

**Movie 10 (Chapter 11 extract)**

# Camera Raw calibration

**Adobe Photoshop CS2 for Photographers** by Martin Evening ISBN: 0 240 51984 1

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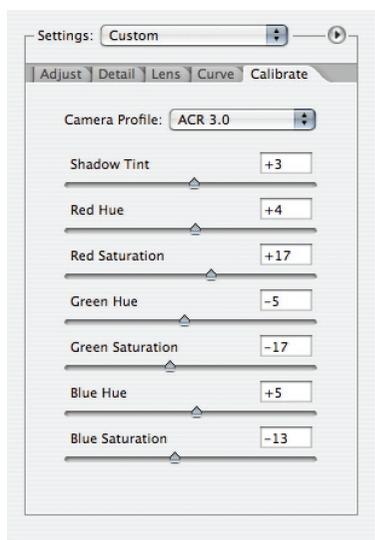
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## Real World Camera Raw

For a definitive explanation of Camera Raw and Bridge and a more detailed explanation of how to create a custom Camera Raw calibration for your camera, I highly recommend you buy Real World Camera Raw in Photoshop CS2 by Bruce Fraser, published by Peachpit Press.



**Figure 1.1** The Camera Raw Calibrate panel controls are used to fine-tune the Camera Raw color interpretation. The Camera Profile setting at the top can offer a choice of camera profile settings. The reason for this is that some of the original Camera Raw profiles that came with the Camera Raw plug-in did not necessarily reflect the best average chip performance of the supported cameras. So some camera profiles have been updated and made available as ACR 3.0 profiles. These profiles will be better than the ACR 2.4 setting, but the older profile is still there so as to not cause conflict for those users who wish to continue using this profile with their pre-saved calibrations.

## Calibrate panel controls

The Camera Raw plug-in is the product of much camera testing and raw file analysis carried out by Thomas Knoll. The list of cameras that the latest plug-in is compatible with can be found at the Adobe website and following this link: [www.adobe.com/products/photoshop/cameraraw.html](http://www.adobe.com/products/photoshop/cameraraw.html). The test cameras were used to build a two part profile of each camera sensors spectral response under tungsten and daylight lighting conditions and from this, the Camera Raw processor is able to calculate a pretty good color interpretation under these lighting conditions, and beyond, across a wide range of color temperature lighting conditions. This method is not as accurate as having a proper profile built for our camera and to be honest, profiling a camera is something that can only really be done where the light source conditions are always the same, because you would need to re-profile the camera every time the lighting changed.

The Calibrate panel controls provide a mechanism for fine-tuning the color adjustments in Camera Raw so that you can customize the Camera Raw output and produce a custom calibration for each individual camera and the specific lighting conditions. This system of calibration requires a little extra effort, but if you are always shooting with the same camera in a studio using the same lighting setup, then it is worth doing. I also create a calibration setting if I am shooting on location under unusual lighting conditions such as when I shot a building interior which was lit entirely using fluorescent strip lights. The tutorial on the following pages describes how I was able to use a Gretag MacBeth color checker chart in conjunction with the Camera Raw white balance and calibrate controls to create a custom Camera Raw setting that could be applied to all the images I had shot in the interior that day and apply an effective color correction at the raw processing stage.

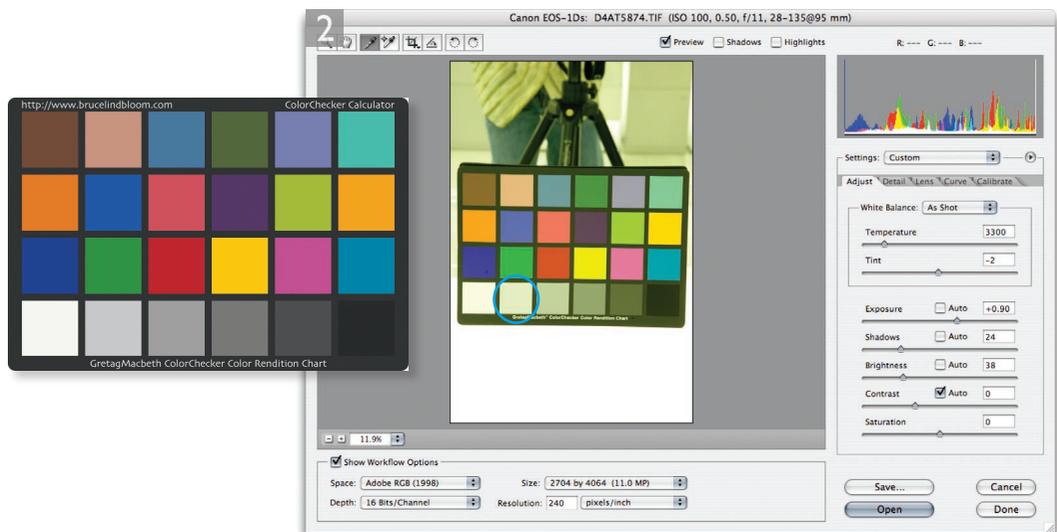


**1** This interior was shot entirely with the available fluorescent strip lighting. The default camera settings produced an image with a heavy yellow/green color cast.

**2** To calibrate the camera for this lighting setup I needed to place a Gretag MacBeth color checker chart in the scene and take a photograph of it under the same lighting conditions and compare the camera raw preview of the photographed chart with a synthetic color checker chart in Photoshop. Bruce Lindbloom has produced a synthetic ColorChecker Calculator image which can be downloaded from his website at: [www.bruceindbloom.com](http://www.bruceindbloom.com). The synthetic image is in Lab mode so I first needed to convert the image to my Adobe RGB work space by choosing Image ⇒ Mode ⇒ RGB Color. I opened the synthetic ColorChecker image and the raw capture image so that both could be viewed side by side.

To set the white balance, I selected the white balance tool and clicked on the light gray patch (circled) adjacent to the white patch, because choosing the brightest white can easily produce a false result. I then made some initial tonal adjustments to get the chart in the Camera Raw preview to match the synthetic chart.

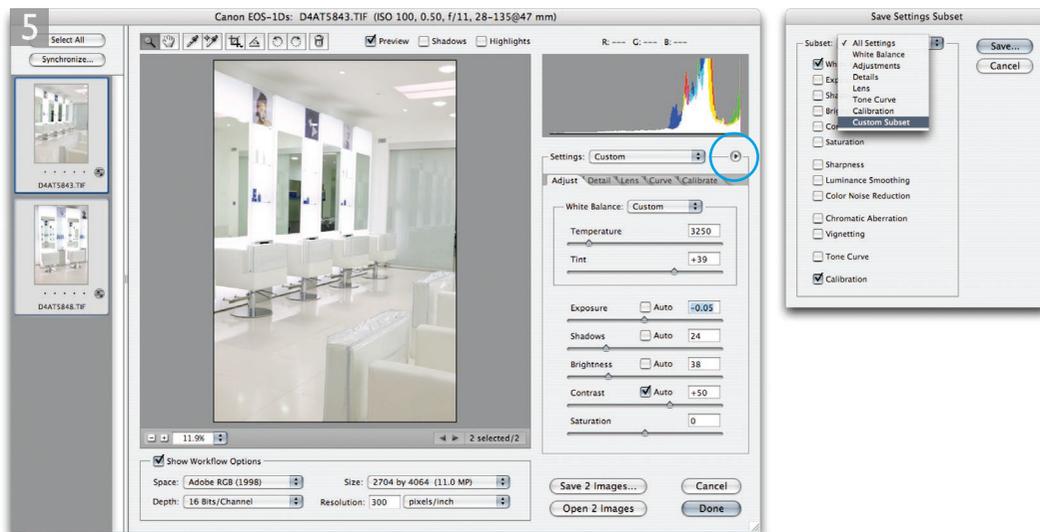
**3** I began by adjusting the Exposure slider until the white patch was just clipped. I then selected the Color sampler tool in Camera Raw and clicked to place a sample point on the Black patch and adjusted the Shadow slider until the RGB values were close enough to R 53 G 53 B 53. I then dragged this sample point to the light gray patch (next to the white patch) and placed three more sample points as shown here. I started by checking the two middle gray patches, which were referenced by the #2 and #3 color sample readouts. By checking the number values for the gray patches, shown in Figure 1.2, I was able to adjust the Brightness and contrast sliders to obtain a close match between the captured chart and the Synthetic color checker chart. I clicked on the Clear Samples button and switched to the Calibrate panel controls.





4 I placed a new color sampler on the Shadow patch and adjusted the Shadow tint until the RGB readouts were as even as possible. I cleared the samples again and set the four points as shown here. I now wanted to concentrate on getting a good match for the red, green and blue patches. One can just make a visual comparison between this and the synthetic chart patches, or refer again to the chart in Figure 1.2 and adjust the Calibrate panel hue and saturation sliders and aim for a closely matching relationship between the RGB values at each patch. It is recommended that you adjust the green hue and saturation first and then move on to the blue and lastly the red hue and saturation.





5 As you adjust the individual hue and saturation color sliders you will notice that each will have an impact on the other two color values. It is virtually impossible to obtain an exact match, but with careful fine-tuning you should be able to get fairly close. I then went to the Camera Raw options (circled) and chose Save Settings Subset... I selected Custom Subset and checked the White Balance and Calibrate boxes only and clicked Save... The next dialog will prompt you to name the setting and save it in the Application Support\Adobe\Camera Raw\ Settings folder. This saved subset setting will ignore the initial Exposure, Shadows, Brightness and Contrast settings that were set at the beginning. It saves just the white balance and calibrate settings. Once saved, this setting will always be accessible from the Settings menu in Camera Raw and use it to apply to single or multiple images that were shot using the same lighting conditions to obtain a more perfect color rendition of the scene photographed with an individual camera. If you don't want to go to the bother of creating a custom setting, you can simply update the calibrated image by clicking Done and choose 'Previous Conversion' from the Settings menu to apply this calibration to other images in a series. Although you may perhaps need to reset the Adjust panel settings before doing this.



**Figure 1.2** The numbers shown here refer to a Lab space Synthetic color chart that has been converted to the Adobe RGB color space.

### **Addendum**

As you can see, Photoshop CS and CS2 has the unique ability of allowing you to create a custom calibration for individual digital cameras. You have to bear in mind that many of the default Camera Raw settings were achieved through testing a limited pool of cameras. And it has been reported by others that there can be a discernible variation in color response between individual cameras. As I explained in Figure 1.1, it was as a result of testing more cameras that Thomas Knoll decided to update the default settings for certain cameras and provided a new v 3.0 default camera profile (in addition to keeping the legacy profile available for use).

### **An automated solution**

As far as many users are concerned, such differences may not matter a great deal. But if you are concerned about achieving consistent color within a studio environment, then the Camera Raw calibration procedure is well worth using. But it has to be said, it can be really tricky to get the color patches in the Camera Raw capture of a Gretag Macbeth chart to match those in the synthetic chart, when you are relying mainly on your eyesight to do this.

There is however an easier solution. Thomas Fors has cleverly written a Script that will automate the Camera Raw calibration process completely. His ACR calibrator script will work for Mac or PC with Photoshop CS or CS2 and can be downloaded from the Chromoholics website at: <http://fors.net/chromoholics/>

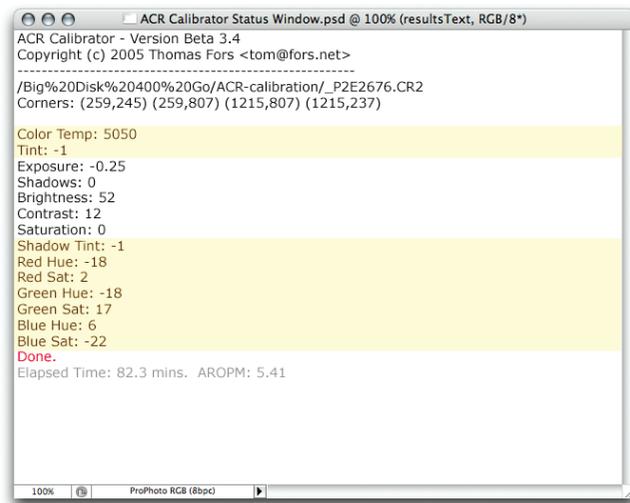
The website also contains two short movies that show you first how to install the ACR calibrator script: <http://fors.net/chromoholics/install/> as well as providing full instructions on how to use the ACR calibrator script: <http://fors.net/chromoholics/using/>

Pay careful attention to the instructions: the bit depth should ideally be set to 8-bits per channel and the image set to open at the smallest pixel size. Next, you will be asked to open the image once, select the pen tool and use it to click on four of the color patches in the Gretag Macbeth chart. You are then ready to go to the Photoshop File ⇨ Scripts menu and choose the ACR calibrator script.

The script will open a new ACR Calibrator Status Window (see below) and run through a series of steps, in which the raw image containing the color checker chart will be opened many times using different settings and measure the results. This process can take a very long time to complete, which is why it is important to keep the bit depth at 8-bits per channel and the image size small. It will also help if you hide all the palettes first before you run the script.

### Special Camera Raw settings

Apart from setting the bit-depth to 8-bit and the pixel dimensions to the smallest output size, there are no other settings you need concern yourself with. It does not matter if the auto settings are on in Photoshop CS2 or not and it does not matter which RGB output color space is selected.



**Figure 1.3** Here is the ACR Calibrator Status Window after the script has run its full course. I have highlighted the calibration settings in yellow. You need to note these figures down, enter these in the Calibration panel in the Camera Raw dialog and save these as a custom calibration setting for your camera. You may also want to make a note of the Color temperature white balance and Tint settings and save these too as part of your custom calibration setting.