Peachpit
Essential books for the creative community

How to Use Camera Raw

As a serious digital photographer, you need the greatest possible control over your images. By leveraging your digital camera's raw format and the new Camera Raw plug-in in Adobe Photoshop CS, you gain precise control over image qualities such as white balance, tone curve, color space, contrast, and saturation. Discover this untapped power in *Real World Camera Raw with Adobe Photoshop CS*, which we've excerpted here to get you up-to-speed on how and why your pictures look better in the raw.

Why Shoot Raw?

The answer to the above question is simply, control over the interpretation of the image. When you shoot JPEG, the camera's on-board software carries out all the tasks listed earlier to produce a color image, then compresses it using JPEG compression. Some cameras let you set parameters for this conversion—typically, a choice of sRGB or Adobe RGB as color space, a sharpness value, and perhaps a tone curve or contrast setting—but unless your shooting schedule is atypically leisurely, you probably can't adjust these parameters on an image-by-image basis, so you're locked into the camera's interpretation of the scene. JPEGs offer fairly limited editing headroom—large moves to tone and color tend to exaggerate the 8-by-8-pixel blocks that form the foundation of JPEG compression—and while JPEG does a pretty good job of preserving luminance data, it really clobbers the color, leading to problems with skin tones and gentle gradations.

When you shoot raw, however, you get to control the scene interpretation through all the aforementioned aspects of the conversion. With raw, the only on-camera settings that have an effect on the captured pixels are the ISO speed, shutter speed, and aperture. Everything else is under your control when you convert the raw file. You can reinterpret the white balance, the colorimetric rendering, the tonal response, and the detail rendition (sharpening and noise reduction) with a great deal of freedom, and, within limits, you can even reinterpret the exposure compensation.

Using All the Bits

Most of today's cameras capture at least 12 bits per channel per pixel, for a possible 4,096 levels in each channel. More bits translates directly into editing headroom, but the JPEG format is limited to 8 bits per channel per pixel: So when you shoot JPEG, you trust the camera's built-in conversions to throw away one-third of your data in a way that does justice to the image.

When you shoot raw, though, you have, by definition, captured everything the camera can deliver, so you have considerably more freedom in shaping the overall tone and contrast for the image. You also produce a file that can withstand a great deal more editing in Photoshop than can an 8-bit per channel JPEG.

Edits in Photoshop are "destructive"—when you use a tool such as Levels, Curves, Hue/Saturation, or Color Balance, you change the actual pixel values, creating the potential for either or both of two problems.

- Posterization can occur when you stretch a tonal range. Where the levels were formerly adjacent, they're now stretched apart, so instead of a gradation from, for example, level 100 through 101, 102, 103, 104, to 105, the new values may look more like 98, 101, 103, 105, 107. On its own, such an edit is unlikely to produce visible posterization—it usually takes a gap of four or five levels before you see a visible jump instead of a smooth gradation—but subsequent edits can widen the gaps, inducing posterization.

- Detail loss can occur when you compress a tonal range. Where the levels were formerly different, they're now compressed into the same value, so the differences, which represent potential detail, are tossed irrevocably into the bit-bucket, never to return.

Figure 1 shows how the compression and expansion of tonal ranges can affect pixel values. Don't be overly afraid of losing levels—it's a normal and necessary part of image editing, and its effect can be greatly reduced by bringing images into Photoshop as 16-bit/channel files rather than 8-bit/channel ones—but simply be aware of the destructive potential of Photoshop edits.
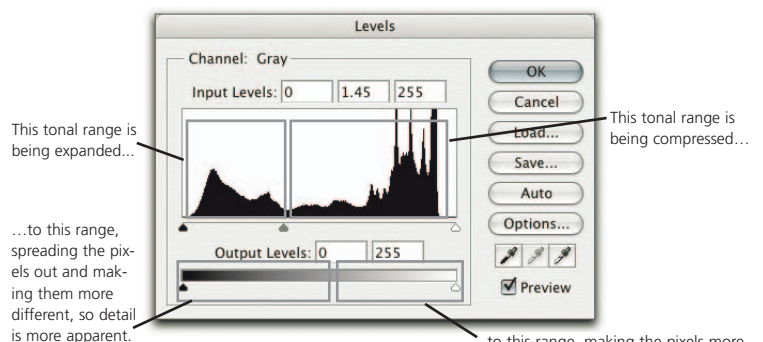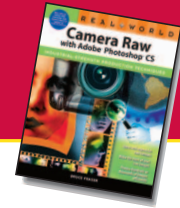

This tonal range is being expanded…

…to this range, spreading the pixels out and making them more different, so detail is more apparent.

This tonal range is being compressed…

…to this range, making the pixels more similar (and in some cases, identical), so detail is less visible or completely lost.

Figure 1. Destructive editing.

Camera Raw Anatomy

Camera Raw opens automatically whenever you open a raw image. In addition to the static elements—the Tool palette, the histogram, the RGB readout, the rotate controls—it offers two sets of controls; one static workflow set that is "sticky" (the settings remain unchanged unless and until you change them) and another dynamic image-specific set that changes depending on which tab is currently selected (see **Figure 3**).
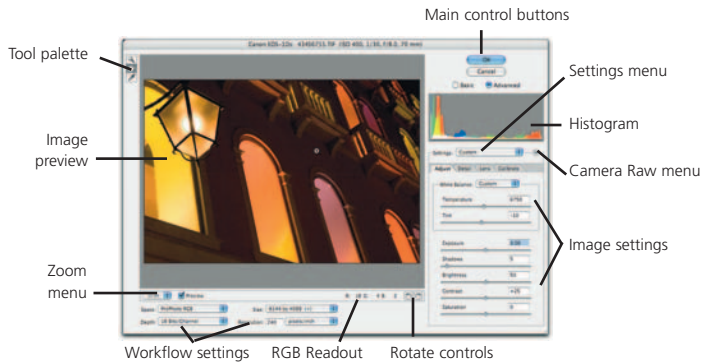

Figure 3. Camera Raw Controls

The static elements include the Tool palette, the Zoom menu, the Preview toggle, the main OK and Cancel buttons, the Basic and Advanced radio buttons that let you toggle between Basic and Advanced modes, a live histogram that shows the conversion that the current settings will produce, and a Settings menu that lets you load and save settings. See **Figure 4**.

The workflow controls govern the kind of output Camera Raw will produce—they let you choose the color space, bit depth, size, and resolution of converted images. See **Figure 5**.

The image controls, which apply to individual images, appear immediately below the Settings menu. In Basic mode, Camera Raw offers two separate panels, Adjust and Detail, each with its own set of controls. In Advanced mode, two additional panels, Lens and Calibrate, become available, with more controls. See **Figure 6**.
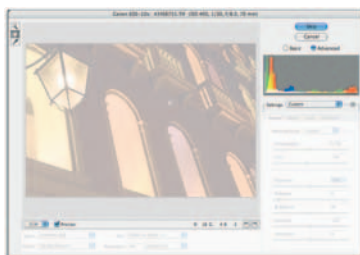

Figure 4. Camera Raw static elements

Figure 5. Camera Raw workflow controls

Figure 6. Camera Raw image controls

Editing Images

At last, we come to the heart of the matter—editing raw images! The controls in Camera Raw are presented in a fairly logical order. I always start with the controls in the Adjust tab, followed by those in the Detail tab, and then, if necessary, those in the Lens tab. Normally, I don't make adjustments to individual images in the Calibrate tab, reserving it for fine-tuning the response of specific cameras; but on occasion, it can be a handy creative tool, too.

Using the Adjust tab controls. The Adjust tab contains the controls that let you set the overall contrast and color balance for the image—see **Figure 7**. A simple rule of thumb that has served me well over the years is to fix the biggest problem first. In the case of raw images, this always boils down to starting with either the Exposure or the White Balance controls.
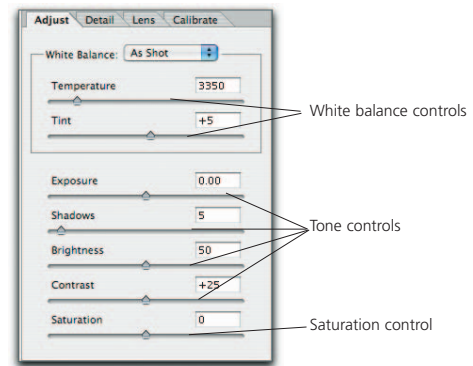

Figure 7. The Adjust tab.

If the image needs a major (more than 0.25-stop up or down) exposure adjustment, it's better to do that before setting the white balance, because the exposure adjustment will probably affect the white balance. If the image needs little or no exposure adjustment, set white balance first.

- White Balance. The Temperature control adjusts the color of the light for which Camera Raw is compensating in Kelvins. So as you increase the color temperature, the color balance moves towards yellow to compensate for the bluer light, and as you decrease the color temperature, the image heads toward blue to compensate for the yellower light.

- The Tint control adjusts the red-to-green color balance—positive values head toward red, negative ones head toward green.

- It's often easiest to start by doing a rough click-balance with the white balance tool by clicking on an area of detail white in the image. Don't click on a specular highlight unless you're going for psychedelic results! Then you can fine-tune using the Temperature and Tint sliders.