

imaging 1

Glossary of Terms

Aberration –Purple, green, cyan, and red fringing or chromatic aberration is caused by the glass of the camera lenses and sensor micro lenses that break down light into its components.

Angle of View –See focal length

Anti-Aliasing -smoothing of jagged edges on diagonal lines created in imaging programs.

Aperture (F-Stop) – Refers to the “diaphragm” of a lens, which is an adjustable opening that controls the amount of light falling onto the film or sensor. F-stop-a fraction. This also helps to increase and decrease depth of field.

Aperture Priority (AV) – This is a semi-automatic mode whereby you can set the aperture so that the camera will automatically determine the best shutter speed.

Artifact -a flaw in a digital image.

Batteries –NIMH “Nickel Metal Hydride” rechargeable are the batteries to use if the camera uses AA. They have no memory effect and have a much longer shooting capacity than Alkaline or NiCd. Lithium AA batteries will last quite long but are not rechargeable and expensive. Li-ion “Lithium ion” is a proprietary battery and is more compact, lighter, has no memory effect, and is usually shipped with the camera. Their chargers are also usually dual voltage 110-240v for world travel. These batteries are however expensive and not as convenient.

Blooming -Blooming occurs when the charge caused by additional photons will overflow (have no effect on the pixel value) over to surrounding pixels, brightening or overexposing them in the process.

Bounce Flash –Accomplished by the use of an external flash. This method of illuminating the subject can soften the harsh flat light as direct flash produces.

This will almost always eliminate background shadows and red-eye.

Brightness -the level of light intensity. One of the three dimensions of colour.

BMP –Image file format for bitmapped images used in Windows, supports RGB, indexed colours, greyscale, and bitmap.

Buffer –An area that data is stored temporarily. Used to absorb differences of speed between operational devices. The buffer stores information so that the main program can continue operating.

Burst -Burst or Continuous Shooting mode is the digital camera's ability to take several shots immediately one after another.

Burning –Used to locally adjust exposure. This adjustable tool adds or darkens exposure.

Cache –An area of information storage set aside to keep frequently needed data readily available.

Calibration –The process of adjusting a device, such as a monitor, printer, or scanner, so that it works consistently with each other. Calibration and Profiling ensures that the monitor displays the correct Gamma and that its settings are optimized to maximize dynamic range and colour reproduction while keeping white, black, and gray neutral. e.g: Adobe Gamma, Monaco Colormeters.

Canvas & Borders–The adjustable frame that can be created around the final image through image editing software. Many different frames can also be added to the final presentation.

Card Reader –A portable external or stationary internal peripheral drive that can be used to download storage card to the computer.

CCD –“Charged Coupled Device” A tiny photocell that is made very sensitive by

carrying an electrical charge before it is exposed.

Channel –Part of an image as stored in the computer. Commonly, a colour will have a channel allocated to each primary or process colour.

Cloning –The process of duplicating pixels from one part of an image to another.

CMOS –“Complimentary Metal Oxide Semiconductor” energy saving design of Semiconductor that uses two circuits of opposite polarity.

CMYK –Cyan, Magenta, Yellow, & (Key) Black. The four colour process used for printing.

CF-Compact Flash Card –One of the four most commonly used kinds of removable storage cards.

Compression –Technique used in reducing the amount of space that a file occupies, by removing redundant data.

Contact Sheet – An index print or layout of a number of thumb nailed images on one sheet of paper.

Contrast –The range of tones across an image from highlights to shadows.

CPU –“Central Processing Unit” The processing and control center of a computer.

Cropping –Delimiting an area of an image. Cutting out unwanted areas when resizing. This can change your ratio size of the image.

Cursor –Symbol with which the user selects and draws on screen.

Copying, Cutting & Pasting –Procedure in graphics for copying or deleting part of an image and pasting it to another.

Depth of Field – This is the area of acceptable sharpness. This can be

adjusted by f-stop, focal length, and distance to the subject. Digital rangefinders have a more extensive depth of field due to the size of the CCD. Imaging Software can also be used to change depth in images by use of filters such as Gaussian blur and other techniques.

Device –Hardware unit that handles data, such as a scanner, printer, or portable storage.

Digital Zoom –A false zoom effect used in most rangefinder digital cameras. Information from the CCD is enlarged with interpolation. See “optical zoom.”

Digital Tablet –A flat rectangular board with electronic circuitry that is sensitive to the pressure of a stylus. Connected to the computer, it is configured to represent the area of the desktop screen. e.g: Wacom

Dodging – Used to locally adjust exposure. This adjustable tool adds or lightens exposure.

Download –Sending data files from one source to another. e.g: the camera to a computer, card reader to a computer.

DPI –“Dots Per Inch” a measure of resolution in half tone printing. See PPI

Drag –Moving an icon or a selected image across the screen by keeping the mouse button pressed.

Driver –Software that sends instructions to a device, such as a camera connected to the computer. If using Windows XP or Newer Mac OS, the driver is not necessary.

Dye Sublimation Printer –A colour printer that works by transferring dye images to a substrate by heat, to give near photographic quality prints.

Dynamic Range – The range of tones that an image device can distinguish. This is affected by the sensitivity of the hardware.

EPS –“Encapsulated Postscript Image” Image file format developed for postscript files or object orient graphics as in draw programs.

EXIF/Metadata –Besides information about the pixels of the image, most cameras store additional information such as the date and time the image was taken, aperture, shutter speed, exposure, and most other camera settings. These data, also known as Metadata are stored in a “header.” A common type of header is an EXIF header.

Feather –Digital fading of the edge of an image.

File Formats – the method of writing and storing a digital image. Formats commonly used for images. JPEG, TIFF, RAW, GIF, and BMP.

Fill Flash –This Setting overrides the Auto Flash setting on the camera. This useful setting helps in balancing foreground and background light. If subject is backlit at all, (e.g: sitting inside in front of a bay window) the fill will illuminate the subject reducing the silhouette effect. This mode will also help in reducing shadows, muted light & colour on outdoor subjects.

Filter –Two types. First. A thin glass optical attachment that is added to the front of a lens which alters colour, sharpness, tones, and quality of light entering the lens. Second. Imaging software included in an image editing program that alters some image quality of a selected area. Others create effects unique to digital photography.

Focal Length –The camera lens projects part of the scene onto the sensor. How much is projected depends on its focal length. Wide-angle lenses have shorter focal lengths (subjects can be distorted and background tend to get separated from subjects with a increased depth of field) and larger fields of view; telephoto lenses have a longer focal length (subjects and backgrounds tend to get more stacked together and depth of field is increased) a narrower field of view. APS-digital SLR sensors typically have a crop factor of 1.5 or 1.6 to 35mm lenses (multiply 1.6 to existing 35mm focal length)

Fringing –A usually unwanted border effect to a selection, where the pixels combine some of the colours inside the selection and from the background.

Gamma –A measure of the contrast of an image, expressed as the steepness of the characteristic curve of an image. Calibrate the monitor with Adobe Gamma in the Control Panel.

Gigabyte –Approximately one billion bytes. Actually –1,073,741,824.

GIF – “Graphics Interchange Format” Image file format developed for bitmapped images up to 256 colours.

Grid Screens – These framing guides are displayed on the LCD monitor or viewfinder to allow for more accurate framing of horizontal and vertical lines.

Grayscale –A sequential series of tones, between black & white.

Histogram – A map of the distribution of tones in an image, arranged as a graph. The horizontal axis is in 256 steps from black to white, and the vertical axis is in the number of pixels. Darks to the left, whites to the right.

Hue –A colour defined by its spectral position: what is generally meant by “colour” in lay terms

Icon –A symbol that appears on screen to represent a tool or file.

Index – In a database. An internal table that speeds up searches.

Interpolation – Bitmapping procedure used in re-sizing an image to maintain resolution. When the number of pixels is increased, interpolation fills in the gaps by comparing the values of adjacent pixels.

ISO – Conventional film comes in varying sensitivities. The lower the sensitivity (100), the finer the grain and more light needed for the image, the higher the sensitivity (400) the grainier the film and less light needed. Digital cameras have an ISO rating indicating their sensitivity as well. Usually from 50-800 and some to 3200 ISO. As the ISO is increased, the output of the sensor gets amplified, but this can also amplify the grain or “Noise.” This sensitivity varies in camera models. There are a few image editing programs that can try to reduce noise in images.

JPEG –“Joint Photographic Experts Group” A system for compressing images. Developed as an industry standard by the International Standards Organization. Compression ratios are typically between 10:1 and 20:1, although “lossy” (but not necessarily noticeable to the eye)

Kilobytes(KB) – Approximately one thousand bytes -actually 1,024

Lasso – A selection tool used to draw an outline around an area of the image.

Layer – One level of an image file, separate from the rest, allowing the image to be composed of different elements.

LCD – “Liquid Crystal Display” Flat screen display used in digital cameras and some monitors. A liquid crystal solution held between two clear polarizing sheets is subject to an electric current, which alters the alignments of the crystals so that they either pass or block the light.

Light Metering – Spot, Center Weighted, and variations of Matrix metering are most common. Spot metering measures the light in a specific spot of the scene you point at. Center Weighted puts emphasis on the center of the scene 80% center –20% outside. Matrix metering divides the scene into a grid and, based on the amount of light in each area, the camera decides the best exposure using its internal algorithms.

Lossless –Types of image compression in which no information is lost, and so most effective in images that have consistent areas of colour and one. For this reason, not so useful with a typical photograph.

Lossy – Type of image compression that involves “loss of data,” and therefore of image quality. The more compressed the image, the greater the loss.

Luminance – Brightness in a particular direction.

Macro – This mode allows the camera to shoot at extremely close distances. Due to the digital cameras small sensor sizes compared to 35mm cameras, many digital

rangefinders come with excellent macro capabilities without need for extenders and converters. Depth of field is reduced greatly in macro. A tripod is ideal for ensuring sharp images. Flash at this close distance can be tricky and is advised to be turned off, manually set or an external Ring Flash used.

Manual (M) –In full manual mode, aperture and shutter speeds are selected independently. This allows full creative expression with regards to exposure.

Megabyte (MB) –Approximately one million bytes. Actually –1,048,576.

MemoryStick –A memory card standard set by Sony. Only drawback is only Sony and select few other manufacturers use it.

Mid tone – The parts of an image that are approximately average in tone, midway between the highlights and the shadows.

Noise – Random pattern of small spots on a digital image that are generally unwanted, caused by non image-forming electrical signals.

Optical Image Stabilizer (OIS) – This gyro sensor is used to detect jitter. A dedicated lens block moves to direct the light straight to the center of the CCD, compensating or counteracting for this jitter. In this way, the full CCD can be used. There is almost no loss in image quality.

Optical Zoom –The magnification between the minimum and maximum focal length of the lens. Optical zoom is the “true” zoom resulting in no pixelation or degradation

Peripheral – An additional hardware device connected to and operated by the computer, such as a drive or printer.

Perspective Control – Perspective adjustments are often necessary in architectural images with a lot of straight lines. Selective image editing software allows this correction especially with the distortion and conversion effect of wide angle lenses.

Pixel – The smallest unit of a digitized image. The square screen dots that make

up a bitmapped picture. Each pixel carries a specific tone and colour.

PPI – A measure of resolution for a bitmapped image.

Processor – A silicon chip containing millions of micro switches and algorithms, designed for performing specific functions in a computer or digital camera. E.g: Canon –DIGIC, Panasonic –VENUS

Ram –“Random Access Memory” The working memory of a computer, to which the central processing unit (CPU) has direct, immediate access. Suggested for imaging: 512mb-1gb of RAM.

RAW- This file format is a very powerful and gives the photographer the most flexibility than any other imaging file format. Regarded as the “True Digital Negative.” Unlike JPEG and TIFF, -RAW is not an abbreviation but literally means Unprocessed. A RAW file contains the original image information before in camera processing.

Pros: -The most powerful and flexible format.
-36 bit potential at half the size of 24 bit Tiff images.
-Faster camera operation.
-No JPEG compression artifacting.
-The ability to modify image through software without damaging original file.

Cons: -4 to 5 times the size of JPEG.
-Slows down camera operation.
-Additional processing needed on the PC.
-Not a universal format like JPEG and TIFF. Even RAW between camera brand can be different.
-Needs special software to read and open images. Being integrated into select new image editing software.
-Not for beginner.

Red-Eye Reduction–Red Eye occurs in low light. It is illuminated when the flash reflects the blood vessels from the back of the retina. The Red Eye Reduction mode stimulates the pupil to close down, reducing or eliminating the red. If possible, turning additional lights on, bouncing an external flash, are other effective ways to eliminate red eye.

Remote Capture – Allows you to control the camera with a computer via the USB or Firewire connection and store the images directly into the computer. It allows you to instantly review the images on the computer, useful for the studio shoots.

Remote Control – Allows you to control the camera via a remote control, usually infrared. Select flash systems have wireless remote operation that allows full or multi flash operation.

Rendering – The process of performing the calculations necessary to create a 2-D image from a 3-D model.

Re-sampling – Changing the resolution of an image either by removing pixels (lowering resolution) or adding them by interpolation (increased resolution)

Resolution -The resolution of a digital image is defined as the number of pixels it contains.

RGB –“Red, Green, Blue” The primary colours of the additive model, used in monitors and image editing programs.

Saturation – The purity of colour; absence of grey, muddled tone.

Secure Digital (SD) – A type of Storage card widely used in many digital cameras, PDA's, MP3 players, and PCS phones. This very compact storage media is presently the most common media card in use.

Sensitivity -Digital cameras have an ISO rating indicating their level of sensitivity to light. ISO 100 is the "normal" setting for most cameras, although some go as low as ISO 50. The sensitivities can be increased to 200, 400, 800, or even 3,200 on high-end digital SLRs. When increasing the sensitivity, the output of the sensor is amplified, so less light is needed.

Sensor Sizes -The sensor sizes of digital SLRs are typically 40% to 100% of the surface of 35mm film. Digital compact cameras have substantially smaller sensors offering a similar number of pixels. As a consequence, the pixels are much smaller, which is a key reason for

the image quality difference, especially in terms of noise and dynamic range.

Sharpening -There are two types of sharpness. Optical sharpness is defined by the quality of the lens and the sensor. Software sharpness will create an "optical illusion" of sharpness by making the edges more contrasty. Software sharpening is of course unable to create detail beyond the camera's resolution, it will only help to bring out captured detail.

Shutter Speed (TV) / Shutter Priority – A curtain that opens and closes with a certain Shutter Speed and determines when the exposure starts and stops. Shutter Priority (TV) is a semi automatic mode whereby you can set the shutter speed and the camera will automatically determine the best aperture. To “freeze action” –a high shutter speed is selected. To “add movement” or create motion in the image, a slow shutter speed is selected.

Slow Synch Flash –This setting sets the shutter speed at a lower setting to allow for more surrounding ambient light in the image. This can create more dramatic effects. The zoom of the camera should be set at a wider setting and the subjects relatively still to reduce shake.

Stitching/Photomerge –The ability to merge images horizontally, vertically or in poster format. Select cameras have this option within the menu. Ideal for creating very wide to 360° views of landscapes rooms. Select image editing programs allow this to be done directly in the software

SuperCCD – In which pixels are oriented as diamonds or octagons. Processing the read-out of each line of pixels requires some interpolation, but gives a resolution higher than the pixel count.

Terabyte - Approximately 1 trillion bytes. Actually –1,009,511,627,776.

TIFF -“Tagged Image File Format” A file format bitmapped for images. It supports CMYK, RGB, and greyscale files with alpha channels. It can use LWZ “lossless” compression. It is one of the most widely used standards for good digital software imaging.

Underwater Housings / Weather Resistance– Select models offer Underwater housings to allow the camera to go to depths of 4 meters or more. There are cameras that rate their bodies for weather resistance.
-Class 5 –Can be splashed on.
-Class 7 – Can be temporarily submerged in water. Ideal for adverse conditions.

USB- “Universal Serial Bus” An interface standard developed to replace serial and parallel ports. USB 2.0 is 40 times faster and is backward compatible to USB 1.1. Most new computers now ship with USB 2.0

USB Hub – a peripheral used to connect several USB devices at the same time. Hubs are now shipped as USB 2.0 configurations.

Vignetting – This is usually caused by stacking too many filters to the front of a wide angle lens. This causes dark corners to the image. This can be cropped out through image editing software.

Voltage Inverters –Allow AC only devices such as digital cameras and battery chargers to be used in vehicle.

White Balance & Colour Temp. - Different light sources have a different “colour temperature” and affect the colour of the scene. A digital camera's white balance feature compensates for this and is the equivalent of conventional filters and emulsions. This setting can be customized in select models and in image editing software for complete control.

WiFi –Wireless image transfers sends images directly from your camera to your computer or printer without the need for wires or cables.

XD(Extreme Digital) –XD storage cards as they are commonly called replace the Smartmedia cards that were used by Olympus, Fuji, and Toshiba. These cards are extremely small and have a potential for very high capacities. They are still used in only a few manufacturers cameras.