A DIGITAL PRIMER:

Maximizing Power, Image Quality and Storage On Your Digital Camera

By Kathy Eyster

Digital cameras have swept the consumer photographic market place. As alluring as their small size and LCD screens are for instant feedback, however, many people are often frustrated with the performance and pictures they're getting from these cameras.

How you plan to use the photographs you capture determines the megapixel requirements of your digital camera. To make excellent 8x10 inch (or larger) prints of your images on your own photo inkjet printer, you need a camera with at least *4 megapixels* and the ability to save files in *TIFF or RAW format* in addition to *JPEG*. Select a model that has an o*ptical or electronic viewfinder,* not just the LCD monitor, for framing your shots. In bright light information on LCD monitors can be next to impossible to see.

The next decision is whether you want to use interchangeable lenses or are willing to use a fixed zoom lens. If you choose a camera with a fixed zoom, evaluate the model's *optical zoom* range and disregard any references to digital or combined zoom. The lenses themselves are very short, so zoom ranges are listed as 35mm equivalent focal lengths, e.g. "7–21mm f2–2.8 lens, 38–115 35mm equivalent." Because most digital sensors are smaller than a 35mm film frame, some digital cameras are limited in their ability to capture a wide-angle view; however, they do provide an extended telephoto capability.

Another consideration is the *range of shutter speeds and f-stops* a camera with a fixed zoom lens provides. Some models advertise manual exposure but actually have very limited choices of aperture or shutter speed. Also check for a selection of *manual ISO settings*. Higher speeds (the digital equivalent of fast film) are useful if you often shoot under low light conditions, but picture quality is generally less than with slower speeds. A *noise reduction system,* either automatic or manual, for high ISO settings and/or long exposures helps improve quality in these cases. And a *manual or custom white balance* setting (the digital counterpart of color correction filters and film light balance) lets you adjust for the color of lighting.

Digital cameras (particularly compact models) have a noticeable shutter lag compared to film cameras. So if sports are your subject matter, look for a *burst mode or continuous frame advance* feature and check the maximum number of frames per second. Finally, digital cameras that associate the most common controls (exposure compensation, flash, white balance, resolution, ISO) with *buttons* on the camera body are faster and easier to use than those requiring you to navigate menus to change settings. Beyond these digital characteristics, look for the same features that are important to you in a film camera.

Once you own a digital camera, you will notice it consumes alkaline batteries at an alarming rate because it relies on electrical power for every aspect of picture taking. Capturing the image on the camera's sensor, converting that image to data and saving it to a memory card are all functions powered by batteries along with focus, exposure, flash and zooming the lens. Given all the operations drawing battery power, it's no wonder single-use cells often fail in a few hours.

To keep your digital camera going as long as you want to take pictures, first invest in at least two sets of rechargeable batteries (three is ideal) and a rapid charger. This way you have one set in the camera and a spare set in your camera bag. If you have a third set, they can be charging while you're shooting. Many camera models accept Nickel Metal Hydride (NiMH) AA cells. Other cameras require a proprietary battery made by the camera manufacturer. Check your camera's manual for the appropriate type. If you use NiMH AA batteries, be sure to keep the sets together and avoid carrying them loose in your pocket or camera bag. If the contacts touch, the batteries discharge and you can end up with a dead set of spares.

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Look for a charger that can fully charge a set in less than eight hours. That ensures your batteries can be fully charged overnight. A charger that first drains the batteries and then charges is also preferable, though NiMH batteries are much less prone to developing a "memory" of a partial charge than their NiCd cousins. If the charger has an optional adapter that works in your car's cigarette lighter, it can be convenient for charging batteries on the road.

Now that you have plenty of initial power, it's time to maximize the power efficiency of your camera. The biggest drain on your batteries is that alluring LCD monitor, so turn the monitor off except when you want to check your photos. Also turn off the image review feature that briefly displays the last shot you took. You can always switch the camera to playback to look at your images. The second big drain on your power resources is the flash. Turn the flash off and turn it on only when you want to use it.

Nearly all digital cameras come with a "sleep" mode that powers down the camera after a specified time of inactivity. This feature is designed to prolong your battery life, so set it to one minute or the shortest amount of time that fits your shooting style. You can further extend your battery power by using an AC adapter when shooting indoors or reviewing images, by setting a manual focus distance (infinity works well) to keep the camera from draining batteries while seeking a focus point, and by limiting the amount of zooming you do with the lens. You may not need to implement all these suggestions all the time. But knowing ways to conserve power can help you eke out the last bit of juice when even your spare batteries are on their last legs.

With enough power for your day of shooting, capturing the best quality image possible is your next step. Because it's easier to reduce a digital photo to a smaller size and retain quality than it is to enlarge one, set your camera for the largest pixel dimensions (highest resolution) and the best quality (least compression). Choosing the largest dimensions (e.g., 2560x1920) means you are using all the sensor's light-capturing ability. The best quality setting is always TIFF or RAW because these file formats are uncompressed and save all the data the sensor captures. However, some cameras don't have this option. In that case, use the highest quality JPEG format. It uses the least amount of compression and therefore discards the least amount of original information.

There are additional steps you can take to ensure you are creating the best quality photo your camera can capture. Begin by turning off digital zoom. When you activate digital zoom, the camera doesn't actually make the subject larger. Instead it crops and enlarges the central portion of the image on the sensor. Usually you can do a better job of enlarging a portion of your original photograph using your computer software. Second, manually select the lowest ISO setting instead of leaving it on automatic. Lower ISO settings reduce the amount of noise (unwanted multi-colored specks in the deep shadows) in your photo just as using a slow film reduces grain. If you are shooting in very low light and need long exposures or a higher ISO just to get the picture, turn on your camera's noise reduction setting if one is available. This invokes additional processing to help reduce noise in exposures of one-half second or more.

An unwanted color cast in a photograph is nearly impossible to correct completely. As a result, it can permanently affect the quality of your picture. So select an accurate white balance setting for the lighting conditions. For best results under artificial light sources, use your camera's custom white balance to take a measurement from a white sheet of paper of the light striking your subject. Finally, avoid changing the original sharpening, contrast or saturation settings in the camera, including shooting for a black and white original. Your computer's software gives you more control (hence better results) over adjusting these characteristics and changing color images into black and white. With your camera you never know what degree or level of increase is applied.

Now that you're prepared to capture your photographs with the highest possible quality, you need sufficient space to save them on your camera's memory cards. The larger the image size (higher resolution) and the better the quality (least compression), the bigger the file your camera creates. The greater the megapixel capability of your camera, the larger the pictures you can create and the more storage you need. (To estimate your camera's largest file size, multiply the number of megapixels by three to get the number of megabytes. For example, a 4-megapixel camera can produce a 12mb file.) This makes high capacity memory cards a necessity.

Ideally you want at least two cards of the largest capacity you can afford (128mb or 256mb cards are good values for the money). Memory cards are small, easy to carry, and reusable. Having multiple cards insures you won't lose all your pictures if one of the cards should fail. Some cameras can use microdrives, tiny hard disks just like those in your desktop computer. Because microdrives contain moving parts, they potentially aren't as sturdy as solid-state cards such as CompactFlash, SmartMedia, Memory Stick, or Secure Digital. Microdrives also require more power to save images, so some cameras can use them only with a battery pack.

Even with a couple large capacity cards, you may run out of space before you're finished shooting. In that case, it's helpful to have some larger capacity storage to which to transfer the images. Several manufacturers make "digital wallets" or portable hard disks. You insert your memory card, copy the photos from the card to the wallet, return the card to your camera, and erase the old images. Now you have room for more pictures. Once you return home or to your hotel room, the wallet plugs into your desktop or laptop computer and acts like another hard disk with images on it. You can choose to transfer these to the computer and write them to a CD or simply save them for editing.

Another option is to take along a laptop computer for transferring images from full memory cards. With a memory card reader or a PCMCIA slot or floppy disk adapter, you can easily transfer your pictures from the memory card to the computer. Besides storing your pictures and giving you the capability to burn a CD for your archives, the computer screen gives you a larger image to review and lets you actually edit images when conditions aren't favorable for shooting.

So now you're prepared to make the most of your digital camera images. You have plenty of power from rechargeable batteries. You have several memory cards to fill with photographs of the highest size and quality your camera can record. And you have some high capacity storage for downloading your pictures so you can reuse the memory cards you have. As with all good camera technique, don't forget a tripod and a cable release or self-timer for the sharpest shots. ■

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