

RAW Files

RAW = Greyscales

- RAW records the luminance value of each cell in the sensor array
- RAW is information *about* each cell
- RAW files are not images
- RAW must be assembled to create an image

Components of RAW

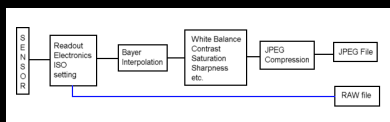
- Pixel Information plus
- Metadata
 - File data - dates, dimensions, file size, etc
 - Exif data - camera data, ISO, shutter speed, aperture, white balance, flash, etc
 - IPTC data - Ownership, copyright, keywords, etc
 - XMP Camera Raw (processing) data - tonal and colour adjustments, sharpening, etc

Variations with metadata

- Metadata carried may vary with different file formats
- Also Raw processing data may be contained in separate *Sidcar* files, .XMP

For example: DSC0123.nef
DSC00123.xmp
DSC0124.nef
DSC00124.xmp

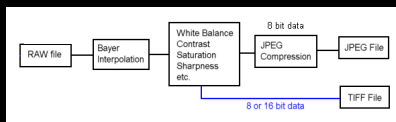
Camera Processing Cycle



RAW Software

- Processes RAW information in a computer instead of using in camera processing
- This allows the user greater control of the final image than is possible through the camera software

Raw Processing



Software Function

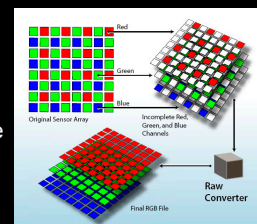
- Bayer Interpolation
- White Light Balance
- Colorimetric Interpolation
 - Maps to CIEXYZ
- Tone Mapping
- Noise Reduction, Anti-aliasing and Sharpening

Possible Software Options

- Adobe Photoshop Lightroom
- Adobe Camera Raw (ACR) with Photoshop and/or Bridge
- Apple Aperture
- Capture One
- Bibble
- Iview Media Pro / Expression Media

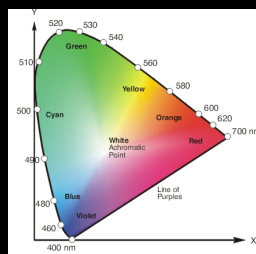
Bayer Interpolation

- Demosaicing information from adjacent cells in camera chip assembled to image pixels



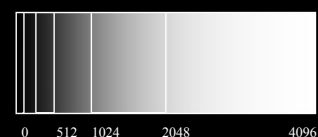
Colour Mapping & White Point

- A neutral white point is established
- Colours are then assigned standard numeric values on the CIE scale



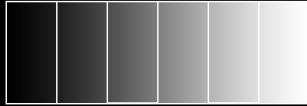
Linear Capture (12 bit)

- Camera's response to light

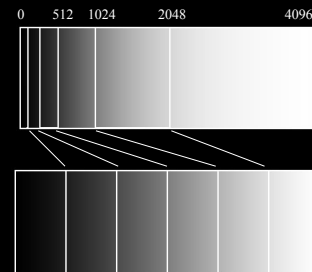


Gamma Gradient

- Eye's response to light



Mapping RAW to Output File

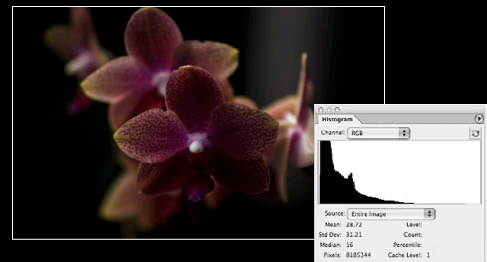


Responses in Practice

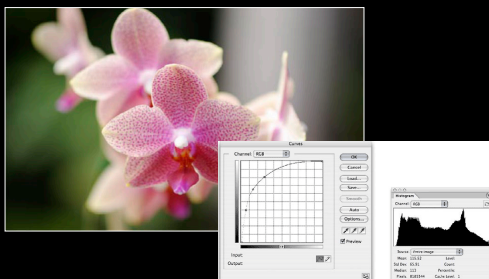
- The Camera
- The Eye



RAW Histogram

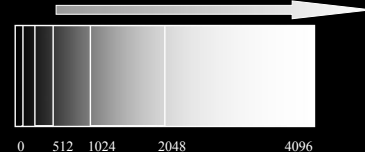


The Effect of Processing



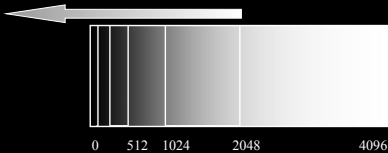
Over Exposure

- Risks *blowing out* the whites
 - Clipping the Highlights
- Blacks are recorded in the mid-greys



Under Exposure

- Significant waste of pixel information
One stop = loss half of all potential data
- Risk of noise in mid tones and shadows



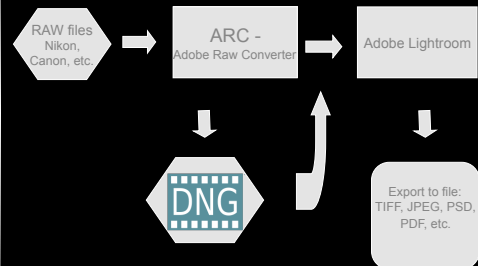
Rule of Thumb

Expose for the Highlights
and
Process for the Shadows

Limitations of RAW

- Proprietary RAW formats
 - Nikon - .Nef
 - Canon - .Crw, Cr2
 - Fuji - .Raf
- Dependence on manufacturer's software
- Processing Time
- Storage Size and Hardware
- Longevity – Archival Accessibility

Adobe Digital Negative (DNG)



Advantages of DNG



- Archival standard
- Access to a wide range of RAW software
- No data loss in conversion from original file
- Verifies the file integrity during conversion
- Original image data is unaltered
- Preserves Metadata:
 - Exif, IPTC & XMP processing information, etc
 - Avoids need for .XMP sidecar files



Information @:
www.fixerstain.com