

Topic 87

The Video Camera

A video camera is a camera used for electronic motion picture acquisition (as opposed to a movie camera, that earlier recorded the images on film), initially developed for the television industry but now common in other applications as well.

The earliest video cameras were those of John Logie Baird, based on the mechanical Nipkow disk and used in experimental broadcasts through the 1920s-30s. All-electronic designs based on the video camera tube, such as Vladimir Zworykin's Iconoscope and Philo Farnsworth's Image dissector, supplanted the Baird system by the 1930s and remained in wide use until the 1980s, when cameras based on solid-state image sensors such as CCDs (and later CMOS active pixel sensors) eliminated common problems with tube technologies such as image burn-in and made digital video workflow practical. The transition to digital TV gave boost to digital video cameras and by 2010s, most of the video cameras were digital video cameras.

With the advent of digital video capture, the distinction between professional video cameras and movie cameras have disappeared as the intermittent mechanism has become the same. Nowadays, mid-range cameras exclusively used for television and other works (except movies) are termed as professional video cameras.

Video cameras are used primarily in two modes. The first, characteristic of much early broadcasting, is live television, where the camera feeds real time images directly to a screen for immediate observation. A few cameras still serve live television production, but most live connections are for security, military/tactical, and industrial operations where surreptitious or

remote viewing is required. In the second mode the images are recorded to a storage device for archiving or further processing; for many years, videotape was the primary format used for this purpose, but gradually supplanted by optical disc, hard disk, and finally flash memory. Recorded video is used in television production, and more often surveillance and monitoring tasks where unattended recording of a situation is required for later analysis.

Modern video cameras have numerous designs and uses, which are listed below.

Professional video cameras, such as those used in television production; these may be television studio-based or mobile in the case of an electronic field production (EFP). Such cameras generally offer extremely fine-grained manual control for the camera operator, often to the exclusion of automated operation. Usually uses 3 sensors to record separate of Red, Green and Blue.

Camcorders, which combine a camera and a VCR or other recording device in one unit; these are mobile, and were widely used for television production, home movies, electronic news gathering (ENG) (including citizen journalism), and similar applications. Since the transition to digital video cameras, most of the cameras have in-built recording media and as such are also camcorders.

Closed-circuit television (CCTV) generally use pan tilt zoom cameras (PTZ), for security, surveillance, and/or monitoring purposes. Such cameras are designed to be small, easily hidden, and able to operate unattended; those used in industrial or scientific settings are often meant for use in environments that are normally inaccessible or uncomfortable for humans, and are therefore hardened for such hostile environments (e.g. radiation, high heat, or toxic chemical exposure).

Webcams are video cameras which stream a live video feed to a computer. Camera Phones, nowadays most video cameras are incorporated in mobile phones.

Special camera systems, like those used for scientific research, e.g. on board a satellite or a spaceprobe, in artificial intelligence and robotics research, in medical use. Such cameras are often tuned for non-visible radiation for Infrared (for night vision and heat sensing) or X-ray (for medical and video astronomy use).

Steadicam is a brand of camera stabilizer mount for motion picture cameras that mechanically isolates it from the operator's movement. It allows for a smooth shot, even when moving quickly over an uneven surface. The Steadicam was invented by cameraman Garrett Brown and was introduced in 1975.

A tripod is a portable three-legged frame, used as a platform for supporting the weight and maintaining the stability of some other object. A tripod provides stability against downward forces and horizontal forces and movements about horizontal axes. The positioning of the three legs away from the vertical centre allows the tripod better leverage for resisting lateral forces.

Tripods are used for both motion and still photography to prevent camera movement and provide stability. They are especially necessary when slow-speed exposures are being made, or when telephoto lenses are used, as any camera movement while the shutter is open will produce a blurred image. In the same vein, they reduce camera shake, and thus are instrumental in achieving maximum sharpness. A tripod is also helpful in achieving precise framing of the image, or when more than one image is being made of the same scene, for example when bracketing the exposure. Use of a tripod may also allow for a more thoughtful approach to photography. For all of these reasons, a tripod of some sort is often necessary for professional

photography. In relation to film/video, use of the tripod offers stability within a shot as well as certain desired heights. The use of a tripod within film/video is often a creative choice of the Director.