Chapter 3: Introduction to Field Equipment

The Parts of a Camcorder

Before we look at the specific camcorders CCTV makes available to you, it may be helpful to briefly review the main features common to all camcorders. This way, you will have an easier time figuring out on your own how to use any camcorder which you encounter.

A camcorder is, by definition, a camera that records. This means, it should have a...

Lens:
The cylinder of glass that “sees” the image. A LENS CAP covers and protects the LENS when not in use. Never touch the lens itself.

Lenses come with at least two controls: One for the IRIS, which regulates the amount of light entering the lens, and one for the FOCUS, which makes the image appear sharper or blurrier. The location of these controls varies from one camcorder to the next; they may be adjustable rings on the lens itself, buttons on the side of the camcorder, or menu settings dialed in by a wheel on the back of the camcorder. Many camcorders also have a FADE BUTTON which closes the IRIS completely down when pressed.

Almost all camcorders come with a ZOOM LENS and a W - T ZOOM ROCKER SWITCH which allows you to variably adjust the camera shot from WIDE ANGLE to TELEPHOTO.

Tape Compartment:
This is where you place the videotape for recording the images seen by the lens. Different camcorders accept different kinds of videotape; the most common analog formats being VHS, S-VHS, 8 mm, and Hi-8, and the most common digital formats mini-DV, DVCam, and DVCPro. CCTV’s classes are all now taught using mini-DV camcorders, although we still have some S-VHS (& VHS) camcorders in circulation.

There must be an EJECT BUTTON for opening the videotape compartment.
There are one or two **RED RECORDING BUTTONS** which you press once to start the recording and push again to pause the recording. At least one of them is located near the **HAND GRIP** and the ZOOM ROCKER SWITCH, where you can control both the recording and lens movements with one hand.

A red **LED TALLY LIGHT** in the front of the camcorder indicates when it is recording. Most camcorders come with a **TALLY ON/OFF SWITCH** which the camera operator can use to turn off the front TALLY LIGHT if they don’t want the talent to know when the camcorder is recording.

There is a sliding or flip-up door that covers a series of buttons similar to the controls found on any VCR: **PLAY, STOP, REWIND, FAST FORWARD, PAUSE**. These buttons allow you to use the camcorder like a VTR to play back your videotape.

**Viewfinder:**

The lens helps the camera see the image, but you still need a viewfinder to help YOU see what the lens sees. This small black-and-white monitor swivels up or out for use, and then swivels back in line with the camera body for compact storage. The viewfinder can be tilted up and down. The EYEPIECE typically has a sliding **DIOPTER** switch or ring, similar to those found on binoculars, which allows different users to adjust the focus of the viewfinder to match their own eyes.

Some of CCTV’s mini DV camcorders also come with a large **COLOR LCD VIEWSCREEN**. These are very cool. As with the B&W viewfinders, extreme care should be taken when swivelling an tilting these screens since they do NOT have full 360 degree range of motion. When a viewfinder doesn’t want to twist or turn anymore, don’t force it!

The camera person is able to monitor the status of the recording via a variety of electronic displays in the viewfinder. Often the biggest challenge in using a new camcorder is figuring out what all those funny things in the viewfinder mean, and determining how this camcorder’s viewfinder displays the information you care about.

**Power:**

All camcorders give you the option of powering through either AC or DC. This means, there is a **BATTERY COMPARTMENT** for storing a battery, plus an **EJECT BUTTON** nearby that allows you to eject the battery. There is also an **AC JACK** on the back or side of the camcorder, where you can plug in a special AC Power Adaptor, which in turn plugs into the wall outlet.
Microphone:
Camcorders come with a built-in microphone. Sometimes these are cheap mics, sometimes they're pretty good ones; but it doesn't usually matter, because the most important factor in getting good audio is the placement of the microphone. For best sound quality, you should place the mic as close to the desired sound source as possible, thereby reducing the strength of the other (undesired) sounds that can leak in at the same time. The camcorder mic is simply too far away, and will let in a lot more unwanted noise than an external mic placed much closer to the sound source. That is why you should always use the EXTERNAL MIC CONNECTOR, typically a mini jack near the camera-mounted mic, to hook a cable running to an external mic that can be placed very close to the sound source. Of course, some camera operators may choose to use the built-in mic to record ambient sound, but should be aware that his/her talking and the operation of the camera's zoom lens might also be recorded.

White Balance:
Every kind of light source has its own color cast, which is called COLOR TEMPERATURE and is measured in degrees Kelvin. The same subject seen under different lighting conditions will appear different colors. For example, photographers often shoot people either early in the morning or late in the day, when the setting sun bathes everything in a warm yellow or reddish light that makes the subject look flushed and healthy. Contrast this with shooting at noontime, when the sun casts everything in a cool, almost bluish light that makes them look pale.

<table>
<thead>
<tr>
<th>Type of Light</th>
<th>Approx Color Temp °K</th>
<th>Color of Light</th>
<th>Effect of Light</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early morning</td>
<td>2000</td>
<td>Reddish</td>
<td>Warm, romantic, relaxed mood</td>
</tr>
<tr>
<td>Late afternoon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incandescent</td>
<td>2500</td>
<td>Reddish</td>
<td>Soft, use for base illumination</td>
</tr>
<tr>
<td>Household bulb</td>
<td>approx 150W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quartz iodine</td>
<td>3200-3400</td>
<td>White</td>
<td>Standard for TV Consistent color</td>
</tr>
<tr>
<td>(tungsten-halon)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fluorescent</td>
<td>5000</td>
<td>Uneven</td>
<td>Green skin tone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>illumination</td>
<td>Picture noise Try to avoid</td>
</tr>
<tr>
<td>Noonday sun</td>
<td>5600</td>
<td>Bluish</td>
<td>Crisp color, good detail &amp;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>contrast Creates shadows</td>
</tr>
</tbody>
</table>

Our human brains automatically tune these color changes out: If we know that a piece of paper is white, we see it as white, even if it really appears reddish or bluish in the light. Video cameras, however, don't come with human brains; they show us exactly what they see.
Video cameras are designed for shooting in standard television light, which has a color temperature of 3200 degrees Kelvin. When video cameras are shooting in light of a different color temperature, the light must be filtered to match. **All cameras come with a WHITE BALANCE CONTROL** that assures proper color rendition; it gets its name because the camera is being told how to make the color white appear white under that particular color of light.

Some cameras have **Preset Settings** for shooting outdoors in broad daylight (5600 degrees Kelvin) and for shooting indoors under TV studio lighting (3200 degrees Kelvin), as well as **Manual Controls** for changing the amount of red or blue to deal with lighting of other color temperatures. Some camcorders come with **Automatic White Balance** switches, where the camcorder automatically sets and resets its white balance as the lighting changes.

Be advised, however, that the camcorder’s automatic white balance may not work well under certain conditions:

1) When the light falling on the subject is different than the light falling on the White Balance Sensor on the front of the camera -- for example, when the subject is in the shade but the camcorder is in the sun, or vice-versa.

2) When something is blocking the sensor window.

3) When the scene has very strong red illumination, such as during sunrise and sunset, or when a light source is outside the range of the sensor, such as a snowy landscape, candlelight, or cloudy weather.

4) When shooting in MACRO mode.

In sum: Using Automatic White Balance does not relieve you from having to pay attention to the white balance. You always need to be paying attention to white balance, which is why CCTV strongly encourages you to bring a color monitor on your shoots. The camcorder’s black-and-white viewfinder is useless about providing information about how the color of your recording looks.

One final note: Factors other than the color temperature of the light will effect the overall color temperature of a scene. The reflective color of the walls, ceilings and floors will slightly change the color of the light, as will the color of the subject’s clothing.

**Tripod Plate:**

TRIPODS are three-legged stands for the camera; they help steady your shots. If you hold the camcorder upside down, you will probably see a couple of holes in the flat part of its base. A metal TRIPOD PLATE screws into these holes, and then attaches securely to the tripod. Different kinds of tripods have different kinds of plates, so make sure that you have the correct plate for the tripod you’ll be using.
The Other Buttons:
The other buttons on the camcorder are for special features. Some of these might come in very handy for you at times, but as long as you’ve figured out the major buttons discussed above, you’re probably going to do just fine. Some of the more useful buttons to know about include:

**ON-SCREEN DISPLAY** and/or **DATE/CLOCK Buttons** turn on and off those many status displays in the viewfinder, and often on the tape too! If you’ve ever recorded your video with the date and time stamp showing, you know how annoying this feature can be. If you’re not sure what’s going to end up being recorded on the videotape, do a test recording and then play it back on a monitor!

What Other Equipment Do You Need?

Obviously, you need a camcorder to record your production; but don’t you need other pieces of equipment for remote shoots? You bet! Here’s a simple inventory of things to consider bringing on your remote shoot:

1. **CAMCORDER**
2. **VIDEOTAPE**
   Of course you need videotape to record onto.
3. **POWER**
   If using batteries, bring at least twice as many as the normal operating life of the battery might suggest. You never want to be caught short of power if you don’t have the luxury of an AC power supply nearby! Ask for the **AC ADAPTOR** and a **BATTERY CHARGING CLIP** if you will have time to charge the batteries.
   If using the AC adaptor, do you need **AC EXTENSION CORDS**, a **POWER STRIP**, and **3-2 PRONG ADAPTORS**?
4. **TRIPOD** and **TRIPOD PLATE**
   Tripods are fantastic tools for keeping your shots steady, so don’t go on a shoot without one! Too many members figure they’ll save time and energy going hand-held, only to wind up spending hours in the edit suite trying to find usable stable footage.
   Different tripods require different tripod plates, so be sure that the tripod and tripod plate you check out fit together.
5. **HEADPHONES**
   You should always bring and use **HEADPHONES** to monitor the audio signal. Too many producers have come back from shoots where they didn’t use headphones, only to discover in the edit suite that they didn’t record any sound or that the interview they recorded is overpowered by booming wind noise, traffic or crowd noises, or the sound of the camera or cameraperson.
6. **EXTERNAL MICROPHONE**

Remember that for best sound quality, you want to get the microphone as close to the sound source as possible, and the camcorder’s built-in microphone is simply too far away. That is why you should always bring an external mic with you. The type you bring -- clip-on LAVALIER, hand-held OMNI-DIRECTIONAL, hand-held CARDIOID, or SHOTGUN -- will depend on your particular needs. Whichever you choose, remember to bring extra MICROPHONE BATTERIES, a WINDSCREEN if working outdoors, and enough XLR CABLES. You will generally need an XLR-to-MINI CABLE for connecting the mic to the camcorder’s External Mic jack.

7. **LIGHTS, GELS, REFLECTORS**

CCTV's Intermediate Remote Class will show you how to use the various portable lights and accessories which you can check out after completing this class. These tools can be used to increase, colorize, or bounce light around. Most camcorders are designed to work in low-light environments. Sometimes, you may find that CCTV’s powerful portable lights are too strong for what you need; and that all you need is a big white POSTER BOARD or piece of FOAM CORE to bounce the available light onto the subject. Other times, you may need to bring in lighting; if you do, don’t forget to bring EXTRA BULBS, AC CORDS, 3-2 PRONG ADAPTORS, and SANDBAGS to keep the light stands from toppling over.

8. **COLOR MONITOR**

Just as you should always bring headphones to monitor the audio signal, you should also have a color monitor to check the video signal you're recording. CCTV’s newer mini-DV camcorders have a built-in color LCD screen, but not so the other camcorders. In these cases, when you have access to AC power, we strongly recommend that you take a color monitor so that you can be assured of the proper white balance and color reproduction.

When checking out a color monitor, don’t forget to bring the monitor’s AC POWER CORD, a BNC-to-RCA CABLE for the video signal, and an RCA-to-RCA CABLE for the audio signal.

9. **GAFFER’S TAPE**

Don’t leave home without it! Gaffer’s tape is an inexpensive investment in insuring a safe shooting environment.
Tripods: What Are They and Why Should You Use One?

Tripods are three-legged stands for your camcorder. They come in three main sections: From top to bottom, these sections are the FLUID HEAD, the TRIPOD LEGS, and an optional DOLLY. Very briefly, the FLUID HEAD is the mechanism that attaches to the camcorder and allows you to pan and tilt the camcorder in smooth, fluid motions, or to lock down the camcorder so that it doesn’t move at all. The TRIPOD LEGS attach to the bottom of the fluid head to give the camcorder a stable footing, and through extendable leg sections, also allow you to raise or lower the height of the camcorder. The DOLLY is an optional set of wheels which attaches to the bottom of the tripod and enables you to move the entire camcorder and tripod assembly around in three-dimensional space very smoothly (assuming you have a level floor surface).

Tripods are fantastic tools for keeping your shots steady, and we recommend that you always take one with you. Sure, many producers prefer the convenience and mobility that carrying a camcorder around on their shoulder affords; and sometimes this is truly the best way to go. But when your camera location isn’t changing, why tire yourself out shouldering the camcorder, and risk coming back with footage that jerks around noticeably? We have seen many producers figure they’ll save time and energy going hand-held, only to wind up spending hours in the edit suite trying to piece together enough stable footage.

Setting Up the Camcorder on the Tripod

The steps for setting up the camcorder on a tripod follows. As we discuss this process, we will also learn about all the tripod’s buttons and knobs.

1) Attach the TRIPOD PLATE to the camcorder. The camcorder attaches to the top of the FLUID HEAD via a TRIPOD PLATE. This tripod plate screws into the bottom of the camcorder and then latches into a recessed opening in the top of the fluid head. Different tripods require different tripod plates, so be sure that the tripod and tripod plate you check out fit together. Usually the tripod plate comes already attached to the camcorder, but not always. So when checking out the equipment from CCTV, always make sure that the camcorder has a tripod plate, and that the tripod plate matches the kind of tripod you’re checking out.

2) If using a DOLLY, spread it out on the floor first. Pull the three ARMS apart until you hear the RELEASE LEVER lock tightly. If they exist, use the WHEEL LOCKS to lock down the wheels so they don’t move on you while setting up. (At the end when your shoot is all done, push the RELEASE LEVER in the middle to collapse the three arms together again and make the dolly easier to transport and store.)

If not using a dolly, adjust the TRIPOD FEET for the type of flooring surface at your shoot. Some tripods come with SPIKED
FEET in addition to the rounded RUBBER FEET. The Spiked Feet are intended for grass, dirt, outdoor rugs or any other place where you have to "dig in"; they are not meant for hardwood floors, linoleum or other places where you might scratch the floor. Screwing the Rubber Feet up, if possible, exposes the Spiked Feet; screwing the Rubber Feet down covers the Spiked Feet. When transporting tripods, always cover the Spiked Feet with the Rubber Feet lest someone or something gets scratched.

3) **Set the approximate height of the tripod by extending the legs as necessary.** Most tripods have legs that come with one or more extensions, so that you can increase the height of the tripod. To extend some tripod legs, it’s a matter of flipping a lever lock; for others, it’s a matter of twisting a rubber clamp ring.

4) **Set up the TRIPOD and FLUID HEAD on the dolly.** The tripod comes with the bottom of the fluid head already attached to the tripod legs, and the legs in their collapsed state. There is a small twist lock attached to the center post; make sure this CENTER POST LOCK is loosened. Then you should be able to gently pull these legs apart. (You can leave the lock loose during the shoot; but you probably want to tighten it back up after the shoot is done for trouble-free transport.)

Now insert each tripod leg into each of the three DOLLY ARMS, and be sure to secure the connection: That may mean tightening a thumb screw, or stretching a rubber noose around the tripod leg.

5) **Fine tune the height of the Tripod, then use the Bubble Level to insure that the Fluid Head is exactly level.** You probably already learned that radically changing the height of the camera relative to your subject will make the subject appear either very weak and powerless or very imposing and tall. Therefore, you might want to adjust the height of the tripod so that the camera lens is on an even level with the subject, unless you wish to convey a special message about the subject’s status.

Some tripods also come with a center post or PEDESTAL that can be cranked up and down for increasing the tripod height even more. Before cranking, be sure to loosen the PEDESTAL LOCKING LEVER. Because the pedestal has two fewer “legs” than the tripod, it is inherently less stable than the tripod; therefore, you’re better off making height adjustments with the legs, and using the pedestal as a last resort. On the other hand, the PEDESTAL is specifically designed to be used for making small height adjustments while recording. Try it out. You may have noticed that it operates smoothly in the middle range but is most jerky at its lowest and highest points. Therefore, if you plan on pedestaling while recording, it’s best to start the recording with the pedestal already cranked away from its extreme positions.
Once you are satisfied with the height of the tripod, the challenge is to make sure that all three legs are extended the same amount, so that when you put the camcorder on top of the tripod, the picture appears to be level horizontally. That is why fluid heads come with a small BUBBLE LEVEL that helps you know when the tripod is perfectly adjusted. Simply adjust the extension on the legs until the small bubble is centered inside the red ring in the bubble level.

6) **Set up the TRIPOD HANDLE for use.** This metal arm attaches to the fluid head, and is there to give you something to grip onto when you want to pan or tilt the camera. It has its own LOCKING SCREW which, when loosened, allows you to swivel the handle into a position that is convenient and comfortable for you to use. You should unlock that screw now, swivel the handle upward and outward until it is in the desired position, and then tighten the locking screw again.

7) **Attach the camcorder (with tripod plate) to the tripod fluid head.** That means simply insert the tripod plate into the recessed opening on top of fluid head, and securely lock the CAMERA PLATE RELEASE LEVER, right? That's true, but with the hexagonal tripod plates CCTV has for some of the Bogen tripods, it's actually harder than you might think; after all, there are six possible ways to insert the tripod plate into the recessed opening but only one of them is correct.

The easiest way to get it right is to first identify the tilt axis. You want to make sure that the body of the camcorder is in line with the tilt axis, so that when the lens tilts up or down the camcorder body itself remains vertical. The other thing you want to be sure to do is to have the lens pointed in the correct direction. Assuming that you've already set up the tripod handles, then it is easy to tell where the “back” of the tripod is (where you stand and hold the handles) and where the “front” is (where the lens should be pointing).

Given that the camcorder is the most expensive piece of equipment on your shoot, it’s also important to make sure that it is securely attached to the tripod and fluid head. After you’ve attached the tripod plate to the camcorder, and locked it into the recessed opening on the tripod, make sure that the connection is a solid one. Some people grip the camcorder by its handle, lift the whole camcorder/tripod assembly off the ground a few inches, and give it a firm shake to make sure that the camcorder and tripod are securely attached.

Having said that, please don't walk around with the camera attached to the tripod, unless you have firm grips on both the camcorder and tripod. You don’t want them to separate accidentally and come crashing to the ground. When walking around with a tripod, make sure you don't whack anything with it. It's embarrassing to explain to your host why you gouged their wall or their leg. Go slowly, and know where your tripod is at all times.
8) **Pan and tilt your fluid head and camera as desired.** There are separate PAN and TILT LEVER LOCKS for the pan and tilt functions; when these locks are tightened, you can’t pan and/or tilt the camera. As you loosen them, the camera becomes easier to move. Generally speaking, you should loosen them only enough so that…

a) you don’t have to put much pressure on the tripod handle(s) to get the camcorder to pan or tilt, and  
b) when you do move the handle(s), the panning and tilting motion is smooth, and  
c) when you stop applying pressure to the handle(s), the fluid head and camcorder don’t pan or tilt on their own.
Going Hand-held

Assuming there will be some times when you want or need to use a camcorder without a tripod, here are a few methods for going hand-held. You should try them all to find the one(s) which are the most comfortable for you and the most stable. Regardless of which one(s) you choose, be sure to hold the camcorder securely at all times. Dropping the camcorder is not good for the camcorder or your bank account.

Standard Shoulder Shot

Most larger camcorders are made for right-handed people. The SHOULDER SHOT, therefore, has the camcorder resting on the right shoulder. You right hand tucks inside the Hand Grip Belt and grips the right front part of the camcorder, your fingers resting on the W-T Zoom Rocker Switch and the Record Trigger button. Your right eye looks into the viewfinder.

The Cradle Shot

Some people prefer the CRADLE SHOT. The camcorder is placed snugly under the right shoulder, held in place with the right arm bracing the camcorder on the right side next to the Cassette Compartment, and the left hand holding the camcorder from underneath. The right hand again wraps through the Grip Belt and manipulates the zoom lens and recording button. The viewfinder is flipped up and the videographer looks down into it to see the scene.

Shooting From the Hip

SHOOTING FROM THE HIP has advantages when you don’t want people to know you’re recording them. Place your right arm along the right side of the camcorder and your right hand under the middle of the camcorder. Since the viewfinder is so low, you probably can only estimate where the lens is pointing. If stealth is important, turn the TALLY LIGHT OFF so that your subject cannot tell that you are recording them.

Shooting From the Knee

SHOOTING FROM THE KNEE is similar to Shooting from the hip insofar as you can’t really tell exactly where the lens is pointing. You can do this shot from either the left or right side. Hold the camcorder with the right or left hand around the Camcorder Handle and extend your arm down to your knee and tilt the camcorder up slightly. This is a good way to show the world from a different angle of view (your kid’s or pet’s, for example).

The Human Steadycam

If the scene calls for a moving shot where the camcorder must move along with the action, doing so with the camcorder on the shoulder, under the arm or by the knee would produce a shaky image at best. In this case, use both hands to hold the camcorder; the right hand holding the front bottom and the left holding the rear bottom.