Camera Movement Techniques - Tilt, Pan, Zoom, Pedestal, Dolly and Truck

by Kyle Cassidy

(Source: http://www.videomaker.com/article/14221/)

Every time we learn a new craft or skill, we need to learn the basic moves or techniques that define that function. Here are some terms you'll hear as you develop your skill.

Beginning to learn to shoot video, whether for a hobby or a budding business, requires some knowledge of the basic moves that define good video shooting practices.

Back when I was in school taking TV Tech, we would practice making a TV Show called The Skills Card Test -- we hated doing it. The studio looked so inviting - the cameras, the lights - that we wanted to get on with being Steven Spielberg and skip over the boring stuff, like learning how to actually use the equipment. The Skills Card Test consisted of a number of grey cards on stands, and the camera operators had to perform certain camera operation tasks that related to things that were on the cards. So, while the camera operators practiced panning between two dots, zooming from one box to another, the directors practiced directing, the narrators practiced narrating, the Technical Director practiced Technical Directing (which involved setting the levels for the cameras, making sure that the lighting wasn't too bright or too dark, among other technical tasks), grips gripped, gaffers gaffed and production assistants learned to do everything else. What I realize years later is that doing that boring show over and over the first three weeks of class taught me not just to appreciate finally getting to write scripts and make our own TV shows, but I realized that I learned right there in a few weeks what it takes many people years to learn on their own.

A camera exists in a three-dimensional world and can move anywhere along the XYZ axis. This means it can move up, down, left, right, as well as forward and backward. So that the director and camera operator can effectively communicate, there are names for each of these moves. This means the director can give a series of verbal instructions, and the camera operator knows exactly what to do without anybody having to get out and draw diagrams.

The Basic Camera Moves

Let's look at the basic moves that are used in every video and film production, from those used by your wedding videographers to those used by Spielberg himself. Our pictorial examples show a videographer using these moves with a hand-held technique, but they apply best to tripod and dolly use.

Tilt: Moving the cameras lens up or down while keeping its horizontal axis constant. Nod your head up and down - this is tilting.

Pan: Moving the camera lens to one side or another. Look to your left, then look to your right - that's panning.

Zoom: Zooming is one camera move that most people are probably familiar with. It involves changing the focal length of the lens to make the subject appear closer or further away in the frame. Most video cameras today have built-in zoom features. Some have manual zooms as well, and many have several zoom speeds. Zooming is one of the most frequently-used camera moves and one of the most overused. Use it carefully.

Pedestal: Moving the camera up or down without changing its vertical or horizontal axis. A camera operator can do two types of pedestals: pedestal up means "move the camera up;" pedestal down means "move the camera down." You are not tilting the lens up, rather you are moving the entire camera up. Imagine your camera is on a tripod and you're raising or lowering the tripod head (this is exactly where the term comes from).

Dolly: Motion towards or motion from. The name comes from the old "dolly tracks" that used to be laid down for the heavy camera to move along - very much like railroad tracks - in the days before Steadicams got so popular. The phrase dolly-in means step towards the subject with the camera, while dolly-out means to step backwards with the camera, keeping the zoom the same. Zooming the camera changes the focal length of the lens, which can introduce wide-angle distortion or changes in the apparent depth of field. For this reason, it's sometimes preferable to dolly than zoom.

Truck: Trucking is like dollying, but it involves motion left or right. Truck left means "move the camera physically to the left while maintaining its perpendicular relationship." This is not to be confused with a pan, where the camera remains firmly on its axis while the lens turns to one direction or the other. You might truck left to stay with a pedestrian as she walks down a street.

The Fancy Camera Moves

Now that you understand the basics, here are few more advanced moves. Some of these usually require the use of a steady device and one or two crew members to execute smoothly.

Handheld Shooting: Sometimes the action is moving too quickly or too unpredictably for the camera to be on a tripod. This calls for making the camera more mobile and able to follow the action of a scene. Most times the camera will simply be held by the operator, who will then employ a number of basic camera moves by moving the feet - trucking in and out, dollying in one direction or another, tilting, panning, zooming - and combinations of all of these.

Floating Cam or Stabilizing Shot: The Steadicam was invented in 1971 by Philadelphia native Garrett Brown. Famously used in the jogging sequence in Rocky and extensively with exceptional effect in the Kubrick masterpiece, The Shining. It uses a series of counterweights (and gyroscopes on more-expensive models) to keep a handheld camera's motion very smooth. Although the term "Steadicam" is used often, this is a trademark name belonging to the Merlin company. Similar to Kleenex for tissues, we call the devices that are non-Steadicams "stabilizers". Stabilizers for the small-business video producer are plentiful, much more affordable and are widely used today.

Crane/Jib: A crane can be used to lift a camera (and operator, if it's big enough) from low to high shooting positions. Less expensive jibs can support the weight of a camera and lift it several feet off of the ground. Sometimes called a boom, but the boom term usually applies to the device that holds a microphone aloft.

Putting it All Together

Just because you're not in school for video production doesn't mean you shouldn't be doing homework and practicing to improve. Your mission, should you choose to accept it, is twofold.

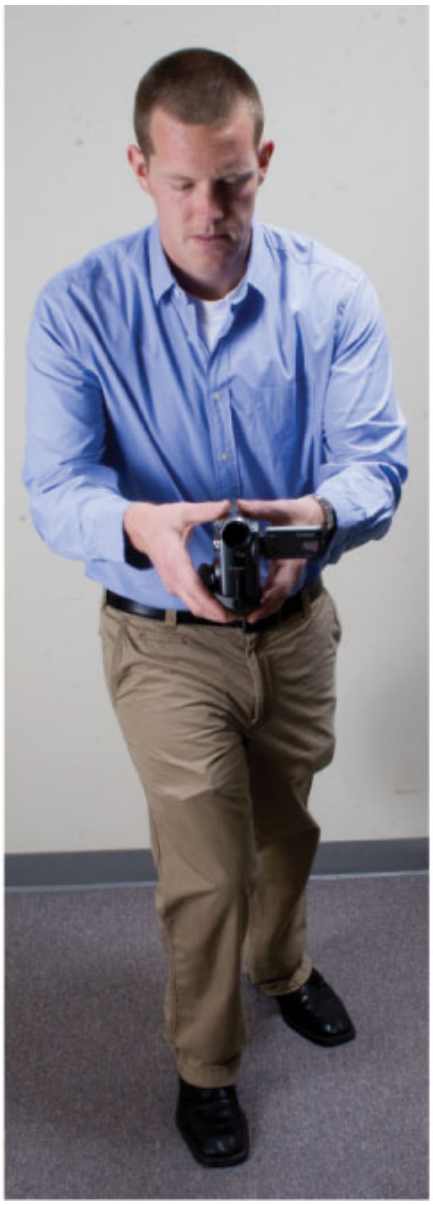
First, to identify basic camera moves while watching movies and television and deconstruct them in your mind. Is the camera trucking or zooming? Is the camera on a crane? Or is the operator merely sticking his head out of a window?

Second, to utilize all of the basic camera moves in a production. Understanding how the moves work gives you a series of new tools to help build productions in the future. If you're already using all of the basic camera moves, consider buying or renting a stabilizing rig or a jib for your next production. Experimenting is half the fun of making videos, and coming up with a new move that wows viewers while helping to get your story across is extremely satisfying.

Contributing Editor Kyle Cassidy is a visual artist who writes extensively about technology.

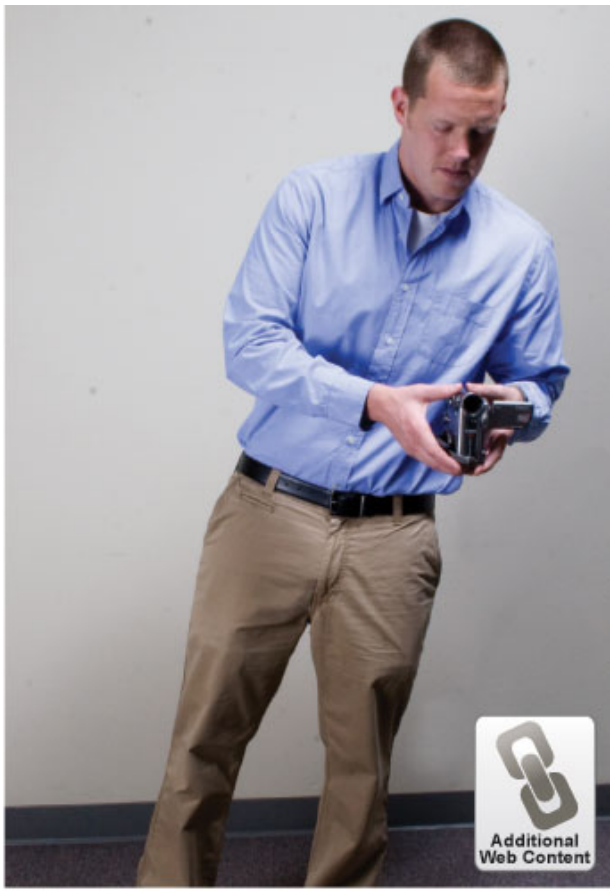
TILT: In a tilt shot, the placement of the camera does not move, but the lens does. You point the lens down then slowly, smoothly move the lens up for a "Tilt Up" shot.

PEDESTAL: A pedestal shot is the opposite of the Tilt shot. The lens does not move up or down, however the entire placement of the camera does. A Pedestal Up shot has the camera physically rising from a low angle position to a high angle position.



DOLLY: A dolly moves forward or backwards from its original position. To do this using handheld techniques, keep one foot in front of the other, balancing your weight on the back foot, them moving your weight to the front foot for good steadying support and balance.

PAN: Opposite of a truck shot, a pan arcs from one position to the other, sweeping across a scene. TIP: To do a good handheld pan, place your upper body in the direction you expect to END your shot. You then twist from the opposite direction. This technique keeps you from being off balance and shaky at the end of the shot so you are in a more relaxed position at the end of the movement.



TRUCK: Notice in the trucking shot above that the videographer isn't changing the camera lens's perspective, but the camera's actual position. **TIP:** To execute a smooth truck shot while using handheld techniques, balance your camera over one leg as it stands firm on the ground, then "truck" over to the other leg, making sure you are balanced over the firmly planted leg at the end of the shot.

STABILIZER and JIB: A stabilizing device, (left) allows you to execute some nice moving shots using handheld techniques. A jib or crane (right) gives you that added POV bonus shot you might not be able to reach otherwise.