

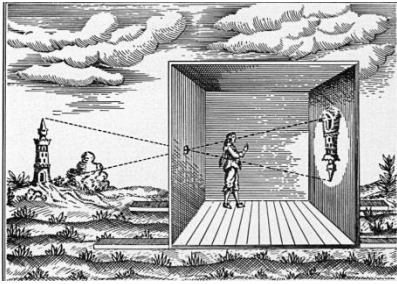
Introduction to Camera

What is Camera?

A camera is an optical instrument that records images that can be stored directly, transmitted to another location, or both. These images may be still photographs or moving images such as videos or movies.

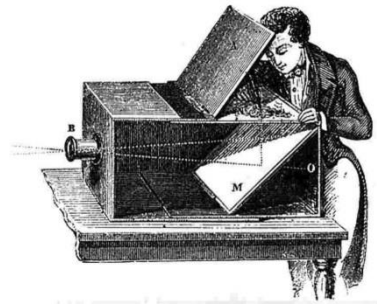
The term camera comes from the word "Camera Obscura" (Latin for "dark chamber"). The modern camera evolved from the camera Obscura & functioning of the camera is very similar to the functioning of the human eye.

What is Camera Obscura?



Camera Obscura is the natural optical phenomenon that occurs when an image of a scene at the other side of a screen (or for instance a wall) is projected through a small hole in that screen as a reversed and inverted image (left to right and upside down) on a surface opposite to the opening. The surroundings of the projected image have to be relatively dark for the image

to be clear. Camera Obscura with a lens in the opening has been used since the second half of the 16th century and became popular as an aid for drawing and painting. The camera Obscura box was developed further into the photographic camera in the first half of the 19th century when camera Obscura boxes were used to expose light-sensitive materials to the projected image.



A few types of Camera:

TLR- Twin-Lens Reflex camera:

A twin-lens reflex camera (TLR) is a type of camera with two objective lenses of the same focal length. One of the lenses is the photographic objective or "taking lens" (the lens that takes the picture), while the other is used for the viewfinder system, which is usually viewed from above at waist level.



SLR - single-lens reflex camera:

A single-lens reflex camera (SLR) is a camera that typically uses a mirror and prism system (hence "reflex" from the mirror's reflection). SLR permits the photographer to view



through the lens and see exactly what will be captured. When the shutter button is pressed on a mechanical SLR, the mirror flips out of the light path, allowing light to pass through to the light receptor and the image to be captured.

Range Finder Camera:

A rangefinder camera is a camera fitted with a rangefinder: a range-finding focusing mechanism allowing the photographer to measure the subject distance and take photographs that are in sharp focus.

Instant Camera:

The instant camera is a type of camera that generates a developed film image. The most popular types to use self-developing film were formerly made by Polaroid Corporation.

Video Cameras:

Studio Camera:

The studio camera is usually very large and too heavy to be used as a remote camera in the field. Because of its size, studio cameras may be placed on a three-legged stand, called a tripod, for support. To allow smooth camera movement, the feet of the tripod are placed into a three-wheeled cart called a dolly; a studio pedestal is another common type of camera support. The camera is attached to a large, single column on wheels that is pneumatically or hydraulically controlled. The size, weight, and mount of the studio camera dictate that it not to be taken out of the studio. Each studio camera comes with a camera control unit (CCU), sometimes referred to as a remote control unit (RCU). The CCU is a piece of equipment that controls the video signal sent from the camera and is usually placed in the control room or the master control room. The CCU controls many signals from the camera, including the color, tint, contrast, and brightness. The video engineer manipulates the CCU controls to match the signal from each camera involved in the shoot.

Camcorders:

A camcorder is a portable camera/ recorder combination. Professional camcorders are lightweight, portable cameras but are not quite as small as consumer camcorders. Professional models have many more internal components. The professional camcorder is a television camera and recorder in one unit and is relatively simple to take into the field. While in use, it is placed on the operator's right shoulder or on a field tripod.

Convertible camera:

A Convertible camera is a camera with a variety of accessory packages available to make it operational in a studio, as a portable field camera, or both.

The Parts of the Camera:

The camera is comprised of four major parts:

- Camera Head
- Viewfinder
- Camera Lens
- Recorder

Camera head:

The Camera Head is the portion of the video camera that contains all the electronics needed to convert the reflection of light from the subject into an electronic signal.

Viewfinder:

The viewfinder is a small video monitor attached to the camera that allows the camera operator to view the images in the shot.

Camera Lens:

The lens is an assembly of several glass discs placed in a tube on the front of a camera. Its primary purpose is to concentrate, or focus, the incoming light rays on the surface of the imaging device, or the target. A picture is considered to be “in focus” when the adjoining lines of contrast are as sharp as possible.

Recorder:

Few important terms and camera supporting equipment:

Focus: Focus is the act of rotating the focus ring on a camera lens until the lines of contrast in the image are as sharp as possible.

The imaging device or the target: A Photosensitive surface of a charge coupled device (CCD).

CCD: Charge coupled device (CCD) is a dime sized component of the camera head into which light enters and is converted into an electronic, or video, signal. The video signal exits on the opposite side of the CCD and enters the rest of the camera.

Gain: The strength of the video signal.

Studio pedestal: A large, single column on wheels that supports the camera and is pneumatically or hydraulically controlled.



Dolly: A three-wheeled cart onto which the feet of a tripod are mounted. A dolly allows smooth camera movements to be performed.

A dolly movement of camera or in camera shot is when you move the entire camera forwards and backwards, typically on some sort of track or motorized vehicle.



Tripod: A three-legged stand that supports a camera.

Tripod head: The assembly at the top of the pedestal column to which the camera attaches. There are two types of Tripod heads- (i) Friction head, (ii) Fluid Head.

Friction head: A mounting assembly on some tripods that stabilizes the camera using the pressure created when two pieces of metal are squeezed together by a screw.

Fluid head: A mounting assembly on some tripods that stabilizes the camera using the pressure between two pieces of metal and a thick fluid that provides additional resistance to movement.

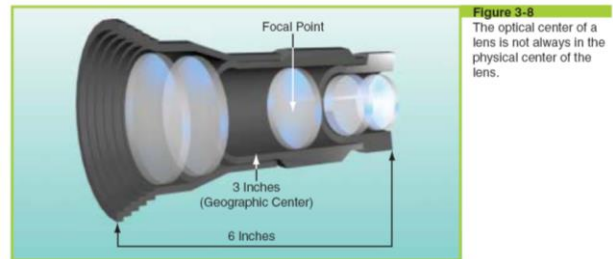


Pan handle: A device attached to the back of the tripod head that allows the camera operator to move the tripod head while standing behind the tripod.

Zoom in: The act of rotating a ring on the zoom lens so that the center of the picture appears to be moving toward the camera.

Zoom Out: The act of rotating a ring on the zoom lens so that the center of the picture appears to be moving away from the camera.

Optical center: The physical location within the lens assembly where an image is inverted. Also called the **focal point**.

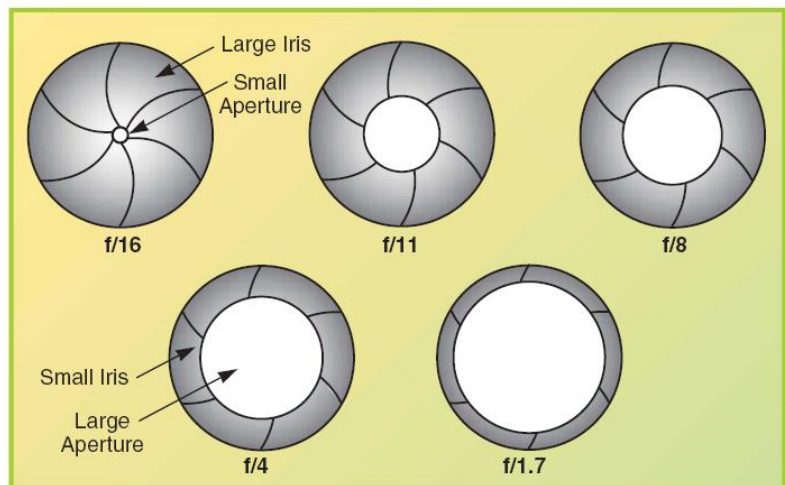


Focal length: Focal length is the distance between the optical center of the lens, and the camera sensor or film plane when focused at infinity. The optical center is where light rays converge inside the body of your lens. The focal length defines the magnification and field of view for a given lens. This value is most commonly measured in millimeters.



Aperture: The opening, adjusted by the iris, through which light passes into the lens. Aperture describes the light intensity of a specific image or set of images. Lens aperture controls light that passes through the lens to the image sensor or film.

Iris: A component of a lens that is comprised of blades that physically expand and contract, adjusting the aperture size. The movement of the blades in the iris adjusts the size of the opening that allows light to pass through the lens. A camera's iris operates much like the iris of the human eye. As the size of the iris increases, light is blocked from passing through to the CCD. When the iris contracts, more light is allowed to pass through.



Zoom lens: The particular piece of glass within the lens assembly that moves forward and back, magnifying or shrinking the image accordingly. This individual lens is the focal point, or optical center, of the zoom lens assembly. It is also called Variable Focal length Lens. The individual zoom lens slides forward and backward within the zoom lens assembly. The focal point is located wherever the zoom lens is positioned.



Variable focal length lens: A lens in which the optical center can vary its position within the lens assembly, varying the focal length measurement as well. Also called a zoom lens.

F-stop: A camera setting that determines the amount of light passing through the lens by controlling the size of the iris. Many cameras offer a manual iris control in addition to the automatic circuit. Adjusting the iris manually is accomplished by moving the f-stop ring. If the camera lens has a manual f-stop ring (some consumer cameras do not), numeric values (1.7, 2.8, 4 etc.) are written on the corresponding moveable ring. Lower f-stop settings (numbers) allow a greater amount of light (more light= brighter image) to pass through the lens. Higher f-stop numbers indicate that smaller amounts of light (less light = darker image) can pass through. The appropriate f-stop setting varies per situation, based on the lighting in the environment and the brightness of the object(s) in the shot.



Shutter Speed:

Shutter Speed is the amount of time the shutter is open. This is typically measured in fractions of a second; especially with video recording. A camera's shutter determines when the camera sensor will be open or closed to incoming light from the camera lens. The shutter speed specifically refers to how long this light is permitted to enter the camera. "Shutter speed" and "exposure time" refer to the same concept, where a faster shutter speed means a shorter exposure time.

Depth of Field

Depth of field refers to how much of your image is in focus, and more specifically the area of acceptable focus. A shallow depth of field will give you a blurred background, while a large depth of field will keep everything in focus so that we can see everything around us. With a shallow depth of field you can place more emphasis on a specific part of your frame.

Depth of field varies depending on camera type, aperture and focusing distance, although print size and viewing distance can also influence our perception of depth of field. A preferred selection Depth of field ("DOF") in a focused subject in an image can be quite subjective. Adequate selection of DOF for one situation, application may be unacceptable for another photographer. It is all a matter of personal preference when trying to determine the appropriate use of DOF to enhance an effect in a photograph.

Insert:

Full screen close-ups of letters, telegrams, photographs, newspapers, signs, posters or other written or printed matter etc. are called inserts. An insert is a shot of part of a scene as filmed from a different angle and/or focal length from a master shot. Inserts covers actions action already covered in the master shot, but emphasize a different aspect of that action due to different framing.