Is one file format superior to the other? It's largely a matter of compression and compatibility.

# PSD vs. TIFF

Photoshop users often debate whether to save their images as PSD files or TIFFs. Is one of these two document formats better than the other, and what options does each provide?

TIFF (tagged image file format), originated by Aldus Corp., is an old and widely supported format for photographic—raster—image data. Years ago, Adobe Systems gained ownership and control of the TIFF format with the purchase of Aldus.

The TIFF format has many interesting capabilities and options, as well as a number of different flavors. Unlike PSD, the native Photoshop format, TIFF is an open specification, so other software makers don't necessarily have to pay licensing fees to use it. TIFF has undergone a number of revisions over the years, but the latest incarnation, TIFF-6, hasn't been updated since 1992. Adobe did make some enhancements in 2002 to specify a few compression options, notably ZIP and JPEG along with LZW. Adobe refers these options as "Advanced TIFF."

TIFFs can store simple or complex images. Saving a layered image created in Photoshop as a TIFF gives you options for compression (**Figure 1**), but you can't be certain that third-party software will have access to the layers. Both PSD and TIFF have an option known as *Maximizes PSD and PSB File Compatibility*, which is always used when saving a TIFF and optional for PSDs, that's set in the Photoshop File Handling Preferences.

Essentially, this option stores a copy of the entire layered document in a flattened state within the document file. On the upside, this allows other applications to view the composited image, but on the downside, it increases the size of the document. A TIFF document will be roughly the same size as a PSD when this option is applied. If you know you'll never work on an image in any application but Photoshop, and if you want to store the file in the smallest size possible, disable PSD with the Maximize PSD Compatibility (the Never setting). This isn't the best practice for archiving your data, though. Even some Adobe applications like Bridge and Lightroom require having a flattened copy within the document for viewing, so my recommendation is to use the settings in **Figure 2**.

Not all TIFF readers support layered documents, but all modern readers should be able to read a single, flattened copy. Depending on the layers and their blending modes, the color in the flattened version might have a slightly different appearance from the color in the layered document viewed in Photoshop. This has long been a problem for Photoshop users, who report that the color appearance often changes when they flatten a layered document; Photoshop has to calculate all the layer data and blending modes differently when producing a flattened copy of the document.

Both TIFF and PSD can contain a maximum of 30,000 pixels, or 4GB. Adobe's variant of PSD format, PSB, can contain as many as 300,000 pixels, which will accommodate extremely high-resolution capture and stitched images. TIFF, PSD and PSB support every option you can save within a document, including alpha channels, annotations and layers, as well as 16-bit RGB, Lab and grayscale data.

You can't save 16-bit TIFF documents with JPEG compression because JPEG can't support this bit depth. If your goal is to produce a smaller TIFF (for DVD backup, for example), I recommend LZW (Lempel-Ziv-Welch), which does support 16-bit TIFF saves. The ZIP option is even less widely supported, so until Adobe updates the TIFF format, LZW is probably your best compres-
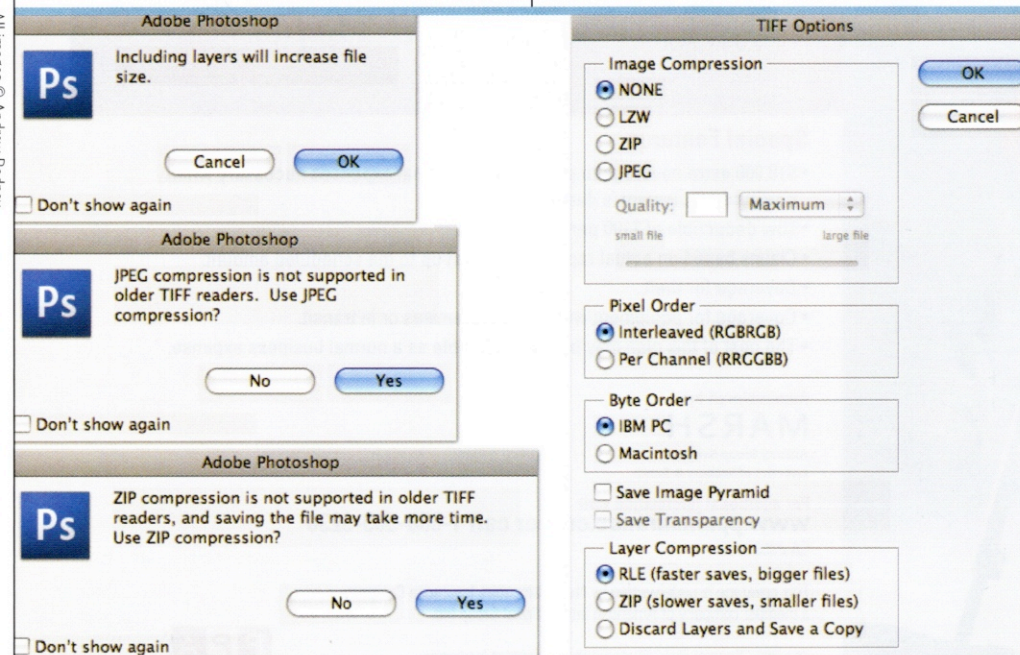


Figure 1. The various options for saving a TIFF document and the associated warning dialogs, which you can turn off for future use (Don't Show Again checkbox).

sion choice. If the size of documents isn't an issue in your workflow, save files with no compression. This allows you to open and save a TIFF far faster than either JPEG- or LZW-compressed files.

The bottom line, PSDs saved with the File Compatibility checked and layered TIFFs are essentially equal, though TIFFs can be saved as smaller documents. Compressing and decompressing eat a bit of speed, as you'd expect. As an openly documented format, TIFF is far more widely supported than the proprietary PSD format.

When saving a TIFF from Photoshop, you have several options available through "sticky" settings, meaning that the setting you make will remain until you change it. Here's a rundown of what the settings do:

**Byte Order**: *Mac or PC?* Well, that debate continues, but in this case, pick PC because a Macintosh will have no problems with this byte order, but ancient PC software may have problems with Mac.

**Pixel Order:** Pixel order is the way color information is written in the document, *Interleaved* is supposedly a more common way of saving a TIFF, and it's been the default method in Photoshop from day one. The *Per Channel* option is supposedly a little faster at reading and writing the file data. With Interleaved, each pixel is written in the sequence RGB, RGB, etc., while with Per Channel it's written in the sequence RR, GG, BB, etc.

**Save Image Pyramid**: These days, few applications use this method of storing multiple resolutions within a single document. You will likely never have reason to use it. TIFF does support this mode; hence, it's an option in the Save dialog.

**Layer Compression:** How should the layer data be compressed? With layers, it's the pixels themselves, not the transparent (checkerboard) part of the image file, that
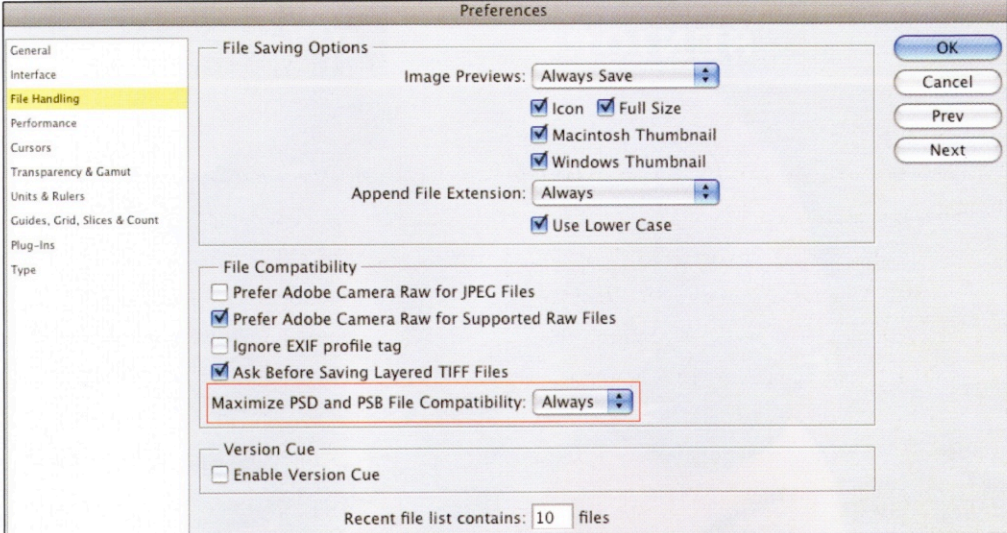


Figure 2: If you want maximum compatibility for your PSD or PSB files, use the settings above in the Photoshop File Handling Preferences (Photoshop > Preferences > General: File Handling).
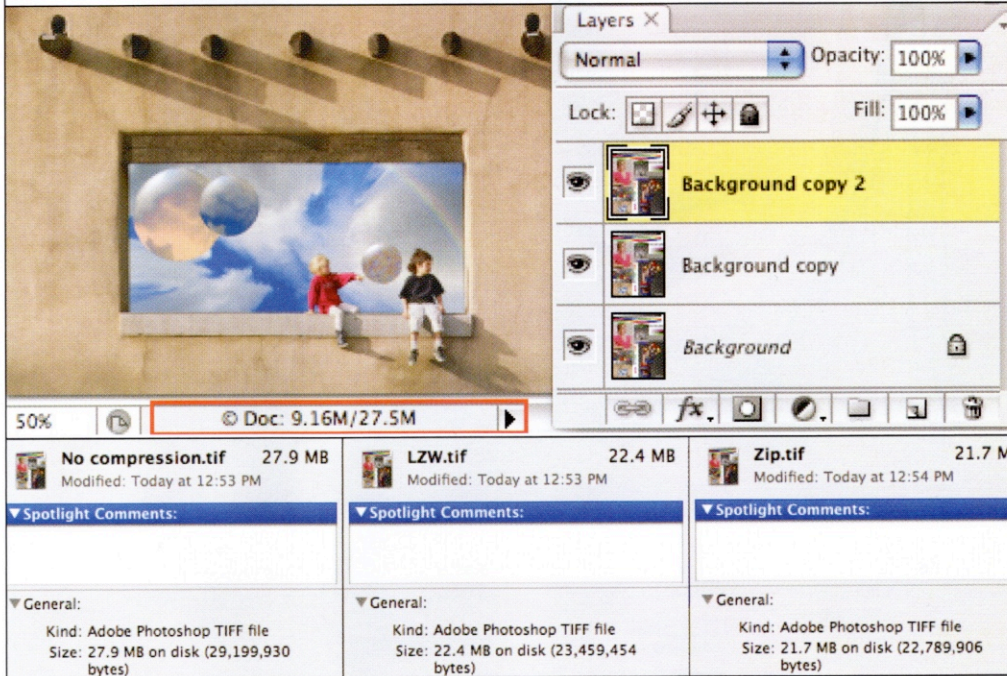


Figure 3. The image file in Figure 3 has three identical layers with no transparent areas. In Document Size (red), Photoshop provides an estimate of the size of the document flattened and with its layers, roughly 3X in this case. The boxes below it show the actual document size on my drive after using no compression, LZW and TIFF.

account for the size of a document. If you have a second layer that's all pixel data, it will take up far more space than a layer with a small amount of image data surrounded by transparency. An adjustment layer is tiny—essentially it's metadata describing a correction. *RLE* (run length encoding)

applies a lossless compression much like LZW to your layers. Or you can use *ZIP* compression for an even smaller document, but at the cost of slower saving and opening. Both methods greatly aid in holding down the size of the resulting TIFF with its backwards compatibility. ∎