



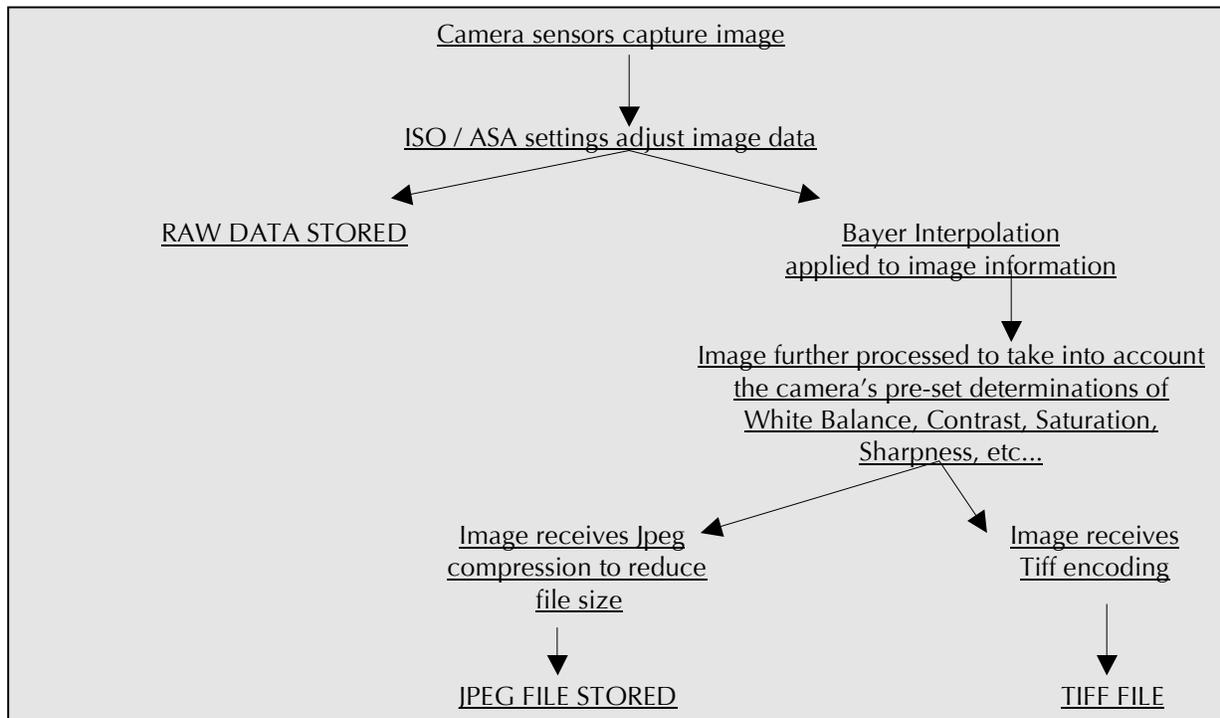
THE BLACK & WHITE PAPERS

SHOOTING IN RAW, TIFF OR JPEG

In the digital photography realm, you have many options that enable high quality image capture. Just like in traditional photography, you can control ISO, shutter speed, aperture and lighting. However, digital offers a wider range of controls that can enhance the image but often frustrate the photographer. With choices of image capture in RAW, Tiff or Jpeg or a combination of the three, you determine not only the speed of capture, but also its final quality. Then with further controls in the computer the options seem infinite. However, you must always consider the initial capture of the image data as it can severely limit your later options and image quality.

THE WAY A DIGITAL CAMERA STORES INFORMATION

There are so many digital cameras on the market today, that we cannot give even the briefest overview of them all. We can however, give you a short explanation of how every camera stores its captured information. All cameras have sensors with a series of three pixel combinations of red, green and blue that read the color of the light coming into the camera and assign that information to the appropriate pixel location. Then the pre-set ISO, akin to the speed of the "film" that you are shooting is applied to that captured information. This is called the RAW or unprocessed data. Here, things differ. Some cameras have the ability to store this RAW unprocessed file while other cameras must compress the images due to size issues. These compressions are stored as Tiff or Jpeg files.



RAW FORMAT

A RAW file is most closely akin to an unprocessed negative. When you capture in this mode, the camera stores every bit of information that the sensors pick up therefore creating large file sizes. However, since the camera is only storing and not actually processing the information, capture times tend to be fairly quick - depending upon the camera, of course.

The dynamic range of a RAW file can best be explained as its ability to capture tonal ranges, especially in shadow detail. The larger the file, the more information available in the printing process, thus the better the final product.

“PROCESSING” THE RAW FILE

Just like with traditional negatives, there is a great deal of manipulation that can be applied to the RAW file in order to correct for mistakes during the capture process. RAW files are proprietary to the individual camera makers and must therefore be converted to a common language readable by programs such as Photoshop. Any camera that has the capability of capturing in RAW mode will come with software to allow you to convert. You can also use Photoshop's **Camera RAW Plug-in**, which we have found to be an excellent program. We will use this program for the purposes of our discussion.

IMPORTING FILES

All cameras come with the capability of downloading your images to the computer's hard drive. Follow the manufacturer's directions to get the RAW files onto your computer. Then, we would advise you to immediately save a copy of the RAW files to a separate storage device for archiving purposes. Computers crash, discs corrupt, things happen – always err on the side of caution and if possible, make two separate copies of your files and store in separate locations.

CAMERA RAW PLUG-IN

Drag your downloaded files into Photoshop CS2, which will open **Camera RAW Plug-In** and allow you to make individual adjustments to each file before the file is converted into a Tiff or Jpeg. Camera Raw allows you to see your image before it has been processed and control the image as it is processed. As you will note, these are the conversions that the camera makes in Jpeg files before compression. The benefit of doing them in the RAW converter programs is that there are no compression issues to deal with and your file remains fully intact without degradation at the initial saving of the file.

SAVING AS A RAW .xmp FILE

If you want to send the Raw but edited file to Dalmatian, you will need to send up the .xmp file. You will first need to go into Camera Raw Preferences and set it to save the .xmp file separately. Dalmatian will make the other necessary changes to your file based upon your edits. You will not have to save an additional tiff file.

SAVING AS A 16-BIT TIFF

Shooting in RAW also gives you the capability of capturing and working on your image in the highest resolution and dynamic range available. Once you have completed your work in the conversion program, the file can be saved as either a 16-bit or 8-bit Tiff, or an 8-bit Jpeg. Your choice needs to be based on the final product you need. If you are going to be printing large custom prints that need Photoshop work, then we suggest you save your files as 16-bit Tiffs. Tiff files are not compressed and therefore quite large, however, they do not degrade each time you save the file. 8-bit Tiffs are appropriate if you are will be doing little to no corrections but want archival files. Again, Tiffs do not degrade with each save. 8-bit Jpegs are well suited for downloads or web based use.

TIFF FORMAT

The Tiff file is an uncompressed file format for digital images. These files receive “processing” in camera that includes adjustment in white balance, sharpness, contrast, density, and color management. These files are mapped into their color space at this point. These adjustments are predetermined by the camera whereas in RAW, the photographer has control of these adjustments. Tiff files tend to be larger in size (8-10x larger than Jpegs) and therefore are slower to transfer. The benefit of a Tiff file is that it does not lose quality saving of the file. Therefore, files that receive manipulation or must be used at higher output sizes need to be captured as or initially saved as Tiff or RAW files. Tiff files can be stored as either 8-bit or 16-bit.

JPEG FORMAT

JPEGs’ greatest attribute is their small file size, often 3-10 times smaller than that of Tiff or RAW files. Because they are so small, they are also quite fast to transfer and download and they save a tremendous amount of space on memory cards, hard drives, and other storage devices. However, there is, of course, a trade-off. In order to reduce their size, Jpegs were purposefully created to be *lossy* – each time you save a jpeg file, pixels are thrown away so that the next time you open the file, it is slightly different than it was before. The dynamic range of a Jpeg is considerably smaller than that of the RAW files. Jpegs are 8-bit files, which assign one of 256 tones to each of the pixels. Since there are few tones available, the lossy compression directly affects the tonal values in the shadow area causing stepped renderings between tones. This is sometimes called “pixilation” or the “jaggies”.

A Jpeg receives two separate applications in-camera. The first is image processing which is dictated by the camera default or custom settings. The most common are Bayer interpolation, white balance, contrast, sharpness and saturation. At this point, the image is mapped into its color space. The automatic processing applied to each image reduces the amount of work that you must perform post-capture but once these processes are applied, there is very little that can be done to alter them without harming the final product. The second application is the *lossy compression* discussed above. As Jpegs are saved, information is discarded. You can vary the compression of a Jpeg in order to limit its lossy quality by setting the values higher - the smaller the file size, the greater the compression and the greater the degradation. ***Remember, every time you save the jpeg, you are throwing away valuable information and losing quality in your image!***

CONCLUSION

Any photographer who wants full control of their images should shoot RAW. RAW format maintains the truest rendition of the captured information, has the greatest dynamic range and most detail, and is the only format available allowing the photographer to produce 16-bit Tiff files that have not been compressed or lost data. Finally, RAW allows the photographer the ability for post exposure processing, which is vital for the control photographers have always striven for in their images. Jpegs are specifically for small, uncorrected prints or web-based applications where compression and degradation may be of little concern. Jpegs are also a useful tool if space is of major concern. If possible, however, you can avoid the space issue by carrying several memory cards. Consider your final product and determine whether space, speed or image quality is the concern and decide from there.