



# Print Tips

SHREVE PRINTING • 390 East Wood Street, Shreve, OH 44676 • 330-567-2341 • 1-800-821-0456

## Digital Camera: Why RAW Beats JPG!

**WE RECOMMEND YOU SAVE** your digital photography images in 16-BIT uncompressed RAW format, **if your camera supports it**. RAW is just as it sounds: The data captured by the camera's light sensor. Instead of locking in the interpretation when the picture is shot, you have the flexibility to choose exposure settings from your computer, after the fact. The four reasons to use Camera RAW format over the JPG format: Image Detail, Smoother Tones, Better Color, and More Flexibility.

**IMAGE DETAIL.** Jpeg is a format that uses lossy compression techniques to reduce file size. With lossy compression, subtle shifts in tone and color are lost so that blocks of image pixels can be described using less data. This may be unnoticeable in a low-resolution web image, but quite apparent in print.

**SMOOTHER TONES.** Grayscale refers to the number of shades available to describe the tonal range of a given color. For each color in an eight-bit image (red, green and blue for an RGB image; cyan, magenta, yellow and black for a CMYK image), there are 256 levels available. Why? Think of each bit as flip of a penny. How many possible outcomes are there? Flip it once: two; twice: four; eight flips? There's 256. 16 flips? 65,536!

256 levels are barely enough tones to make the step from one to the next smooth. Reduce that number even just a little, and you notice an abrupt shift, a situation known as banding. Unfortunately, most image adjustments reduce the number of tones (Levels dialog box looks like a comb rather than smooth curve). With 65,536 levels of tone, you have more than the human eye can notice. While a color correction still compresses the tonal range, the steps are so small, it is not noticeable.

**BETTER COLOR.** Better color is a function of the first two issues. The full range of data captured by the camera is saved with RAW, but not with JPG. Also, with more tones to describe each 16-bit color, there is a dizzying increase in the combinations of tones to describe the overall color.

**MORE FLEXIBILITY.** With Photoshop CS, you can change a number of exposure settings (white balance, sharpness, the ambient light conditions) from a special dialog box that appears when you open a RAW image. It has dozens of image settings that can be applied to pictures you have already taken. If you make the first round of color adjustments here, you can do so without experiencing any tone clipping, and gives you the flexibility to evaluate the "right" setting from your computer, instead of in real-time as you take the picture. It's just easier to get it right.



**16-bit RAW format is the uncompressed image data measured by the camera's CCD. Notice the detail in the tire, and the smooth transitions in the paint. The detail results from the increased gray levels per color: 256 levels per channel for 8-bit JPEG vs. 65,536 for 16-bit RAW.**

## WHEN SHOULD I CONVERT TO CMYK?

During the creative process, you should only convert to 8-bit if you need to take advantage of an image editing feature that requires it.

Even so, on a color-critical image you should perform all of your color correction and proofing adjustments (levels and curves, for example), as well as proof your image, before conversion. If you don't need to apply a specialty filter, leave your images as 16-bit RGB until you are ready to print a proof or release your project.

You can convert to CMYK while still in 16-bit, and then convert to 8-bit CMYK for placement in your layout. Save your files as TIFFs, unless you've added type or silhouettes in Photoshop, in which case you should choose EPS as your final image format.

- ! 16-bit-compatible features with Photoshop. You can expect future versions of Photoshop to increase the feature compatibility with the 16-bit camera RAW.
- A good example is the excellent new camera RAW import image dialog in Photoshop CS. That said, expect the artistic, distortion and rendering filters to be compatible with only 8-bit images.

## WHAT TOOLS WORK WITH 16-BIT?

Many Photoshop features and filters only work on 8-bit-per-channel images, which may require you to convert from your 16-bit original sooner.

### COPY/EDIT

Canvas Size  
Clone Stamp  
Crop  
Duplicate  
Healing Brush  
History Brush  
Image Size  
Slice  
Patch  
Path Tools  
Pen

### SELECTION

Feather  
Hand  
Inverse  
Lasso  
Marquee  
Modify  
Rotate Canvas  
Transform  
Selection  
Measure  
Zoom

### COLOR

Auto Levels  
Auto Contrast  
Auto Color  
Channel Mixer  
Color Balance  
Color Sampler  
Contrast  
Curves  
Equalize  
Eyedropper  
Gradient Map  
Histogram  
Hue Saturation  
and Brightness  
Invert  
Levels

# Digital Camera Reference Guide

## REVIEWS AND RESOURCES

There are a number of informative web sites, books, and magazines that can help you make a good decision when you are ready to buy. Each is updated frequently, which is critical given the pace of change in the digital camera industry.

### ON-LINE

WWW.DPREVIEW.COM is by far the most informative and comprehensive site on digital cameras, with in-depth reviews of most camera models by a very experienced photographer. Bookmark this one site if no where else.

*Toys photographed with a Canon G2 digital camera with the optional macro (close-up) lens attached.*



WWW.AMAZON.COM. You can't beat the selection.

WWW.MYSIMON.COM is a great place to search for the best available price. Be careful though, read the small print for shipping, make sure the camera isn't "gray market" from offshore it voids the warranty.

### NEWS STAND

*DIGITAL PHOTO*, on the web at [www.pcphotomag.com](http://www.pcphotomag.com)

*DIGITAL PHOTOGRAPHY MADE EASY* is one of several outstanding publications from the U.K. You can find it and others at larger bookstores and news stands.

### BOOK STORE

There are hundreds of books on photography and easily dozens on digital photography. Two that we have found useful are on filters and their use.

*HOW TO DO EVERYTHING WITH YOUR DIGITAL CAMERA*, by Dave Johnson.

*THE PHOTOGRAPHER'S GUIDE TO FILTERS*, by Lee.

*USING FILTERS*, published by Kodak Books.

## LIGHTING

**ACETATE.** Clear plastic-like sheet often color tinted and fitted over studio lights.

**AMBIENT LIGHT.** Natural, outdoor light.

**BARN DOORS.** Set of four flaps that fit over the front of a studio light to control the direction of the light.

**BOOM.** Long arm fitted with a counterweight which allows studio lights or reflectors to be positioned above the subject.

**CONTINUOUS LIGHTING.** Sources that provide steady illumination, in contrast to flash which fires briefly.

**DIFFUSER.** Any kind of accessory which softens the output from a light source.

**EFFECTS LIGHT.** Studio light used to illuminate a specific part of the subject.

**FILL LIGHT.** Studio light for reducing shadows.

**FLASH HEAD.** Studio lighting unit which emits a quick and powerful burst of light.

**KELVIN.** Scale used for measuring the color of light. Daylight and electronic flash is balanced to 5500K.

**KEY LIGHT.** The main lighting source.

**LIGHT METER.** A light-sensitive tool built into most digital cameras that determines the light level(s) of the image. A camera uses these readings to determine the exposure length.

**REFLECTOR.** Metal shade around a light source to control and direct it, or a white or silvered surface used to redirect it.

**RING FLASH.** Circular flash tube which fits around the lens and produces a characteristic shadowless lighting.

**SCRIM.** Any kind of material placed in front of a light to reduce its intensity.

**SNOOT.** Black tapered cone that concentrates light.

**SOFT BOX.** Popular lighting accessory that produces extremely soft light. Various sizes and shapes are available; the larger they are, the more diffuse the light.

**SPOT.** A directional light source.

**SWIMMING POOL.** Large soft box giving soft lighting.

**UMBRELLA.** Lighting accessory used to bounce a light source from and onto a subject. They come in a range of colors. The larger the umbrella, the softer the light.

## LENS

**APERTURE.** The circular area behind the lens that opens to allow light in and expose the film or digital CCD. Most cameras can vary the aperture's diameter to control the amount of light reaching the exposure plane.

**DEPTH OF FIELD.** The difference between the nearest and furthest in-focus objects. The smaller the aperture, the larger the  $f$ /stop value, and the more background will be in focus.

**F/STOP.** A measurement of the diameter of the aperture's opening during exposure. The lower the  $f$ /stop, the larger the aperture will open and the more light will be sent to the sensor. For example, if you set the aperture to  $f/2.8$ , it is larger than  $f/8$ .

**FILM SPEED/ISO.** The sensitivity of a given film to light, indicated by the ISO [International Standards Organization] number. The higher the number, the more sensitive or faster the film becomes. Some digital cameras have an ISO setting that emulates film ISO by varying the CCD's light sensitivity. The digital image can be made to appear like a print from film with the corresponding ISO level.

**FOCAL LENGTH.** The distance between the film and the optical center when the lens' focus is set to infinity.

**INFINITY.** The farthest-away position of focus.

**OPTICAL VS. DIGITAL ZOOM.** Optical zoom cameras rearrange and move internal lenses to achieve magnification. Digital zoom enlarges the image via pixel interpolation, like Photoshop, resulting in a lower-quality image. Because digital zoom doesn't generate any new image data, you don't see extra detail when compared to optical zoom.

**OVER- AND UNDEREXPOSURE.** Too much or too little light reaches the exposure plane. Overexposure results in a light image with lost highlight detail; underexposure results in a dark or muddy-looking image with lost shadow detail.

**SHUTTER SPEED.** The length of time the camera's aperture remains open during the exposure. The slower the shutter speed, the longer the exposure time.



## DIGITAL FILE

8-BIT VS. 16-BIT. The amount of data ( $2^8$  vs.  $2^{16}$ ) that can be used to describe the grayscale tone gradation for red, green or blue, for each pixel. An 8-bit image has 256 levels of tone description of each color for every pixel in the image.

CCD. [Charge Coupled Device] The light-sensitive instrument that records the image. Made up of thousands of pixel-sized sensors, each of which typically read only red, green or blue. The camera's "megabits" represent an approximate rounding of the size of the CCD array, which is determined by multiplying its horizontal pixel-sensors by its vertical ones. The camera we used is a 4-megabit camera, since its CCD measures 1,722 x 2,274 pixels, which totals roughly 4 million.

PIXEL. [Picture Element] The building blocks of a digital photo, and single unit of light capture.

RAW FORMAT. The uncompressed data as it comes from the CCD. This may contain additional detail that can improve image quality when compared to saving in the JPEG format.

RESOLUTION. The density of pixels per measurement unit, expressed as a number of horizontal pixels by a number of vertical pixels. "300 DPI" scans measure 300 horizontal x 300 vertical pixels for a total of 90,000 pixels per square inch.

**RESOLUTION** is a major factor in determining the quality of your photographs. As a general rule, images used for commercial printing require a resolution of at least 300 dpi when the image is at 100% of the size it will appear in the document. *If you are using a digital camera to take photographs, be sure to set the image capture at the highest resolution.* Be aware that this may limit the total number of photos you can take before changing the image storage card. Also, we recommend that you use a digital camera with a minimum of 2.2 megapixels of data capture.

## ••••• CHUCKLES •••••

### JOB FAIR

A jock and a geek were applying for the same job.

The boss said, "Boys, you need to take a test before you can get this job."

So they took the test and the next day they came back to see who the boss chose. "Well," he said, "Both of you got the same score except I'm going to choose the geek."

The jock complained, "Don't you think that's prejudice or something?"

"Well," the boss said, "Let me tell you what happened. Both of your papers were right all the way through until the last question came up, and the geek answered 'I don't know,' and then when I looked at your paper, you answered, 'Me either.'"

### BILL GATES AND GENERAL MOTORS

Bill Gates is hanging out with the chairman of General Motors.

"If automotive technology had kept pace with computer technology over the past few decades," boasts Gates, "you would now be driving a V-32 instead of a V-8, and it would have a top speed of 10,000 miles per hour. Or, you could have an economy car that weighs 30 pounds and gets a thousand miles to a gallon of gas. In either case, the sticker price of a new car would be less than \$50."

"Sure," says the GM chairman. "But would you really want to drive a car that crashes four times a day?"

## PRINT. IT WORKS.

There's nothing experimental about print. It just works.

Whether direct mail, branding materials, investor relations or your corporate identity, a well-printed piece makes you look your best. Give them something tangible to keep your message top-of-mind.

Need help? Call one of our Sales Representatives. That's what we're here for.



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