

CONVERTING COLOUR IMAGES TO MONOCHROME

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1. THE OPPORTUNITY

Historically, black and white photographers have controlled image contrast and tone by the use of coloured filters, choice of film, exposure, processing and printing. Furthermore, they could apply treatments such as sepia or selenium to the print to create coloured tones and further control the final result.

The degree of control with digital technology is at least as great, but the tools and techniques are very different. The camera (or scanner) usually captures a full-colour image and there is the opportunity to experiment endlessly to achieve the desired effect in mono, at your leisure. Unfortunately this can often be at the cost of image quality and it is frighteningly easy to damage a digital image file beyond recovery, so experimentation should always be done on a copy of the image.

We may continue to develop these notes with more advanced techniques but as a starter, this document records some popular methods by which an RGB file can be converted to a monotone image.

As with all forms of photography, it is always better to get as much right about the image at the capture stage than try to rescue it later on. If you are new to monochrome photography, it is worth experimenting with a digital camera switched to monochrome mode to help visualise the image. If you are able to shoot in RAW mode then you will be able to get back the colour information at the processing stage if you need to.

2. RETAINING IMAGE INFORMATION

There is no single 'good' way of creating a monochrome image from an RGB file. It depends what you are trying to achieve. It could be argued that the 'best' way is to retain as much of the original information as possible. This is likely to give the smoothest tones but may well be less satisfying in terms of contrast and drama.

Any 'conversion' will contain less information because, at the pixel level, all you are doing is creating one number from three numbers (ie. the red, green and blue). The different methods produce different mixtures and the more complex techniques produce different mixtures for different parts of the image. The more extreme the technique (e.g. throwing away information from two of the three channels) the more information will be lost and the more likely the final product will be posterised and blotchy. Nevertheless using just the red channel for example can give a very punchy, high contrast image similar to that achieved conventionally with a red filter. Just be aware that you may lose some highlight detail in this process and that shadow areas can easily go completely black.

Digital processing allows you to mimic effects of traditional film such as the use of colour filters to change contrast, and the use of infra red film for example. Don't expect to get exactly the same effect and if you want to explore this seriously it is almost certainly better to use red, green, orange, yellow and infra red filters at the taking stage. You can use these just as well with a digital camera as with a conventional film camera but of course you cannot then use the image as a colour photograph later on. However, with a digital camera, you have the advantage that you can take two consecutive pictures – one with the filter and one in colour!

There are lots of things you can do with digital mono that are virtually impossible in any other way and perhaps it is that which should be emphasised. If you want to get the results of traditional monochrome photographers, it is better either to use a film camera or to treat your digital camera as though it has monochrome film in it at the taking stage.

3. CONVERSION METHODS

There are many conversion methods, each with their supporters. Here are some of the more common ones;

3.1 For Photoshop or Photoshop Elements;

3.1.1 Image>Mode>Greyscale. Simple and much derided, but it works just fine for many images and gives a smaller file. You do, of course, lose all control of the colour information but you can then concentrate on the greyscales. This is probably as close as you can get to traditional film processing but you can only tone through duotones because it is no longer an RGB image. An alternative is to use Image>Adjustments>Desaturate (for Elements: Enhance>Adjust Color>Remove Colour) which still loses the colour information permanently but leaves the image in RGB mode.

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3.1.2 Hue/Saturation Adjustment Layer. Reduce saturation to the minimum. This will simply take a standard blend of the RGB channels (roughly 6G 3R 1B) for each pixel. It also has the advantage that with the Colorise setting selected you can juggle Hue and Saturation to give a variety of 'toned' effects such as sepia. You only need a very small amount of saturation (sometimes as little as 5 – 10%) to get a marked effect in the print.

3.1.3 Double Hue/Saturation Adjustment Layer. Create more control by doing 3.1.2 above but then adding an additional Hue/Saturation adjustment layer underneath the first one. Set the Blending Mode of the upper adjustment layer to Color. By altering the Hue and Saturation sliders of the lower adjustment layer, especially for individual colours (change Edit: Master to Edit: Red etc), the resulting conversion will be radically altered. You could do something similar with a Color Balance adjustment layer instead (Photoshop only).

In summary, you end up with your background layer and two hue/saturation layers on top. The top layer has saturation at minimum and blending mode of Color; the middle layer is used to change the effect.

3.1.4 Dedicated Black and White Tools. Later versions of both programs have added special tools for conversion to black and white. In CS3 there is a dedicated black and white conversion tool. You can use this directly on your background layer through Image<Adjustments or better by forming a black and white adjustment layer – Layers<Adjustment Layers<Black and White. Use with caution!

This is a clever tool which allows you to alter the ratios of individual colours during the conversion. You can even do this by stroking the cursor over the image – stroking to the left makes the conversion for the colour underneath the cursor darker, and to the right makes it lighter e.g if you stroke over a particular shade of red then all the pixels in the image with this colour will go darker. It gives very dramatic effects extremely quickly. For small images this is usually fine. However, because you are dealing with individual colours, it is only pixels with that colour (or at least a very limited range) that are affected. That can quickly cause ugly blotchiness and posterisation which only becomes obvious when you view the image later on full screen. You can also lose image detail. It is easy to get carried away! Elements version 5-up have similar facilities. This is the way to go for instant impact and works well for small prints, projected images or the web. It is an excellent tool for experimentation and includes some useful presets to help visualise different effects.

There is a similar tool in the newest Adobe Camera RAW conversion program (not Elements). It works in a similar way and also allows you to experiment with duotones very easily. The disadvantage of this approach is that the conversion is then embedded in the file and you would have to go back to the RAW file to reprocess the data.

3.2 Photoshop Only;

3.1 Channel Mixer Adjustment Layer. This has long been a popular method with many Photoshop users. Select Monochrome and ensure the channels are roughly equal (which interestingly they now are by default in CS3 – whereas in earlier versions the default removed the blue and green info). Move away from this mix gradually to get more dramatic effects (eg by increasing the red channel) but in a correctly exposed file make the total number add up to 100%. Check the image at actual pixel size for burnt-out highlights, blocked shadows, blotchiness or posterisation.

3.2 Use Lab mode (L*a*b = El, Ay, Bee to go with RGB) You can use this to good effect. Image<Mode<Lab Color. View the channels and select the Luminosity channel only. Throw away the a and b channels then Image<Mode<Greyscale mode. This gives the same blend as desaturating in RGB but produces a lighter image so could be preferred for some images especially those with a lot of detail in the lighter areas.

4. OTHER TIPS

4.1 A simple non-destructive idea is to increase contrast in the colour image before conversion. One way of doing this is to select the whole image; copy it; paste it on top of itself and then change the blend mode of this new layer to Multiply; finally reduce the opacity to a desired level. If you then do your chosen conversion on layers above this, you can still control the opacity later in the process. Alternatively you can also use Image>Apply Image and then set the blend mode Multiply (Photoshop only).

4.2 An alternative method of toning for Photoshop users only is to use the Duotone Mode (having first converted to Greyscale Mode). Choosing two suitable colours such as blue and black or yellow and black can create cyanotype or sepia-like effects. Controllability is achieved by manipulating the curves for each colour.

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4.3 It is really important to keep sight of the starting point that however you do it, you are basically reducing three numbers to one (on a scale of 1-256 by the time it gets to the printer) for each pixel. If too many adjacent pixels have the same number then you get posterisation.

4.4 Some RAW images can benefit from processing twice – once to retain highlight detail and once for the shadows. There are various ways to then combine the best bits of the two images before using one of the conversion methods above. This is particular useful for high contrast images. There is third party software available for all versions of Photoshop, and a tool is now included in CS3 (File>Automate>Merge to HDR), which allows you to automatically combine several images with different exposures thus giving a better dynamic range for high contrast images. The idea is that you take a sequence of say three to five images with exposures varying by half or one stop. It is better to do this with the camera fixed on a tripod so that the images overlap perfectly.