

# Learning Center

## General Video Info

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### DV terminology

Everyone starting out in digital video finds themselves faced with a bewildering array of new buzz-words, acronyms, and terminology. This glossary aims to help you through the confusion by explaining many of the commonly used terms. Rather than just a glossary of words in alphabetical order, the terms are introduced in the order you would encounter them when working through a typical video project. For quick reference there is also an [alphabetical index](#).

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**Linear editing** is the process of copying video between multiple VCR machines, possibly including special effects processors, etc. It can be manually or computer controlled. It is fast but requires expensive equipment for good results.

**Non-linear editing (NLE)** is the process of manipulating video stored as digital computer files. Special video editor software is used. This allows video to be visually constructed in a manner similar to cutting and sticking cine film. This tutorial focuses on NLE.

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Video computer files in the PC world are usually either **AVI** or **MPEG** types. The process of getting video into a computer from an external device such as a camcorder is called **capturing**.

There are two main methods of capturing, either **analog** or **digital** (see [Video media & formats](#)). You can use analog capture with almost any device; you can only use digital capture with digital devices that have a **Firewire** output. Both methods require appropriate hardware installed in the computer.

Analog capture normally requires a **capture card**, but MPEG capture can be done using an external device on a USB or parallel port.

Digital camcorders use the **Digital Video (DV)** standard. This defines not only the size of the tape, but also the format of the digital data. All DV camcorders produce digital data in the same format. DV and **Mini-DV** are the same except for the physical size of the cartridge and hence the running time. **Digital-8** cameras also use the same data format, but use a tape that is physically the same as Video-8.

**Firewire** (or IEEE1394) is a high-speed serial data connection, used by almost all DV camcorders. It needs a Firewire port on the computer (often as a plug-in card), but there is now a trend in high-end computers for Firewire to be built-in.

DV captured by Firewire is stored in AVI files (when using Microsoft Windows). There are two types, **Type-1** and **Type-2**.

An AVI file can contain multiple streams, usually one video and one audio. DV is a data stream that itself contains video and audio. In a Type-1 AVI, the whole DV stream is stored unmodified as one AVI stream. In a Type-2 AVI the DV stream is split into separate video and audio data, which are stored as two streams in the AVI.

The advantage of Type-1 is that the DV data does not need to be processed, and is stored in its exact original format. The advantage of Type-2 is that it is compatible with video software that is not specially written to recognize and process Type-1 files.

There are several limits that affect the maximum size of an AVI file.

The original specification for AVI files limits their size to 4GB, but for software reasons the maximum workable size is **2GB**. This corresponds to about 9.5 minutes of DV format video.

**OpenDML** is a standard that extends the AVI specification to effectively remove the file-size limit. If video software and drivers support OpenDML then the size of AVI files is only limited by the operating system and size of disks.

File sizes are also limited by the disk format used by the operating system. **FAT32**, supported by Windows 95 onwards, does not allow any single file larger than 4GB. **NTFS**, supported by Windows NT, Windows 2000, Windows ME, and Windows XP, allows effectively unlimited files and partitions.

Once video has been captured to disk files, it can be edited. This is done using a special **video editor** program, and the majority of non-linear editors, such as *MediaStudio Pro*, are based on the idea of a **timeline**. This presents a visual workspace on the screen, representing time from left to right. The finished video is composed in the way a cine film might be composed by laying out film clips on a bench. In the NLE process the **clips** are disk files containing captured video.

Different editors have different capabilities, but most will include **transitions** allowing various effects when going from clip to clip, **filters** allowing the look of the video to be altered, and **overlays** allowing multiple clips to be combined in various ways.

When everything has been laid out as required in the timeline, the editor program **renders** a new video file which contains the result. The original files are not altered, the computer combines information from the files, transitions, effects, and overlays and computes a new file. Depending on complexity, this can require large amounts of computing power resulting in a long **rendering time** (sometimes more than 10 times running time). The faster the CPU the faster this process runs.

If the result is intended for recording to tape (e.g. DV), the rendered file must be played on the computer, and an output taken to a VCR or recording camcorder. In the case of DV, the output is again the Firewire connection, allowing the pure digital data to be recorded onto tape. If a camcorder is to be used as the external recorder, its Firewire connection must be able to record input as well as replay output. Such a capability is called **DV-in** and not every camcorder supports it, especially if it is made in Europe.

Both the capture and output-recording processes are simpler and more accurate if the computer can control the tape functions of the camcorder/VCR. **OHCI** is a standard for sending controlling commands over the Firewire link. If supported by the digital camcorder/VCR and by the computer software, then no manual control is required and the external device effectively becomes a computer peripheral.

There are many more technical terms used in connection with video on computers, but we hope this has helped to explain many of the frequently encountered terms.

### Index of terms

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