a folder for every day. If I took pictures every day, then my vacation photos would be spread out into 14 folders. I prefer to see them all together. A better way to use this system in this case is to create a main folder with a general date — such as the date the files were uploaded — and then add all files to this one folder instead of placing them into individual daily folders.

caution

Mac users can use a slash (`/`) in a folder name instead of a hyphen. However, Windows users may not be able to see the folder because `/` is an illegal character in a Windows environment. Web servers may also have a problem with the character, therefore it's best to not use this character in your naming strategy.

Naming folders with descriptive names

Another strategy is to use a descriptive name to identify a shoot. With this strategy, the folder from my coast trip is named `Oregon_Coast_08`. If I took more than one trip to the coast in 2008, I would add the month after the year. An

advantage to this strategy is that folder names have a more descriptive name. Another advantage is that all photos from the shoot are automatically located in one main folder.

The main disadvantage is that folders are sorted alphabetically by your system, instead of chronologically. If that's important to you, then this system may not be the best choice. Another disadvantage is that a single descriptive name doesn't always describe everything in the folder. This happens when you allow lots of images to collect on your camera's media card before uploading them. One way to solve this is to do multiple uploads from the camera's card — placing groups of images into individual folders with descriptive names. A better way to solve this is to regularly upload your photos so they don't accumulate on the card.

Choosing a folder naming strategy

I know photographers who use both the date and descriptive systems to file images. The people who tend to use the date system are photographers who shoot lots of images, such as commercial and stock shooters. They also tend to be photographers who are highly organized because they often have to locate stored files over long periods of time. The photographers who tend to use the descriptive name method are mostly portrait and wedding photographers who are more oriented to locating jobs by the client's name.

Some photographers don't fall squarely into either of these camps. They tend to use a blend of the two naming systems. If the images in the folder can be categorized with a descriptive name — such as `Hawaii 08`, or `Jones Wedding` — then they use a name. When the images don't have a predominant theme, they use a general date for the name and then use keywords to identify the individual images.

No matter which system you choose, make sure that you're consistent in the way you use it.

note

A keyword is a descriptive term that you attach to a photo file to describe something about it. For example, if I go to the coast I might use keywords such as beach, seagull, tide pool, and ocean to identify the contents of various photos. Later, if I search for the keyword seagulls, all photos with the seagull keyword attached to them will be found. You learn how to do this with Bridge in Chapter 2.

Naming original files

Digital cameras automatically create filenames for every photo you shoot. Sometimes those names are quite cryptic. Filenames like those shown in Figure 1.6 don't tell me much about the photos they represent, even if I understand why the camera created that name in the first place. That's why I always like to change these names to descriptive names that tell me something about the image when naming original files. This is usually done as the original files are transferred from the camera's media card to the computer, as discussed in Chapter 3. I might use something like Jane_Doe_123 instead of the name created by the camera because it makes more sense on a couple of levels. First, if I ever need to find Jane's photos using the photo's names, I can do a system search with my computer's operating system for Jane_Doe. Without a descriptive name, this becomes impossible.

The second reason a descriptive filename makes sense is that eventually derivative files for editing and output will be created from some of the originals. It's easier to keep those files organized when you begin with a meaningful name. For example, suppose the original file is named Z0A6337.cr2 because that's what the camera automatically named it, the master file is named sarah_jones123.psd, and the final file for 8 × 10 printing is named girl_in_boat.jpg. This causes problems in two ways. First, if the files are all in the same folder and they're being sorted

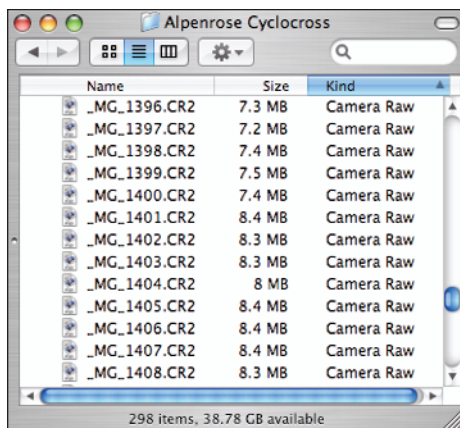


Figure 1.6

alphabetically, they're scattered all over the place among the other files. Second, if you learn some new tricks next year and decide to redo the girl_in_boat.jpg image, you may have trouble remembering from which original file it's derived.

I solve this problem by naming the original file as soon as it's copied from the media card to the computer. Then any new derivative file uses that name as a base. In the previous example, the original file becomes sarah_jones123.cr2, the master file becomes sarah_jones123_edited.psd, and the final file becomes sarah_jones123_8x10.jpg. This way, I know exactly what kind of file I'm looking at just by looking at the name. In the case of sarah_jones123_8x10.jpg I even know that it's been prepared for an 8 × 10 print.

After you establish a naming methodology, you must address the second level of file organization: filing different kinds of workflow files into the appropriate folders. Figure 1.7 shows how I organize my file folders. When I begin a new project, I create a folder for it. In this case, the parent folder is titled Sarah Jones. I create three subfolders inside of the Sarah Jones folder: Originals, Masters, and Finals. (You can also place the originals directly into the parent folder, eliminating the need for the Originals folder.)

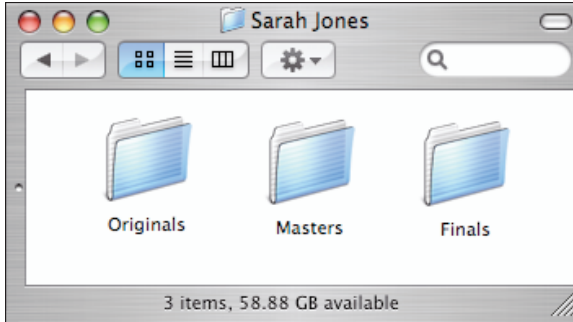


Figure 1.7

My goal with this organizational system is to make it so intuitive that I know where everything is without looking. Even though I never do it, I want to be able to call my assistant back at my office and ask her to send a particular file to me if I need it. I can do that because I know exactly where the file should be, and so does she.

Your system doesn't have to look exactly like mine. If necessary, create something that makes more sense to you because you're the one who needs to understand it. The thing that's most important here is to get a system in place and begin using it now.

Backing Up and Archiving

Why organize all your photos if you don't take the time to back up all your work? Digital photography offers all kinds of creative opportunities that have changed the way photographers work with images. Unlike film, though, digital files can disappear in an instant when a hard drive crashes. If proper archiving measures aren't used, a bad hard drive crash can be catastrophic. The following sections explore some archiving options and strategies.

Hard drives

One of the easiest ways to create a backup is with a separate hard drive that backs up all image files. In its more sophisticated form, this is often an array of multiple hard drives that are set up to act as one. This kind of array is called a RAID (Redundant Array of Independent Disks). Several different schemes are used to protect file integrity on a RAID. Here are the two main ones:

- **Mirroring.** (Sometimes referred to as RAID1) Identical data is written to more than one disk. If a disk in this array crashes, identical data is recovered from the mirrored disk.
- **Striping.** (Sometimes referred to as RAID0) Information is spread out across multiple disks. This greatly enhances performance because several disks are doing the job of one disk when reading and writing. However, unless some form of redundancy is built into the system, there is no data protection as in mirroring. Setting up some form of redundancy allows for striped data to be recovered after a crash. One method of doing this is to have software that can reconstruct missing data from a crashed hard drive by analyzing data that wasn't lost on the other hard drives.

All the workings inside a RAID, mirroring and striping, happen in the background. The best part is that it happens automatically. The RAID just looks like a big hard drive to the computer's operating system. After a RAID is set up, it does its job whether you think about it or not. With the low cost of hard drives today, a RAID is a great option if you're dealing with lots of files.

A less sophisticated, yet equally effective hard drive solution is to have a secondary hard drive that's used for storing backup copies. These backups can be created automatically with specially designed software, or they can be created manually by dragging and dropping files. Of these two schemes, the automatic solution is by far the best. With backup software like ChronoSync by Econ Technologies (for Mac) and Microsoft Sync Toy (for Windows), multiple auto-backup scenarios are easy to set up so that you never have to think about them again.

tip

I solved my crashing hard drive problem by purchasing an uninterruptable power supply (UPS). A UPS is little more than big battery that you plug your computer into. If the power goes out unexpectedly, the UPS kicks in, giving you time to close important files and shut down your computer. Most UPS units also do something else: they clean up the incoming power so it's more stable. That's what solved my crashing problem.

Hard drive storage is a great solution for storing backup files, but this also can lead to a false sense of security. A few years ago, shortly after relocating my office, I had three hard drives crash within months of each other. They were all from different manufactures, and they weren't in a RAID. One of those drives was my main drive that had lots of data files on it. One of the other

drives was a backup drive of that same data. Unfortunately, I hadn't taken the time to restore all the backed-up data, so when the second drive crashed everything was gone.

A more extreme nightmare scenario with hard drives is fire and theft. Either of these events can wipe out years of work. You have to think about all these possibilities when you consider the storage of image files. I know several photographers who locate a backup drive or RAID in a hidden portion of their home or office in case of theft. With some of the wireless hard drive solutions appearing today, this is an even more viable option. In the case of fire, the best protection is to have a backup of important data that's stored off-site.

tip

Many photographers are beginning to use online storage options for backing up image files. This can be a great solution, too. But if you use online storage, make sure it's not your only backup. You want to make sure your data is still there when you need it. As you may recall, a few years ago when the economy took a dive many Internet companies disappeared overnight without any warning.

CDs and DVDs

Another system for backing up and archiving images is using CDs and DVDs. CDs and DVDs are cheap, and almost any computer can read them. If handled properly, they faithfully preserve data for many years.

CDs and DVDs are not as easy and seamless as using a hard drive, and they don't offer quick access to data. In my mind, they're best used as an adjunct to a hard drive backup — more of an archive that can be pulled out anytime a file needs to be resurrected. In a well-designed workflow, they should be used at two different times:

- **As soon as you finish transferring, sorting, and renaming a new job or project burn a CD (or DVD if necessary) of all original files and store it in a safe place.** In the case of a professional photographer, that would be in the job or client's folder.
- **After all work for the job or project is done, burn a DVD(s) of all related folders — originals, masters, and finals folders.** File this DVD with the first CD/DVD backup you created. If the job or project is important, burn a second copy and store it off-site. Now everything is completely covered. You will probably never need these discs, but it's comforting to know that they are there in case you do. If the job or project is a big one that takes lots of time, then intermediate DVD backups are a good idea. You can use rerecordable media for this.

note

A debate is currently raging concerning the longevity of CDs and DVDs. Some people say that they can't be trusted, while others say they'll last 100 years. In my own experience, I've seen more hard drives fail than CDs or DVDs. However, some photographers recopy their CD/DVD archives every few years to ensure longevity.

When working with plastic discs, you need to observe some basic ground rules regarding handling. They scratch easily when dragged across rough surfaces, so they should be in some sort of acid-free sleeve at all times. It's important to use acid-free sleeves because acids in other types of plastic or paper sleeve can deteriorate the plastic that the discs are composed of. Keep these additional things in mind when working with CDs and DVDs:

- **Try to avoid writing on the top surface.** These discs are read by a laser beam that shines up from the bottom through the lower layers of plastic, reflects off the shiny layer on top, and bounces back down. If anything is done to degrade the reflective nature of the surface on the top of the disc, the laser won't be able to read it. Sometimes the acid in a pen's ink can destroy the shiny layer on top.

If you have to write on a disc, try to do it on the inner circle where the plastic is clear. Another option is to purchase printable CDs and DVDs. These are designed to be printed on with an inkjet printer, so they have a more durable surface that you can write on.
- **Only use labels that are approved for CDs and DVDs.** These use adhesives that are acid-free. You really don't know what kind of adhesive is used on a standard mailing label. Besides the adhesive issue, mailing labels can cause a different set of problems. A couple of years ago, a client dropped off a CD with files he wanted me to work on. He labeled the CD with three small, rectangular mailing labels. Each label had a different set of information. I was unable to read this disc on any of my systems because when it was spinning at 10,000 RPM in the disc drive, the labels threw it out of balance.
- **Store disks in proper, acid-free sleeves or envelopes.** Keep them out of the sun, preferably in the dark. Store them lying flat if possible, rather than upright.

In a perfect world, hard drives and CDs/DVDs are used together with the hard drive acting as an up-to-date backup that can be easily accessed and the plastic discs acting as long-term storage. You don't need a sophisticated backup and archiving system, but you do need a system. Working without one is like a trapeze artist working without a net. When things come crashing down, it can be a real showstopper.