

GLOSSARY OF TERMS

Absorption: The blue filtering effect of water. Sunlight consists of all the colors of the spectrum. Water absorbs light selectively, one by one as depth increases, filtering out the warmer colors first, so that at depths of 60-70 feet, only hues of blue and green remain.

Ambient light: Available sunlight underwater used as a source of illumination. Also referred to as natural light.

Amphibious camera: A specially-designed camera that can operate both underwater and on land. All ports, caps, and controls are sealed with O-rings.

Angle of acceptance: The maximum angle at which light enters a particular lens. Also referred to as angle of coverage and angle of view.

Aperture: An adjustable opening which regulates the precise amount of light passing through the camera lens when the shutter is open. The size of the aperture is referred to as the f-stop.

Aperture priority: An automatic exposure system in which the photographer selects the f-stop and the camera automatically determines the corresponding shutter speed for a correct exposure.

Apparent distance: The refraction of light underwater creates a magnifying effect which causes objects to appear 25 percent closer than they actually are. A lens, like the human eye, sees and records apparent distance underwater.

ASA: An abbreviation for American Standards Association. See *ISO*.

Automatic exposure: When camera and strobe communicate electronically to create a correct exposure.

Backscatter: When suspended particles in the water are illuminated by light from a flash, they reflect the light back at the lens. The particles appear as specks or snow in the photograph or digital image.

Beam angle: The angle of a strobe's light beam, expressed in degrees.

Bit: Stands for binary digit, the smallest unit of digital information. Eight bits equals one byte.

Bitmap: A method of storing digital data that maps an image pixel out, bit by bit. The density of the pixels determines how sharp the image resolution will be. Most image files are bitmapped, which results in jagged edges that become apparent when you enlarge the image.

BMP: Bit-mapped Files, a standard Windows image format. Denoted as .bmp file.

Bracketing: The technique of taking several shots of the same image at higher and lower f-stops than the one indicated by the meter as a correct exposure.

Built-in meter: An exposure meter in the camera that measures ambient light and relays exposure data to the electronic controls in an automatic camera or to the photographer in the LED if the camera is manually operated.

Capacitor: The unit in the strobe that stores high-voltage electrical energy.

Card Reader: A computer peripheral device that accepts specific memory cards for quick and easy download of your images to your computer.

CCD: Charge-coupled device. The image sensor that separates the spectrum of color into red, green, and blue for digital processing by the digital camera. A CCD captures only black-and-white images. The image is passed through red, green, and blue filters in order to capture color.

Center-weighted metering: Light measured from the center of the viewfinder, most often a 12mm circle in the middle of the viewfinder. The remaining 25% is read from the outside.

Close down: To make the lens opening smaller to allow less light to strike the film.

Close-up attachment: A lens that is fitted over the normal camera lens to magnify the image and allow for sharply-focused photographs at a closer range.

CMY: Cyan, Magenta, Yellow. The three colors used to make all other colors. Used in printing to create the colors seen in a color print.

Color temperature: A rating of the relative blueness or redness of light expressed in degrees Kelvin (K). Noontime sunlight is about 5500°K. Daylight film is set at 5500°K. Most strobe light ranges from 5400-6000°K to emulate sunlight.

Compact flash card: A type of storage card, the equivalent of a floppy disc for digital cameras. The cards are rated MB, relative to their image storage capacity

Composition: The photographer's arrangement of the separate elements in the image area that are recorded.

Compression: Refers to image compression, especially important in digital video. because digital video files tend to take up a lot of storage space on the hard drive. Digital video can be compressed without impacting the perceived quality of the final product. Compressing video is essentially the process of throwing away data for things we can't perceive. JPEG photos, hardly compress at all because they're in a format that's tightly compressed to begin with.

Connector: A plug that joins the strobe's sync cord directly with the camera. Usually

called a sync connector.

Conversion lens: A lens mounted in front of another lens, to alter the focal length of the prime lens.

Cyberspace: The generic term for the total universe of all interconnected computers, a term coined by science fiction author William Gibson.

Depth of field: The area in front of and behind the subject that will appear in sharp focus. The range of depth of field is determined by aperture, focal length, and lens-to-subject distance.

Diaphragm: Also called the iris. A mechanism which controls the amount of light that reaches the film. It consists of overlapping leaves inside the lens that form a circular opening of variable sizes. *See Aperture.*

Diffuser: An adapter that spreads the light emitted from a strobe and increases its angle of coverage. It also warms the color temperature and decreases light intensity by approximately one-stop.

Digital image: bytes of data, created when light strikes electronic sensors, called a Charged Coupled Device, to transform light values of the scene into numerical form.

Digital zoom: A method of decreasing (narrowing) the apparent angle of view of a digital photographic or video image. Digital zoom is accomplished by cropping an image down to a centered area with the same aspect ratio as the original. Allows the user to zoom in on a subject beyond the range provided by the optical zoom lens. Digital zooming crops the center of the digital picture and resizes the new cropped picture to the size of the selected resolution.

Download: The process of transferring the digital image file to a computer hard drive.

Dynamic range: The ability of the camera's CCD to capture a full range of shadows and highlights.

Electronic flash: An electric light source that projects a burst of light. The light is produced from electricity which is stored in a capacitor and is used to energize a small amount of gas in a glass flashtube. *See Strobe.*

Elements: The components of a compound lens, consisting of several pieces of glass precisely ground and polished to different specifications.

Exposure: The amount of light regulated by aperture and shutter speed.

Exposure meter: Also referred to as a light meter. It measures the brightness of light available so as to calculate the correct aperture and shutter speed combination for a proper exposure.

Exposure mode: Camera operation, such as manual, aperture priority, shutter priority, that determines which controls you set for an exposure and which ones the camera sets automatically.

Fill lighting: The use of artificial light to enhance color and brighten shadows when ambient light is the primary source of illumination.

File format: The way an image is saved to a digital camera's memory. JPEG is the industry standard.

Film: Light sensitive material that records, in the form of an image, the patterns of light rays that have passed through the lens.

Filter: A piece of transparent glass or plastic or gelatin coating placed over the lens to change the quality of the light.

Fisheye lens: A short focal length lens, generally from 6mm to 16mm, with an extreme wide angle of view.

Fixed focus lens: Also called a focus-free lens. A lens with distance irrevocably set, depending upon depth of field to deliver a subject from several feet away to infinity in acceptably sharp focus.

Flare: Hot spots and loss of contrast and sharpness caused by stray light bouncing between the glass elements of the lens.

Flooding: Water leakage into camera, housing, lens, or strobe.

F-number: A numerical designation on the aperture scale indicating the size of the lens opening. More commonly referred to as the f-stop.

Focal length: The distance, expressed in millimeters, from the optical center of the lens to the focal point of the sensor when the lens is focused on infinity. Focal length affects the amount of the scene shown and the size of the image on film.

Focus: Adjusting the distance setting of the lens to achieve maximum sharpness of the subject. Also refers to a scale on your camera or lens barrel which shows the distance in feet and/or meters.

Focus control: The focusing mechanism that moves the lens back and forth so that it can project sharp images of both near and far subjects.

Frame: One single image in a roll of film. Also refers to the edges of an image.

Fringing: Usually a white fringe that appears on the edges of a objects in a picture. Happens when an image is artificially sharpened. Can also happened as a result of compression.

F-stop: A number indicating the diameter of the aperture. The higher the number, the smaller the aperture. The lower the number, the wider the aperture.

Gain: A method of adjusting a CCD's sensor's sensitivity to light.

GIF: Short for Graphics Interchange Format. A file format for storing graphics. It uses LZW compression which is a lossless compression method. Popular on the web for logos and any color images with 256 colors or less.

Guide number: A relative evaluation of a strobe's power output. Expressed in feet in the US, in meters internationally. This number can be used to calculate the correct combination of camera-to-subject distance and f-stop for a particular ISO.

Hot shoe: A mount on the top of the camera to which a flash is attached, providing the electrical connection needed to synchronize camera shutter and flash.

Http:: Hypertext Transfer Protocol, is the command sent to a Web server whenever you type in a site address.

Image format: This is the manner in which digital images are stored. This is the manner in which digital images are stored. There are numerous ways to store an image, and the most popular are jpeg, gif, tiff, bitmap and raw files. You can identify which format is used by looking at the end of the file name after the period. For example, picture.jpg is a jpeg file.

Infinity: The farthest distance indicated on the focusing selector.

Interchangeable lens: A lens that can be removed from the camera and replaced by another lens.

Internet: A vast global network that connects computers, enabling them to share information. The Internet was created by the U.S. Department of Defense as a research network to link computers in universities, research labs, and government centers across the country. The bulk of internet traffic is electronic mail (e-mail), which enables you to share messages and images with anyone on the Internet anywhere in the world.

ISO: An abbreviation for International Standards Organization. A number rating system that indicates the speed of a film. Formerly called ASA.

JPEG: (also written jpg), pronounced "jay-peg," is the acronym for Joint Photographic Experts Group, the committee that devised the photographic-image compression standards for this format. It offers the smallest file size for e-mailing your images. It is considered the universal language that all computers can read.

LCD screen: An acronym for liquid crystal display. This is a panel or window on most modern cameras which provides information, as well as allowing the user to preview an image immediately after it is taken.

LED: Light-emitting diode. A display of lights and symbols in the viewfinder of some cameras that provides exposure data.

Lens: An optically-shaped glass which gathers the light rays and causes them to converge on the film.

Lens coating: A thin transparent coating on the lens surface which improves picture quality by reducing reflection.

Lens speed: The widest aperture to which the lens can be opened. The wider the aperture possible with a particular lens, the more light is admitted and the faster the lens; another characteristic of a lens.

Light meter: See *Exposure meter*.

Lossy: Used to describe data compression methods that reduce some detail of a digital image.

Macro lens: A lens specifically designed for macrophotography, enabling extremely sharp focusing at close lens-to-subject distances.

Macrophotography: A type of photography where the camera lens is positioned very close to the subject and the resultant image is magnified.

Manual exposure: Camera operation in which the photographer sets the aperture and shutter speed.

Megapixel. One million or more pixels. Offer the best quality

Memory Card: A device that stores digital images. It is not the “film” of a digital camera. Unlike film, it has no effect on image quality.

Minimum focus distance: The shortest distance at which the focus control can be set. The lens can focus closer if depth of field margin is added to the scale setting.

Motor drive: A camera accessory or a built-in unit that automatically advances to the next frame.

Negative: An image of light and dark tones, created when film is exposed, that are the opposite of those in the original subject. Also refers to film that has been processed to create a negative image.

Noise: A random, usually unwanted, variation in brightness or color information in an image. Noise in digital images is most visible in uniform surfaces, such as blue water. It increases with sensitivity, especially the color noise in digital compact cameras. Noise also increases as pixel size decreases, which is why digital compact cameras generate much noisier images than digital SLRs.

On-line service: A network that provides access, for a fee, to the Internet. America On Line (AOL) is a service provider.

Open up: To make the lens opening larger to allow more light to strike the film.

Optical Zoom: The zoom feature on a camera where the focal length changes by physical movement of the lens inside the camera. Optical zoom magnifies the size of an image by adjusting the lens. Unlike digital zoom, optical zoom enlarges the

subject without sacrificing resolution.

O-rings: Synthetic rubber gaskets which seal the junctions between parts of all amphibious photographic equipment.

Overexposure: Exposing the film to too much light, resulting in a too-dark negative or a too-light positive.

Parallax: The displacement of an image when photographing at very close range. The image seen through the camera's viewfinder is not what the lens will record because they see the image from different positions in space.

Pixel: Short for pixel element. Pixels are the dots that make up a digital image.

Pixelated: Describes an image in which individual pixels are apparent to the naked eye. Typically the separate square pixels in bitmapped images do not appear individually except when the image is displayed too large or at a low resolution.

Primary lens: Also called a prime lens. The lens that is either built into the camera or the lens to which supplemental lenses are attached.

Print: A positive image on photographic paper, made from a transparency or a negative.

Proper exposure: A photograph that looks like the scene or subject photographed, with the same balance of highlights and shadows. A photograph that is neither too light (overexposed) nor too dark (underexposed). Also referred to as a correct exposure.

RAM: Random Access Memory. A type of computer memory that can be accessed randomly.

Rangefinder: A type of viewfinder built into the camera, which allows you to view your subject through a window on the back of the camera.

RAW: Any data that has not been translated. Unlike JPEG and TIFF, RAW is not an abbreviation but literally means "raw" as in "unprocessed". A RAW file contains the original image information as it comes off the sensor before in-camera processing so you can do that processing afterwards on your computer with special software. Raw image files are sometimes called digital negatives, as they fulfill the same role as negatives in film photography.

Recycle time: The time it takes for a discharged strobe to recharge.

Refraction: The bending of light rays when they pass through transparent objects of different densities. This property of light underwater causes objects to appear closer and larger than they actually are.

Reflection: When light rays bounce off the water's surface back into the atmosphere. The closer the sun to the horizon, the more light is reflected, affecting the intensity of available light underwater.

Reflector: A device fitted into the face of strobe in front of the flash tube that disperses

light.

Reproduction ratio: The size of the image on film compared to the subject's actual size. Commonly used when designating the relative magnification of extension tubes and macro lenses.

Resolution refers to the pixel size of the image. Resolution (when talking about film) refers to the number of dots per inch that represent the image. For digital images, resolution refers to pixels high and pixels wide.

Reversal film: Film that produces a positive transparency after it is exposed and developed. Commonly referred to as color slide film.

Shutter: A mechanical or electronic device that lets light into the camera and keeps light out. It functions to control the duration of light that will be allowed to strike the film.

Shutter delay: Also called *Shutter Lag*. This is the amount of time between pressing the shutter button and the camera recording the image. In film cameras, the delay is caused by the mechanism inside the camera that opens the shutter, exposing the film. Shutter lag in film cameras is virtually unnoticeable. Shutter lag is more of a problem with digital cameras. In digital cameras, the delay results from the charging of the CCD and relatively slow transmission of its capture data to the circuitry of the camera for processing and storage.

Shutter speed: A means of controlling the length of time the shutter remains open and exposes the film to light. The higher the shutter speed, the less light reaches the film.

Single lens reflex: A viewfinding system which enables you to view the image through the camera's lens. This configuration is typical of land cameras. Commonly called SLR.

Slave sensor: A built-in sensing system that detects light from another strobe and then automatically triggers the slave strobe.

SmartMedia: another common type of storage card.

Specifications: The nomenclature used by a manufacturer to describe the individual characteristics of a particular piece of equipment.

Step: An f-stop; used when referring to increasing or decreasing exposure.

Stop down: To make the lens opening smaller, allowing less light to strike the film.

Strobe: An electronic flash. Submersible strobes are specifically designed for underwater photography, and all controls and ports are O-ring sealed.

Sync cord: Synchronization cord. The cord that transmits electrical impulses from strobe to camera. It allows the camera to synchronize the flash with the camera shutter so that the flash fires when the shutter is triggered.

TIFF: Tagged Image File Format, an uncompressed mode that can exchange files

between applications and computer platforms. Developed in 1986 by the Aldus Corporation, specifically for saving scanned images.

Transparency: Another word for slide. A positive image mounted in a small cardboard or plastic frame.

TTL: An abbreviation for through-the-lens, as in through-the-lens metering. Also refers to a type of strobe. See *TTL strobe*.

TTL sensor: A sensor built into the camera which measures the light reflecting off the film plane.

TTL strobe: A type of strobe designed to communicate electronically with a camera that has a TTL sensor, allowing for automatic strobe exposures.

Underexposure: Exposing the film to less light than is required to create an image as the eye sees it; results in a too-light negative or a too-dark positive.

USB: A computer port through which downloading images is done more quickly than through a serial port or floppy drive.

Viewfinder: Window on a camera or an attachment used to see the subject.

Viewfinder camera: A camera with a viewfinding configuration that allows you to view your subject through a window on the camera above the lens.

White balance: The camera's ability to correct color and tint when shooting under different lighting conditions including daylight, indoor, fluorescent, and underwater lighting.

White light: Light from the sun, composed of all the colors in the visible spectrum.

Wide angle distortion: Changes in appearance or perspective of a subject caused by using a short-focal-length lens very close to the subject.

Wide angle lens: A lens of short focal length, specifically designed to provide a wider angle of view than seen by both human vision and a standard lens.

World Wide Web: Commonly referred to as The Web. The Web is the part of the Internet that consists of pages (documents) linked to each other around the world. These pages have pictures, sounds, and more accessed via the internet. World Wide Web has become a synonym for Internet.

