

VIDEO



Video

In general, a video is a series of electronic signals used to generate a steady source of still images, which simulate movement. Videos can utilize graphics, images, or text, and are used for entertainment, education or other purposes. Today, many web pages have downloadable or streaming video that visitors can watch on their computer. Below is an example of YouTube video.

Video is an electronic medium for the recording, copying, playback, broadcasting, and display of moving visual and audio media.

Video technology was first developed for cathode ray tube (CRT) television systems, but several new technologies for video display devices have since been invented. Charles Ginsburg led an Ampex research team developing one of the first practical video tape recorder (VTR). In 1951 the first video tape recorder captured live images from television cameras by

converting the camera's electrical impulses and saving the information onto magnetic video tape.

Video recorders were sold for \$50,000 in 1956, and videotapes cost \$300 per one-hour reel. However, prices gradually dropped over the years; in 1971, Sony began selling videocassette recorder (VCR) decks and tapes to the public. After the invention of the DVD in 1997 and Blu-ray Disc in 2006, sales of videotape and recording equipment plummeted.

Later advances in computer technology allowed computers to capture, store, edit and transmit video clips.

History of video multimedia

Curiously enough, the beginnings of video recording go back to the beginnings of television itself, and where television begins, John Logie Baird is sure not to be far away.

In 1926, the very year that Baird first publicly demonstrated television, he applied for a patent on a system for video recording, which he called 'Phonovision'.

The patent (324049), granted in 1928, described a device called a 'Phonovisor', designed to replay Phonovision discs. Baird managed to record images on disc, but he never publicly demonstrated playback, no doubt because the quality of the 30-line images is even worse than they were when broadcast. However, with the aid of modern digital processing technology, author Don McLean, a researcher who is at pains to give Baird no less than the recognition he deserves, has recovered the content from all the existing Phonovision and other 30-line disc recordings and made them available on his web site (www.tvdawn.com) and on CD-ROM.

Phonovision used what was essentially a modified standard 78-rpm cutting lathe. It was possible to use this to record the 30-line images because the bandwidth was in the audible range - in fact, Baird's 30-line transmissions were made on medium wave (AM) where the frequency response hardly exceeded a few kilohertz. Even so, Baird had to drop the frame rate from the broadcast 12.5 images per second down to just four to capture the images on disc (three frames per disc rotation at 78-rpm), which caused loss of greys. There are some other

differences between Baird's recording system and his broadcast system, notably the fact that the 7:3 aspect ratio portrait-style image is scanned with 30 vertical lines from right to left on the air, but left to right in Phonovision.

Due to the anti-intuitive 'flying spot' scanning system that Baird used, where a scanning beam was emitted from a fixed 'camera' and light reflected from the scene was captured by banks of photocells that could be moved or crossfaded to change the 'lighting', Baird 30-line transmissions and recordings demonstrate quite strange illumination.

The extant Phonovision discs have clearly visible radial striations across the disc surface, which suggest that they contain sync information and show how the frames were synchronised to disc rotation.

Eleven additional private off-air disc recordings of television broadcasts (The 'Marcus Games discs') from the period 1932-35 also exist and have been restored by Mr McLean. Television programmes were not to be recorded directly again for another twenty years.

At this time, as it had been since the BBC's 405-line Television Service opened in 1936, apart from films, all television was live (and the expense of film made it unusual for the production of television programmes in the UK). If a programme was to be repeated, it required a second performance. There was a way of recording television images, but only by shooting a television monitor with a specially-modified synchronised, usually 35mm, film camera. The results from the 'kinescope', as this system was called, were considered by and large acceptable (although there were significant problems with the image quality) and the process reliable, but by the 1950s in the United States, where time-shifting across the continent was a way of life - a live network show broadcast to New York had to go out three hours later on the West coast - the 35mm kinescopes of the networks and their 16mm backups ate up more film in a year than the entire Hollywood film industry: NBC is estimated to have used over a million feet a month, and the costs were astronomical, including requiring extremely rapid processing turnarounds.

The first on-air use of the machines was on CBS on 30 November 1956, when the news was recorded on the west coast for rebroadcast, but for the first month the network ran kinescopes as a backup. Initial problems were ironed out and production of the new VR-1000 began the following year. Also that year, RCA's TRT-1A was unveiled, using the same recording system, RCA referring to the process as 'quadruplex' recording for the first time because of the four heads. The first machines cost around \$50,000 and tape was \$300 per one-hour reel - much cheaper than kinescope recording and not nearly as fraught. Colour recording followed in the early 1960s.

By the late 1950s, VTRs were being used regularly for time-shifting purposes, but as far as the recording of programmes on videotape was concerned, the problem was the lack of a simple editing capability. Although the first totally video-recorded show went out on CBS in 1958, programmes were primarily 'recorded as live'. Physical editing and splicing was possible, but only by 'developing' the magnetic pattern on the tape and cutting between TV frames. Early recorders added edit pulses to the control track on the tape to make these points more obvious. Even

so, half a second of audio was lost at the edit point, requiring laying the audio back from a second machine. One technique was to edit a film copy made with a kinescope and then conform the video recording to it - early off-line editing. Editing with timecode was introduced in 1967 while the first computerised editing systems began to appear in the early 1970s.

Meanwhile, another recording technique had been invented, this time wrapping the tape most of the way around a large drum, the drum containing heads that rotated against the tape to produce a helical scan - an approach that eventually became dominant. This technique led to the first consumer video recorders, such as the Philips semi-pro EL3400 open reel recorder (1964) and the development of smaller and lighter recorders, such as the Sony 'Portapak', that could be used in the field. Then came the first cassette-based recorders with the introduction of Sony's popular 3/4in U-Matic recorder in 1971 (designed for home use but finding its true niche in the corporate and educational fields, and ultimately some broadcast applications), and the Philips N1500 consumer 'VCR' or videocassette recorder, introduced in 1973, which

was capable of extremely good quality recordings on a one-hour VC60 cassette. Later versions reduced the tape speed and thus increased the recording time. Sony's consumer Betamaxformat arrived in 1975 and the technically inferior JVC VHS system a year later. But Sony was trapped in a court battle with Hollywood that gave VHS an unassailable edge.

At the broadcast end of the chain, quad machines persisted until around 1978, with the introduction, once more by Ampex, of Type C, 1in open reel recorders. Broadcast-quality camcorders became possible in the early 1980s, with CCD imaging devices and recording systems that instead of recording colour subcarriers (which were badly handled by helical scan systems) recorded full-bandwidth luminance (the black and white signal) on one track plus two bandwidth-limited FM colour difference signals on another, allowing tiny helical-scan recorders.

The next fundamental revolution was the introduction of D1 digital video recorders in 1986-87. High prices kept these out of all but the most well-heeled facilities until more affordable digital systems began to appear in the mid-1990s. Today, there is a proliferation of digital TV

technologies, and the ability to store and edit digital video on modern computer-based systems has led to the introduction of video servers and other non-tape-based methods of working on and distributing television programs.

Video concept

- Video is an excellent tool for delivering multimedia.
- Video places the highest performance demand on computer and its memory and storage.
- Digital video has replaced analog video as the method of choice for making and delivering video for multimedia.

Advantages of using Video

- Captures interest
- Increase retention
- Explains complex physical actions and relationships
- Can incorporate other media

Disadvantages of using Video

- Is expensive to produce
- Requires extensive memory and storage
- Requires special equipment
- Does not effectively illustrate abstract concepts and static situations