Micro-Mobile Workshop

The Micro-Mobile combines the sophisticated production capabilities of a studio with the portability and ease-of-use of a camcorder. A multi-camera remote unit such as the Micro-Mobile allows the producer to videotape an event “on location”, while at the same time giving the viewer a continually changing variety of viewpoints. Therefore, a multi-camera system is ideal for such productions as sporting contests, concerts, theatrical presentations, and lectures.

The “Micro” is one of 2 high-definition mobile systems available at MetroEast:

**The Micro-Mobile** - Small enough to fit the entire system in the back seat of an average car, and simple enough to operate for even a novice crew to set-up and operate quickly.

**The Mini-Mobile** - This system is larger (requires a truck or van to transport), more complex in set-up and operation, but provides higher quality cameras, and additional features that are not available on the Micro.

*Note: This class will not certify you to operate the Mini-Mobile system.*

**Reservations and Check-Out:**

The Micro-Mobile can be reserved up to approximately three months prior to your production. Because of the high demand on equipment, advance reservations are advised.

The system can be checked-out for a maximum of 72 hours.

Reservations, and equipment pick-up/return may be made only during Equipment Room hours:

- **Monday, Thursday, Friday** - 2:00 p.m. until 10:00 p.m.
- **Saturday and Sunday** - 11:00 a.m. until 9:00 p.m.

Call 503-667-8848 extension 307 during these hours to reserve the Micro-Mobile.

**The Micro-Mobile equipment package includes:**

1) **Base Unit**
   With 1 multi-view monitor for viewing cameras, preview, and program, a video switcher, and a high-definition digital video recorder.

2) **4 Video cameras** in 2 carrying cases. Each includes a charger with cables and 2 re-chargeable batteries.

3) **4 Tripods** in carrying cases. Each tripod includes a remote control for zoom, focus, iris, and record/stop functions.

4) **Camera Cables**
   4 - 100 foot, and 2 - 50 foot cables

**Optional Equipment:**

- Microphones, Power cables and power strips, Video and audio cables

**Crew Requirements:**

During equipment check-out, the producer will be asked to provide MetroEast with the names of crew members operating equipment on the production. MetroEast requires at least one certified operator for each camera, and for the Micro-Mobile switcher/mixer unit.
Planning the Mobile Production

While each mobile production will present its own unique set of challenges, all share similar organizing goals. Here is a checklist to guide you through the pre-production planning.

☐ Develop a Production Concept.
  Contact the organizer of the event to get permission to shoot. Explain that you’ll need access to the site 2-3 hours before it begins, a separate but close-by room to use as a control room, positions for the 3 cameras, access to AC power, etc.
  Don’t wait until the day of the shoot to explain to the event organizers how the production will impact the event for the performers and in-house audience members.

☐ Reserve Equipment.
  Once you get the OK to tape the event, you’ll need to reserve all needed equipment as far in advance as possible to ensure availability.

  - Call the Equipment Room at 667-8848, Extension 307 during these hours:

    Mon., Thu., Fri.  2:00 - 10:00 pm  or  Sat. - Sun.  11:00 am - 9:00 pm

  Ask the Equipment Room staff to give you a “Program Number” for the production. Then schedule appointments to pick-up and return equipment during these hours.

☐ Recruit Crew.
  Recruit from 5 to 8 crew members from the Volunteer Directory. Copies are available at the Equipment Room. All crew must have completed the Micro-Mobile or Basic Studio workshop to operate equipment.

Let each crew member know:
1) “Crew Call” and “Wrap” times. That is, when to meet at the location, and when they can expect to be done with the shoot. (Usually about 5 to 7 hours)
2) Appropriate attire for the type of event, location, and weather conditions.
3) Whether you’ll be providing food and drinks (a good idea).
4) Specific directions to the location, and parking information.
5) Crew assignments (what position they will be expected to fill).

☐ Perform a Site Check.
  Visit the location to scout out locations for equipment, and potential trouble spots:

1) Access to the site. What’s the best way to get the equipment in and out of the location.
2) Control Room. Find a room that is close to the event, but quiet enough to communicate.
3) Power. The Micro-mobile can plug into any standard AC outlet. It’s best if the outlet is not shared by lighting or kitchen equipment.
4) Camera Positions. Choose one position which can provide a wide overall view of the stage or field, and the other two in positions which can provide clear close-up views of all the action. Choose positions which will not block or be blocked by the audience. Also, select positions where the camera won’t be in danger of falling or being knocked over.
5) Cable Runs. How will you run the cables from the cameras, lights, audio equipment, etc. while minimizing the chances of tripping people, or damaging the gear? How long will the cables have to be?
6) Lighting. Will there be enough light to produce a decent picture? Will they be adding more? Will they allow you to bring in extra lighting equipment?
Sound Board.
Need 1/4" Mono Male Plug
100'+50' audio cable to
reach to Micro-Mobile

Cables run tight
against wall, out
stage exit to
Control Room

Cable taped
down to floor
across aisle

Cable "flown"
above doorway.
Taped in place.

Rope-off
this seat

Cam 1
Camera Cable run
across floor, tight
to front edge of stage

Cam 2

Cam 3
Against edge
of bottom stair

Cam 1

Cam 2

Cam 3
The System Layout

Here is a simplified view of the Micro-Mobile system. Each camera (1) produces a picture, which feeds into a Video Switcher (2) where one of the 3 cameras picture is selected. It feeds into the Video Recorder (3), which is then fed to a Video Monitor (4) to allow you to see what is being recorded.

Audio

Each microphone (A) feeds into the Audio Mixer (B), which blends the sounds together. The mixer feeds into the Videotape Recorder (C), and then into Audio Headphones (D) to monitor sound quality.
**Setting-Up the Micro: Tripod**

**Set-Up Tripod:**

1) With tripod legs together, lift leg extension levers near the bottoms of each leg, and extend to desired height.
   
   Note that there are 2 extension sections on each leg, which give a maximum camera height of 5’11” when fully extended.

2) Lock (push down) leg extension levers firmly. One of the most common causes of camera damage is when the tripod tips over because one of the legs is left unlocked.

3) Spread tripod legs wide for maximum stability. Make sure all 3 legs are pulled out to limit of hinge.

4) If you want additional camera height, loosen the “pedestal lock” knob, and slide the center shaft up. Retighten the knob after adjusting.

**Level Tripod Head:**

5) Locate BUBBLE LEVEL on upper surface of tripod.

6) Loosen red level ring on bottom of center shaft, and rock tripod head until bubble is centered in circle printed on bubble.

**Attach Camera:**

6) On Tripod head, loosen the clamp lever by turning several turns counter-clockwise.

7) Line up the plate attached to the underside of the camera with the slot on the top of the tripod head. Slide the camera into the slot, from the back side (near the panhandle), until you hear a “click”.

8) Tighten the clamp lever to prevent the camera from sliding in the slot.

**Adjust Panhandles:**

9) Adjust the angle of the panhandle to a comfortable position by loosening the lever at the base of the handle. Align the teeth between the handle and the base, and re-tighten the lever.

**To Remove Camera from Tripod:**

10) Loosen the clamp lever.

11) Push and hold the release button and slide the camera back off of the tripod.
Camera Set-Up

With the camera securely mounted on its tripod, and the panhandles adjusted, you can now connect the focus and zoom controls, and connect a power source.

**Attach the Lens Controls:**

1) The Control attached to the right pan-handle allows remote control of the zoom function, as well as adjustments to picture sharpness (focus), and brightness (iris).

2) Attach the cable from the zoom control to a connector on the side of the camera just above the hand strap. It is located under a small round rubber cover.

3) Make sure that the cable is also connected securely to the jack on the top of the remote control unit.

**Connect a Power Source:**

4) The camera may be powered from either a rechargeable battery, or an AC Power supply unit.

   The battery should power the camera for up to 2.5 hours. The number will be reduced by heavy use of the zoom and other auto features.

5) Slide a battery downward into the slot at the rear of the camera, below the eyepiece viewfinder.

6) To remove the battery, push and hold the release button just above the battery, and slide the battery up.

   —— OR ——

7) Attach the AC Power supply. Connect the 2 power supply cables to the supply box. Plug one end into a wall outlet, and attach the other to the connector labelled “DC in 8.4 Volts” located just below the battery slot.
Now connect the Camera Cable. This includes the Video Out connection, and attaching the Intercom cable and headset.

The camera cable carries video from the camera to the switcher through one cable, and connects the camera operator to the production Intercom system with the other.

Note that at one end of the cable, the free portion of the wire is only about 12” long, while on the other the free wire is about 36” inches long.

Place the long end of the cable (the “Long Y”) at the camera end, and the “Short Y” at the Switcher end.

**Attach the Video Out cable:**

1) Locate the HD/SD SDI connector near the hand-strap (it may be under a small rubber cover)

2) Find the cable end with the “Long Y” (the “Short Y” goes at the switcher end). Push the BNC connector onto the jack, and twist clock-wise to secure.

**Attach The Intercom Headset:**

4) The Intercom system includes a 1 or 2 earmuff headset, and a belt-pack.

   The Intercom allows 2-way communications between the Control Room and each of the other cameras.

5) Connect the 4-pin plug on the headset to the matching jack on the underside of the intercom beltpack.

6) Attach the 3-pin plug on the camera cable to the matching jack on the underside of the intercom beltpack.
Camera Set-up

The final few steps of preparing the camera for production include turning on the power, and setting functions that control image color, brightness, and focus. Generally, you won’t need to worry about any of the sound functions since they are recorded in the control room.

Simple Operation Mode:

In this method, the camera operator relies on the camera to make most of the adjustments of the picture quality. While this mode generally produces good results, it may result in uneven quality when lighting conditions are variable or poor.

In a later section, you’ll see how to take more complete control of these functions by using the manual control functions.

1) Push in the tiny green button and slide the POWER switch left to the “CAMERA” position.

2) Set the CAMERA switch to the FULL AUTO position.

3) Gently swing open the LCD viewfinder, and tilt it to a comfortable viewing angle.

4) On the Remote Zoom unit, set the FOCUS switch to AUTO.

5) When the switches are correctly set, you should see these 2 items (among others) displayed in the cameras LCD Viewfinder.

For more information on Camera Operation and advanced control options, see Page 18
Control Room Set-Up

The “control room” (switcher, audio mixer, video recorder) should be placed in a separate room from the event being recorded to improve crew communication, and to avoid creating a distraction for the audience watching the event.

The room used for the control room should:
1) Close enough to the area where the cameras are placed to be reached by the available cables (6 x 100’ and 2 x 50’)
2) Contain a power outlet (standard household outlets), not shared by other equipment such as ovens, refrigerators, air conditioners, lighting consoles, etc.
3) Be fairly quiet, separated from the sound of the event.
4) Allow running cables to cameras that avoid high traffic areas.

Unpack the Base Unit:
To create a comfortable working environment, you’ll want to lift the unit onto a table. The table should be sturdy, since the unit is heavy. Also, get some help lifting the unit!
1) Remove the front cover of the unit.
2) Lift the upper section that contains the video monitor. This section has latching legs that allow you to adjust it to different viewing angles.
3) Slide out the switcher drawer at the bottom of the case.

Connect the Power:
1) Open the panel on the rear of the unit, and connect the long power cable to a standard wall outlet.
2) Turn on the power switch on the switcher, the recorder, and the monitor.
**Control Room Set-Up: Video Connections**

The next step in the Control Room set-up is to connect the 4 camera cables. Each cable has connections: One feeds video into the switcher, and the other connects the Intercom system.

**Connect the Cameras:**

1) Open the panel on the rear of the base unit. Note that there is a connection guide attached to the inside of the rear door.

2) Connect camera 1. Attach the 3-pin Intercom plug to the first connector on the left. Then, attach the “BNC” video connector to the leftmost BNC jack on the panel.

3) Repeat, working from left-to-right, for each of the other cameras.

**NOTE:** The diagram to the right shows the connections for Cameras 1 & 2.

Camera 1 is shown with the black wires, and Camera 2 with white wires to make the diagram easier to follow.

**What Are All These Other Connections?:**

The other jacks on the panel are not normally needed for productions.

1) **Tally Connection.** Allows the Mini-Mobile Cameras to interface with the Micro-Mobile.

2) **Video Out.** May be used for connecting an additional external monitor. This is an HD-SDI output, and so requires a compatible monitor.

3) **Audio Out.** May be used for sending sound to speakers, or an additional recorder.

4) **Intercom Program.** Allows program audio to be monitored through the Intercom system, so that the director can more easily follow the program flow.
Control Room Set-Up

The final step in connecting the Control Room gear is to wire in the audio equipment. This process may vary based on the particular needs of your shoot. This diagram shows the standard configuration, using the basic audio mixer set-up. If you are planning a more elaborate production, talk with the Equipment Room Staff about adjusting the set-up.

**Connect the Audio Mixer/Monitor Unit:**
The Micro-Mobile comes with a small case that contains 1) a small audio mixer, 2) a monitor speaker/VU meter display, and 3) a power strip.

1) Remove the front and back covers of the Audio Mixer case.

2) Connect 2 XLR audio cables from the AUDIO OUT jacks on the mixer case to the AUDIO IN connectors on the back of the Base Unit.

3) Connect 2 XLR audio cables from the AUDIO OUT jacks on the Base Unit to the AUDIO IN connectors on the Mixer Case.

![Diagram of audio equipment connections](image-url)
Control Room Operation: Switcher

The switcher allows the crew to select which of the 4 cameras (+ an optional 5th input for a computer display) is to be recorded, as well as to create special effects like dissolve or wipe transitions, and picture-in-picture effects.

A Quick Tour of the Switcher:

1) PROGRAM. This row of buttons lets you select which of your 4 cameras will be recorded. The first button on the left selects Camera 1, the next button is Camera 2, and so on. When pressed, the button lights and that camera is selected until a different button is pressed.

2) PREVIEW. This row of buttons lets you select the next camera to switch to. The cameras are arranged on the row just like the PROGRAM row.

3) TRANSITIONS. The SLIDER control, and the buttons marked CUT and AUTO are used to execute a transition from the camera currently selected on PROGRAM to the one selected on PREVIEW.

The CUT button performs an instant transition.

The AUTO button performs either a MIX transition (gradually fading from one camera to the other) or a WIPE transition (using a pattern moving across the screen to replace one camera with another) at a pre-set speed.

The SLIDER (fader) performs the same transition as the AUTO button, but at the speed you move the slider control.
Control Room Operation: Switcher

More Quick Tour of the Switcher:

4) **TRANSITION TYPE: MIX or WIPE.** These 2 buttons let you select which type of transition will occur when you push the AUTO button, or move the fader slider.

5) **FTB ON.** When pushed creates a “FADE TO BLACK” effect in which whatever camera is currently on program fades to a black screen. Once on, you must push it again when you are ready to fade from black back to whichever camera is selected on program.

6) **PinP.** This effect lets you shrink the size of the picture of one camera, and then superimpose that over the picture from another camera.

   There are 2 buttons for setting up the effect: The **BUS DELEGATION - PinP BUTTON** lets you choose the camera that will be the smaller size (the other camera is selected on PROGRAM), and the **PinP ON** button turns on the effect on PROGRAM.

7) **OSD.** “ON SCREEN DISPLAY” controls allow you to adjust features like the type of wipe pattern desired, the duration of AUTO transitions, the size and placement of the PinP box, and others through a menu system.

   The OSD ON button turns on the menu (displayed on the PREVIEW monitor), and the OSD/TIME button knob lets you select and adjust the desired setting.

**NOTE: The remaining buttons are not used in the current Micro-Mobile configuration.**
Control Room Operation: Switcher

Basic Switching:

1) **Select a Program Source.** Select Camera 1, 2, 3, or 4 on the PROGRAM row. The button will light when pushed, and the camera will appear on the PROGRAM monitor.

2) **Select the Next Camera.** On the PREVIEW row, pick the camera that you want to transition to next. The button will light, and the camera will appear on the PREVIEW monitor.

3) **To perform a CUT.** Push the CUT button. The cameras selected on the two rows will “flip-flop” positions, as will the cameras showing on the PROGRAM and PREVIEW monitors.

4) **To perform a MIX or WIPE.** Push either the MIX or WIPE button in the Transition Type area, and then either push the AUTO button OR move the FADER slider. As with the cut, the 2 cameras on PROGRAM and PREVIEW will flip-flop positions.

To Perform a Picture-in-Picture Effect:

5) **Select the “Background”** (full screen) camera on the PROGRAM row.

6) **Push the PinP button** in the BUS DELEGATION area. The button will light.

7) **Select the “Foreground”** (in the box) camera on the PREVIEW row.

8) **Turn on the Effect** by pushing the PinP ON button. The button will light. Push the button a second time to turn off the effect, and return to basic switching.
Control Room Operation: Recorder

The “Ki Pro Rack” device records directly to a removable hard drive or solid state memory device. The unit can record up to 40 hours on the 2 drives (one holds 120 Gigabytes and the other holds 250 Gigabytes).

The “tapeless” recording makes it easy to instantly review material you have previously recorded, and difficult to accidently record over material. When you return the Micro-Mobile, you will transfer the footage you’ve recorded to your editing drive.

A Quick Tour of the Recorder:

1) **AUDIO METER.** These 2 vertical columns of led lights provide a visual measurement of the volume of the sound being recorded. The 4 lights at the bottom are green, the next 2 up are yellow, and the top light is red.

2) **HEADPHONE JACK & VOLUME.** Plug in headphones here to monitor sound recording, and use the knob to adjust the loudness of the headphones.

3) **STATUS, CONFIGURATION, and MEDIA buttons.** Status shows the current settings of the device (such as input device). Configuration controls let you change those settings, and Media gives control of how the video will be recorded on the drives.

4) **TRANSPORT CONTROLS.** Rewind, Play, Fast Forward, Stop, and Record.

5) **DISPLAY.** Shows info when the Status, Configuration, and Media buttons are selected.

6) **SELECT.** Use to select menu items from the Status, Configuration, and Media screens, and to select which clips to play when reviewing recorded material.

7) **ADJUST.** Use to adjust menu item settings from the Status, Configuration, and Media screens, or to adjust the speed of playback when watching recorded material.

8) **DELETE CLIP.** Delete a recorded clip stored on the drive. When selected, the device will ask you to confirm your choice before deleting to avoid accidental erasures.

9) **SLOT.** Select which of the 2 drives you wish to record to, view recorded clips from, or deselect so that you can safely remove a drive.

10) **DRIVE EJECT.** Each drive slot has a button to let you safely eject the drive. Push and hold the button, and then pull the selected drive from the slot.

11) **DRIVE ACTIVITY.** These led lights glow continuously to indicate which drive is currently selected. The lights flash when recording is underway.

12) **MAIN POWER.** Push to turn the unit on. Push and hold for 2 seconds to turn off.

13) **DRIVES.** Removable drives for video storage.
Control Room Operation: Recorder

Basic Recording:

1) Select a Drive Slot. If the drive activity light below the drive you wish to use is already lit, don't change anything. If you wish to swap drives, push the SLOT button twice to change drives. The display will read “Media Mounting” while it makes the change, and then the drive activity light will come on below the other drive.

2) Check the Status. Push the STATUS button once. The display should show info similar to the example at right. If it does not show the REC 1080i 29.97 LT option, go to “Troubleshooting” below.

3) Start Recording. Push the Red RECORD button. The button should light, the selected drive activity light will flash, and the counter numbers (H:M:S) will begin running.

To stop recording, push the STOP button.

To Watch What You’ve Recorded:

4) Switch the Monitor. Press the SELECT button on the right control panel of the monitor. This should change the display from the Multi-Viewer (PGM, PVW, CAMS) to a full screen view of the recorder output.

Push SELECT again to return to Multi-view.

5) Select a Clip. If you’ve recorded more than one clip, you can skip from clip to clip using the up/down select keys.

6) Push Play. Push the play button. If you wish to speed up playback, push the Fast Forward button.

NOTE: While Playing, pushing STOP once will pause playback. A second push will stop.

Troubleshooting/Resetting the Recorder:

7) Push CONFIG.

8) Push SELECT up or down buttons until you see a display like the one shown.

9) Push ADJUST up or down buttons until the display shows 20 Preset 20.

10) Push SELECT UP button, then push the ADJUST button. The reset will occur.
Camera Operation: Tripod Head

Adjusting the Locks and Drags

The Tripod Head is designed to help you make smooth and steady movements of the camera. Pivoting the camera lens up and down is called TILT, and pivoting the camera lens left and right is called PAN.

Each of these directions of movement has 2 controls that affect it: The Lock and the Friction adjustments.

1) **Unlock the TILT LOCK.** On the right side of the Tripod Head (looking at it from the operator position, turn the LOCK knob one full rotation counter-clockwise (away from the arrows).

While you are operating the camera, this should always remain unlocked. However, if you leave the camera, it is a good practice to lock the locks.

2) **Adjust the TILT FRICTION.** On the opposite side, turn the FLUID DRAG knob clockwise to add more friction, or counter clockwise to lessen tension.

3) **Unlock the PAN LOCK.** In the gap under the camera, turn the Pan Lock knob to loosen.

4) **Adjust the PAN FRICTION.** Turn the wide red band to add or reduce friction on the Pan motion.
Camera Operation: Advanced Operation

By learning to use some of the Manual Controls instead of relying on the AUTO settings, you’ll be able to have more complete control of the camera operation and the look of the video.

Going into Manual Mode

1) **Turn off FULL AUTO Mode.** Slide the CAMERA switch from FULL AUTO to M (Manual). This lets you operate each individual basic camera function in AUTO or MANUAL.

**White Balance**

This adjustment lets you control the color of your video, based on the color of light (sunlight vs. man-made light sources) illuminating the scene. There are several options available.

2) **Push the WB button** several times until the display in the lower right corner of the viewfinder shows a flashing “A 5500K” (the number will vary).

3) **Point the Camera** at something white, and zoom in so that the white fills the picture. The object can be a piece of paper, a white shirt, a white wall. Make sure that the light falling on the white is similar to what will be lighting the scene you’re shooting.

4) **Push the button.** The viewfinder symbol will flash quickly for several seconds, and then stay on continuously. This indicates that the white balance was successful.

**Iris**

This adjustment is one of 2 controls that change the brightness of the picture (see Gain below). The Iris is an opening at the back of the lens that controls how much light enters. You can open the iris to brighten the image, or close it to darken it.

5) **Push the IRIS button** and look at the lower left corner of the viewfinder display. You will see an “f-stop” number, which describes how opened or closed the iris is. If there is an “A” to the left of the number, it is in AUTO mode. Push again until the “A” disappears (manual).

6) **Turn the IRIS wheel** to change the number, and brighten or darken the picture.
Two other important camera functions are the ZOOM and FOCUS controls. The remote control gives easy control of these functions without having to use the controls on the camera.

**Zoom**

Place your thumb in the curved “rocker” switch at the base of the remote control. You can rock the switch left and right to control the zoom.

1) **Switch the ZOOM / FOCUS switch** on the right side of the remote control to the ZOOM position. This lets you use the rocker to control the zoom. The control is variable speed, so if you push just a little to the side, you can zoom slowly. More to one side zooms faster.

2) **Turn the Knob** at the upper part of the control to control the maximum speed of the zoom.

3) **Check the Light.** There are 2 small lights just above the rocker switch that indicate which setting the switch is in.

**Focus**

Manual focus control gives a much more accurate and consistent sharpness to the picture than using the Auto Focus function. You can even momentarily activate the Auto Function to help you quick set focus, but remain in Manual Mode.

4) **Set the MAN / AUTO Focus switch** on the left side of the remote to the MAN position.

5) **Zoom All the Way In** to your subject, as close as you can.

6) **Switch the ZOOM / FOCUS switch** to the FOCUS setting. Move the rocker (now adjusting the focus) one way or the other until the image is sharply focused.

7) **Switch the ZOOM / FOCUS switch** back to ZOOM, and zoom out to the desired shot. The shot should now remain focused unless the distance to the subject changes.

8) **Push and Hold the AF Button** on the remote as an alternate method of focusing. This button momentarily activates the AUTO FOCUS function, but then returns to the manual focus mode when you release the button.
Camera Operation: An Introduction

The Micro-mobile is equipped with 4 cameras, which will be placed to provide one good overall view of the scene, and angles for close-up views of the action. Each camera is equipped with an intercom headphone/microphone so that the crew members may communicate.

Operating a mobile system camera is very different than shooting with a single camcorder:

1) **Teamwork.** Each of the 4 camera operators must work as part of a team. Instead of trying to cover all of the action, each camera will be assigned to cover a specific part of the scene.

2) **Remote Controls.** The camera operator need only worry about pleasing composition of shots, sharp focus on subjects, and the cameras “Zoom” settings. Most of the other settings on the camera are remotely adjusted from the Control Room.

3) **“Hot” or not.** Only 1 of the 4 cameras is being seen at any given moment. This allows cameras which are not currently “hot” to move to different subjects, or to change the composition of a shot to provide the viewer with more variety.

Some Basic Terminology:

1) **Tilt.** Up or down movement of the lens. Tilting the lens up moves the image on-screen lower in the frame. Directors may ask a camera operator to “tilt up” or “tilt down” to adjust their framing of the subject.

2) **Pan.** Left or right lens movement. As with tilt, Directors may ask a camera operator to “pan left” or “pan right” to adjust composition of a shot, or to follow movement by a subject.

3) **Zoom.** Simulates movement toward or away from a subject by magnifying the image. A Director may ask you to “zoom -in” if she wants a closer view of the subject, or “zoom out” to see a wider view of the scene.

4) **Focus.** A control of the lens which sharpens the image. Focus changes as the distance from the camera to the subject changes. If you move your camera, or move to a different subject, you may need to re-focus the camera.

5) **Pre-Focus.** A technique for achieving sharp focus. The camera operator first zooms -in as close as possible to the subject, then turns the focus control until the image is clear. Once focused, the operator may zoom-out to the desired framing of the subject.

6) **Dolly.** Cameras may be fitted with “Dolly wheels” to allow the camera to be moved easily. The term “Dolly” is used to describe movement of the entire camera toward the subject or away from the subject. The Director may ask the camera operator to “dolly in” or “dolly back”.

7) **Truck.** Movement of the entire camera to the left or right. For example, if your shot is blocked by an object, or your shot is at an odd angle, the Director may ask you to “truck right” or “truck left” to improve the shot. The direction is left or right from the position of the camera operator, not the talent.
Camera Operation: Composition

Composition and Framing
While the terminology may change a bit from Director to Director, here are some common names for shots, and tips to help you compose a pleasing picture.

**Extreme Close-Up**
A shot which is so “tight” that you can’t fit the entire head into the frame. Adjust zoom and tilt so that the top of the frame cuts across at mid-forehead, and the bottom is a few inches below the chin.

This shot is used when the Director wants the viewer to be able to experience the emotions of the subject along with him.

The shot is not very flattering, and not used often.

**Close-Up**
A well-framed Close-Up leaves a small amount of space between the top of the subject’s head and the top of the screen. This space is called **Headroom**.

The bottom of the picture should be a few inches below the tops of the subject’s shoulders. Avoid cutting-off the subject right at the base of the neck.

Also, **center** subjects from left-to-right on the screen.

**Medium Close-Up**
A little wider than the Close-Up, this shot is used frequently. Because it’s wider, it is easier to keep the subject “in frame” when he leans or moves, and focus is less critical on a wider shot.

The shot should have **headroom** at the top of frame.

The bottom of the frame cuts the subject somewhere between the chest and belly button.

**Lead Room / Nose Room**
When shooting a subject from the side, whether he is completely or only partially in profile, don’t center the head between the left and right edges of the frame.

Instead, leave a little more space between the subject’s nose and the side of the frame than behind the subject’s head.

This space, called “Lead Room” or “Nose Room” will usually place the subject’s nose at about the center of the screen, from the left to right sides.