

Competencies

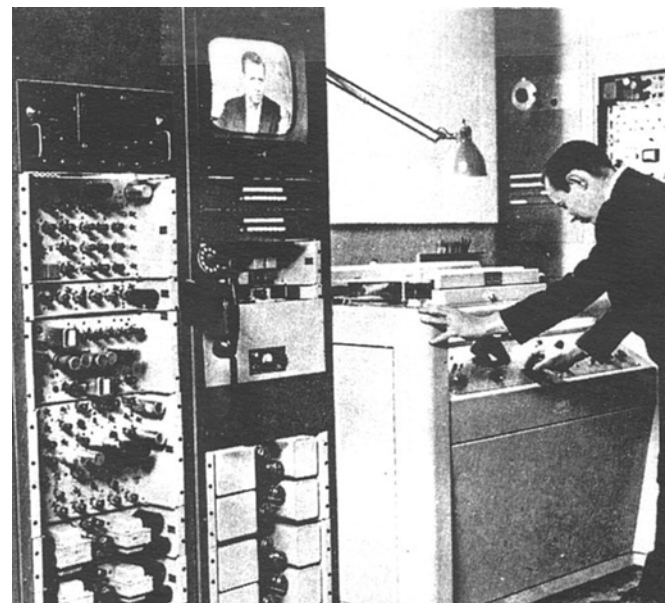
- History and development of the video recording technology
- Video recording history
- Basic operating controls of the Sony DVCAM DSR-1800, Betacam SP UVW-1800 recorder and UVW-1600 player
- Basic operating controls of the Panasonic DMR-T3040 DVD Video recorder
- Basic operating controls of the S-VHS VTR
- Basic operating controls of the Sony UVW-100 and DSR 370 Camcorders

Development of Recording Technology

The basic technology for magnetic recording of electrical signals was developed before WW II. The initial medium for storage was a thin strand of wire. This was quickly replaced with 1/4" magnetic tape. This allowed recording of audio signals for playback at a later time.

Before the advent of video tape recording, broadcasters had to film a live program by aiming a 16MM motion picture camera at the face of a TV screen. After the film was processed, it was "bicycled" or shipped from station-to-station across the country. After a coast-to-coast microwave link was completed in 1951, live TV was available to most stations. High speed film processing allowed a program done live on the east coast to be shown on the west coast at the same clock time, which was actually three hours later.

While audio and video recording use the same electromagnetic theory, video recording is more complex because much more electronic information must be stored over an extremely wide frequency range or bandwidth. A high quality audio recording is usually made at a tape speed of 15 inches per second. To record the same quality video signal, the tape would have to travel at 1,000 ips. A one-hour show would take almost 57 miles of tape. The first experimental video recorder actually used this high tape speed.



The ingenious solution to the speed problem was to not only move the tape but the recording head as well. Ampex Corporation developed the first commercial video tape recorder and shipped the first machine in 1956. The machine used 2" tape and the tape head configuration consisted of four heads mounted on a wheel rotating at 14,400 rpm. The actual tape speed was 30 or 15 ips. This configuration is called the quadraplex format, and remained the industry standard until the late 1970's.

Video Recording History

The 2" Quad format was replaced in the 1970's with the 1" helical format. The helical scan was able to record a full-frame image by wrapping the tape at least half way around the tape head.

About the same time, Sony introduced the 3/4" U-Matic format. This allowed the first truly portable recorder and allowed for the development of Electronic News Gathering (ENG).

Component recording formats were introduced the 1980's. The color (chrominance) and brightness (luminance) portions of the picture are kept separate and produce a better quality picture. The Betacam SP and S-VHS are the mostly widely used component format.

Digital recording formats were introduced in the late 1980's. The D-1 format is component digital (Sony DVCAM DSR-1800), while the D-2 format is composite digital. The main advantage of digital recording is multi-generational recording-making copies of copies.

DVD Technology

Digital Video Disk technology is a relatively new evolutionary step in recording history with direct links to the phonograph record invented by Thomas Edison. The Compact Disc, an earlier step in that evolution, was jointly introduced in 1983 by Philips of the Netherlands and Sony of Japan as a distribution medium for digital audio. Then, in 1995, they introduced the first DVD. These new high-density mediums were the same shape, size, and appearance as a CD, which minimized the changes necessary to manufacture mass quantities and get them into the marketplace.

The increased data density, enabling a DVD to hold video, was made possible by using a laser of higher color in the light spectrum than that used on regular CDs. DVD Video players hit the market in the US in March 1997. DVD recorders (DVRs) did not become widely available, until around 2002, in part due to the high cost of DVR players and records compared to VHS records. However, as more homes purchased DVD players, DVR production has increased and begun replacing VHS recorders across the nation.

Studio Recording Equipment

The primary format used in the studio is Sony DVCAM. The Sony Betacam SP, Pioneer DVD and Panasonic DVD recorders which are also used in the studio to create copies of every program and for duplication.

All of the formats in the studio record in at least two audio channels. Except for the Panasonic DVD recorders, they also record SMPTE time code that assigns a unique code to each frame of video. Time code is essential for editing.

Sony DVCAM

The Sony DVCAM digital format uses a 1/4" videotape and records in the component digital format. There are three cassette sizes, the mini can record up to 42 minutes, the DVCAM standard can record up to 184 minutes and the DVCPRO 25, can only be played back, not recorded to. It also can record up to four audio channels.

The master recorder in the control room is a DVCAM DSR-1800. It is used to record the live output of the switcher and is the record VTR when editing. The unit can be operated from either the controls on the front of the machine or remotely by the AVID editor with the use of the local/remote button. The unit is easy to operate. The basic controls are located on the front of the machine. Further adjustments and operating features are located on a subsidiary control panel behind a door at the bottom left of the machine.

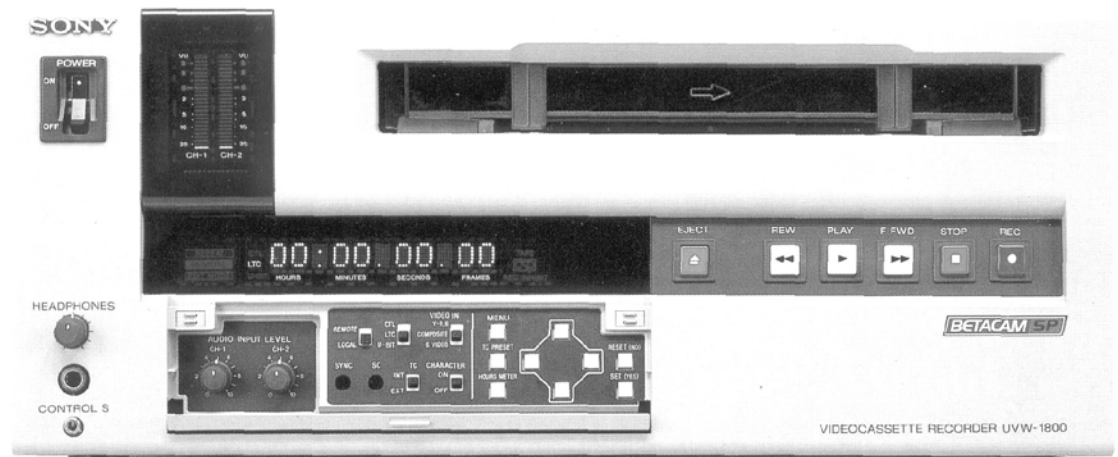


Sony Betacam SP

The Sony Betacam SP format uses a 1/2" videotape and records in the component format. There are two cassette sizes, the smaller one can record up to 30 minutes and the larger one can record 90 minutes maximum.

The units have a local/remote switch, which allows it to be operated from the controls on the front of the machine or remotely by the AVID editor. The unit is easy to operate. The basic controls are located on the front of the machine. Further adjustments and operating features are located on a subsidiary control panel behind a door at the bottom left of the machine.

The Betacam UVW-1800 can be used to record the live output of the switcher and is VTR-1 when editing.



Panasonic DVD Format

The Panasonic DMR-T3040 is used to record the live output of the switcher, it is also used for recording backups, promotions, and copies of shows. The unit can be operated from the controls on the front of the machine or by using its remote. The Panasonic DMR-T3040 recorder can record to its 40 GB Internal Hard Drive or to various types of DVD discs, including DVD-RAM discs [single-sided 4.7 GB (5"), double-sided 9.4 GB, (5") or 2.8 GB (3")] and DVD-R 4.7 GB for General Ver.2.0.



This Panasonic DVD unit can record in five different modes: XP - high picture quality recording mode, SP - Standard recording mode, LP - Long recording mode, EP - Extra long recording mode, and FR - Flexible recording mode. 1 to 6 hours of recording is possible on the 4.7GB DVD-RAM and DVD-R discs, while 2 to 12 hours can be recorded on 9.4GB DVD-RAM discs. Recording to the HDD (40 GB hard drive), 8.5 to 52 hours of recording is possible depending upon the recording mode selected.

- Chasing Playback uses the Time Slip-function to let you play a show from its beginning, even as the recorder continues recording the program.
- Simultaneous Record and Play is a similar feature that allows you to watch a previously recorded show while recording another show.
- Direct Navigator displays a list of programs recorded on a disc. If you click on a desired program, that program is displayed behind the list. You can also select and erase programs from the program list. This function can also be used while recording.
- Playlist Playback - You can select from among the scenes recorded on the disc and arrange them in any order you like, and then save it as a playlist.
- Firewire - IEEE 1394 Terminal, gives you the ability to connect with digital sources.

S-VHS Format

The S-VHS format is ½" video tape and can record for 2 hours on one tape. Because it also records in the component format, the "S" (Super) or separate video channels provide for a somewhat comparable picture quality to the Betacam SP format. It also records and playback regular VHS tapes. A unique feature of the recorder includes four audio channels (2 are CD quality and 2 are stereo quality).

Portable Recording Equipment

Betacam SP UVW-100

A Sony UVW-100 Betacam SP camcorder is available for stand-alone recording. The single unit includes a camera and recorder.

The camera uses only the small cassettes and can record up to 30 minutes. It is battery powered or an external AC power supply can be used. The camera has a Canon 18:1 internal focus zoom lens.



DVCAM DSR-370

A Sony DSR-370 DVCAM camcorder is available for stand-alone recording. The single unit includes a camera and recorder.

The camera uses many kinds of small cassettes and can record up to 184 minutes. It can be either battery powered or AC power supply can be used. The camera has a Canon 19:1 internal focus zoom lens.

