



PHOTOS COURTESY OF WAYNE PALMER

When a digital camera records an image as a JPEG file, left, it discards information, which can lead to loss of detail in especially bright or dark areas. Saving in "raw" format makes all the information initially captured available in the image file. Note, for example, the edge of the shed, which is lost in the left version but remains defined in the right.

## Losing color data? Start saving in the RAW

If your digital camera records shots as JPEGs, you may be losing a lot of color information without realizing it.

That's because the JPEG file format is limited to 8-bit color. That simply means that the amount of information recorded is limited to eight bits per channel.

There are three channels in a color image, so you may also hear this referred to as 24-bit color (8 x 3). Remember, digital cameras only understand numbers, 0's and 1's, just like computers.

With 8-bit color, 2 to the eighth power, you have 256 possibilities of brightness for each pixel in each color channel. Multiply this times three and you have over 16 million possibilities.

This may sound like more than enough color options, but many digital cameras can actually record 12 or 14 bits of information, taking the number of brightness possibilities for each pixel to 4,096. As you can imagine, this is a significant increase.

Unfortunately, in the complex process of saving the image as a JPEG file, many cameras throw away this extra information.

Some of that information loss may reduce exposure details, causing shadow areas to turn solid black and bright areas to become pure white.

However, over the last few years, a number of manufacturers have produced cameras that can save that extra information in a file format called Camera Raw.

Shooting in Camera Raw passes along to the camera storage card whatever the camera's sensor saw. There is no internal processing, no demosaicing, no color balance and no sharpening.

You can't open a Camera Raw file with just any photo-editing program. You need to use either the program that came with the camera, or a third-party program specifically written to read Camera Raw.

With the program, you're making the adjustments to an



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### Bits & BYTES

unprocessed file instead of the camera.

The advantage is you are not counteracting something the camera has already applied to the file.

For example, in a winter photo with a lot of snow, a processed file might turn the snow to pure white not showing any details. In a Camera Raw file, you would be able to process the file to bring out the subtle details of the snowy scene.

If all this sounds intriguing and you are ready to try out this format, assuming your camera offers Camera Raw as an option, be aware there are a few trade-offs.

The file sizes recorded are much larger than JPEG files and will fill your camera's storage card much more quickly. In fact the file size will be, at minimum, the size of the camera's sensor. An 8-mega-pixel camera will produce an 8-megabyte file. Many cameras offer the option of recording both Camera Raw and JPEG.

This is a great option, as JPEG may suffice for many shots, and you then have the option of Camera Raw if the JPEG file is unsatisfactory.

Proprietary file formats are another drawback of Camera Raw. Nikon and Canon raw files are different, and even the files created by different models of camera within the same company may be different.

Adobe, the largest producer of graphics software, foresaw this as a problem with the files becoming unreadable over the years, and created its own format called DNG. A free program download from the company enables the photographer to convert their proprietary

file formats into the DNG format, which Adobe claims they will support indefinitely.

With Camera Raw you personally are making decisions on how each file should be processed, rather than having the camera automatically make those decisions.

This increases the time you sit at the computer. Some software allows you to batch process files eliminating the need to address each image individually. One advantage of all this additional processing time is that after the file is processed, it creates a new file,

leaving your Camera Raw file just as it was, just like a negative.

Using Camera Raw may require you to use the software that came with your camera just to view the images. Fortunately, Windows XP now supports Camera Raw with a free download from Microsoft.

It does not let you adjust the images, but it allows you to view them in Explorer without opening a specific editing

program, which can be a tremendous help if you need to sort through a large number of images.

Camera Raw is still a relatively new file format, but has quickly gained ground among amateur and professional photographers alike. Most see the downside of more computer time and more storage space as a minor inconvenience compared to the flexible results that can be achieved from this "digital negative."

### Film images, digital images and the importance of 'latitude'

Back in the days before digital, one of the first decisions that faced the photographer was what type of film to use.

"Purists" often chose slide film because basically what you saw is what you got, unlike negative film, whose prints were subject to interpretation from the film lab.

Photographers who used colored filters or intentionally underexposed or overexposed the film would find their images "corrected" by the well-meaning lab. Slides, by contrast, were just the developed film placed in mounts.

Both slide and negative films were generally balanced for the lighting conditions experienced in broad daylight or with the use of a flash.

Other lighting conditions, like early morning, late afternoon, artificial lighting

added a color cast to the image. With film, you either selected a different type of film or added a color correction filter to your lens to correct for the color cast.

With digital, you just choose the proper lighting set-up in the camera's white balance settings.

One of the primary differences that separated negative film from slide film was the accuracy in exposure.

With slide film, the exposure had to be fairly precise or the image simply was not very good. With negative film, the exposure only had to be in the ballpark and you would have a usable picture.

That is one of the reasons why negative film was so much more popular than slide film. That is also why single-use cameras were and are successful.

These inexpensive cameras have no control over exposure and bank on the film's ability to produce a usable image even when overexposed or underexposed, a term referred to as "latitude."

The tight exposure requirement for slide film exposure parallels the correct exposure needed for digital cameras when recording in 8-bit color files such as JPEGs. In both cases, overly casual exposure settings can result in "blown-out" whites and all-black darks.

Camera RAW files, like negative film, have more latitude in them, giving users a better chance of capturing subtle details through the complete tonal range of the image.

— Wayne Palmer

## Survey: At work, Internet surfing even beats coffee

By ANICK JESDANUN  
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NEW YORK — It should come as no surprise that most Americans with Internet access at work do some personal Web surfing on the job. A new survey finds that half of them would rather give up their morning coffee than forgo that ability.

Maps, news and weather are the chief nonwork-related sites visited.

A quarter of employees watch or listen to streaming media at least once a week from work, and 18 percent have downloaded and stored nonwork music, photos and video clips, according to a telephone-based survey sponsored by Websense Inc., which makes software that helps companies filter and monitor Internet use.

Many companies have Internet policies that ban pornography but allow reasonable personal Internet use, such as e-mailing a doctor to schedule an appointment or buying a gift during a lunch break.

According to the survey, 61 percent of employees with Internet access have spent at least some time accessing personal sites. The average is 3.1 hours a week, compared with 12.8 hours for work-related surfing.

The survey of 500 employees was conducted March 12 to April 4 by Harris Interactive. The random sample was limited to adults who work at a company with at least 100 employees and who have Internet access on the job.

The survey has a margin of sampling error of plus or minus 4 percentage points.