

Out damned cast – Out, I say!

Removing color casts from digital camera images

by Brian P. Lawler (with apologies to Will Shakespeare)

The color of available light versus the expectations of the camera

When we make photographs on color negative film – snapshot cameras are usually the best example of this – the film lab processes the film, and then makes prints on a sophisticated printer that can evaluate the color of the film and (usually) detect color casts that are a result of the wrong lighting relative to the film's color sensitivity.

Most color negative films expect the available light to be daylight. When the light that strikes the film is not of that color – indoor lighting for example – the film records the image with a color cast, and the *photo* printer will detect and correct the lighting error when the prints are made.

Digital cameras and white balance

Most digital cameras have the ability to balance to the ambient light at the time of exposure. This is sometimes less successful when there are mixed sources of light on the subject; the image will come out with a noticeable color cast.

The examples on these pages show some variations-on-a-theme with color balance and color casts. Look at each one and reason with the camera to see if you can determine what is wrong with the image.

In the *Auto* image above, the press appears to be normally illuminated, until you compare it with the *Fluorescent* version in the middle, which is better-balanced (Now *Auto* seems to have a slight greenish cast). The more honest lighting setting would be *Fluorescent* (especially considering that the primary source of light is the banks of fluorescent lighting overhead).

The other source of light in the printing press photo is sunlight, entering from over the right shoulder of the photographer, and striking the stack of paper in the feeder at the end of the press. If the camera is set to balance to *Daylight*, the photo appears to have a strong yellow-green cast.

On the following pages I have made visual corrections to images of the printing press which were made with the wrong light settings. In each



White Balance balance on the camera set to “Auto”



White balance on the camera set to “Fluorescent”



White balance on the camera set to “Daylight”



Color balance on the camera set to "Flash"



Compare each image to this one (Fluorescent).



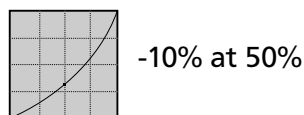
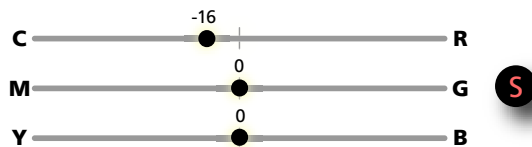
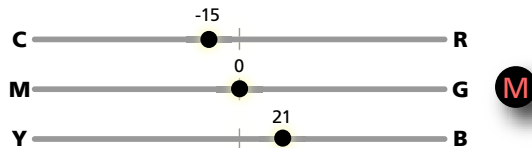
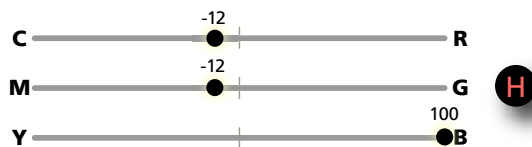
Adjustments made:

of these examples I have attempted to correct the color cast in each image using Photoshop's *Color Balance* settings (Command-B). You will see that in each case I have made a nicer looking image, but in no case was I able to match the color cast of the image created by the camera when set to *Fluorescent*.

In each image, after making the color balance adjustments, I had to apply a small amount of tonal adjustment using the *Curves* control to lighten each image by 10 percent at the midtone.

I think that each one would reproduce acceptably, and if viewed alone, each one looks "normal." It is only when compared to other images that the subtle color cast still present are visible.

Whenever a color cast is present, and you wish to make adjustments on the computer display, it is critical that the display be properly calibrated. With a calibrated display, the cast you see *is actually present* in the image, and the corrections you make will actually occur to the image. With

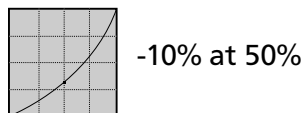
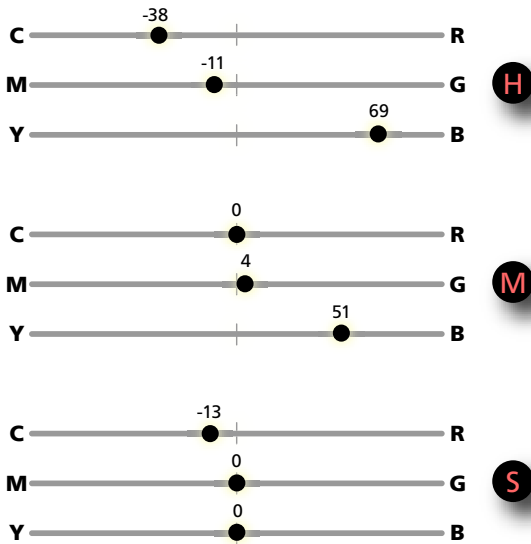




Color balance on the camera set to "Open Shade"



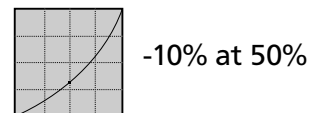
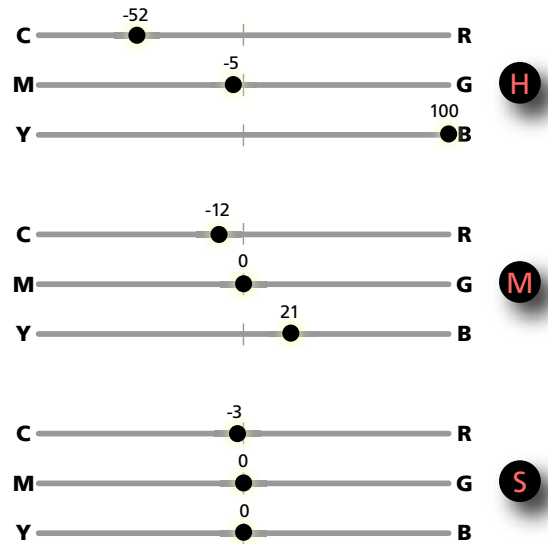
Adjustments made:



Color balance on the camera set to "Cloudy Daylight"



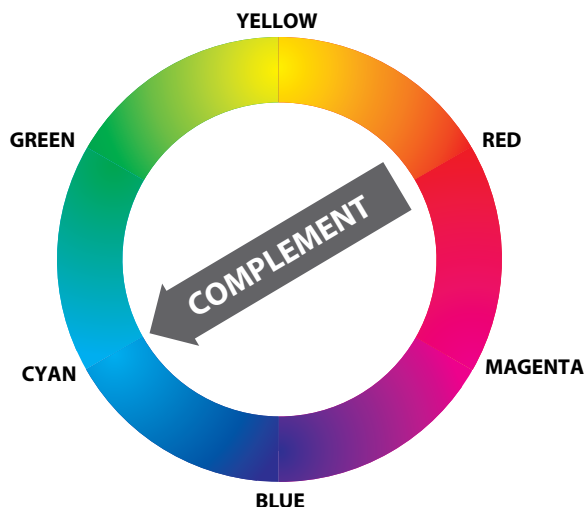
Adjustments made:



an uncalibrated display, all bets are off – the image on the screen is unreliable for either viewing or correcting an image.

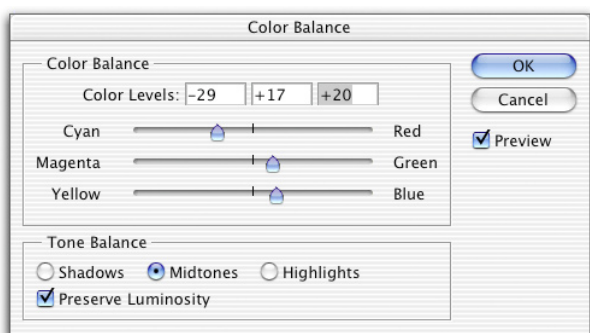
The rules for color cast correction are that you add the complement of the color cast to the image to counteract the cast. The chart below shows this.

In the chart above, a red color cast is being

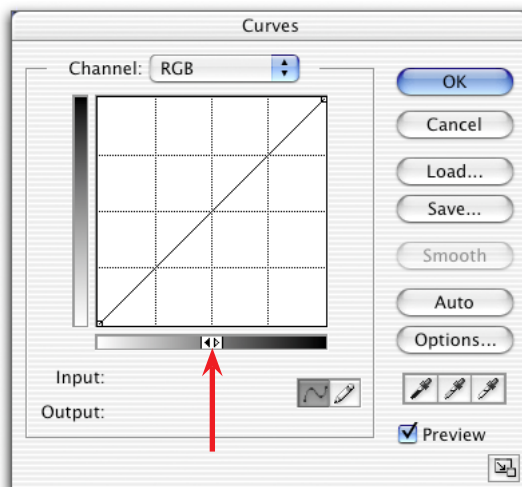


countered by a cyan color cast being introduced into the image. Sometimes it's hard to identify what the problem is, but in Adobe Photoshop it's relatively easy to make trial-and-error changes to images and then watch the results. Separate complementary sliders are available for Shadows, Midtones and Highlights in images.

It is usually true that only two sliders should



move for any color cast, but you may find it easier to move three, which causes the image to get darker, and then adjust the tonality of the resulting image with the Curves control palette after the cast is removed. This is an easy solution to the darkening effect of moving all three sliders.



The Curves palette defaults to the 0-255 values set in Photoshop. I prefer to reverse it to what I call Graphic Arts settings, with black in the upper-right and 0-100 percent settings. To change it, click on the little double-triangle (red arrow) in the middle of the bottom gradient and it will change.

To lighten an image I usually click on the midtone at the 50 percent point, and then pull downward, lightening the image. The result is usually successful. In all of the images on the previous page I reduced the 50 percent value by 10 percent while leaving the highlights and shadows alone.

Practice makes perfect images!

If you try these techniques on a few poorly-exposed images, you'll discover that your photos will begin to look a lot better – quickly.

■ This is one of a series of essays I have written on the use of computers in the graphic arts. For others, please visit my Web site: www.thelawlers.com

Brian P. Lawler
Graphic Arts Consultant
1329 Peach Street
San Luis Obispo, California 93401 USA
Tel: (805) 544-8814
e-mail: brian@thelawlers.com