

## Camera Handout v.1

*This handout will introduce you to basic operation of the miniDV camcorders available for check-out from the SF Cage. Please keep in mind that the department currently has four different models of miniDV cameras, therefore, there will be some differences between how each camera operates. Take a moment to review the manual of the camera you are using prior to a shoot in order to become familiar with the specific details of operation, how to adjust settings, and the specific features available, for the camera you are using.*

### Access to miniDV camcorders

The Studio Foundation department has miniDV camcorders available for you to use in class or for check-out from The Cage (located off the S305 lobby). All equipment taken out from the cage must be returned the same day before the cage closes. Another option for checking out cameras is MassArt Audio Visual Services, located on the third floor of Tower (T303). They offer overnight and week-end check-out of cameras, lighting kits, tripods, and more. To learn about their services, visit <http://inside.massart.edu/x671.xml>. All students using Studio Foundation equipment are expected to abide by department cage policy, which can be found at: <http://sf.massart.edu/cage-policy/>. For the Studio Foundation cage hours of operation, see: <http://sf.massart.edu/cage-schedule/>.

### Camera models available

Currently the department has four models of miniDV camcorders in inventory. Cameras get checked out on a first-come, first-served basis, so we can't guarantee you will always get the model you want. Kits checked out from the cage go out with a fully-charged battery, AC adapter, a FireWire cable (for connecting to a Macintosh in the lab for video capture) and a carrying case. Make sure you have everything when you check-out the camera, for you will be responsible for any missing cables or parts.

#### Sony DCR-HC96

A MiniDV camcorder that is capable of shooting in either the 4:3 or 16:9 wide-screen aspect ratio. The button for switching between 4:3 and 16:9 is located along the bottom of the LCD panel. Make sure you're shooting in the aspect ratio you want to be shooting in. The camera comes with a docking station that includes an A/V input/output port, a USB port, a FireWire port, and an additional DC input port (for powering the camera with the AC adapter). You will need to use the camera & dock combination when capturing video into Final Cut Express via the FireWire cable connected between the dock and the Macintosh. Attaching the camera to the dock can be tricky, so make sure the camera is fully seated in the dock prior to capturing from the camera. Unlike the DCR-TRV17 and DCR-TRV19 camcorders, this camera does not have the ability to accept a "plug-in-power" microphone via a mini-jack. You can download the manual for this camera from: <http://sf.massart.edu/docs/Sony-DCR-HC96.pdf>.



**Sony DCR-HC32**

A MiniDV camcorder very similar to the DCR-HC96 except it's not capable of shooting in the 16:9 wide screen aspect ratio. The camera comes with a docking station that includes an A/V input/output port, a USB port, a FireWire port, and an additional DC input port (for powering the camera with the AC adapter). You will need to use the camera & dock combination when capturing video into Final Cut Express via the FireWire cable connected between the dock and the Macintosh. Attaching the camera to the dock can be tricky, so make sure the camera is fully seated in the dock prior to capturing from the camera. Unlike the DCR-TRV17 and DCR-TRV19 camcorders, this camera does not have the ability to accept a "plug-in-power" microphone via a mini-jack. You can download the manual for this camera from: <http://sf.massart.edu/docs/Sony-DCR-HC32.pdf>.

**Sony DCR-TRV19**

A MiniDV camcorder. Kits go out with a fully-charged battery, AC adapter, a FireWire cable for connecting to a Macintosh and a carrying case. The camera features electronic image stabilization and touch screen controls. The camera has an on-board FireWire connector, so no dock is needed for video capture. Since on-camera microphones rarely provide good audio, the microphone in jack provides the option of using an external "plug-in power" microphone. The use of the headphone jack for monitoring rounds out the camera's essential features. You can download the manual for this camera from: <http://sf.massart.edu/docs/Sony-DCR-TRV19.pdf>.

**Sony DCR-TRV17**

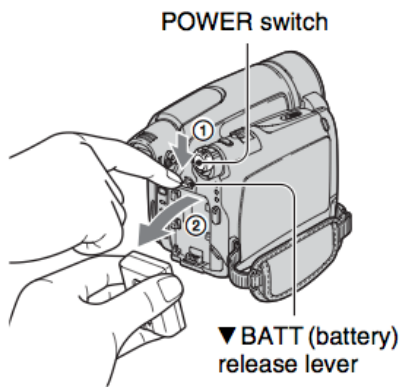
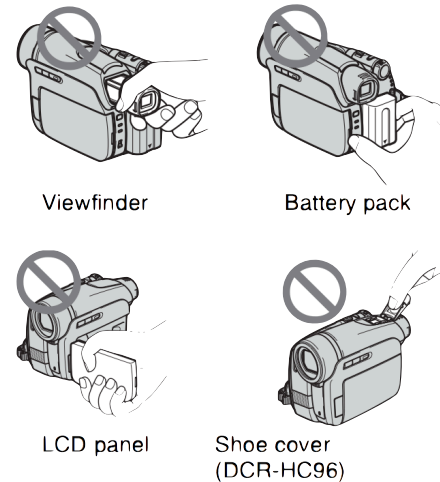
A MiniDV camcorder. Kits go out with a fully-charged battery, AC adapter, a FireWire cable for connecting to a Macintosh and a carrying case. The camera features electronic image stabilization. Unlike the DCR-TRV19, it does not have touch screen controls, instead, controls are on the side of the camcorder, revealed when you flip out the LCD. The camera has an on-board FireWire connector, so no dock is needed for video capture. Since on-camera microphones rarely provide good audio, the microphone in jack provides the option of using an external "plug-in power" microphone. The use of the headphone jack for monitoring rounds out the camera's essential features. You can download the manual for this camera from: <http://sf.massart.edu/docs/Sony-DCR-TRV17.pdf>.

**Getting started with the miniDV camcorders**

This step by step guide will walk you through using the camcorder for the first time. Many details are left out of this guide. See the getting help section of this handout for information on additional resources.

**Important precautions**

Camcorders are delicate instruments, please handle them carefully and keep them away from extreme heat, direct sunlight, dust (especially charcoal dust), and moisture. Always handle with clean hands, and never force any moving parts. Please don't hold the camcorder by the viewfinder, battery pack, or the LCD panel. If something does not operate with gentle pressure, ask your teacher or cage monitor for help. Don't clean the lens unless you are using a tiny bit of lens fluid and lens cleaning paper or a very clean and soft cotton cloth.



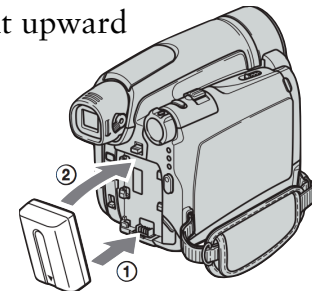
**Removing the battery**

Cameras are checked-out from the cage with a fresh battery. However, if you ever need to change batteries, here's how to remove the battery: Turn off the power and then hold down the battery release lever with one hand and remove the battery in the direction of the arrow with the other hand (see illustration).

**Attaching the battery**

Align the terminals of the battery pack and the camcorder (see illustration) and then attach the battery pack and click it into place. Some cameras require a slight upward or downward motion. The HC96 and HC32 batteries just click straight into place.

Align the terminals of the battery pack and the camcorder (see illustration) and then attach the

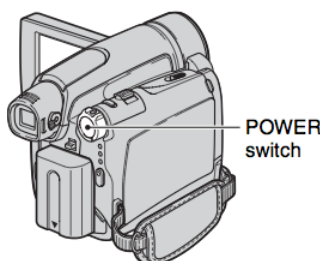


**Turing the camera on and off**

Slide the POWER switch in the direction of the arrow as indicated to turn OFF (CHG) or ON as needed. CHG indicates that if the AC adapter is connected, the camera will charge the



battery connected to the camera. The MODE switch allows you to switch the camera between various modes (including CAMERA/TAPE, CAMERA/MEMORY, PLAY/EDIT modes. Use CAMERA/TAPE to record video, PLAY/EDIT to play back video. Cameras vary, so the POWER switch illustration and the modes may differ from the camera you are using. Also note that the power switch has a little button that needs to be pressed as you are moving the switch.



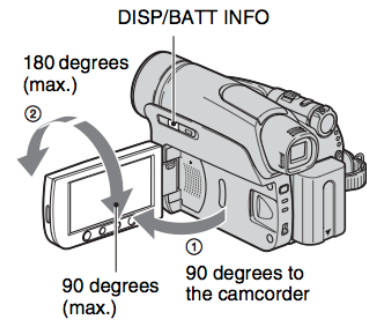
**Flip-out LCD Panel**

Open the LCD panel and rotate it for the best viewing angle. Be careful not to turn it too far in any direction. If you encounter resistance, you've reached the end of the range of movement. If you rotate the panel 180° to the lens side, you can close the panel with the LCD facing out which is useful for playback operation.

### Touch panel and Menu

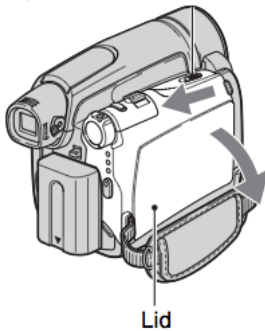
On cameras with a touch panel (all except the Sony DCR-TRV17, which has controls you will see on the side of the camcorder when you open the LCD) you can operate the controls by pressing the buttons on the LCD display itself. Hold the LCD with your index finger behind the panel and use your thumb to press buttons for the easier operation and to avoid placing too much stress on the LCD hinge. The details of all the menu choices are listed in the manual for your respective camera. With these controls you can stop, play, fast-forward, and reverse in PLAY mode. This is also how you will adjust MENU settings.

**IMPORTANT:** There are some MENU settings you will want to set right away to make sure you're recording in the proper format: **RECORD MODE: SP** (Standard Play) and **AUDIO MODE: 48kHz**.



Open the LCD panel and rotate it for the best viewing angle. Be careful not to turn it too far in any direction. If you encounter resistance, you've reached the end of the range of movement. If you rotate the panel 180° to the lens side, you can close the panel with the LCD facing out which is useful for playback operation.

☐ OPEN/EJECT lever

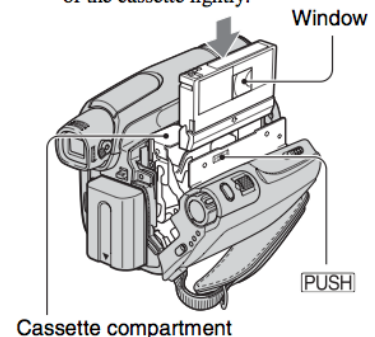


### Inserting a tape

You will need a MINIDV video tape cassette in order to record video. These can be purchased from the MassArt Book & Supply Store in Kennedy. To insert a tape, slide and hold the OPEN/EJECT lever towards the back of the camera. The cassette compartment will come out of the automatically, don't obstruct its movement. Insert the cassette with the window facing away from the camera, with the end-label side

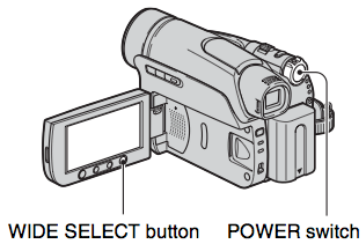
facing up, do this carefully, pushing gently until the cassette is full seated (you'll feel it stop). Now gently push the side of the cassette compartment where you see the label PUSH. The cassette compartment will automatically slide back into the camera. Don't push the compartment closed where you see the label DO NOT PUSH while the cassette compartment is in motion. This will damage the camera. Now close the lid.

Push the center of the back of the cassette lightly.



### Ejecting a tape

Open the lid of the camera as described above and remove the cassette. After removing the tape, gently push on the PUSH button and the cassette compartment will move back into the camera. Then gently close the lid.

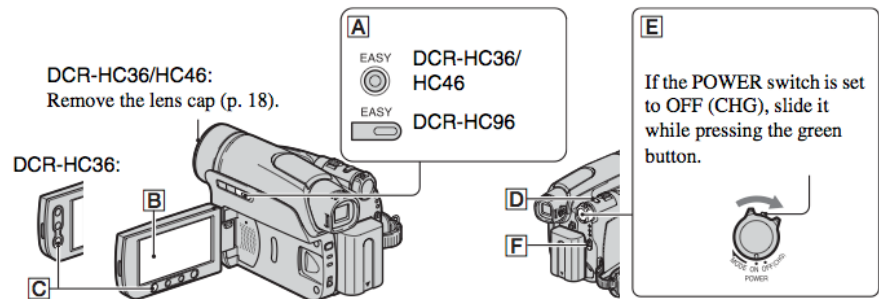


### Choosing the aspect ratio

The Sony DCR-HC96 cameras support 16x9, when using these cameras you want to choose whether you're shooting 4x3 (standard aspect ratio) or 16x9 (wide screen aspect ratio). This is done with the WIDE SELECT button at the bottom of the LCD screen. Be sure to have the power switch in CAMERA/TAPE setting so the camera will let you change the setting. Keep in mind that if you're mixing cameras on a shoot (or shooting over a period of time) you might not always have access to a 16x9 capable camera. Plan ahead for this.

### Recording video

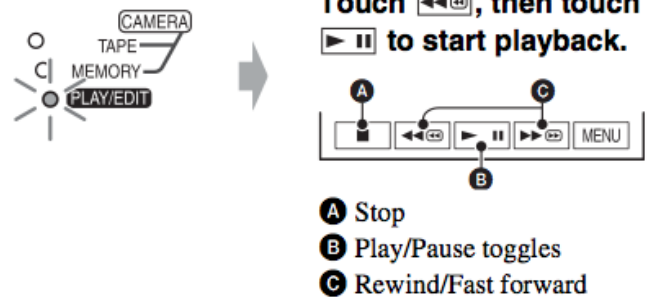
Now that you have a tape in the camera, and the camera powered on, you're ready to record video. If you see an indicator EASY on the LCD display, press that.



This provides an all automatic mode which is good to use the first time, however, you will want to explore the various settings of the camera for maximum creative control. But for now, let's take it "EASY." Now press REC START/STOP (F in illustration) the button may look a little different or be in a slightly different location on your camera). The camera will start recording. Depending on how the camera is set up, you may see timecode numbers counting up. That's good to see. When you're done recording, press REC START/STOP (F in illustration) to stop the camera.

### Playback

Slide the POWER switch (E in illustration) to turn on the PLAY/EDIT lamp. Touch the controls on the LCD display (or the controls on the side of the camera if you are using the Sony DCR-TRV17) to rewind and play back the video.



### Menu settings and special features

The Sony camcorders have many settings, some of which are quite useful to explore and get to know. It's like exploring the nuances that a musical instrument is capable of. For example, you will want to explore things like White Balance settings, Shutter Speed settings, Night Shot Mode, etc. We can't cover them in this handout, however, you should check-out a camera from the SF Cage, download the manual PDF for the specific camera you have onto a computer, and explore the possibilities. Most small camcorders have a similar set of settings, so much of what you learn is applicable to other cameras, but keep in mind each camera is also unique in certain ways. Many of the Sony cameras have Night Shot mode (for example, see p. 33 and p. 53 of the DCR-HC96 manual) that allows them to literally shoot in the dark (the camera has a built-in



infrared light and the chip is sensitive to infrared light). There are interesting things to be discovered about every camera.

### **Check tape**

Once in while while when shooting, it's a good idea to rewind a little bit and view a small portion of the video you have just shot to make sure the video camera is operating properly. Sometimes the heads get dirty and drop-outs start to show up on the image when the tape is played back. You want to catch this before it's too late. When doing this, however, you need to avoid time-code breaks (which makes capture a nightmare) so to make checking tape go smoother, get in the habit of rolling a little extra at the end of each take whenever you're shooting, so if you go back to check tape, it's easy to overlap with the end of the last shot without losing anything important. As long as you see that the time code numbers have not gone back to 00:00 you're OK. The camera reads the time code off the last frame of video, if the tape went ahead of the last frame, it will not be able to see the last frame of video and then it starts the counter back at 00:00.

## **Camera**

There's a lot of technology, technique, and terminology involved with the use of cameras and lighting gear. Here's an outline of the most important concepts we'll be reviewing in the digital media workshop session:

### **Camera: imaging system**

In essence, the video camera is very much like a still camera, except that it's recording 30 frames per second (technically standard definition video is 60 fields per second but let's not go there right now). The settings and controls for the most part are very similar. The camera itself (not including the lens) consists of a light-sensitive semiconductor chip that converts light into electrical signals that are then processed in various ways including formatted into a standard video signal and then recorded onto tape. We use the following terms and concepts when talking about video camera imaging:

- ▶ **WHITE BALANCE.** A circuit in a video camera that establishes the relative balance of red, green, and blue light that comprises the white reference. Video cameras are pretty "dumb" when it comes to color reproduction, therefore, setting white balance is required in order to have white objects appear white in video. Cameras typically have two preset white balance settings (tungsten 3200°K and daylight 5500°K), along with an Automatic White Balance setting, and a Set White Balance function. This function allows you to hold a white card under the predominant light source, point the camera at the card (filling the frame if you can) and then pushing the "set white balance" button. Then the camera will use the card as a reference of what should be recorded as white in the scene.
- ▶ **GAIN.** An adjustment in the voltage level of the video signal expressed in decibels (dB). When the gain is increased, the image is brighter (you can shoot in lower light conditions), but the price you pay is more visible noise. Professional camcorders offer full control of gain. With many little cameras, this is handled automatically.
- ▶ **SHUTTER SPEED.** How much time it takes to record a single frame. Most cameras offer a "slow shutter" mode that results in better low light performance and interesting motion blur. High shutter speeds allow crisp recording of action, but also results in a "strobing" effect.

- ▶ **EXPOSURE.** The video exposure is determined by a combination of gain and aperture settings. Over-exposed (a.k.a. blown-out) video has no textural detail. Watch you zebras to avoid over-exposed video. Learning to use the manual exposure setting will give you complete creative control over your images. Some cameras have a histogram which is also useful for monitoring and adjusting exposure.
- ▶ **Zebras.** These are diagonal strips that appear in the video viewfinder or LCD screen that indicate portions of the scene which are overexposed. Learning to use zebras is the key to good video exposure and avoiding ugly overexposure.

### **Camera: lens**

A video camera has a lens very much like a still camera. We use with the following terms and concepts when talking about video camera lenses:

- ▶ **FOCUS.** The sharpness or definition of an image. It also refers to how the lens is focused. When you focus the lens on one object, other objects closer or farther are out of focus, depending on the depth of field.
- ▶ **FOCUS PULL.** The process of refocusing a lens during a shot in order to keep a subject in focus or to change the subject of attention. Very hard to do with little camcorders, which is why professionals like using larger cameras and larger lenses that sport real focus rings.
- ▶ **FOCAL LENGTH.** The distance from the center of the lens to the point on the film plane where light rays meet in sharp focus. A wide-angle lens has a short focal length; a telephoto lens has a long focal length. Most video cameras have a zoom lens, which means the lens has a variable focal length you can adjust. Changes in the focal length has an effect on the **ANGLE OF VIEW**, which is the angle of acceptance of a lens.
  - **WIDE ANGLE LENSES** have a wide angle of view, they tend to exaggerate the size of objects close to the camera, and make objects farther from the camera look smaller than they normally are.
  - **TELEPHOTO LENSES** have a narrow angle of view, they have a tendency to compress depth, making objects near and far from the camera looking closer than they really are. Shooting in telephoto makes it easier to create selective focus (through shallow depth of field), where the object you focus on is sharp while the distant background is soft.
- ▶ **APERTURE.** An adjustable opening (iris) in the lens that controls the amount of light passing through a lens, often expressed as an f-number (a ratio of the opening and the focal length of the lens). The aperture has an effect on depth of field. Wide openings (e.g.  $f/2.8$ ) result in shallow depth of field, while smaller openings (e.g.  $f/11$ ) result in greater depth of field. Thus the aperture affects both the exposure and the depth of field. Typically this is controlled automatically (along with the gain) in consumer camcorders. Professional camcorders offer full control of aperture, many consumer camcorders mix the gain and aperture settings as a single control called “exposure.”
- ▶ **DEPTH OF FIELD.** Refers to how much of the area in front and behind the subject you are focused on is in focus. Sometimes it is desirable to have the subject in focus and the background slightly out of focus (shallow depth of field). This typically requires the use of a telephoto lens and backing away from the subject.

### **Camera: movement and support**

Camera movement is any movement of the camera during a shot, such as panning, tilting, dollying, tracking, etc. We use with the following terms and concepts when talking about video camera movement and ways of supporting the camera:

- ▶ **HAND HELD.** A shot in which a camera operator, rather than a tripod or a mechanical device, supports and moves the camera while recording video.
- ▶ **TRIPOD** (a.k.a Sticks). A three legged contraption used to keep the camera steady. Consists of two major components: the legs and the head. Try to use a tripod with a

good, smooth “fluid head” with a ball mount (facilitates fine tuning the level), this makes a huge difference, making it easier to perform smooth pan and tilts. Look for heads that have a spirit level and smooth operation and are designed to work with the weight of your particular camera.

- ▶ **MONOPOD.** A tripod with only one leg. Handy for doing handheld shots, use it as a one-legged tripod or raise it off the ground and use the “leg” to lower the center of gravity of the camera, holding it gently right below the head of the monopod, as a “poor-person’s steadicam” for more stable hand-held shots.
- ▶ **TILT.** A shot in which the camera pivots vertically, from top to bottom or from bottom to top.
- ▶ **PAN.** A pan, short for panorama, is a camera move (often using a smooth tripod head) in which {describe here}, there are several flavors:
  - **360-DEGREE PAN** is a panning shot which turns around a full circle
  - **WHIP PAN** (a.k.a. swish pan or zip pan) is a shot in which the camera pans rapidly, often causing motion blur.
- ▶ **ZOOM SHOT.** A zoom shot is a shot made with a zoom lens, which makes the image appear closer (zoom in) or farther away (zoom out) by varying the focal length of the lens. Offers a very different quality than a tracking shot. Often a pan is done to help “hide the zoom.” We often refer to a **SLOW ZOOM** or **FAST ZOOM**.
  - **SMASH ZOOM.** A smash zoom is a jarring zoom into specific detail or object in a scene.
  - **REVERSE ZOOM.** A zoom shot in which the camera tracks towards the subject while the lens zooms out, or the camera tracks away from the subject as the lens zooms in. A shot sometimes used for dramatic effect in which the background changes dramatically while the subject size remains constant, examples can be found in the diner scene in *Goodfellas* (1990) and *Safe* (1995).
- ▶ **DOLLY.** A dolly is a contraption with wheels (e.g. wheel chair, doorway dolly, tube dolly, etc) used to support the camera for the purpose of recording video while the camera is moving. A dolly shot is any shot that involves the use of a dolly.
- ▶ **TRACKING SHOT.** A shot in which the camera, mounted on a vehicle, dolly, or other moving support device, moves while recording video. Some people differentiate tracking shots as those following a subject as they move. Thus the method of support and characteristic of the movement determines the actual term used, for example, we call it a dolly shot when a dolly is used, we call it a tracking shot when tracks are laid down for a dolly to roll on, though not always true, for the most part, dolly, tracking, traveling, and trucking shots are synonymous. A follow shot is a shot in which the camera pans or travels to keep a moving figure or object within the frame, but the terms are often intermixed and imprecise at best.

### **Camera: frame and position**

Framing is often described in relation to the subject being framed. Likewise, the position of the camera is often described in relation to the subject being framed. We use the following concepts and terms when talking about the camera frame and position:

- ▶ **ASPECT RATIO.** The ratio of frame width to frame height. Most video cameras are 4x3, some can work in either 4x3 or 16x9. The aspect ratio of standard television is 4x3, while the aspect ratio of wide screen television (either standard or high definition) is 16x9.
- ▶ **CAMERA ANGLE.** We use this term to describe the position of the camera in relation to the subject while recording video. It may be:
  - **EYE-LEVEL,** a straight shot,
  - **LOW-ANGLE,** a shot tilted up at the subject,
  - **HIGH-ANGLE,** a shot tilted down at the subject, or



- DUTCH-ANGLE, obliquely tilted off the vertical axis to either side, a.k.a. oblique angle or canted frame.
- ▶ CAMERA FRAMING. Various terms are used to describe the camera framing in relation to the subject. These terms are imprecise at best. Often used terms include:
  - EXTREME CLOSE-UP (XCU): a very close view of a person or object which features specific details;
  - CLOSE-UP (CU): a close view of a person or object which features details isolated from their surroundings, close-up of a person typically only shows their head;
  - MEDIUM CLOSE UP (MCU): A close shot that shows a person from the shoulders up.
  - MEDIUM SHOT (MS): A relatively close shot that shows part of a person or object in some detail. A medium shot of a person typically shows their body from the knees or waist up.
  - LONG SHOT (LS): a shot that includes an object or the human body “in full” within the frame, a.k.a. full shot.
  - EXTREME LONG SHOT (XLS): a panoramic view of a scene from a great distance.
  - TWO SHOT: a medium shot featuring two actors or subjects.
  - THREE-SHOT: a medium shot with three actors or subjects.
  - RULES FOR SHOT-SHOT RELATIONSHIPS. There are lots of “rules” for framing that apply to the relationship of one shot with another, consult a standard text on editing if this of interest, some of these rules comprise the “classic continuity” style that is the predominant style in mainstream motion pictures, but it is only one of many grammars for film.
- ▶ CHEATING. We use this term to describe the process of moving a subject, prop, or lighting instrument to a new position (usually between two shots of the same subject) for better results. The cinematic equivalent of poetic license.

### Camera: additional concepts

These are advanced topics you don't have to worry about most of the time, but we'll list them because you'll come across them at some point.

- ▶ SHOT and TAKE. A segment of video resulting from one continuous run of the camera. Filmmakers generally films several “takes” of the same scene and then selects the best one, so they may have several takes of a single shot.
- ▶ DOUBLE-SYSTEM SOUND. The technique of recording sound and image using separate recording devices. In film production this is the normal methodology since film camera can't record sound, however, it is sometimes used in video as well when mobility is required by the sound recordist who may want to avoid running wires to feed the video camera with the audio signal. If you record sound with the Roland Recorder, while shooting with the camcorder and you sync it up later, you're doing double system sound.
- ▶ SYNCHRONOUS SOUND (sync sound). Recording sound in synchronization with recording image. Can be single or double system. In single system sound recording the camera records sound and image, with double system sound recording, the camera is used to record images and a separate sound recorder is used to record sound.
- ▶ DROP OUT. Loss of a portion of an audio or video signal, usually caused by an imperfection in the tape's coating or dirt covering a portion of the tape. If you see drop-outs in your playback, you might need to run a head-cleaning tape. Always follow the directions that came with the head-cleaning tape, as the head-cleaning tape is abrasive and can do more harm than good if you don't follow the instructions.
- ▶ TV SAFE. This is the area of the video image which will normally appear on a standard home television set. Due to the design of CRT monitors, they over-scan the image, which means that they overshoot the edge of the tube, so you can't be sure that something that appears in the frame will actually be seen by “viewers at home.” Therefore, it has become standard to keep titles within an area called “title safe” and the rest of the action within “action safe.” Non-linear editing system and DVD authoring systems have

guidelines you can turn on and off to see these margins. The rule of thumb is not to place any elements that are critical to your scene at the very edge of the video frame, some viewers might not see it.

## Capturing Video into Final Cut Express

To import video from a camcorder into Final Cut Express, follow these steps. We assume you've placed the tape in the camera before starting these steps.

1. If your camcorder has a dock, place the camera in the dock and place the dock close to the Macintosh. Plugging the A/C adapter into the dock will prevent interruption of capture in the event of a low battery. If using a battery, make sure it's got lots of juice left on it before you start capturing.
2. Connect the four-pin (smaller) end of the FireWire cable to the Camcorder or Dock, and then connect the six-pin (larger) end FireWire cable to the FireWire 400 port on the back of the iMac (or on the side of the iBook).
3. Turn the camera on to VCR mode, and rewind the miniDV tape to the beginning (or another spot on the tape if the material you want to capture is not at the start of the tape).
4. Launch Final Cut Express and check the System Settings to make sure that media is going to be captured into a project folder you've created specifically for your project. This folder should live on the "Media" drive (if you're using an iMac in S304 or S305) or a folder on the desktop (if you're using an iBook from the laptop cart). This is a project folder you've created for the specific purpose of media capture for your project.
5. Capture the video. For specific instructions for capturing with Final Cut Express, refer to the handout titled "A Brief Introduction to Editing with Final Cut Express," which is available for download from the page at:

Make sure you first set the "System Settings" to put the "Capture Scratch" on your portable hard drive, not the System Disk. If you capture video onto a storage device other than your own portable FireWire hard drive, the files might not be there next time you come to class. Make sure you have removed your tape and turned the camera off before returning it to the cage.

Always eject your portable FireWire drive before unplugging or turning off your device. Failure to do so will corrupt your disk. To eject a drive: Locate the icon for the device on the desktop. Drag and drop the icon into the trash (the last button on the dock—the trash icon will change to "Eject.") Another option is to click the little "Eject" icon next to the volume in the Finder window Sidebar. Only after the device disappears from the desktop is it safe to turn off the device and unplug it.

When importing digital video footage from a DV tape, you can use a DV deck in the labs or connect your camera via FireWire to a computer. FireWire cables are included in each camera kit. Don't forget to return the cable along with the camera to avoid having to replace the cable.

## Resources

While fundamental operation of the various camera models available have a lot in common, each camera model has its own unique features and quirks. We can't cover all of the differences in this handout nor in the Digital Media Workshops. If you have

specific questions about any of the Studio Foundation cameras or lighting gear, try asking a fellow student, your teacher, or a cage monitor.

For more about CAMCORDERS in general, check out *The Little Digital Video Book* by Michael Rubin, an excellent guide if you're new to video camcorders. A couple of copies are available for check-out from the Studio Foundation Cage.

For details on LIGHTING, check out the Lighting handout available for download from the page <http://sf.massart.edu/workshops/vl2-handouts/>. A good introductory book on lighting is *Matters of Light and Depth* by Ross Lowell, an excellent and entertaining introduction to the art of lighting for photography, video, and film.

For information on SPECIFIC CAMERAS, refer to the owners manual of each camera, which can be downloaded from: <http://sf.massart.edu/equipment/camcorders/>. It's a well kept secret among video professionals who seem to know a lot: the actually read the manual when nobody is looking.

And for ALL SORTS OF OTHER INFORMATION you will not find in the manual nor a book, check out DVinfo.net, a wonderful discussion community chock full of camcorder information and advice, visit them at: <http://DVinfo.net>.

## Feedback please

Please let us know how this document can be improved, please send your ideas, suggestions, and corrections to: David Tamés, Media Arts Studio Manager, david.tames@massart.edu or call 617.879.7298.

## Acknowledgements

Images of Sony cameras are taken from Sony camcorders manuals, which are copyright by Sony, and are used for educational and informational purposes under the terms of fair use guidelines of U.S. copyright law.

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