

Aperture — Lens opening. The hole or opening formed by the metal leaf diaphragm inside the lens or the opening in a camera lens through which light passes to expose the film. The size of aperture is either fixed or adjustable. Aperture size is usually calibrated in f- numbers-the larger the number, the smaller the lens opening. Aperture affects depth of field, the smaller the aperture, the greater is the zone of sharpness, the bigger the aperture, the zone of sharpness is reduced. The hole or opening formed by the metal leaf diaphragm inside the lens; controls amount of light and depth of field, prevents vignetting and reduces lens aberrations; the size of the aperture is indicated by its f-number, i.e., the ratio of the diameter of the opening to the focal length of the lens; a large aperture is indicated by a small numerical f-number.

ASA — American Standards Association. Group that determining numerical ratings of speed for US made photosensitive products. eg films. In 1982, its role and its influence was narrowed down by the establishment of the ISO (International Standards Organisation). Used as a benchmark for film sensitivity, or, “speed”. (i.e. ASA400 for Tri-X black and white 35mm film).

Aspect Ratio — The ratio of width to height in photographic prints - 2:3 in 35 mm pictures to produce photographs most commonly measuring 3.5 x 5 inches or 4 x 6 inches; Advanced Photo System cameras deliver three aspect ratios as selected by the user.

ATA — This means the camera supports the electrical interface standard, defined by the PC Card Association (formerly PCMCIA), known as ATA (AT Attachment). This is the mobile computing equivalent of the IDE standard for desktop computers. Most computers have ATA support built-in. ATA is supported by most operating systems like Microsoft Windows 3.1, Windows '95, Windows CE, IBM OS/2, Apple System 7, etc. ATA is supported by most computer manufacturers including IBM, Compaq, Packard Bell, Dell, Gateway 2000, etc.

Automatic iris — Lens diaphragm which is controlled by a mechanism in the camera body coupled to the shutter release. The diaphragm closes to any preset value before the shutter opens and returns to the fully open position when the shutter closes.

Backlighting — Light coming from behind the subject, toward the camera lens, so that the subject stands out vividly against the background. Sometimes produces a silhouette effect. Always use something (a hand, a lens shade to avoid the light falls onto the lens - to avoid lens flares).

Barrel Distortion — Straight lines are bowed in at the edges of the picture frame re sembling the sides of a barrel; present in small amounts in some wideangle or wideangle-zoom lenses, but uncorrected in fisheye lenses.

Balance — Placement of colors, light and dark masses, or large and small objects in a picture to create harmony and equilibrium. Description also applied to colour films to indicate their ability to produce acceptable colour response in various types of lighting. The films normally available are balanced for daylight (550~6000K photo lamps (3400K) or studio lamps (3200K).

Balanced Fill-Flash — A type of TTL (Through The Lens) auto flash operation which uses the camera's exposure meter to control ambient light exposure settings, integrated with flash exposure control. That is, flash output level is automatically compensated to balance with ambient light, resulting in a better exposure for both subject and background.

Bellows — The folding (accordion) portion in some cameras that connects the lens to the camera body (like the Mamiya RZ). Also a camera accessory that, when inserted between lens and camera body, extends the lens-to-film distance for close focusing or macro photography. Some retains the automatic functions where some have to stopdown the lens for manual exposure reading.

Bounce Lighting — Flash or tungsten light bounced off a reflector (such as the ceiling or walls) or attachment that fits on the flash (like the LumiQuest's Pocket Bouncer) to give the effect of natural or available light.

Bracketing — Taking a series of photographs of the same subject at different exposures to insure the "correct" exposure; useful when shooting in situations where a normal metering reading is difficult to obtain. Taking additional pictures of the subject through a range of exposures-both lighter and darker-when unsure of the correct exposure. Some top cameras have provision for automatic bracketing, while manually you can bracket by the use of, say, adjust apertures or shutter speeds setting or both, manually influence the ASA setting or even adjust the flash output power etc.

Burning-In — Basically, a darkroom process that gives additional exposure to part of the image projected on an enlarger easel to make that area of the print darker. This is accomplished after the basic exposure by extending the exposure time to allow additional image-forming light to strike the areas in the print you want to darken while holding back the image-forming light from the rest of the image. Sometimes called printing-in.

Cast — Abnormal colouring of an image produced by departure from recommended exposure or processing conditions with a transparency film, or when making a colour print. Can also be caused by reflection within the subject as from a hat on to the face.

Color temperature — Description of the color of a light-source by comparing it with the color of light emitted by a (theoretical) perfect radiator at a particular temperature expressed in kelvins (K). Thus "photographic daylight" has a color temperature of about 5500K. Photographic tungsten lights have colour temperatures of either 3400K or 3200K depending on their construction.

Condenser — Generally a simple lens used to collect light and concentrate it on a particular area, as in enlarger or projector. Frequently in the form of two planoconvex lenses in a metal housing. A condenser, normally of the fresnel type, is used to ensure even illumination of the viewing screens on SLR cameras.

Condenser Enlarger — An enlarger with a sharp, undiffused light that produces high contrast and high definition in a print. Scratches and blemishes in the negative are emphasised.

Contact Print — A print made by exposing photographic paper while it is held tightly against the negative. Images in the print will be the same size as those in the negative.

Contrast — The range of difference in the light to dark areas of a negative, print, or slide (also called density); the brightness range of a subject or the scene lighting. It may be also explained as tonal difference. More often used to compare original and reproduction. A negative may be said to be contrasty if it shows fewer, more widely spaced tones than in the original. Or another way to explain, a difference in visual brilliance between one part of the image and another; without contrast, there would be no such thing as a visible image; a line in a photograph is visible only because it is either darker or lighter in tone than the background; every distinguishable part of the image is the result of a contrast in tonal values.

C 41 — Kodak's standard chemical process for developing color negative film, an industrial reference standard.

Densitometer — An instrument used for measuring the optical density of an area in a negative or print.

DEPTH OF FIELD — In simplest terms, we define depth of field as the zone of sharpest focus in front of, behind, and around the subject on which the lens is focused; it can be previewed in the camera - very handy for critical work. Generally, the closer the subject to the camera, the more evenly with the distribution of depth of field both in front and behind the subject. As subject distance grows, it extends more behind than in front of the subject. Strictly speaking, it is the amount of distance between the nearest and farthest objects that appear in acceptably sharp focus in a photograph. Overall, it is a matter of personal preference when composing your shot.

The general rule of thumb for selecting the right aperture for your desirable depth of field is: given the same object distance and the image size, the bigger lens opening (like f2.8, f2, f1.4 etc.), the narrower band of depth of field will occur in the exposure, meaning that critical focusing is essential; while on the other hand, if an extended depth of field is desired, the choice of a smaller lens opening (like f8, f11, f16, f22) will ensure that greater depth of focus will be generated.

The amount of exposure is a matter not only of the amount of light allowed to strike the film but also of the amount of time the light is allowed to strike the film. The camera has two mechanisms to control exposure, the diaphragm and the shutter. The diaphragm consists of blades which open and close to certain size openings called apertures. The size of the aperture determines the amount of light which will fall on the film. The various size apertures are indicated by a set series of numbers called f/stops or f/numbers. Each f/stop represents some amount of light that is allowed to pass through the lens. The smaller numbers are called large f/stops while the larger numbers are called small f/stops. This is because the larger numbers represent smaller apertures and allow less light to pass through the lens. Each time you move from one f/stop to the next smaller f/stop (larger number the amount of light allowed through is exactly halved. In effect, the amount of exposure itself is also halved. Using f/2 as a standard, the amount of light reaching the film will change according to f/stop:

f/stop	1.2*	1.4	1.8*	2	2.8	3.5*	4	5.6	8	11	16	22
Brightness ratio	3	2	1-1/4	1	1/2	1/3	1/4	1/8	1/16	1/32	1/64	1/128

* Half f/stops.

The largest f/stop on the lens is called the lens maximum aperture. The smallest f/stop on the lens is called the lens minimum aperture. The maximum and minimum apertures differ according to the lens. The maximum lens aperture is important because it indicates the largest amount of light that the lens will transmit.



Sometimes the maximum aperture is a half-f/stop rather than a full f/stop on the aperture scale. Now suppose that you have the camera set for a certain exposure value (EV), say the exposure you get with f/4 at 1/60 sec. There are certain other combinations of aperture and shutter speed which will give you the same amount of exposure as that above. Some of these combinations in this example include f/5.6 at 1/30 sec. and f/2.8 at 1/125 sec. You simply move up and down the f/number and shutter speed scales.

Depth of field is governed by three factors: aperture, lens focal length and shooting distance. Remember the following relationships:

1. The smaller the aperture, the deeper the depth of field (the other two factors remaining the same). For example, if the lens focal length and the shooting distance stay the same, the depth of field is much deeper at f/16 than at f/1.4.
2. The shorter the lens focal length, the deeper the depth of field (the other two factors remaining the same). For example, comparing a 28mm lens with a 50mm lens at the same aperture and shooting distance, depth of field is deeper with the 28mm lens..
3. The greater the shooting distance, the deeper the depth of field. i.e. other two factors remaining the same). For example, if the subject is photographed from three and then from seven meters away, the zone of sharpness in the foreground and background is greater at seven meters.

Another characteristic of depth of field is that it is generally deeper in the background than in the foreground.

Diffusion Enlarger — An enlarger that scatters light before it strikes the negative, distributing light evenly on the negative. Detail is not as sharp as with a condenser enlarger; negative blemishes are minimised.

Dodging — Holding back the image-forming light from a part of the image projected on an enlarger easel during part of the basic exposure time to make that area of the print lighter.

E6 — The standard chemical process used for all grades and brands of positive color transparency film (e.g., Kodak's Ektachrome) OTHER than Kodachrome. Kodachrome film must be sent directly to Kodak for developing. E6 film can be developed by any reputable processing lab.

Easel — A device to hold photographic paper flat during exposure by an enlarger, usually equipped with an adjustable metal mask for framing.

Emulsion — Micro-thin layers of gelatin on film in which light-sensitive ingredients are suspended; triggered by light to create a chemical reaction resulting in a photographic image. Basically, suspension of light-sensitive silver salts in gelatin.

Exposure bracketing — Shooting the same subject at a range of different exposures.

F-number or F-stop — The numbers on the lens aperture ring, or digital camera's LCD (where applicable), that indicate the relative size of the lens aperture opening. The f-number series is a geometric progression based on changes in the size of the lens aperture, as it is opened and closed. As the scale rises, each number is multiplied by a factor of 1.4. The standard numbers for Calibration are 1.0, 1.4, 2, 2.8, 4, 5.6, 8, 11, 16, 22, 32, 64, etc., and each change results in a doubling or halving of the amount of light transmitted by the lens to the film plane. Basically, calculated from the focal length of the lens divided by the diameter of the bundle of light rays entering the lens and passing through the aperture in the iris diaphragm. What does the "f" in f-stop mean? Although the historical origins of this term have been lost, some suggest that it stands for "finestra", the Italian word for window. The Italians are reportedly responsible for inventing the series of numbers we have come to know as f-stops.

Focal Length — The distance between the film and the optical center of the lens when the lens is focused on infinity. The focal length of the lens on most adjustable cameras is marked in millimetres on the lens mount. The distance from the principal point to the focal point. In 35mm-format cameras, lenses with a focal length of approx. 50mm are called normal or standard lenses. Lenses with a focal length less than approx. 35mm are called wide angle lenses, and lenses with a focal length more than approx. 85mm are called telephoto lenses. Lenses which allow the user to continuously vary the focal length without changing focus are called zoom lenses .

Fogging — Darkening or discoloring of a negative or print or lightening or discoloring of a slide caused by exposure to nonimage-forming light to which the photographic material is sensitive, too much handling in air during development, over-development, outdated film or paper, or storage of film or paper in a hot, humid place.

Format — The actual size of the photograph, either slide or negative, produced by a camera; in 35mm photography, the picture measures 24mm x 36mm and has a diagonal of 43mm, While the new APS (Advance Photo System), several new formats were included, including panorama . While it can also be explained as shape and size of image provided by camera or presented in final print or transparency. Governed in the camera by the opening at the rear of the body over which the film passes or is placed. The standard 35 mm format is 36 x 24 mm; half-frame, 18 x 24 mm; 126 size, 28 x 28 mm; 110, 17 x 13 mm; standard roll film (120 size), 2x 2 in.

Frame — One individual picture on a roll of film. Also can apply to a object that can be utilised (tree branch, arch, etc.) to frame a subject in composition.

Graininess — The sand-like or granular appearance of a negative, print, or slide. Graininess becomes more pronounced with faster film and the degree of enlargement.

Grey card (18% Grey Card) — Tone used as representative of mid-tone of average subject. The standard grey card reflects 18 per cent of the light falling on it.

Highlights — Small, very bright part of image or object. Highlights should generally be pure white, although the term is sometimes used to describe the lightest tones of a picture, which, in that case, may need to contain some detail.

Hot Shoe — The fitting on a camera that holds a small portable flash, or a slave unit that fires remote flash units. It has an electrical contact that aligns with the contact on the flash unit's "foot" and fires the flash when you press the shutter release. This direct flash-to-camera contact eliminates the need for a PC cord. Some referred it as accessory shoe.

Iris — Strictly, iris diaphragm. Device consisting of thin overlapping metal leaves pivoting outwards to form a circular opening of variable size to control light transmission through a lens.

ISO Speed — The international standard for representing film sensitivity. The emulsion speed (sensitivity) of the film as determined by the standards of the International Standards Organization. In these standards, both arithmetic (ASA) and logarithmic (DIN) speed values are expressed in a single ISO term. For example, a film with a speed of ISO 100/21° would have a speed of ASA 100 or 21 DIN. The higher the number, the greater the sensitivity, and vice versa. A film speed of ISO 200 is twice as sensitive as ISO 100, and half that of ISO 400 film.

K — Kelvin. A scale use to measure the color temperature. 5000 K refers to normal daylight.

K 14 — Kodak's chemical process for developing Kodachrome slides.

Latent Image — The invisible image left by the action of light on photographic film or paper. The light changes the photosensitive salts to varying degrees depending on the amount of light striking them. When processed, this latent image will become a visible image either in reversed tones (as in a negative) or in positive tones (as in a color slide).

LCD panel (Liquid Crystal Display) — A display panel showing electronically-generated text, numerical values & symbols.

Leader (Film Leader) — Part of film attached to camera take-up spool. 35 mm film usually has a leader of the shape originally designed for bottom-loading Leica cameras, although most cameras simply need a short taper.

LED panel (Light Emitting Diode) — Light producing transistors used to display dots, numerical values, and text anywhere on a piece of electrical equipment.

Lens Speed — The largest lens opening (smallest f-number) at which a lens can be set. A fast lens transmits more light and has a larger opening than a slow lens. Determined by the maximum aperture of the lens in relation to its focal length; the "speed" of a lens is relative: a 400 mm lens with a maximum aperture of f/3.5 is considered extremely fast, while a 28mm f/3.5 lens is thought to be relatively slow.

Macro Lens — A lens that provides continuous focusing from infinity to extreme close-ups, often to a reproduction ratio of 1:2 (half life-size) or 1:1 (life-size). Nikon's version for their "macro" is "micro", eg. 105mm F2.8 Micro-Nikkor.

Micro lens — A lens for close-up photography; designed to focus continuously from infinity down to a reproduction ratio of 1: 2, or with a matched extension ring or teleconverter down to 1: 1; available in normal or telephoto focal lengths to provide a variety of free working distances; with the exception of Nikon, this type of lens is called a "Micro Nikkor" lens.

Magnification ratio — Ratio that express greatest possible on film magnifying power of the lens. Used commonly on the macro setting of the zoom lenses, macro lens or with bellows.

Normal Lens (or Flat-Field Focus) — A lens that makes the image in a photograph appear in perspective similar to that of the original scene. A normal lens has a shorter focal length and a wider field of view than a telephoto lens, and a longer focal length and narrower field of view than a wide-angle lens. Normal lenses corresponding to that portion of human vision in which we can discern sharp detail; technically defined as a lens whose focal length is approximately equal to the diagonal of the film frame; in 35mm photography, the diagonal measures 43mm, but in practice, lenses with focal lengths from 50mm to 60mm are considered normal. Used for copying artwork and other critical uses where the elimination of any lens distortion is imperative.

NTSC — National Television Standards Committee. Standards for video broadcasting and recording in the US and Japan. PAL is the standard in Great Britain and the commonwealth countries. SECAM used in many countries in the European communities.

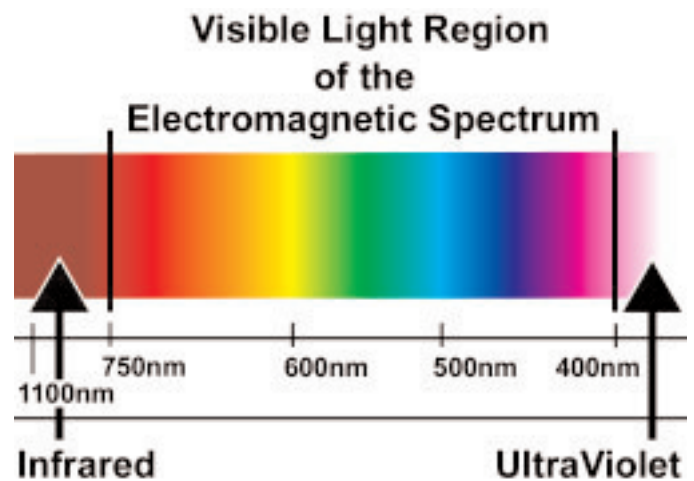
Ortho (Orthochromatic) — Denotes film sensitive to blue and green light. (nm = nanometre)

Pan (Panchromatic) — Designation of films that record all colors in tones of about the same relative brightness as the human eye sees in the original scene, sensitive to all visible wave-lengths.

Parallax — With a lens-shutter camera, parallax is the difference between what the viewfinder sees and what the camera records, especially at close distances. This is caused by the separation between the viewfinder and the picture-taking lens. There is no parallax with single-lens-reflex cameras because when you look through the viewfinder, you are viewing the subject through the picture-taking lens.

PC Cords (or synchronization cord) — The purpose of PC cords is to allow a camera to control the flash, so the flash fires at the correct time.

PC Terminal/PC socket — Some older flash units may not have a hot shoe on the flash unit and require a cable connection to the camera in order to fire correctly. Some flash cords have a connector that makes electrical contact with the center part of the socket and is held securely in place by a threaded ring which screws into the outer part of the socket on the camera body. Some of the modern autofocus cameras have omitted this feature on the body. It can also be used to activate another flash unit via a sync cord or a slave unit in a multiple flash setup. PC sockets and common PC cords fit together by pushing the connector on the cord into the socket on the camera.



Polarising Screen (Filter) — A filter that transmits light travelling in one plane while absorbing light travelling in other planes. When placed on a camera lens or on light sources, it can eliminate undesirable reflections from a subject such as water, glass, or other objects with shiny surfaces. This filter also darkens blue sky.

Push Processing — Increasing the development time of a film to increase its effective speed (raising the ISO number for initial exposure) for low-light situations; forced development.

Rangefinder — Instrument for measuring distances from a given point, usually based on slightly separated views of the scene provided by mirrors or prisms. May be built into non-reflex cameras. Single-lens reflexes may have prismatic rangefinders built into their focusing screens.

Rear-Curtain Sync — A technique to fire off a flash an instant before the second (rear) curtain of the focal plane shutter begins to move. When slow shutter speeds are used, this feature can create a blur effect from the ambient light, i.e., a flowing- light patterns following a moving subject with subject movement frozen at the end of the light flow. For example: most portable flash units are optimized for use at a shutter speed of 1/60th of a second. If you compensate with your f-stop setting and slow the shutter speed accordingly, the shutter will physically lag in time behind the flash firing, creating the desired light blur.

Reciprocity — Most films are designed to be exposed within a certain range of exposure times-usually between 1/15 second to 1/1000 second. When exposure times fall outside of this range-becoming either significantly longer or shorter-a film's characteristics may change. Loss of effective film speed, contrast changes, and (with color films) color shifts are the three common results. These changes are called reciprocity effect. Generally, as a quick reference, exposure beyond one second needs to compensate for this characteristic of film.

Resolution — The ability of a lens to discern small detail; in photography, the image resolution in the final photograph depends on the resolving power of the sensitive emulsion and on that of the lens. The two are not related, but the effective resolution is a function of both; for reasonably accurate photographic measurements of lens resolution, the sensitive material must therefore have a much greater resolving power than the lens. Also: resolution can refer to the dot-pattern density in a half-tone printed image, or the pixels-per-inch value in a digital image.

Safelight — An enclosed darkroom lamp fitted with a filter to screen out light rays to which film and paper are sensitive. Light source consisting of housing, lamp and screen of a colour that will not affect the photographic material in use. Safelight screens are available in various colours and sizes for specific applications.

Saturation — An attribute of perceived color, or the percentage of hue in a color. Saturated colors are called vivid, strong, or deep. Desaturated colors are called dull, weak, or washed out. Also: a key adjustment in pre-press preparation and digital color correction.

Shutter — Blades, a curtain, plate, or some other movable cover in a camera that controls the time during which light reaches the film.

Shutter Priority — An exposure mode on an automatic or autofocus camera that lets you select the desired shutter speed; the camera sets the aperture for proper exposure. If you change the shutter speed, or the light level changes, the camera adjusts the aperture automatically.

Shutter speed — Indication of the time duration at which the shutter curtain opens up and closes during an exposure process. A 1/125 setting means the shutter curtain open and close within one hundred and twenty five of a second while 1 means in one full second the shutter open up to absorb the light source onto the film for an exposure.

Sidelighting — Light striking the subject from the side relative to the position of the camera; produces shadows and highlights to create modelling on the subject.

Slave Unit — Accessory flash "slave" units are available to fire multiple flash units without multiple electrical connections to the camera. These units sense the light output of the first flash, which is mounted in the camera hot shoe, or cord-connected to the camera. When the light output is sensed, the slave unit triggers a second flash unit that is connected only to the slave. Additional slaves and flash units can be used, if needed.

Stop Bath — Darkroom material. An acid rinse, usually a weak solution of acetic acid, used as a second step when developing black-and-white film or paper. It stops development and makes the hypo (fixing bath) last longer.

Stopping Down — Changing the lens aperture to a smaller opening; for example, from f/8 to f/11. Some lenses, like PC lens or attachment with a none dedicated bellow on macro photography, stop down exposure metering is required for correct reading.

Telephoto Lens — A lens that makes a subject appear larger on film than does a normal lens at the same camera-to-subject distance. A telephoto lens has a longer focal length and narrower field of view than a normal lens and have a shallower depth of field than wide angle lenses, or, a lens whose focal length is longer than the diagonal of the film frame; in 35mm photography, lenses longer than 50-55mm; also referred to as a "long" lens.

Through-The-Lens Focusing — Viewing a scene to be photographed through the same lens that admits light to the film. Through-the-lens viewing, as in a single-lens-reflex (SLR) camera, while focusing and composing a picture, eliminates parallax.

Through-The-Lens Metering — Meter built into the camera determines exposure for the scene by reading light that passes through the lens during picture-taking. Most SLR cameras have built-in meters which measure light after it has passed through the lens, a feature that enables exposure readings to be taken from the actual image about to be recorded on film, whatever the lens angle of view and regardless of whether a filter is used or not.

Time exposure — A manually-controlled, extra-long exposure, utilizing a cable-release for the shutter control. Useful for critical treatments of delicate lighting situations and outdoor nighttime photography.

Tungsten lamps — A special style of photographic lamp bulb, with carefully controlled temperature, used in conjunction with special color-corrected film stock, resulting in absolutely true color reproduction.

Wide-Angle Lens — A lens that has a shorter focal length and a wider field of view (includes more subject area) than a normal lens. Also can explained as a lens whose focal length is shorter than the diagonal of the film frame; in 35mm photography, lenses shorter than 50mm; also referred to as a "short" lens.

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