

VIDEO CAMERA BUYING GUIDE FOR DANCERS

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Some people have been asking me for advice on purchasing a video camera. It can be pretty overwhelming out there with all the options available. It's hard to say, "Buy this camera" because the manufacturers change their model lineup every six months. But I can tell you some things to look for so you can scan the specs of a camera and make an informed decision yourself.

▲ Tapeless or Tape

What, are you crazy? You definitely want a tapeless system. Tape is dead. When you import tape footage into Final Cut, you're using LOG AND CAPTURE which can be problematic. Final Cut has to control the camera and capture the footage as it plays back realtime. Things can easily go wrong, especially if there were a timecode break while you were shooting from starting and stopping the camera. When you use a tapeless system, you import footage with LOG AND TRANSFER. All you're doing is copying a file from the camera to the computer—it's pretty foolproof.

Plus, up-to-date technologies all use tapeless. If you're getting a tape system, it means you're getting an outdated technology. Do not venture down Obsolescence Road.

▲ Resolution

Resolution means how detailed your image is, measured in pixels. Hi-Def comes primary in two flavors: **1080** and **720**. These numbers refer to the vertical dimension of the image. The resolution of these two sizes is width times height.

1080 = 1920 X 1080 pixels

720 = 1280 X 720 pixels

1080 is the current gold standard (if you're not making a feature film). 720 is starting to be less common. The iPhone 4 shot 720 video, but now the iPhone 4S shoots 1080 video.

You might also run into HDV. HDV was a way of getting Hi-Def video on old-school DV tape. It's 1440 pixels by 1080 pixels, but it still has a 16:9 aspect ratio because those 1440 pixels are stretched out to the equivalent of 1920. I'm telling ya, stay away from tape.

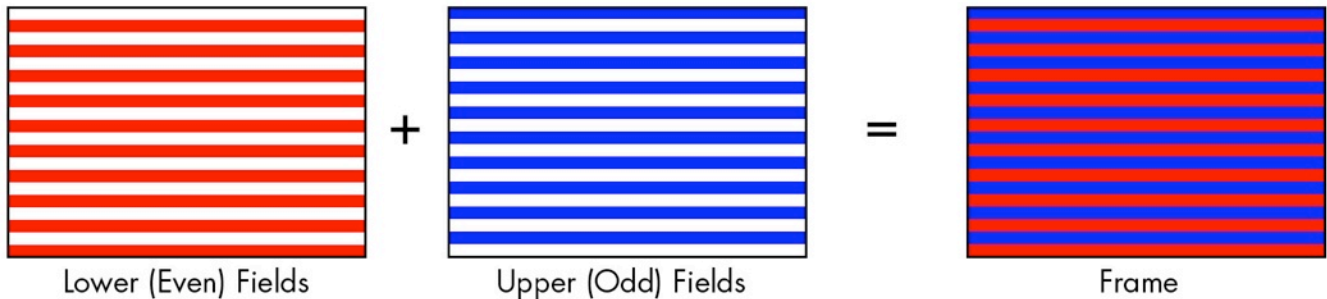
Do you need 1080? What are you going to do with the video? You're going to put it on the web—and 720 footage, with its width of 1280 pixels, is more than enough resolution for a computer video window that's 6" wide. And you're going to make a DVD of it—and DVDs have a resolution of 720 pixels wide. And you're going to project it—and most projectors have a resolution of 1024 pixels wide—again, the 1280 pixels of 720 footage is plenty. With all the above output destinations, you're just going to be throwing away resolution anyway.

So why get 1080? Because starting with higher resolution your image will still be better even when you reduce the resolution. And when you get a camera with 1080, you're getting a more modern camera that's probably going to all around be better.

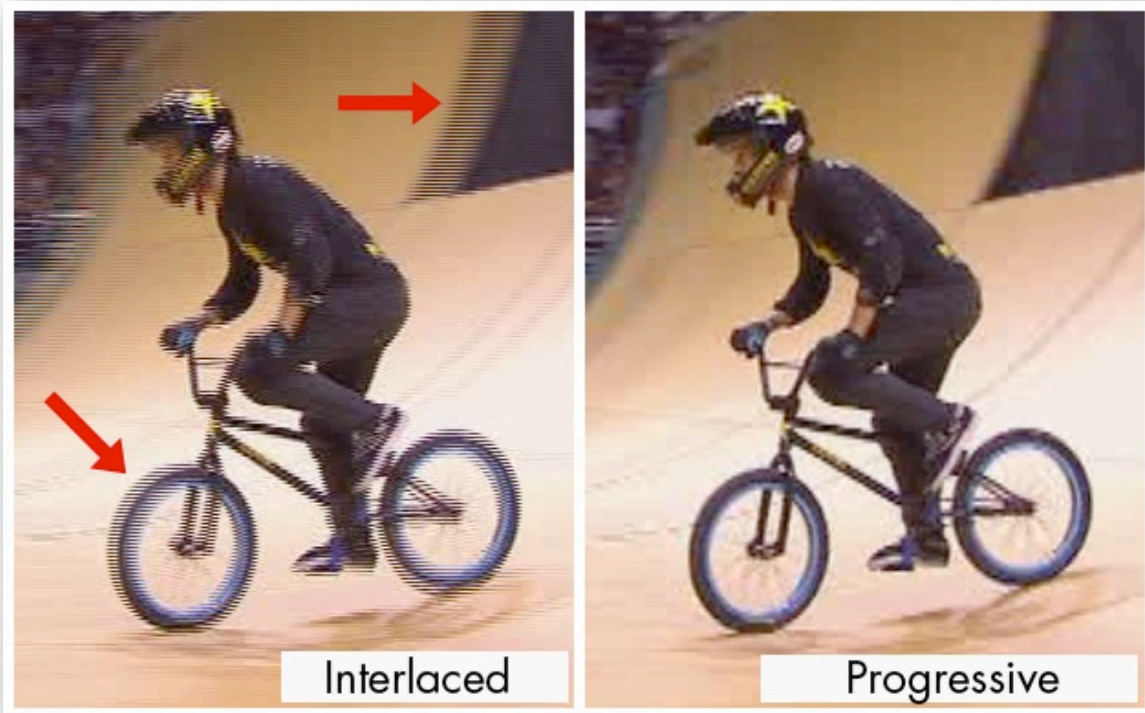
▲ Progressive vs. Interlaced

There are two ways that a frame of video can be constructed: Progressive and Interlaced. An interlaced frame is made up of two "fields": an upper field and a lower field. This is an artifact of earlier days of television. A progressive frame has no fields—the entire frame is displayed at the same time. Interlacing is OK if all you plan to do is output to DVD. But for web, computer screens, projection, or any post-production that includes compositing, progressive is much better.

In an interlaced frame, the lower fields are displayed, and then the upper fields are displayed. It happens so quickly, the eye blurs it together and sees it as one.



When you shoot interlaced footage with a lot of motion (like dance) and then display it on a progressive display (like a computer) you get a "combing" effect, as in the photo. The more motion, the more combing. So it's better to avoid interlaced footage if possible—shoot your footage with a camera, or camera setting, that shoots progressive.



[Click here for a comparison of video footage](#) shot progressive and interlaced.

When you see the letter **P** or **i** after a resolution, that indicates whether the video is Progressive or Interlaced:

1080P is 1920 X 1080 Progressive
1080i is 1920 X 1080 Interlaced
720P is 1280 X 720 Progressive

The more inexpensive a camera is, the more likely it'll be that it shoots only interlaced. I suggest paying a little more money to get a camera that shoots 1080P. This is important.

▲ Frame Rate

Frame Rate is how many images are taken per second. Most video is 30fps (frames per second). Film is 24fps. Many digital filmmakers shoot 24fps because the look is more filmic. (The eye subliminally detects the blinking of the image.) Increasingly you see cameras touting 60fps, boasting that it's *smoother*. But to me, I don't want smoothness—that smoothness has a video feel. It's too real. Plus, your files will be twice as big with 60fps.

Because dance has so much motion, my personal preference is to shoot 30fps—I think that's the sweet spot between the chewy feel of film's 24fps and the smoothness of 60fps.

Like resolution, frame rate will often include whether it's progressive or interlaced by the addition of a **P** or an **i**. So you'll see: 24P, 30P, 30i, 60i, 60P... and others.

My suggestion: 30P

▲ Lens

How wide a lens can shoot is a consideration in dance. When shooting a rehearsal in a tight space, you want to be able to get as wide as possible. In a camera's specs, for the lens (or zoom) it might say its "35mm equivalent" is 38-280, or some number range like that. The smaller number is how wide it can go. The smaller, the wider. Consumer Canon cameras tend to be 38 wide. That's not terribly wide. I see Sony's and Panasonic's going to 31 or even 28. That's good, but their inexpensive cameras also don't shoot 30P—they shoot 60P.

The *35mm equivalent* number you're looking for is in the 20s, 30s, or 40s. If it's in single digits, that's a different system of measurement—ignore that. Sadly, besides the *35mm equivalent* thing, there's no other simple standardized measurement for how wide a lens can shoot. You may want to evaluate the wide angle of a lens by just trying it out in the store. You could use your iPhone's camera as a reference to measure various camcorders against.

Many cameras have threads around the lens so you can add a filter or wide-angle adapter, which cost \$100–200. So if you find a camera you like but it doesn't shoot very wide, you might be able to add an adapter for those times you're in a studio or tight shooting situation.

If a camera can take a wide-angle adapter, in the specs you'll see an item listed something like: Filter Size = 43mm. Or some number like that. This means you can screw on an adapter that has a diameter of 43mm. If it never mentions filter size anywhere, it probably can't take one.

▲ Media Type

Tapeless cameras have different ways of storing footage:

- Internal flash memory. This is like a USB thumb drive—you're recording right onto a memory chip. This is convenient. There's nothing else to buy.
- SD Cards These are small memory cards like in a point-and-shoot still camera. They're fairly inexpensive. These are convenient because if you're on a shoot and your storage fills up, pop in a new card. There are also other types of SD cards called SDHC and SDXC. Make sure you get high speed, high quality cards.
- CF Cards These are higher-end memory cards. They're faster (for cameras that can take a higher data rate), bigger, and more expensive.
- An internal hard drive. Not recommended. It increases camera size/weight and hard drives can fail.
- Writes to a DVD This is a ridiculous way for a camera to store footage.

Some cameras might have two storage systems. For example, you'll see cameras that have internal memory but also take SD cards. So when the internal memory gets full, recording bounces over to the SD cards.

You'll want a bare minimum of 16GB. That's only 33 minutes of recording time at best quality.

▲ Video Format and Data Rate

Video Format refers to what codec, or type of QuickTime, it records to. With consumer cameras you'll typically see **AVCHD**. This is fine. If you're editing in Final Cut Pro X, iMovie, or Premiere, they can natively edit AVCHD. If you're editing in Final Cut Pro 7, you'll need to convert (transcode) the footage to ProRes as you import it (which is no big deal). ProRes is a better editing codec anyway.

Data Rate is how much digital information streams into memory. The higher the data rate, the more information there is, i.e. the better the image. At its highest quality setting AVCHD is 24mbps. So look for a camera that can do 24mbps. Many cameras can also record at a smaller data rate, good when image quality is less important—rehearsals and funny cats.

▲ Sensor Size

This is one of the most important factors in image quality... and one that you probably can ignore unless you spending over \$1200. The larger the sensor, the more light it can take in which increases low light sensitivity. And some cameras have three sensors instead of one—one each to capture the red, green, and blue.

You'll see sensors that are 1/4" wide. And better one that are 1/3" wide.

But on cheaper cameras, you probably can't be concerned with this—you'll need to take whatever you can get given all the other factors in play.

▲ Controls

This is one of the most important considerations to me. I want to be able to easily and quickly control focus and exposure. If you're shooting a performance, there are going to be times when the lighting is bright and others when it's very dark. If you have the exposure set to automatic, in those dark sections, the camera is going to open up the lens and try to make the blacks be gray. It will look grainy and wrong.

The cheapest cameras are automatic everything.

The next tier up lets you control focus and exposure from onscreen touch-menus. This is usually OK when you're making a dance-film and there are fewer surprises and things aren't changing that fast. But it would be hard to shoot a performance this way because it's hard to change exposure menus on a touch-screen while you're following the action.

Better cameras have separate controls on the body of the camera (not on touch-screens). There are buttons to select options on the camera and you can assign the exposure to the focus ring around the lens. This is faster and more convenient, and is fantastic for performances. You usually see these types of individual controls on cameras again above \$1200.

▲ Audio

All cameras have a built-in microphone but these are not great quality and can pick up camera noises like the mechanical squeak of the zoom buttons when you press them. Some cameras allow you to connect an external microphone. This may not matter to you so much. If you're shooting rehearsals, audio isn't critical. If you're shooting a dance-film which isn't going to have live sound, audio isn't critical. If you're shooting a performance, or a documentary with interviews, audio is critical.

If you want clean sound, you'll want a camera that has a mic input. There are two levels of mic jack:

- Consumer level: A regular stereo 3.5mm mini-jack, like on earbuds.
- Professional level: XLR connections. As in the photo, this is the 3-pin jack you see professional mics have. These are on cameras that are \$1500 or more.



Another way to get good sound is to record it separately with a recorder and then sync it up during editing. A popular choice is [Zoom recorders](#) for \$120 and up.

▲ Low Light

Since dancers are often shooting with available light, a camera's ability to capture low light situations should be weighed. This is measured in **Lux**. The smaller the number, the better.

▲ Image Stabilizer

You're going to want this for smoothing out your handheld shooting. Most cameras have it.

▲ Screen Size

The larger the size of the flip-out screen, the easier it's going to be to see your image for composing the frame and checking focus and exposure.

▲ Batteries

The battery they typically give you with a new camera might only yield 45 minutes of shooting. You're going to want a bigger battery. Check around—you can find steep discounts on batteries.

▲ DSLRs

If you ask a filmmaker what type of camera to get, they're probably going to tell you to get a DSLR (digital single lens reflex). These are digital still cameras that also record video. Filmmakers love these because the image is gorgeous—they have a very filmic look. The sensor is large so you get great video. And, for the image quality, they're relatively inexpensive.

I'm going to tell you—don't do it. One of the reasons filmmakers like them is they have a narrow *depth of field*, meaning only the subject you focus on is actually in focus—everything else is blurry. This is the look we're used to in films. It drives the eye right to the point of interest. In a dialogue scene in a movie, that's fine—watch the couple talk, keeping them in focus, and let the Eiffel Tower in the background stay soft. But in dance you have people in the foreground and people in the background. Do you really want one dancer in focus and the other soft? You're also going to have people moving towards and away from you quickly. You're not going to be able to follow the focus.



I also don't like the way you hold a DSLR with its still camera form factor. I prefer the way you hold a camcorder with the right hand supporting the camera and the left adjusting controls.

▲ Tripods

If you buy a tripod, the most important thing is the head. You want a true fluid-head, rather than the cheaper friction heads. This will let you smoothly feather the start and stop of a pan or tilt without jerking.

▲ Brands

There are a lot of companies that make fine cameras. I'm not going to tell you you have to buy from a particular company. Go through all the specifications of a camera and see if it has the options I've listed above that you care about. Then read extensively about the camera. Do web research and read professional reviews, as well as user comments on BH-PhotoVideo and Amazon.

But I will say this: Canon has a large ecosystem, meaning there are a lot of Canons out there and so they're well supported—you can easily get accessories, etc.

▲ Where to Buy

You can do a lot of research online. There's good information on [BH-PhotoVideo](#) and [Amazon](#). And their prices will be good.

Then ask yourself, How much support am I going to want for my new camera? If you have a problem/question, you're not going to drive your camera over to Amazon. Although buying online is initially cheaper, I think there's real monetary value in being able to walk into a store and talk to a person you have a relationship with. You're going to want to hold and try out the tool which will be such a large part of your work. And you're going to want to see for yourself how good the image is, how easily the controls are accessible, how well it performs in low light, and how wide the lens shoots. Plus you'll feel better about circulating money in your community, rather than sending it off to a huge corporation.

In the local store I go to, I talk to actual humans who are really nice and very helpful—they'll spend all day talking with you. And they give decent academic discounts, so if that applies to you, ask them about it.

I would buy a camera, tripod, and bag from a brick and mortar store where I can hold the equipment and try it out. But with things like batteries, memory cards, and wide angle adapters... there aren't a whole lot of variables there. I'd buy those online.

Here are the consumer camcorder lines from different companies. Check out the specs:

[Canon](#) [Sony](#) [Panasonic](#) [JVC](#)

▲ Summary of Recommendations

Resolution	1080P (progressive, not 1080i)
Frame Rate	30fps
Lens	as wide as 32mm (otherwise consider a wide-angle adapter)
Media Type	internal memory or SD cards
Video Format	AVCHD at 24mbps
Controls	at a minimum, ability to manually adjust focus and exposure
Audio	a mic input jack if you need clean audio

