

**HD Editing and Workflow**  
**Copyright © 2007 by Jack Giammerse, Jr.**  
**Edited by Walter M, Scott, III**

## **High Definition**

NTSC Standard Definition video has a screen resolution of 720 x 480 with 480 lines of horizontal resolution. It is interlaced and is sometimes referred to as 480i.

There are three HD resolutions:

**720p** has a resolution of 1280 x 720. There are 720 horizontal lines of resolution.

**1080i and 1080p** have a resolution of 1920 x 1080 with 1080 horizontal lines of resolution.

The i stands for interlaced which is 2 fields per frame, similar to NTSC video. The p stands for progressive scan in which the 2 fields are combined simultaneously to give a more stable and nicer looking picture.

The screen resolution figures mentioned above have been in reference to square pixels, but a lot of confusion has occurred because some HD camcorders and some HD TV's are based on rectangular pixels instead of square pixels.

For example, many Sony HD cameras use a CCD that has a resolution of 1440 x 1080, and each pixel has an aspect ratio of 1.33:1. To determine the final aspect ratio of the picture produced by these cameras, you multiply the AR of the overall display x the AR of each pixel. So, 1440/1080 gives an Aspect Ratio of 1.333:1. The pixels are also 1.333:1. So, 1.333 x 1.333=1.777:1, or 16:9, which is the standard resolution for High Definition.

## **HD Camcorders**

There are several different types of HD camcorders.

Some shoot at 720p resolution and output MOV files using the H.264 codec, which is some form of MPEG-4. The screen resolution is 1280 x 720 (in square pixels).

The next 2 types of HD camcorders shoot at 1080i. One type uses HDV format and puts out MPEG-2 Transport files that are based on the MPEG-2 codec. The other type of camera that shoots at 1080i uses AVCHD format and it puts out MPEG Transport files that are based on the MPEG-4 codec instead of the MPEG-2 codec.

Both types of these 1080i cameras are listed as having a screen resolution of 1440x1080 using rectangular wide pixels (instead of the square pixels used in computers.) The Aspect Ratio is 16:9 for both HDV and AVCHD formats.

Another way of classifying HD camcorders is in terms of storage. Some 720p HD camcorders record to an SD memory card. In this case, you "capture" to your computer by using a USB 2.0 cable between camera and computer and simply copy video files from the SD card to your computer's hard drive.

HDV camcorders usually record to mini-DV cassette tapes.

Most AVCHD camcorders record to a built-in hard drive.

If your camera records to a mini-DV tape you capture the video to your computer in real time by using a firewire (IEEE-1394) cable between camera and computer (turn your camera on LAST-Firewire is NOT hot swappable!). Go to the "Capture: tab in a video editor designed to work with the HDV format, "play" on your camera (in VCR mode) and hit record or capture in your video editing software. When the tape is through playing stop the capture in your editing software and stop the tape in your camera.

If your camera records to a hard drive, then connect a USB 2.0 cable between camera and computer and copy the video files from the camera's hard drive to your computer's drive.

Since HD editing is so intensive, it is highly recommended that you have a second hard drive in your computer for a data drive.

### **PC Hardware requirements for Editing HD**

HD editing is very demanding, especially the AVCHD format.

- 1 Dual-core Pentium 4 CPU 2.8 Ghz or AMD X2 64-bit CPU (you might get by with a little less, but the better your CPU, the better off you are.)
- 2 System RAM should be at least 1 GB, but 2GB to 4 GB is much more realistic.
- 3 Very good Video card with at least 256 MB of video RAM, but 512MB of video RAM is more realistic.
- 4 Windows XP Service Pack 2 (Some people have reported good results with Vista as well)

### **Editors**

The AVCHD format is unquestionably the most difficult HD video format to edit because the software support for this format is very erratic and because it is based on the MPEG-4 codec which is a highly compressed video format. According to reviews, so far the best software for editing the AVCHD format are:

- 1 Pinnacle Studio 11 Plus. This software has gotten very good reviews for every

aspect of handling AVCHD editing. It reportedly imports the native camera files with no trouble and handles the editing of these files very well.

- 2 Ulead Video Studio 11 Plus. You need to install the new Power Pack to this software in order to import individual native camera files (AVCHD files). Without the Power Pack, you can import the native camera files, but not individually, you would have to import a whole collection of your camera's native video clips in a folder (of your camera's hard drive) as a folder. Once you have the video clips imported into UVS11 Plus, it reportedly edits these files well, but things will go slowly editing these highly compressed native camera files.
- 3 Sony Vegas Movie Studio+DVD Platinum Edition. This software only imports native AVCHD video files from Sony HD camcorders.
- 4 Sony Vegas 8. The professional level of the above software. This should handle anything you throw at it.

### **Workflow for editing the AVCHD format**

If you have software that directly supports the native file format for your camera, simply import the camera's video files into your software and edit the files in their native format. If you do this, be aware that rendering the final edited video will be SLOW, even on a good computer because of the highly compressed MPEG-4 video format.

There is an alternative workflow that adds an additional step, but it may well be worth the trouble. You can use Elecard software (Elecard Converter Studio AVCHD Edition) <http://www.elecard.com/products/products-pc/consumer/converter-studio-avchd/> to convert AVCHD files to high-definition MPEG-2 files that are the same screen resolution (1440x1080 wide pixels) as the camera's original native video files. Furthermore, these converted MPEG-2 files have a small GOP which is better for editing. You can then import these converted MPEG-2 files into your favorite editing software and edit with a lot more ease than editing with the camera's highly compressed MPEG-4 video files. You can try this out for free by going to the Elecard website and downloading a free trial of Elecard Converter Studio AVCHD edition. The trial is full featured as long as it lasts. The free trial ends after you have converted 15,000 frames of video. After that, if you want to buy the software it is \$75.00 (US).

### **The Conclusion of the HD video making process.**

After you are through editing your HD video, you will want to save your edited video. For archival purposes, you will probably want to export your edited HD video to a high-quality MPEG-2 file that is the same screen resolution as your camera's native video files. Or, if you use a tape based camera you can archive to tape. You might also save the edited video as a WMVHD file. You can use the WMV version for distribution on the Internet.

As for burning your video project to a DVD, you can burn to a Data DVD to play on a computer in its HD quality. Many people these days have computers that are at least good enough to play an HDWMV or HD MPEG-2 file. The other alternative is to feed your edited HD video file to DVD authoring software to make a standard definition (preferably anamorphic) DVD.

If your budget permits, burn your HD video to a Blu-ray or HD DVD disc.