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Mendel Sherman

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About the Author

Mendel Sherman was trained as a combat motion picture photographer in the Signal Corps program during World War II at Astoria, New York, the site of the former Paramount studios.

Following his final assignment as officer in charge of the Signal Corps Film and Equipment Operations Branch of the European theater of Operations, Sherman returned to the Cincinnati Public Schools to supervise the Audio-Visual program and in 1954 to include the production and use of in-school television programs. During that time he produced a film for the training of elementary science teachers and several short sequences for the TV in-school programs.

While completing a doctorate at the University of Southern California, Sherman's program included studies in cinema and television.

During the later years of his 20 years as faculty member at Indiana University he was Director of the Division of Instructional Systems Technology. Earlier in his tenure, he was assigned by the university and the United States Government as consultant to the Ministry of Education, Government of Thailand. While there, he produced a film, "Education Under A Thatched Roof," and several film sequences for use on Thailand television. Since retirement, he has produced video marketing material for the community in which he lives.

In all his productions, the mainstay of the techniques used are those described in this publication.

Dr. Sherman was president of AECT (then DAVI) in 1964-65.

Introduction

Schools throughout the nation are acquiring video cameras and related equipment as never before. The lightweight 8 mm camcorder, the super VHS and other formats offer user-friendliness and quality pictures and sound not dreamed of a few years ago. Trainers of personnel in industry are using video equipment to such an extent that video manufacturers have established a separate "Industrial Division" to concentrate on the needs and uses of video equipment in various types of industries.

Ever since the advent of the 35mm colored slide, schools have been using the pictorial medium for interpreting the school to parents and to other interested adults. Sets of slides have been prepared also for instruction in industry, in schools and for innumerable additional purposes. The moving image, however, holds a special fascination for children and adults alike. When properly produced, the video-taped message can be especially effective in telling the school's story to the public. It can also play an important role in training industrial workers and personnel at various levels of management. Many schools are attempting videography with varying results. The finished productions generally are not what one would hope for. The viewer is usually treated to abrupt jumps of images without sufficient continuity from one camera shot to the next. Individually the pictures might be acceptable but not in the way they have been joined. This seems to be the most pronounced problem; not the identification of the audience, purpose etc., but just plain knowledge and skill in visual sequencing, in pictorial continuity. This is the first thing that hits an audience. Without it the other criteria for an effective presentation mean little.

Although some large industries have sophisticated equipment and well trained personnel for their videographic needs, there are many others that are not so well blessed. Their productions also often lack the smoothness and continuity that can

accompany video productions with pictorial continuity.

The same problem of skill in shooting pictorial continuity was encountered in the U.S. armed forces during World War II when skilled still photographers were sent to training areas and to battle locations to bring back motion pictures with continuity of action. Initial results from the skilled still photographers were not satisfactory. Special training was needed even for the best of them.

To meet the need, a concentrated motion picture training program was developed primarily by Arthur Gaskill for training combat motion picture cameramen. They learned to shoot movie stories with pictorial continuity from beginning to end. The story, usually unrehearsed action, had to carry itself visually. If it could do that, sound could always be added. The assignments were effective lessons in the concept of visual primacy—in visual literacy with the moving image. Although some modifications have been developed since World War II, the basic concepts that were taught are as sound today as they were then.

An excellent source for thorough treatment of the concept of pictorial continuity is the publication by Gaskill and Englander, "How To Shoot A Movie And Video Story."

The primary audience for this booklet is the media specialist in education or in industry, the instructor and the student. Regardless of the type of audience, however, the techniques of videographing sequences for pictorial continuity are basically the same.

At the completion of reading this booklet and studying the illustrations, anyone comprehending the information should be able to:

1. Identify and describe the basic shots that are employed in achieving pictorial sequencing and continuity.

2. Describe the contribution that each of the basic shots makes toward the concept of pictorial continuity; in other words, the "why" or rationale of the basic shots.

3. Identify and describe additional shots and information that supplement and complement the basic shots.

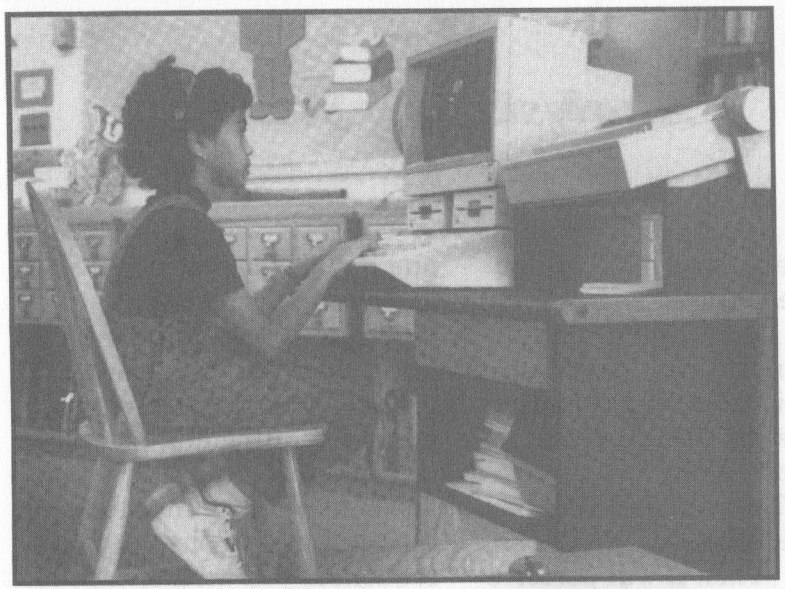
4. Shoot a scene in pictorial continuity provided the person is equipped with the manipulative skills of operating a video camera.

5. Use selected basic terms that are associated with videographic skills.

I
Analysis of a Scene

Perhaps the first skill that the videographer needs to develop is the ability to look at a scene and become aware of the pictorial elements that are present. Your eye takes the picture; your brain takes note. The brain generally will note the whole scene - the big picture. Then it will perceive selected component elements that make up the big picture - the whole scene. This analysis of a scene with its pictorial components will not happen automatically. It takes practice but that can be done at any time you look at any scene. Practice looking around. Your eye will take the picture of every scene. Your thinking process, with a little discipline, will note the component pictorial elements and their relationship to each other. You will learn to anticipate your sequence of pictorial elements well before you begin actual shooting.

Suppose as the media specialist in your school you have decided to let parents and public know what goes on in the school's media program. Your purpose is to get understanding of the present program and support for any additional innovations that you and your fellow teachers want to introduce. Included among the sequences you wish to tape is a scene of a learner or learners at word processors. This scene and any other scene is made up of interrelated pictorial elements. Somewhere among them is a center of interest. It often is also the center of action. Now what are the elements of this particular scene that you need to identify and isolate. You will photograph them individually and then combine them in the order you want. If you do it skillfully, the finished sequence is one of pictorial continuity, a smooth flow from one pictorial element to another with the viewer able to follow the sequence without any disorientation.



Establishing shot (ES) of a Learner at a computer.

As you glance at the scene of the learner at the computer in your media center your analysis includes the following:

1. The setting in its entirety - the "Big Picture" the full figure of the learner at the computer on the table and enough of the surroundings that you think will enable viewers to "know where they are"
2. The computer as a unit
3. The keyboard
4. Individual letters or groups of letters on the keyboard
5. The center of action - fingers of the learner striking the keys on the keyboard
6. The monitor
7. A section of the monitor as letters appear on it
8. The manuscript or paper from which the learner is typing
9. The face of a learner as she works at the keyboard
10. Elements of special interest that are in the scene but are tangential to the main action. This could be an on-looker.

So here are 10 pictorial elements that you have identified. There can be many more because each of the above has sub-elements. The face of the learner at the keyboard has a nose and two eyes and two lips. You may want to consider them as you move in for your sequencing but for the moment, you are satisfied with the prospect of selecting units from the 10 you have noticed.

Now, what are you going to do with all the above pictorial elements in the scene? You are going to select what you need and learn to shoot each one as one of the following shots in a sequence. Each shot has a distinct and definite purpose.

1. Establishing Shot: ES, (Long Shot, LS)
2. Medium Shot: MS
3. Close Up: CU
4. Extreme Close Up: ECU
5. Re-establishing Shot: RS (often an MS but so important in the usual sequence that it should be listed as a distinct shot.)

There are additional shots to be considered as you gain skill but the above will do admirably for a sound beginning. If you learn these, you will be well on your way to surprisingly good results.

II

The Shots That Make Up a Sequence

The video shots, that is the Establishing shot—ES (also called the Long shot—LS), the Medium shot—MS, the Close-up—CU, the Extreme Close-up—ECU and the Re-establishing shot—RS, are the basic ingredients of a pictorial sequence. You will shoot quite a number of them and string them together in a planned order to make up your complete video story. You will not always shoot your sequences in the order in which they will be shown. For convenience and other reasons you may often shoot out of sequence and rearrange the shots by means of editing.

While learning to shoot a sequence, however, it is advisable to begin the sequence with the establishing shot and then go right through the others in order- MS, CU, ECU (if applicable) and finally the RS. You will be pleased with the initial results. After you have learned this skill sufficiently you can begin experimenting and creating. You will find, however, that no matter how much you depart from this order, you will return frequently for some sequencing in these basic shots. These are the "bread and butter" shots in your repertoire.

1. The Establishing Shot—(ES or LS)

The function of the ES is to let the viewers "know where they are" in relation to the overall picture. They may not put it in so many words but if the scene is in the media center, their thinking should be "This is the media center in a school." Any time viewers say or think, "where are we now?" the establishing shot is inadequate or is missing altogether.

The ES (LS) is an overall shot, the "big picture" shot that includes every pictorial element needed to tell the story - no more and no less. If it takes in too much it will be difficult to attract attention to the main action in the setting. If, for example, the ES of the learner at the computer includes a group of others far off to the side at the listening center watching a filmstrip

and perhaps another distant group of a volunteer reading to a few children, viewers find their attention divided. They are not ready then for the medium shot which follows the LS of the learner at the computer. If videographers want to include all the groups mentioned and more in their opening shot, they will be shooting a "locale" shot of the media center. They will then need to follow the locale shot with an establishing shot of the learner at the computer.

Much will depend on what precedes and follows each scene or sequence of the learner at the computer. If the media center already has been established in a previous sequence, then the establishing shot for the learner at the computer need not include much else. The viewers already know "where they are" - in the media center. If you as the videographer also want to establish the entire school setting, that probably would be established best in an earlier scene. Thus the scope of an ES is relative to what the viewers have seen in previous sequences.

The ES is not any particular distance that should be thought of in feet or any other linear measurement. It is not so much a distance as it is an area that includes related visual elements in a setting. You will learn to see and note this immediately as soon as your gaze settles on almost any scene whether moving or static. You will be ready to place your camera in the right location and begin shooting. How long should you let the camera run on that long shot? There can be no set answer. If you are shooting for visual composition and sequencing only, that is one thing. If you are shooting from a script, however, that is quite another. You will then be shooting enough action for the narration to be added. In the taping of the learner at the computer you might let the tape run long enough for the learner to strike the keys for about 20 seconds before pausing the camera and moving in for the medium shot. As a general rule don't try to move to the medium shot with a zoom. You probably will want a slightly different angle and elevation than you used for the LS.

Before you proceed with any additional shots there is one guideline you will want to follow almost without exception: each time you complete a shot you need to

Establishing shot (ES) of a reading group in an elementary school.

change the relative size of your image or the angle at which you are shooting or change both the size and the angle. The size of the image can be changed by moving the camera closer or farther or, occasionally, by judicious zooming. The camera angle changes as the camera is moved to a new location in relation to the scene being videographed. By changing the size of the image and the angle of shooting, you will avoid "jump"edits. For example, suppose you begin shooting when someone in the scene starts to walk across the room and then you stop your camera. He continues to walk. You start your camera again after he has taken a number of steps. When you view this scene later it will appear as though the person had "jumped" from one spot to another. If you didn't re-start your camera until the person had left the room, he will seem to have suddenly disappeared from the scene altogether. If on the other hand you had changed the size and/or angle of your shot, you could have picked him up in the camera when he was across the room and there would have been smooth pictorial continuity. Without giving it any thought, the audience accepts the passage of time between shots as long as there is coherence.

An ES of three students at compters in a technical college.

2. The Medium Shot—MS

The medium shot (MS) begins to zero in on the main action. It deletes some of the visual that was included in the long shot; elements that were needed to establish the scene but are no longer necessary or wanted. The elements that are needed now of the learner at the computer includes a closer look at the learner as an individual, a personality, and not merely as an object in a scene. Needed also are the keyboard, the fingers striking the keys, and the monitor. There also may be a pad or hand-written sheet from which the message is being typed. As many of these pictorial elements as possible are to be included as a unit in your medium shot. They all have a functional relationship to each other.

To get from your ES to the MS it will be best to move your camera to a closer location. There will be the temptation to zoom in with your lens but as previously mentioned, you usually will want to choose a different angle for the MS. Your medium shot might be from the front or slightly to the side in order to get the learner's face while also getting the other elements needed for the medium shot.

Medium shot (MS) of a learner at a computer.

After you feel that the viewer has seen enough of the medium shot, and the action in the scene warrants it, stop ("pause-mode") your camera and move to the close-up, CU.

You might at this time ask, "Why didn't we go directly to the CU from the ES—do we really need the MS?" Well, sometimes you don't. If you study some of the scenes on TV you will see that this is done occasionally. Moving directly from the ES to the CU can be quite a jar to viewers. Occasionally that is intended. If not used judiciously, however, the jar can be disorienting and for a moment the viewers may wonder if they are looking at the same scene. The medium shot is usually needed as a transition shot from the ES to the CU.

Another reason for the MS is that the viewer needs to see the CU with its closely related surroundings before it is seen in isolation. Often the CU can be understood only if the other elements are provided.

3. The Close-up

The LS and the MS pave the way for the CLOSE-UP, the CU. The first two shots keep you oriented so that at the moment you are ready for it, mentally asking for it, the CU pops right into view.

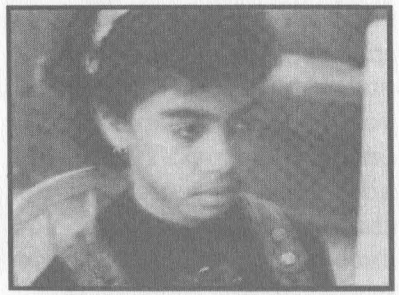
All the pictorial elements of the medium shot and their

sub-elements are candidates for close-up shots; the learner's face in a head-shoulder shot, the face alone, the monitor, the keyboard, and the fingers striking the keyboard. The sequence in which each CU is shot depends partly upon the videographer's preference but also upon the logic of the action in the scene. If you as the photographer want audiences to understand at every moment what is going on, you will look at each CU with their eyes as much as possible. That desire will help determine the order of the CU shots.

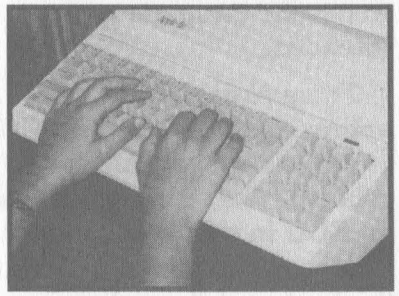
The first close-up you might select could well be a head and shoulder shot of the learner working at the keyboard. The next CU could be the source, if there is one from which the learner is typing the message. Then a CU of the hand striking the keys with the keyboard included in the scene. The monitor with the letters appearing on it would follow.

4. The Extreme Close-up (ECU)

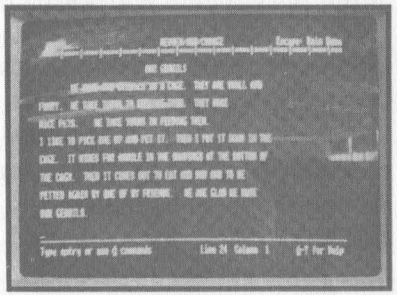
The ECU is merely a smaller pictorial element of the CU. It is a "closer still" look into the actions or heart of the scene. When you shoot



A close-up of the student



A close-up of the keyboard



A close-up of the screen

an ECU, you are, in effect, selecting a smaller but related element of a CU and enlarging it for better understanding. The learner at the word processor looks not only at the monitor but also at the individual letters and groups of letters. When you do the same with your camera you are shooting ECUs, the

smallest units of significance in your story. The finger striking a key is an ECU if you decide it is significant enough to shoot. There are additional extreme close-ups that belong to each CU. You shoot some; you ignore others. It all depends upon your purpose and the audience for whom the completed story is intended.

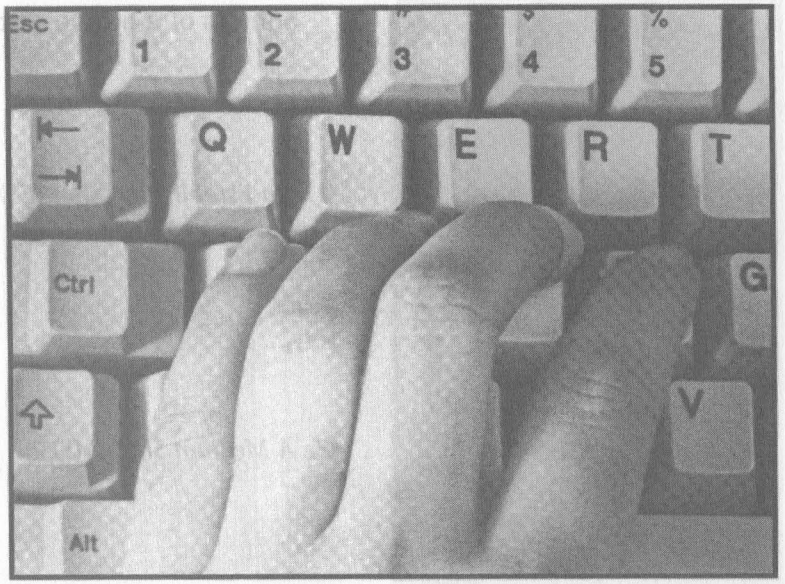
There is no definite or approximate size for an ECU or any other shot. All are relative. The smallest size for an ECU in the computer sequence might be a finger at the keyboard. In a playground scene it might be a head and shoulder shot.

Usually an ECU will follow immediately after the CU to which it belongs. This is not mandatory, however. As long as the ECU is obviously related to a CU that has appeared earlier in the sequence, it will be accepted by the viewer without disorientation.

If you shoot many CU's and ECU's in succession, you will find that it is too much. You can take in only a few at a time without wanting some kind of re-establishment. You feel as though you want to back off and look at something larger in the scene. You want to reexamine the CU and the ECU in just a little larger setting. That brings up the RE-ESTABLISHING SHOT (RS) one of the most neglected shots in shooting the moving image.

5. The Re-Establishing Shot

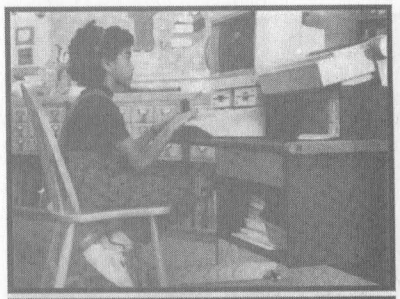
The re-establishing shot has several functions. For one, it follows the way observers normally behave when they have been looking closely at something small in relation to the whole of which the CU is a part. You seldom turn away abruptly from a miniature part of a whole. You back off a bit and take another glance or two. At that moment you are re-establishing the larger scene. You may bore in on another close look or two and again back off. This can be repeated several times in the same scene. When you do that with your video camera, viewers usually feel quite satisfied. You have taken them on a well-oriented visual journey with a re-establishing shot each time it was needed. It all occurs so naturally that even the experienced videographer is unaware it's happening.

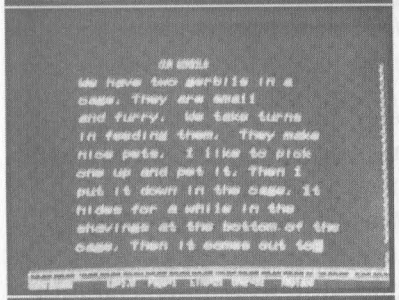


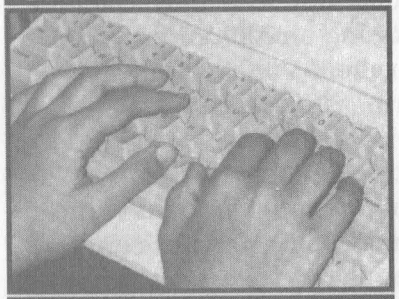
The ECU- the smallest pictorial element in the sequence.

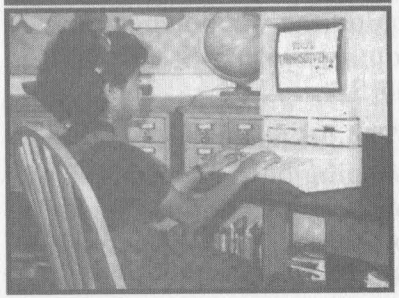
Another use of the re-establishing shot is to introduce something new to carry action to another scene. Thus when you move your camera back from the CU of the student at the computer to a MEDIUM shot and are thereby re-establishing, you could include another person as an onlooker. The fact that the onlooker wasn't there at the beginning is immaterial. Viewers of the taped scene tacitly assume that while they were looking at the CU, the onlooker stepped in. If you prefer, you can have the onlooker enter the re-established shot after the camera has started. Now that you have re-established with the onlooker in the scene you can introduce new action with her or you can follow her with your lens as she moves to another location, e.g. the group of four or five students viewing and listening with earphones to a sound film strip. She could stop at the new location or she could move on beyond. You and your camera could have the same choice. If your camera stopped at the group you would have established a new sequence with MS, CU, ECU and RS.

The RS need not be a "stepping back" to practically the same location as the MS from which you moved in for your CU and ECU. It can be









5 shots of a single pupil:

1. *An Establishing Shot (ES)*

2. *A Medium Shot (MS)*

3. *A Close-Up (CU)*

4. *An Extreme Close-Up (ECU)*

5. *A Re-establishing Shot (RS)*

5 shots of a reading group:

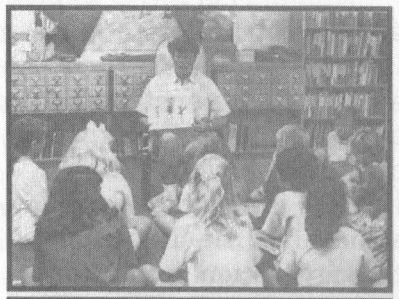
1. *An Establishing Shot (ES)*

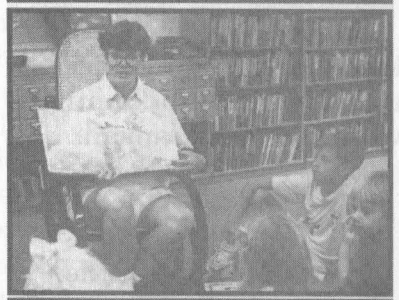
2. *A Medium Shot (MS)*

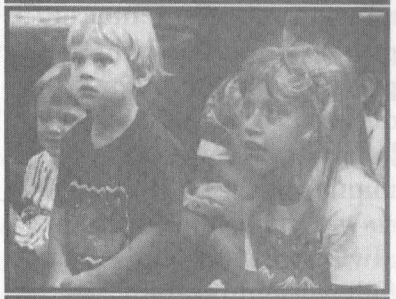
3. *A Close-Up (CU)*

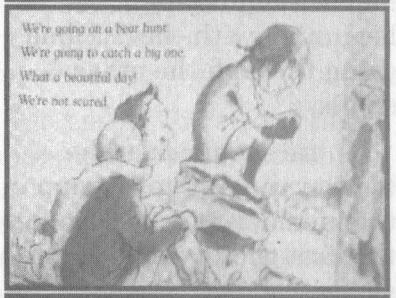
4. *An Extreme Close-Up (ECU)*

5. *A Re-establishing Shot (RS)*









at a slightly different angle or it can be on the exact opposite side. This is sometimes called a "reverse angle" shot which can be an advantageous location from which to follow someone in the RS scene to the next action or location.

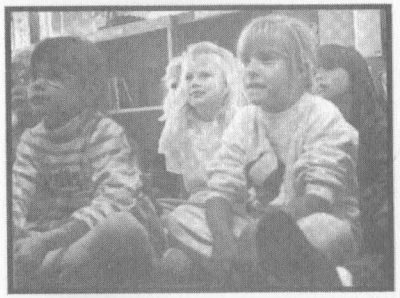
So there you have it - knowledge of a procedure for achieving pictorial continuity with your video camera.

Your knowledge at the moment may be a mental process only. You will need to practice it over and over on different types of scenes before it becomes a manipulative skill. In doing so you will find that it isn't always desirable to strictly follow the procedure of beginning with the ES and going through the other 4 shots.

In the sequence of the teacher reading to a group in the media center, for example, the first shot could well be the subjective over-the-shoulder shot of the page being read with the listeners' faces just beyond. CU's of several faces could follow, then the MS and finally the ES. Here you have practically reversed the order of the sequence and it could well be the most effective

Rearrangement of Shots in a Sequence:

1. The first shot could be an over the shoulder MS...



2. The second could be a CU of the children...

3. The last could be an ES.

arrangement of shots. You can think of your five shots as picture cards in a card hand, to be played in any order you wish. You can also vary the speed at which you play them depending upon the effect you want on those who watch. That brings up another important skill the videographer and editor need to develop - the skill of pacing.

As you practice your basic shots, you probably will ask yourself, "how much time should I give to this shot— how long should I let the tape run before I move to the next shot ?" As you gain experience in videographing different types of scenes you will begin to feel that each sequence, each story needs a certain rate of development. We call this pacing or timing or tempo. The pacing at which sequences move depends basically upon the nature of the subject matter. The sequence of students painting a mural, for example, needs a much slower pacing than the sequence of a gymnastics class.

Pacing need not depend entirely upon the subject matter, however. It can be built into a story by a combination of several means. One of these is the amount of time each shot remains on the screen. A series of close-ups for example, of two to three seconds duration or even less can increase the pace. Videographers usually are not the ones, however, to make the final decisions on pacing unless they are doing in-camera editing. The length of time that each shot remains on the screen is essentially the job of the editor. Therefore, you as the videographer, the camera-person, will need to shoot excess of each shot and let the pacing up to the editing process even though you may be the one to do the editing.

In addition to the amount of time each shot remains on the screen, pacing can be affected by interspersing close-up shots of the main action with close-ups of interested on-lookers. Short shots of these can speed up the action.

Increasing the size of the image can heighten action. Each time you cut-in to the brush of students painting a mural, for example, you can make it a closer CU, a larger image. This gives the feeling of a faster pace especially if the images are of short duration.

It may be surprising that even the angle at which you

videograph a scene can affect the feeling of timing. A low angle shot or one from the side can give the impression that things are happening or moving.

The arrangement of basic shots in the sequence is another aspect of pacing. Initiating your story with the time-honored ES generally is a nice leisurely approach. It's like beginning with, "Once upon a time..... ." As soon as you hear it you settle down for a comfortable, slowly paced beginning. When you see an ES of the chemistry lab in the school you feel that you are going to get a logical, scholarly explanation of something that goes on there. If the opening shot, on the other hand, is a CU or even an ECU of an experiment, the pace is quickened in order to get to an MS or longer shot so viewers will "know where they are."

How can you tell when you have achieved the desired pacing ? It's by the viewer interest you are able to establish and hold. You can begin with yourself. Is there any place in the sequence where your attention flags? If there is, you have at your disposal the above approaches to change the tempo. Then try it out on your friends. While they are watching the tape, sit on the side and observe them. You can sometimes pick up body language that tells you interest is flagging. You might also get some candid responses from other movie makers. Eventually, you will get the feel of it but outside evaluation can always help.

III

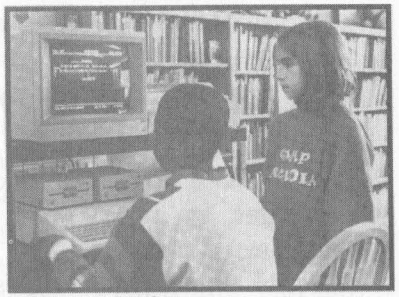
Additional Useful Shots and Angles

Your 5 shots are basic and you can get by pretty well with these. There are additional shots and angles, however, that can add versatility and interest to your video sequences. Although they are supplemental, the CUT-AWAY and the CUT-IN are invaluable shots. Many sequences cannot get along without them.

The ***Cut-Away*** is usually a MS or a CU that is related to but is not part of the main action. In your sequence of the learner at the computer you have just gone through the ES (or LS), MS, CU, ECU and have reestablished to an MS over the shoulder of the learner with the camera focusing on the monitor. The letters appear slowly since the learner is in the "hunt and peck" stage of word processing. You don't want to take all that time on the tape but would like to have a lapse and then return when more of the story is on the screen. But you don't want a "jump" edit - that is a scene that suddenly jumps from a few words on the screen to a screen that is three fourths full. You could maintain continuity with a dissolve in editing later or you could do it by cutting-away with the camera from the main action at the computer to the teacher or to Susie who is watching. An MS or a CU of onlookers' faces will add interest to the scene and will also signal that time is passing and words are appearing on the monitor while they are watching. The shot of an onlooker and all other shots that are related to but are not an integral part of the main action are termed CUT -AWAYS. The effect usually will be best if the onlooker has been established in an early shot, often the original ES. It will be easy then for the audience to accept an onlooker without any disorientation.

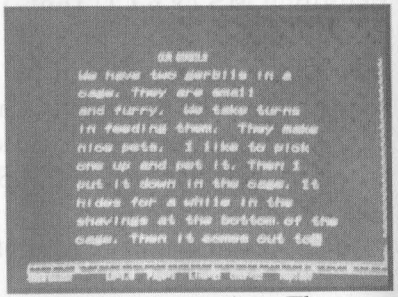
The cut-away need not be an onlooker or even a person. It can be an object. It also can be a short sequence that is concurrent with and related to the main action. It is then termed "parallel action".

The ***Cut-In*** is a shot that returns to the main action following the cut-away. In the scene we have been describing, the cut-away shot is an onlooker. Now we want to see what is being observed. We feel that the onlooker is watching close-ups of the action, either the words appearing on the monitor or the fingers hitting the keys. So we cut into the action with our camera and show a CU or ECU of the fingers hitting the keys. This gives the viewer the impression that time is passing and many additional words are being added to the screen. The cut-in shots then, are those that cut back into the main action. They usually are CU's and ECU'S. (The term cut-in is used by some videographers to refer to any ECU whether or not it is a return from a cut-away)



1. An onlooker.

2. Cut-away to onlooker.



3. A cut-in to monitor. The screen is full.

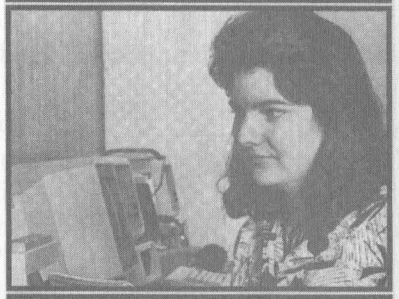
The ***Subjective Camera*** presents the view from the eyes of the performer rather than the position of the bystander. A useful camera position for the subjective shot is just above and behind the shoulder of a person demonstrating a skill.

This shot is so commonly used that it is often referred to as an "over the shoulder" or an OVS. For the person watching the completed tape, the OVS puts him in the position that he would be in if he were the performer. It can be a dramatic shot as well as an especially useful shot for learning a skill.

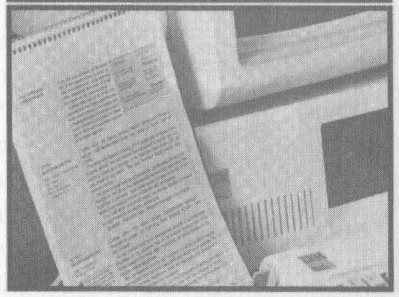
A complete sequence of the three students at the computer stations, introduced earlier with an ES, incorporates the use of the cut-a-way, cut-in and subjective camera together with the 5 basic shots.

1. ES- Three students at computer stations.

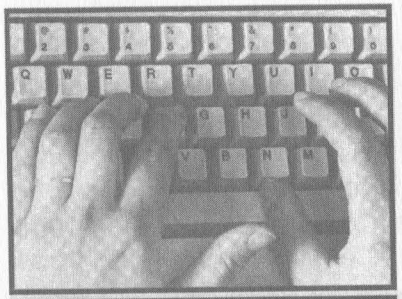
2. MS- One student at computer; second student observing.



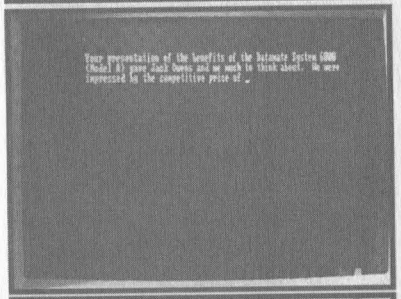
3. CU- student



4. CU- tablet from which student is working.

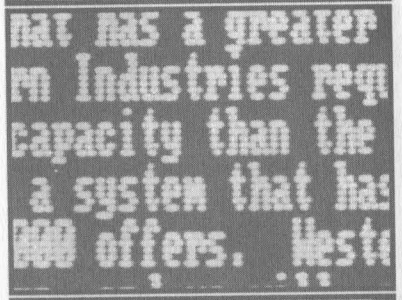


5. CU- keyboard

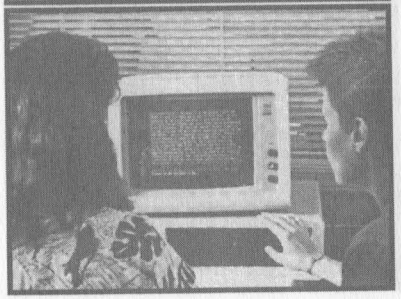


6. CU- monitor with 3 lines of words on screen.

7. A CU cut-away to onlooker.



8. A Cut-In to an ECU of letters on monitor.



9. An RS, "over -the-shoulder" of the main action.

Panning -

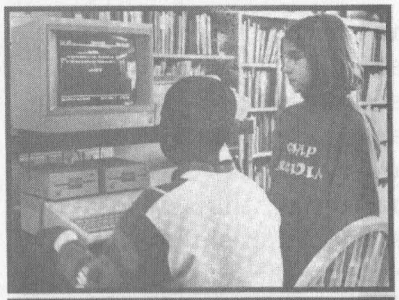
Panning refers to a turning movement of the camera across a scene. If it is an up or down motion, it is called a "tilt-up" or a "tilt-down". Used judiciously, the pan can be a very useful and attention-holding shot. Used badly, it can be an irritating distraction from the pictorial content.

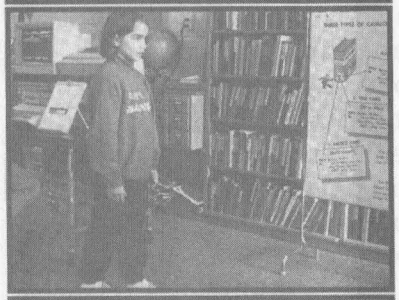
The impulse to use panning frequently is a common fault of the beginner - the rank amateur. Unless its use can be justified in a particular scene it is best to avoid it.

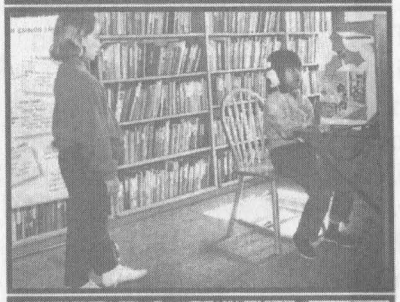
There are situations where panning a static scene can be effective and dramatic. In general, however, panning should accompany action. In the basic sequence we have been using as an example, suppose you have re-established on an onlooker at the computer. You wish now to establish on another activity a short distance away, that of listening to a recorded tape. It would be a simple matter to have the onlooker at the computer location walk to or past the listening post. In this instance panning would be helpful.

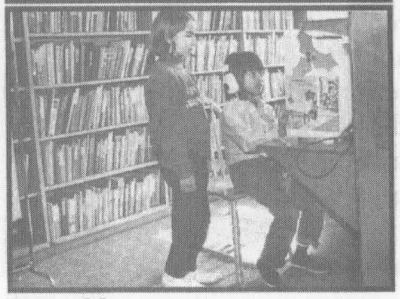
The camera would focus on the onlooker departing from the computer location and pan with her to the listening post. There the panning would stop but the camera would continue shooting at the new location as an establishing shot. The sequence of shots that would follow the ES would be similar to those described earlier at the computer.

Attention should be given to screen direction when videographing a person moving to a different location. If the person is moving from left to right that direction should continue in subsequent shots until the destination has been reached. Otherwise it will appear that the person is suddenly and inexplicably returning rather than going. A classic example is the case of the team of two motion picture photographers shooting a horse race. They positioned themselves some distance apart, one inside the track and the other outside. The direction of the race for the outside photographer was from left to right but for the inside photographer it was from right to left. Their edited film had the horses running one way and then suddenly the reverse which is not the usual way to win a race.









Panning to accompany action:

1. *Onlooker and learner at computer.*

2. *Onlooker turns to depart.*

3. *Camera pans with onlooker as she proceeds to another location.*

4. *Onlooker approaches new location.*

5. *Onlooker has arrived. A new sequence of shots can be videographed at the new location.*

Clean Entrances and Clean Exits

When panning with a moving person try for a clean entrance and a clean exit. A clean entrance is achieved by starting the videographing of a scene from a fixed camera position before a moving person enters the picture. After the moving person enters the scene, the camera pans with the subject for a desired distance and then halts its movement.

The tape keeps recording while the subject continues right out of the picture in a clean exit. Where a choice is available, a forty-five degree angle for the camera is a good one for both the clean entrance and the clean exit.

Clean entrances and clean exits are especially helpful for later editing.

While in the process of panning a moving object, try to provide more space, that is more picture area, in front of the subject than in back. In other words avoid having the subject "push the frame".

Panning a still scene generally should be avoided. The use of the various basic shots usually can present more satisfying viewing than the pan. In those instances where it seems justifiable to pan a still scene a few guidelines are suggested:

(1) The pan must be steady. A tripod should be used when possible.

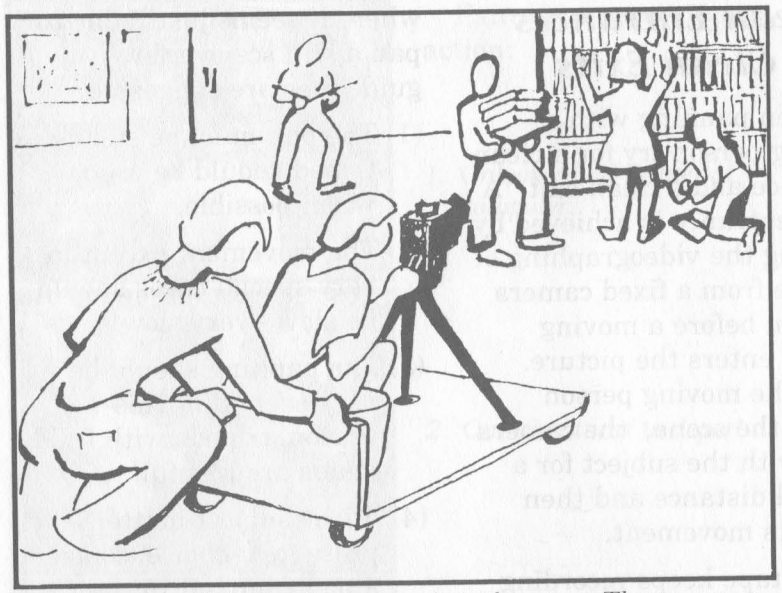
(2) The movement except in very special cases should be slow - very slow.

(3) The panning should be very even. For this reason, tripods with fluid heads are helpful.

(4) If the subject matter presents a choice, consider a pan from left to right - the accustomed movement of the eyes in reading.

(5) Whether you are shooting a still or an action scene, avoid starting or stopping your camera during a pan. Begin with the camera established at the beginning of the pan -hold still a few moments and then begin the pan. At the end of the pan hold the camera still again before stopping the shooting.

Dolly and Tracking Shots are made from a moving camera. This differs from the panning shot where the camera remains in place but swivels to accompany action. Dolly and tracking shots can be tried from a moving wagon, a



A "dolly-in shot" moves the camera into the scene. The nearer an object is to the camera, the larger it grows. If the camera moves with the action in a parallel direction, it is a "tracking shot."

wheelchair or some other vehicle. A "dolly-in" shot moves into the scene while the action continues. A "dolly-out" shot moves back. A tracking shot moves with the action thereby maintaining the image size and the angle of the camera to the moving person or object. The tracking shot often moves parallel to the action with very little angle if any. Because of the difficulty in getting a smooth ride for the camera, it is best to use the lens near the wide angle settings. This minimizes the effect of jars.

The dolly shot has a different and usually more interesting and dramatic effect than the zoom shot in which all subjects and objects in the scene are magnified or reduced in size equally. In contrast, the elements in a dolly shot are magnified or reduced in proportion to their distance from the camera. A dolly shot moves into or through the scene. An object on a distant wall may change very little during a dolly-in but a person near the camera may grow dramatically in size and importance.

The Zoom -

Practically all video camcorders are equipped with zoom lenses that vary in focal length from about 8mm to about 80mm or 96mm. The zoom is a continuous change in focal length anywhere between the widest angle at 8mm and the narrowest angle at 80 or 96mm. The lens can zoom from a wide angle LS to an extreme CU. It's a great temptation to use it at the slightest opportunity. The frequent use of the zoom and the pan are distinguishing characteristics of the neophyte. While learning pictorial continuity, the best use of the zoom lens is for framing the individual shots as you move from the LS through the MS, the CU, the ECU and the RS. The zoom lens enables you to put the tripod at the approximate location for any of the shots and then use the zoom to get exactly the framing that you want.

When shooting indoors this use of the zoom lens will remain its chief asset.

Avoid zooming with the hand-held camera. If you decide that a zoom is needed, however, remember that the wide angles of the zoom lens result in the steadiest pictures for the hand held camera. As you zoom in for close-ups it becomes increasingly difficult to hold a steady picture with the lens at the long focal lengths -the narrow angles. Any slight movement of the camera is very noticeable in the picture.

You might wonder why you shouldn't leave the camera in one location on a tripod and use the zoom lens to shoot all the shots - at least the LS, the MS and in some cases the CU. You would soon find that the resulting pictures are not as interesting. When you move in with the camera you can change the angle at which you shoot - both vertically and horizontally. You need this versatility in order to select the planes that provide the clearest and most interesting views.

A good use of the zoom is to maintain the framing on an object that is moving directly toward or away from the camera. As the object approaches, slowly zoom back to keep it occupying the same picture area. If it is moving away use the zoom in the opposite direction to also maintain the same framing.

IV
Angles and Framing

Angles

The camera position in relation to the object being photographed can be: (a) high angle, (b) low angle, (c) side angle, and (d) what is sometimes called a "flat" angle.

A few guidelines about the use of angles without going into extensive detail include:

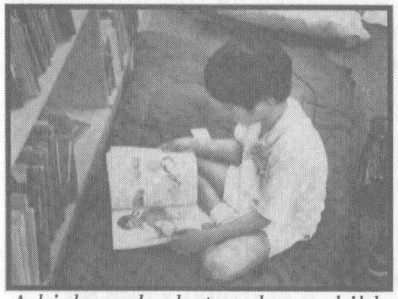
1. Avoid high angles (elevations) when videographing children. Camera height generally should be no higher than their heads. A slightly lower elevation is even better to give dignity and importance. A low angle shot makes people appear taller; a high angle shot makes them seem smaller.
2. "Flat" angles from camera positions directly in front of the subject generally are not as interesting or dynamic as those taken slightly from the side or at a 45 degree angle. Flat angles can be quite useful, however, during the shooting of a sequence. The change of the angle from left side of a person working at the computer to the opposite side can be too abrupt and disorienting to the viewer if made in one move. The flat angle or direct frontal view is an added shot by the camera en route to the other side. It serves as an intermediate shot which helps keep the viewer completely oriented.
3. Avoid unusual angles for pictorial effect only. The viewers attention should be on the story content. The camera work should be inconspicuous.

Framing

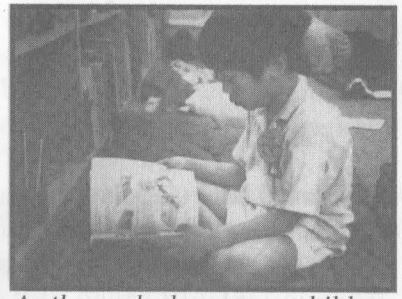
The frame for the images of our present TV system and consequently your camera pictures are fixed in an aspect ratio of 3 to 4 - that is, the height of the picture is 3/4 of the width. Within that frame you have some latitude in arranging your pictorial content. There are several important guidelines to consider when framing your video image:

1. If there is movement in your picture, e.g. a person walking from left to right, provide more space in front of the person than there is behind him. The amount of space depends on the speed with which the person (or object) is moving and upon additional factors. Experiment to determine how much space is appropriate. You will soon get the feel for it. In general, provide sufficient room so that you the viewer won't feel that the person is pushing against the frame.
2. In vertical spacing, provide comfortable space at the top of the picture in the long shot. This "headroom" as it is often called is reduced as you move to the medium shot and is almost eliminated as you go to the close-up.

None of the above is a hard-fast rule. The subject matter, your purpose and the anticipated response of your intended audience can modify any videographic guideline.



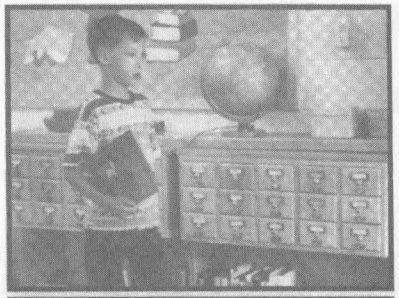
A high angle shot makes a child seem smaller.



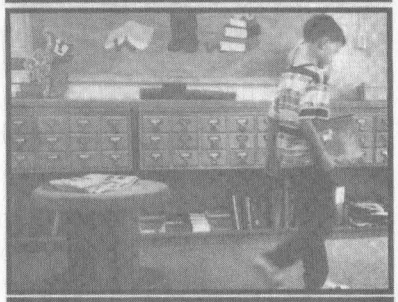
As the angle decreases a child gains in importance.

An angle slightly below eye level increases stature and adds dignity.

Framing the video shot:



1. *Provide more space in front of a moving person than in back.*



2. *This is "pushing the frame". AVOID IT!*

3. *The LS should have adequate "head room"—space at the top.*

4. *Head room is reduced in the MS.*

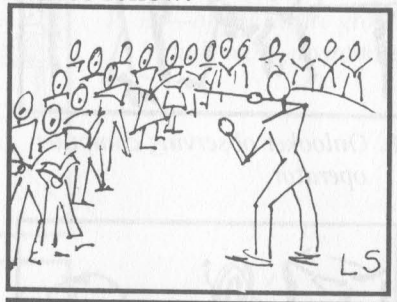
5. *Head room is minimal in the CU.*

V
The Story Board

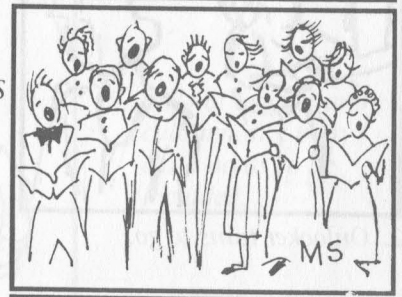
Some of the videography in the schools will be done with only a plan in mind; others from a prepared script. The most detailed type of direction to the videographer for shooting sequences and individual shots is a "Story Board".

The story board is a planning device consisting of a description or sketch of the visual and an indication of the sound that will accompany it. Usually, a drawing is made of each shot that is to be taken. The drawing of the ES, MS and all the others are shown individually as they are to occur in the sequences. The story board illustrations can be as simple or as well developed as desired. Usually there will be some differences between the story board picture and the one that is actually taken but the story board serves as a guide to videographers to help them get the pictures that the director wants. The individual pictures of the story board usually are arranged horizontally and follow in sequence from left to right but they also can be arranged vertically in one column with the narration or sound directions in another. Examples of story board sketches follow.

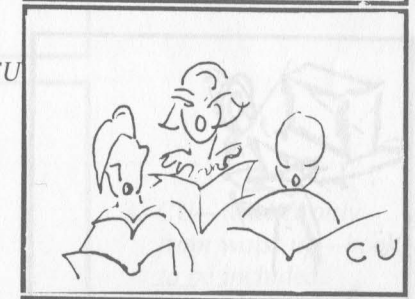
LS



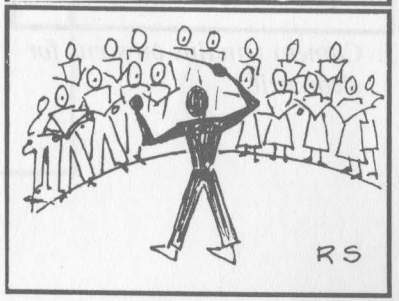
MS



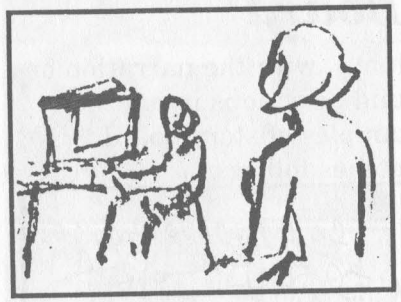
CU



RS

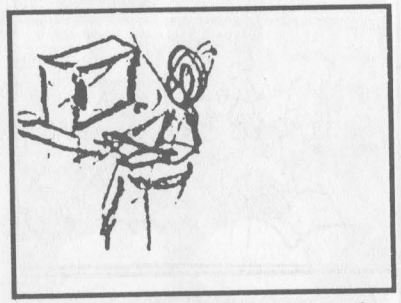


Story Board of Clean Entrance and Clean Exit as an onlooker carries action from one scene to another.

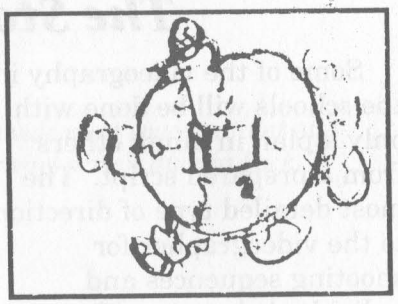


1. *Onlooker observing computer operator.*

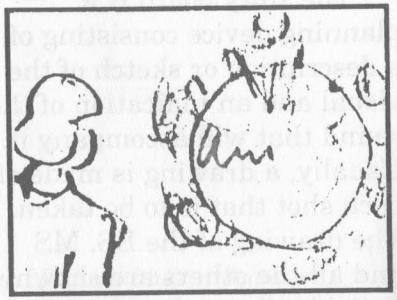
2. *Onlooker turns to go.*



3. *Camera remains on scene for clean exit.*



4. *Camera begins shooting at new location.*

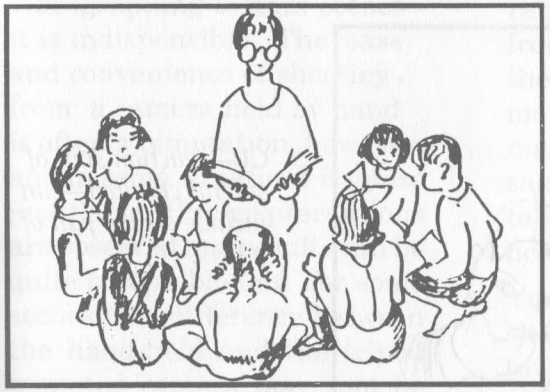


5. *Onlooker enters scene (clean entrance).*

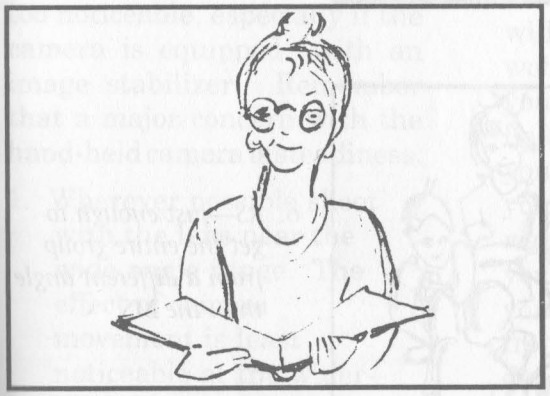
6. *Onlooker joins group.*

Story board sketches of a reading group sequence. (live sound- some will be selected in editing).

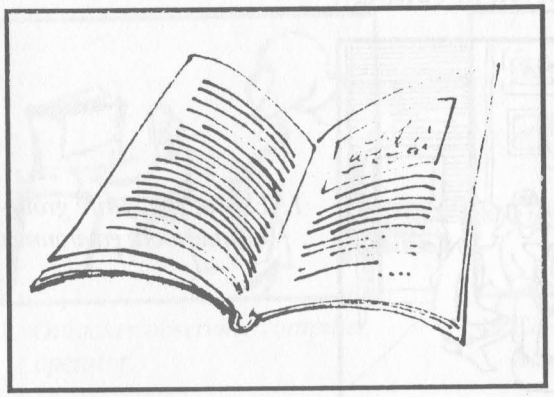
1. *ES—of the entire group—include room environment.*



2. *MS—of teacher and children, not every child needs to be included.*



3. *CU—teacher only from waist up—book to be included.*



4. *ECU—overshoulder of teacher to show pages from which she is reading.*

5. *CU—reaction shot of several children—can include a slow pan of others.*

6. *RS—just enough to get the entire group from a different angle than the MS.*

VI

Briefs on: (a) Hand-held Camera and (b) Videographing Uncontrolled or Unrehearsed Action

Hand-held Camera.

To shoot the steadiest of pictures at various heights above the ground, a tripod is a necessity and for videographing certain scenes it is indispensible. The ease and convenience of shooting from a camera held by hand is often a temptation, however, and in some situations is quite justifiable. If some precautions are observed the results can be quite acceptable and for some scenes the difference between the hand-held and the tripod mounted camera may not be too noticeable, especially if the camera is equipped with an image stabilizer. Remember that a major concern with the hand-held camera is steadiness.

1. Wherever possible shoot with the lens near the wide angle range. The effect of camera movement is least noticeable at the wider-angle ranges. The effect of even a slight camera movement becomes increasingly noticeable and annoying when zoomed out toward the telephoto ranges. Many cameras have a zoom ratio of 8:1 or greater - from the widest angle to the narrowest. Camera movement will be magnified in about the same ratio. If you need a telephoto shot you also need a tripod.
2. Your stance while shooting can contribute toward steadiness. If your feet are close together you will have a tendency to wobble. Experiment with your stance. If you are holding your camera on your shoulder or against your right cheek or the right side of your body, you will find that placing your left foot well out in front and at about a 45 degree angle toward the left will provide a steadier position.

3. Keep your arms and elbows against your body. This provides some degree of support and avoids unwanted bumps from someone passing.
4. Learn to breathe in just before shooting. If the shot is to be relatively short, hold your breath until you finish. If you find you must breathe, do it gently.
5. If you are going to pan with your shot, place your feet and body position for the finish of the pan. Then swivel your shoulders and waist to the beginning of the pan and start your shooting from that position.
6. Make use of any readily available body supports such as a post or wall or doorway or desk - anything against which you can lean while shooting. You will especially need support if you hold your camera for low angle shots. The electronic view-finders on most video cameras make it convenient to view the scenes from various heights including waist level or below. When you do this, steady support becomes a problem. Sometimes you can support the camera on a desk or box while you manipulate the camera controls.

Videographing Uncontrolled or Unrehearsed Action

In order to capture spontaneity and naturalness it may be necessary at times to videograph scenes as they are happening without any attempt to direct, control or change in any way. This may be any activity in the classroom, the playground, the media center or whatever. The approach to shooting any scene remains that of the ES, MS, CU, ECU the RS and additional shots and angles described earlier.

Success in shooting unrehearsed action depends partly on the type of locale and the size of the area in which the action is taking place. If you are including art activities, for example, in your interpretation of the school's program, that should be comparatively easy. Individuals or small groups are at fairly specific locations. As you watch their activities you can fairly well anticipate their next moves. You can move in and out for the various shots, re-establishing frequently and then moving in again for CU's and ECU's. Shooting unrehearsed action of playground activities is more difficult. Some of the action may be over a wide area and may be difficult to anticipate. In such situations count on shooting a lot of tape and editing out much of it. You will need your whole range of shots including cut-aways if your sequences are to have the continuity you want.

VII

A Few Words About Video Movie Equipment and About Lighting the Video Scene.

Advice about specific video equipment would be obsolete almost as soon as it is written, so rapidly are innovations being introduced. A general word of advice for the average school with a limited budget would be to "keep it simple and sturdy." Equipment that is sold through the usual consumer market is often loaded with all types of features. On the camcorder there are digital effects - "fades," 15 or more types of "wipes," dissolves etc. etc. A "flying erase head" is essential but the digital effects except for fades have limited value on the camcorder. Wipes and dissolves are useful primarily in editing. It is the editing equipment that should provide for these effects. Actually, the special effects are not needed in edits very often if the camera work is in accordance with the directions given herein for the basic shots and sequencing. Dissolves are often overused in an attempt to cover up for inadequate skill in pictorial sequencing.

Despite the foregoing observations, camcorders equipped for fades, dissolves, etc. can be useful in copying sequences of still photographic materials, illustrations, etc. for later presentations. Quick dissolves help prepare viewers for pictures that lack the continuity that is provided by shooting LS, MS, CU of the same scene. The camcorder can be mounted on a copying stand and the still materials copied to accompany a script if desired. If a school intends to make extensive use of video equipment for copying, a camcorder equipped for special effects should be considered. Best results, however, will come from editing equipment that incorporates special effects and character generators. The latter generates captions and graphics.

Schools should give consideration to purchasing equipment that is manufactured for industrial or professional use. The price is not that much greater for some of the basic equipment. It is often sturdy and simple in operation with few of the embellishments which the trade sometimes calls "bells and whistles." With this type of equipment students are not so apt to become enamored by the provisions for special effects to the detriment of learning to videograph in pictorial sequence and continuity.

Several different formats for videographing are available at the present time. Included are Beta, VHS, Super-VHS and 8mm. Several new ones are on the horizon. At this writing, the VHS format is probably a proper choice for most schools. The final generation of the tape probably will be played on existing VCR's which for the most part are in the VHS format. You might want to opt for the S-VHS format if dubs (copies) are to be made to the third generation. Your original tape is the first generation. From that you edit to a second generation. Dubs of that are the third generation. Each generation loses some pictorial quality. The S-VHS format loses the least.

Make sure you will be able to get prompt maintenance. A wait of several months for parts to arrive from foreign sources can be devastating to your program. The well established manufacturers are most likely to provide the parts and maintenance that you might need.

Although ordinary VCR's can be used for editing there are several essential features needed for accurate editing and clean edits. In addition to the flying erase head mentioned earlier, a jog and shuttle switch is another desirable editing feature. It enables the operator to advance or reverse the tape as slowly as desired to locate the exact frame for the edit.

Some VCR's without the tuner-timers are made specifically to facilitate editing. If available they should be considered and examined carefully before purchase. Descriptions in advertisements can be misleading.

An editing controller facilitates the starting and stopping, the playing and recording, of the VCR's, either individually or in synchronization. Editing controllers range in price from

a few hundred dollars to many thousands. Get only what you need. Don't engage in "overkill" just because funds are available.

The type of editing controller you decide to get should accommodate the features that you will need on your VCR's. An example might be a "5-pin" controller on the VCR which is needed for certain types of editing controllers. This type of control is among the most accurate in getting the tape to stop exactly where you want it to. In general it would be best to get the VCRs and editing equipment as a set. A hands-on demonstration should tell you if the equipment will do what you anticipate.

You may want a character generator with which titles can be composed and superimposed on the pictures. These range upwards from a few hundred dollars. Be sure you really want it before you buy. Some camcorders have enough of this built in to take care of elementary needs. The school's computer can be used to prepare titles and graphics for titling.

Devices which provide fades and wipes are very helpful in editing but are not mandatory. Those which provide genuine dissolves are much more expensive but again are not essential to basic editing. Their procurement should be justified before any purchase is made. It may be more prudent to purchase a second camcorder rather than obtain sophisticated equipment that will not get much use.

Some school programs and budgets can justify very sophisticated and expensive equipment. Such equipment requires highly skilled personnel. Unless they are available, the money spent in equipment will not be well invested. In general, as stated earlier, keep it simple and sturdy.

Lighting.

Fortunately for the videographer, general lighting in and around the school and other instructional settings is sufficient for today's video equipment. Occasionally deep shadows may need some fill-in light. Some situations may call for the usual three lights: the main or highlight, the fill-in, and the rear or separation light. For many purposes, additional lighting is not worth the bother or the irritating effect upon the

people being photographed. Battery lights are available for mounting on the camera if needed.

For outside scenes try to arrange your shooting schedule when the sun is at an angle. Avoid noon-time shooting when the sun is overhead and casting shadows around the eyes and other similar indentations. A hazy sky disperses the light which helps light up the shadows. In general avoid backlighting. Try to shoot with your back to the sun.

Closing Statement

The information in this booklet was presented to help instructors and students, in fact anyone with video equipment, to acquire basic skills in pictorial sequencing and continuity. These skills are by no means the sum total of what there is to know about recording the moving image but as a beginning they will enable you to do a creditable job with the camcorder whenever you approach a scene you want to videograph.

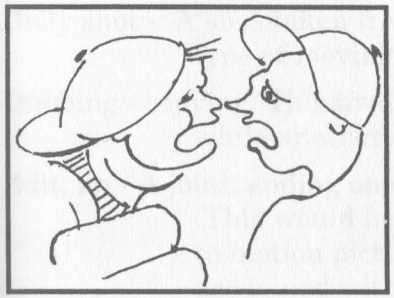
With practice and critical evaluation of the results you will soon have some mastery of the basic shots. You then will have the potential for creating with them. The creativity can be in the content, in the story you are trying to communicate by means of the basic shots, and the order in which they are arranged. Or you can create by modifying the shots themselves. Consider the Close-up, for example; specifically, the framing of the head and shoulder shot. The generally recommended framing places the top line just a little above the head and the bottom of the frame at the chest or the pockets on a shirt. It is the type of shot that is used when videographing the president of the United States - or the principal of the school. To get closer would be to invade that invisible, private space, that surrounds each person. To restrain viewers from entering that private territory, the videographer frames the CU head-and-shoulders shot as described above. It is conservative, respectful and safe for videographing the head and shoulders of a dignified personality.

A "head and shoulder" shot for dignity.

If the head and shoulders belong to a smiling young man or woman, however, we may want to venture closer so we move or zoom in with the camcorder, not concerned that the top of the frame is just above the hairline and the bottom barely below the lips.

We might re-establish quickly from that shot but the viewer has had a moment of intimacy that would not have been there with the usual head and shoulder close-up.To get the effect we had to modify the usual approach to the framing of a basic close-up shot. That is one of the elements of the creative process.

A feeling of antagonism might surprisingly call for somewhat the same tight framing that was appropriate for the opposite. A baseball manager, furious at an umpire's call, for example, might deliberately invade that private invisible territory and argue his point while his nose is within a few inches of the umpire's face. To get the tension of the dramatic scene the picture would have to crowd the frame with eyes and noses that almost meet.



A "tight" shot for antagonism.

Another modification of basic techniques could be in the use of camera movement. In general, for many of the stories we shoot we can get along very well without a trucking shot. The slightly moving camera from a wagon, a wheelchair or some other vehicle, however, can provide some interesting and dramatic effects. The shot from the moving camera can hold attention so intensely that a few seconds exposure on the screen will sometimes be sufficient. If you need to tell a great deal in a short time, the moving, zooming, dollying, panning camera can help do it.

Professional directors and videographers in the advertising industry have learned much about the modification of the basic shots and the use of the moving camera. For effective advertising, stories need to grab attention immediately, hold it and then get the message across in the shortest amount of time. The shot may last 2 or 3 seconds before it is followed by a 1 second CU from a slowly moving trucking shot. It may seem that pictorial continuity as we know it has been somewhat abandoned. But there are similarities of one kind or another in successive shots and commentary that lead you into the next scene.

Consequently you as a viewer do not get too disoriented.

To observe the many modifications that the advertising industry makes with the basic shots, watch some of the commercials on TV programs with the sound turned off. Or if you can, obtain a copy of a tape such as SHORELINES, produced by Tri-Com, Hilton Head Island, one of the outstanding and skillful firms in the business.

Play the tape again and again and you will notice the basic shots as described herein. You will observe also a wide variety of modifications of the basic shots. But don't be misled into thinking that is the way to tell all your story. You could be a master of these techniques and yet not be able to tell a simple story. Many a would-be videographer has been lost in techniques to the detriment of his skill in simple communication. It would be like the trick-shot golfer who cannot play a respectable round of golf. You may want to experiment with some of the shots you see in commercials on TV, but place your reliance on the basics. You won't go wrong.

A Glossary of Selected Videographic Terms

The items in the first part of the glossary are those which are frequently encountered in basic videography. Following those are additional items with more technical information.

Character generator - a device that can superimpose numbers and letters for titles, etc.

Continuity - joined without interruption or cessation. Continuity with videographed visuals refers to a logical succession of related individual shots and sequences.

Digital effects - Visuals such as "wipes", "freeze frames" and similar special effects that are produced in-camera, in VCR's or devices designed for that purpose.

Dissolve - A double exposure in which a new picture gradually appears while the other gradually disappears. See "fade-in" and "fade-out". The dissolve is a combination of the two.

Dolly - A wheeled platform upon which a tripod is set to move the camera toward or away from a scene.

Dolly shot - A shot taken from a mounted camera on some type of moving vehicle.

Dubbing - copying. This involves one VCR for playing a tape while another connected VCR records.

Edit, an - A joint, ending one shot and beginning the next. (This would be termed a "splice" when referring to motion picture film.) In straight edits, shots are joined without the use of fades, dissolves or other special effects.

Editing - The selection and arrangement of shots in sequential order and the subsequent orderly arrangement of the sequences. In assemble editing, shots are added one after another. In insert editing a previously videographed scene is replaced by another of equal duration. In a straight edit one shot is joined to the next without the use of a fade or dissolve.

Fade-in (or fade-up) - The picture gradually appears as light increases on the initially blank screen.

Fade-out (or fade-down) - The picture gradually disappears as the screen darkens.

Jump cut (jump edit) - A gap in pictorial continuity from one shot to the next. It commonly results from not changing camera angle or image size at the end of each shot. The jump-edit occurs when the camera re-starts shooting and the subjects had moved during the time the camera was recording.

Master video tape - the original video tape. This is a first generation tape. An edited master tape is one that is edited directly from the master. It is a second generation tape. A copy made from the edited master is actually a third generation tape.

One-shot - A shot with one person in it. A 2-shot has 2 people; a 3-shot has 3 people.

Out-takes - Tape which was videographed but not used in the edited tape. It is a "left over".

Panning - Turning of the camera in a swiveling motion while it is in a fixed position such as on a tripod. Panning also can be hand-held with the operator in a stationary position.

Racked focus shot - Changing focus on different objects in a scene while the camera continues shooting.

Pre-production - Preparations before shooting begins including outlines, scripts, story boards etc.

Post-production - Editing, titling, addition of sound, special effects, etc. needed to complete a tape and have it ready for showing.

Screen direction - The direction in which events are moving or facing on the screen.

Script - A description of each shot in each sequence of a videotape. The video is described in one vertical column of a page and the audio in a corresponding second column.

Sequence - An orderly arrangement of related individual shots which continue one after the other without interruption or disorientation. Sequences are joined to tell a story.

Shot - The image recorded between one start and stop of the camera. It is a basic pictorial element in a sequence. Shots can be classified in several ways. In this booklet, they are described according to function - the establishing shot, the medium, the close-up, the re-establishing shot and the various supplementary shots. Shots can also be classified according to distance of the camera from the subject using somewhat the same terminology as is used for classification by function.

Story board - Drawings representing each shot in the script in the sequential order that the shots are to appear. These often are mounted on a bulletin board and referred to for picture and sound directions.

Tripod - A three-legged stand on top of which a camera is mounted.

Tracking shot (also called trucking) - A dolly shot that moves parallel to the moving subject thereby keeping the subject in constant framing if so desired. A wagon, a wheelchair or some other type of vehicle can be used for a tracking shot.

VCR - Video Cassette Recorder

Video - Pertaining to picture signals in a television system.

VTR - Video Tape Recorder, includes reel-to-reel and cassette tape; an electro-mechanical device capable of recording, storing, and reproducing an electronic signal which contains audio, video and control information.

Wipe - A replacement of a picture by apparently moving it off the screen. The replacement can be another picture or it can be darkness. Wipes can begin at the sides, the corners, or at the center. There are innumerable types and shapes of wipes.

Zoom shot - A shot from a zoom lens with controllable varying focal lengths. Without changing camera location, the zoom lens can go from an establishing shot to a medium shot or a close-up - or vice versa.

Zoom lens - A zoom lens is unique because its focal length can be changed while the object being viewed remains in focus. Thus, a zoom lens can bring distant objects into clear view as a telephoto lens, but can also view a scene as a wide angle lens.

This sampling of terms with more technical information is provided through the courtesy of Frank Nix, Associate Director, Communication Center, Clemson University.

A/B Roll Editing - This takes selected odd (A-roll) and even (B-roll) shots from two VCRs and puts them on a tape in a third VCR in the proper sequence.

Analog, Analog components - Video signals in which a continuously variable voltage (rather than a set of numbers) represents the value of a pixel.

Aperture - The opening of a lens which controls the amount of light reaching the surface of the pick up device. The size of the aperture is controlled by the iris adjustment. By increasing the f stop number (f/1.4, f/1.8, f/2, f/2.8 etc.) less light is permitted to pass to the pickup device.

Assemble Editing - In assembly editing, you add new material to the end of a previously recorded portion.

Chrominance - The color part of a signal, relating to the hue and saturation but not to the brightness or luminance of the signal, e.g. black, gray and white, have no chrominance, but any colored signal has both chrominance and luminance. U,V:Cr,Cb:I,Q:(R-Y),B-Y) represent the chrominance information of a signal.

Digital - Representation of data by discrete characters which can be regenerated easily by a set of numbers.

Drop-out - Missing information from magnetic tape caused by dust, lack of oxide, etc.

Field - One half of a television picture. One complete vertical scan of the picture, containing 262.5 lines. Two fields make up a complete television picture (frame). The lines of field 1 are vertically interlaced with field 2 for 525 lines of resolution.

Film Chain - Projections, multiplexers and a camera, used to transfer film to video.

First Generation - The first time the signal is recorded on tape, that tape is called first generation.

Frame - A single picture in a shot. There are 30 frames in each second of a shot. (A) The total area of picture which is scanned while the signal is not blanked. (B) A complete TV picture consisting of two fields; a total scanning of all 525 lines of the raster area; occurs every 1/30 of a second (625 lines, 1/25 sec. in Europe and many other countries.

Generations - The number of times a video clip is copied or processed. The first time the signal is recorded on tape, that tape is called first generation. In analog systems, extensive efforts are made to keep generations to a minimum since each copy or process adds noise and other artifacts. In digital systems however, this requirement is no longer necessary since each copy can potentially be perfect. This enables digital systems to work in quite different ways than analog systems.

Horizontal Resolution - Smallest increment of a television picture that can be discerned in the horizontal plane. This increment is dependent upon the video bandwidth and is measured in frequency.

Hue - (A) Distinction between colors. Red, blue, green, yellow, etc. are hues. White, black, and gray are not considered hues. (B) The dimension of color that is referred to a scale of perceptions ranging from red through yellow, green, blue back to red.

Jitter - Small and rapid variations in a waveform due to mechanical disturbances, changes in the characteristics of components, supply voltages, imperfect synchronizing signals, circuits, etc.

Keying - The process of replacing part of one television image with video from another image, e.g., chroma keying and insert keying.

Moire - A wavy or satiny effect produced by the convergence of lines, caused by the interference of similar frequencies.

Monitor - A special type of television receiver designed for use with closed circuit TV equipment.

Multiplexer - An optical system allowing a number of film and slide projectors to feed video information into the same video camera.

Pixel - Picture element or pix element; related to a particular image address in digital systems or to the smallest reproducible element in analog systems.

Primary Colors - In television, the primary colors are specific sets of red, green and blue. Colors, usually three, which are combined to produce the full range of other colors within the limits of a system. All non-primary colors are mixtures of two or more of the primary colors.

Resolution - A measure of the greatest amount of detail that can be seen, or resolved, in an image.

Scanning - The rapid movement of the electron beam in a pickup device of a camera or in the CRT of a television receiver.

SEG (Special Effect Generator) - The SEG is used in multi-camera production and editing to change from one camera (or VCR) to another. Many different changes or "wipes" are possible.

Snow - Random noise on the display screen, often resulting from dirty heads. Also could be TV signal breakup caused by weak video reception.

Split Screen - A special effect utilizing two or more cameras so that two or more scenes are visible simultaneously on each part of the screen.

Switcher - Term often used to describe a special effects generator; a unit which allows the operator to switch between video camera signals.

Tape - A medium capable of storing an electronic signal and consisting of backing, binder, and oxide coating.

Title Generator - Commonly a black and white camera is used to shoot titles which are electronically imposed over the video picture while shooting or during editing.

Zoom ratio - A mathematical expression of the two extremes of focal length available on a particular zoom lens.

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Notes