TIFF vs PSD
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One area of discussion and debate on-line is that by Photoshop users who wonder if they should save their documents as TIFF or PSD. Lets take a look at these two document formats in detail to see if one is more ideal than the other and what options they provide.

TIFF (Tagged Image Document Format) is a very old and widely supported document format for storing photographic (Raster) image data. It was originally owned and controlled by Aldus but Adobe purchased that company many years ago so like PSD, Adobe controls this format. There are a number of different flavors of TIFF and it has many interesting capabilities and options. One advantage of TIFF over PSD is that it is an open specification. Other software products do not need to necessarily pay any licensing fees to Adobe to use it, unlike PSD, the native Photoshop document format. TIFF has undergone a number of revisions over the years although the latest incarnation, TIFF-6 hasn't been updated since 1992. Enhancements were made in 2002 by Adobe to specify a few compression options, notably ZIP and JPEG along with LZW. Adobe references these options as "Advance TIFF"

TIFF can store very simple or complex types of images. For example, you will see in Figure 1 that I can save a layered image created in Photoshop as a TIFF and have options for compression. However, like a PSD document, we don't know for certain if other 3rd party products will have access to the layers. In both PSD and TIFF, there's an option known as *Maximizes PSD and PSB file Compatibility*. This is always utilized when saving a TIFF but an option for PSD and set in the Photoshop General Preferences. Essentially, a copy of the entire layered document in a flattened state is stored within the document. This allows other products; both those by Adobe and 3rd party, to view the image composite. These applications may not necessary have access to the individual layers however. If you use this option, your document size grows due to this embedded, flattened version of the image. A TIFF and PSD document will roughly be the same size when this option is applied. If you are sure you will never work with any application other than Photoshop and you want the smallest document size possible, use PSD with the Maximize PSD Compatibility disabled (set to *Never*). Note this is not the best practice for archiving your data. Furthermore, even some Adobe applications like Bridge and Lightroom will require a flattened copy within the document for viewing so my recommendation is to have this always set as seen in figure 2. Since TIFF is widely supported in many applications, unlike PSD, working with layered documents will not be an issue once this flattened copy is automatically saved in the TIFF. Not all TIFF readers supported layered documents but all modern readers should have no issues reading the single, flatted copy. Note that depending on the layers and their blending modes, the flattened version may have a slightly different color appearance compared to the layered document seen in Photoshop. This has always been somewhat of an issue for Photoshop users who often report that when flattening a layered document, the color appearance changes. Photoshop has to calculate all the layer data and blending modes differently when producing a flattened copy of the document.

One limitation of TIFF (and PSD) is it has a limit of 30,000 pixels or a maximum document size of 4 gigs. Because more photographers are working with very high-resolution devices or stitching multiple images, Adobe has a variant of PSD known as PSB, which can store images as large as 300,000 pixels. Otherwise, TIFF, PSD and PSB support all the options one can save within a document such as Alpha channels, annotations and of course layers as well as 16-bit RGB, Lab and Grayscale data.

If you save 16-bit TIFF documents, the JPEG compression radio button will be grayed out since JPEG can't support this bit depth. The other option, and the one I recommend if your goal is to produce a smaller TIFF (for back-up to DVD as an example) is LZW (Lempel-Ziv-Welch) which does support the saving of high bit (16-bit) TIFFs. The Zip option is even less supported and therefore, until Adobe updates the TIFF format to version 7 (someday?), LZW is probably your best choice in a compression scheme. If the size of a document isn't an issue in your workflow, save a TIFF with no compression. This will allow you to open and save the TIFF far faster than using either JPEG or LZW compression.

The bottom line here is that, PSDs with the File Compatibility checked and layered TIFFs are essentially equal with the TIFFs capable of being saved as smaller documents at the expense of slower opening and saving. Compressing and decompressing take a bit of a speed-hit as you would expect. Another benefit of TIFF is it's an openly documented format and far more commonly supported in other applications than PSD, which is a proprietary format.

When saving a TIFF out of Photoshop, you have several options; fortunately these settings are "sticky" meaning that once you set them, they will remain that way until altered. Here's a rundown of what the settings do:

**Byte Order**: *Mac or PC*? Well that's a debate that will continue on, but in this case, pick PC since the Mac will have no issues with this Byte order but the ancient PC software may.

**Pixel Order:** *Interleaved* is supposed to be a more common way of saving a TIFF and the default, traditional method used by Photoshop from day one. The *Per Channel* option is supposed to be a little faster at reading and writing the data. The dialog does give some idea of what the differences are; the pixel order is the way color information is written in the document, so with interleaved, each pixel is written in the RGB sequence (RGB, RGB, etc) while Per Channel is written in that order (RR, GG, BB etc).

**Save Image Pyramid**: This is an option few need to worry about as few modern applications utilize this method of storing multiple resolution levels within a single document. If you're old enough to recall Kodak PhotoCD, FlashPix or Live Picture's IVUE format, you have experienced formats that used multiple resolution levels within a single document. TIFF also supports this mode and hence, its an option in the Save dialog. You probably have no reason use it however.

**Layer Compression:** How should the layer data be compressed? Note that with layers, it's the pixels themselves, not the transparency that accounts for the increase in document size. So if you have a 2nd layer that is all pixel data, it will take up far more space than a layer that has only a small part of image data, surrounded by transparency (the checker board). An Adjustment layer is tiny, its essentially metadata describing a correction. *RLE* (Run Length Encoding) uses a lossless compression much like LZW on your layers. Or you can use *Zip* for an even smaller document but at the expense of speed in saving and opening the document. Both greatly aid in keeping the resulting TIFF with backwards compatibility to a manageable size. Your call here, faster speed or smaller documents?

Figure 1. Here you see the various options for saving a TIFF document and the associated warning dialogs, which you can turn off for future use (Don't show again check box).
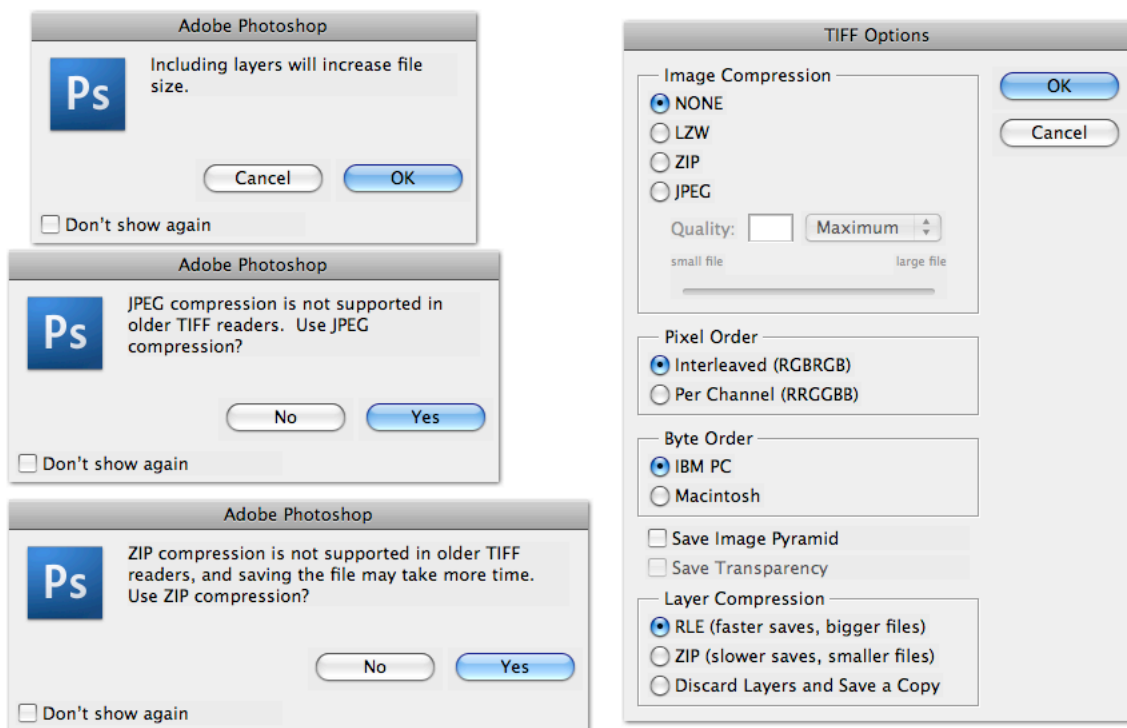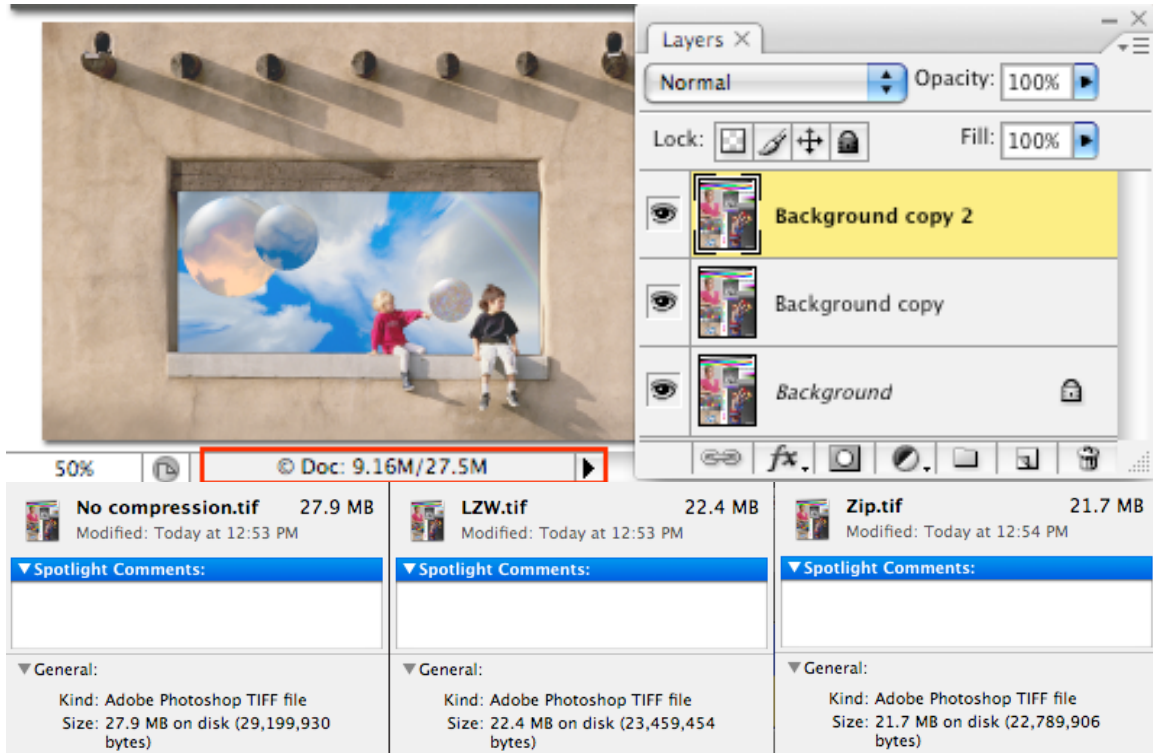
Figure 2 and 3. Figure 2 shows a document with three layers. Each layer is identical and contains no transparency. In Document size (red), Photoshop provides the estimate of the document size flattened and with the current layers in memory, roughly 3X in this case. Figure 3 shows the actual document size on my drive after using no compression, LZW and TIFF.