

## Adding Dimension to Your Monochrome Images

### *Printing Duotones, Tritones, and Quadtones*

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Computer programs, like Adobe Photoshop CS, can differentiate 256 shades of gray. Printers, however, especially desktop ink jet printers, cannot generate 256 distinct tones from the same color. Most can generate just a small fraction, maybe fifty or sixty distinct tones.



**Figures 1a and 1b.** A color image converted into a grayscale image. A selenium quadtone adds warmth overall and depth to the hay peeking through the barn wall. An old cotton barn in Sneads, AL.

Duotones add a second ink to extend and/or smooth the available tonal range. Tritones add a third ink. Quadtones add a fourth.

It is common to use the term “duotone” when talking about duotones, tritones, or quadtones. A duotone technically is an image that uses two inks and only two inks. This tutorial will instead use the term “duotone mode,” which is a more appropriate term.

Duotones are different from images printed with a spot color. Spot colors are used when traditional ink sets, such as CMYK offset printing, cannot print a color or when a precise color match is needed. Spot colors are typically applied to specific, isolated areas in an image, such as a corporate logo.

The inks in a duotone are generally applied to the entire image. The density of the inks is controlled by a separate plate for each duotone color. The inks in a duotone overlap, which is how the tonal range is broadened and smoothed.

Many fine art photography books that reproduce B&W images use duotones, tritones, or quadtones. It is an expensive printing process. Additional plates and setups are required for each added ink. The result of adding overlapping inks to a monochrome image can be truly breathtaking! Crisp, dark shadows. Subtle tonal transitions. Delicate highlight details. Duotones, tritones, and quadtones can bring out details in a print that would go unnoticed with a simple B&W image printed from just one shade of black ink.

A duotone image remains a monochrome image in Adobe Photoshop CS. There is still just one channel. In fact, if you convert a B&W image in Adobe Photoshop CS to a duotone, the size of the image does not increase, except by a few bytes.



*Figure 2.* A brown tritone displays a more antique feel.

A quick look at the duotone dialog from Adobe Photoshop CS makes it obvious why duotones do not consume any appreciable amount of RAM or file space. You allocate your second ink to specific parts of the tonal range for the image. You can use one color

for the shadows, for example, and a second ink for the midtones, and highlights. A tritone could use a second ink for the midtones and a ink color for those highlights. A fancy mathematical equation, called a transfer function, handles where the additional inks get added and how much is added.

Duotones, tritones, and quadtones are also popular methods for adding a slight color cast to an image. Sepia images often employ a tritone combination of black, magenta, and yellow. Popular quadtones include selenium and bronze. Sunsets can be enhanced with an orange or red duotone. You can add just a little tone to your image or a lot. The creative possibilities are limitless.

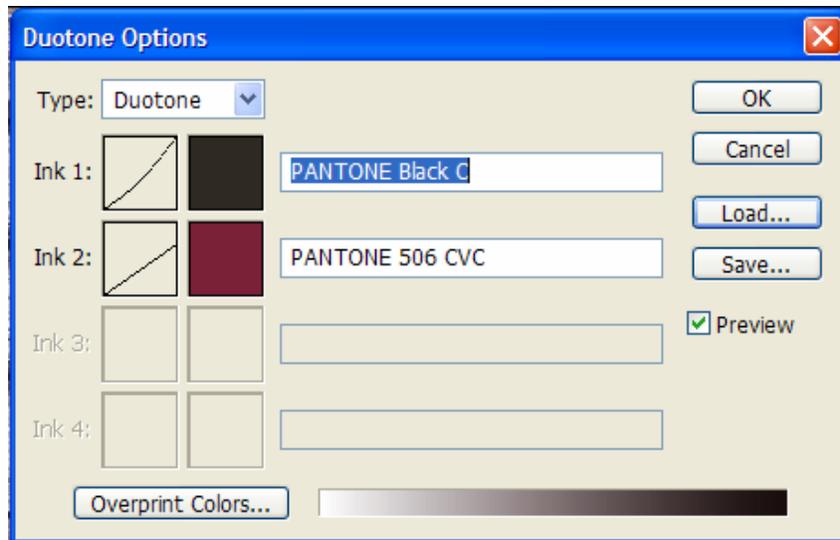


**Figure 3.** It is easy to add just a little warmth with a duotone, tritone, or quadtone. In this case, a quadtone was used. The result is different from the selenium quadtone in *Figure 1b*.

Quadtones are popular among photographers who use expensive desktop inkjet printers like the Epson 2100/2200. Because those printers only have one or two shades of black in their cartridges, lighter shades of gray mix varying amounts of cyan, yellow, and magenta. This makes it extremely difficult to get absolutely neutral grays. Worse, their gray tones visibly change under different lighting conditions, a problem known as *metamerism*. As a result, some photographers prefer to use quadtone ink systems for their B&W art prints with ink jet printers. Quadtone ink systems provide four different neutral shades of black and gray inks to use for different tonal ranges in a monochrome print.

### **The Mechanics of Adding Tone**

Whether you want to make a duotone, tritone, or quadtone with Adobe Photoshop, you start with a monochrome image. You can use whatever method you prefer for B&W conversion: Image|Mode|Grayscale, Image|Adjustments|Desaturate, Channel Mixer, Calculations, Split Channels, etc. The image will need to be converted to 8-bits. So it is best to have your major tonal corrections done prior to invoking Image|Mode|Duotone.



**Figure 4.** The dialog for setting duotone options. Tritones and quadtones use the same dialog.

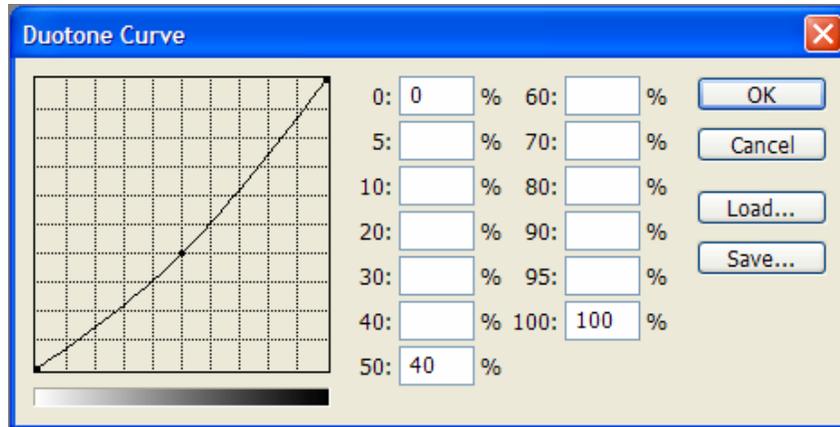
An example of the Duotone Options dialog appears in **Figure 4**. When you open the dialog, you first need to select the type: duotone, tritone, quadtone. Selections can be saved for subsequent use as presets, and Adobe Photoshop CS includes a number of custom duotones, tritons, and quadtones in the Presets\Duotones directory. You can also find presets on the Web. My own Photoshop action set – TLR Toner – can be downloaded from my Web site:

<http://www.thelightsright.com/DigitalDarkroom/PhotoshopTools.htm#TLRToner>

The duotone in **Figure 4** is for a burgundy duotone. It uses two ink colors from different Pantone swatch books. Using custom colors is typical when an image is intended for printing by a print shop rather than a desktop printer. For desktop printing, you can use the Photoshop Color Picker for selecting ink colors.

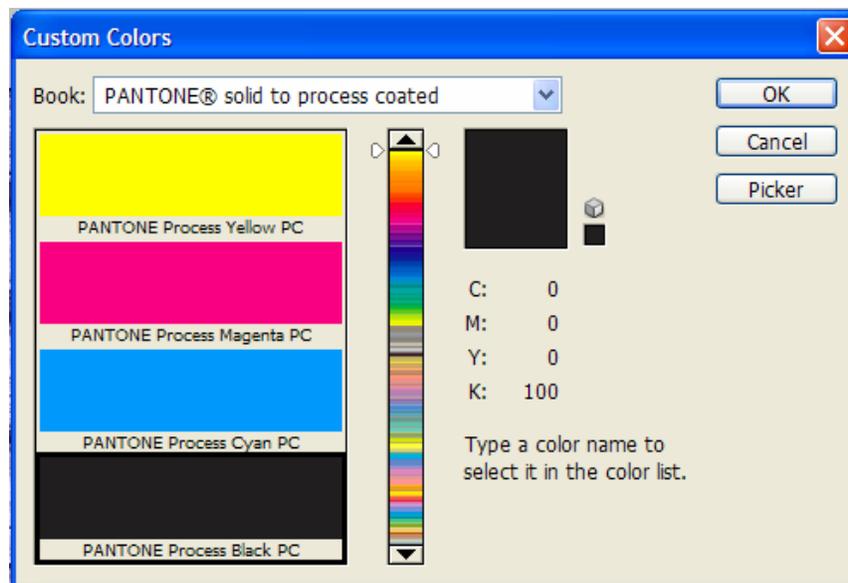
The gradient at the bottom of the Duotones Option dialog shows the tonal transitions for the selected inks and associated curves. As you make new ink selections or adjust the curves, the gradient will change to give you a visual indication of the available tones for your image.

Once you select the type, you can then click on small curve display for a particular color and the Duotone Curve dialog will open. You can click and drag the curve or you can enter density values directly. **Figure 5** is a screenshot of the duotone curve for the Pantone Black C ink in **Figure 4**.



**Figure 5.** Duotone curve for Pantone Black C ink used in the burgundy duotone in **Figure 4**.

Where the grayscale image has 50% density (midtone), the black ink in the duotone will be slightly lighter. Density ramp is another name for a duotone curve. 70% density is the maximum for the burgundy ink. The rest of the ramp is actually linear, with 35% density at the midtones. Changing a curve will change the distribution of the ink.

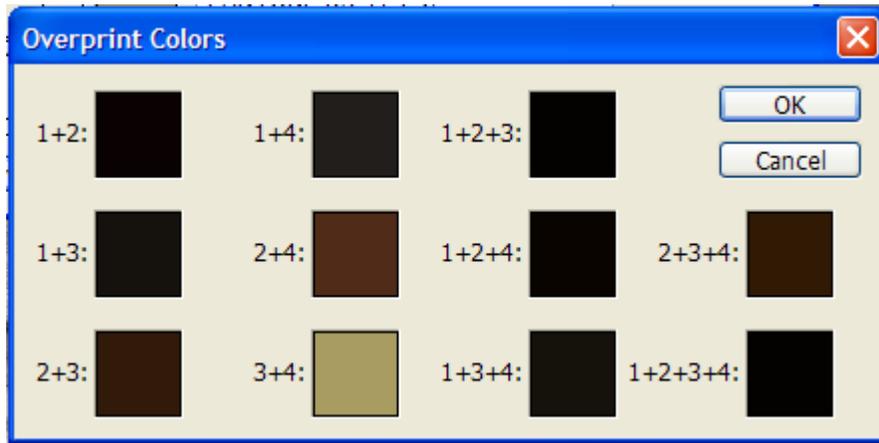


**Figure 6.** Clicking one of the color patches on the Duotone Options dialog opens the color picker.

Clicking on the colored patches opens the standard Photoshop Color Picker dialog. You can toggle back and forth between the standard Photoshop color picker and the Custom Colors dialog, which provides access to the many thousands of spot color inks used in offset printing.

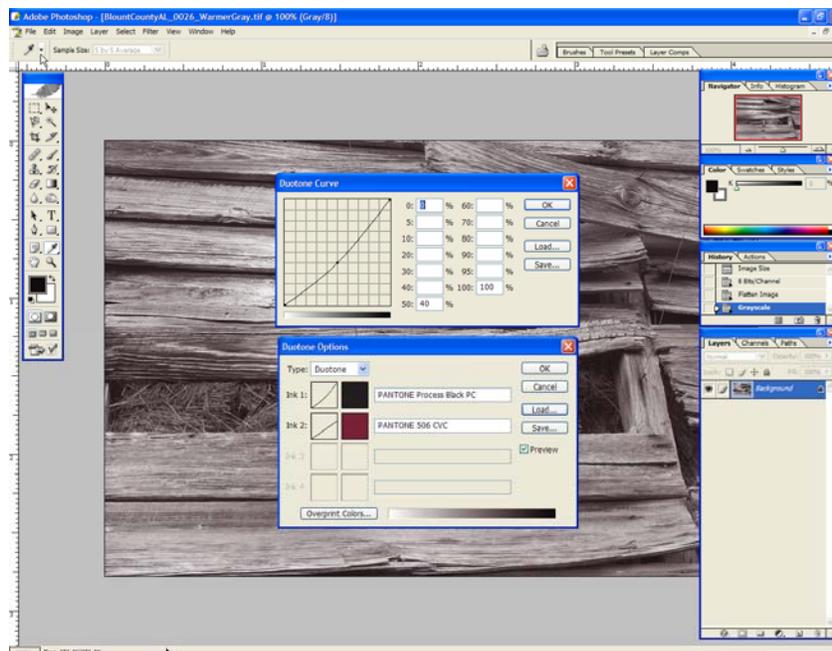
The button labeled “Overprint Colors...” opens Overprint Colors dialog. **Figure 7** is an example from a selenium quadtone. With a duotone, only 1+2 is available. Tritones add

1+3, 2+3, and 1+2+3. You can click any of the overprint color patches to make any necessary changes.



**Figure 7.** The Overprint Colors dialog shows you how the inks will interact.

Converting a monochrome image to a duotone is usually an iterative process, one that can require considerable experimentation. Once you select a color, you need to carefully adjust the duotone curve. Fortunately, you can watch the effect on your image as you choose colors and adjust their individual curves.



**Figure 8.** The Duotone Options dialog and Duotone Curve dialog for a burgundy-colored duotone. The image will change as adjustments are made.

You can also use the Info Palette to monitor changes. As you move the cursor over the image, the Info Palette will display both the “before” and “after” values. If you set on of the Color Readouts to Grayscale, you can keep your eye on the ink density. Otherwise,

try Total Ink. You want to extend the dynamic range of the image *without stopping up the shadows*.

## **Printing Duotones, Tritones, and Quadtones**

After you spend considerable time finessing your duotone curves, the printed result from your inkjet printer could differ a lot from your expectation. Printing a duotone, tritone, or quadtone is a tricky business.

If you send a duotone mode image to a desktop printer and print it like any other image, the result is not a duotone. It is a pseudo-duotone. Your duotone will get converted to RGB before it is sent to the printer; then the printer will do its operations on the RGB image.

Adobe Photoshop does not support duotone soft proofs. You will need to convert the image to RGB or CMYK first, if you want to use View|Proof Setup. The conversion to RGB or CMYK will invoke your color settings. This can cause subtle or profound changes in your image, depending on those settings. Sometimes a Curves adjustment layer can suitably restore the image. Once the image is in RGB (or CMYK), you can use color management, media profiles for your printer, etc. to reduce the unpredictability of the final result.

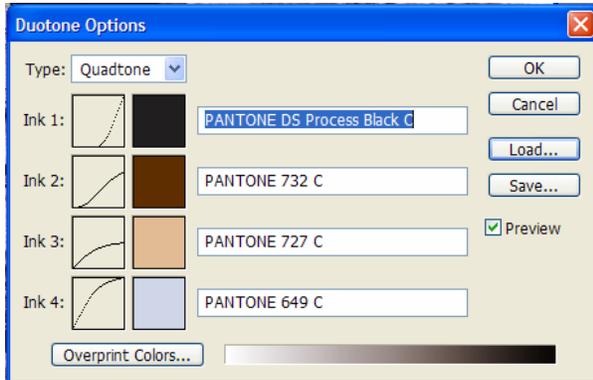
Some photographers use special quadtone ink sets for their fine art B&W images. Epson 2200 owners can choose from several manufacturers and some of those manufacturers offer quadtone ink sets in a variety of hues. Media profiles for these solutions can improve the soft proof process and reduce paper and ink waste during hard proofing.

You can also use an inkjet printer and OEM ink sets to print a true duotone, tritone, or quadtone. This is not a task most of us will want to try. Each color selected on the Duotone Options dialog will need to be printed separately by the printer. This requires a printer with sufficient registration accuracy. The Epson 2100/2200, for example, does have enough registration accuracy. To print each color separately, you will need individual channels for each color. A duotone has only one channel, so the quickest way to separate the inks into separate channels is to use Image|Mode|Multichannel. This will leave you with two channels for a duotone, three for a tritone, and four for a quadtone. The Split Channels command on the Channels Palette will take the channels and make a separate file from each. Start with the darkest ink and progress to the lightest. You will need to allow sufficient drying time between each pass through the printer. By the time your first quadtone emerges from the printer, you will appreciate why the process is reserved for expensive fine art books.

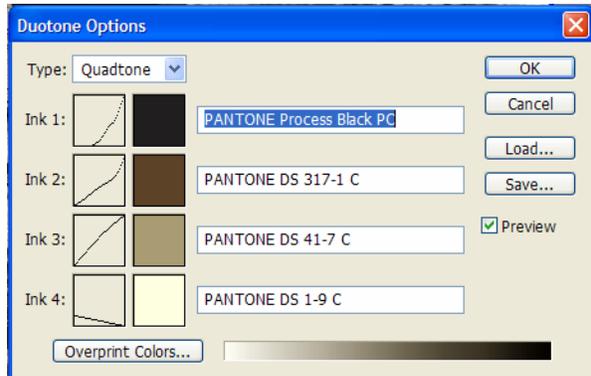
If you own a Postscript printer or you will be sending the file to a printer, you will likely want to save your duotone mode image as a .EPS file. If you load a Photoshop .PSD file into a page layout program, the likely result is an RGB or CMYK conversion. All your efforts will be lost.

## Some Duotone, Tritone, and Quadtone Recipes

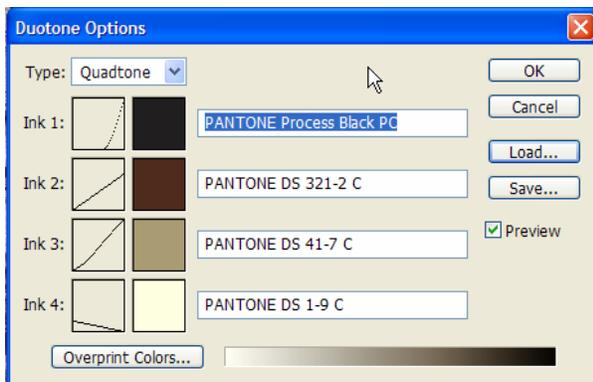
Below are some of my personal favorites for adding a bit of tone to a B&W image. You'll find these and dozens more in the TLR Toner action set.



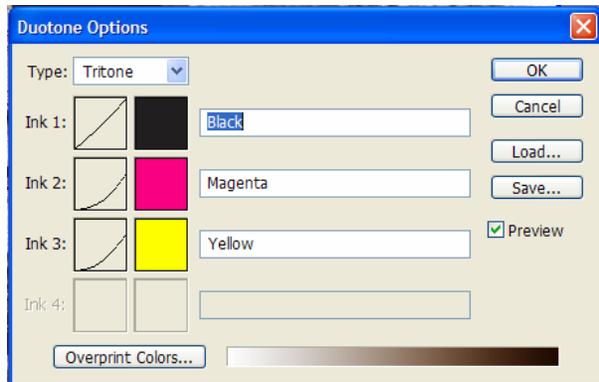
**Selenium Quadtone**



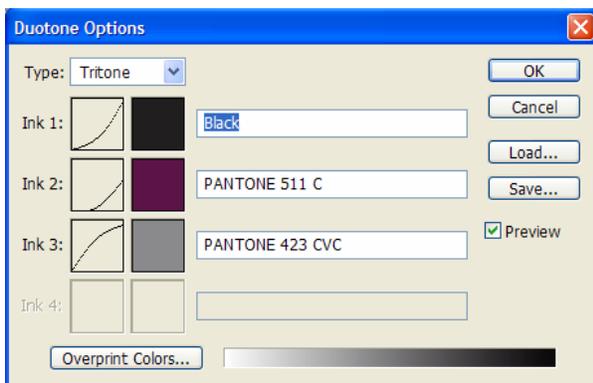
**Neutral Bronze Quadtone**



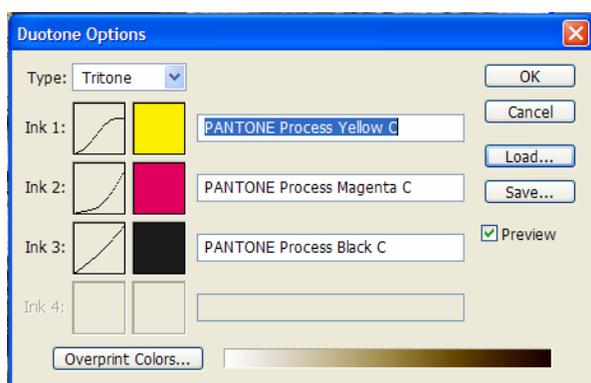
**Warm Bronze Quadtone**



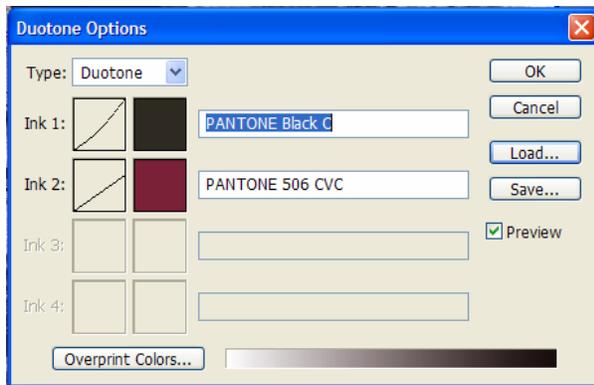
**Sepia Tritone**



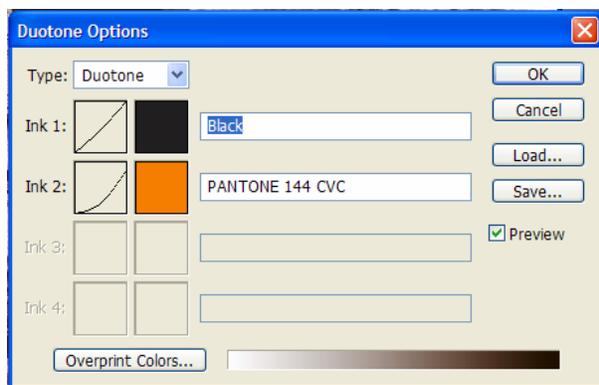
**Mauve Gray Tritone**



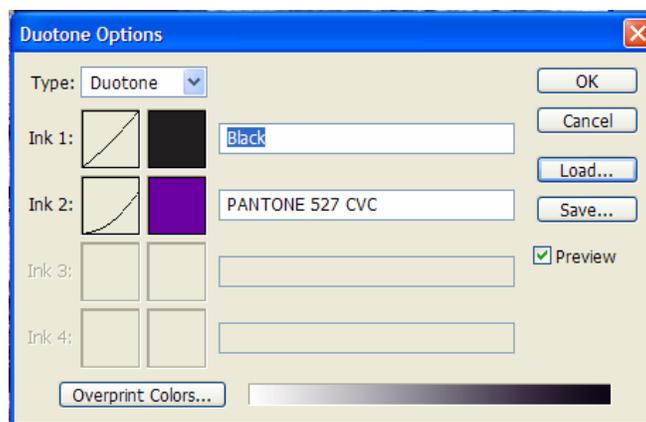
**Very Brown Tritone**



**Burgundy Duotone**



**Orange Duotone**



**Purple Duotone**

*Figures 9a-i.* Favorite quadtone, tritone, and duotone recipes.

## Conclusion

Many fine art photography books that reproduce B&W images use duotones, tritones, or quadtones. It is an expensive printing process. Photoshop makes it possible to get similar results with a desktop inkjet printer. Printing an image that has been meticulously adjusted with Image|Mode|Duotone or getting it ready for the Web is trickier than most articles and tutorials admit. Realize that your image will be converted to RGB (or CMYK) behind the scene, so be prepared for the tones in the image to shift slightly. You can apply a Curves adjustment or, if you are really brave and want the fullest experience, you can use Image|Mode|Multichannel and print your duotone in multiple passes.

You can use the duotone technique to add extra dimension to your B&W fine art images, apply a slight cast to warm or cool the neutrals, or even some really strong casts for sunrises and sunsets, etc.