



# Chapter 6 Video Editing

Digital Video History

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## Chapter 6: Video Editing

Most people think that editing a video means connecting their camcorder to the VCR and transferring one piece of footage at a time. That is not the case. Computers now dominate in the editing process. With the cost of digital video cameras and firewire cards coming down every month, computer editing is now a reality in schools and at home.

### Digital Video Editing: A Brief History

It once took a room full of expensive equipment to produce a polished looking video complete with titles and special effects. The amount of time it would take to make these videos was phenomenal. In the digital realm of desktop video, the entire edit suite consists only of a computer and an input/output device. Computer graphics and animation can be created easily taking the desktop producer beyond what was once considered impossible.

Desktop video refers to producing videos using a computer system for the production of graphics and performing the editing. Computer systems have had difficulty in the past dealing with full motion video that could be played back from the hard drive in real time at full screen size.

Many early hardware and software combinations allowed the user to input small amounts of video, manipulate it, and then output it to the computer monitor in a small, barely viewable box. This seemed

impressive but what good was it for video producers? A full length video to be shown on a television set could not be done. The picture was too small and the video looked like it had a strobe effect applied to it.

As technology improved, the pictures started getting bigger and the strobe effect was disappearing. This was great news for professional videographers. Once the prices began to fall, desktop video became an affordable alternative to tape.

By 1995, desktop video systems had reached nearly the same price level as mid range professional videotape equipment. Pioneers in the industry like Avid Technologies and Newtek were introducing non-linear digital desktop systems aimed at the event videographer. Avid based their systems on the PC and Macintosh platforms while Newtek stuck with the Amiga. Silicon Graphics was also in the race with their own machines that could produce stunning animations once only seen in the movies.

In late 1995, many new revolutionary video capture boards were introduced at prices breaking the \$2000 price barrier. Most notably was the Miro DC30 video capture board which retailed for around

### Production Notes

- Digital Video Editing: A Brief History
- Desktop Video

### DID YOU KNOW?

*The Panasonic EZ-1 made headlines when it was first introduced. It was the first Mini-DV video camera and was considered to be affordable for prosumers. The only problem was that it didn't have a firewire port to do digital video editing on a computer.*

*Panasonic's EZ-1 was the first Mini-DV camera introduced in 1995*





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\$1000 US. The board came packaged with Adobe Premiere, Adobe Photoshop LE, and Asymetrix 3D. It was voted as the best video capture board under \$2000 by Videomaker magazine in their best of 1995 issue.

The fact that computer based digital video was going to take over the industry was reinforced in 1996 when Panasonic, one of the largest tape based editing equipment suppliers in the world, introduced their first non-linear system called the MX1000. This monumental event signaled the beginning of the end of analog videotape based production.

When the firewire standard was developed in 1995, it quickly came on to the editing scene as the new standard for post production. As more and more cameras were being developed that utilized the firewire technology, the cards themselves began dropping in price. Packages that once sold for over \$1000 are now down to the \$200 level with cards themselves starting at \$20. Processors have jumped from 486's running at 66Mhz being the standard in 1995 to Pentium IV Quad-core processors running at 3.0Ghz (3000Mhz) in 2008. The power of the personal computer has made digital video editing soar to new heights.

## Editing Methods

There are three methods that are used in professional videography:

- i) Edit As You Shoot
- ii) Tape Editing
- iii) Computer Editing

As a videographer, you should plan out which type of editing you will use before you begin taping anything. The type of editing you select will determine what

you shoot, how much footage is shot, and answer such questions as "Do I need to reshoot the entire video or can it be fixed in editing?"

How the video will be edited will determine how the video is to be shot. In most videos, you will use a combination of types of editing to make your finished product.

### *Edit as you Shoot*

Although all types of editing require extensive amounts of planning, editing as you shoot is the one that requires the most. All of your shot types, angles, and camera movements will need to be planned. The following are a few tips that may help in this process.

*Always allow for the short delay between the time you press the record button and when the camcorder actually starts. This is called the pre-roll time and usually lasts from half a second to a full second.*

*Look around to see where the light is coming from. If you are shooting into the light, your subject will be dark. It is best to have the camcorder operator with their back to the source of light. Keep the light consistent when shooting the same subject or scene.*

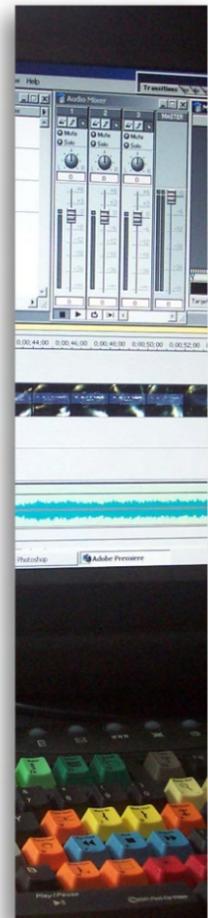
*Always use a tripod when shooting to make sure each shot is steady.*

*Plan out camera movements such as pans, tilts, and zooms.*

*Plan out the types of shots and angles you will use.*

## Production Notes

- Editing Methods
- Edit as you Shoot
- Tips for Editing as you Shoot





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*Walk through the scene so you get an idea of what the shot is about. You may find that changes are necessary.*

### Tape Editing

As digital video continues to grow in popularity, tape editing is slowly being phased out. But, it still does have a place in some industries. The broadcast news industry uses tape editing quite frequently to put together short news segments that have a small amount of footage and will be fairly short in length. These segments have no special effects or transitions so it makes sense to edit on a tape based system. Straight cuts from one shot to another does not require a large time commitment on a tape system. On a computer system, it can be quite time consuming since the footage will need to be captured to the hard drive, edited, rendered, and put back on to tape. The process will probably take 3 times as long.

Long form videos also benefit from tape editing. Computers have a difficult time storing many hours worth of footage. A 2 hour TV movie stored on a computer at a broadcast level would take up hundreds of gigabytes, even terabytes. Tape is an inexpensive storage medium and editing long productions can go quicker with tape.

To edit using a tape based system, all you need is a camcorder and a VCR to perform basic functions. These 2 machines joined together through video and audio cables will give you a crude editing system. Most tape based systems will have 2 or 3 professional VTR's with an edit controller between them to activate the usual VTR functions as well as perform the edits. The process involves transferring the footage

you want to keep from your raw tape to the master tape. When you do this all in a row, it is called assemble editing. You put one shot after another in a line. If you want to change a shot later on, you have to use insert editing to cover up the old shot and replace it with a new one.

### Computer Editing

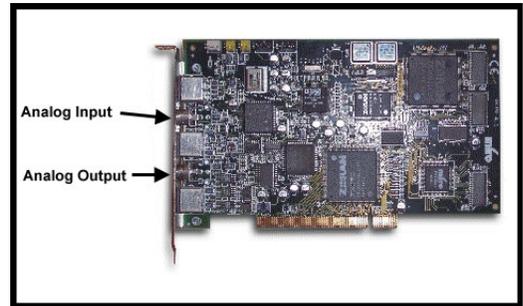
Computer editing is the most popular type of editing. Almost every production company in North America uses some type of computer system to make their videos. It has become so affordable that even the average consumer can produce a professional looking video with their home computer.

A computer editing system will consist of a few key components. First of all, the computer must be capable of handling the fast speeds that digital video requires. That means the hard drive must be at least a 7200RPM drive. SCSI is not necessary to maintain the data rate required. It is an added expense that only professionals really need.

You will also need a capture card which will probably be a firewire card (IEEE1394) if you own a digital video camera. The card will only accept digital video. Analog cameras that use VHS, VHS-C, S-VHS, 8mm, or Hi8 cannot be hooked up to a firewire card. You will need a separate unit to convert the signal to digital (\$200) in order to use analog footage with your firewire card. Digital 8 and Mini-DV use firewire. The firewire card allows you to transfer both your audio and video from your digital tape into the computer. Your

### Production Notes

- Tape Editing
- Computer Editing
- What Computer you Need to Edit Digital Video



*The MiroDC30 analog video editing card*

### What You Need for Digital Video Editing

*(Minimum)  
Pentium II, 400Mhz  
128 MB RAM  
20 GB, 7200RPM  
Hard Drive  
Firewire Card  
8MB Video Card  
Sound Card*

*(Recommended)  
Pentium IV, 3.0 Ghz  
512MB RAM  
120 GB, 7200RPM  
Hard Drive  
Firewire Card  
128MB Video Card  
Sound Card*



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camera is all you need as a source machine.

Firewire cards all work the exact same way. So why do some cost more than others? Software. Cards that come with editing software can range dramatically in price. That can be from \$20 to \$2000. It is the software that is increasing the price of most cards. Some professional cards do offer additional features which may increase their price like real-time editing or digital and analog inputs.

The minimum processor speed for most firewire cards is a Pentium II 400Mhz. Make sure you check the requirements that the manufacturer has on their box before deciding on a card.

The preferred operating system at this time is Windows 2000 Professional or XP Professional. Windows 98 has a maximum file size limit of 2GB which translates into 9 1/2 minutes of digital video. If your video is longer than that or you need to do a time lapse of a clip, the 2GB limit is frustrating. Windows 2000 Professional and XP Pro do not have that file size limit allowing you to make a file 1 GB in size or 40GB. Windows Vista still needs more testing. On Mac systems, OS10 or above is preferred. Once you have all of these things in place, all you have to do is plug in your digital video camera and start editing.

### Edit Decision List

The Edit Decision List or EDL is used to keep track of your raw video footage. It can also be used during the editing process to locate your shots quickly, to estimate the final length of your video, arrange your shots in the proposed order, and mark the scenes that have already been edited into the final master. This essential tool will make

editing easier and quicker in the long run.

At the top of the EDL is the Information Area which is used for fast identification. It includes the Tape Number, the Title of the production, the Shoot Date, and who logged the tape (Logged by:). It is important to fill this area out on each individual sheet because if a sheet is not labeled properly, it may get mixed up in sheets from another production.

The "Details" section includes the beginning (Time In) and ending (Time Out) point for each raw footage shot. It also has a brief "Description" of the shot, the "Proposed Length on Master" which is the length of that shot on the edited master, the "Order" for that shot on the edited master, and a "Used" section to check off once the shot has been put into the edited master.

### Editing Styles

An Editing Style is the distinct way in which an editor makes decisions about length of cuts, which shots should follow each other, and the overall look of the video. It is important to develop a style which you are comfortable with, is effective, and looks professional. The best way to do this is by watching television shows and music videos. Watch how the shots are put together and decide whether or not it is effective. Take all of these different styles and create one which uses the best points of what you have seen. This will give you a style that is all your own.

Some examples of style can be seen on television today. For example, the opening credit sequence and establishing shots used in CSI and Las Vegas have a distinct style. It is fast paced with the edits occurring on the well defined drum beats in

**Production Notes**

- Edit Decision List
- Editing Styles







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the soundtrack. This is done on purpose to attract the attention of the viewer. The editing style is combined perfectly with the video shooting style which was discussed earlier.

Another popular editing style right now has to do with the speed of shots and camera movement. Fast moving shots and fast edits are used in many TV shows.

The white flash transition is popular and most common in music videos. Between each shot there appears a few frames of white that when played back at a regular speed looks like a flash. Remember that each frame of video is 1/30th of a second in length. A three frame white section is still only 1/10th of a second, which is just enough to give the illusion of a quick flash. Each frame in the flash is not the same intensity as the others, therefore giving the effect more impact. In fact, the transition is actually a very quick fade that is colored white instead of black. These are just a few examples of distinct editing styles that can be seen today.

Let's take a look at some of the more obvious editing styles that are in use.

### 1. Edit to the Beat of the Music

Editing to the beat of the music is probably the most common editing style there is. It is also much easier to do than it originally appears to be.

The first step is to get your music into the computer. You can do this by using recording software and transferring your music in real-time or by using a ripping program which will convert an entire song to a WAV file in about 25 seconds. WAV

(PC) files (pronounced "wave") and AIFF (Mac) files are audio files that are in data form on your computer. Most editing programs will require your audio to be in this form or MP3 in order to use them.

Once the song is in the computer, you put it on your timeline first, when there are no shots on it yet. Be sure to put in your 10 seconds of black first. Your editing program will have the ability to play back the sound as you insert shots onto your timeline. As you listen, find and locate the spot where a beat occurs. Insert your clip and preview it to see how it fits. You can trim the clip if it does not end exactly on a beat.

Through trial and error, you will eventually match the clip up to the beat. You may also be able to determine a pattern as well. Beats are patterns so if you notice that your clips are the same length each time you edit them, you can save time by simply typing in the duration for a clip so you know it will fit exactly.

The more difficult part of this type of editing is matching the lips if you have a person mouthing the words to a song. Again, if the music is already in place, just place a clip on the timeline where you think the lips will match. Move it forward or backward to get it perfectly in sync. As long as you have mouthed the words while playing a CD when you shot the video, you will be able to match them up perfectly. A word of warning though, do not use cassette tapes. They do not sync well.

That is all there is to editing to the beat. In the old days, this process was very difficult with tape machines. In fact, this section in the first edition of this book was 3 pages long!

### Production Notes

- White Flash Transition
- Edit to the Beat of the Music

### DID YOU KNOW?

*Editing to the beat of the music is used in almost every single music video on television. It was the easiest effect to produce in the early days of music videos.*





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## 2. Pace Editing

Pace Editing is different from editing to the beat of the music in that you are selecting an edit frequency or how fast the shot changes. When performing pace editing, the editor has a few things to take into consideration.

The first consideration is the speed of the music to be used in the segment. Fast music will require a different pace than slow music. The second consideration is the mood of the video. As with music, different moods will require different paces. The final consideration is the audience. Teenagers require a more attention grabbing attack while adults prefer a more deliberate approach. The question that needs to be answered is how do you choose your pace?

### Slow Pace

A slow pace has an average shot length between 5 to 9 seconds. Each shot in the video is on the screen for an extended amount of time, giving the viewer ample time to absorb what they are seeing. Most television dramas and comedies work with a slow pace. You see each shot long enough to know what is going on.

A slow pace is used for the following reasons:

*To evoke emotion from the viewer, usually sadness, grief, happiness, or retrospect.*

*The target audience is middle age or elderly people.*

*The music is slow and meaningful.*

*The mood is romantic, insightful, or solemn.*

A slow pace can be a very powerful tool,

especially when you are portraying emotions or trying to evoke a specific emotion. For example, wedding videos will often have a series of baby pictures at the start of the bride and groom. A slow pace, coupled with a slow song, and very tasteful and discrete transitions can make a very powerful and emotional sequence. Quite often, at the end of the sequence, the bride and groom as well as their parents will be in tears.

That is how slow pace editing works. That is also your measure of success. If you've managed to evoke the desired emotion from the viewer, you have edited the sequence together properly.

### Fast Pace

Fast pace editing seems to be getting faster and faster as time goes on. With the invention of music videos in the early 1980's, fast pace editing has soared to new heights. The average shot length for this type of editing is 15 frames (1/2 second) to 2 seconds. It is very difficult to do fast pace editing without an edit controller that is very accurate for tape systems or without using a computer. Computer systems are ideal since they give editors total control over the pace.

As mentioned, the most common use for fast pace editing is music videos. The average shot length in music videos today is about 1 second. That means the viewer is getting bombarded with 60 images per minute. In Gwen Stefani's 2005 video for "Cool", the viewer sees over 200 shots in a 3 and a half minute music video. That is a large number of shots for a slower song.

**Production Notes**

- Pace Editing
- Slow Pace
- When Slow Paced Editing is Used
- Fast Pace





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The second most common use of fast pace editing is in action television shows or movies. High action scenes require many different angles so the viewer can see what is going on all over the place in a short amount of time. The fast pace makes the viewer feel more involved in the scene as well as getting the adrenaline pumping.

A fast pace is used for the following reasons:

*To evoke emotion from the viewer, usually fear, anticipation, excitement, chaos, or tension.*

*The target audience is young people or teenagers*

*The music is fast and upbeat.*

*The mood is restless, uneasy, exhilarating, or passionate.*

A fast pace is often married to violence. The speed of the cuts can get the heart pounding faster and faster. An example of this is in the movie Twister. The opening sequence of the movie combines a fast pace with upbeat, suspenseful music that makes the viewer very uncomfortable and uneasy in their seat. By the time the scene is over, many people found that they were gripping their theater seat so tightly that their hands were red. This is the measure of a good fast pace sequence. The emotion was evoked from the viewer and the message was sent loud and clear. As with slow pace editing, success is measured by the viewer's reaction.

### Importance of Picking the Right Pace

Picking the right pace for your video production will make or break the final

product. A slow song coupled with fast pace editing will result in a very awkward video. That means that people will not like it which can spell disaster if you've invested large sums of money into a production.

The basic rules to keep in mind have been outlined for you. In general, fast music, high action sequences, and a young target audience requires fast pace editing. Slow music, somber scenes, and an older target audience points to slow pace editing. There is some middle ground where shots can last between 2 to 5 seconds. This is a medium pace that can go either way as far as evoking emotions. If you are faced with a mid-tempo song, do your best to combine the aspects of both slow and fast pace editing to achieve your desired result.

**Production Notes**

- When to use Fast Pace Editing
- Importance of Picking the Right Pace
- Diagram of Slow Pace Editing and Fast Pace Editing

### Slow Pace Editing



Notice how the shots are spaced apart in Slow Pace Editing. Each shot is on the screen between 5 to 9 seconds.

### Fast Pace Editing



Notice how the shots are spaced apart in Fast Pace Editing. Each shot is on the screen between 15 frames and 2 seconds.

Mastering the pace of video can be a tough job. It is not an easy concept to be consistent with. However, if you can conquer the pace dilemma, your videos will benefit tremendously. You will be one step closer to more professional looking videos.