

Not too long ago, moviemaking on the PC was considered the domain of the “enthusiast”, spending hours configuring a PC and thousands of pounds on capturing video on expensive video hardware.

The arrival of Digital Video (DV) camcorders, with exceptional picture clarity and the ability to transfer video to a PC without any loss in quality, allowed people to experiment with their video footage knowing that the quality of the video would be preserved, no matter how many times the video was transferred to and from the PC.

Today, consumers can purchase a PC to capture, edit and export video “out of the box”, and the price of entry into the world of video has never been more affordable. The choice of delivery has also become much wider, with the ability to do everything from create a DVD movie title to stream video live to a personal website.

Pinnacle has been providing video making solutions to PC users for several years, with a range of products to satisfy everyone from the first time users up to broadcast professionals.

Whether you go with a Studio solution or a video editing package using Pinnacle Professional hardware or Liquid Edition software, you need to have the right PC to allow your video editing hardware and software to perform.

THE OPERATING SYSTEM

Working with video on the PC platform has never been more rewarding, with a great combination of price, performance and the latest Microsoft Windows® XP™ operating system providing the tools to create your own video movies quickly and easily.

Editing applications vary in features, price and ease of use, depending on your level of video editing experience. Video editing software packages have price points ranging from around £50 to over £1,000. Best of all, many of the more professional effects found on most video editing packages are optimised to take advantage of the latest processors such as the Intel® Pentium™ 4 processor.

CHOOSING A COMPUTER

Video editing demands a reasonably fast processor and adequate storage to keep both the raw video footage captured, as well as the finished video to be delivered to either the web, a CD/DVD or back to tape. Space saving features such as Pinnacle’s SmartCapture technology help keep the storage demands to a minimum. However the storage requirements for video editing are still substantial.

THE RIGHT PC FOR THE JOB

The important aspect is to prioritise your purchases to optimise your system for DV editing within your prescribed budget.

If your budget is £1,500 you are not going to spend £1,000 on a professional capture card and install it in a £500 PC. Another issue to consider is whether the system is to be a dedicated unit for DV editing, or will you be making the PC perform multiple tasks? Realistically, your PC may also be doing the home budget, playing online games and surfing the web.

Many calculations for DV editing have already happened on the camera, as the camcorder performs the compression (5:1 for MiniDV) and then simply moves the data into the PC through the FireWire card. If you were to perform effects, transitions and wipes, then the CPU will be more important in the equation. However at this point it becomes a judgment call on how valuable your time is, not whether your PC can get the job done. A reasonably fast CPU will perform nearly all of the tasks that a high-end video-editing machine will do; it will just take longer.

FireWire does nothing more than provide a bridge from your DV camcorder to the PC. DV Effects (DVE), filters, titles and the final rendering demand a lot more from the system processor compared to an analogue



Today’s desktop computers are able to perform video editing tasks that would previously have needed a high end professional system

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A portable FireWire hard drive can be an indispensable tool for anyone working with video, allowing you to store your finished video or work in progress safely.

solution, as the capture card helps out with the processing tasks. If you don't have a 'Real Time' solution such as a Liquid Edition PRO solution, rest assured that your PC processor will be doing a lot of work. In most cases, the PC's processor has to handle elements like real-time previews and transcoding DV to Video-CD, DVD or video for the web.

RAM

256MB of memory should be the base level of RAM you should consider for video editing, particularly when you consider the price of RAM at the moment. After 512MB it is a case of a diminishing return on investment, 512MB is ideal if working with video on the Windows XP platform. Issues such as SDRAM, DDR RAM and Dual Channel RDRAM are not crucial, although a motherboard that can support DDR RAM is preferable. The speed advantages using DDR266 RAM over PC133 SDRAM is real and the price is about the same. On the other hand, PC800 RDRAM continues to be priced well above SDRAM and isn't worth the money if you are working within a budget. 512MB of DDR RAM is better than 256MB of PC800 RAM.

STORAGE ISSUES

All ATA EIDE drives with a speed of 7200 rpm will work fine with DV. However, since the transfer rate of DV is 3.6MB per second, the capacity of the drive is also important, so the larger the hard drive the better for your future needs.

At about 1GB for two minutes of DV, you may want to consider the latest 80GB ATA EIDE drives. In an optimised system it is necessary to have the video drive as a second drive, with the computer's primary drive (C: drive) responsible for holding the operating system and application software.

For editing video, a critical component is the operation of the Direct Memory Access (DMA) for the hard drive. If stable DMA is not possible, the video stream to the hard drive will be interrupted. This may cause dropped frames of video making the finished movie unwatchable.

HARD DRIVE SETUP

Use the following setup for hassle-free video. The assumption is that your system has two IDE slots supporting a total of four IDE devices. Some motherboards also ship with onboard RAID, allowing you to add multiple IDE drives with ease.

- **Primary Master:** C: or main drive used for applications. Don't capture video to this drive.
- **Primary slave:** CD-ROM, DVD-ROM
- **Secondary master:** AV drive. This drive should be as clean and as fast as possible, with video captured to this drive.
- **Secondary slave:** AV drive 2. A CD-RW drive or DVD+/-RW drive.



Video editing applications such as Studio 9 provide all the tools the home user needs to create great movies on the desktop.



Once you have finished, you can deliver your movie to the web, tape or even onto a dvd disc.

Getting digital video into your PC is only half the battle in making a great movie. Once you have the raw video, you need to ensure that the final production appeals to your audience, and that's where editing technique and a good video editing application can make or break a movie.

The tools available for video editors are becoming more powerful and more affordable, with "super computer" processing speeds now available to the average PC user. Also, software applications such as Pinnacle Studio 9 are available to do everything from special effects to preparing video for the web. However, all the power and performance in the world will be of little help if you don't follow some basic editing techniques from the beginning of a project.

TELL THE STORY SIMPLY

Don't go overboard with your effects or transitions and don't create the most elaborate 3D titling sequence imaginable just because you have the tools to do so. A transition or any effect, has to make sense within the context of the video, or you quickly distract the audience from the story.

Watch your favourite movie or TV show and you will notice that most of the scene changes are simple cuts. Effective editing should free up the video to tell the story as cleanly as possible.

Finally, remember that all of the following guidelines are general rules, if you feel the need to add a swirling transition or a pixelated fade out, and you can justify it's use, go ahead and be creative.

MOVING FROM ONE SCENE TO ANOTHER

Aside from the obvious need to cut at the end of a piece of footage, make sure your transitions or cuts are motivated by a need to link two scenes for the audience.

Transitions are mechanisms for moving smoothly from one clip to the next. The simplest transition is none at all, or a "cut" where the first frame of the second video immediately follows the last frame of the first. Other simple transitions include fades—where the first video fades out to either white or black, while the next fades in, from white or black—and wipes, where a line moves across the screen "wiping" off the first video and "wiping" on the second.

Studio 9 provides amazing transitions, however remember that a simple cut can also work well.



If a person turns to another character an obvious cut to the character would be in order. Also, if a character is examining an object, a cut to a shot of the object is definitely called for. Greetings, doors opening or sudden noises off screen may also demand a cut, as the audience generally expects to see the reason for the intrusion.

Captured video clips are typically only one component of the final video. Most projects also contain still images, animation and other audio files that you want to incorporate into your movie.

CONTINUITY

Most home video camcorder users will be shooting their video using one camera only, as opposed to large productions where multiple cameras shoot a scene from various angles. This can make the job of movie making easier as you don't have to coordinate a lot of different scenes; however single-camera production also requires attention to detail, as it is crucial to keep positions and content consistent from one scene to the next. Ensure your character has the same clothes, watch, glasses etc as this can ruin a scene if not caught early in the production.

SCENE DURATION

Be careful to determine the duration of your scene, taking into account that some people in the audience may not be as intimate with the subject matter as others. We have all seen the family video with a 30 second shot of little boy at the beach waving to mum. The boredom factor is extreme due to the fact that the audience ascertained in about 2 seconds that he was at the beach waving to his mum. Therefore the next 28 seconds are pointless footage.

If the subject, object or situation is obviously familiar, keep the scene to around 2 seconds. However if you need to establish a mood, or you need to highlight a persons emotional state, you may need to provide the audience with a longer scene to ensure they recognise the message you are trying to convey.

Creating your own movies at home has never been easier using a PC and the Pinnacle Studio 9 software.





“...BE CAREFUL NOT TO GO OVERBOARD WITH YOUR CREATIVITY. EVEN THE MOST AMBITIOUS PRODUCTIONS FROM HOLLYWOOD OFTEN OPT FOR A SIMPLE TITLING SEQUENCE.”

FORMATS FOR CD/DVD

THE HOOK SCENE

It's important to keep the audience interested in the movie from the beginning to the end. Try to start off with a good hook, or compelling scene, and ensure that interesting scenes are distributed throughout the whole movie. However, you still need to make sure that the scene is relevant to the story you are telling.

If you don't think that a scene adds needed information, leave it out. By including it you will probably slow down story development and maybe even blur the focus of the production and sidetrack the central message.

AUDIO FILTERS

Audio has a powerful impact on the audience, quickly providing the appropriate mood for a scene. However, the same rule applies for audio effects as video. Keep it simple. The most commonly used audio filters are fades, used to fade in from silence at the start of a clip and fade down at the end.

Unlike video fades, which force you to cut a clip into two components to fade to black at the end, you can usually start your audio fade from any point without having to alter the original audio file. Simply anchor the clip by touching the audio volume line at the point you want to begin your fade and then drag the volume indicator down.

A cross-fade occurs during transitions when the first clip's audio fades to silence while a second clip's audio fades in from silence. Unfortunately, most video editing programs won't let you sample the filters when you select them; you have to apply the filter and then preview. This makes audio filters more difficult to access than video filters. However, once you become familiar with the audio effects you want to use, you may not feel it necessary to constantly preview your audio effects until you have nearly finished the project.

TITLING

For the most part, editing programs treat titles like any other bitmapped image: you place a title on a video or overlay track, integrate it with your other videos with keying techniques, and move the title around the screen with motion controls. For this reason, the title generation utilities included in video editors are similar to limited use graphics editors primarily oriented towards text creation.

Most video editors can use all system fonts and modify font size, style, justification, and colour. All video editors can anti-alias text objects for smooth appearance, however some applications also allow you to alter the kerning and shape of your text, giving you a lot more power to put your personal stamp on a production. However, be careful not to go overboard with your creativity - even the most ambitious productions from Hollywood often opt for a simple titling sequence.

FINAL OUTPUT

Once you have finished your movie, the final step is to send it out to your family and friends. Today's applications offer a wide variety of output choice when it comes to delivering your video to tape, CD/DVD or the web. However, remember that keeping a copy of your video at the the highest quality setting allows you a much wider range of choices when it comes to sending your movie making masterpiece out to the world.

VCD (VIDEO CD FORMAT/MPEG-1)

The main advantage of this format is that it can be read by CD-ROMs, VCD players, or DVD players.

You can capture in VCD/MPEG-1 format to create a VCD CD that will play in PCs and many home DVD players, or you can simply copy the MPEG-1 file to a CD and the file can be played back on Windows PCs with a CD drive.

Once you have created a movie in VCD format you can use your CD-R/RW burner to copy the VCD movie to a CD.

SVCD (SUPER VIDEO CD - SVCD)

SVCD is actually MPEG-2 video but recorded at a lower bit-rate and resolution than full broadcast resolution DVD. Up to 40 minutes of SVCD video can be recorded on a conventional CD-R/RW disc. The playback options for SVCD are Windows-based PCs with a CD-ROM drive and an MPEG-2 playback codec (such as PowerDVD) and some domestic DVD players.



DVD (MPEG-2)

First of all, MPEG-2 files and Digital Video files are of the same video resolution. NTSC MPEG-2 (DVD) is 720 x 480 pixels, while PAL MPEG-2 (DVD) is 720 x 576 pixels. A two-hour movie will use up about 4GB of hard drive space.

DVD quality video can also be copied directly to a CD (around 20 minutes) for playback on a PC (MPEG-2).

This means that the disc can be played back on any Windows based PC with a CD-ROM drive. However, at the end of the day, if you want to create MPEG-2 quality video to be viewed on a standard DVD player in your home, you must write your video onto a DVD disc.

The world of video on the PC can be a daunting place for the inexperienced, with many new users unfamiliar with the video specific terms and technologies used in day to day world of digital video. The following glossary is compiled to help.

AC-3: Audio Compression-3 is usually marketed as Dolby Digital and used in DVD, HDTV, and many movie theatres.

ANALOGUE: Analogue video and audio emit a steady wave of magnetic patterns that are interpreted as video and audio to be transferred to magnetic tape for viewing.

AVI: AVI stands for Audio Video Interleave and is one of the most common formats for audio/video data on the PC.

ANTI-ALIAS: Removing the jagged edges from letters or graphic elements such as titles and 3D objects.

APERTURE: An adjustable opening in a lens that, like the iris in the human eye, controls the amount of light entering a camcorder. The size of the aperture is controlled by the iris adjustment and is measured in f-stops. A smaller f-stop number corresponds to a larger opening which passes more light; f-stop examples are F2, F2.8, F4, F5.6, F8, F11. f-stops are logarithmic. Each stop admits 100% more light than the previous one.

ASSEMBLY EDIT: An edit where all existing signals on a tape, if any, are replaced with new signals. Assembly edits cannot be used for editing because they erase the control track portion of the video tape.

BLUE SCREEN: A special effects procedure in which a subject is photographed in front of a uniformly illuminated blue or green background. A new background image can be electronically substituted for the blue or green during the shoot or in postproduction through the use of chroma key to convert analogue video to digital form.

CCD (CHARGE COUPLED DEVICE): A CCD is a sensor that creates a video picture by recording light intensity to recognise a video image and then measures the levels of red, green and blue to reproduce a full-colour picture. A single CCD captures information on RGB colours in one go, while a three-chip CCD (found on more expensive camcorders) devotes a CCD to each of the three colours.

COMPOSITE: Composite video was created as a backward-compatible solution for television's transition from black and white to colour. Usually recognised as a yellow plug, composite video cable is often teamed with a red and white audio connection.

COMPONENT VIDEO: Component video improves the picture quality above S-Video. Component video is most frequently labelled Y, Cb and Cr on high-quality video players such as DVD and HDTV decoders.

COMPOSITING: The overlaying of several layers of DV over the main footage. This facility is found in painting, drawing and graphics programs.

COMPRESSION: Reducing the amount of digital data associated with a single frame of video information. Compression ratios operate up to 100:1, typically reducing 1+MB down to around 10KB. This means that more video information can be stored on the hard disk. There are several (mostly incompatible) compression systems including: Motion-JPEG, JPEG, MPEG, DVI and Indeo. Content that has been compressed must be decompressed for playback.

CODEC: Short for compressor/decompressor, a codec is any technology for compressing and decompressing data. Codecs can be implemented in software, hardware, or a combination of both.

CAPTURE DEVICE: A hardware component that converts analogue content (either audio or video) to digital for use on a computer.

CONTENT: A general term that refers to audio and video media, images, text, and any other information that is seen or heard as part of a media presentation.

CROSS-FADE: A method of smoothly moving from one video clip or photo to another. With a cross-fade transition, the frames in the playing clip fade out as the frames in the new clip fade in.

CHROMA KEY: The process of overlaying one video signal over another by replacing a colour with the second signal. Also called "keying." Typically, the first (foreground) picture is photographed with a person or object against a special, single-colour background (the key-colour).

CUTAWAY: A shot of something outside the frame that can be used to hide an edit, e.g. going from a wide shot of a scene to a close-up of unwrapping presents at a birthday party.

DISSOLVE: A video transition where one shot gradually fades out while a second shot fades in.

DIGITAL VIDEO (DV): A format for storing digital audio and video used by DV-standard digital video cameras.

DIGITAL VIDEO DISC (DVD): A CD sized media providing MPEG-2 cinema quality video and high levels of interactivity.

EDIT CONTROLS: Some VCRs and camcorders can have their transport actions directly controlled via cables. Most DV devices can also be controlled from the PC through a Firewire cable.

FADE: A video image that gradually increases or decreases in brightness usually to or from black. Sound can also fade to or from silence.

FPS (FRAMES PER SECOND): FPS refers to how many video frames are shown on a screen every second. PAL and SECAM video are delivered to the screen at 25 FPS. NTSC video is 29.97 or 30 FPS, while Cinema films are 24 FPS.

FIREWIRE: FireWire is a standard for high-speed transfers between devices including camcorders and Firewire-enabled PCs. This standard supports data rates of 100/200/400Mbps. The other terms referring to the same standard are iLink and IEEE (Institute of Electrical and Electronics Engineers) 1394. The latest FireWire standard (FireWire 800) is able to support data rates of 800Mbps.

INSERT EDIT: An electronic edit where the original video and audio are replaced with new footage. See also Assembly Edit.

LINEAR/NON-LINEAR: When video is stored on normal video tape it is done so in a linear fashion. This means that one scene follows another in a sequential order. With non-linear editing the video information is stored on the hard disk in the computer and you can record scenes in any order. This is because it is possible to access the material on the hard disk almost instantly and randomly.

MINIDV: MiniDV is the most popular camcorder format, with cassettes holding 60 to 90 minutes of footage. The video format has an impressive 500 lines of resolution, and can be easily transferred to a computer with Firewire capability.

MOIRE PATTERNS: Video artefacts that occur when recording an object that has many thin parallel lines; the lines appear to move or crawl and can be distracting.

MOVIE FILE: The file created by combining the audio, video, and still images contained in your project. You can save movies to your hard disk, or send them in an e-mail message or to a web server.

MPEG: MPEG stands for Moving Picture Experts Group and is a group of standards used for coding audio-visual information (e.g. movies, video, music) in a digital compressed format. MPEG formats use sophisticated compression techniques to deliver video over the web, on DVD or VCD,

depending on the MPEG format.

MONITOR: A video display similar to a TV, but having superior visual quality and without a television tuner. An audio monitor is a speaker.

NTSC: National Television Standards Committee created this first international television system for use in the U.S. and other countries. It produces pictures by creating 525 alternating lines across the TV screen for each frame of video. Since PAL and SECAM, the other two world systems, were developed later, they took advantage of better technology. Insiders joke that NTSC means “Never The Same Colour.”

PAL: Phase Alternation by Line. An international TV standard. (see NTSC)

PLUG AND PLAY: The ability for an operating system to recognise and install necessary drivers for a device without input from the user. To be truly plug and play, the device must work straight away without you having to restart the computer.

PLAYBACK CONTROLS: A set of buttons that allow you to play back the tape in the camcorder. These controls are much like the ones on a VCR. They usually include the basic functions of Play, Stop, REW, FF and Pause.

PLAYER: A program that displays multimedia content, typically animated images, video and audio — for example, Microsoft Windows Media Player and Apple Quicktime Media Player.

PROGRAM AE: When selected, the camcorder’s Auto Exposure can be set to perform specific program functions. Program settings include Portrait, Sports, High Speed Action, Twilight, Spotlight, Sand & Snow and Low Light.

PROJECT FILE: The file created when you save the results of adding various clips to the workspace. The extension varies with the program being used, for example a Premiere file will be saved as a .PPJ file, while a VideoStudio 6 file will be saved with a .VSP extension.

QUICKTIME: Quicktime is Apple’s equivalent of Video for Windows for the Macintosh. Apple also makes Quicktime for Windows. Quicktime also refers to the Quicktime movie file format, a widely used format for digital audio, video and other multimedia.

RENDERING: The computer process of creating a special effect, animation or editing task.

RGB: Colour represented as red, green and blue components. Most computer monitors use RGB pixels to display an image.

SHUTTER SPEED: The shutter electronically regulates the amount of times the light passing through the lens exposes onto the CCD. Most camcorders are set at a shutter speed of 1/50sec, with fast shutter speeds varying from 1/120sec through to 1/10,000sec. The higher the speed the more precise the detail and the less blur noticeable.

STORYBOARD: A storyboard is a view of the workspace showing thumbnails of the clips in a video editing program. Storyboards also refer to sketches or descriptions of scenes to be shot in a movie before production gets underway.

STREAMING: Streaming video is video that is played over a network where you can play a portion of a video before the entire file is delivered.

S VIDEO: S-Video provides better colour separation and a much cleaner signal than composite by keeping separate the colour and picture parts of a composite-video signal.

TIMELINE: A view of the workspace that focuses on the timing of your clips.

TRANSITION: The method of smoothly moving from one video clip or photo to another.

TRIMMING: This process involves removing parts of a clip that you don’t want in your project without deleting them from the original source material. You can trim by adjusting the start or end trim points of a clip.

USB: Some of the latest capture devices, mostly external ones, are connected to the PC via the USB port. These offer a much lower data rate than FireWire/iLINK, but they do not require a capture card to be installed into the PC. Generally they are good for capturing high-resolution still images from video, or lower resolution MPEG-I video files.

WHITE BALANCE: White balance either takes an automatic reading or one chosen by the user, and sets the balance for the ambient light in the scene based on the information.

ZOOM: The lens on a camcorder ranges from wide angle through to telephoto. Currently camcorders come with anything from a 10x to a 22x optical zoom. All camcorders also have a digital zoom which magnifies pixels.