

## ■ Camcorders (DV)

If you have a young child in the family or you want to capture a special event like a wedding, anniversary or reunion, still shots taken with a digital camera just won't fill the bill. Live video is irreplaceable in capturing life's greatest moments and fortunately, camcorders are keeping pace with digital cameras and have been offering a multitude of improved features over the past few years.

The first video cameras were clunky, heavy and a chore to use. Today, they're light, slim, connect via multiple ports and since most are now digital, the quality of the playback is superior to the old analog camcorders. Post-production editing is also much easier with consumer friendly software allowing nearly anyone to create professional quality videos with minimal work.

If you have an older camcorder that you've been

thinking about upgrading or are looking into buying your first one, there are a lot of options available. In this newsletter, we'll discuss the new and improved features of digital consumer camcorders including standard DV and High Definition (HD) options.

### Types of Camcorders - Storage Formats

There are many types of consumer camcorders on the market; some cost less than \$100 and are simple point-and-shoot models you can fit in your pocket while others cost several thousand dollars and are full featured rivals to professional video cameras. Depending on your needs, there is a camcorder for nearly everyone these days.

The first thing to decide when researching camcorders is which storage format you want. There are currently **five storage formats to capture data**: 1) miniDV tape for standard definition (SD) camcorders or HDV miniDV tape for HD camcorders, 2) DVDs (8cm discs), 3) hard drives, 4) flash memory cards, or 5) mini Blu-ray discs (for HD camcorders). Some cameras offer two options increasing your flexibility.

Camcorders that accept miniDV tape generally capture the best quality video and are usually smaller than their DVD counterparts although you'll need to transfer the video to a DVD if you wish to play it in a set top DVD player or Blu-ray player. Camcorders that record directly to DVD can be removed and dropped into a player for instant playback.

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## ■ Tips of the Month

1. Camcorders that capture data to a hard drive are generally the most expensive while camcorders that record to flash memory cards are the least expensive.
2. Video editing can be a slow process. To speed things up, make sure both the camcorder you purchase and your PC/Mac have firewire ports. Firewire (IEEE1394) is considerably faster than USB during video transfers.
3. LCD screens may be more comfortable to look at than peering through a small glass lens but they definitely consume more energy. If your short on battery life, use the viewfinder rather than the LCD screen to record video.
4. Some camcorders will take still photos at the push of a button and save them to a memory card.

## ■ Websites Worth Watching

1. [www.allaboutbirds.org](http://www.allaboutbirds.org) – Excellent site for learning about our feathered friends. Includes beautiful photos, identification, sound and video clips for over 500 North American birds. Great tutorials on identifying birds by sight or sound.
2. [nasascience.nasa.gov/](http://nasascience.nasa.gov/) - Spectacular photos of Earth, planets and other celestial objects.

Most people will want to spruce up their video though, (add music, edit scenes, add titles) before showing it, so this may not matter much in practicality. If you don't envision yourself editing the video, a DVD camcorder is a good option.

Likewise, camcorders that have hard drives (HDD camcorders) are convenient because you can attach the camcorder directly to an HDTV through an HDMI or component cable for instant playback. HDD camcorders also give you instant access to all scenes of your video unlike tape in which you have to fast forward or reverse.

The one downfall to hard drives is that once the drive

is full you have to download the video before you can resume filming. Some HDD camcorders have 2 - 4 GB of internal memory while others have dedicated hard drives with between 32 - 240 GB of capacity giving ample space for most people's needs.

Flash memory (secure digital, Memory Stick, etc.) is another format which is getting a lot of attention due to the higher capacity cards now available. Lower end models use this format exclusively while higher end models will pair this with another format. Flash memory is convenient since the cards/sticks are widely available. This format also allows instant access to video scenes.

### Things to consider when researching camcorders

1. Look for an LCD screen that is viewable in bright light if you intend on using it outside. Many screens, including those on PDAs and Smartphones, wash out in bright light making it difficult to see images and read instructions.
2. On the flip side, a brightly lit LCD screen may be a distraction in certain situations so having a viewfinder is a good idea. Many cameras (low end models in particular) have removed the viewfinder to conserve weight and size so look for this feature when you're doing your research.
3. Another feature to look for is how the camcorder films in low light situations. Camcorders that have an infrared light are rated highly as well as those that have a slow shutter mode or built-in LEDs.
4. As with digital cameras, look for a camcorder that lists values for an optical zoom, not digital. Optical zoom lenses will physically move while digital zooms magnify the image causing distortion and lost pixels. Most camcorders will have at least a 10x optical zoom – if you want to be farther away from the action but still capture close-ups, look at camcorders with a higher optical zoom value. Many models offer 40x - 70x optical zooms.
5. Jittery videos are even worse than blurry images from a camera. Image stabilization technology seeks to correct problems like camera shake and keep the video smooth. It comes in two types: optical and electronic. Optical stabilization is better as the camera physically moves to stabilize the image during capture. Electronic stabilization happens after the image has been captured. As with digital cameras, the best way to prevent shaky video is to use a tripod.
6. Silent movies are fascinating but most people would agree that adding sound to video enriches the experience. Microphones are therefore very important to the camcorder selection. Look for a microphone that is mounted on the front of the camcorder rather than on the top as they pick up more sound from your subject than from you. Also look for an external microphone jack to increase your audio recording options.
7. Pay attention to the weight of the camcorder. Often manufacturers will create a lightweight camcorder by removing components or using cheaper components. On the flip side, considering most people will shoot a video 15 minutes or longer, a heavy camcorder will be a burden unless you use a tripod.
8. Both HD and standard DV camcorders offer widescreen modes suitable for playback on an HDTV. HD models are more expensive but do offer higher quality components in many instances. If cost is more important, go with a standard definition camcorder that offers a widescreen mode in 16:9 resolution. You won't have true HD quality but you'll eliminate the vertical black bars on either side of the video during playback.

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## HD (high definition) or SD (standard definition) – which format should I go with?

As most people have found out with the recent transition, digital TV is superior to analog TV; likewise with HD camcorders. They offer superior quality video to SD camcorders, as long as you have the right equipment to process and view the results.

Some notable features include: HD camcorders that have an HDMI port can be plugged directly into an HDTV and watched instantly. Likewise, if you purchase an HD camcorder that records to mini Blu-ray discs, you can also watch the video instantly if you have certain Blu-ray players or a Playstation 3 gaming console. For all HD camcorders you'll need a robust computer equipped with software capable of processing HD content if you want to edit your video.

There are two types\* of consumer HD camcorders:

1 - **HDV (High Definition Video)** uses MPEG2 compression which is the industry standard. Recording media include miniDV cassette tapes or HDV miniDV cassette tapes.

**Advantages:** Video captured can be easily edited with nearly all video editing software available. Excellent picture quality especially in low light situations. Requires less processing power than AVCHD. Low cost recording media (~\$4 per tape for miniDV) is great for archiving.

2 - **AVCHD (Advanced Video Codec High Definition)** uses MPEG4 compression which requires special software in order to process and edit (this format is not natively supported in Windows XP or Vista but it is supported in the upcoming Windows 7). Recording media include 8cm DVD, flash memory (SD), Sony's Memory Stick, or hard drive.

**Advantages:** Newer technology; excellent HD image quality with the right software. Requires less time transferring data than HDV models (drag and drop simplicity). Ability to access scenes immediately. Built-in

features include menus, subtitles and slide shows.

There are also **disadvantages** to both however. Some consider tape to be a dying breed although professional camcorders still rely on tape based units. You'll need ample hard drive storage space for any HD camcorder you purchase but especially tapeless models using the AVCHD format since the video files need a dedicated drive for processing the video and another drive(s) or DVDs for storage. On average, you'll need 13GB per hour of footage for HDV models and 8GB per hour for AVCHD models. A large hard drive, robust processor and a transfer cable like Firewire 800 will make the editing process smoother for either format.

If you purchase an AVCHD camcorder that records to mini Blu-ray discs, you can fit more footage on each disc (25GB single layer; 50GB dual layer) than on a traditional DVD (4.7GB, single side; 9.4GB dual). PC Blu-ray burners are now available so if you get a HDD or flash based AVCHD camcorder, you can burn video to Blu-ray recordable (BD-R) or rewritable (BD-RE) discs.

All HD camcorders will record in standard mode, though, so if you want the option of being able to record HD in the future and don't mind spending extra now, you can invest in the technology. As with all electronics though, HD camcorders will sport new features and will be less expensive in a couple of years.

With these things in mind, HD camcorders are a great idea as they offer superb image quality, but they require more effort than standard DV camcorders. If the time doesn't seem right for an HD camcorder, an interim solution could be to purchase an SD digital camcorder, record in widescreen mode and then watch the videos on an HDTV. This will give you a near HD quality experience without the associated costs or hassles.

If you are willing to do your research though and ensure that you have the computing and software capability to download and edit HD video and/or you want to futureproof your purchase, then go for it. HD will only get bigger and better in the coming years - start now and stay ahead of the curve!

\* Other formats such as XDCAM HD and DVCPRO P2 are tapeless formats like AVCHD, but are geared for professional camcorders costing thousands of dollars.



Figure 1. Canon HFS10 HD Camcorder

## Summary – Digital Video Camcorder Storage / Media

**miniDV tape** – Best quality output and easiest editing capabilities – each tape costs about \$4 and provides 60 minutes of video. Disadvantages include durability issues and access delays to specific scenes on the tape. To many people, tape is on its way out but models are still being produced and supported.

**Recordable DVD** [ mini DVD ] – 8cm/3” disks come in multiple formats including DVD+RW, DVD-RW, DVD-R, DVD+R. They can be played in a standard DVD player or DVD Drive on your computer. Cost varies by format and storage capacity, range \$1 - \$7 each. Single sided disks can store 30 minutes while double sided disks can store 60 minutes of video. DVD rewritable disks can be used over and over if the contents are transferred to another source.

**Flash Memory** – Some models offer internal flash memory only (similar to a hard drive but much smaller capacity) while others accept memory cards or Sony's Memory Stick. The cost of flash memory depends on storage space; on average an 8GB card will run about \$20 and can hold up to 2 hours of video. Flash memory can be rewritten after downloading to a PC.

### Specs to look for in a DV Camcorder:

- Optical image stabilization
- Optical zoom greater than 10x (ignore digital zoom values)
- Weight (test it by holding for 15 min)
- Easy to use buttons / controls
- Microphone on front of camcorder, not on top - port for external microphone
- Low light mode
- Record in widescreen feature with a widescreen LCD
- Auto mode for point-and-shoot simplicity
- Viewfinder
- Verify the ports for connection between your computer, TV, DVD player, etc. Make sure they're compatible and you have enough for all of your devices



Figure 2. Various camcorder styles

**Hard Drives** – One clear benefit is that these camcorders don't need external media to shoot video. Turn it on and away you go. Depending on the size of the hard drive, expect at least 4 hours of high quality video footage – about 20 hours of standard quality. When you're done shooting, transfer the video to your computer via a Firewire or USB cable. Hard drive units offer instant access to video footage on the camcorder.

In summary, cost seems to be the prominent factor in deciding which camcorder to purchase. HD camcorders offer much better image quality but are considerably more expensive and require more processing time and power than their standard definition (SD) counterparts. The HD camcorder market is changing rapidly so if you're on the fence, it may be worthwhile to purchase an SD model, see how you use it and then purchase an HD model in the future. Either way, captured video far surpasses still images in most situations. Keep shooting and enjoy your memories!

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