

Field Production Workshop

Instructor: John Aden



The equipment you will learn about in this class:

- Manual prosumer cameras vs. smaller DV cameras
- Handheld, shotgun, & lavalier/lapel microphones & audio cables
- DOM light kits & reflectors
- Tripods & monopods
- The DOM equipment scheduler (if you are a DOM member)

First things first, DOM policies:

1. This class certifies you to use the DOM equipment covered in this class.
2. Once certified, you can rent DOM equipment at commercial rates, or you can purchase a DOM membership and check-out DOM equipment free of charge. (Currently, a DOM Equipment Access Membership costs \$250. Under this membership, individuals may reserve one complete field package, including but not exceeding: 1 camera and accessories, 2 batteries, 2 microphones and cables, one camera support, 1 light kit with accessories, field monitor and headphones for 24 hours, or for 72 hours if you rent Saturday-Tuesday. For equipment needed beyond these quantities, members will be charged reduced commercial rates, aka “member rates”.)
3. If you are accessing our equipment through your DOM membership, all material you create using DOM equipment must be non-commercial in nature and be submitted to air on our channels with a Creative Commons Attribution-Noncommercial-Share Alike license. If your material is commercial in nature and/or cannot air on our station, you must rent our equipment at the commercial rates.
4. If you are accessing our equipment through your DOM membership, neither you nor your crew may be paid to produce your video project. If you are getting paid, you must rent the equipment at the commercial rates. Certain exceptions are made for nonprofit organizations based on project proposals. Please see our Station Director for more information.
5. Uncertified people cannot touch DOM equipment.
6. Damage to the equipment due to inappropriate use is the responsibility of the user. Damage to the equipment due to normal wear and tear is the responsibility of Denver Open Media.
7. Plan on spending 30 minutes to check in and check out equipment. Examine your equipment carefully on check-out. Make sure the equipment works and there is no visible damage (cracks, breaks, etc.). You are responsible for any damage to the equipment once you leave the building.

Your Primary Tool: The Digital Video Camera

When you complete this class, you will be certified to access our larger cameras with manual controls and the smaller, handheld 3-chip cameras. People often think that the more expensive cameras like the Z1U are higher-resolution than the cheaper & smaller DV cameras. Unless you're dealing with a high definition camera, all DV cameras are the same resolution (about 500 lines of resolution). Even a \$200 mini DV camera is exactly the same resolution as a \$4,000 camera like the Sony Z5U. What you are actually paying for is to have more control over your audio and other settings (i.e. iris and shutter speed.)

How a DV Camera works:

Light comes into the lens just like a film camera, through an aperture (iris), past a shutter, and onto something that captures the image. In a film camera that something is a piece of film that gets exposed to a small amount of a light that is focused by the lens for a tiny fraction of a second, over and over again, dozens of times each second. In a DV Camera, the light is focused onto a chip, or a "charge coupled device" that samples the light that hits it and turns that image into a bunch of ones and zeroes that it stores on a magnetic mini DV tape.

Understanding the controls on Your Camera:

NOTE: If you don't see the readout of a certain control, the camera is likely set to auto!

The two primary tools you use in any camera **to control the brightness and quality of image** are: **Shutter Speed and Iris.**

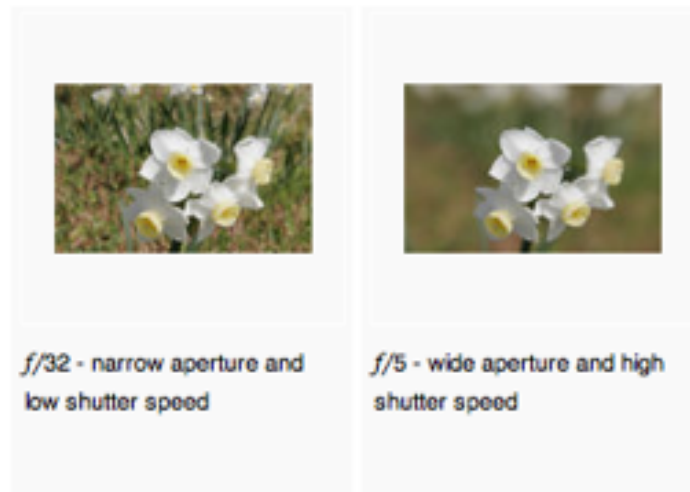
Iris (Aka "Aperture" or sometimes, "F-Stop"): Iris affects the brightness of your image and depth of field, or range of focus. As mentioned before, the light travels through your lens, through your iris (or aperture) before hitting the CCDs. The aperture affects both the amount of light that reaches the CCDs, as well as the focus of that light.

When you open the iris on your camera your picture gets brighter, allowing you to film in dimmer conditions, but your depth of field shortens and it is harder to keep your subjects in focus. (Although it seems a bit backwards: **the smaller your f-stop setting is (i.e. 1.4), the bigger the opening is** (see below.)



If you want people paying attention to something in particular, the best thing is to have a shallow depth of focus because things in front of or behind your subject will be out of focus. Whereas

with a small aperture opening (i.e. 11) a lot more of your image would be in focus, and your audience *may* not know where to look.



In order to achieve this effect you should place the camera as far from the background as possible, and make sure there is also ample space between the subject and the camera. This will ensure that your background is out of focus, and will prevent your scene from looking flat and cramped.

Now, let's talk about shutter speed, and how it is used as a tool to correctly expose your shot after you've set your Iris.

Shutter Speed: Shutter Speed also affects brightness. The shutter speed determines how long the shutter opens to expose each frame. Slow shutter speeds (i.e. 1/60th of a second) let in more light because the shutter is open longer. Therefore, the result is a brighter image but blurrier motion and should generally be used only when you are not recording any fast-moving subjects, when you are not zoomed in too far, and when using a tripod. (Remember: Zooming in tends to show motion and blur more easily.)

As mentioned previously, the CCDs in your camera are generally sampled every 1/60th of a second (unless you are recording in 24p or 30p), and so 1/60th of a second is often the slowest shutter speed available. Speed it up, your picture gets darker and motion gets sharper.

Caveat: unlike the iris, where the quality of the image changes in terms of its depth of focus, shutter speed doesn't really affect the image until you get down to relatively slow shutter speeds (under 100). Lower than 100th of a second and you start getting fuzzier images.

Concept Break - Focus: The strongest tool in the cinematographer's bag of tricks (as far as controlling what the viewer is looking at) is focus. A full-face close-up in sharp focus in the foreground will dominate the audience's attention, diverting their attention from softer, unfocused images in the background. Conversely, a figure in soft focus in the foreground can occupy more than half the frame and yet attract less attention than a smaller figure in the

background, proving that focus is more important than the location or size of the object.

Rack Focus: A shot where focus is changed while shooting. A rack focus is usually done to shift attention from one thing to another.

Gain: Your camera's ability to have a large aperture is what makes it more expensive. Gain is cheap. Gain electronically boosts the brightness of your picture, but adds graininess and reduces image quality (i.e. noise is added and your colors are muted.) Avoid using gain whenever possible, and when you must use it, try to limit the amount of gain as much as you can (unfortunately in a lot of the smaller, less-expensive cameras gain is automatically added in low-light conditions and there is no way to turn it off.)

If you are in a situation where your image looks dark, first adjust the shutter speed, then adjust your iris, and finally add more lights if necessary. Only use gain when the aliens have landed and you have no other choice. **Pause to demonstrate the effect of using gain.**

ND Filter or Neutral Density Filter: The Neutral Density filter affects the brightness of your picture without adding any extra junk. An ND filter is the equivalent of putting a pair of sunglasses on your camera; it is simply a dark piece of glass or plastic that reduces the amount of light coming into your camera. The reason it is called a *neutral* density filter is that it does not affect the quality of your image. Most often a neutral density filter is used outdoors on bright days to keep from forcing you to max out your shutter speed and allowing you to still have control over your iris. An ND filter will allow you to use a slower shutter speed and/or a larger aperture to allow for shallow depth of field, even when the light calls for a fast shutter and small iris. **There is no reason to use the ND filter indoors.**

Tripods and Monopods: Mechanical image stabilization, in its simplest form, can be as simple as pinning the camera up against a wall or resting your elbows on a table. In its most complex form, it is a crane or a camera jib. The tripod is always your best, most stable option when you don't need to move the camera. A monopod is a cheap, mobile option with one pole that you hold steady yourself as it rests on the ground. A monopod is always better than a hand-held when you don't want an intentionally shaky image. Also, you should make all of your camera movements when the camera is turned off. Even if you want to pan, try instead to take a bunch of static shots.

Concept Break – Framing: Framing refers to the placement and movement of the frame itself. Like any painter, the cinematographer gets to decide what items are inside and outside of the frame of his picture, as well as how the items are arranged within that frame. Of course film and video differ from most other forms of art, in that the frame itself can move. Dolly shots, pans, zooms, tilts, etc. are unique tools of the cinematographer.

Framing for Beginners: An important tip for beginners is to conduct ALL your camera movement while the camera is off, and only record stationary shots. Beginners tend to want

to move the camera to keep things interesting, but the end result is often chaotic. More experienced cinematographers often learn to keep most shots interesting using placement alone, resorting to movement of objects within the frame and only moving the frame itself on special occasions and/or deliberately.

Concept Break - Zooming: Zooming is often considered an amateur technique and is rarely seen in professional film and TV. When you do see zooming in a professional piece it is usually being done with dollies, jibs or cranes. Since we do not have access to these items, you should always try to keep the camera still and compose all of your shots of static shots. If you want to show a wide shot and follow it with a close-up, instead of zooming you can set up the wide shot, turn off the camera (or mentally pause it), and then set up the close shot, moving from static shot to static shot.

Zoom affects not only the closeness of the picture, but also the steadiness of the picture. If you do not have a tripod, a good rule of thumb is to stay fairly wide (zoomed out). The more you zoom, the more noticeable a shaky camera becomes, and your footage becomes more amateur looking.

Lighting

Basic 3-point lighting setup:

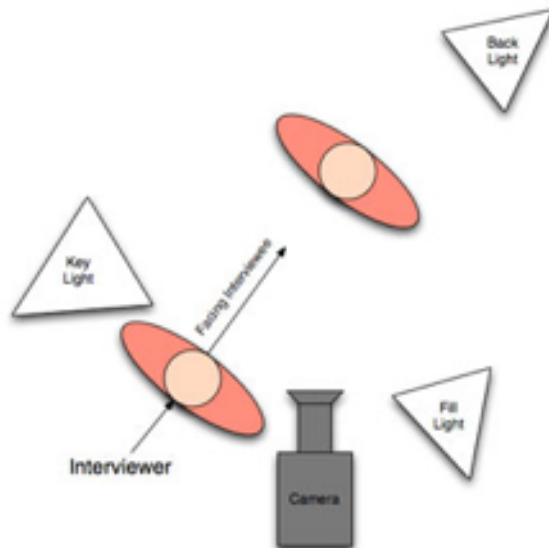
- o **The Key Light:** **The primary source of light for your shot.** This light is used to illuminate your subject. The other lights are used to make your shot look pretty, or to support the key light.
- o You can place it anywhere you want, but a common placement is about 45 degrees to either side of the camera

o Which side of the camera should you place it on? **It depends on the look you're going for.** You can get as creative as you want with this. However, if you're trying to create a standard look, use the following rule of thumb:

§ ***Whichever way the subject is facing in the frame, put the key light on that side of the camera.***

o The Fill Light: A diffused light, dimmer than the key, the fill light is placed on the opposite side of the subject, **filling in the shadows left by the key light** and ensuring the entire subject is properly exposed. (A reflector can also serve as a fill light.)

o The Back Light: A small light, above and behind the subject, shining on the back of their head and shoulders. The back light casts a glow in the subject's hair and atop their shoulders, which helps to **separate them from the background.**



Other Lighting Tools:

The three kinds of lighting “fixtures” we address in this class are:

- **The Spot (Lowell's Omni):** These are the most common type of lights you will see. Usually a square or round open-faced light designed to throw a bright light; spots can be used as a key, fill, or backlight. Use your thumb to control the intensity of the light, and the barndoors to control the focus.

- **The Pan (Lowell's Tota):** A small, open-faced light with a long-skinny shape. It's called a pan light, because it is shaped to provide a wide, thin light that you can pan across. Larger pan lights are also referred to as "broads". Pan lights are usually used for fill, backlight, and set lighting. (A Tota light with an umbrella pointed AWAY from your subject can serve as a good fill light. By moving it further/closer from the subject you can adjust the intensity of this light.)
- **Soft:** Soft lights provide a soft, diffused light, used as a fill light to fill in the shadows left by the harsher key light. Usually a spot light covered with diffusion such as a diffusion gel or an umbrella can serve as a soft light.

When moving lights, be sure to switch them off first so there is no breakage.

Color Temperature: Different lights have different color temperatures and the camera is much more sensitive to these differences than the eye. Flame, fire or candlelight (orange), household lights (yellow), tungsten, halogen and photoflood (between yellow and green), fluorescents (greenish), sunshine or daylight (blue).

White Balance: You should always adjust your camera's white balance setting to get the correct color representation, no matter what kind of light you are shooting in. There are pre-sets for indoor and outdoor lighting, and a custom white-balance setting for everything in-between. To use the custom white balance setting, turn your white-balance setting to custom (usually an A or B or the icon that looks like a flower), point the camera at a white surface illuminated by the same lighting as your subject, zoom in to fill the frame with the white surface, and then press the white balance button. Make sure that you white balance in the same light as your subject, NOT immediately in front of your camera. **Pause for white balance demonstration.**

Gels: It is important to note that the custom white balance setting does NOT rectify the problems caused by having **different light sources** of differing color temperatures. The most common example is when filming indoors with light coming through a window serving as a fill or key light. This will often result in the two sides of your subject having a different color tinge. The simplest solution to this situation is using a gel. Before you white balance, match your light sources by using a gel and then white balance.

A gel is a colored plastic square that changes the color temperature of a light, usually to match other light sources. For example, a blue gel over an indoor light will match its color temperature to sunlight. (Please note that gels do not typically come in the light kits provided by DOM but can be bought at any film/video supply store for about 70 cents a piece or \$10 a set.)

Other Tools:

Diffusion: Most light kits will also include an opaque or finely textured gel that helps to diffuse the light (i.e. spread it out), making it more suitable as a fill. Other ways to diffuse light include:

reflecting it off a wall or ceiling or reflecting it off an umbrella reflector. As a rule of thumb, shots tend to look better when the light is diffused. FYI the best condition to shoot outdoors is on an overcast day when the light is naturally diffused.

Barndoors: The flags that come on most light kits that you can open and close to adjust the shape and amount of light coming from the light.

Flags: A flag is technically ANY material or object which blocks light completely. So, your metal barndoors, or even a reflector that you use to block the light, are flags.

Scrims: The round, metal mesh, screen-door-like frames that come with DOM light kits are examples of a scrim. They dim (and to a small extent diffuse) the light. Many people will use scrim and net interchangeably, and on movie-sets, the huge, white fabric panels people use to diffuse and dim sunlight are referred to as scrims.

Shooting Outdoors: Outdoor lighting is usually easiest to work with on cloudy or overcast days, or at dusk and dawn. Shooting under direct, sunlight will usually appear very harsh and flat. The light can be significantly adjusted with nets, scrims, and reflectors. When shooting outdoors, you should still be aware of creating a good 3-point light set-up.

Reflector set: These fairly inexpensive sets of collapsible fabric rings are a MUST for anyone who plans to shoot frequently outdoors. Used to improve the quality of light, inside or out, a standard set will include a white fabric reflector that can be used as a soft reflector or as a net, to shade the sun from the subject, but allow enough diffused light to pass through to get good exposure.

Audio

Audio is the most important element for conveying meaning. If something is wrong with your picture, you can always use a different picture (i.e. B-Roll) and still convey the meaning, but if your audio is bad, you're stuck with it.

Types of Microphones:

As you watch the video, rank the microphones in order of the quality of the sound.

- **Camera or built-in mic:** To be used only when your audio is coming from multiple sources that cannot be easily mic'd.

- **Handheld microphone:** The most common kind of mics. Handheld microphones only pick up sounds from things that are close to it, which makes them well suited for noisy situations.
- **Lavalier:** A lavalier mic or “lapel” mic is a small clip-on microphone most commonly used in sit-down interviews and non-narrative video. These mics require power, so you either need a battery-pack or a camera with phantom power. (Please note that the Canon XL1 does not have phantom power.) They pick up a lot of ambient sound, so they are not always recommended for noisy situations. When using a lav, be aware of things around the mic that may rub against it and interfere with the audio you are trying to record. For example, long hair and necklaces can rub against the mic, causing extra noise.
- **Shotgun mic:** Directional microphones best used for capturing sound at a distance. Shotgun mics are most commonly used in narrative filmmaking, where you do not want to see any microphone in your shot, and are often attached to boom poles. They also pick up a lot of ambient sound as well, so you must have good control over your environment in order to use them.

XLR Cables: Cables used to connect microphones to cameras. When connecting mics to cables, make sure they CLICK in. Note: Anytime you're filming something that uses a PA system, it's best to get your sound straight from the PA instead of a microphone because it is cleaner.

Tips and Techniques:

Here are some suggestions for capturing good sound:

- **Never film without headphones.** There is no fix for bad audio...in a way it is more important than capturing good video.
- In general, you want the mic as close to a person's mouth as possible
- If you are in a position to choose the environment, make sure that you choose a location that is far from any fans or rattling furnaces, traffic, screaming children, etc.
- If there is a lot of excess noise, make sure you film some of it (i.e. kids playing) to include as an establishing shot.

Manual audio settings: Please refer to the camera's individual cheat sheet when using an external mic. It's always a good idea when you only have one microphone to offset your left and right channels so one is louder than the other; that helps ensure that if something super loud or quiet happens, one of the channels will capture it. Your audio levels should be *peaking* at -12db.

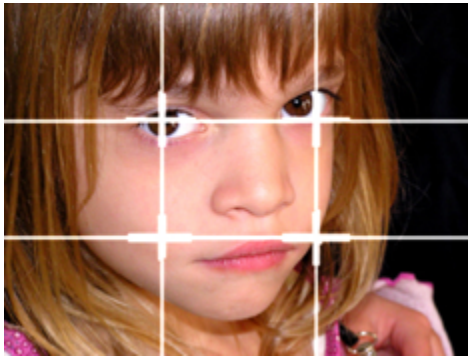
Cinematography

Once you understand how to use your camera's settings, lighting, and audio to capture good video, the next step towards producing high-quality footage is the composition of your

shots, also known as your cinematography. The idea is: **as a filmmaker, you always want to understand where your audience will be looking, and you want to be able to subtly control where they focus within each shot.**

It's important where you place people and objects in the frame across all three dimensions: up and down, left to right, and near to far.

Rule of Thirds: When filming people, regardless of the shot (whether a close-up or wide shot) you want the subject's eyes in the top third of the frame. Any shot is aesthetically more pleasing to the viewer when the rule of thirds is followed. If you watch any professional video you'll see the rule of thirds being followed. Not following the rule of thirds will make your video look like amateur work right from the start. **If you only ever learn one thing about cinematography, this should be it.**



In an ECU (extreme close-up) the eyes are usually aligned with the top third, and the mouth along the lower third.

Also, if your subject is looking off to one side or the other, they should be framed off-center such that there is more room in front of their face than behind it.

A timecode is a sequence of numeric codes generated at regular intervals by a timing system. Timecodes are used extensively for synchronization, and for logging material in recorded media.

Avoiding time code breaks: Each frame of video is identified using a number called a timecode. When you edit video on your computer, the timecode identifies the exact places where you make edits. On your DV camera, a timecode indicator tells you how much video has been recorded on the tape. This indicator usually shows up in the camera's viewfinder or the LCD panel. A typical timecode looks something like this: 00:07:18:07. This number stands for 0 hours, 7 minutes, 18 seconds, and 7 frames.

Sometimes while recoding, there can be a timecode break. A timecode break is most likely to occur if you fast-forward or play a tape past a blank, unrecorded section and then start recording again.

When you capture video from a DV camera onto your computer, the editing software reads the timecode from your DV tape. If there is a timecode break, this can cause a problem when trying to capture your footage and edit it in a program such as Final Cut Pro.

So remember: **The best way to avoid timecode breaks is to refrain from shuttling the tape (fast-forwarding/rewinding/playing) between recording segments OR if you know that you want to review your tape throughout filming, record an extra 5+ seconds so that you can always stop the tape on recorded material.**

To view any of the videos that we watched in class, go to: www.denveropenmedia.org. Click on the Classes tab along the top, then the Educational Resources link along the left-hand side, then the Field Production Handbook & Videos link. Enjoy!

Field Production Workshop Cheat Sheet

Using the Sony Z5U (or similar camera)

Achieving a small depth of field

1. Use manual settings (switch to Manual)
2. Open aperture all the way
 - a. Innermost ring on camera (low f/stop number, i.e., 1.6)
3. Set brightness of image by using shutter speed (60 to ?)
 - a. Push Shutter Speed button
 - b. Number should highlight on LCD screen
 - c. Use Sel/Push Exec wheel to select value
 - d. Push wheel in to make selection

Don't use gain

1. Switch to Manual mode
2. Switch gain to L

Set critical focus

1. Zoom all the way in on subject's eyes
2. Adjust focus (outermost ring on camera)
3. Focus is now set regardless of zoom, as long as distance between camera and subject does not change

Audio (using one microphone)

1. Plug microphone into Input 1
2. If it is a handheld microphone, switch Input 1 to Mic
3. If it is a lavalier microphone, switch Input 1 to Mic +48V (phantom power)
4. On the side of the camera, switch Channel 1 and Channel 2 selection to Input 1
5. Switch audio controls for Channel 1 and Channel 2 to Man and adjust levels with numbered wheels
6. Levels on LCD screen should bounce around $\frac{2}{3}$ of the way to red
7. Monitor with headphones
8. Adjust headphone volume with controls near LCD screen

Setting white balance

1. SET LIGHTS FIRST!
2. Switch to Manual mode
3. Switch to either A or B
4. Focus on white piece of paper
5. Press and hold white balance button (the one with the flower-looking symbol) until symbol stops flashing on LCD screen

Using the HD Record Kit

Instructions for HD Record Kit

1. Attach the HD Memory Recording Unit to the back of the camera (behind where the battery goes in)
2. Switch the Power button on the unit
3. Press Menu button
4. Scroll up and down using the rewind and fast forward buttons
5. Press the play button to make the selection

Format the card (this will erase the memory card)

1. Enter the Menu
2. Select Delete
3. Select Format
4. Select OK

Reset the HD Memory Recording Kit (to default settings)

1. Enter the Menu
2. Select All Reset
3. Select OK

Sync the HD Record Kit to the Camera (so when you push the Record button on the camera, it will start recording on the HD Memory Recording Unit)

1. On the HD Record Kit
 - a. Enter the Menu
 - b. Select Setting
 - c. Select Camlink Sel
 - d. Select Synchro
2. On the camera
 - a. Enter the Menu
 - b. Select In/Out rec
 - c. Select Ext Rec Ctrl
 - d. Select Rec Ctl Mode
 - e. Select Synchronous

BE SURE TO COPY YOUR VIDEO FILES TO A COMPUTER BEFORE RETURNING THE HD RECORD KIT!

Grip Kit

- Headphones
- Gloves
- Tape
- Tools (screwdrivers, pliers, scissors) or multi-tool
- White balance card
- Gels and diffusion
- Batteries
- Lens paper
- Makeup/powder and disposable sponges
- Snacks

Preparing for the Interview

- Scout your location, if possible
- Find quiet location where you will not be interrupted or disruptive
- What your subjects should not wear
 - Don't wear white
 - Don't wear intricate patterns
 - Don't wear big jewelry
 - Don't wear turtlenecks or anything that would be hard to attach microphone
- Be ready for interview on time (give yourself an hour to set up)
- Have producer ask questions
- Make your guests comfortable
- Ask crew to be inconspicuous
- Ask interviewee to talk like in a normal conversation (i.e., at a dinner table)
- Ask interviewee to restate question in answer (i.e., "What did you have for breakfast? I had eggs for breakfast.")
- Don't ask yes/no questions
- Ask interviewee to state and spell name and give title/affiliation
- Don't be afraid to ask follow-up questions
- Don't interrupt interviewee
- Be sure to get 30 seconds of room tone at the end of interviewee for editing purposes
- Don't rush the interview

Interview Questions

- What brought you to Open Media Foundation/Denver Open Media?
- Tell us about your project.
- What did you hope to learn from this class?
- What are some of the most important concepts that you retained from this class?