VIDEO CAMERA BUYING GUIDE FOR DANCERS

by Mitchell Rose

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 lineups 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.

◢ Body Type: Camcorder or DSLR

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) like in the photo at right. 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 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 the camera quickly. You're not going to be able to follow the focus, and autofocus on DSLRs is poor or nonexistent.

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.

◢ Resolution

Resolution means how detailed your image is, measured in pixels. Hi-Def comes primary in two flavors: **1080** and **4K** (the latter also called Ultra HD or UHDTV).

1080 = 1920 X 1080 pixels (width times height)
4K = 3840 X 2160 pixels

1080 is excellent quality. There is controversy about how necessary 4K is. When you go to a movie theater, the movie there is 2K wide. Do you ever think to yourself, *Boy, that's blurry*. I think 1080 is perfectly adequate for almost anything you'll be doing. Remember 4K files are two to three times bigger than 1080. There goes your hard drive.

So what's with 4K? I personally feel it's a scam from equipment manufacturers. *You already have a camera and you already have a hard drive? That's great, but we need you to buy a new*

camera and bigger hard drives. Nevertheless, the march of "progress" is unstoppable, so in a few years it will be hard to buy a camera that isn't 4K. Fortunately, the menu settings in those cameras will allow you to set the recording resolution down to 1080, thereby saving you a ton of file size while still giving you a beautiful image.

That also means that for the next few years, it might be a little cheaper to buy a 1080-only camera that is viewed as older technology.

◢ Frame Rate

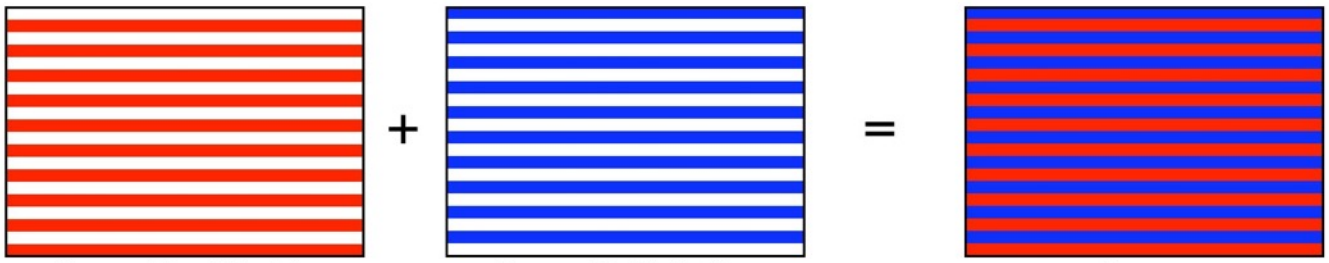
Frame Rate is how many images are taken per second. Most video is 30fps (frames per second). Film is 24fps. Many digital filmmakers shoot 24fps because the look is perceived as more filmic. We're just enculturated to see 24fps as looking like film.

Increasingly you see cameras touting 60fps, boasting that it's *smoother*. But to me, I don't want smoothness—that smoothness has a video game feel. It's too *real*. Plus, your files will be twice as big with 60fps.

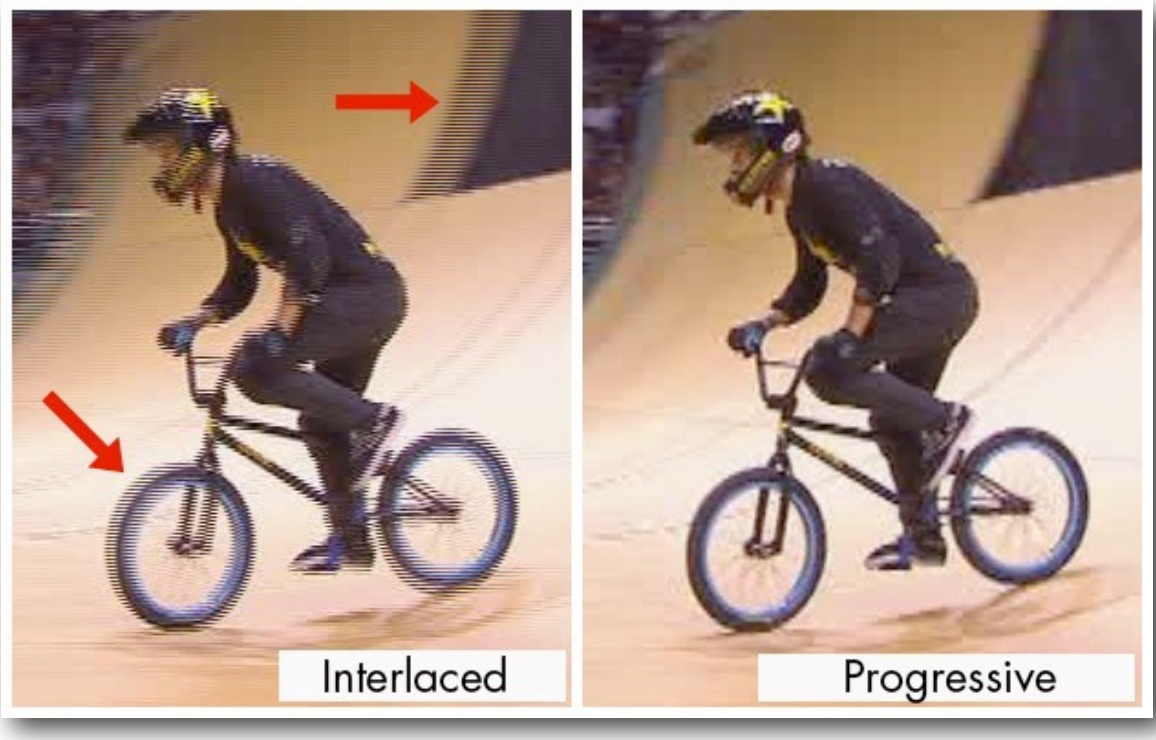
Because dance has so much motion, my personal preference is to shoot 30fps—I think that's the sweet spot between the chewy feel of film's 24fps and the smoothness of 60fps.

◢ 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. Progressive is what you want.



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 on the next page. So it's important that you get a camera 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

Sometimes the indication of whether a camera shoots Progressive or Interlaced goes after the frame rate, also by adding a **P** or an **i**. So you'll see: 24P, 30P, 30i, 60i, 60P... and others.

The more inexpensive a camera is, the more likely it'll be that it shoots interlaced. I suggest paying enough money to get a camera that shoots 1080P (or 30P). This is important.

◢ 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" (they're comparing it to a 35mm still camera) is 38-280, or some number range like that. The smaller number is how wide it can go. The smaller, the wider. It's great if a camera can down to 28 for a nice wide shot. 31 is good. 38 is pushing it. 42, you've got problems.

Note: There are different systems for measuring how wide a lens can go. 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.

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

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.
- SD Cards — These are the small common memory cards and they're fairly inexpensive. 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.

My personal preference is to record on a card. If you're on a shoot and your storage fills up, pop in a new card. And you can keep those cards as archives. Most computers have SD card slots, so when you want to capture your footage, you can just bring the SD card with you and not have to schlep the whole camera around.

You'll want a bare minimum of 16GB. That's 85 minutes of recording time at best quality.

Some cameras might have two storage systems. For example, you'll see cameras that have internal memory but also take SD cards. In those cases, sometimes the SD cards are meant to only record the photos the camera can take.

◢ 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** or **MP4**. Use AVCHD. If you're editing in Final Cut Pro X, iMovie, or Premiere, they can natively edit AVCHD. (AVCHD can also be called H264.)

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. Just use those when image quality is not important—rehearsals and cats.

◢ Sensor Size

This is an important factor in image quality... and one that you probably can ignore unless you're 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 ones 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 manually. 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 iris 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 and knobs to adjust levels. This is faster and more convenient, and is fantastic for performances.

◢ 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 $1300 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 $150 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.

◢ Viewfinder 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, sometimes made by other manufacturers (but read user reviews).

◢ 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, but they cost a lot more. 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.

But I will say this: Canon and Sony have large ecosystems, meaning there are a lot of Canons and Sonys out there and so they're frequently improved and well-supported—you can easily get accessories, etc.

What about iPhones? They have a great image outdoors. They don't offer many features.

What about GoPros? I would leave them to skateboarders. Too wide angle, few features, small or no viewfinder.

◢ Wifi

A gimmick. You can transfer your footage easier and faster with the SD card.

◢ Summary of Recommendations

Resolution	1080P (Progressive, not 1080i)
Frame Rate	30fps
Lens	as wide as 32mm (otherwise consider a wide-angle adapter)
Media Type	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

◢ 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 can be initially cheaper, I think there's real 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 Columbus I go to Midwest Photo Exchange in Clintonville. They're really nice and very helpful—they'll spend all day talking with you. And they give decent academic discounts—prices that come very close to (and sometimes beat) online prices, particularly if you're getting a package.

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 sometimes buy those online.

DO NOT go and get an hour of free advice at a store and then go buy online! If you do, I hope all your footage is blurry, you lowlife.

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

Canon Sony Panasonic JVC

◢ What to Get

OK, this is all you want, right? Some recommendations on cameras. Here are some I think could be good choices for various budgets. But remember, new models come out every six months—I'm writing this in April 2016.

And I'm posting links to online stores only for info-gathering convenience. Buy in a real store if you can.

Go to these links and click on SPECS, and then REVIEWS.

$300 Canon VIXIA HF R600

$700 Canon 32GB VIXIA HF G20

$1300 Canon XA10

$1700 Sony FDR-AX100

or if you need better audio, like making a documentary with lavalier mics, then Canon XA20