

Television Production:

a vocational approach

2nd edition

by Richard L. Williams

TELEVISION PRODUCTION: A VOCATIONAL APPROACH

Second Edition

By

Richard L. Williams



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*To Rhonda, Tracy, Trevor, Trenton,
Tyler, Travis, and Tiffany.*

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About the Author

Richard L. Williams has been lecturing at television workshops and conventions since 1965 all over North America. More than 6000 students have learned television production, utilization, and program design techniques from workshops conducted by Mr. Williams.

Mr. Williams has extensive experience in commercial television, network production, educational TV, instructional CCTV, and industrial television. He is an award winning producer, director and writer. In 1980 alone he was awarded five international awards for industrial training programs he had either produced, directed, or written.

Mr. Williams holds degrees from the University of Utah and for five years was the National Training Manager of TeleMation, Inc., a manufacturer of television systems and equipment. He headed up a consulting company for five additional years specializing in training and studio design. Currently he is the Vice President of Administration and Training for Skaggs Telecommunications Service, Inc., a subsidiary of Skaggs Companies Inc.

Mr. Williams began publishing in the 1960's with a series of 70 articles on television production techniques. His first book "The Video Signal" was an overnight success and was later incorporated in the first edition of this text.

Richard and Rhonda Williams have had 6 children and make their home in Salt Lake City, Utah.

Preface

After the printing of the first edition of this text many former students and friends of Mr. Williams were interested in the history of the book. For that reason it is included in the Preface to the second edition.

In 1968 Mr. Williams began writing a monthly column called "Clipboard" for the magazine PACESETTER. After several years of writing articles for PACESETTER and several other magazines, he had accumulated over 70 articles on television production techniques. In 1974 he began compiling the articles in manuscript form. To a great extent, the chapters covered in the first edition were a result of articles written in the previous years. Very little additional information was added over that contained in the original articles.

The book was published in 1976 by Vision Publishing Company and was titled, TELEVISION PRODUCTION: A VOCATIONAL APPROACH. The title of the book illustrated the point that Mr. Williams believes that television production is a vocational expe-

rience, rather than an academic endeavor. The book went through three printings and was adopted as a standard text by hundreds of high schools and universities around the world.

After the first edition of the book was published, Mr. Williams began a process of rewriting the entire text. Rather than using existing articles as chapters, he began with what he felt was an ideal teaching outline, and then used a combination of adaptation of chapters and development of new material. For example, the section on Portable Production Techniques is new to the second edition, and has not been published previously.

Mr. Williams has conducted a number of television workshops titled, *How To Teach With Television*. In those workshops he explored with the students the techniques of program design and how to make successful training experiences. Several articles were an outgrowth of the "Teaching" workshops, and Mr. Williams intended to publish a new text with the same name as the workshop. However, he was not convinced that the new material should exist as a "stand alone" teaching tool, so he delayed the publication.

That material, intended to be a separate text titled *How To Teach With Television*, has been included as Part V of the second edition. It can be used in association with the production sections of the text.

Mr. Williams has spent the better part of his adult life in the formation of experiences and materials to teach television production and program design. This text is just the next item in a long series of materials to aid the classroom teacher in the teaching of television production.

Acknowledgments

Writing a textbook is a team effort. It takes many people to put together a text of this size. Although my name appears on the text, it is really the work of many people.

My wife and children have been extremely patient while the writing and editing were being done. It took countless days, evenings, Saturdays, and even holidays to complete the text. During that time there were no complaints — just encouragement.

Erick V. Myers, a long time friend and colleague, assisted with the writing, and edited the text for continuity and grammar. His efforts and abilities are sincerely appreciated.

Don L. Skaggs and Skaggs Telecommunications Service provided the time and word processing equipment for me to write the text. Mr. Skaggs' cooperation and encouragement was essential for the completion of this text.

Recognition should be extended to Whitney Jones and Ron Christensen for the line drawings and illustrations.

And finally, credit should be given to all of the students who have attended my television workshops. Many of the ideas and teaching concepts in this text are a result of my listening while I was teaching.

Introduction

This text has been divided into five basic sections:

1. Beginning Television Production Techniques
2. Studio Techniques
3. Portable Production Techniques
4. Advanced Production Techniques
5. Teaching With Television

The organization of this book is such that it can be used to teach a wide variety of subjects, in almost any sequence possible. For example, it is possible to study the text in the following sequences:

Traditional approach:

- Part 1
- Part 2
- Part 3
- Part 4
- Part 5

Studio approach:

- Part 1
- Part 2
- Part 4

Film style approach:

- Part 1
- Part 3
- Part 4

Software approach:

- Part 5
- Part 1
- Part 2
- Part 3
- Part 4

The teachers of television classes have debated for years as to the “proper” sequencing of topics for teaching production. The author of this text has experimented for fifteen years with many sequences and every technique imaginable. As an outgrowth of those experiences, he has organized the second edition to his text to accommodate all of the “authorities.”

Part I.
Beginning Television Production
Techniques



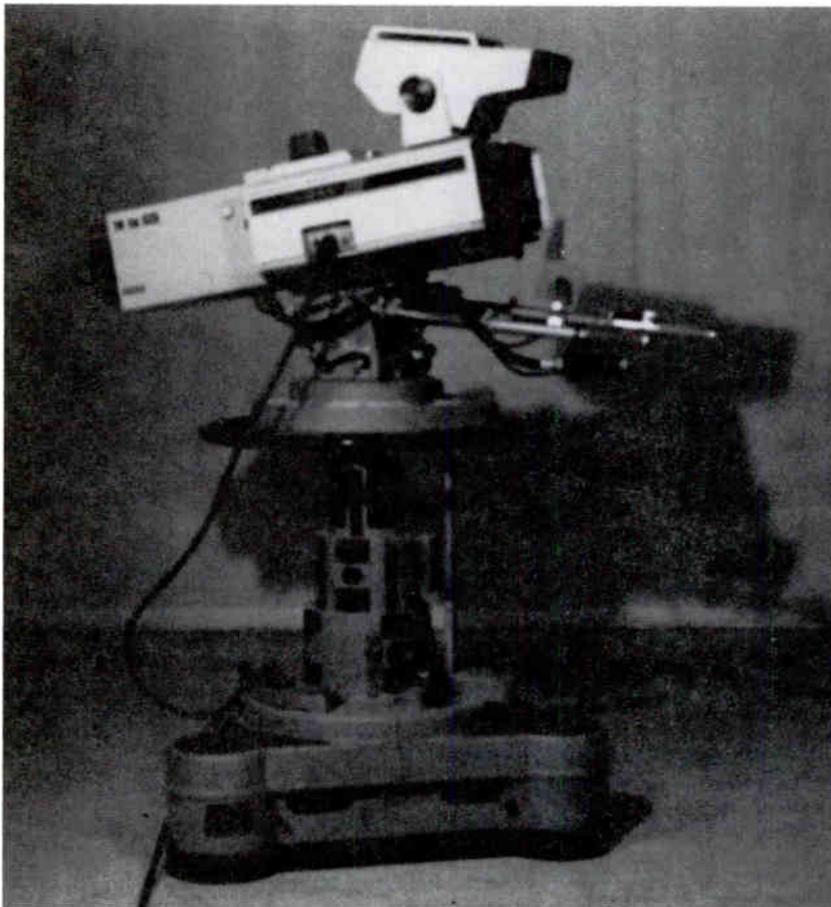
1. Introduction to Production

People involved with television production during the first few decades of its existence were handicapped by the serious limitations of the hardware. The mere act of getting a picture on videotape took the television engineers several decades to master. When the director of an early television program wanted to switch from one camera to another, it was a noisy mechanical cut which often times resulted in a roll between the two pictures.

By contrast, today's producers and directors are limited only by their imagination. Digital electronics makes it possible to accomplish almost anything with regard to the video signal. With each advance in the television production industry has come a corresponding wave of new and highly sophisticated equipment. Each year, new products replace the inventions of just a year or so earlier. In fact, it is a difficult job just to keep up with the new bells and whistles.

Although dozens of new gadgets enter the video market place each year, the basic components of a television facility remain the

same. Newer models may have a different color knob, but their function is basically the same. That is why this textbook on television production begins with a tour of a medium size television facility. The pictures and captions will aid the beginner in an understanding of the equipment.



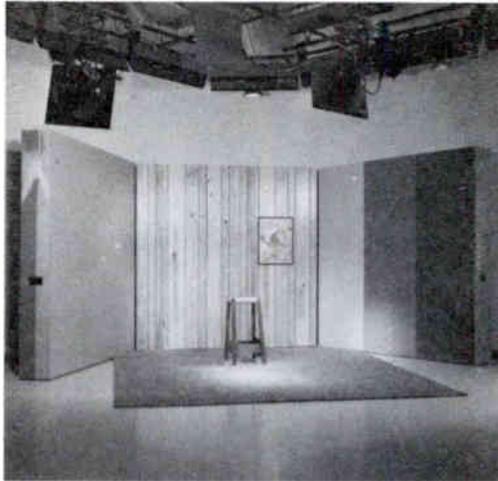
Picture 1-1. The television camera is the most basic of all television equipment. It is fundamental to all production and requires great skill to operate effectively. The camera actually consists of five basic parts they are as follows: the camera with a viewfinder, camera head to mount the camera, lens to focus the image, tripod to support the camera, and a dolly to enable movement.



Picture 1-2. A portable camera is one which normally operates on batteries. It is often capable of “shoulder mounting” on the operator.



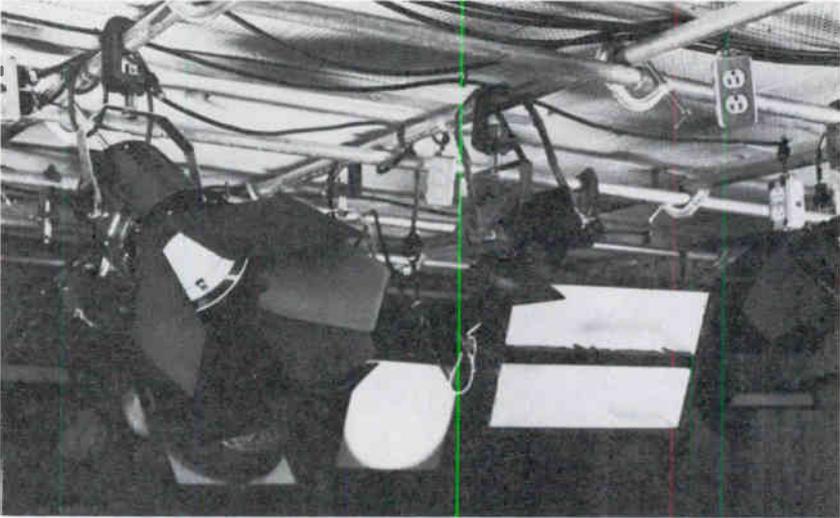
Picture 1-3. A television prop is anything used in the studio to help create a mood or atmosphere. Typical props are as follows: chairs, tables, rugs, podiums, and stools. When used effectively, props either serve a functional purpose such as a blackboard for a teacher, or an aesthetic purpose such as a potted plant to create a warm mood.



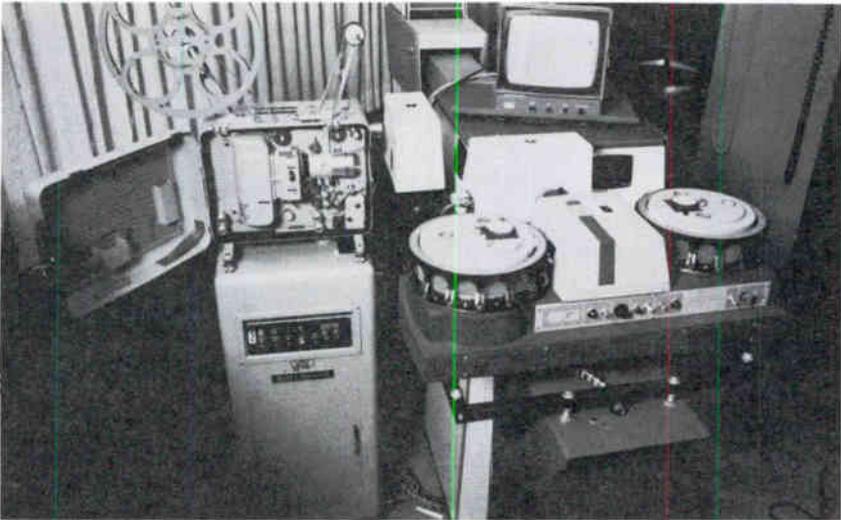
Picture 1-4. Television scenery is defined as anything in the background. With that definition scenery could mean the use of a curtain, wood flats, or even a brick wall. Whatever is used is selected because it will support the visual meaning of the program and will help to convey the purpose of the program. Scenery, then, is supportive of props in terms of functional use and aesthetic purpose.



Picture 1-5. The television studio is where the production of programs is done. It is where the cameras are located and also is used to store the scenery and props when not used.



Picture 1-6. Television cameras require a great amount of light to operate efficiently. To create this kind of light many light fixtures are used. The fixtures are mounted on a pipe grid network while allowing them to be moved to create various lighting effects.



Picture 1-7. The film chain, sometimes called a telecine, multiplexer, or film island, is a device which will enable 16mm film, super-eight film, or 35mm slides, to be projected into a television camera.



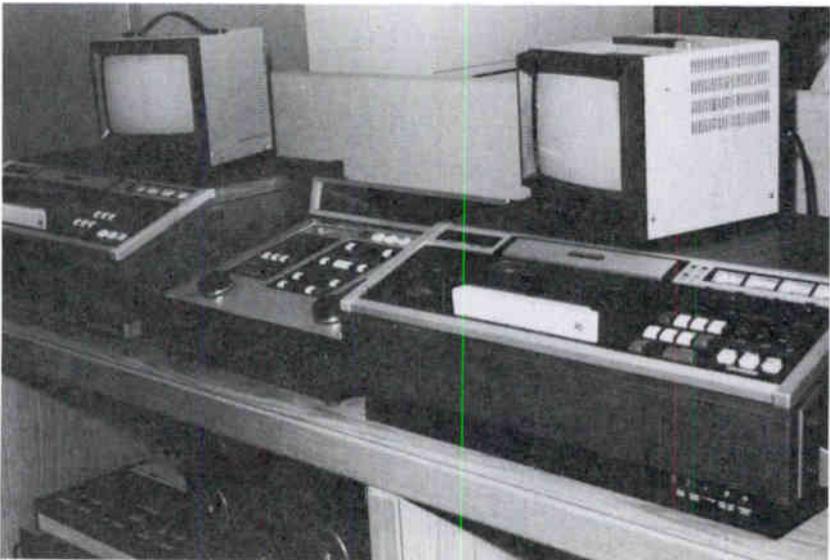
Picture 1-8. A videotape recorder records audio and video signals on a magnetic tape much like the magnetic tape used on consumer audio tape recorders. The tape does not have to be processed before playback as is necessary with film. This enables instantaneous playback with a videotape recorder. The VTR pictured is a cassette machine.



Picture 1-9. A remote videotape recorder is usually compact and capable of battery operation.



Picture 1-10. Most broadcast stations use large reel-to-reel machines which produce very high technical quality.



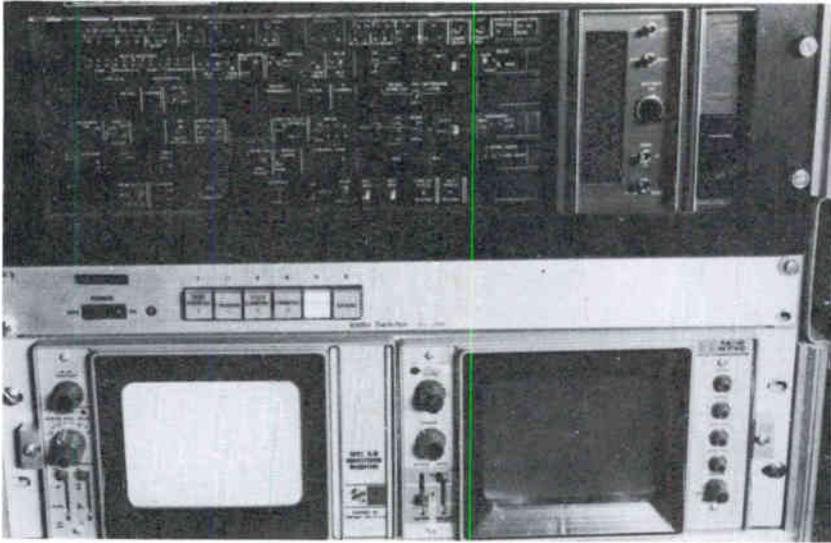
Picture 1-11. 3/4 inch U-Matic videotape editing has become a standard editing system. A typical editing system consists of 5 elements: 2 VTR's, 2 monitors, and an editing controller.



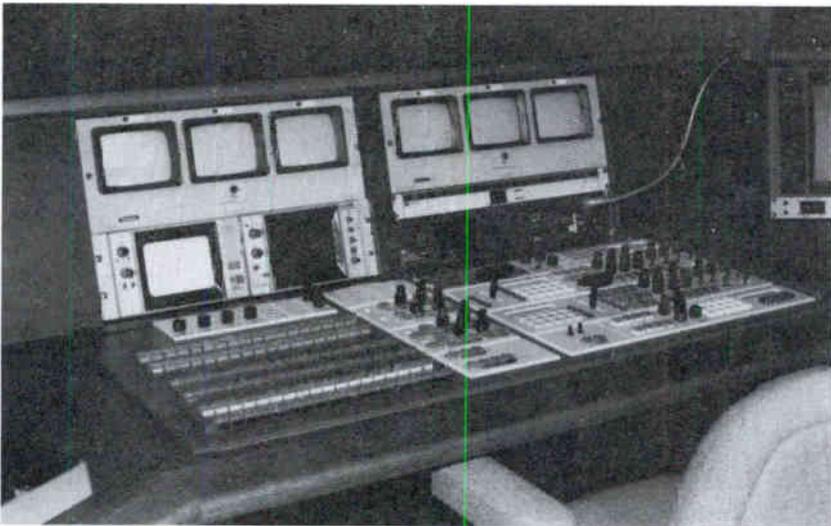
Picture 1-12. Sophisticated editing systems use computers to manipulate not only the VTR's, but also the production switcher.



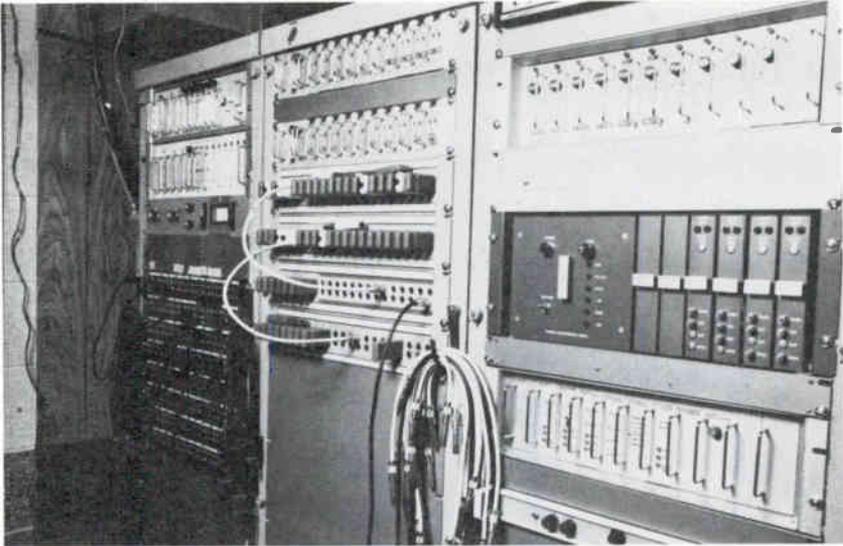
Picture 1-13. The heart of the audio system is the audio mixer. It brings all of the audio sources such as phonograph, audio tape, cartridge tape, and microphones together for mixing. The audio mixer has a knob or volume control for each source to permit proper mixing of each input.



Picture 1-14. The video control is the portion of the control room where the pictures from the cameras are adjusted. This is done with camera control units and waveform monitors.



Picture 1-15. The central part of production control is the production switcher. The director operates the production switcher to select among the cameras during a program. The director should also have easy access to special effects, film and videotape recorder remote controls.



Picture 1-16. In a control room there are many pieces of equipment which are called "terminal" because they do not need constant adjustment, but are necessary for the system to function properly. Equipment such as sync generators, distribution switchers, pulse and video distribution amplifiers and test equipment are mounted in large vertical racks for ease of maintenance and operation.



Picture 1-17. Remote production vehicles provide a control room working atmosphere at a remote location.

CHAPTER ONE QUESTIONS

After reading Chapter One and, perhaps, having visited a television facility, discuss the following.

1. Which work areas in a television facility should be separated from each other? Why?

2. Some studios are operated with a half-dozen crew members or more; other studios may operate with just one or two crew members. What factors must be considered when designing a television facility for a small or large crew?

2. *The Production Crew*

No matter how large or how small the studio, the television production or the size of the crew, a “division of labor” is essential. When each crew member is assigned to a certain job, all necessary details are more likely to be taken care of, without duplication, resulting in a smooth program and a satisfied production team.

In all low budget operations, two or three people will have to perform assignments delegated to as many as eight or ten persons in a larger system. But regardless of how many people staff the production, a number of basic positions must be assigned:

EXECUTIVE PRODUCER. The person who authorizes the production of a television program and establishes the budget or money for the cost of production is called the executive producer. It is common for the executive producer of a television program to assign a producer and director to a project, establish a budget within which the program must be produced, and then move on to another venture

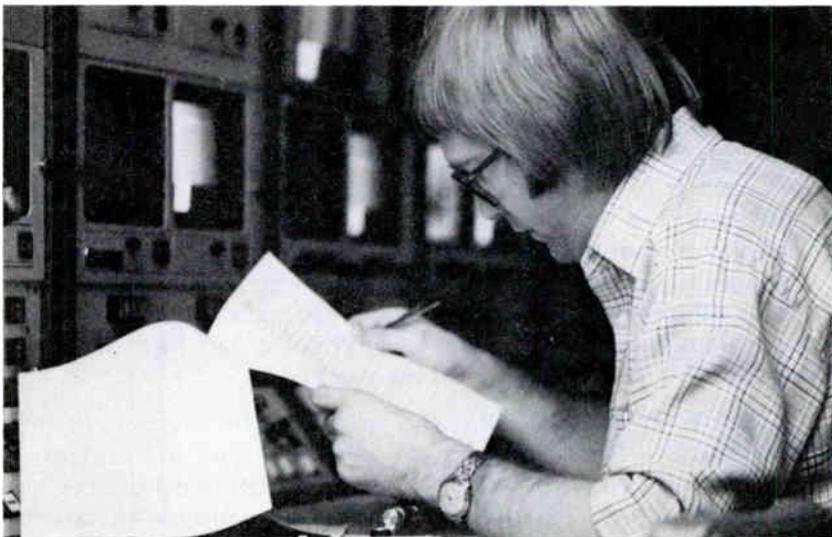
leaving all decisions up to the producer and director. In this way, one person may be the executive producer of several programs at the same time.

PRODUCER. The producer is responsible for the success or failure of a program. He or she may originate the idea, or may start the wheels turning when someone else suggests a production, and it is not uncommon for the producer to even write the script. It is the producer's responsibility to produce the program within the budget which has been established for the program.

After appointing a director, both discuss technical requirements of the program — script, audio, shooting locations, lighting, editing, talent — as well as the tone or slant of the program, to give the Director a clear idea of the program objectives.

DIRECTOR. The director implements the producer's idea by assigning tasks to each member of the production team. He or she must plan, and explain to the appropriate staff member the set design, shooting locations, camera angles, staging, lighting, audio and video requirements.

On the set or in the studio the director is in charge of the production crew. It is the director who makes the moment-to-

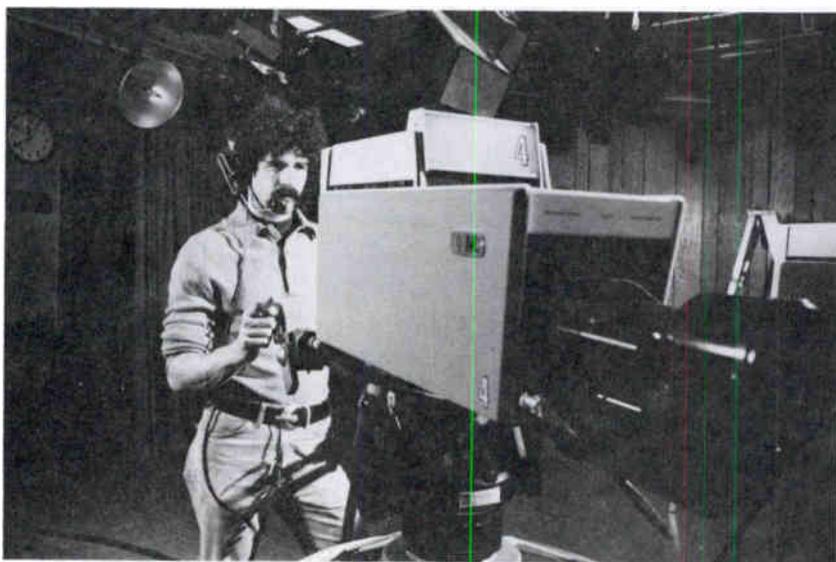


Picture 2-1. Television Director.

moment decisions concerning the program. If the producer and/or executive producer happen to be present during the shooting of a program, it is possible that one of them might make suggestions to the director. And because the producer and executive producer control the budget for the production and are ultimately responsible for the success or failure of the program, the director will have to be sensitive to those suggestions or ideas.

ASSISTANT DIRECTOR OR PRODUCTION ASSISTANT. In a complex program there may be countless things which need to be coordinated, such as talent, props, locations, special objects and so forth. An assistant director or production assistant may be assigned by the Director to help coordinate these things.

CAMERA OPERATOR. The director should provide the camera operator with a list of shots which will be required during the production. If the production is extensive, a shot sheet may be used which lists each shot in order and describes each special movement. If



Picture 2-2. Camera Operator.

the camera operator is not yet adept at operating the camera, he or she should spend time practicing for the shots, dollying, trucking, zooming, and framing. In smaller systems, the camera operator will probably also be assigned to set up the lighting and arrange props,

under the director's supervision. Periodically, the camera operator should clean the camera lens, oil the dolly and perform other chores to ready the camera for operation.

During production, the camera operator alone is responsible for framing shots. The director should specify which shot should be framed, but it is the camera operator who must compose the shot. He or she should look for interesting shots which the director might not notice or, with previous instructions from the director, the camera operator may "follow the action," with no specific shots assigned. The camera operator also may double as a floor manager during the production.

VIDEO ENGINEER. Before the show, the video engineer checks all video equipment, including cameras, to be sure everything is in working condition. If not, he or she either fixes the item or informs the director of the malfunction.



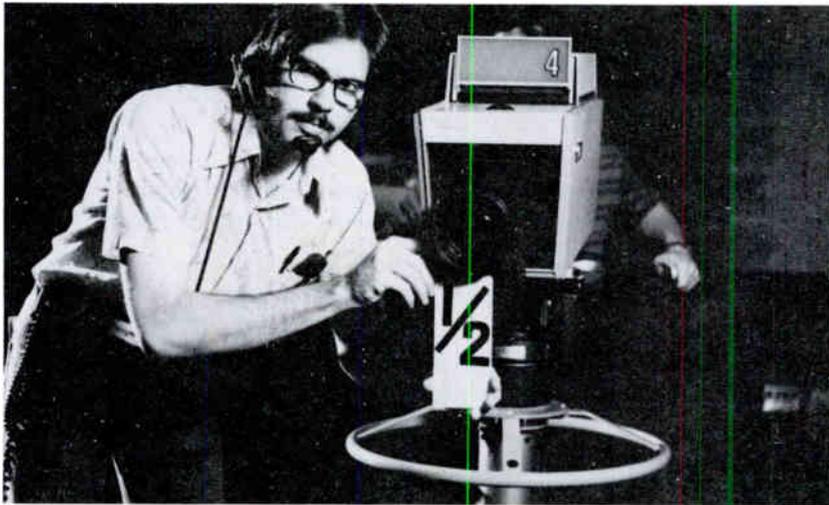
Picture 2-3. Video Engineer.

The video engineer works closely with the lighting director to be sure minimum lighting requirements are met for a good picture. He or she also sees that scenery, props and graphics have adequate contrast for use on television.

During the shooting, the video engineer is responsible for the technical operation of the cameras and other video equipment. If two

or more cameras are being used in the production, the video engineer should keep the balance between the cameras as close as possible.

FLOOR MANAGER. The floor manager is “the eyes and ears of the director on the studio floor.” He or she oversees the production of a program on the floor by giving time cues, cuing the talent, preparing the stage area and working with the prop person to be sure the set fits the director’s plans.



Picture 2-4. Floor Manager.

AUDIO ENGINEER. The audio engineer selects the proper microphones and places them on the set as instructed to do so by the director. He or she then sets the voice level for each person speaking on the audio mixer. In addition, the audio engineer may select sound effects for the production. During the program, he or she “rides” the audio level to maintain the proper audio balance and levels between all of the talent, and may add sound effects when cued by the director.

SCRIPTWRITER. The producer gives the program objectives and approach to the scriptwriter, who interprets the content material within the limitations of the TV medium. The scriptwriter often uses a content specialist as the source of the information to be presented.

GRAPHIC ARTIST. The scriptwriter and the director request art materials from an artist. The materials are constructed within the limitations of visual materials for television.

LIGHTING DIRECTOR. The director stages the program in the studio from the script supplied by the writer. The lighting director places lighting instruments in such a way as to create the proper mood and quantity of light.

PROJECTIONIST. All film and slides to be used in a production are loaded into projectors by a projectionist. This person is responsible for cleaning, sequencing and placement of each film source.

VTR OPERATOR-EDITOR. The VTR operator is responsible for the set-up, cleaning and threading of the VTR. Before the program the audio and video levels are set. This person may also be responsible for editing during and/or after the production.

MAINTENANCE ENGINEER. The video engineer maintains proper levels during the program. The maintenance engineer repairs equipment which break during the day-to-day use of the studio.

CHAPTER TWO QUESTIONS

1. Discuss the advantages and disadvantages of one person performing more than one job function in a small television facility.
2. If economy is important to a television facility, what job functions might be combined? Which ones would be the most difficult to combine?
3. What problems could result from a situation where crew assignments have not been clearly defined?

3. Television Camera Operation

The television camera, by its design and limitations, must select what it “sees.” Once the frame of the camera has singled out a subject or group of subjects, concern for the arrangement of the picture elements becomes important. In this chapter we shall discuss the principles of framing and the arrangement of elements in a picture and the camera movement necessary to effect proper composition.

BALANCE

If we compare the television screen to a scale or balance, we can easily see that an object must be centered on the screen in order to be balanced. If the object is not centered but is instead placed to one side, as in Picture 3-1, those viewing the screen will tend to think that something should appear or happen on the opposite side of the screen. If you look at Picture 3-1 for twenty seconds or more without



Picture 3-1. This picture is not balanced.



Picture 3-2. The person is centered or balanced.

looking away, you will very likely feel uneasy because the picture is not balanced; the elements of the picture are out of symmetry.

In Picture 3-2, the person is centered in the frame and the picture conveys a feeling of balance and stability. With more than one object in the frame, balance is achieved by arranging the elements in such a way that one side of the picture is equal in “weight” to the other.

LINES OF INTEREST

Within the area of the television screen are certain lines of major and minor interest. Strange as it may seem, these lines of interest are not in the center of the screen. So it is that even though a picture is balanced, it may not be very interesting. To find the lines of interest, the picture is divided into thirds, both horizontally and vertically as in Illustration 3-1. The intersections of these lines tend to be the points of

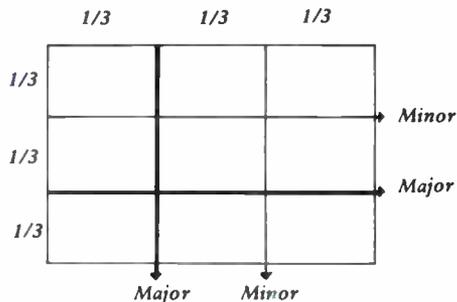


Illustration 3-1. Heavy lines are those of major interest, lighter lines indicate those of minor interest.

greatest interest on the television screen. Expert camera operators look for opportunities to place objects, or the intersection of objects, on or near the interest lines. Granted, the use of interest lines is a sophisticated technique, but even beginning camera operators should be aware of them and look for occasions to use them.

TELEVISION FRAMING OF PEOPLE

Since the human being is the most frequently televised object, it is important for new camera operators to learn the most pleasing way to



Picture 3-3. The horizontal line illustrates the proper positioning of the talent's eyes for headroom.

present that subject. As two people meet for the first time, it is common for them to communicate with their eyes. In fact, in American culture it is expected that the two individuals will establish immediate eye contact.

HEAD ROOM

Since the eyes are so important in the process of communicating, it is necessary for a television camera operator to maintain a consistent rule for the framing of people. The long-established rule of “head room” has developed out of this need. It is interesting that even the great masters of painting have used the rule of head room. Head room refers to the distance between the top of the head and the top of the television screen. A general rule to follow in medium shots is to frame the eyes of the talent one-third from the top of the screen. This places the eyes on the horizontal line of minor interest and places the rest of the face in a pleasing position on the screen. Framing the eyes in this

position is particularly necessary to prevent eye shift when cutting between different camera shots. If the eyes of the talent shift very far in their vertical position on the screen as the director changes from one



Picture 3-4. This shot does not provide enough nose room.

camera shot to another, viewers — who generally focus on the eyes of the performer — may be annoyed.

There are two exceptions to the rule of head room. In an extreme close-up shot of a person it is possible, but not mandatory, that the camera operator increase the head room (i.e., lower the eyes of the talent on the screen) for aesthetic reasons. The opposite is true in an extreme long shot, where the head room may be decreased and the level of the talent's eyes raised on the screen. Both of these adjustments should be done in moderation and according to individual taste.

NOSE ROOM

When shooting the profile of a person, it is important for the camera operator to frame the talent to one side of the screen, thus

leaving a space in front of the talent. This unused space is called “nose room” and it is used by the talent as a looking area, or an area in which to move. In Picture 3-4, for example, the subject is looking off the



Picture 3-5. Sufficient nose room allows the subject to move forward and not go out of frame and avoids viewer frustration.

screen. There is plenty of empty space in back of the subject, but we cannot see the object at which the talent is looking. This type of framing can cause the audience a great deal of frustration.

In Picture 3-5, the talent is framed in the left half of the screen, leaving plenty of nose room. An audience will feel less frustrated, or left out, looking at this composition as compared to that in Picture 3-4.

New camera operators must learn that the degree to which the talent looks away from the camera determines the amount of nose room which must be left. In other words, a 20-degree-angle profile shot will require much less nose room than a 90-degree-angle profile shot.

In summary then, nose room is a method used by a camera operator to provide space in which the talent may look or move. It is a psychological framing technique which reduces the natural frustration of an audience when the talent looks to one side or the other, thus leaving the television audience out of the conversation.

BASIC TELEVISION CAMERA SHOTS

The following terms and accompanying pictures are subjective but necessary. They are the most frequently used camera shots in a television program. These are the shots that the director will probably



Picture 3-6. Extreme Close-Up, ECU.



Picture 3-7. Close-Up, CU.



Picture 3-8. Medium Close-Up, MCU.



Picture 3-9. Medium Shot, MS.



Picture 3-10. Long Shot, LS.



Picture 3-11. Extreme Long Shot, ELS.

call for most often, and the abbreviations used most frequently to describe them.

New television camera operators tend to select a camera shot out of convenience rather than experience. It is common to see a new operator trying all of the shots between ELS and ECU “just for fun.” Actually, each camera shot should be selected as a result of experience, rather than fun or convenience. A “close-up” shot, for example, indicates to the audience that the message being communicated is of a highly emotional or dramatic nature. Close-ups are commonly used on soap operas because those shows deal with emotional and dramatic themes.

A “wide-angle” shot, on the other hand, says something much different to the audience than a close-up shot. A WA shot indicates “generality” or “orientation” to the audience. It is commonly used near the beginning of a scene to orient the audience with the location of the surroundings.

A “medium close-up” shot is normally used when the other shots don’t seem to be appropriate. An MCU is the most frequently used shot on television because it has little emotional impact and it is close enough to the talent to offer a good perspective of the message.

CAMERA MOVEMENT

If you visit France, you’ll no doubt better enjoy the cuisine, accommodations, scenic tours and social contact if you speak French. In a television studio, programs proceed more smoothly and valuable time can be saved if the director and camera operators speak the same language. The director’s commands initiate important camera movements which, if timely and done well, can mean the difference between a professional program and an amateur one.

The following terms of 10 basic camera movements are given by the director and are enacted by the camera operator to produce a dramatic effect or to alter picture composition on the television screen.

TYPES OF MOVEMENT

PAN LEFT OR PAN RIGHT. A horizontal movement of the camera by means of the pan handle, used most frequently to follow the talent as he or she moves on the set. (The command to “pan right”

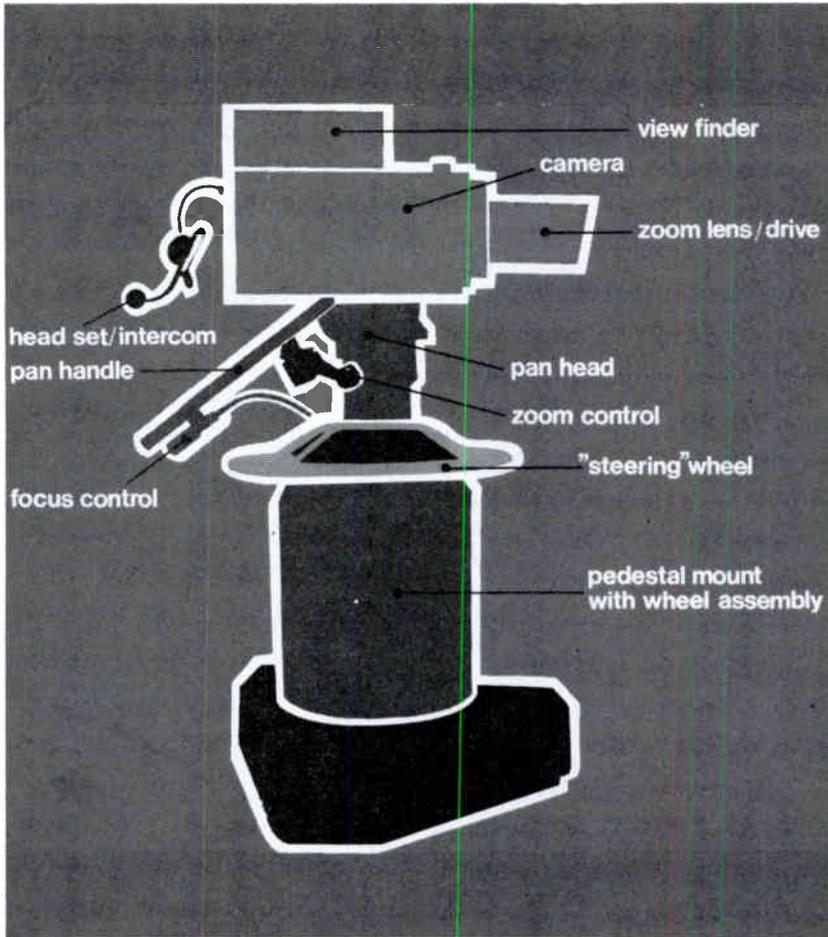


Illustration 3-2. Parts of a studio camera.

means to “see more right,” and “pan left” to “see more to the left.”)

TILT UP OR TILT DOWN. A vertical movement of the camera used to follow vertical action (such as a leaf, as it floats from a tree to the ground), or to create a dramatic effect, such as suspense (the camera shows the sheriff’s gun and holster and tilts slowly downward to reveal a wounded cowboy), or to show the height of a person or an object, such as a building.

DOLLY IN OR DOLLY OUT. A movement of the camera and tripod toward or away from an object or talent. A “dolly in” will gradually enlarge an object on the screen, enabling viewers to see detail. To “dolly out,” the camera moves away from a specific shot to show the general, overall picture.

When the camera operator moves the camera toward the talent or object being televised, the relative sizes of the objects in the frame will change proportionately, in a natural manner.

ZOOM IN OR ZOOM OUT. An adjustment of the camera’s zoom lens will produce a result very similar to the dolly technique. A fast “zoom in” is often effective, if used sparingly and carefully, to emphasize an action or an object, or to indicate shock or surprise. (With a fast “zoom in,” images may seem to crash through the television screen; if used excessively, this technique can become annoying to viewers.)

The zoom lens tends to distort the proportions of the objects in its field of vision. Zooming in on a scene produces an obvious compression of depth, and zooming out produces a depth stretching. In other words, the proportions of all objects in the frame remain the same while the field of view is altered.

TRUCK LEFT OR TRUCK RIGHT. A lateral movement of the camera and tripod to the left or right. For example, the “truck” command may be given when the camera is to be moved to a different part of the studio — such as from a lab table on stage right to an easel on stage left, or from a position that shows a profile of the talent to a straight-on or head-on view. The camera is sometimes “trucked” in front of or alongside moving talent or action to maintain perspective.

A trucking camera indicates the feeling of inspection or observation to the audience viewing it.

PEDESTAL UP OR PEDESTAL DOWN. An indication to raise or lower the camera mount and, hence, the camera. This movement is

sometimes used simply to accommodate short or tall camera operators, but it can change perspective by permitting the camera to televise an upward or downward view of a scene or person. As a general rule the camera should be at eye level with the talent; the pedestal control should be used to maintain the proper camera elevation.

SUMMARY

The mark of an experienced camera operator is to first understand the rules of composition, and second, to move the camera without the movement calling attention to itself. Most camera operators can memorize the basic rules of composition, but only a few can effect a complex camera movement which does not call attention to itself. New camera operators should carefully watch the techniques of professional camera operators and then imitate those techniques as much as possible. Beyond the rules and admonitions presented in this chapter, it is the experience of the operator which will spell success.

CHAPTER THREE QUESTIONS

1. What is head room? What is the basic rule which the camera operator should follow?

2. What is nose room? What is the basic rule which the camera operator should follow?

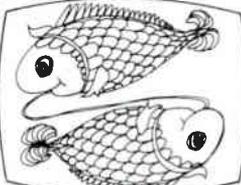
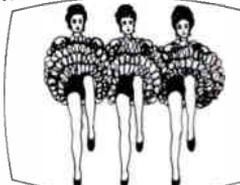
3. What is symmetry? What rule should the camera operator follow?

4. Which of the standard camera shots is most commonly used in a television program? (ECU, CU, MCU, MS, LS or ELS)

5. Explain the difference between a CU and a LS in terms of audience reaction.

6. Explain the difference between zooming in and dollying in on the talent. What is the difference between a zoom and a dolly? When should each be used?

7. Test your understanding of the basic camera movements by determining the proper director's commands to the camera operator for altering the pictures presented below.

<p>1.</p>  <p>The command for the camera to follow the talent as she walks to the camera operator's right is</p>	<p>2.</p>  <p>The command for the camera to descend from the man's face to surprise viewers by revealing his bare feet is</p>	<p>3.</p>  <p>To obtain a close-up of Pisces in the Zodiac, the director says or</p>
<p>4.</p>  <p>The command to change from a close-up of Pisces to show the entire Zodiac is</p>	<p>5.</p>  <p>A shapely dancer appears short and stocky. To correct the distortion, the directors say to</p>	<p>6.</p>  <p>To obtain a straight-on view of the girl at the camera operator's far left, the director says to</p>

4. *Lighting for Television*

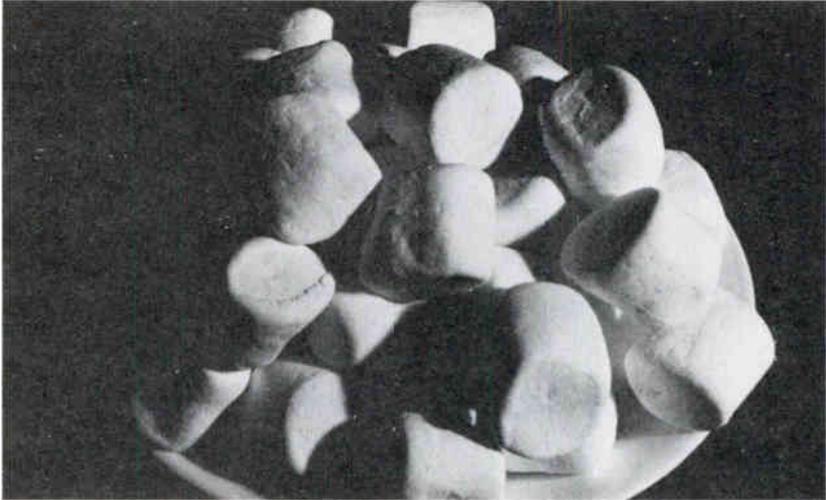
Lighting for television depends on a multitude of variables. The kind of camera tube used, the nature of the production itself, physical characteristics of the talent such as baldness or a very prominent nose, and the imagination of the lighting director are all important considerations.

But the two major considerations of TV lighting are technical and aesthetic. The foremost technical requirement is that there be enough overall quantity of light, or base light, on the set plus a proper light-and-shadow ratio so the camera can produce a technically acceptable picture. Lighting can suggest the shape of people or objects, add the illusion of depth to an otherwise two-dimensional picture, and establish mood, i.e., gaiety, gloom or mystery. These are all aesthetic considerations. The control room monitor will show whether or not the light fixture placement and adjustment achieve your program goals.

This chapter, will discuss both technical and aesthetic considerations of lighting.

First the most common lighting terms:

HARD LIGHT. A hard source of light is one which produces extremes of light and dark areas with few shades of grey in between. A hard light usually is produced by a fixture called a spot light.



Picture 4-1. Example of very hard shadows.

SOFT LIGHT. A soft source of light is one which produces as few distinct shadows as possible. Good soft lights create numerous shades of grey and commonly emanate from a fixture called a flood light. Several manufacturers of soft light fixtures use a reflective system of diffusing the light before it strikes the set.

SPOT LIGHT. A spot light is a light fixture which produces a hard light in a concentrated area.

FLOOD LIGHT. A light fixture which produces a soft diffused type of light is called a flood light.

FRESNEL. Fresnels are fairly lightweight, flexible spot lights with high light output. Many Fresnels feature variable focusing for easy adjustment of the light beam. A Fresnel is most easily identified by a special lens on the front of the fixture. The lens provides an even distribution of the light beam over the coverage area.

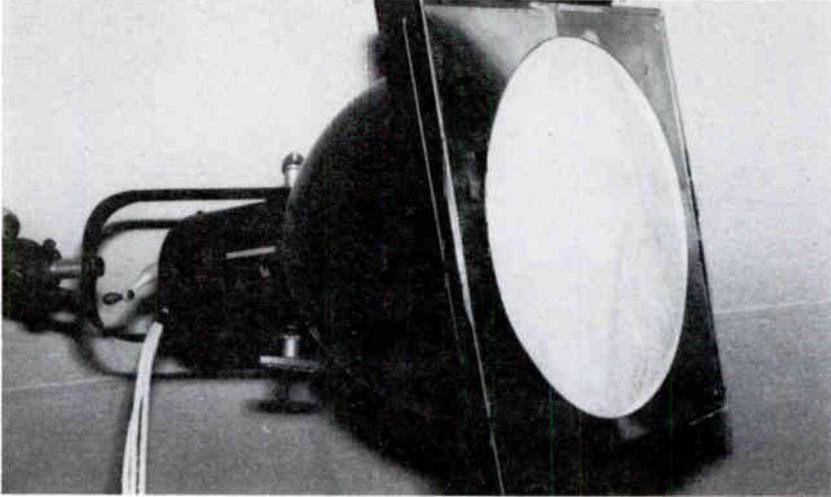


Picture 4-2. Example of very soft shadows.



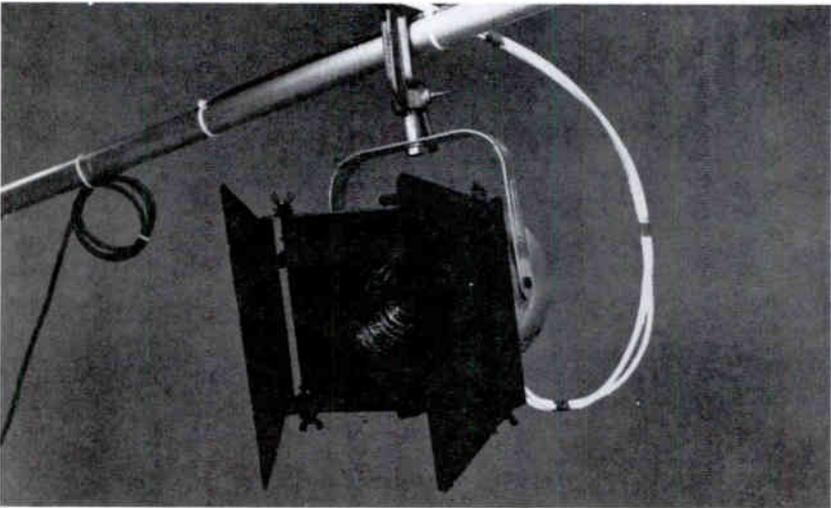
Picture 4-3. Fresnel spot lights are characterized by a high light output.

SCOOP. A scoop is a half-spheroidal fixture which produces a soft, partly reflected type of light.



Picture 4-4. A scoop is a common light fixture which produces a soft light.

BARN DOORS. Barn Doors are metal flaps mounted in front of a spotlight to control and shape the spread of the light beam.



Picture 4-5. Barn doors control the spread of the light beam.

GRID. A lighting grid consists of pipe 1 to 2 inches in diameter, strung either crosswise or parallel and suspended at least 10 feet above the studio floor, depending on ceiling height and studio size. The lighting instruments are mounted directly on this lighting grid with the use of “C” clamps.

RACEWAY. The power distribution which provides electrical outlets on or near the grid is called the raceway. It may lead to a circuit breaker panel or to a studio dimming system.

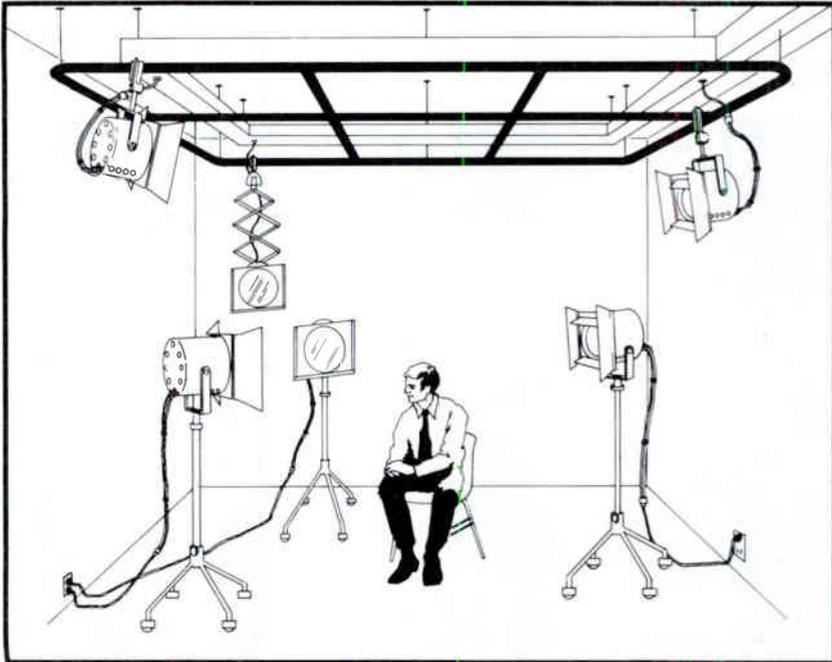
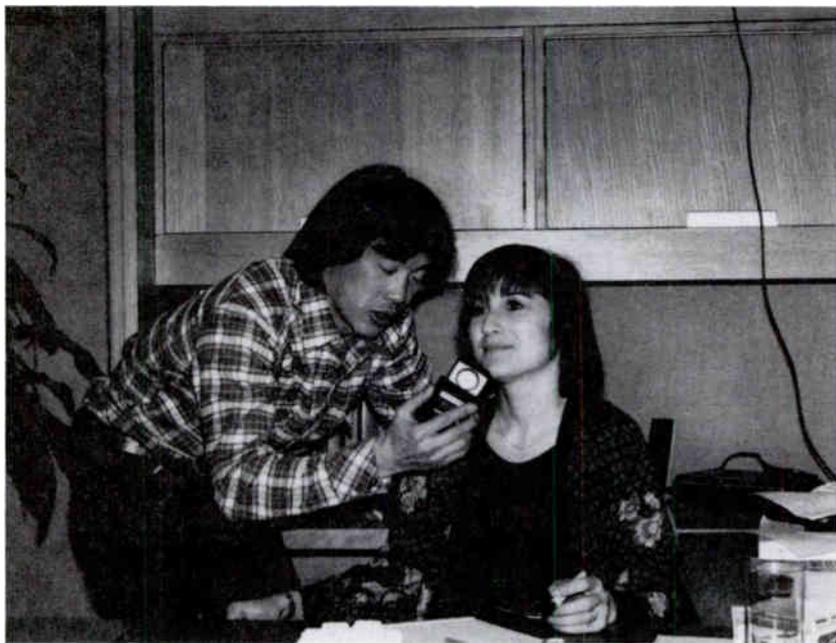


Illustration 4-1. The two basic lighting and power distribution systems are (a) grids suspended from the ceiling with raceway carrying power cables from the circuit box to the lights, and (b) lights mounted on stands and power distributed via outlets in the walls of the studio. For a permanent studio situation, the grid and raceway system is preferred. For temporary, one-time-only or low ceiling production facilities, light stand and wall sockets may be the only feasible system.

FLOOR STANDS. In lieu of a lighting grid, floor stands must be used to elevate the lighting instruments. Even in a studio a floor stand may be used when the instrument needs to be lower than the grid will permit. In remote applications floor stands must be used extensively.

KELVIN TEMPERATURE. Kelvin Temperature is a measurement of the temperature at which the filament in the bulb burns. The higher the temperature, the brighter the light and thus, the brighter the color. For color television, the standard Kelvin temperature for accurate color reproduction of flesh tones is 3200 degrees Kelvin. In black and white television any temperature of light may be used because Kelvin temperature only affects the color of a picture.

LIGHT METER. A light meter is a device which measures the quantity of light illuminating a set. The scale is divided into increments called footcandles. A typical scene for television will have several hundred footcandles of light. Most television light meters measure



Picture 4-6. Light meters used in television measure footcandles of light. By holding the meter next to the subject, the number of foot candles of light can be measured.

incident light: the light which is about to strike the talent. Most photographic light meters measure reflected light (light which has been bounced off the talent), which is much different than incident light.

EQUIPMENT LIMITATIONS

Perhaps the single most important problem in lighting a set for television is the limitation of equipment. A lighting director obviously can't do a program with the complexities of a major network special with only three inexpensive lights on stands. A lighting director must understand two basic questions regarding the lighting of any program: first, what is the minimum quality of lighting acceptable to the crew and the audience; and second, what is the maximum level of complexity possible with the lighting equipment available for the production.

The following example is typical: A regional insurance company wants to communicate with all of its branches via television. They purchase a portable color camera, a videotape recorder, a microphone, and three lights on floor stands. The first program they attempt to produce is a round table discussion with eight people.

What complicates the situation with the insurance company is the fact that inexpensive color cameras require a high quantity of light (often several hundred footcandles) before they will produce an acceptable picture. So no matter how the three lights are situated the picture on the screen will appear dull and muddy. Then when the tape is played back the person in charge of the production is asked, "Why does it look so unprofessional?"

The answer to that question is simple: it is not possible to meet high technical and aesthetic standards of television when using three lights to light eight people in a studio. Moreover, it is possible that the poor quality picture may interfere with the message to be communicated.

An alternative to the eight person discussion would be to change the format of the program to an interview between two persons, or even a monologue. In other words, the quality and quantity of equipment should help determine the type of program format to be used.

DESIGN LIGHTING ALONG WITH THE STUDIO

In designing a studio facility, special care should be taken to plan for the lighting system. The first decision is whether the light instruments will be mounted on stands or a grid. That decision will help determine where the electrical power outlets should be placed in the studio.

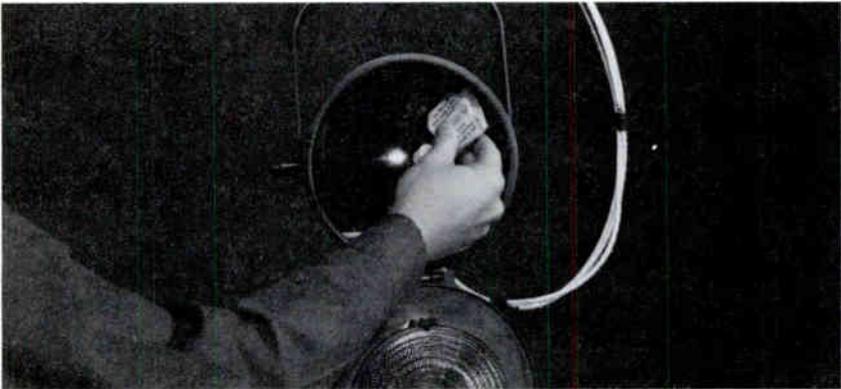
Television studio lighting requires a significant amount of electrical power. Even a modest studio of 20 by 30 feet will need at least five twenty-amp circuits. And a large studio may require many times that amount.

Ideally, a studio lighting system should be designed around the type of programs to be produced in that studio. For example, a studio which will be used to produce car commercials will need a grid elevation of at least 15 feet, while the grid in a studio used only for sitdown interviews need only be 10 to 12 feet. Additionally, the type and quantity of lighting instruments should be dictated by the programs to be produced. It is unfortunate that more care is not used in the selection of lighting instruments.

INCREASING COST EFFICIENCY OF QUARTZ LIGHTS

With the limited budgets for maintenance and for new or replacement equipment, anything which can be done to increase the life of quartz light bulbs is important. This even includes saving money when purchasing the bulbs. A studio facility using black and white cameras may as well purchase bulbs with Kelvin temperatures below the color television requirement (i.e., less than 3200 degrees Kelvin). This in itself will save money and usually means longer bulb life.

There are four things which, when done, will decrease the life expectancy of quartz bulbs. They are as follows: 1) do not turn quartz



Picture 4-7. When installing a quartz light bulb, use the piece of paper which comes with the bulb to hold it. This will decrease the possibility of fingers touching the bulb surface.

lights off and on in rapid succession. Bulbs will last longer if they are allowed to cool completely before they are turned on again; 2) if the barn doors are closed down completely, the air supply necessary for proper ventilation to the bulb is reduced, and that can cause decreased bulb life; 3) when a bulb is touched by a finger, a residue of oil is left which will cause the bulb to overheat and burn out (some bulbs which have been touched may explode, much to the surprise of the talent and crew); and 4), after a bulb has been heated it is important that the light instrument not be jarred.

By observing the four suggestions for the care of quartz lights, it is possible to increase bulb life as much as 100%. Obviously, by not observing the admonitions listed above it is possible to reduce bulb life down to just a few seconds.

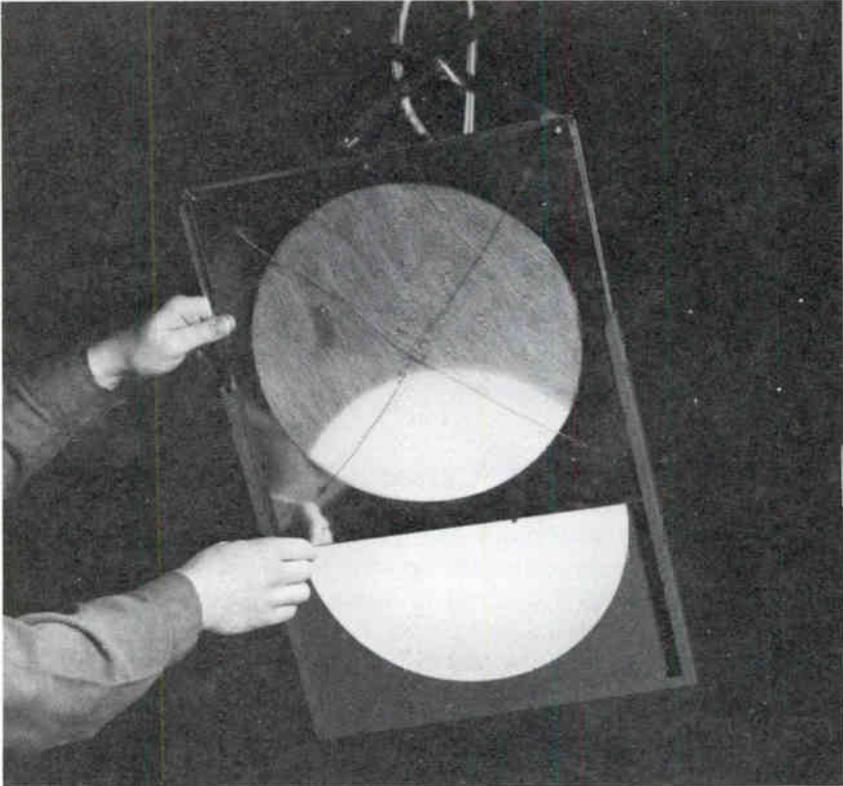
INCREASING AND DECREASING LIGHT INTENSITY

There are four common methods of increasing and decreasing light intensity for technical or aesthetic requirements: light dimmers, light diffusion devices (i.e., diffusion lenses, spun glass, and scrims), variable focusing, and altering the distance between the light instrument and the talent or object.

DIMMERS. The life expectancy of a bulb which has been dimmed will be much greater than a bulb which is operating at full or normal voltage. For this reason many studios frequently dim lights to achieve a variety of effects. Not only does this give the lighting director flexibility with respect to light intensity, but the use of a dimmer increases bulb life as well. Dimmers are, however, very expensive as compared to the other physical elements of a lighting package. It is possible, for example, for a studio to spend as much money for a dimming system as for all of the lighting instruments in the studio.

Dimmers must be used with extreme caution with color television cameras. As the voltage on a quartz bulb decreases, the Kelvin temperature decreases also. This results in a faulty reproduction of colors; this can be particularly disturbing with regard to flesh tones.

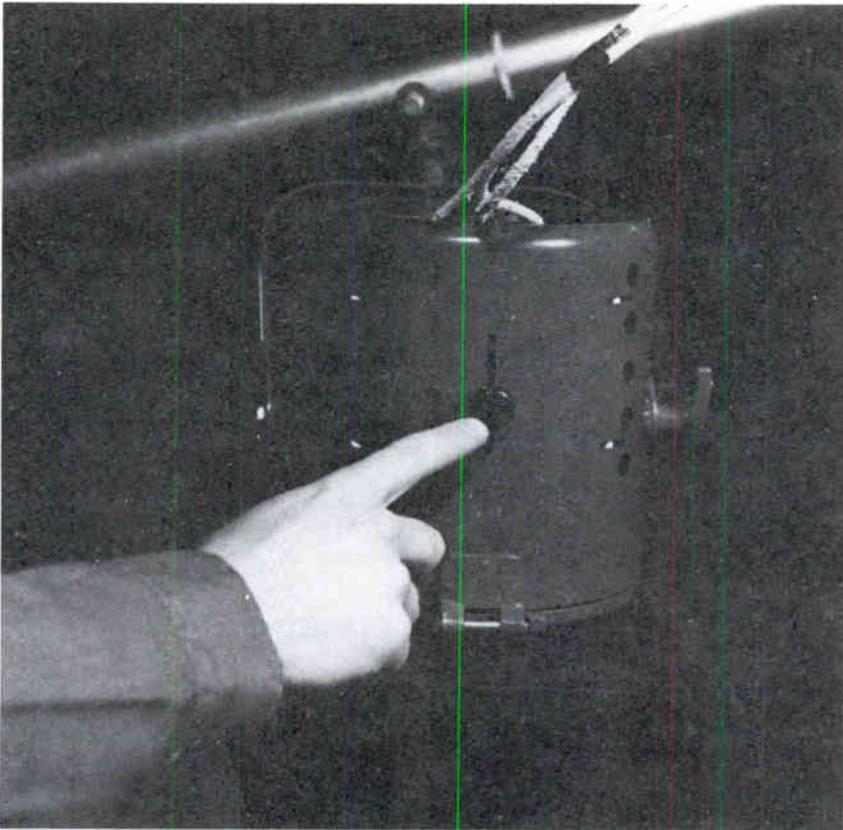
DIFFUSION DEVICES. Diffusion lenses, while they do an excellent job of diffusing the light beam, are expensive and easily broken because they are made of glass. Spun glass mounted on holders which fit over the light fixture (or clipped on the barn doors) is the least expensive and most useful light diffusion device. It is



Picture 4-8. Spun glass and holder fit into a frame mounted on light fixtures.

primarily used by the professional lighting director to achieve a desired contrast ratio, or to eliminate a hot-spot caused by a specific light beam. A scrim is a wire mesh placed in front of a light fixture such as a spot light. It may be used to create a shadow pattern on a background, or as an attempt to reduce the light output of a fixture.

VARIABLE FOCUSING. Variable focusing involves moving the bulb of the light forward or backward in the fixture. This has the effect of focusing or diffusing the beam of light. Most professional lighting directors prefer variable focusing on all hard light sources. A scoop light with variable focusing capability is almost as versatile as a dimmer. As is the case with most things in life, the ability of the bulb to move smoothly within the light fixture is based, to a large degree, upon the price paid for the instrument.



Picture 4-9. The variable focusing knob may be on the bottom of the light fixture (as shown) or at the back of the fixture.

LIGHT TO SUBJECT DISTANCE. Altering the distance between the light and the talent is the most readily available method to increase or decrease light intensity. It is not always practical, however, to do this. There may not be enough room to move a light fixture away from the subject. Also, when moving the light fixture any distance, the angle of inclination is either decreased or increased and this may create other problems.

LIGHTING PEOPLE OR PLACES

One frequently posed question with regard to television lighting is whether to light for an individual, such as the talent, or to light for an

area. Should people and props be lighted as one general area, or should specific elements within a scene be considered separately? Both techniques work well in the right situation. The problem is that some beginning lighting directors confuse the two techniques and tend to consistently light an area, and forget about the object which will appear within that area. Except where a specific area is being lighted for a valid reason, it is important for the lighting director to consider each object to be televised individually.

Lighting for specific objects often produces holes between things. Perhaps one of the best examples of this technique is the lighting used on many soap operas where dark holes may be found between two well-lighted areas. On the other hand, lighting for a general area gives no consideration as to whom or what will be in that area. A valid application of the general area technique is lighting for a large dance program in which a great deal of movement will take place. It would be helpful to consider the question of lighting for individuals or areas as it affects each specific situation.

AREA OR SPACE LIGHTING

The method to light a space or area is nothing more than a combination of front and back light. It is usually necessary to combine the use of spots and floods in order to obtain the quantity of light necessary for the camera to operate. Several fixtures are staggered to light the area from the front, and several more fixtures are positioned from behind the set to illuminate from the back. It is not uncommon for area lighting to require as many as 20 lighting fixtures to light a space of 400 square feet.

The goal of area lighting is to have an even distribution of light from one side of the area to be lighted to the other. The lighting director will walk from one side to the other with a light meter and observe the difference in light quantity. This process is then repeated while measuring the light from the back. When the quantity of light is as even as possible, the set is ready for production.

As was mentioned earlier, the advantage of area lighting is the even distribution of light over a given area. It has a flat appearance and will not be flattering to some objects or talent. But, in the case of a dance sequence, it may provide the most effective technique available.

THREE POINT LIGHTING

The most frequently talked about, and written about too, technique of television lighting is three point lighting. Every lecture on lighting probably begins with the positioning of lights for the three point approach. Even with all of this information on three point lighting, there is still a lot for the beginning lighting director to learn about the technique.



Picture 4-10. The single back light from three point lighting.

Three point lighting consists (in its true form) of three light fixtures: two spots and one flood. One spot light, called a key light, is positioned in front and about 40 degrees to one side of the talent and provides the primary source of light for the scene. Because it is a spot light, it creates harsh shadows with a reading of a hundred or more footcandles on a light meter.

A flood light, called a fill light, is added to the opposite side of the talent, also about 40 degrees to the side, to help soften the shadows created by the key light. The fill light is often an extremely variable source of light. It is common for the fill light to be moved to several positions before the desired effect is achieved.

The side angles for the key and fill lights are most commonly referred to as 45 degrees. In this text we have mentioned 40-degree side angles; actually, a beginning lighting director should experiment with 30- to 45-degree side angles and monitor the results.

Not to be confused with the side angles, is the angle of elevation of the light fixtures. The key light should be approximately at a 45-degree angle of elevation above the talent. The fill light usually

produces a more pleasing effect when it has a lower angle of elevation; 10- to 20-degree elevation angles for the fill light are common. The back light, for convenience and effect, may be positioned at a much greater elevation angle than either the key or fill lights. A 60- to 70-degree angle of elevation for the back light will produce good results.

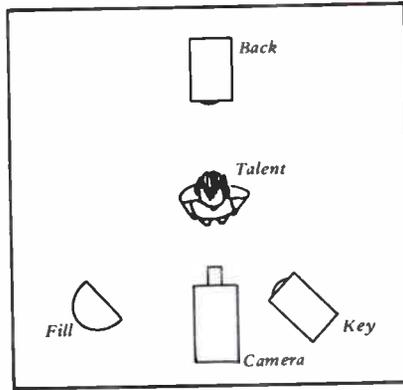


Illustration 4-2. Three-point lighting provides contrast control for mood and the type of program.

The second spot light is positioned behind the talent as a back light. Many inexperienced lighting directors confuse the back light with the background light. The back light is aimed at the back of the talent, while the background light is illuminating the scenery or curtains in the studio. The purpose of the back light is to separate the talent from the background or scenery. By adding a highlight to the hair and clothing of the talent, the back light creates an illusion of a third dimension which is so important for an interesting television picture.

The amount of back light used for one person is usually much different for someone else. Four primary factors determine how much back light should be used: 1) hair color (dark hair color requires more back light than light hair color); 2) amount of hair (thick hair requires more back light than thin hair, and, obviously, a bald person needs very little back light); 3) use of hair spray (natural or artificial oils will change light reflectance); and 4) clothing color (dark clothing will absorb the light while light colors will reflect the light).

CONTRAST RATIO

For our purposes, we will define the contrast ratio of lighting as the ratio between the key and fill lights. In other words, it is the ratio between the hard and soft light illuminating the talent.

The contrast ratio — i.e., how bright the key light is as compared to the fill light — depends on at least three factors: 1) the mood of the program; 2) the talent's complexion features; and 3) the ability of the television camera to accept a high contrast picture.

The contrast ratio is measured by turning on the key light and measuring the quantity of light in incident footcandles. Then the process is repeated with the key light off and the fill light turned on. If the key light reading were 200 footcandles and the fill light 100 footcandles, then the contrast ratio would be 2:1. If in a program only a key light is used for a dramatic effect, the contrast ration would be 1:0.

If the mood of a program is comic, a contrast ratio of 1:1 is common; but for a highly dramatic presentation such as that in a soap opera, the ratio may vary from 5:1 to 1:0.

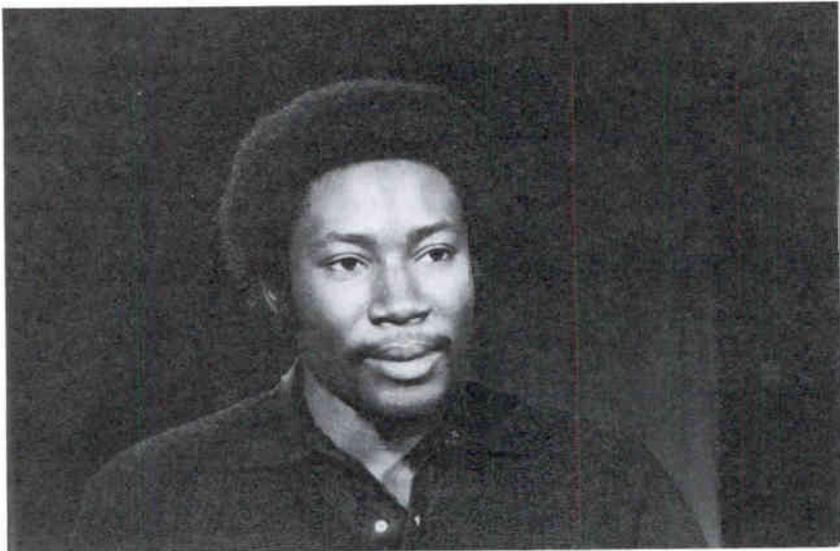
The talent's complexion or prominent features may suggest the contrast ratio. A 1:1 ratio can cover up some complexion problems and prominent features. For extreme cases, two fill lights may be used instead of a key and a fill, and the ratio would still be 1:1. A high contrast ratio, i.e., 5:1 to 1:0, will bring out too much detail and produce a monster effect on a person with bad complexion or prominent features.

The typical contrast ratio for lecture demonstrations, news programs and discussions is between 2:1 and 4:1. Note that an interview program on new employee orientation for a manufacturing company may have a contrast ratio of 2:1, while an interview program on abortion for a cable television company could have a contrast ratio of 5:1.

To obtain the best contrast, plan a ratio based on the mood of the program when lighting for television. Then, alter the ratio based on the people used as talent. It should be pointed out that even using the above as a guideline, professional lighting directors will light differently from one another. For example, television personnel on the East Coast of the U.S. are influenced by the theatre. Consequently, most television programs produced on the East Coast use a higher contrast ratio than those produced on the West Coast, where the personnel are influenced by the motion picture industry. It is possible



Picture 4-11. High contrast ratio.



Picture 4-12. Low contrast ratio.

to determine on which side of the country a program was produced by looking closely at the lighting techniques used.



Picture 4-13. The two back lights from four-point lighting demonstrate the purpose of back lighting.



Picture 4-14. The two front lights from four-point lighting.

FOUR POINT LIGHTING

Four point lighting is the most simple of all television lighting formulas. It is so simple that everyone does it correctly the first time. And it is so straightforward that even a first-time lighting director can do it as well as the seasoned professional. Perhaps four point lighting is a rebuttal to the complicated three point and cross key formulas; but whatever the reason, four point can be used by anyone with just a few minutes of instruction.

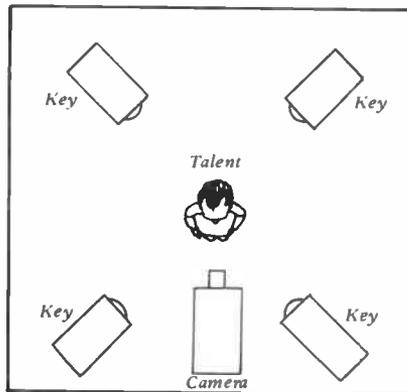


Illustration 4-3. Four-point lighting has the advantage of easy set-up, but provides no control over mood or individual facial needs.

Four point lighting consists of four light fixtures (typically they are spot lights, but they can be floods also) positioned in a square and all aimed toward the center of the box. The resulting contrast ratio of the four lights is 1:1:1:1.

Obviously, four point lighting has the limitation of no control over contrast ratio; and it also appears flat on the television screen. But, there are advantages which are worth considering. Not only is four point very easy to set up, but it also affords maximum lateral camera movement. In three point lighting the lighting effects could be destroyed by merely trucking the camera 90 degrees to either side of the specified camera position. In four point lighting the camera operator may truck 360 degrees and no change in the lighting should be noticed.

CROSS KEY LIGHTING

Thus far in our discussion of television lighting we have only talked about methods of lighting one person. Granted, it is possible to squeeze two persons in with either three or four point lighting, but the

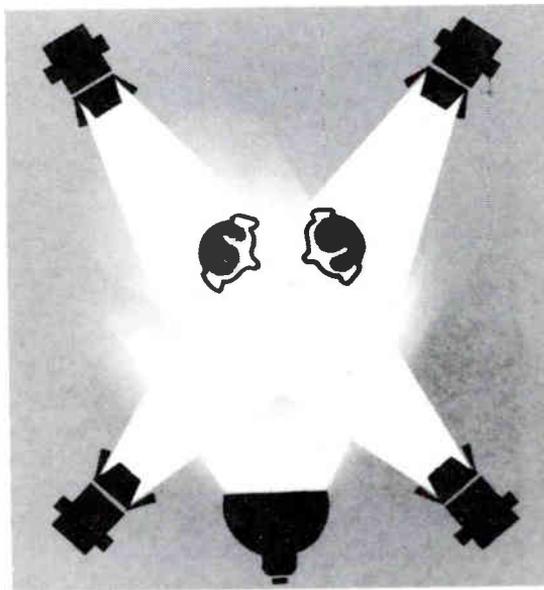


Illustration 4-4. Cross key lighting can be done with as few as 5 light fixtures.

results are usually less than desirable. Additionally, the beginning lighting director often gets the impression that if it takes three light fixtures to light one person, then it should take nine fixtures to properly light a three-person interview program.

A simple modification of four point lighting can create the technique called cross key lighting. It is so named because the two front lights, usually hard spot lights, are crossed so that the key on the left is aimed at the talent on the right, and the key on the right is aimed at the talent on the left. The talent in the center position is lighted by both of the key lights. That means that the contrast ratio for the two outside talent would be 1:0, but the ratio for the center person would be 1:1. To balance out the overall contrast ratio, a fill light is added in between the two key lights. The fill light reduces the overall contrast ratio of the scene to an average of 3:1 or 2:1.

Back lighting for the cross key technique is ideally done with one back light for each person in the panel. If the studio does not have a lighting grid, it is possible to use two spot lights on floor stands which are placed out of camera view. In a remote situation floor stands would be used for all of the light fixtures.

One advantage of the cross key lighting technique is that additional persons may be added to the panel by merely adding a key and a back light for each person. Often times it is possible to share back lights and occasionally a key light as well. The cross key technique may be used for a panel of six people and provide an even lighting balance across the entire scene.

BACKGROUND LIGHTING

Background lights are those which are aimed at the scenery or curtains to establish the mood or scene. Background lights may be spot, floor or whatever is desired. The amount of light on the background can be varied to achieve an effect. No background light may create a black limbo effect which tends to focus all attention on the talent. In this case the talent and the foreground props must establish the mood desired for the scene.

Black limbo lends itself well to intense or dramatic scenes. Conversely, a great deal of background light tends to make a more friendly atmosphere. It is used where the scenery is needed to help create the desired atmosphere.

When lighting the background or scenery for a television production, attention should be given to the color of the background

set. Television cameras are significantly affected by background color. For example, a white background which has been well lighted, can alter an inexpensive camera's ability to distinguish contrast on foreground objects. When this happens the normal reaction of the inexperienced lighting director is to increase the amount of light on the face of the talent in an attempt to regain the proper contrast. However, no amount of light can solve the problem; it can only be rectified by eliminating the white background color, or by reducing the amount of light falling on the white object.

LIMBO LIGHTING

A lighting technique that can be quite effective when executed properly is limbo lighting. In this sense, limbo is defined as an "indistinct background." Most people think of limbo lighting as being black only, but an indistinct white background is also properly called limbo.

The effect of limbo is to concentrate the attention of the viewer on the talent. However, some people dislike the effect limbo produces and for this reason it should not be used as a standard set for all productions in a studio.

The limbo effect can be achieved in two ways. Indistinct scenery such as black flats or a black cyc may be used to create black limbo, the reverse to achieve white limbo. The second method is to stage the talent 12 to 15 feet from the scenery and use high elevation lights so that no key or fill hits the scenery.

COMMON PROBLEMS WITH LIGHTING

The most common problems with regard to television lighting are: 1) bald talent; 2) moving talent; and 3), people with very dark skin tones.

A bald person will require much less back light than a person with a thick head of black hair. A variable focusing spot light will help to reduce the glare from the bald head. Also, the light beam can be lowered from the head to the shoulders and still produce a good highlight effect without glare from the head.

Whenever the talent is to move from one lighted position to another, it is necessary to consider three elements: both positions

where the talent will remain, and the transition area through which the talent will move. It is possible, for example, to use three point lighting with a contrast ratio of 3:1 in both of the lighted areas, and front and back area-lighting for the transition lighting. Or, another effect is to let the talent walk from one pool of light to another; in a poetry program this could be a most interesting effect.

The skin of a black person will absorb more light than the skin of a white person. Consequently, the television camera will see the black person a little differently. As a general rule, a black person will require more overall light than that needed for a caucasian. Also, high contrast ratios are not normally flattering for a black person. Lower contrast ratios produce a much more pleasing effect.

SUMMARY

It should be obvious from the foregoing that the lighting of a television production can contribute as much to its overall success as can the other components. For this reason, beginning lighting directors should take the time necessary to plan which formulas should be used, which fixtures should be used, what mood should be created, and where the light fixtures should be placed. Doing these things will help make the production a success and bring the lighting director one step closer to being a professional.

CHAPTER FOUR QUESTIONS

1. Arrange the following concepts into four categories: hard light; floor stand; power cables; soft light; spot light; grid; flood light; fresnel; scoop; and, raceway.
2. Can a portable lighting kit with three small spot lights be used to light a five person panel discussion and produce at least 200 footcandles on the face of each panel member? Why?
3. List the four procedures which will increase the bulb life of a quartz lamp.
4. List the four basic methods of varying the intensity of a light fixture and discuss the merits of each.
5. What is the difference between subject lighting and area lighting? When should each technique be used?
6. Draw a diagram which illustrates the purpose and placement of the following lights: back light, key light, and fill light.
7. What are the horizontal and vertical angles associated with Three Point Lighting?
8. What is a lighting contrast ratio? How is it calculated? How is it used?
9. What are the advantages and disadvantages of Four Point Lighting over Three Point Lighting?
10. Discuss the following statement: Cross Key Lighting is merely an adaptation of Four Point Lighting.
11. Draw a diagram illustrating how five floor stands with lights could be used for Cross Key Lighting.
12. What is the difference between a back light, and background lighting?
13. How is limbo lighting created? Give an example of when it should be used.

5. *Television Scriptwriting*

The author of a magazine article employs a wide assortment of aids to help communicate the message the words represent. He or she uses punctuation marks, capitalized letters or words, dashes, quotation marks, parentheses, and spaces to clarify the meaning and to make the narrative as interesting as possible. In written communication, these punctuation marks play an important role in conveying the message to the reader.

A television scriptwriter, on the other hand, must rely on the spoken word and the visual impression made by the picture to communicate the message. The subtleties indicated by parenthesis or dashes have to be communicated differently in a television script. Moreover, the scriptwriter must write not only what is heard, but what is seen, as well. These two factors make scriptwriting both different and difficult.

Consequently, it is the opinion of many television scriptwriters that a television script is more difficult to create than a magazine article or a term paper for a college class.

One of the most difficult things for the trained writer to understand is that writing a television script is like no other type of writing. A trained and experienced television scriptwriter is a unique breed of person who is in high demand by many television producers.

In this chapter we will discuss not only the attributes that a good scriptwriter must have (including writing style), but also the mechanics of putting together a script which will make sense to a television director.

MECHANICS OF A SCRIPT

Most television scripts are divided into a column for the audio information and a column for the visual instructions. While dividing the page exactly in half may be convenient, it is not practical for all programs. It is usually easier to condense the visual instructions into a few words, while the audio information may need to be written. Because of this many television facilities have adopted a format such as the one shown in Illustration 5-1. Note that the video column is narrower, thus providing more room for the audio information.

		TITLE _____	
		CLIENT _____	
		LENGTH _____	PAGE NO. _____ OF _____ PAGES
VIDEO INFORMATION	AUDIO TEXT		
	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11		
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Illustration 5-1. Script page.

The heading of the script can be easily customized for each facility or school. In addition to looking nice, customized script paper makes a good impression on clients.

In the example shown, each line has been numbered to match the kind of typewriter which will be used to type the scripts. Numbering the pages and lines in a script is a convenient method of locating a specific point of reference. For example, how long would it take the director to locate page three, line six?

Scripts should be double-spaced to make them easier to read and so that too much information does not appear on one page. Traditional margins don't apply here: one-quarter of an inch on each side is adequate.

When the final version of a script is typed, the typist should place video instructions opposite the corresponding audio information. If at all possible, each new scene, each point at which an edit will occur, or each time something significant happens in the program, the typist should place the audio information for that point in the program at the left margin of the audio column. Doing this will enable the director to enter the necessary cues in the video column without disturbing the page.

WRITING STYLE

Although our verbal communications follow an informal style, our written language has a fairly rigid structure. Most educational systems train students to adopt a very formal style for written communications. High school students come face-to-face with the differences in the two styles when they try to change their writing from an informal verbal structure into the formal style expected by their teachers.

The epitome of formal writing is legal communication, where no consideration whatsoever is given to the beauty of the phrase. The object of legal communication is to set forth conditions and restrictions. The purpose of the audio portion of a television script is to reinforce, explain and communicate ideas which will simultaneously be represented visually on the screen. An informal style of writing that mimics our language as it is spoken works best for television.

A television program in which the audio reflects a formal style of writing stands out as a strange program. The reason is that television is a verbal and visual medium. It is not a medium of the written language.

When a formal style is used in an instructional program, it appears awkward and artificial, and does not usually meet the program objectives.

The formal style of writing is typified by long sentences. (Often a sentence will have more than thirty words.) It usually has a very intricate organization and relies on numerous dependent clauses that are set apart with commas or semicolons. And, a close inspection will frequently show that a synonym dictionary has been used to locate several uncommon words.

An informal, or verbal, style of writing is characterized by short sentences with few dependent clauses and few commas. The words are common, ordinary ones that come straight to the point, and the organization is centered around how the subject is visualized.

SUBJECTIVE AND OBJECTIVE SUBJECT MATERIAL

There is a vast difference between objective and subjective content material in a television script. Objective programs are relatively easy to visualize and the verbalization centers around what the object is or how it operates. Subjective programs, on the other hand, deal with philosophies, attitudes or abstract ideas and are very difficult to visualize. It is easy to see how subjective programs often end up being “big talking faces.” With nothing to visualize, the talent just reads the script.

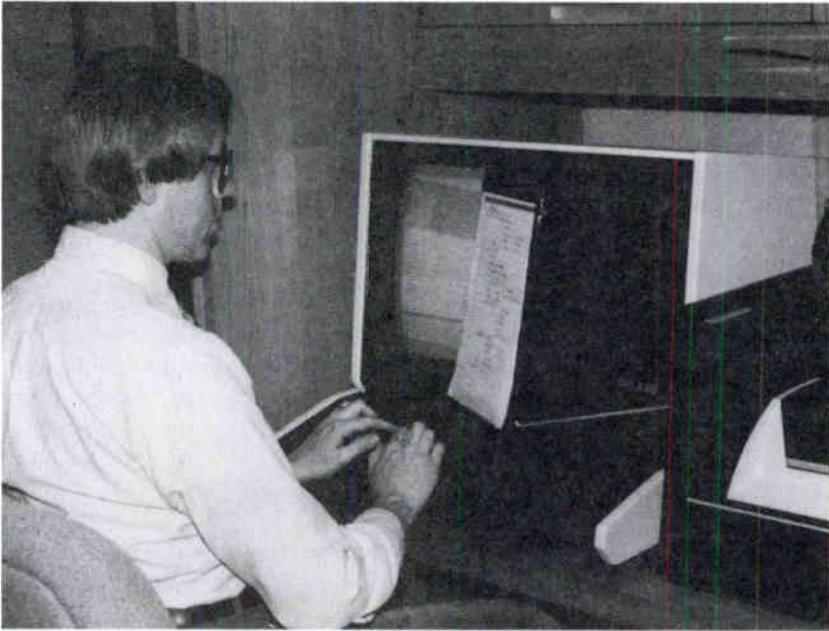
An instructional program which teaches the audience to disassemble and repair an electrical motor can be called a “how to” program. The content of the program is “objective” in that it covers specific information and leaves little to debate.

If a program were to be produced with the title, “Appreciation of Gothic Columns”, the content would probably be considered “subjective.”

When a television script writer is aware of the type of content material about which he or she is writing, the program stands a better chance of success because both the writer and director understand the limitations under which they must work.

VISUALIZATION

The most significant difference between a television scriptwriter, and any other kind of writer is the scriptwriter’s ability to visualize a



Picture 5-1. A word processor can be a valuable tool for the television scriptwriter.

process, concept or situation. A scriptwriter who can visualize is able to see in his or her mind what should happen on the television screen to make the communication effective. It is not uncommon while watching an experienced scriptwriter, to see him or her nod off into a daydream of visualization. Experienced television writers must constantly consider which camera shot will best explain a word, sentence or paragraph. It's not just a matter of explaining a process. It is, rather, coordinating two media of communication: aural and visual.

It has been said that some individuals have an advantage over others regarding the ability to visualize a scene. Perhaps it is a "stimulated right brain syndrome" as some researchers have proposed. Or, maybe some of us have an ability to turn on the television set in our mind to watch what has just been written or is about to be written. Whatever the reason, some writers visualize better than others. This writer has observed, however, that a person's ability to visualize can be improved with cultivation and practice. It is vital that a television scriptwriter constantly ask himself or herself, "What camera shot will best explain that phrase."

PHRASES BEGINNERS SHOULD AVOID

There are certain phrases which can create havoc for a director. Phrases such as, "This is . . .", "Here are . . .", "Note that . . .", and "As you can clearly see . . ." are among them. When these phrases are used the director must provide the audience a view of the specific thing described in the script. If that process or thing is not possible to see clearly with the television camera, the members of the audience may become confused or may even think that the program is too advanced or difficult for them to understand.

On the other hand, a scriptwriter need not avoid these phrases altogether. In fact, in some cases, they may be absolutely necessary. But he or she should be aware that they create a nervous reaction in the director. If the process or object mentioned is easy to see, then there may be no problem in using the phrase.

TALENT CONSIDERATIONS

The ability of the talent to communicate through the medium of television is another factor for the scriptwriter to consider. A three-page discourse on a technical subject to be delivered with a teleprompter would be difficult challenge for a professional talent. But to ask a Vice President of Manufacturing who has very little experience in front of a TV camera to make that presentation is perhaps foolish. Such a situation will almost certainly result in frustration and wasted production time.

Sentence construction, word selection, length of phrases and organization of ideas are all considerations which must be determined, at least in part, based upon who the talent will be. Professionals and very experienced inhouse experts will be able to deliver complicated messages; however, amateur talent will not be able to deliver much more than simple messages with all the help the production crew can muster.

TYPES OF SCRIPTS

There are two basic types of scripts: 1) those written before the program is videotaped and 2) scripts which are written after authorities and witnesses have been interviewed. In this discussion we will concentrate on the former, scripts written before production begins.

The three most common forms of scripts used in television are word-for-word, outline and format.

WORD-FOR-WORD SCRIPTS. A word-for-word script is one in which every word to be spoken is predetermined and written in the script. It could be used effectively in a News or Poetry program where the selection of each word is important. It is also a must where the content is objective, such as a program teaching the operation of a complicated piece of machinery.

A word-for-word script is difficult for a new television director to use because of the rigid time structure of the program. Most new directors are not sufficiently experienced in the mental planning process necessary to direct a word-for-word script successfully.

Inexperienced television performers often use a word-for-word script as a crutch. Because the performer is nervous, he or she tends to feel that having every single word written down on paper will make the task easier. When this happens the performer usually reads the script with little expression or spontaneity. And, as a result, the program lacks viewer interest.

OUTLINE SCRIPTS. An outline script is similar to the word-for-word script in that the sequence of thoughts is predetermined. However, the outline script requires the talent to construct the sentences spontaneously. As a result, the finished program is in a logical sequence, but has the appearance of an impromptu program.

Many “off the cuff” lecture demonstrations recorded for ETV today could be improved significantly if the talent and director would prepare an outline script.

FORMAT SCRIPTS. A “format” script should be used when the director does not know the program content in advance of the taping. Many interview and panel discussion programs are so loosely structured that the program content is nothing more than a few thoughts or questions in the mind of the moderator prior to the taping session.

In these examples an unexperienced director falls into a pattern of “flying by the seat of your pants.” In contrast to this approach, a format script could be used to block out the basic plan for the program. The talent and director could agree upon the opening and closing shot sequence, which camera will take each shot, and the sequence for the questions. This type of planning could then be developed into a format script and improve the quality of the program.

The following three examples will help explain the three types of scripts.

WORD-FOR-WORD SCRIPT

VIDE INFORMATION		AUDIO TEXT
		TITLE <u>Example of a Word-for-Word Script</u>
		CLIENT _____
		LENGTH _____ PAGE NO. _____ OF _____ PAGES
 WA Super slides →	1	OPENING THEME MUSIC UP, UNDER ANNCR, AND OUT
	2	
 MCU Single Shot Center →	3	HOST: Good evening and welcome to "This Week
	4	in Centerville." Tonight we are very pleased
	5	to have with us in the studio two
	6	distinguished guests who will present their
	7	views on the proposed health hazard insurance
Zoom back to A Two shot left →	8	program for city and state law enforcement
	9	officers.
	10	
 MCU single Shot right →	11	On my right is City Commissioner Reed
	12	Blackham, and on my left is Ralph McAllister,
 two shot left →	13	Chairperson of the State Peace Officers'
	14	Association. Commissioner Blackham, it's a
	15	privilege to have you with us.
	16	
	17	BLACKHAM: It's my pleasure to be here, Dave.
	18	
 MCU single Shot right →	19	HOST: Mr. McAllister, I believe you mentioned
	20	that there are more than 1500 peace officers
	21	in your organization, is that correct?
	22	
	23	MCALLISTER: That's right. Our membership has
	24	grown remarkably in our two year history.
	25	
 MCU Single Shot Center →	26	HOST: It's good to have both of you here.
	27	We'll be hearing from you out in our televi-
	28	sion audience, I look forward to your
	29	questions and comments. Our telephone number
Super Number →	30	is: 555-1234.
	31	
	32	Now, before we begin our discussion tonight,
	33	we have a film clip which will introduce our
	34	topic.
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Salt Lake City, Utah 84127		

OUTLINE SCRIPT



Television Script

TITLE Example of an Outline Script

CLIENT _____

LENGTH _____ PAGE NO. 1 OF 1 PAGES

VIDEO INFORMATION

AUDIO TEXT

⚠ WA Super Slides → 1

OPENING THEME MUSIC UP, UNDER ANNCR, AND OUT

2

⚠ MCU Single Shot → 3
Center

HOST:

1. Welcome to program
2. 2 guests to discuss police insurance
 - A. Commissioner Blackham
 - B. Ralph McAllister

4

5

⚠ Zoom back to a → 6
two shot left

BLACKHAM:

1. Response to introduction

7

8

⚠ MCU Single Shot Right → 9

HOST: (to McAllister)

1. How many officers in the organization?
2. How long has the organization been in operation?

10

11

⚠ MCU Single Shot → 12
Right

MCALLISTER:

1. 1500 at the present time
2. 2 years with an excellent growth rate

13

14

15

16

17

18

19

20

⚠ MCU Single Shot → 21
Center

HOST:

1. Television call in program
2. Telephone numbers
3. Introduce film

22

23

24

25

26

27

28

29

30

31

32

33

34

Super Number →

FILM:

FORMAT SCRIPT

 <p>Television Script</p>		TITLE <u>Example of a Format Script</u>
		CLIENT _____
		LENGTH _____ PAGE NO. <u>1</u> OF <u>1</u> PAGES
VIDEO INFORMATION		AUDIO TEXT
⚠ WA Super Slides →	1	OPENING THEME MUSIC UP, UNDER ANNCR, AND OUT
	2	
⚠ mcu Single Shot Center →	3	Single shot center of host for introduction of the program
	4	
	5	
	6	
⚠ mcu Pan left →	7	Single shot left of Blackham for introduction
	8	
	9	Super name
	10	
	11	
⚠ mcu Single Shot Right →	12	Single shot right of McAllister for introduction
	13	
	14	
	15	Super name
	16	
	17	
⚠ mcu Single Shot Center →	18	Single shot center of Host for question
	19	
	20	
⚠ mcu Single Shot Right →	21	Single shot right for response from McAllister
	22	
	23	
⚠ mcu Single Shot Center →	24	Single shot center of host to explain telephone call in
	25	
	26	
Super Number →	27	Super phone number
	28	
	29	
⚠ mcu Single Shot Center →	30	Single shot center while host introduces the film
	31	
	32	
	33	
	34	Film
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6. *Audio Production*

What are the characteristics of microphones for professional television use? What kind of mike is best suited for an orchestra or for a single musician? Consider these factors before selecting a mike for a production.

GENERATING ELEMENTS

Every mike has a generating element (one of the components which generates electricity in the microphone) and each kind varies in expense as well as in fidelity, complexity, ruggedness and life expectancy.

DYNAMIC MICROPHONE. In a well-designed mike, the dynamic generating element surpasses all others by providing excellent fidelity and extremely stable performance at a reasonable

price. It will stand up under “close working distance” (that is, when the sound source is very near the mike), and under high sound levels produced by one or more musicians.

CERAMIC AND CRYSTAL MICROPHONES. Ceramic and crystal generating elements lack fidelity and ruggedness and therefore fall short of even the most modest professional mike requirements.

CONDENSER MICROPHONES. The condenser generating element, although expensive and fragile, is good for television use because of its capability to respond to, or pick up, a wide range of frequencies. However, this element requires an external voltage supply such as a battery, and it may produce noticeable sound distortion under high sound pressure generated at close working distances.

RIBBON MICROPHONES. The ribbon or “velocity” generating element can be destroyed by one blast of air. Reliability is even lower than a condenser, and most performers cannot tolerate such fragility.

PICK-UP PATTERNS

The pick-up pattern of a mike dictates, more or less, the situation for which it is best suited. The most popular, most frequently used microphones offer either of two basic pick-up patterns: Unidirectional (usually a cardioid, or super cardioid, mike) or omnidirectional.

OMNIDIRECTIONAL MICROPHONES. An omnidirectional microphone picks up sound that is moving within a 360° radius of the fixed mike to produce a constant, smooth output regardless of orientation. (Using a wheel for an analogy, the omnidirectional mike is the hub which picks up sound produced within the circumference of the rim.) Usually, its somewhat limited pick-up range requires the main sound source to be within about ten inches of the omnidirectional mike. Where extremely close working distances prevail (one-eighth to seven inches, for example), the advantages of the omnidirectional mike over the cardioid kind are a generally smoother frequency response; significantly less susceptibility to “breath pops;” less sensitivity to mechanical shock; and better durability. Because an omnidirectional mike picks up sound equally well from several directions, a few mikes can serve many people, making this kind of mike ideal for an orchestra or a large singing group.

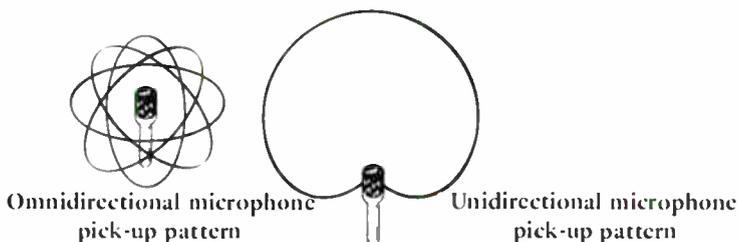


Illustration 6-1. An omnidirectional mike literally picks up sounds from ALL directions.

The suitability of any mike, of course, depends on the situation in which it is to be used. Since the omnidirectional mike does pick up sounds within a 360° radius, background noise produced within its pickup range can be offensive. In this case, a unidirectional mike should be used.

CARDIOID MICROPHONES. Cardioid and supercardioid (a supercardioid is an even more directional mike than a cardioid) are usually very popular with professional performers. The pick-up



Picture 6-1. This picture illustrates the normal operating distance for two basic types of microphones. The super cardioid microphone on the right is placed about 17 inches from the performer, and the omnidirectional microphone on the left is placed about 10 inches away.

pattern of a cardioid microphone is heart-shaped (hence, its name), or like a pyramid with a large base. Sounds originating from the front of the mike are emphasized; sounds originating from the rear are reduced, and sounds at the sides of the mike virtually cancel out each other. The pick-up pattern of the supercardioid mike emphasizes even more the sounds originating from the front of the mike; the shape of its pick-up pattern can be likened to a pyramid with a small base — smaller than that of the cardioid.

A performer using a cardioid or supercardioid instead of an omnidirectional mike can stand farther away from the instrument and retain a “proximity effect” — a sound almost as warm and rich as if he were in the same room as his audience. Working distance allowed by a cardioid or supercardioid is greater than the omnidirectional kind. A ratio of 1.7 over the omnidirectional mike, for instance, means the performer can stand as far away as 17 inches from the cardioid, while he or she would need to be within 10 inches of an omnidirectional mike for a similar proximity effect. A supercardioid allows an even greater working distance. Both the cardioid and the supercardioid are excellent mikes for a boom, used when a microphone is to be placed out of sight of television viewers. Incidentally, when a performer stands beyond the working distance allowed by a mike, the sound will become overly reverberating, hollow and distant. The possibility of picking up excessive background noise is also increased.

OTHER CONSIDERATIONS

Microphones covered by a warranty are a better investment than those not backed by the manufacturer. Some companies offer a two-year unconditional warranty on omnidirectional microphones; the manufacturer will repair a damaged mike at no cost except that for necessary outer refinishing.

WIRELESS MICROPHONES

A wireless microphone consists of a regular mike and a miniature transmitter which sends the audio signal to a receiver. The audio signal can then be sent from the receiver to an audio mixer. The most obvious use of wireless microphones in recent years is on the referee in televised NFL football games.

A wireless mike is commonly seen as a panacea to all audio pick up problems to the beginning audio production engineer. However, as in

the case of the NFL games, there are numerous problems associated with their use. A radio frequency dead spot is a physical position which may or may not be close to the talent, but where the microphone transmitter does not function properly. Dead spots can ruin a taping session.

Perhaps one of the most significant disadvantages to a wireless microphone is the initial cost. A medium-priced wireless mike with transmitter, antenna and receiver may cost up to twelve times the price of a standard lapel mike.

TECHNICAL CONSIDERATIONS

HIGH AND LOW IMPEDANCE. Low impedance in a mike is a prerequisite for professional television use. Low impedance permits the use of longer cables than with high impedance. High impedance mikes are acceptable for non-professional audio tape recording, but these mikes will not provide adequate frequency response when a cable is longer than 15 to 20 feet.

MICROPHONE MOUNTING

HAND-HELD MICROPHONES.

PROS: Using a hand-held mike, the talent can move around, talking with people in the audience or sharing the mike with a guest on stage. It even serves as a “security blanket” for some performers or as a prop.

CONS: The successful utilization of a hand-held mike depends largely on the performer’s ability to use it well — some performers may hold it too close or too far away — or they may handle the mike too much, causing noise interference.

SHOT-GUN MICROPHONES.

PROS: A highly directional shot-gun microphone may be used to pick up sounds from a great distance. In the case of a football game, a shot-gun mike can often pick up the quarterback calling signals.

CONS: Most shot-gun mikes are expensive and out of the reach of small television facilities. A shot-gun mike used to pick up talent at a



Picture 6-2. Hand held mike.



Picture 6-3. Table mike.



Picture 6-4. Small lav.



Picture 6-5. Floor mike.

distance of even a few feet lacks the studio presence of a lapel or hand held microphone. The lack of presence increases background sounds and leaves a hollow, echo, or distance effect.

FLOOR MIKE FOR ONE TO FOUR PERSONS.

PROS: Since this is a hands-off mike, the audio technician won't have to worry about extraneous sounds caused by too much handling. The height of the mike is adjustable; and if several people are walking on and off stage for brief appearances, a floor mike is adaptable.

CONS: Performer movement is limited. The stand has to be planned as part of the set in order not to be a "sore thumb."

FLOOR MIKE WITH LARGE GROUP.

PROS: This is the most economical way to pick up a medium to

large group, including musicians and students in a classroom. Placement can be determined with a minimum of experimentation. It is also used to pick up random audience sounds at sporting events and for applause.

CONS: Floor mikes are not ideal for picking up individual voices in a large group, since voice levels vary so much. When gain is increased to pick up a soft-spoken person or one far from the mike, unwanted background noise is intensified.

TABLE MIKE.

PROS: If a table or lectern is part of the props in a panel discussion, it costs less to use a table mike than a lavalier, since two mikes properly placed adequately pick up four voices.

CONS: Height of the mike is not adjustable, so proper placement depends on table height in relation to that of each performer behind it. Any thumping on the table will be picked up by the mike unless the mike is placed on padding.

BABY BOOM.

PROS: A baby boom is a hand-held, horizontal extension of an upright microphone. Basically, an audio engineer uses a baby boom to pick up an individual voice from a large group of people. Its advantages are: it is easy to manipulate, and not too expensive; it can reach more people than a hand-held mike, and it has better balance pick-up than a floor mike.

CONS: It takes a good deal of experience and practice to manipulate the boom from person to person without interfering with either the production or with the audience.

BOOM MICROPHONE.

PROS: A boom on a tripod and dolly can pick up voices anywhere in the studio since the boom itself is long, the dolly provides mobility, and pick-up direction is controllable. Neither the boom operator nor the mike is seen by the viewing audience. It's good for televised stage plays.

CONS: A good quality boom is expensive — at least \$1,000 — without mike. Studio lighting must be planned to avoid shadows on the background caused by the boom.

LAVALIER OR LAPEL.

A small hand-held or table mike removed from its stand can be attached to a cord and hung around the neck. Not many people use a large lavalier since it looks bulky. Small lavaliers give the talent mobility and freedom to use his or her hands. It is the least obtrusive microphone, invisible behind a tie or inside clothing. If it is simply placed around the neck unconcealed, caution the talent not to play with the cord. If it is concealed, avoid wide-angle shots which show the cord dangling behind the talent.

CHAPTER SIX QUESTIONS

1. Which generating element would be best suited for a cable television studio which frequently televises sporting events?
2. Describe the pick-up patterns of omnidirectional and unidirectional microphones.
3. Which impedance (high or low) is the best for a professional television facility?
4. The lavalier is perhaps the most frequently used microphone. List the pros and cons of using the lavalier.
5. The boom microphone is thought of as a panacea to all audio problems. What are the problems of using a boom microphone?
6. Discuss when the microphone should be concealed or left in the open for the cameras to see.

7. Sources of Visual Materials

Television, when it is used most effectively, is a visual medium. Unlike its use during its early years, it is not radio with pictures. So, when writing, producing or directing any television program, the producer/director should try to tell the story visually. The visuals, in other words, should be an integral part of the production and not an afterthought. In many cases, the viewer's imagination can provide the soundtrack — if the story is visually effective.

SOURCES OF VISUALIZATION FOR TELEVISION

The visual components of any television program can be categorized into four main areas: (1) Graphics (maps, diagrams, illustrations, supertitles, etc.); (2) Photographic techniques (motion picture film, slides, film strips, and still photos); (3) Backdrop, props, scenery; and, (4) the on-camera talent.



Illustration 7-1. Radio programs require the listener to do the visualizing.

It is important to understand the fundamentals of how visuals must be tailored for television before producing or selecting them. The novice director who doesn't understand these basic principles may see a visual he or she likes and will say, "That's great! I'll use it!" The veteran will not rely on first impressions but will base his or her enthusiasm and final decision on more technical guidelines.

PHOTOGRAPHS AND FILM VISUALS

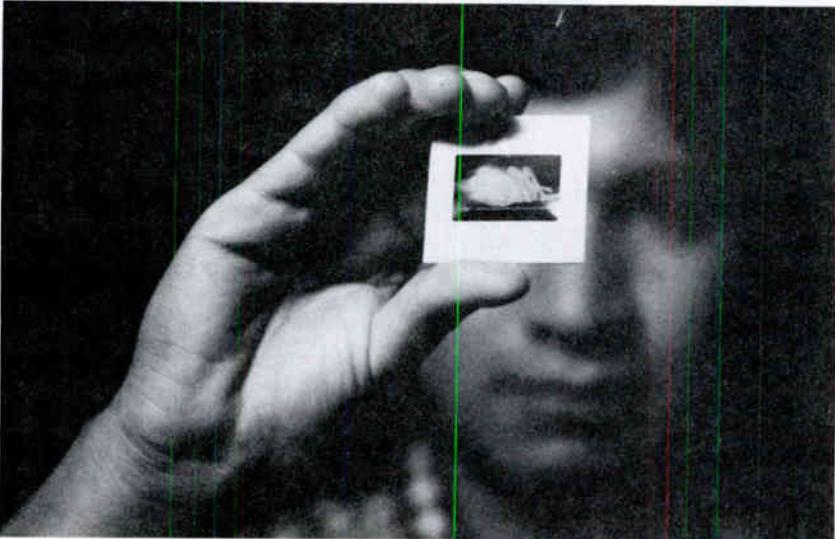
PHOTOGRAPHS. Enlargements from film negatives have the same on-the-set uses as graphic materials. Often it is more practical to take a still picture of a large or complicated display than it is to take the display to the studio, although stills of physical objects are possible only when the talent is not required to demonstrate the display.

Enlarged photographs can come alive with creative use of the television camera. Viewers can go “inside” the scene as the camera moves slowly from a full-picture shot into a close-up, pinpointing one detail. Camera pan and tilt also add movement and interest to the still photograph.

Mount all photographs on 14-ply grey cardboard backing, keeping the important parts within the critical area.

35 MM SLIDES. Slides are televised from a remotely controlled projector directly into a preset television camera, requiring no on-the-set handling. They may also be projected from behind onto a translucent screen to become part of the set.

When using slides remember: (1) The projected area must conform to the standard television format, 3:4. In other words, only horizontal slides, not vertical slides, may be used. (2) If slides are in



Picture 7-1. 35MM slides are frequently used as television graphics.

color, remember the grey scale limitations on televising color. (3) If you are making slides in color, keep contrasts down. A slightly overcast day outside or low light ratio inside are preferable. (4) Number each slide according to the program script.

35 MM FILM STRIPS. Although it is possible to use film strip projectors on the set or on a multiplexer, they are not normally a part of television. It is preferable to prepare slides from a film strip (the double frame size only) and mount them as slides.

16 MM MOTION PICTURE FILM. Motion pictures are especially compatible with television. Film projection, like slide projection, is remotely controlled by the television director.

When using film, keep in mind the requirements of television low picture contrast, the 1/6th marginal loss of picture area, and the value of close-up scenes. Use 16mm film at sound speed only, 24 frames per second. Sound-on-film can be used, or the talent can narrate under the footage.



Picture 7-2. This is a keyboard for an electronic character generator. The layout of the keys is similar to a typewriter with the addition of several function and operating controls.

OBJECTS AND MODELS. Objects can be displayed on a table-top individually and in groups, with or without added visuals. In this method, extreme close-ups are possible.

SCENERY

Television scenery plays a very big role in the quality of the visual portion of a TV program. All guidelines that apply to other visual elements also apply to scenery — especially the concepts of contrast and detail. Today the emphasis is on simplicity in creating good scenery. It is more important to be symbolic than to try to be too realistic — unless of course the production calls for the dramatic staging of a home or office, for example. Generally, however, the talent, the graphics or other visual materials in the foreground demand viewer attention; the background should usually stay where it belongs . . . in the background.

CHAPTER SEVEN QUESTIONS

1. List the four most common forms of visuals for television.
2. What sources of photographs and 35mm slides are available to a director?
3. Explain how a 35mm film strip could be used in a production.
4. What part does the selection of visuals for a program play in the overall success of the production?

8. Preparation of Graphics

EVALUATION OF VISUAL MATERIALS

Regardless of what visual is used for a television program, the director must make an evaluation as to the suitability and effectiveness of each specific visual to be used. Experienced directors make those judgments based upon past experience. Unfortunately, inexperienced directors must make their decisions based on a guess, hopefully an educated guess.

It is possible to evaluate any visual to be used for television based upon a set of guidelines which can help predict the effectiveness of the visual.

These guidelines are as easy to memorize as A-B-C-D-E-F-G: *Aspect ratio*, *Bleed area*; *Contrast*; *Detail* and size; *Essential area*; how the director *Feels* about the visual; and *Glare*.

ASPECT RATIO. The aspect ratio of the television screen is three units high and four units wide. When preparing or selecting visuals, it

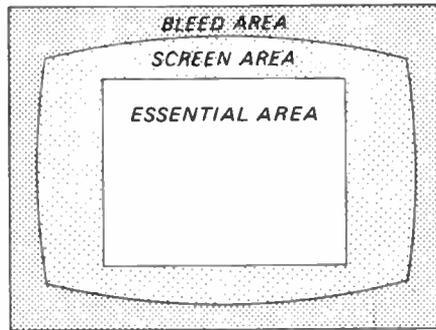


Illustration 8-1. Special Requirements of Television.

is important to adhere to this ratio — 6:8 or 9:12, for instance. Materials and objects to be televised should be placed within this three-to-four format (essential area, scanning area, and bleed area, explained below, all conform to this ratio).

BLEED AREA. The bleed area is the extra or unused area on all sides of the scanning area, the area framed by the television camera and ideally, transmitted to the receiver. It is important to include sufficient bleed area in graphic materials, for example, to allow for camera setup and to allow the director the freedom to position the material in the essential area (discussed below).

CONTRAST. Contrast in visuals for television should be definite but not extreme. Large areas of white should be avoided because such high light will cause glitter and flare — especially during camera movement. Colored materials will, of course, appear as shades of grey on monochrome receivers. And, while the human eye generally perceives about 100 shades of grey, a monochrome TV receiver will reproduce only about ten different shades.

Color plays an absolutely essential role in the production of a television program. Even if the receiver is monochrome, the colors used are important. Dark shades of brown, blue, etc. are generally indistinguishable from black. Other colors, such as red, medium blue and medium green, look the same — dark grey. The important thing to remember is to test the grey values of selected colors if monochrome receivers are used.

Even a color TV system acts as a filter — it only sees a portion of the hue and saturation that the human eye can. And, if the cameras used are inexpensive, even more color is lost. So, it is necessary to stay with

basic, solid colors. It is also a good idea to stay with blues and greens when using inexpensive cameras, and to avoid super-saturated colors.

DETAIL AND SIZE. Keep detail in graphics and photographic visuals simple, bold, and free from unnecessary detail. Irregularity of lines in a drawing, for example, will be intensified when the television camera shows a close-up of the illustration or lettering. If the lettering is very fancy, the camera will enlarge it to appear even fancier — and perhaps, unreadable. If a visual is “busy” or includes too much material, it will probably be distracting.

Limit outlines and other lists to no more than five lines, each with a maximum of five words; that means that the average audience can only read a maximum of 25 words on the screen at one time. Unusual audiences, such as one person looking at a good quality monitor, may be able to read many more than the 25 word limit. A director must use experience as a guide when determining the number of words appearing on the screen at one time.

Limiting the copy permits the use of a lettering size that is easily legible. The lettering size should be no less than 1/20th the size of the screen area. Large letters are especially important for color TV since the limited resolution power of a color distribution system will not reproduce detailed artwork or small print very well.

ESSENTIAL AREA. The essential area, synonymous with critical area or safe title area, is about five-sixths the scanning area. Since different receivers crop visual information differently, placing vital information in the essential area ensures that the receiver will display all of it. Some production people use tape or a felt tip pen mark to indicate the essential area. To recap: the bleed area gives the director “breathing room” around the scanning area; the scanning area is the portion of the visual that the camera “sees”; and, the essential area is the safe area that the receiver displays.

FEELING. Often a piece of TV artwork, photo or other visual material meets the technical requirements outlined above. But, how the director feels about it is sometimes the missing ingredient. Aesthetics, program continuity and other criteria all should be taken into consideration when evaluating visual material.

GLARE. Glare can often ruin an otherwise good visual. Spraying the item with powder, changing lighting or moving the article are options open to the director in reducing glare. Selecting the right

visual in the first place, however, is usually the best way to avoid the problem.

PREPARATION OF GRAPHICS

Graphic materials, such as colored artwork, lettering and “super” (title) cards generally are not the center of attention in a television production. Many times, however, a well done piece of flat or three-dimensional artwork is the only means to illustrate a particular point. And, charts, diagrams and outlines are often vital in the teaching of an important concept. So, any piece of graphic material must not only be readable, but it must neither detract from nor clutter the rest of the visual presentation.

In preparing any type of graphic material, the technical guidelines discussed in the previous chapter certainly apply. In particular, the aspect ratio and the size of the artwork should conform to those requirements. The typical size for an artcard, for example, is 11” x 14” with a 10” x 13” scanning area and an 8¼” x 10¾” essential area. The



Picture 8-1. Press-on letters are frequently used to create lettering on art cards.

material used should be stiff enough to stand by itself if necessary. Graphic information can be hand-lettered or it can be presented with rub-off letters or type-set copy — depending on the scope of the production and the size of the budget. Poor lettering looks even poorer when shown on television. Again, the simpler the type face, the better. Rub-off letters from an art supply store are now available in hundreds of type faces, many of which can be used very effectively on TV. And, typesetting firms can provide type, either on slick paper (reversed if you wish) or on acetate overlays. Generally, it is cost-effective to order type set only if large quantities are needed. In any case, check the price and the process before ordering.

Flat artwork and hand lettering can be done with any opaque paint or in some cases, with professional-quality felt tip pens. Large colored areas generally are illustrated with colored paper or overlays. It may also be a good idea to check with local art studios or advertising agencies for quotations on large jobs *if* they are familiar with the preparation of TV graphics.

Pictorial artcards often employ printed photographs — from magazines or other publications — to portray a graphic, newsy effect. However, cluttered, detailed artwork should be avoided in TV graphics. Simple, bold art with strong curves and definite, straight lines are visually the most appealing.

Super cards or title cards usually have white letters on a black background. The white area has a high luminance so everything else can be made invisible. It is important, however, to make sure that the black area is flat or matte, not glossy.

DISPLAY OF GRAPHIC MATERIALS

How the visual materials are displayed depends on the general staging of the program as well as on its major objectives. Graphic materials, for example, may either be displayed by themselves, full screen or as supers, or with talent or other visual elements. Studio easels, artists' easels, flannel boards and magnetic chalkboards are all used by production houses for graphics display. Some of them — the chalkboards, for example — can be used effectively by on-camera instructors. Still photographs may be displayed similar to graphics — usually mounted on an easel or music stand.

An optical multiplexer or a film chain is the means of showing films and slides on television. There are many different configurat-

ions available from a variety of manufacturers, but generally they feature three to four inputs (projectors) and one to two outputs (cameras). Rear-screen projection techniques may also be employed to serve as background visual material.

CAMERA APPLICATIONS

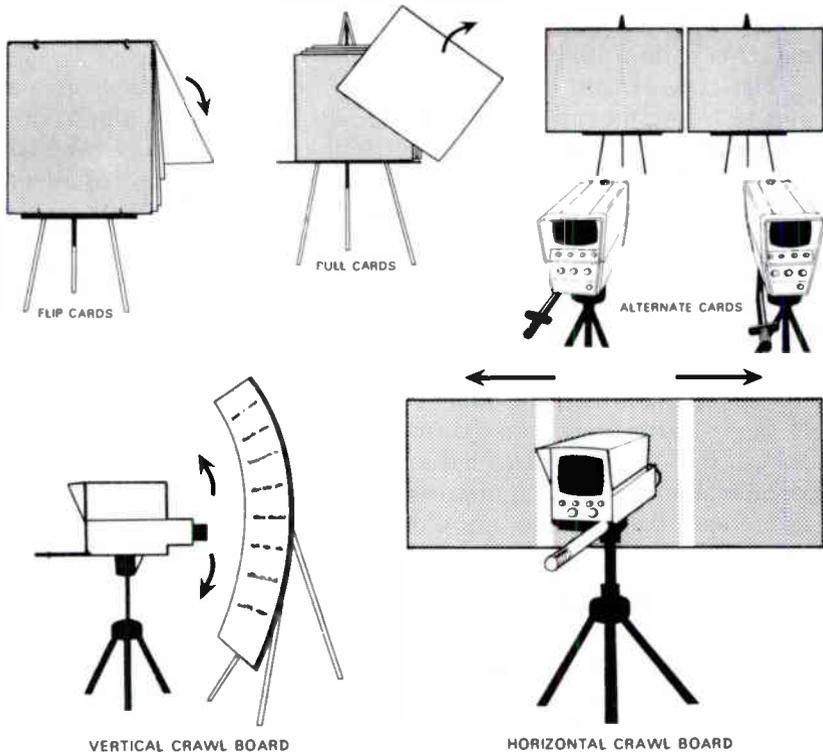


Illustration 8-2. Examples of studio techniques for televising art cards.

CHAPTER EIGHT QUESTIONS

1. From memory, list A B C D E F G.
2. What is the aspect ratio of a television screen?
3. How much bleed area is enough?
4. What are the contrast limitations for the television signal?
5. How small can lettering be on a screen and still be seen by an audience?
6. How many words can be displayed on a screen at one time and be understood by an average audience?
7. What is the relationship between: essential area, bleed area, and screen area?
8. List several methods of displaying studio graphics.

Part II.
Studio Techniques



9. Production Switching

One of the most impressive, but often frightening, pieces of equipment in a television control room is the production switcher. It is impressive because of its vast array of buttons, knobs, switches and lights. But these same features can intimidate a person.

All production switchers use similar principles of operation. A large switcher, for example, is nothing more than the basic principle of a simple switcher, repeated many times. Once a student has learned one basic principle of a switcher, he or she actually understands in theory how a very large switcher operates. Consequently, the beginning student should not worry about the size, apparent complexity, number of lights and so forth on a large switcher, because it is actually just a series of small devices operating together.

Mastery of a production switcher contributes greatly to the quality of a professional television production. The most expensive of switchers will provide no advantage over an inexpensive one unless

the person operating the device is experienced and knows what he or she is doing. This chapter will present some basic switching techniques to help new operators gain expertise in using this important piece of control room equipment.

When a director or technical director operates a production switcher, he or she is actually performing a function very similar to the job of a videotape editor. Both jobs involve editorial decisions which connect various camera shots or scenes into a finished program. This means that all of the creative techniques of editing that apply to basic cinematography are also helpful to the operator of a production switcher and to a videotape editor.

PRODUCTION SWITCHING TERMS

BUS. A bus is a horizontal row of buttons on a switcher. When multiple busses are used on a switcher, it is important to understand that the positioning of inputs is vertical. In other words, if camera one is located on position one of bus A, then camera one also appears on the first input of all other busses.

BUS ACTIVATION

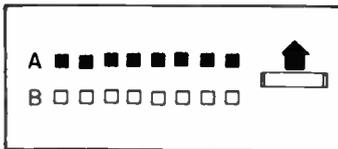


Illustration 9-1. To activate Bus A, move the fader handle to the "up" position.

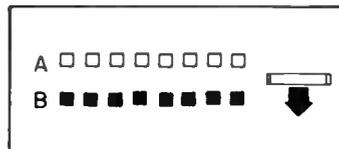


Illustration 9-2. Bus B is activated by moving the fader handle to the "down" position.

INPUT. Each button on a bus represents an input to that switcher. For example, button number one could be designated as an input for camera one, and button number two for camera two, and so forth.

OUTPUT. The output of a switcher may be sent to a videotape recorder, to a monitor or to many other areas of a television facility.

FADER HANDLE. The fader handle is the device located on the right side of two busses. It determines which of the two busses is operational or "on the air." When the fader handle is pointed toward

the A bus, it is activated and any button depressed on the A bus will change the output of those two busses. Likewise, when the fader handle is moved toward the B bus, it is then activated. In addition to determining which bus is activated, the fader handle is used to effect dissolves, fades, and supers.

PREVIEW BUS. The preview bus is normally a single bus switcher, the output of which is fed to a monitor to enable the previewing of a video source.

PREVIEW MONITOR. The preview monitor is connected to the output of the preview bus and is used by control room personnel to preview a video source prior to its being put on the air.

PROGRAM BUS. Most production switchers have one or more busses which are called program busses. A program bus(es) controls the output of the switcher. Whichever button was pressed last on the program bus determines what video input is being fed to the output of the switcher. Most production switchers have a fader handle between two program busses, so the fader handle is actually selecting between the two program busses.

PROGRAM MONITOR. The program monitor is connected to the output of the program bus, or more specifically, the fader handle. Control room personnel use the program monitor during the production of a program.

TAKE OR CUT. In the motion picture industry a “cut” is when two pieces of film are glued together. The result on the screen is an instantaneous change from one camera shot to another. In television the same effect is called a take, and is accomplished with a production switcher. A take is done by pressing, and thus activating, a button on the program bus.

Audiences have been preconditioned by experience to accept a take as a change in camera angle within a scene.

DISSOLVE. The visual effect of a dissolve is a gradual fading out of one picture and an equal fading in of a second source. A dissolve is accomplished by moving the fader handle from one program bus to the other. In other words, if camera one was last pressed on the A bus, and camera two last pressed on the B bus, then a dissolve between camera one and two could be effected by moving the fader handle from one bus to the other.

An audience perceives a dissolve as something much different than a take. Usually a dissolve suggests to the viewing audience a change in time, scene or place. Other applications of a dissolve involve the need for a camera change, where a take would be too abrupt, such as in the case of a ballet or a fashion show. A dissolve may also be used when changing from a wide angle shot to an extremely different perspective such as a close up shot.

SUPERIMPOSITION (SUPER). When the fader handle is stopped approximately half way through a dissolve, the effect is called a super, or superimposition. The visual effect is much like a photographic “double exposure.” One common application is a lower-third super, where one camera is aimed at the talent and the second is looking at a black art card with white letters. The visual result on the program monitor includes the talent with only the white letters supered below the talent’s face; the black on the card disappears automatically.

The viewing audience may see a well-motivated super as a practical effect which enhances a program. On the other hand, they may see an improperly motivated super as nothing more than a gimmick which detracts from the message of the program.

FADE. A fade is a gradual decrease of a picture until the program monitor reaches black. A fade is done by moving the fader handle from a bus with a video source to an input on the other bus which has been specified as “black.” The black video source is more than just an empty or unused input on a bus. It is a video signal without any luminance or picture.

Many television directors use the term “fade in” when referring to the technical reverse of a fade which fades out. The proper television term for beginning a program, or bringing the picture up from black to a video source, is “come up on camera one.”

A fade on the television screen is much like the closing of the curtains in a live theater. The audience sees each technique much the same.

SPECIAL EFFECTS. The topic of special effects is covered in Chapter 10 of this text. It is mentioned here because most production switchers include special effects as a part of the device. The beginner need only understand at this point that the ability to produce a special effect is accomplished with the use of video sources, inputs and busses.

CONCLUSION

Most beginning students of television production find production switching a challenge. Some students, in fact, find it very confusing. It is vital that all beginning students not only read a text, such as this, but also be given the opportunity to operate a switcher until the student can perform all of the basic moves without having to stop and figure each one out.

The ultimate goal of a director (or other such person operating a production switcher) is to operate the switcher as a typist operates a typewriter: without looking. The ability to do this will enable the director to concentrate his or her attention upon other matters.

PRACTICE EXERCISE

The following series of illustrations includes all of the basic moves which a beginning director must understand. Beginning students should follow this sequence through until they can quickly understand the sequence for each of the basic moves. For the following exercise, assume an eight-input, two-bus, switcher, with three cameras and a black source on the eighth input.

SWITCHING EXERCISE

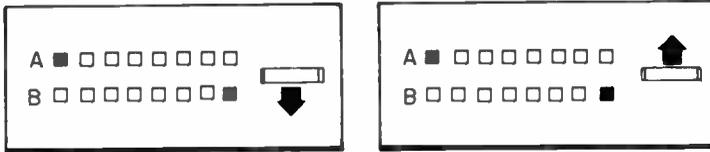


Illustration 9-3. To begin a program the director may say "up on one"; to do this button 1 on Bus A is depressed and the fader handle is moved from Bus B to Bus A. Illustrations 9-4 through 9-8 follow a logical sequence of switching operations, using the position of the switcher in Illustration 9-3 as a starting point.

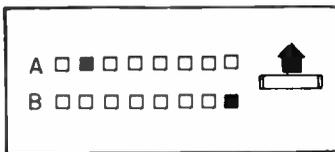


Illustration 9-4. "Take two", button 2 on Bus A is pressed.

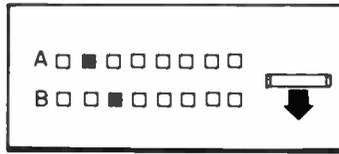


Illustration 9-5. "Dissolve to Three" — dissolve, or gradually change, from one camera to another by pressing Button 3 on Bus B and gradually moving fade handle from Bus A to Bus B.

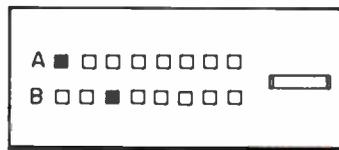


Illustration 9-6. "Super One and Three" — to superimpose Camera 1 over Camera 3, push Button 1 on Bus A and move fader handle to the middle position.

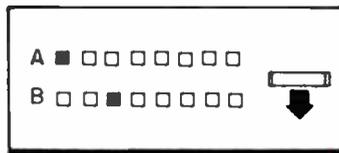


Illustration 9-7. "Full to Three" — to lose the super, move fader handle back to Bus B.

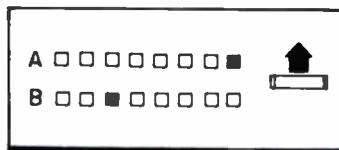


Illustration 9-8. "Fade to Black" — fade the picture to black by dissolving to the black input.

CHAPTER NINE QUESTIONS

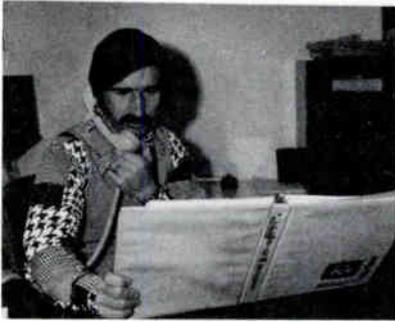
1. Explain the visual effect on a program monitor, and the visual effect upon the audience, for the following:
 - A. Take
 - B. Dissolve
 - C. Super
 - D. Fade

2. Should a director use takes or dissolves on the following programs:
 - A. Fast moving debate on the economy of the country.
 - B. Slow paced panel discussion on discrimination.
 - C. A biology lecture-demonstration on frogs.
 - D. A fashion show with evening gowns and formal attire.

10. Electronic Special Effects

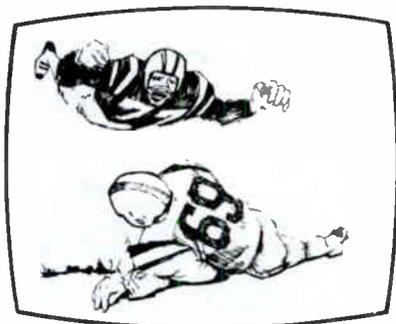
There are many kinds of special effects used in the theatre, motion pictures and television. Some of these include studio, electronic, lighting, audio, and videotape effects. Of these, the most common and traditional is the studio special effect. Placing several pieces of dry ice in hot water and using a fan to blow a fog or mist across the studio or stage floor is an example of a studio special effect.

In this chapter we will limit our discussion to electronic special effects. This type of special effect is done with a special effects generator in conjunction with a television production switcher. (The effects generator may be purchased separately but is most typically part of the switcher.) Depending on how they are used, all special effects are either practical or gimmick. So as we mention the special effects, notice that the application of each one could be in either category.

*Camera 1**Camera 2**Illustration 10-1. Split Screen.*

SPLIT SCREEN

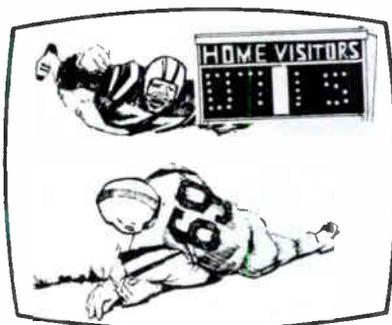
In a split screen special effect there are usually two cameras, but more may be used. In the example shown one camera is framed left on a person talking on the telephone, the other camera is framed right, also on a person talking on the telephone. With the special effects generator in a vertical split screen mode, both people can be placed on the screen at the same time. The advantage with this example is that both ends of the telephone conversation can be visualized on the screen at the same time.



Camera 1



Camera 2

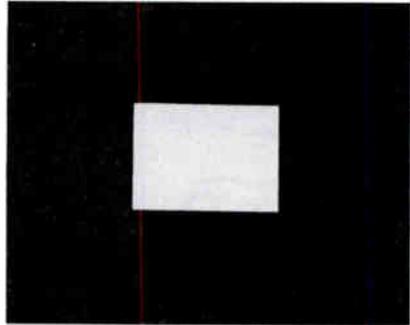
*Illustration 10-2. Corner Insert.*

CORNER INSERT

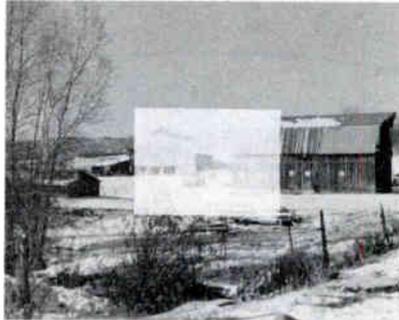
A corner insert is similar to a split screen in that two camera shots are combined on the screen at the same time. In the example shown, camera 1 is following some football action and camera 2 has the scoreboard framed in the upper right-hand corner of the viewfinder. The corner insert effect positions the scoreboard on the program monitor in the upper right-hand corner. Most effects generators also have upper left, lower right and lower left corner inserts.



Camera 1



Camera 2

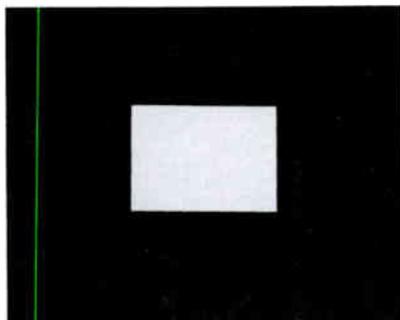
*Illustration 10-3. Supered.*

SUPERIMPOSITION (SUPER)

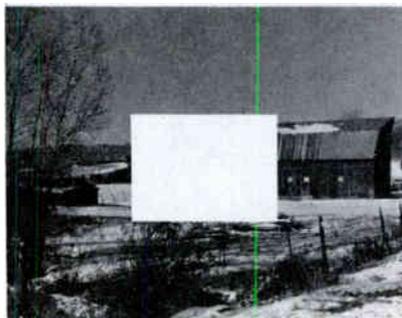
Camera 1 is framed on an outdoor scene while camera 2 shoots a black card with a solid white square on it. The production switcher can superimpose cameras 1 and 2, but problems may occur because the intensity of the outdoor scene and the luminance (whiteness) of the white block have each been reduced by 50 percent. Additionally, there is “see through” from the white block to the outdoor scene. Both of these problems create a picture with poor definition and a dull image. Nevertheless, this process has been used for years to superimpose titles on background pictures.



Camera 1



Camera 2

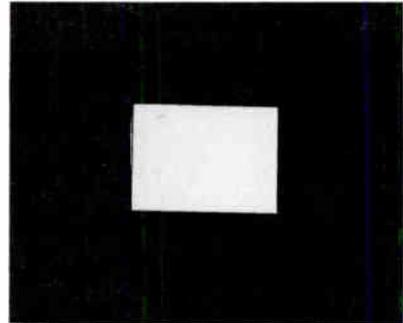
*Illustration 10-4. Internal Key.*

INTERNAL KEY

An alternative to mixing two sources for a superimposition is a luminance key, usually called internal key and occasionally referred to as self key. In the example shown, camera 1 has the same outdoor scene as in the previous illustration, and camera 2 is focused on the same white square and black card. However, the two sources are put into a special effects generator in the internal key mode and the result is a “knock-out” effect. Because the knock-out effect is internally keyed, we see 100 percent of both the background and the white square. And there is no “see through” either. Contrast this to the superimposition, where each source was reduced by 50 percent. With internal key each source maintains its 100 percent.



Camera 1



Camera 2

*Illustration 10-5. Matte.*

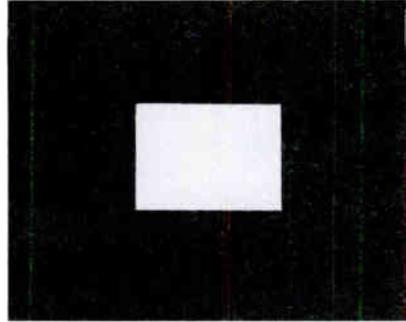
MATTE

The matte mode of a special effects generator takes the luminance-keyed information and allows the operator to vary the gray scale of the keyed material. This means that the block could be white, light gray, medium gray, dark gray, or black, as the operator selects.

It is important to understand how the special effects generator selects the information to be keyed. In the internal key mode the special effects generator (SEG) selects the information with the highest luminance and inserts that material over the other video from the other camera. The examples have used a white block on a black square because of the high contrast in luminance. White letters on a black card could have just as easily been selected. If the card had green letters on a blue background, the special effects generator would have difficulty selecting the highest luminance, and therefore, an internal key would probably not work.



Camera 1 Background Source



Camera 2 Pattern Source

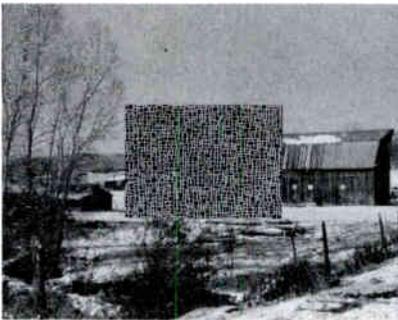
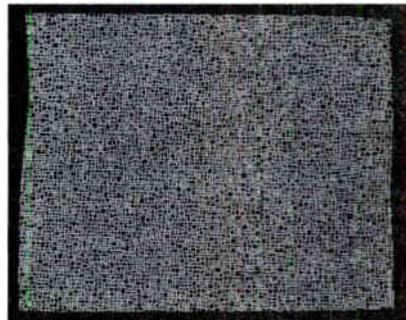


Illustration 10-6. External Key.



Camera 3 Inserted Source

EXTERNAL KEY

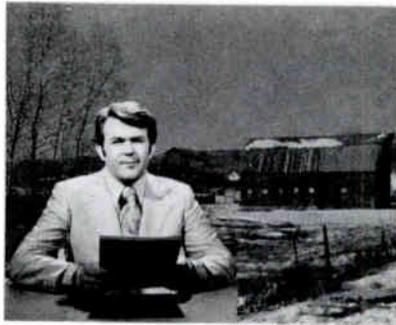
Once again, camera 1 is showing a background scene and camera 2 a white block. Now camera 3, which is looking at a moiré pattern, is added. These three sources can be labelled as: camera 1 - background source, camera 2 - pattern source, and camera 3 - inserted source. These three sources can go together into what is called the external key mode of the special effects generator. The output would be the background source, the white block as a pattern source, and the moiré pattern inserted inside the pattern source. It should probably be noted here that an external key is almost always in the gimmick category of special effects. However, there are undoubtedly a few practical examples somewhere.



Camera 1



Camera 2

*Illustration 10-7. Chroma Key.*

CHROMANANCE KEY (CHROMA KEY)

This effect is generally known as “chroma-key,” but it is technically named a chromanance key. In the example, camera 2 is looking at a newscaster framed left, while camera 1 is looking at an art card with the shot of mountain scenery on it, framed right. The newscaster is sitting in front of a flat (wall) painted a vibrant, rich, saturated blue. The special effects generator in the chroma key mode can select any color in the television spectrum and wherever that color is in a picture, a new picture from another camera can be inserted. In the example, if the chroma key hue control is turned to blue, the blue flat behind the newscaster can be replaced with the art card on camera 2. This is a popular news program technique.

Problems occur when the announcer has blue eyes or blue clothing. If, for example, the announcer were wearing a striped blue tie, several stripes would probably key out and be replaced by the art

card. If the announcer had blue eyes and the background information were a film or moving object, his eyes might glitter and jump. This is sometimes called the “*Star Trek effect*.”

It should be noted that in the example of the chroma key presented above, that the key was from a monochromatic (single color) source. In the example blue was selected as the keying color, but a chroma key will key from magenta, cyan, green, red, or any television color. In all the previous special effects the cameras could have been either black/white or color. However, with chroma key you obviously must have color cameras.

The reason for using a blue background for chroma keying as opposed to yellow is that most people have less blue pigmentation in their skin than any other color in the television color spectrum. If another television color were selected for the example presented above, the skin, hair, and other body features would begin to key out of the picture along with the background.

WIPES

The last electronic special effect to be discussed is the “wipe.” A wipe replaces or wipes off of the screen one source and replaces it with another source. (See *illustrations*) The two basic wipes are horizontal and vertical. With the horizontal, it appears as though a curtain were being drawn across the screen from one side to the other. The vertical wipe is the same effect, but moves from top to bottom instead of from side to side.

The rate or speed of the wipe is controlled by how rapidly the fader handles are moved from one bus to the other on the special effects generator.

Depending on the size of the special effects generator, the director may have anywhere from a few to literally hundreds of wipe patterns available. Each pattern is selected by the director pressing a button which corresponds to the particular design. Obviously, the more special effects wipes on a switcher, the more that switcher will cost.

Expensive production switchers allow the director to determine how rapidly the wipe will be made, from a part of a second to several seconds. Other options may include a “joy stick” for positioning a pattern, such as a circle, anywhere on the screen. Yet another option may be control to adjust the frequency and amplitude of the wipe

pattern, allowing the director to wipe with lines that are flowing back and forth as in a rhythmic sea current.



Camera 1



Camera 2



Illustration 10-8. Vertical Wipe.



Camera 1



Camera 2



Illustration 10-9. Horizontal Wipe.

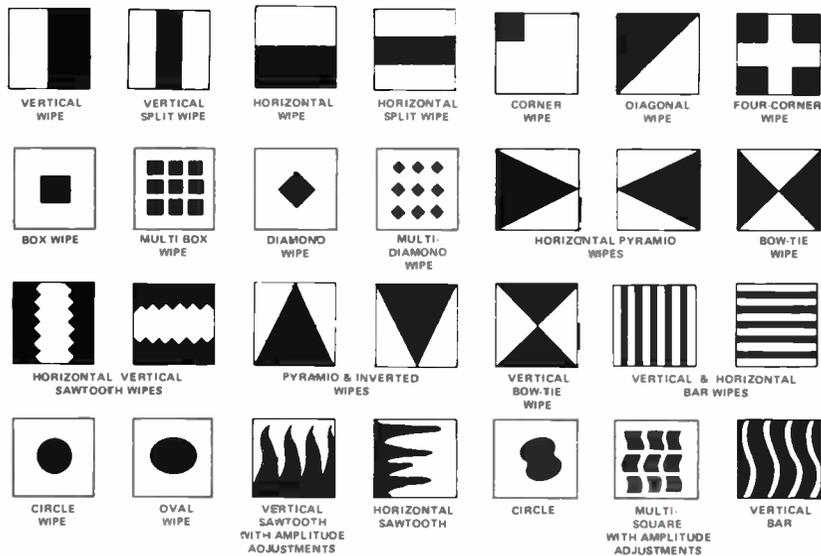


Illustration 10-10. Basic Wipes.

CONCLUSION

Again, the wipe effect, as other special effects, can be practical or gimmick. Using a corner insert to show the time and score when televising a basketball game can be either gimmick or practical depending on when and how the effect is used. For example, the time remaining and the score are critical elements during the last few seconds of a game, providing the scores are close. The use of a corner insert then could be an example of a practical special effect. If, however, the same effect were used throughout the entire first quarter of the game, it would be almost total gimmickry. The moral: Practical effects can add professionalism to a television program. A few gimmicks may add interest, but too many gimmicks add confusion.

CHAPTER TEN QUESTIONS

1. Discuss electronic special effects as related to the categories of practical and gimmick.
2. Describe the resultant difference between a lower third name super being supered and keyed.
3. Why is a matte feature on a special effects generator a good investment?
4. What is a practical application for an external key?

11. Directing in the Studio

Sitting down at a production switcher in a television control room to direct a program is like few other experiences a person can have. People doing so have literally had a heart attack and died while sitting there. It is a potentially frightening experience for the inexperienced director.

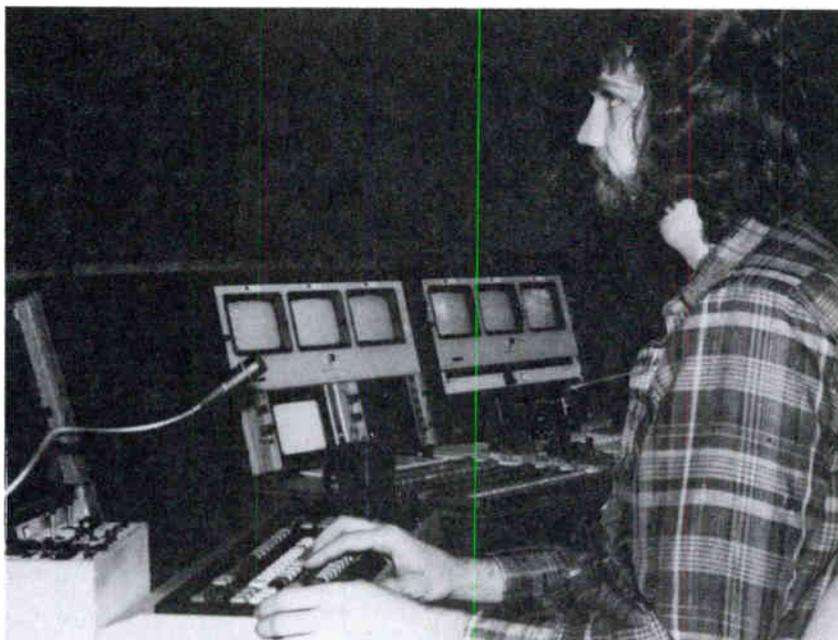
In addition to the obvious fear of everyone watching the director, and of trying to understand all of the intimidating lights and buttons on the equipment, is the uncertainty as to what needs to be said, and to whom. Making a mistake with the switcher is almost a private affair, but saying the wrong thing at a critical point in the program is public knowledge.

It is possible to master the production switcher, know how to get the VTR to record, and what switches to push to get the video from the switcher to the VTR, and still be unable to communicate effectively with the production crew. One of the greatest fears of the beginning studio director is what to say.



“Ready when you are, Harry.”

Illustration 11-1.



Picture 11-1. Director at a production switcher.

Of particular concern to the inexperienced director is the verbage necessary to begin a production. For this reason it is suggested that new directors literally memorize a sequence which will get them into a program. What happens beyond the initial sequence should be helped by a well-planned script.

Success is more nearly assured if the director adheres to a preprogram routine. A routine can be so simple to develop that it is surprising that more television systems don't have one. By adopting professional procedures for "getting into a program," and by religiously following the sequence for every production, better-than-ever programs will be the visible reward for the crew's diligent coordination and organization.

A director who has been directing studio productions for a number of years will most probably have developed a set routine of verbal communications which he or she will deliver at the beginning of each program. The routine makes the director look professional to the crew, talent, and any visitors who may be present during the taping. Additionally, the visual result on the screen will show of

professionalism and organization.

A Ten-Step Approach has been developed for the average television facility. It is designed to consider the important verbal messages which need to be communicated between the various members of the crew. Each television facility should develop its version of the Ten-Step Approach to assure professional productions.

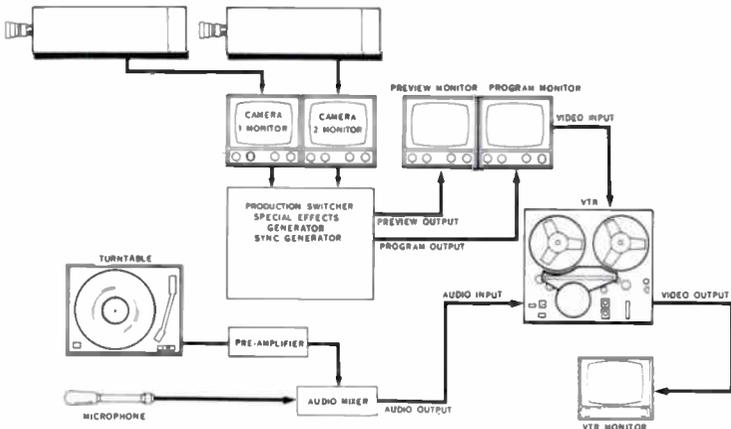


Illustration 11-2. This is a wiring layout involving several monitors and a switcher. Note the inputs and outputs of each device.

TEN-STEP APPROACH

Here is a suggested sequence of events which should occur within the last five minutes before each videotape production:

1. When the floor is ready (that is, when the talent, camera operators and equipment are in the studio, fully prepared for the production, the director goes to the control room. Believe it or not, many directors either go to the control room before the crew is properly prepared, or he or she may delay too long in the studio going over needless contingencies.

2. Once in the control room the director should conduct a verbal test over the intercom system to make sure that there is two-way communication with each camera operator.

3. The director then tells the floor manager: "Stand by in the studio."

4. The floor manager, who in many studios may be operating one of the cameras, relays the director's message, "Stand by in the studio,"

loudly enough to alert everyone in the studio.

5. Director to VTR operator: "Stand by to record," followed by the command "Record." These commands are given at least 30 seconds before cuing the talent, to provide the necessary "black" at the beginning of each tape.

6. Director to floor manager: "Stand by to cue the talent."

7. The floor manager responds immediately by raising his or her hand as a cue to all personnel that the "take" is imminent.

8. Director: "Stand by Camera 1," (or first video source). "Stand by the microphones," and/or "Stand by the audio tape."

9. The director's final command for getting the program underway is, "Cue him," "Cue her," "Cue the talent," or a similar term.

10. The floor manager lowers his or her arm and points directly toward the talent. Together, the audio technician opens up the microphones, the first video source comes up, the talent performs. It all happens simultaneously, the result of the director's succinct verbal directions and the point of a finger.

The sequence is slightly altered for live production, since everyone will be working to meet a strict air-time deadline. The floor must be ready and the intercom system tested for director-camera

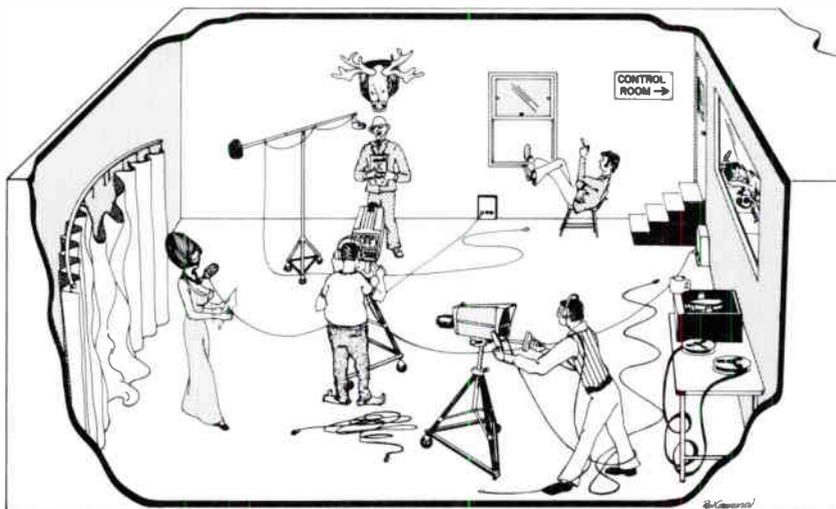


Illustration 11-3. A comedy of errors.

operator communications, with time remaining for the director to dictate the commands that put all technicians, equipment and talent in operation at a precise moment. The command to the VTR operator (number 5) is deleted for a live production, unless the program will be concurrently videotaped.

Why is a sequence so important? How can it improve program quality? Probably the most obvious, or at least the most typical, difference between the novice and the experienced director is organization. The professional, knowing who and what must be cued, cues them in logical order without getting confused or forgetting a simple command such as "Record." By memorizing and following a sequence, it becomes a "safety device". Mistakes commonly made during the hectic pre-program time will most likely be eliminated (the VTR operator will be cued) and everyone in the control room and studio is more self-assured.

CHAPTER ELEVEN QUESTIONS

1. List the steps in the ten step approach and indicate who says what, and to whom.
2. Explain why it is important to use the ten step approach and begin a program efficiently.
3. Make a new list based on the needs of the studio in which you work.

12. The Videotape Recorder

One of the skills necessary to produce television programs is the ability to operate a videotape recorder. All of the finest pre-program planning can be in vain if the video signal does not get recorded on the videotape. Therefore, knowledge of this process is important to the student of television production.

This chapter has two primary purposes: first to acquaint the student with the basic video flow of a VTR system and, second to stress the importance of further study in the specific instruction manual of the VTR used.

The videotape recording field has few standards. The few standards which are used concern the technical nature of videotape recording rather than the operational aspects. Therefore, each manufacturer has a similar, but different, method of operation, labeling of controls, and sequence of operation. For this reason a complete discussion of VTR operation in this chapter is impossible.

Our purpose is to explain the process involved in setting up a recording system which, along with an instruction or operation manual, should enable the student to understand the system, or hopefully, plan a system.

The following subjects are the common, and mostly interchangeable, terms used in association with videotape recorders.

RECORDING PROCESS

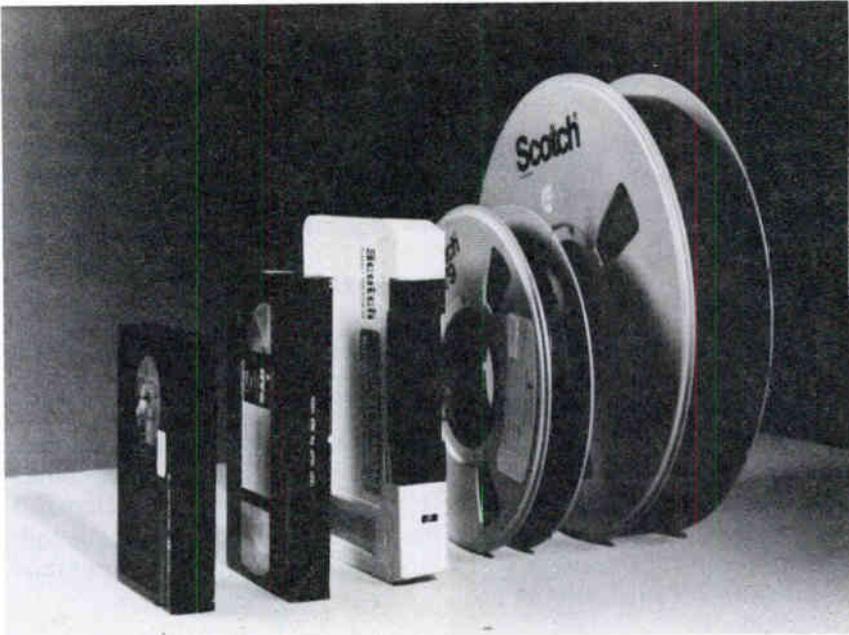
The method by which an audio signal is recorded onto a videotape is much like the one used to record on audio tape. It involves the conversion of an audio signal to a magnetic force which is then transferred by an audio recording head to a moving tape. The tape is sensitive to the magnetic force transmitted by the head, thus the signal is recorded on the tape.

The video recording process is similar to the audio process in that the signal is transferred to the videotape with the use of a recording head. The audio head is mounted to the frame of the VTR while the video head spins on a drum assembly to increase the tape-to-head velocity. This increased velocity between the videotape and the recording head helps to create the high quality of the signal when it is recorded on videotape.

VIDEOTAPE FORMAT

A videotape format is a series of technical and operational characteristics which distinguish one videotape recording system from another. For example, one manufacturer may elect to use a particular method of wrapping the videotape around the video head; another manufacturer may use a totally different wrapping system. The result is that the two systems are not compatible. A tape recorded on one system will probably not play back on a machine from the other system.

Most videotape formats have been marketed with generic trade names such as EIA-J, U-Matic, Betamax, VHS, Type A, Type C, and Quad. These are just a few of the videotape recording systems, or formats, which have been developed by manufacturers and sold to television users. The problem comes when the television user does not understand that a tape recorded on one format is incompatible with a



Picture 12-1. Pictured are the common videotape formats: Betamax, VHS, U'Matic, one inch, and two inch.

machine of another format. For example, a Betamax videotape will not play back on a VHS machine.

The U-Matic format is an inter-manufacturer format. In other words, several different manufacturers produce videotape machines which all use the U-Matic system and they are all compatible. Another inter-manufacturer format is the Type C format.

New television producers and directors soon learn the formats and what tapes play back on which machines. Until this is learned, however, it is common for the inexperienced producer to make several mistakes.

VTR INTERCHANGE

The ability of a videotape which has been recorded on a VTR of one format to properly play back on another machine of the same format is called interchange. There are several technical adjustments which must be performed within a videotape recorder to maintain

proper interchange. Television systems which have machines of the same format spread across a campus or around the country usually have a system to keep those machines within the technical standards of interchange.

The VTR technician bringing one or more videotape recorders into interchange will often use a special videotape which has been prepared by the manufacturer as a standard for setting interchange.

VIDEOTAPE SIZES

One of the main differences among different videotape formats is the size, or width, of the videotape used on each machine. The sizes, in inches, of videotape commonly used are 1/4, 1/2, 3/4, 1, and 2 inch. The reason for different sizes of videotape is two-fold: 1) narrow videotape can be played back on lightweight, compact machines which are cost-effective for television producers who demand portability; and 2) wide videotape has the capability of producing high quality technical standards which are demanded by the commercial broadcaster or professional user.

TECHNICAL TERMS

CONTROL TRACK. Most users of television videotape recorders assume that there are two signals recorded on a videotape: audio and video. Actually, there are three signals recorded; the third is control track.

Control track is an inaudible signal which the VTR records on the videotape as a reference for playback. During playback, the control track signal of a videotape performs a function quite similar to that of sprocket holes on motion picture film. The purpose of sprocket holes is to maintain an even film movement through the film gate. Control track is a series of electrical pulses which provide the same function during the playback of a videotape.

TRACKING. Tracking is an adjustment of the control track signal of a VTR when it is in the playback mode of operation. Adjustment of the tracking control is made to either achieve the most stable playback picture, or to obtain a specified indication on a meter. Many VTR's have an automatic mode for the tracking adjustment. It is important for the beginning student to realize that the automatic mode on most

recorders is not a technical adjustment, but rather a manufacturer's guess as to where the tracking control should be set. It is not an automatic search by the machine resulting in an automatic setting that the operator can completely rely on. This is particularly important to understand when videotapes from many sources are to be played back on a recorder other than the one on which the tapes were originally recorded.

TAPE TENSION CONTROL. The tension control alters the tension of the videotape on the tape transport. Adjustment is made to correct a tearing of the picture at the top of the screen. If a videotape has been recorded with improper tape tension, it may be impossible to correct the problem with the playback tension control. Proper VTR maintenance should include an adjustment of the record tension system.

VIDEO LEVEL. The meter used to indicate the tracking adjustment during playback is usually used to display the video level during the recording process. The scale typically indicates several markings



Picture 12-2. Meters on a VTR.

leading up to a line marked 100%. When recording a program it is important for the operator to keep the video level near, but not above the 100% mark. Technically the indication should only reach the 100% line if there is a quantity of white information in the picture being televised. As with the tracking control, most videotape recorders have an automatic white level mode of operation which is called automatic gain control (AGC). The circuitry which controls the AGC is normally adequate enough to rely upon for most average recording sessions.

AUDIO LEVEL. The audio level control works in principle much like the video level control. Levels on both of these controls are normally set before the recording session begins and minor attention should be given during the recording session.

The audio level control when operated with an AGC (automatic gain control) presents a unique problem not found in the video recording circuitry. The video AGC maintains a reasonably accurate video level for VTR because there is normally some form of video being recorded at all times. The audio AGC, however, is a different story. In a typical television program there are periods of audio, and periods of silence. Any silent portion of a program, intended or not, will not be understood by the AGC. The automatic circuitry will search for something to amplify and will increase the background noise to abnormal levels. When played back the high noise levels between the program audio may be distracting to the audience. The solution to this problem is to record the program in a manual audio level mode. This will result in a greater dynamic range for the audio portion of the program.

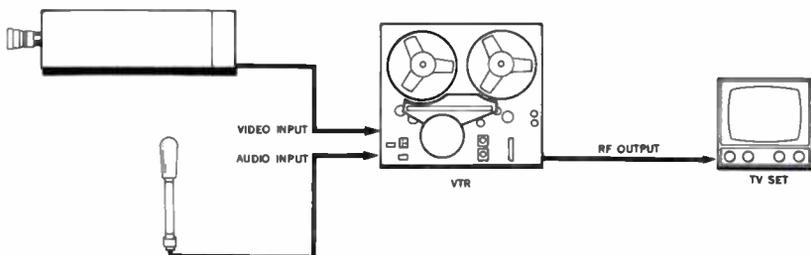


Illustration 12-1. This is a typical wiring layout of a VTR system using the RF output.

INPUTS AND OUTPUTS. To the novice television producer the concept of inputs and outputs may be confusing. The terms do sound

technical, but they can be understood with a little study. An understanding of the terms will enable the novice to better comprehend the wires, or cables, going to and from a videotape recorder. And that knowledge will be important in an emergency.

There are two basic cables going to a VTR: the audio and video signals. When a signal goes into a device it is called the INPUT. In the case of a VTR the inputs would be the video signal from a camera or switcher and the audio signal from a microphone or audio mixer.

The OUTPUTS are the cables (signals) coming from the device and they also consist of two signals: the audio and video. The video output of a VTR may go to a monitor or perhaps to another VTR in the case of videotape duplication (dubbing). The audio output of a VTR may go to an amplifier and speaker or to the audio input of another VTR in the example of videotape dubbing.

Some videotape recorders have a special output called an RF output. It is different than the conventional video output in that the signal is modulated to an RF frequency such as channel 3 or channel 4. The signal on the single wire contains both the video and audio information and can be displayed on a conventional television receiver. This type of output is convenient for playing back videotapes to classroom audiences.

In summary, the signals going to a device are connected to the input, and the signals coming from a device are the output.

VIDEOTAPE RECORDING SUGGESTIONS

When the technical questions such as input and output have been solved, the problem of recording the video and audio signals still remains. The solution is probably in the VTR operation manual, but there are a few other suggestions which should be mentioned.

TEST RECORDING. There is nothing like the experience of learning that the program just recorded did not, in fact, get recorded. This problem will happen to every producer, but hopefully not when the boss is the talent. The cause of such an experience may be multifold, but some precaution could prevent it from happening.

A standard practice of recording a sample video and audio should be done prior to each important recording session. When playing back the signals, the operator should look for not only recording levels, but also the quality of each signal. Most problems in this area

are a result of the two signals never reaching the VTR; this simple check will solve that problem.

NEW VIDEOTAPE. It is possible for a roll of new videotape to have a small amount of loose oxide, or other particles, which could clog the video heads on the videotape machine. A standard practice of running all new or recycled videotape through a VTR two or three times before an important program is recorded will help solve this problem.

ENVIRONMENT. Many problems concerning a videotape recorder involve an unclean environment. The area immediately around a VTR must be clean. A videotape recorder should not be placed in the direct path of a forced air furnace or air conditioning system without good filtering. But perhaps the most violated rule concerning the use of a videotape recorder is smoking near the machine. Tars and other smoke particles will coat parts of the machine and cause intermittent problems over a long period of time. Professional studio facilities restrict the use of smoking in the same room as a VTR. When not in use all VTR's should be covered with the dust cover supplied by the manufacturer.

Cassette recorders resist dust better than open reel machines because the recording chamber is partially closed to the outside air. This, and the fact that the tape cassette is enclosed, make the cassette system better than an open reel machine in resisting dust and dirt. These points should be considered when selecting a videotape recorder for a particular environment.

SUMMARY

It is neither possible, nor the intention of this chapter to present a complete discussion of videotape recording. The purpose of this chapter is to present information which is normally learned through several years of experience.

The hints explained here, along with the instruction/operation manual, should enable the student to better understand the process of videotape recording.

CHAPTER TWELVE QUESTIONS

1. How is a video signal recorded on to a videotape?
2. List the videotape formats most frequently used.
3. What is VTR interchange? Why would it be important to an insurance company who desired to ship training programs to 100 branch offices?
4. What is the purpose of control track on a videotape? What happens when the control track is damaged?
5. What does the picture look like when the tracking control on a VTR is improperly adjusted?
6. What does the picture look like when the tension control on a VTR is improperly adjusted?
7. Discuss the pros and cons of using a video AGC.
8. What is the difference between the video output and RF output on a VTR?
9. What suggestions were given in the chapter to help insure a successful recording?

13. Electronic VTR Editing

Since the early days of television, directors have been able to select shots on various cameras and, in this way, add variety and aesthetic value to programs. But not until the 1970's did the television director have as much freedom as the motion picture film editor in selecting among several takes of a scene and putting the best of these together in a desired sequence. This came about when the technology of the television industry had increased to a point where anything which could be done by a film editor could now be done by the videotape editor. So it is that today the methodology of the two systems may be different, but the available techniques are very similar.

This chapter will present the topics which surround electronic videotape editing. Terms and techniques will be discussed to aid the student in learning the skills of videotape editing. It is important for the beginning student to understand, however, that learning the language of editing from a textbook is one thing; sitting down at an

electronic editor and performing a series of calculated edits is a totally different experience. Most successful editors have learned that it is necessary first to speak the language of editing, and then to experience the equipment to become skilled at the techniques.

It is necessary to distinguish between mechanical or physical editing and electronic editing. In physical editing, as with audio tape, the editor mechanically cuts the tape with a cutting device or a pair of scissors and splices the two ends together with splicing tape. In the early days of television a similar practice was used to edit videotape. Now videotape is edited electronically. An electronic edit is as clean as a take on a production switcher and is accomplished without physically cutting or splicing the tape.

WHY EDIT? Some new students of television production have a difficult time understanding why an edit is necessary. So, perhaps it is necessary to explain how a television director uses editing to make a program.

In a traditional television recording system, once the videotape recorder is placed into the record mode there can be no stopping until the final scene is recorded. That means that only a few years ago all programs produced on videotape had to be recorded in chronological order without stopping the VTR. Every scene had to be shot as if it were a live program. It is an understatement to say that this technology seriously limited the creative abilities of the production crew.

By contrast, the equipment of today literally allows the assembling of thousands of individual animation cells into a fully animated television program or commercial. The equipment of today is a far cry from the equipment of just a few years ago.

CRASH BANG EDITS. Another concept which some students miss is the difference between a videotape recorder which was designed to perform electronic edits, and one which was not. Editing VTR's have special circuitry which enables the machine to make a clean, unnoticeable transition between different video sources. A standard VTR, which was not designed for editing, will not have that ability.

For example, if an electronic edit is attempted on a non-editing VTR, the result will be several seconds of breakup or loss of picture and sound. Television people call that breakup a "glitch" or an undesired loss of video.



Picture 13-1. 3/4 inch editing system.

TYPICAL EDITING SYSTEM

An editing system consists of five basic elements: 1) a playback videotape recorder, 2) an editing or record machine, 3) the electronic editor, 4) a video monitor for the playback VTR, and 5) a monitor for the record machine.

The playback machine is usually placed to the left of the editor (person), and the record VTR to the right. This means that the flow of information (new audio and video) travels from the operator's left to right. This concept seems basic, but during a very complex editing session it is possible for the operator to become very confused. When the operator understands that all information will flow from the left to the right, it is easier to keep control of the situation.

More sophisticated videotape editing systems may include several playback machines, time base correctors, integration of a production switcher, and other elements of a studio operation. An editing system may be very simple with only the five basic elements, or it may include an entire studio facility.

EDIT POINT

An edit point is the point in time, or exact place in a program or scene, where a change in video and/or audio is desired. It is, for example, where the director desires to change from one camera angle to another, or where a certain shot is to be inserted for a desired result. A new editor must learn how to identify and locate an edit point and then how to “park” the VTR on the exact point of the edit. Experienced teachers of television production have learned that the only way a student can learn this technique is with first hand experience.

A good “parking” exercise is to record several minutes of a digital clock that has a readout in seconds. Then each student is asked to “park” the VTR at a specific point in time: such as 3:45:15. Each videotape recorder and electronic editor has its own method of starting, stopping, pausing, fast forward, and rewind. It may take some time for each student to get the feel of identifying an edit point, and then park the machine on that precise point.

BACKSPACING

When an *audiotape* recorder is started in the play mode, the start-up time is almost instantaneous; there seems to be no perceivable delay between the time the play button is pressed and when the music begins. The reason is that the mechanical and electrical circuitry are simple enough that very little needs to happen to get the music started.

When a *videotape* recorder is started in the play mode, the start-up time may be as much as five to eight seconds. It is far from being instantaneous. In fact, there is a considerable delay between the time the play button is pressed and when a stable picture is seen on the screen. The start-up delay is caused by the complexity of circuits necessary to create a video picture on a television screen.

Because of the start-up time delay in a VTR, there is a requirement in editing to backspace the machine to a point before the edit point. The amount of the backspace is usually determined by how long it takes the VTR to stabilize from a parked position. Typical backspace amounts are from three to ten seconds. The more expensive the VTR, the more accurate and sophisticated the circuitry, and the faster the lock-up time from a parked position.

The electronic editor determines the backspace for the editor (person). When asked to perform an edit, the machine will back the tape to the backspace point, pause, and then roll forward toward the edit point.

PREVIEW & PERFORM EDIT

After the edit points have been determined on both the playback and the record VTR's, most electronic editors are capable of previewing what the edit would look like if performed.

By pressing the preview button, both machines will backspace to the backspace point, pause, and then roll forward toward the edit points. When the machines reach the edit points, a simulated edit will appear on the record machine monitor. If the result is not what the editor (person) had in mind, either edit point may then be "trimmed."

The edit can be performed by pressing a button labeled "perform" or one with a similar designation. The machines will then backspace to the backspace point, roll forward and the editing VTR will automatically be placed into the record mode at the edit point.

TYPES OF EDITS

ASSEMBLE EDITING. An assemble edit should always done at the end of an existing scene, segment or program. It should not be used to insert a segment into the middle of an existing program. The most distinguishing feature of an assemble edit is that it begins with a clean, production switcher-like transition, but ends with several

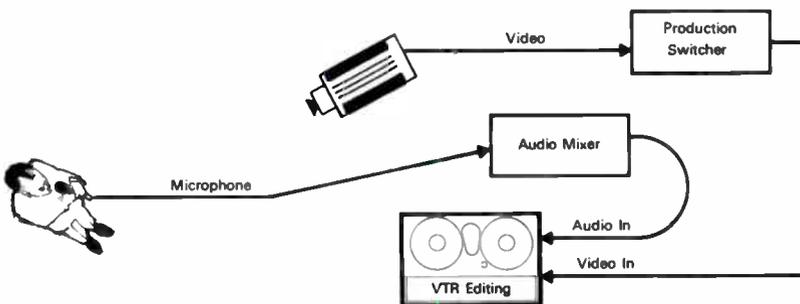


Illustration 13-1. Live Assemble Edit.

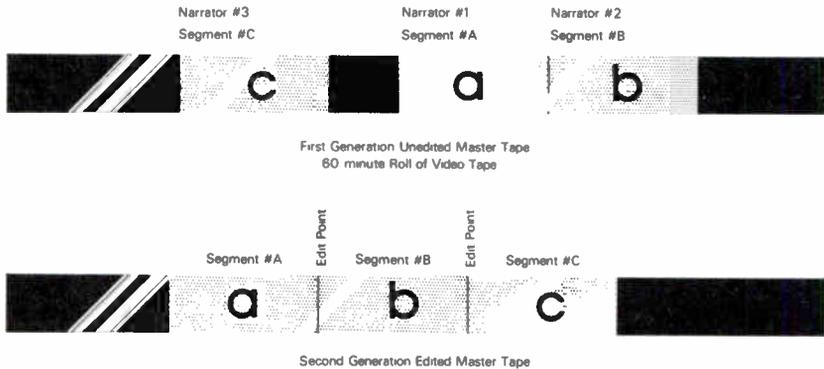


Illustration 13-2. Segment Assemble Edit.

seconds of breakup or glitches. That is why an assemble edit can only be used at the end of an existing segment of video.

If the program is recorded with the edited new segments coming from a live announcer, the edit is called a “live assemble edit.” If two videotape recorders are used with one machine transferring segments of video to the other VTR, the edit is called a “segment assemble edit.” Only one videotape machine is needed for a live assemble edit, while two VTR’s are required for a segment assemble edit.

INSERT EDITING. Insert editing differs from assemble editing in that the edited segments must be placed into the middle of an existing segment, scene, or program. An insert edit should not be attempted at the end of a segment of video. A little later in this chapter the section on control track will explain why this should not be done.

An insert edit may be done with a live announcer (live insert editing), or it may be done with two VTR’s and insert segments into other prerecorded video (segment insert editing).

Additionally, an insert edit has the capability on most editing systems of performing video and audio edits, video only edits, and audio only edits. This is particularly important when editing a complex program.

PROGRAMMED IN AND OUT POINTS

Low cost editing systems will expect the operator to manually determine when an edit is to stop and then to press a button to make

that happen. These systems are prone to human error, and mistakes result. Sophisticated electronic editors will use a different system, where the editor must program not only the point where the edit is to take place, but also the place where the VTR is to come out of the edit mode. If segment insert editing is being used, then there are actually four edit points which must be determined: in and out for the play VTR, and in and out for the record VTR.

Because the electronic editor is a computer, it thinks logically. So the operator only needs to specify three of the four edit points; the computer can do the necessary calculations to locate the fourth point based upon the location of the other three. The operator may select and “mark in” any of the three points that he or she desires and the electronic editor will mark the fourth.

VIDEOTAPE GENERATIONS

The videotape on which a segment or program is recorded is called a first generation tape. If that video is dubbed to another videotape, the second tape is called the second generation or a second generation dub. If the second generation copy is then dubbed to another tape, it would be the third generation dub. In other words, each successive dub takes on a new generation number.

If the master copy of a program is used to duplicate ten copies of the program, each copy would be a second generation dub.

It is important to understand that each time a program or segment is dubbed to another generation, there will be a loss of technical quality on the dubbed copy. The amount of the loss between generations is based upon three factors: 1) quality of the original video, 2) quality and condition (mechanical and electrical) of the videotape recorders used to make the dubs, and 3) whether any precautions were taken to reduce the potential loss.

Precautions which can reduce the potential loss of video signal quality between successive generations include the use of a processing amplifier (proc amp) or a time base corrector (TBC). Before the student can understand what these two devices do, it is first necessary to understand what the problems are with a dubbed video signal.

Basically, the signal coming from a videotape recorder has two types of problems or errors. Mechanical error is caused from friction and tension and results in “time base error.” Electrical error is caused from the videotape recording process itself.

A time base corrector, or TBC, can be used to correct any problems which have been caused by a mechanical error, and a proc amp can be used to help correct any electrical degradation in the VTR. It should be noted that a proc amp is usually contained in a TBC; it is not generally necessary to purchase both units. The primary difference between the two devices is cost: a TBC can cost many times more than a proc amp.

EDITING TRANSITIONS

A transition is the change from one camera shot to another. In simple terms it is a comparison between the last shot of one segment, and the first shot of a the next segment. A good transition involves careful shot selection for the two pieces of video being joined together. A bad transition is caused when the two shots do not match logically or make the talent do something which is unnatural. It is important for the beginning student of videotape editing to be concerned with transitions because they are often the most noticeable difference between an experienced and inexperienced videotape editor.

In addition to the shot selection for a transition, there are other factors which the editor must consider. For example, there are five different types of transitions from which the editor may select. Not all electronic editors are capable of performing all five, but with a little imagination, even a medium level device can provide some similar effects.

CUT OR TAKE. The most common transition is a cut or take. It is an instantaneous change from one shot to another and looks like a take on a production switcher. All electronic editors are capable of performing this type of transition, some with more accuracy than others. An audience perceives this transition as nothing more than a change in scene or camera angle.

THROUGH BLACK. An edit can be done through black by having the first video fade to black, and then the second video come up from black. The edit points would be in black and the transition commonly lasts just a second or two. Any electronic editor is capable of this transition, but the execution involves some planning by the editor to make it appear smooth. The audience perceives a through-

black transition as an indication of a major change in time, scene or place. In other words, there is a significant change in the program at the point of the edit.

DEFOCUS. Each camera can be defocused at the point of the edit to create an interesting effect. The first segment ends with the camera racking out of focus; the second segment begins out of focus, with the camera operator immediately racking into focus. This transition requires the same kind of coordination as the “through-black” transition. This effect indicates a change in time, scene, or place to the audience, but is most commonly used to indicate a flash-back in time.

DISSOLVE. The one transition most desired by all editors is the dissolve. The problem is that only very sophisticated electronic editors and videotape recorders are capable of performing a dissolve. It requires two playback VTR's along with a record machine. Additionally, it takes a great deal of experience on the part of the operator to effectively coordinate the two playback machines. A dissolve is used to suggest a minor change in time, scene, or place. It can also be used where a “take” would be too abrupt, such as in a change from a wide-angle shot to a close up.

SPECIAL EFFECTS. Sophisticated electronic editors which have been tied in to a control room have the ability of performing a number of traditional electronic special effects as a transition between scenes. A wipe, for example, could be programmed as a transition between two video segments. Or, any number of other special effects could be used. An audience perceives a special effect as a gimmick, which could suggest a change in time, scene, or place.

UNDESIRABLE TRANSITIONS. Most beginning editors are so worried about pushing the correct buttons in the proper sequence that they forget to pay attention to the continuity between scenes.

A “jump cut” is the most common result of an editor's failure to coordinate the last video of one scene with the first video of the next scene. A jump cut is created when the two video shots are very similar, but just a little different. For example, the last shot of one scene is a medium closeup of the talent holding an object. The first shot of the next scene is also a medium closeup of the same talent, but without the object. The result will appear as if it were a magic trick. The object will disappear, and the talent will move very suddenly across the screen.

Jump cuts are very distracting to an audience, and can call attention to themselves. When this happens, there is the potential of a loss of attention to the content of the program.

There are two methods of eliminating jump cuts from a program. First, if the shot selection of each scene is well planned, there will be very little possibility of a jump cut. And second, it is possible to cover up a jump cut with a third source of video called a cut away. For example, in the case of the talent holding the object, a video only insert edit placed over the edit (typically about five seconds) can cover up the mistake. In this case a reaction shot of the audience could be used as an effective cut away shot.

AUDIO AND VIDEO DELAY EDITS

Most editing systems only permit both the audio and video to be changed simultaneously. Some editors have learned methods of cheating their way around this handicap, but technically, most inexpensive electronic editors only allow a simultaneous audio and video edit.

A sophisticated electronic editor may have the ability to perform either a delayed audio or delayed video edit. Essentially, the effect is to have either the video or audio change while the other element remains the same for a predetermined period of time. This type of edit is particularly effective in the editing of a dramatic scene where the audio of the previous scene needs to overlap the video of the next scene.

ACCURACY OF EDITING

The accuracy of videotape editing is the ability of the VTR to perform the edit at the exact point selected by the editor. Inexpensive machines are famous for inaccurate edits. In other words, the editor may select the edit point very carefully only to find that the machine “slipped” while performing the edit. The amount of that “slip” is the accuracy of the system. Another common problem is a continued slipping during each preview. If several previews are used, and if the machines are not accurate, then the performed edit could be several seconds from the original edit point.

The accuracy of an editing system has a lot to do with three areas: 1) the condition of the equipment such as alignment and wear, 2) the

ability of the system to locate edit points consistently and accurately, and 3) the skills of the person operating the system.

FRAME-ACCURATE EDITING. The term “frame-accurate editing” is used in the television industry to illustrate an editing system which will always perform an edit at the exact point selected by the editor. Systems with this type of accuracy usually incorporate the use of time code.

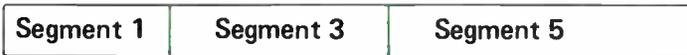
UPCUT. An “upcut” is the professional term used to denote the cutting off of the beginning of a segment. An upcut may be nothing more than the first syllable of a word, or it may be several seconds of the segment.

DOWNCUT. A “downcut” is the cutting off of a segment prior to the intended ending.

A-B ROLLS

In a dissolve transition, the editor uses two playback VTR’s and creates what is called an “A” and a “B” roll. The A-B rolls may be assembled for one particular transition, or the entire program can be assembled with the use of A-B rolls.

“A” ROLL



“B” ROLL



AB MIX

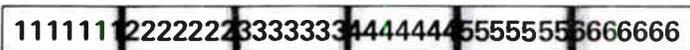


Illustration 13-3. Example of A B rolls.

Illustration 13-3 shows a six-segment program which has been assembled with the A-B roll technique. Note that each roll of videotape is the same length as the final program, but each roll contains alternate video segments. The odd numbered segments are on the "A" roll, and the even numbered segments are on the "B" roll.

If the two playback machines are started at exactly the same time, the segments, thus the transitions, will occur at the proper time. The editor switches from one playback machine to the other with a production switcher and can use any number of effects for the transitions.

CONTROL-TRACK-LOGIC AND TIME CODE

CONTROL TRACK. In Chapter 12 it was mentioned that a third electronic signal in addition to audio and video is recorded on a videotape by the VTR. That signal is a series of pulses called the "control track", and it performs a function similar to sprocket holes on motion picture film. In other words, the videotape recorder uses the control track pulses in the playback mode as a reference to keep the video picture stable. If for any reason the control track pulses are damaged, or are not recorded accurately, the videotape will not play back properly.

Control track pulses are the heartbeat of most medium-level editing systems. When the electronic editor backspaces to the backspace point, it is actually counting control track pulses. When the electronic editor is locating the edit point after a preview edit, it again is counting the control track pulses. Obviously, the ability of an editing VTR to record and play back control track pulses accurately is paramount to the accurate operation of a CTL (control track logic) editing system.

In both the normal record mode and in the assemble edit mode, the VTR records new control track pulses on the videotape. In the insert mode, however, there is no control track recorded on the videotape. The machine uses the previously recorded control track as a reference. This is the reason why an insert edit must be done in the middle of an existing segment or program. Actually, it must be done in the middle of existing control track.

TIME CODE. Time code editing is a system which is completely different from CTL editing. The most common type of time code is SMPTE (Society of Motion Picture and Television Engineers). SMPTE



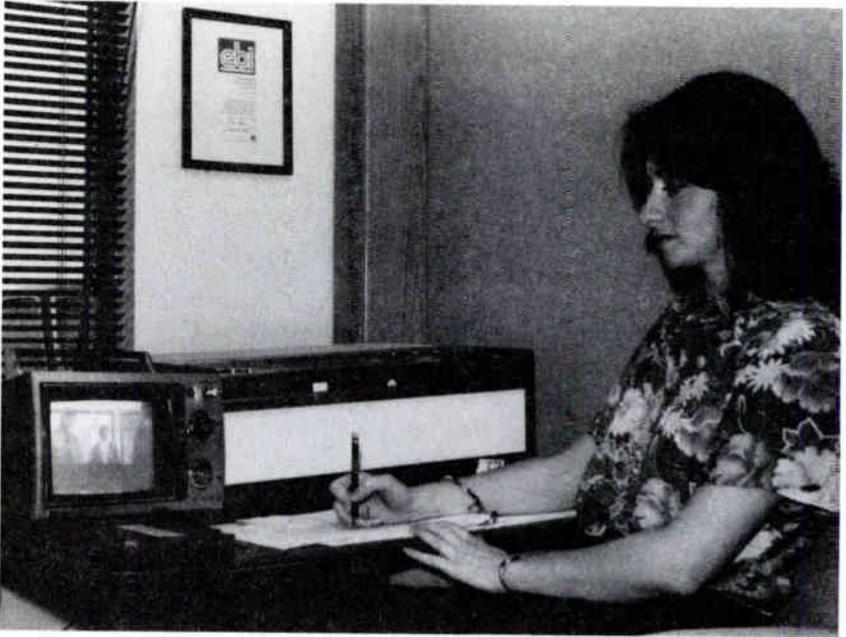
Picture 13-2. SMPTE time code displayed as a window in the video.

(pronounced SEMP-tee) time code is an audible signal which is recorded on an unused audio track on the VTR. It sounds like a digital audio signal when amplified to a speaker.

When time code is fed to a time code reader it creates a series of numbers which represent hours, minutes, seconds, and frames. A typical time code number could appear as 03:16:20:10. That number is read as three hours, sixteen minutes, twenty seconds, and ten frames. Because there are thirty frames in each second of video, the ten frames are the equivalent of one-third of a second.

When time code has been recorded on an audio track of a videotape, each frame of video has its own unique identification point or street address. No two points on the tape would have the same time code number.

What this provides the operator of the editing system is an ability to locate exact points of reference consistently without error. In a CTL system there is always a possibility of damaged control track, or the counter may make a mistake while shuttling videotape back and forth. But in a time code system there is not a possibility of confusing two points of reference; it is the most accurate form of videotape editing.



Picture 13-3. A director using off-line editing.

OFF-LINE EDITING

In order to understand “off-line editing”, we must first define “on-line editing.” On-line editing is the type which has been discussed thus far in this chapter. It is using a playback and record VTR with an electronic editor to perform edits.

An off-line approach uses a much different technique, and requires the use of a time code system. After all of the video segments have been shot, they are time-coded with a time-code generator. At this point a dub of all tapes is made with a special device which inserts a visual display of the time code in the video, or the picture. These dubs are called “off-line dubs.” Picture 13-2 shows a sample of time code appearing in the video.

The director can play back the off-line dubs on any videotape recorder. Editorial decisions can then be made outside of the control room, perhaps in the director’s office or in a special off-line viewing room. Difficult transitions can be plotted and any special problems can be worked out in advance of the actual editing session.

All of the edits to be made in the editing session are logged by the director on an “Edit Decision List”, which is a chronological list of all edits to be made in the program. In the actual editing session the director or editor will program each edit into the electronic editor by indicating the edit points by specific time code. The equipment is then controlled by the electronic editor and the edit is performed, very accurately.

CONTINUITY SHEETS

A director can keep a simple program — one with only two or three segments — very clear in his or her mind. However, when a program contains many segments, it is very easy to become confused, particularly in the editing session. For this reason, experienced videotape editors use a continuity sheet for better organization.

Illustration 13-4 is a sample of a continuity sheet for a typical program. “Segment Number” is merely a numerical listing of all segments which have been recorded, regardless of their apparent value or content. The “Scene Number” is a number designated on the script or by the director for each scene shot. It is possible, and quite common, for a director to misplace a segment on a reel of videotape. By adding a brief description of the scene in the “Description” column, a director can quickly locate the exact segment desired. The “Length” column is merely the length of each segment. “In Cues” and “Out Cues” can be either an aural, visual or a time-code reference as to the beginning and ending of each segment. And the “Rank” column is the place where the director makes a comment, such as “excellent”, or “false start” or some other designation which indicates the merit of the segment.

It is vital that the beginning editing student develop the habit of using some form of a continuity sheet from the outset of editing. Successful videotape editors use a form of the sheet.

SUMMARY

Videotape editing is, perhaps, one of the most exciting of all production topics. It is the one topic which has created the most interest in recent years. And, it is one of the areas where technology has passed up the ability of the user. The television industry is full of “former producers” who don’t know the difference between a time

code and a continuity sheet. Today's student of television production has the obligation to learn not only the difference between those two items, but also to learn the proper use of the equipment.

CONTINUITY SHEET						
Segment Number	Scene Number	Scene Description	Length	In Cue	Out Cue	Rank
1	1-1	Pan of building exterior	10"	Move	See door	Poor
2	1-1	" " " "	10"	"	" "	Ok
3	1-1	" " " "	10"	"	" "	Good
4	1-5	Annrc walking into frame	25"	Walk	"today."	Good
5	1-5	" " " "	25"	"	"	Use
6	2-3	Enter building	5"	Turns		Bad
7	2-3	Enter building	22"	Turns	Exits	Good
8	2-22	Intro of President	15"	1st Word	Pan	Good
9	3-2	Welcome by President	50"	Smile	Pause	Rough
10	3-2	" " "	53"	"	"	Jerky
11	3-2	" " "	49"	"	"	Good
12	4-1	Annrc in factory	55"	Move	Walk out	Good
13	4-1	" " "	5"	"		Bad
14	4-1	" " "	58"	"	"	Better
15	5-5	Annrc walking out back	38"	Enter	Exit	Great
16	5-30	Annrc in parking lot	15"	1st Word	"Company"	Fair
17	5-30	" " " "	14"	" "	"	Good
18	5-30A	Annrc close-up cut away	5"	"We"	"here"	Good
19	6-10	Closing of program	22"	Turns	Walks	Noise
20	6-10	" " "	21"	"	"	Good

Illustration 13-4. Continuity sheet.

CHAPTER THIRTEEN QUESTIONS

1. What happens when an edit is attempted on a VTR which is NOT an editing machine?
2. In a paragraph, where are the most likely edit points to be found?
3. On the videotape, where is the backspace point in relation to the edit point? Before or after?
4. What is the difference between an assemble edit and an insert edit?
5. When should an assemble edit be used over an insert edit?
6. How many VTR's are required for a live assemble edit? How many for a segment assemble? How many for a live insert? How many for a segment insert?
7. How many in and out edit points must be programmed into the editor before it will preview the edit?
8. What is the relationship between videotape generations and video quality?
9. What type of problems does a TBC correct? A proc amp?
10. Discuss the following transitions and list an example of when each could be used effectively in a program: cut, through black, defocus, dissolve, and a special effect.
11. Describe a jump cut.
12. What is "frame accurate editing"?
13. What is the difference between an "up cut" and a "down cut"?
14. What type of program could be assembled using an A B roll technique?
15. What is the difference between CTL and time code editing?
16. In long form, what is the following: 08:12:15:29?
17. What is the advantage of using off-line editing?

Part III.
Portable Production Techniques



14. Remote Production Techniques

In 1968 a leading television equipment manufacturer put on a demonstration at a convention of “the new generation of portable television equipment.” A group of three sales persons rehearsed for a week for the demonstration and set up a two camera shoot with switcher and videotape recorder. It took the group slightly more than sixteen minutes to set up the equipment. The television professionals in attendance were so impressed by the incredible display of “new equipment” that the three sales people received a standing ovation.

The demonstration in 1968 was the beginning of a new dimension for the television industry. It signaled the initiation of portable, lightweight cameras which can even be operated on batteries, of compact videotape recorders, and system reliability which had not been seen in the past.

Today the users of portable television production equipment expect all of the flexibility of the film producer, with the high technical quality of the studio operation. And they get both.

In a studio the physical environment is controlled and somewhat predictable. When the production crew leaves the studio, however, and goes “remote”, many of the predictable rules change and the director must play with a different rulebook. Remote locations are typically not suited for “studio operation.” After all, the reason for the remote is to shoot an event which could not be created in the studio. In a studio the environment is adapted to the requirements of the television medium; in a remote production the television equipment must be adapted to the environment. In this chapter we will discuss the major differences between shooting in the studio and in the field.

PRODUCTION CREW

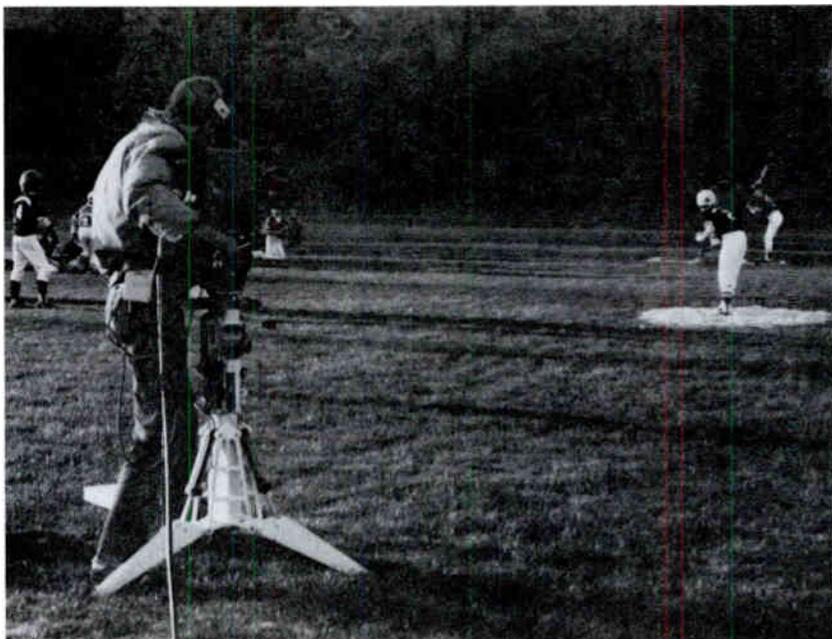
In the studio the crew size is determined by the complexity of the program. In a remote shoot the crew size is determined not only by the complexity of the program, but also by the physical location of the shoot.

A studio shoot may require a crew of one or two persons or ten times that number, depending upon what type of program is being produced. A remote production has many similarities. Some portable shoots can be effectively done with one or two persons on the crew; other programs may require literally dozens of persons in a wide variety of positions.

In most remote or portable production situations, the following job functions must be covered by someone on the crew: producer, director, camera operator, lighting director, audio technician, video technician and VTR operator. Additionally, a complex remote shoot may require people for: makeup, assistants for the jobs named previously, and grips (people whose job is to lift, carry and push equipment).

PORTABLE CAMERA OPERATION

In a studio the camera operator works on a smooth floor with few obstacles to restrict camera movement. That is probably not the case on a remote. Remote locations are usually not suited for extensive camera movement. For that reason many remote programs are shot in short scenes without extensive camera movement. Camera dollies (the wheel assembly at the base of the tripod) are sometimes a handicap rather than an advantage on remotes. Many experienced



Picture 14-1. Portable cameras can be taken anywhere.

remote camera operators don't use them unless a dolly or truck is specified in the scene.

Television camera manufacturers push the use of hand-held cameras for remote applications. But there are actually very few applications where a hand-held camera should be used. Experienced camera operators use a tripod whenever possible because it offers greater stability over a hand-held camera. Beginning camera operators should take note of this fact.

REMOTE LIGHTING

In a controlled studio environment all ambient light (light which exists before the television lights are added) is turned off and television lights are used to create the proper light levels and desired mood for the production. In most remote situations the lighting director uses completely different techniques than would be used in a controlled studio environment.



Picture 14-2. Remote lighting is much different than studio lighting.

The remote lighting director must keep in mind that the reason for the remote is to capture an existing environment, look or feeling, not to create an artificial studio appearance. For this reason most remote lighting consists of adding to the ambient or existing light. A fill light may decrease an already high contrast appearance, or a little more back light may help separate the talent from some object in the background. Some added light may lend a visual highlight to a product. The standard lighting formulas discussed in Chapter Four are used only when the director desires to create a studio look in a remote location.

One technique which the remote lighting director must learn well is the elimination or control of ambient light sources. Lighting outdoors often has as much to do with the control of existing light as it does with the addition of new light fixtures.

SCRIPTING FOR PORTABLE PRODUCTION

In the studio an environment is adapted or created as indicated by the program script. But for a portable production, the scriptwriter

must create a script based upon the physical limitations where the scene will be shot. That means that a script for a remote shoot is basically different than a script for a studio shoot. It is essential that the scriptwriter be very familiar with all shooting locations as well as any objects or remote props which will be used in the program. Experienced scriptwriters will make several visits to the site where a program is scheduled to be shot. In those visits the writer must visualize each shot and mentally calculate all movements of talent, props and cameras.

Experience plays an important part in the writing of a successful script for a remote shoot. The mere timing of words or phrases for talent or prop movement requires years of experience. Successful writers learn from mistakes and are quick to adapt to new situations.

Many directors require the scriptwriter to be on location during the shooting of a complex scene. Frequently it is necessary to change the script to match the way the scene must be shot. Minor dialogue changes in remote dramatic scenes are very common.

REMOTE AUDIO PICK-UP

The difference between studio and remote audio pick-up is basically the control of ambient sources of sound. Studios are constructed to be sound proof, have proper accoustics and eliminate unwanted sounds. Remote locations, however, may have high noise levels or undesirable accoustical properties. For this reason the audio production engineer for a remote shoot must be experienced with the control of sounds. Wind noise caused by the movement of air across a microphone may be partially or completely controlled with the use of a wind screen on the mike. Unwanted background sounds may often be partially eliminated by placing the mike as close as possible to the source of sound desired. This will cause an increased amplitude or audio level for that mike. As a result, the audio technician must compensate by lowering the level at the mike mixer, which in turn lowers the level of the unwanted background sounds as well. The net result is a higher ratio between desired and undesired sources of sound.

In the studio it may be possible to use a boom microphone to pick up the voices of a two-person interview because there should be little room reverberation or ambient sound. In a factory, however, a boom

mike would probably pick up so much extraneous sound that the interview might not even be heard by the viewing audience. An audio engineer picking up voices in a factory should experiment with lapel mikes clipped close to the talent's mouth, a hand-held announcer's mike, and perhaps prerecorded voices mixed with factory ambience.

Because the purpose of a remote is to capture the feeling of the location, the audio engineer should place microphones so they will pick up *some* of the room ambience. If at all possible, room ambience should be recorded separately from the program audio for later mixing into the program audio track. This process will aid the director in his or her attempt to create a true remote look and feeling.

SOURCES AND STAGING OF VISUALS FOR REMOTES

In the studio the director selects a combination of scenery and props to establish a scene, mood, or feeling. It is common for the director to spend countless hours in the selection and staging of visual elements in the studio. A remote shoot is different. The location was chosen because it probably already had the necessary visual elements.

The selection of visual elements is done, therefore, when the site is specified by the scriptwriter or director. Hopefully, few if any additional props need to be added to the scene. If they do, all of the basic rules of staging for television should be considered.

PORTABLE VIDEOTAPE RECORDERS

Lightweight videotape recorders capable of operating on either internal batteries or standard electrical voltage are available from several manufacturers. The features most desirable for portable production use include: long battery life, meter to indicate battery usage, ability to perform assemble edits in the field, on and off pause control from a trigger on the camera, audio and video level metering, and professional audio and video connectors for inputs and outputs.

Many portable videotape recorders have cases which are designed to attach to shoulder straps. If the tape recorder will be moved frequently, this type of capability may be desirable.

CONCLUSION

The television industry has come a long way from the heavy, unreliable equipment of a few years ago. Today, it is possible for the television producer literally to go anywhere to shoot a program. Programs, for example, have been produced by Eskimos on an ice pack in the Arctic Ocean. Cameras are frequently taken into burning buildings for training purposes, and high school students use portable systems much as Super-8 systems were used just a few years ago.

The techniques of portable television production are different from the traditional techniques used for studio production. It is the responsibility of the persons using the portable equipment to master the techniques necessary to produce meaningful programs which solve specific problems.

CHAPTER FOURTEEN QUESTIONS

1. What are the differences between a studio crew and a remote crew?
2. What are the differences between studio camera operation and remote camera operation?
3. What are the differences between studio lighting techniques and remote lighting techniques?
4. What are the differences between scripting for a studio shoot and scripting for a remote shoot?
5. What are the differences between audio pick up in a studio and audio pick up at a remote site?

15. *Film Style Shooting*

Television in the 1950's was essentially live production where a director made permanent, irrevocable decisions with a production switcher. Since the programs were live, it was not possible to change a shot once it passed by the production switcher. The videotape recorder was introduced in 1956 by Ampex Corporation, but it was only a recording device; no editing was possible.

In the 1960's videotape editing was perfected to a point that programs could be modified after they had been taped. Early editing, however, was crude by our standards today. The person doing videotape editing in the early 1960's looked more like a scientist peering through a microscope than an artist creating a television program.

The technology of videotape editing was sufficiently advanced in the 1970's to enable total freedom with regard to producing programs. Inexpensive electronic editors brought about wide-spread use of "film style techniques."

The 1980's offer even more advances in technology to produce programs. Higher quality equipment with greater sophistication will bring costs down, quality up, and increased and more professional techniques.

FILM STYLE PRODUCTION

For the beginning student of television production to understand film style shooting, he or she must first understand the historical differences between traditional television studio production and motion picture film production.

Since the early days of motion picture film production, the film directors have had almost total freedom to edit a program after it has been shot. This freedom led to creativity and experience for the film directors, and to a conditioning of the audiences. The film crews learned basic cinematography and by viewing films over a period of time, the audiences learned what to expect on the screen.

When television came along the TV directors were unable to achieve the production levels of their film counterparts. The quality of early television production was definitely inferior to film programs of the same era. In fact, there were some interesting debates between film and television directors as to the relative merits of the two media.

The space programs of the 1960's increased the technology of computer circuits. And as that new technology entered the television industry, TV producers and directors were given the opportunity to edit a program after it had been shot. In fact, the technology soon advanced to the point where television directors were able to do almost everything film directors could do.

Because film directors had developed portable production techniques, and had conditioned audiences as to what to expect from a program, television directors had to adopt the filmmakers' techniques. And that is why television directors today use "film style" techniques to shoot their programs.

STUDIO VS. FILM STYLE SHOOTING

After the student understands the differences between a film director and a television director, he or she must then consider the differences between the traditional television studio director and a television director using film style techniques. It is important to keep



Picture 15-1. The director must be able to work closely with the talent.

in mind that film style techniques may be used either in the studio or at a remote location; film style is a technique of producing programs.

The traditional studio director has been trained to shoot programs as one long scene, in chronological order, and often with a “live” look. Film style directors, on the other hand, break the program down into specific scenes and camera angles. Each shot is carefully calculated and planned in advance and not necessarily shot in chronological order.

The director of a live studio production must learn to work under immediate and constant pressure. The clock keeps ticking and decisions must be made, oftentimes without enough time to consider alternatives. A remote production television director is under a different type of pressure. He or she is directing the taping of numerous scenes, segments or camera angles which will later be brought together to make a cohesive, finished product.

A live studio director has camera monitors which display what each camera is seeing. The director prompts the camera operators as to changes in angles, movement and so forth. Quite often a television director using the film style approach will not have a camera monitor

other than the camera's viewfinder to see framing and movement. In these cases the director must depend heavily upon the ability and experience of the camera operator for correct composition and movements based upon proper motivation. It is necessary in these circumstances for the director and camera operator to work as a team. Film style camera operators generally need more experience than most studio camera operators.

FILM STYLE TECHNIQUES

Film style technique is best illustrated by the fact that each shot or scene is rehearsed individually and then recorded on videotape. Each time a scene or shot is recorded it is labelled with a number such as take one, take two, and so forth. It is common for a film style director to record several takes of the same scene for protection purposes. Close up shots, cut aways, reaction shots, and wide angles may even be shot after the "good" take has been recorded. In other words each visual element is considered individually, while integration of shots or scenes is done during the editing session.

If for example, there is a scene in which two persons carry on a dialogue for a period of time, each person's lines may be recorded or shot separately from different camera angles and edited together at a later time. The technique of changing a camera from one position to another to record different angles of the same scene is called "reversals." The perspective is reversed for the audience so that they can see both sides of a discussion.

A director using film style shooting must have extensive experience with that technique to be able to keep all of the visual elements clear in his or her mind during the shooting session. As a general rule a director using the film style technique must be better organized and prepared than the traditional studio director. A studio director can shoot with only an outline of a script, but the film style director must have a detailed script with exact instructions as to content, camera angles and so forth.

SUMMARY

Educational and business administrators have frequently wondered when the television industry was going to settle down so that the equipment would not change so drastically and so frequently. For

the past two decades the manufacturers have introduced new equipment each year. And each new product seems to make existing equipment obsolete in studios around the world. Producers who think they can wait to purchase equipment “until things settle down” will probably have a long wait. If the past is an indicator of the future, the television industry will continue to obsolete equipment on a regular basis.

However, it has been the dynamic nature of the television industry which has brought about the abilities the producers now have. Without the seemingly constant change in equipment, film style techniques would still be a dream of the future.

CHAPTER FIFTEEN QUESTIONS

1. Why is the term “film style shooting” used in the television industry?
2. What are the differences between traditional studio production and film style shooting?
3. Discuss the film style techniques commonly used today.

16. Directing in The Field

Inasmuch as the direction of a television program or scene using “portable techniques” is a relatively new art, it is necessary to discuss those basic techniques as a separate chapter.

The most important quality or technique of any director, studio or portable, is the ability to “take charge”, to gather a group of people, props and equipment and record a scene or program which meets the goals of the producer. Often new directors fail not as a result of a lack of knowledge, but because they lack an ability to firmly grasp a situation and make quick decisions. Experience is a partial remedy for this problem, but it takes much more than just a few programs to one’s credit to become an effective director.

Television direction is similar to military command, or to the managerial abilities one needs in business. It is leadership, having a strong personality, being aggressive and passive when necessary, having a good knowledge of television production, the ability to solve problems quickly, and perhaps being a Father Confessor on occasions.

In addition to the qualities listed above, there are specific things which need to be done for the taping of a program using portable techniques. These are mostly those areas where studio and remote direction differ in style and technique.

KNOWLEDGE OF EDITING. A director using the portable production techniques, commonly called film style shooting, should have a good understanding of the following principles of VTR editing: assemble and insert editing, control track, transitions, back spacing and edit points. These concepts are discussed in Chapter 13 of this text.

PLANNING. There is a tendency for the beginning producer and director to treat portable production much the same as traditional studio production. Portable production, however, requires a great deal more planning in such areas as the call sheets, personal organization and the program script.

Without a detailed program script the director using the film style approach will most likely commit potentially fatal errors which will not be recognized until the editing session. In the editing session it may be too late to correct these problems. As a general rule, more attention should be given to the program script of a film style production, than to a traditional multiple camera studio production.

CALL SHEET. A “call sheet” is a listing of the talent, locations, props, crew assignments, equipment, arrival times, departure times, special requirements and other information about the shoot. The call sheet is published several days in advance of the shoot to help coordinate all of the production elements.

Successful directors who use the film style approach are, on the whole, better organized personally than directors who merely use the traditional studio approach. It requires a conscious effort on the director’s part to become personally organized.

FIXED TIME ELEMENT. Another aspect of the film style technique which is different than studio production is the “fixed time element.” In portable production it is common to record either the audio or video portion of a program first, and then match the other element to the first element in editing. In other words, the audio element of a program, read by an off-camera announcer, can be recorded first. Then, during videotaping, the visual elements can be shot to match the audio element. Or, it is possible to shoot visual scenes which tell a story, and match the audio element to the video during editing.

Staff	Name	Time	Staff	Name	Time
Director	Olson	6:00	Audio Tech	Cook	6:00
Asst Director	Parker	6:00	Boom Operator		
Prod Manager			Asst Boom Op		
Prod Assist	Smith	6:00	Make-up	Burns	6:00
Casting	Bennett	6:00	Asst Make-up		
Script Clerk	Myers	7:00	Hairdresser		
Stills			Wardrobe		
VTR Operator	Ellis	6:00	Property Mgr		
Floor Manager			Set Dresser		
Tech Supervisor	Rash	6:00	Other Crew		
Camera Tech	Ellis	6:00			
Camera Operator	Kuramada	6:00			
Camera Operator					
Asst Camera Op					
Gaffer	Merrick	6:00			
Key Grip	Williams	6:00			
Grip-Gaffer	Whiteside	6:00			
Grip-Gaffer					

Time Schedule	Scene Number	Props	Cast	To Make-up	On Set
6:00	Set-up	Jackets	Chad	6:00	6:30
6:30	21, 24	Money	1st Employee	6:30	7:00
7:30	22, 23	Family picture	2nd Employee	7:00	7:30
8:30	Set-up	Training Room	3rd Employee	8:00	8:30
9:30	11, 12	Baseball	4th Employee	8:00	8:30
10:30	13, 15	Paper, pens	5th Employee	8:30	9:00
11:30	Lunch		General Mgr	9:00	9:30
12:30	18	Extra Chairs			

Vehicles and Special Instructions

Assorted offices and supplies needed for scene 13
 Chad's car must be on set before 2:00 P.M.

Illustration 16-1. Production Call Sheet.

In traditional studio production both elements are usually taped at the same time and both elements determine the actual length of the program. In film style shooting, however, it is possible to record either element first and match the second element to the first. In this manner the length of the program may be determined by either the audio or the video portion of the production.

REMOTE FADES. Simple videotape editing systems do not have the capability of producing a “fade up” or a “fade to black”, during the editing session. An editing system must have sophisticated editing and processing capabilities before it can provide these types of features.

If a director is using a system which does not have the ability to add fades during editing, it is necessary to perform a manual fade at the remote site. A manual fade to black can be done by placing an object (such as the camera operator’s hand) over the lens with a uniform movement. Or a fade can be accomplished by closing down the f-stop to the closed position. It takes good planning and excellent coordination among the camera operator, director and the talent to effectively use a manual fading system.

HEADS AND TAILS. In Chapter 13 it was mentioned that an editing system utilized a signal called control track to measure the distance to the backspace point. Most backspace points are at least five seconds before the actual edit point. That being the case, it is necessary for the director and videotape operator to record a “head” consisting of at least five seconds of video before the talent is cued or the scene begins. (Actually, most heads should be eight to ten seconds in length.) That five-second pause will provide the control track necessary to enable editing at a later time.

A “tail” is a recorded pause at the end of the scene. Editing systems do not require control track at the end of a scene, but it is a good practice to provide a recorded pause (tail) at the end of each recorded scene. Tails are typically five to eight seconds in length.

AUDIO AND VIDEO LEVELS. Proper adjustment of video and audio levels is paramount to the overall success of a program. Many programs and scenes have been ruined by a careless mistake regarding the levels. It is important to remember that once the levels of a scene have been improperly recorded, they cannot be corrected in the editing session. Consequently, it is vital that a person be charged with the responsibility of setting, and maintaining, the proper audio and video levels on the remote videotape recorder.

SHOOT FOR THE EDIT. After a director has produced several film style programs, it will be possible for him or her to plan each scene specifically for the editing session. The goal of a film style director is to plan each transition as the scene is shot. By paying attention to the beginning and ending of each scene, the director can prevent

mistakes such as jump cuts or improper screen action. Shooting for the editing session will also reduce by a considerable amount the time necessary for editing.

SUMMARY

The ability of a director and crew to effectively use film style techniques is directly related to their understanding and experience with the techniques. A new director should use simple, straightforward programs and scenes as a training ground for the more difficult programs ahead. Only through practice and self-critique can a crew become proficient with the film style approach.

CHAPTER SIXTEEN QUESTIONS

1. What is the purpose of a Call Sheet?
2. How can a Call Sheet be incorporated in your production system?
3. What is a “fixed time element”?
4. How does a director determine if the audio or video will be the fixed time element?
5. List several methods of producing a fade to black in the field.
6. What is a “head”? A “tail”?
7. How can a director plan to “shoot for the edit”?

Part IV.
Advanced Production Techniques



17. Staging for Television

Proper utilization of good staging principles is one of the most important earmarks of a professional television production. It is surprising to find, therefore, that very little has been written to instruct television directors in good staging practices.

In this chapter, staging will be defined as the placement of visual elements in the television studio or remote location. These elements will be considered in terms of what the viewer sees and how the viewer may react to the visual feeling created by the director. This includes the placement of props (anything in the foreground) and scenery (anything in the background), as well as the talent and the cameras.

Unfortunately, there is no single set of staging rules that works for every situation. The television director must consider staging a production from aesthetic (or artistic), psychological, and practical points of view. Oftentimes, the best psychological effect is not practical to produce with a limited budget or production system. It is

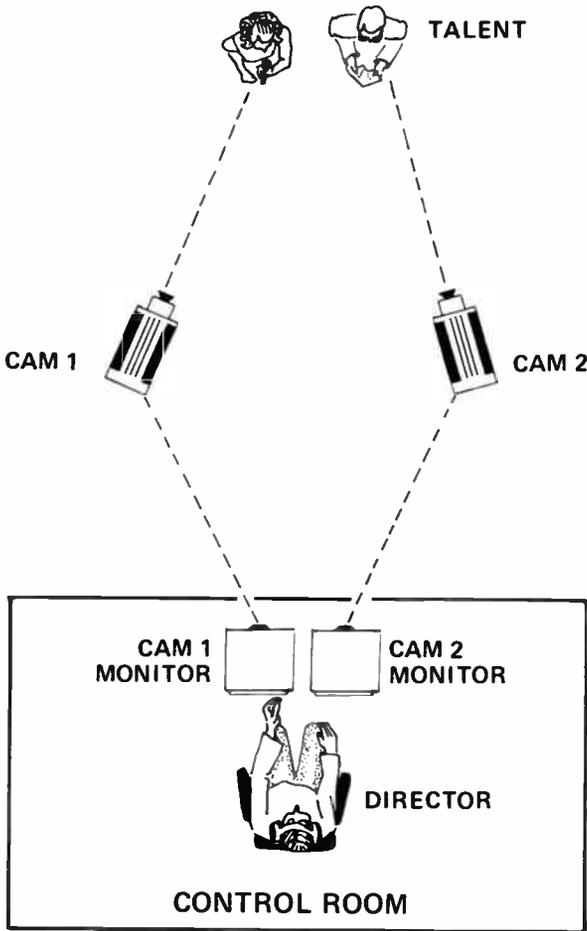


Illustration 17-1. Uniform perspective.

the task of the director to consider every aspect of the situation and to reach a compromise which will most closely produce the desired effect.

STAGING THE CAMERAS

The positioning of cameras in television production is critical. When placing cameras in a multiple-camera production, Camera 1

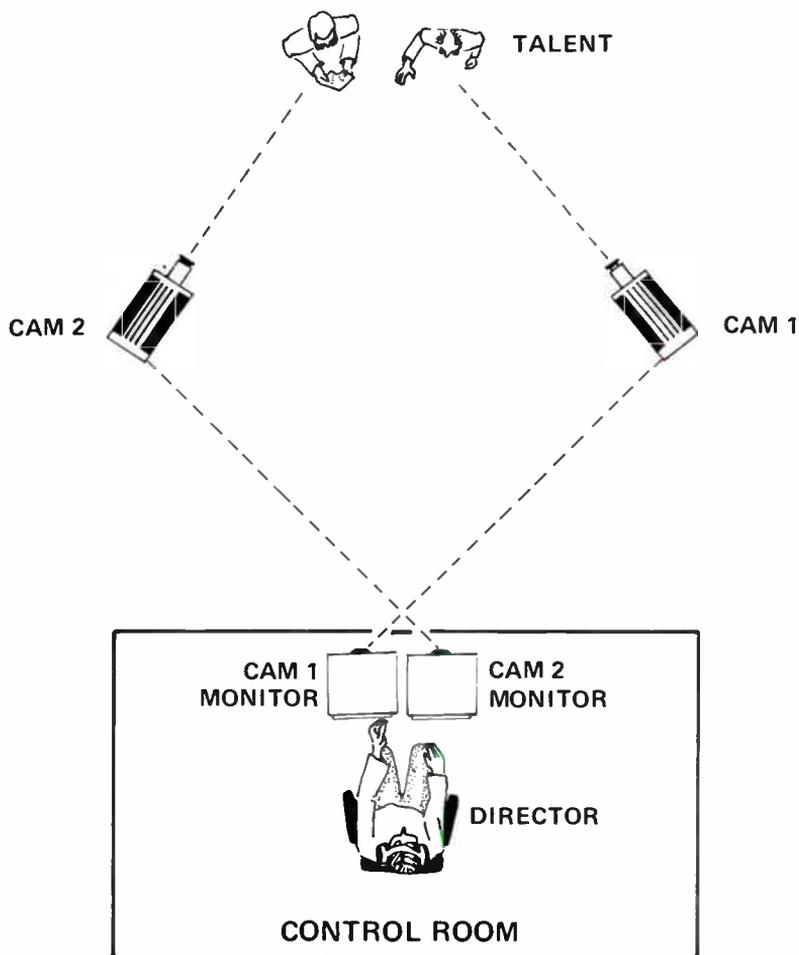


Illustration 17-2. No perspective uniformity.

should be placed to the left and Camera 2 to the right (as viewed from behind the cameras). (See *Illustration 17-1*.) In the control room, the director's monitors and inputs on the production switcher will also be positioned left to right. This creates a perspective uniformity for the director and camera operators which will avoid any misunderstandings. It should be noted that this seemingly "natural" order to the placement of cameras, inputs and monitors is actually determined by our western culture custom of reading from left to right. In some

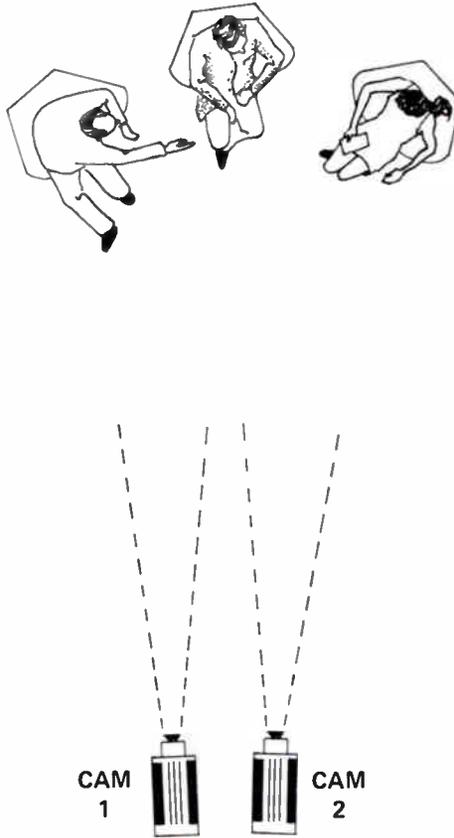


Illustration 17-3. Inverted-V or friendly grouping without cross-shooting or camera splitting.

cultures, other arrangements may be more “natural.”

To avoid physically “crossing the cameras” and the confusion that results, the cameras should be labelled in both the front and the back with a large “1”, “2”, etc., for camera operators and the talent to see. Then, if a performer is requested to look into Camera 2, he or she can locate the proper camera quickly. In short, consistent positioning of the cameras is important to everyone in the studio.

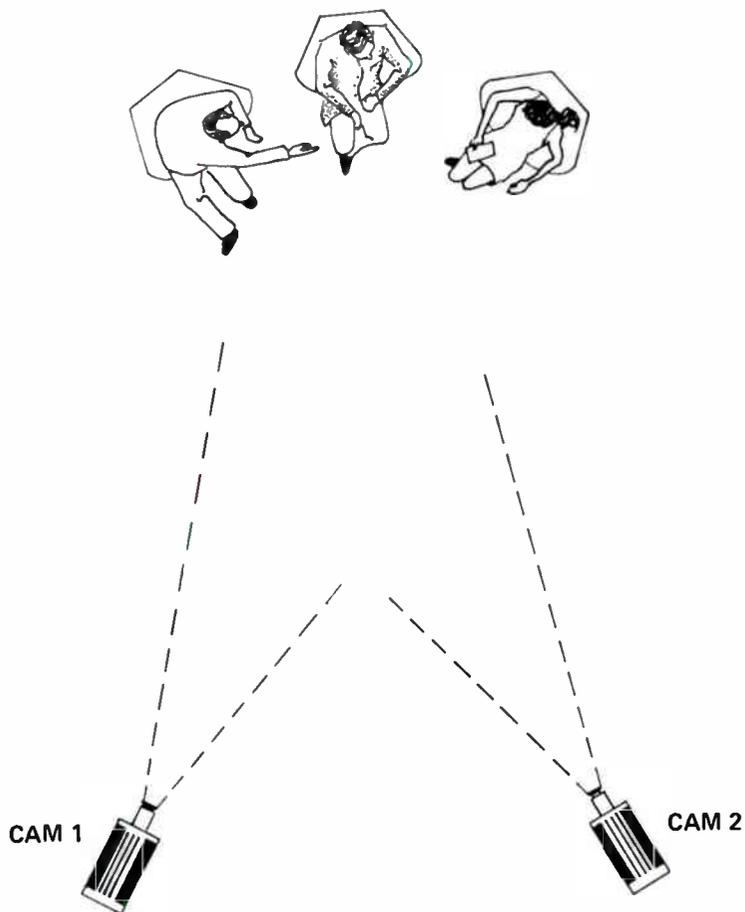


Illustration 17-4. Inverted-V or friendly grouping with the cameras split and cross-shooting.

CROSS-SHOOTING

Cross-shooting with two or more cameras is the practice of using the camera on the right to televise people on the left, and the camera on the left to televise people on the right, as shown in Illustration 17-4.

Note that cross-shooting is the crossing of a field of vision, not the cameras themselves. The camera operator and director still have a uniform perspective. This technique is applicable to either a two-person interview or a panel discussion with several persons.

CAMERA SPLITTING. Effective cross-shooting requires splitting the cameras to the point that each one has a true head-on shot of the people to whom it has been assigned. If the cameras are not split enough when cross-shooting, the panelists will be profiled most of the time. A few profile shots are fine, but too many make the viewing audience feel as though they are peeking around a corner.

THREE-PERSON PANEL. The correct way to shoot a three-person panel discussion in an inverted-V format is to split the cameras. First move the cameras apart, as much as fifteen or twenty feet, and then cross-shoot the scene. This method will provide a front and three-quarter face view of each panelist.

180 DEGREE LINE OF ACTION

There is a point beyond which a scene cannot be shot without transposing persons or objects. If the set is viewed as a circle, the proper production area would be a horizontal line from left to right of the set, bisecting the circle, or dividing it in halves. Behind that line, a mirror effect is achieved, and the panel members, talent, etc. change positions when the director changes from one camera position to another.

In other words, if the scene were a dramatic sequence with two persons shot in a two-shot from one side of the 180-degree line of action, and the director were then to cut to a two-shot from the opposite side of the action line, the talent would be transposed on the screen. In the first shot one actor would be looking to screen left. When the cut was made the same person would be looking to screen right. The result to the viewing audience would be confusion and disorientation.

Every production situation has an action line which must be observed by the director. But perhaps the most precise action line involves the televising of sporting events that have a basket or goal. A beginning director was asked a few years ago to broadcast a sold out high school basket ball game to the adjoining classrooms. Being a new director, he decided that a simple approach would present the fewest

problems. Two cameras were used, one on each side of the court. Camera 1 was asked to remain wide and merely pan back and forth as the action moved. Camera 2 was to get a close-up shot of each basket so that the audience could see if the basketball went through the hoop.

As a player would shoot the ball the director would take the close-up camera from the opposite side of the court while the ball was in mid-air. The result was that a player would shoot the ball to the basket on the left, but it would go in the basket to the right. It was very confusing to the viewers. The most interesting thing about the experience was, however, that the director could not determine on his own what was wrong with the situation. Only later did he learn what his staging error had been.

TRANSPOSING THE TALENT

Viewers can be confused by transposing of the talent just as they were during the televising of the basketball game mentioned above. Suppose that during a three-person interview program a director has given orders for Camera 1 to get a two-shot right, and Camera 2 is to focus on a two-shot left. When the director switches from one camera to the other, the person in the middle will move from one side of the screen to the other. In effect, the person appears to change from one chair to another each time the director changes cameras. Unless there are many wide-angle shots of the entire scene, this type of transposing can be frustrating to the audience.

STAGING THE TALENT

How the talent — the people in front of the cameras — place themselves in relation to each other tells an audience a great deal about what is happening in the conversation. For example, if two people are standing very close and face-to-face as they speak (See *Picture 17-1*), the staging indicates an atmosphere of tension, debate or conflict. In *Picture 17-2* the talent have been staged side-by-side and the projection of feeling is much different: coldness, separateness, or indifference. *Picture 17-3* has a completely different feeling than the other two examples. It presents an air of friendliness or a relaxed feeling. The staging of the talent can express formality or informality, friendly cooperation or conflict.



Picture 17-1. Head to head.



Picture 17-2. Straight line.



Picture 17-3. Inverted V.

Not only does the method of staging the talent affect the way an audience perceives the scene, but the staging can also alter the feeling of those who are participating on camera. It is possible, therefore, for the staging of the talent to ultimately control the outcome of a discussion or debate. It can make a discussion a debate, or a debate a discussion.

SOCIAL DISTANCE

Studies of non-verbal communication in our culture show that friendliness can be expressed by people being physically close to each other, and that formality can be expressed by a large amount of physical space. These distances and proximities and their meanings are called social distance. The greater the physical distance between people, the greater the formality. (Refer to the following section on *distance distortion in television*.) Separation can also reflect hostility,

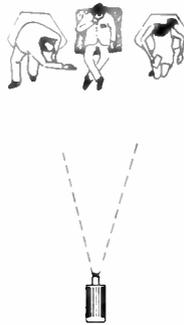


Illustration 17-5. The straight-line panel is not conducive to discussion.

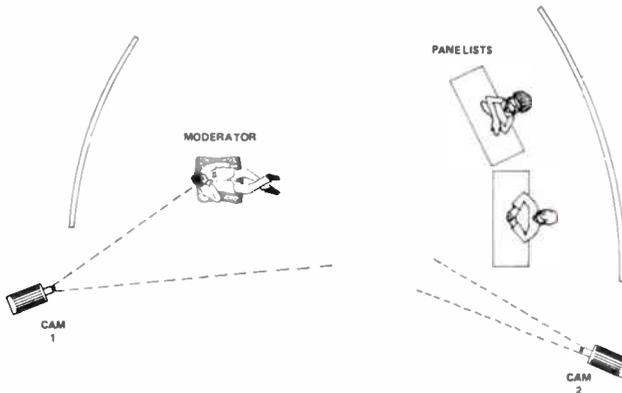


Illustration 17-6. Above is an illustration of the swivel-chair panel discussion, and a suggestion as to how to shoot it using a two-camera production.

unfriendliness or conflict. Conversely, closeness suggests intimacy, casualness or friendliness. Moving people apart may symbolize unequal status, or it may symbolize the respect owed to a person of authority.

A good example of these varying effects can be seen in the arrangement of a simple panel discussion. The panel is an effective, yet simple, program format for beginners as well as professionals. The panel may be arranged in a number of ways, depending on the goal of the producer.

STRAIGHT LINE PANEL. One type of panel discussion is the “straight line” discussion. In this arrangement, panelists cannot easily talk among themselves and the impression is one of formality. This

format may work well in an interview situation in which the interviewer is off-camera, asking questions to the panel. But the panel members will find the staging not conducive to any discussion among themselves. The arrangement makes it practical for a one-camera facility to pan the camera back and forth continuously among the speakers (See *Illustration 17-5*).

SWIVEL CHAIR PANEL. The “swivel-chair” panel discussion is perhaps one of the most creative panel configurations. It works well for a weekly interview program. The moderator, the person who hosts the program each week, does not need to be spotlighted. For an inexpensive one-camera production, the host may be seated in a swivel chair directly in front of the camera. The camera operator shoots over the host’s shoulder to the panel members. When the director wants a shot of the host, the host merely swivels the chair

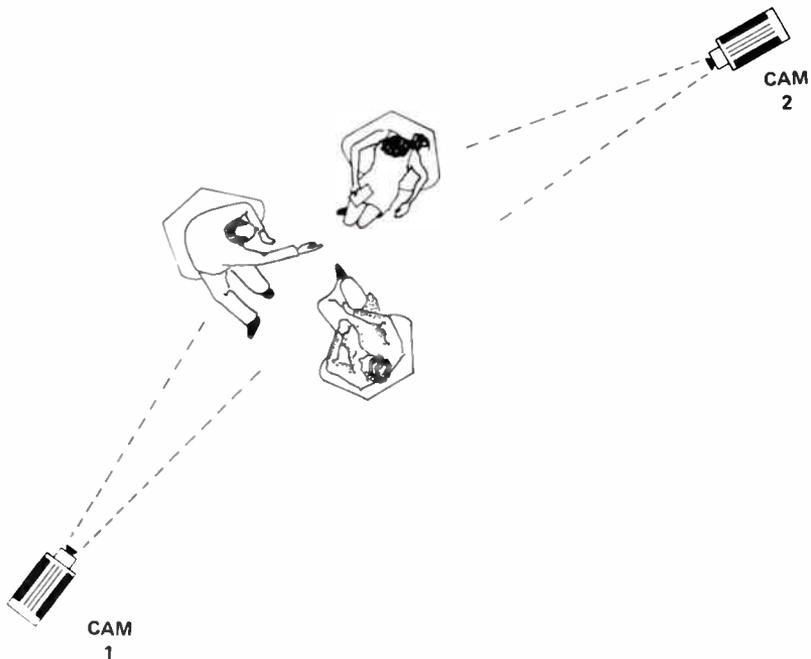


Illustration 17-7. The triangular arrangement is creative but a challenge to produce with only two cameras.

around to face the camera. For a multiple-camera production, Camera 1 can be positioned the same as above (behind the host, shooting over his or her shoulder) and Camera 2 can be positioned opposite Camera 1 for a shot of the host. (See *Illustration 17-6*.) One note of caution: in this “double background” arrangement, twice as much scenery is required.

INVERTED-V PANEL. The third and the most common staging for a three-person panel is the inverted-V format. This is appropriate for the “friendly” panel discussion or interview program because it promotes discussion and interaction among panelists. In this case, all the panelists are “equal,” including the moderator, because each member of the panel is equidistant from the center of a circle of which the camera is the center. Each can establish eye contact with all other panel members, as well as the camera lens. This configuration is pleasing to the viewer because it has soft flowing lines and promises a lack of tension.

In the inverted-V format, the positioning of the moderator is most important. When the moderator is placed between the two panelists, a barrier is created which suggests that they are on opposing sides. When the moderator is placed to one of the sides, an impression of unity among the panelists is created.

DISTANCES

It is wise to remember that television tends to exaggerate distances. An actual distance of two or four feet in the studio may look like eight feet to the viewing audience. The viewer judges size by proportion relative to a reference object. So the audience’s standard of reference on television might be the width of a human body or the length of a desk. It is important that the director remember this exaggeration so that compensation may be made in the staging of the talent and props.

The following quote explains this unusual phenomenon in academic terms:

Laboratory experiments have been performed which reveal size constancy in certain contexts is absent when there has been nothing but the size of the retinal image of the object to go by. That is to say, with context removed, the size of the retinal image determines the perceived size of the object . . . Shape

constancy is greatly dependent upon what we know about the object perceived, and their relationships to other objects.

*Psychology, The Fundamentals of Human Adjustment, by Norman L. Munn
Houghton, Mifflin Company, Boston, 1956, p.506*

FRIENDLY AND ANTAGONISTIC STAGING

As was pointed out above, the social distance between people conveys a mood which helps the audience understand a situation. A director, therefore, must clearly define the mood for which he or she is striving. If the mood to be communicated is one of conflict or opposition, the participants are positioned face-to-face. The tension is heightened as the antagonists are moved closer to each other. (See *Picture 17-1.*)

By putting two people together facing the camera and away from each other, feelings of indifference, coldness, and unawareness between the panelists are implied. (See *Picture 17-2.*)

By positioning two persons in an inverted-V formation, an air of warmth and friendliness is created. For example, a husband and wife should always be staged in an inverted-V formation to eliminate any distancing between them. (See *Picture 17-3.*)

In an interview where the panelists will not be discussing material among themselves, participants could be placed facing the camera. In a debate or controversial exchange, the antagonistic positioning is most effective.

The concept of friendly or antagonistic staging can also be applied to the staging of a three-person panel. The “friendly” inverted-V formation of staging is the most gentle and congenial of the four examples discussed. The swivel-chair staging is quite dramatic, but a little harsh. The straight-line interview is formal. And the triangle indicates equality, but is difficult to produce.

PHYSICAL BARRIERS

Physical barriers, such as desks or lecterns, produce the same effect as increasing the distance between people. It is simply a different kind of separation. Much of the success of staging has to do with a proper understanding of the psychological effect of positioning such items, in addition to their artistic effect as props.

Physical barriers are often placed between performers, and between the performer and the audience. It should be noted that the

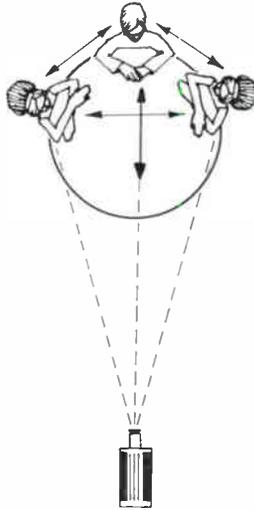


Illustration 17-8. The table in the above illustration is not only a barrier between the panel members, but it also stands as a barrier between the group and the audience.

effect of these barriers upon the television audience is often greater than one would expect by looking at the object in the studio. Also, a barrier placed for a positive reason may end up being a negative barrier in another, perhaps unforeseen, way. In other words, a director must always consider all resulting effects, or the total pattern of staging props and people. (See *Illustration 17-8.*)

The most common prop used in staging is a desk or table. A desk or table affords a measure of protection to the talent; he or she does



Picture 17-4. Large table.



Picture 17-5. Small table.

not have to think of the positioning of his or her legs or the part of the body which is shielded. A desk or table can also give the talent something to hold on to, and helps the talent to relax. If a program appears on a regular basis, perhaps weekly, a desk can clearly distinguish the host from a guest panelist and provide a semblance of permanence and stability. Desks and tables can also be used to hold papers, a water pitcher or glasses.

However, it is important to use barriers in moderation. A large dark desk can be overpowering and should be avoided except where it is properly motivated, whereas a light-colored, low coffee table is not only an acceptable barrier, but a desirable one for many situations. (See *Picture 17-5*.)

In the case of a large table with three people positioned around it, the table separates them from each other and is a barrier as well between the panelists and the camera (thus the viewing audience). The table in our example is too large and creates an impression of separateness, so it probably is not a good prop to use for an informal discussion. (See *Picture 17-4*.)

At times, the producer will want to create a formidable barrier to add formality and authority. A judge, for example, always appears behind a large dark bench. If the judge were not apart from the other

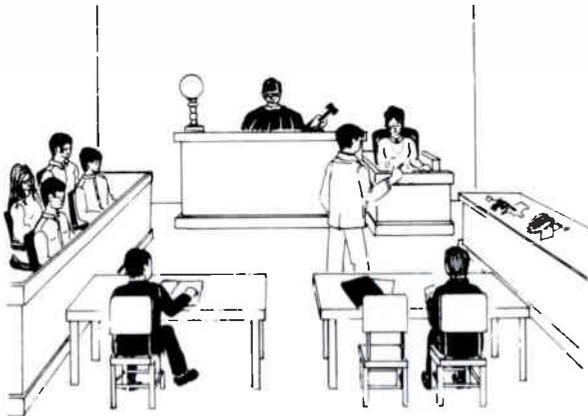


Illustration 17-9. A judge is set apart from the other participants in the court room and thus given authority with the use of staging.

persons in the court room, he or she would lose some psychological power or authority. (See *Illustration 17-9*.)

How do all of these techniques apply to a small television facility? During the taping of a message by the company president, it would seem natural to establish authority with the use of a desk. In the opening shot the camera operator could frame the desk with the president behind it, and then zoom past the desk to the talent. The camera operator could establish the authority of the president again once or twice depending upon the length of the message. The audience might be a little tense and not feel as cooperative about accepting the president's message if the camera operator were to keep the desk in the foreground for the entire scene.

Of course, physical props, or barriers are important for aesthetic reasons, as well as psychological ones. They prevent a scene from appearing bare and stark. Props and scenery function to fill up space and balance a scene. They help to establish a time, place, mood or sensation. Without any scenery or props (which is a situation or staging referred to as limbo), all interest is focused upon the talent. A limbo setting with dramatic lighting might be aesthetically pleasing for a poetry reading, but a limbo setting for a television cooking class would appear strange and make the audience uneasy.

STAGING THE TALENT AND SCENERY

Beginning producers tend to make the mistake of staging the talent too close to the scenery. If possible, the talent should be placed at least six feet from the background. When people are staged too close to the scenery (from two to five feet), the back light loses much of its effectiveness and causes background shadows which are dark and harsh. By staging people away from the scenery, a third dimension illusion can be created with the help of good lighting techniques.

CAMERA AND TALENT ELEVATION

TALENT ELEVATION. Another technique of staging which can add professionalism to a production is the proper use of elevation. By situating the talent at different levels horizontal to the floor, an otherwise ordinary production can appear quite creative and appealing. An amateur director staging a folk-singing group would most likely have the performers standing together at ground level. A professional might use lifts, platforms or risers to stage the singers in an

inverted-V formation on different vertical planes. This type of dramatic staging is frequently seen on commercial television variety programs.

CAMERA ELEVATION. Camera elevation or reduction and proper positioning can create dynamic staging. However, if the angle is too acute, the effect is bad. (See *Pictures 17-6 and 17-7.*) In the first situation, the camera is pedestaled high, looking down at the talent. In the second, the camera is pedestaled low, looking up at the talent. In both cases, the camera is about five feet from the talent and that is what causes the exaggerated feeling from the pictures. When a camera is close to the talent and is pedestaled to either extreme, a sharp angle leading from the lens of the camera to the eyes of the talent is created. This angle of focus creates in the audience an emotion of either superiority or inferiority to the talent.



Picture 17-6. High camera angle.



Picture 17-7. Low camera angle.

Suppose a cable TV system arranges for an interview with the newly elected governor of the state. If the camera is pedestaled high and is positioned close to the governor, it would make him or her appear unassuming and meek. If the camera were pedestaled very low, and also close to the talent, the new governor could appear as a dictator. The proper elevation for a camera televising a new governor is probably eye level with the talent. The distance between the talent and the camera, as well as the elevation of the camera, play an important part in the psychological mood created by the medium of television.

Camera elevation can also be an aid in shooting certain personalities. A meek individual can be given an air of authority by a

slight lowering of the camera, and an overbearing person can be made more temperate by elevating the camera position. The correct amount of authority adds to the believability of a person communicating on camera.

TELEVISION HARDWARE AS A PROP

In order for the television audience to identify with a situation or a personality on the screen, such as in a dramatic program, all television hardware or equipment must be hidden from the camera. The sight of a camera or microphone in the scene will instantly break down the identification process. In some programs a dramatic illusion is important to the communicating process.

On the other hand, the audience does not identify emotionally with panelists or a lecturer (though perhaps they may identify intellectually). In an interview or lecture format, then, it would be acceptable for hardware to be seen. Similarly, the hardware in a talk show will not seriously interfere with the aesthetic staging of the program. When they do, it is often for the purpose of creating a special effect in staging. When television equipment appears on camera, the result is a less formal appearance to the program.

SUMMARY

Staging is, in essence, bringing together the various aesthetic, psychological and practical elements of a production. It is the selection and positioning of elements in a television scene. Studio cameras, control room monitors, and the production switcher input placement in a logical sequence from left to right are critical practical applications of staging technique. An example of aesthetic and psychological application is the physical barrier concept in which props placed between the performer and camera set the mood of the scene as well as give the audience a basis for reaction by showing distance.

Professional staging is one of the great differences between an amateur and an experienced director. Experienced directors have learned the psychological implications of staging with years of observation. New directors need to first be aware of staging techniques, and then to practice them effectively.

CHAPTER SEVENTEEN QUESTIONS

1. Draw a studio layout indicating the principle of cross-shooting for a three-person panel discussion.
2. Describe the three basic methods of staging multiple talent. What is the mood created by each method?
3. Discuss the use of physical barriers on a television scene. When is a barrier effective, and when does it interfere with the message being communicated?
4. What staging techniques could be used to create a mood of authority for a television performer?
5. Give several examples of programs which could have television equipment seen. Give examples of when it should not be seen.

18. *Depth of Field*

Depth of field or depth of focus is a subject that has concerned television camera operators and directors as well as photographers for years. According to the standard definition, depth of field is that area from the point in focus nearest to the lens to the point in focus farthest from the lens. In the complex arena of television production, depth of focus is a relatively easy concept to understand. Nevertheless, it is a vital part of the process.

DEPTH OF FIELD VARIABLES

In television, as well as in photography, there are a number of variables that affect the depth of field. The focal length of the lens, the f-stop, the available light, the speed of the film or pick-up tube — all affect the depth of field.

FOCAL LENGTH. The first of these, the focal length of the lens, is inversely related to the depth of field. A 100 millimeter lens, for example, would have a shorter depth of field than a 50 millimeter lens. As the f-stop number increases or as the lens is “stopped down,” the depth of field is also increased. In other words, if the lens is set at f-16, the depth of field would be much greater than when set at f-2.8.

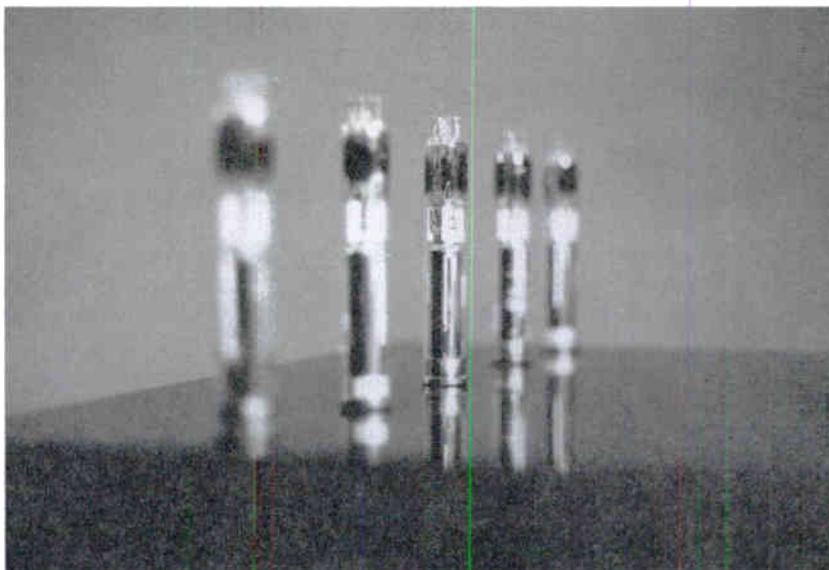
AMOUNT OF LIGHT. The amount of light available for a particular situation also affects depth of field. With more light, greater depth of field is possible. If there are 200 footcandles of light on a subject, adding 200 footcandles — for a total of 400 footcandles on the subject — would allow the camera operator to close down the iris on the lens one stop (from f-8 to f-11, for example) and thus increase the depth of field.

FILM OR PICK-UP TUBE SENSITIVITY. As most amateur photographers know, film speed also allows an increase in depth of field. Film with an ASA rating of 400, for example, allows the photographer to stop the lens of the camera down lower than film with an ASA rating of 64. In television, a television camera’s pick-up tube may be compared to film in a film camera. And likewise, there are pick-up tubes with various degrees of sensitivity.

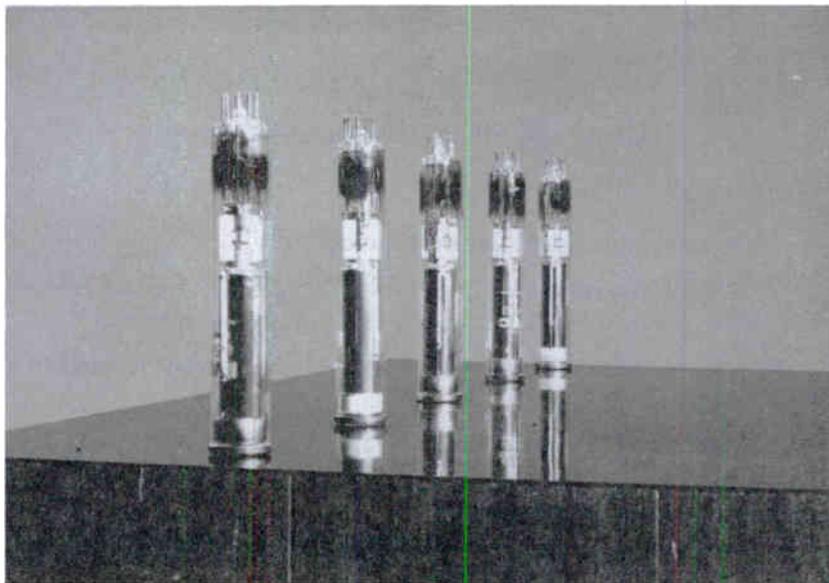
DEPTH OF FIELD APPLICATIONS

To illustrate what role depth of field plays in television production, consider an incident that happened during the production of an educational program. An educational television station was working on a early morning children’s program. Beautiful, intricate scenery was constructed showing alphabetic designs and other “school room” effects. The director, however, insisted upon a low key (reduced lighting level) lighting effect. Because of the low footcandle level in the studio, the video technicians had to open up the camera f-stops. As a result, the beautiful, elaborate scenery was a fuzzy blur to the television audience.

Depth of field becomes very crucial in the televising of remote sporting events, such as football or golf. Night-time football is the ultimate in testing a camera operator’s and a director’s ability to achieve and work with depth of field. The players capitalize on lateral movement and, as a result, the television camera operators have to use all their talent to maintain a properly focused picture while catching



Picture 18-1. Photo taken at $f-2.8$. Note how the objects in the foreground and background are out of focus.



Picture 18-2. Photo taken at $f-22$. All of the objects are in focus.

fast action, getting in close during inside plays and following the ball as it travels towards or away from the camera. Low light level is the primary obstacle to good depth of field in televising night-time football.

SELECTIVE DEPTH OF FIELD

Selective depth of field may be used when the camera operator or director wants to pick one person or thing out of a crowd. In such a case, the camera operator purposely selects a narrow depth of field (by stopping up, or opening, the camera lens). The occasion may be an announcer at halftime at a football game, standing in front of a crowd. Another example could be a child running through a forest. The foreground and the background may be out of focus to concentrate the attention of the viewers on the desired object. Or, the scene may be a news room with the announcer in the foreground and news staff and maps blurred in the background.

The purpose in any case is to show the detail of an object and drop out details of secondary objects. Depending on the situation, a camera operator may include detail or leave it out; he or she may increase the camera's depth of field or decrease it. It all depends on the story which needs to be told.

CHAPTER EIGHTEEN QUESTIONS

1. What is depth of field?
2. What factors affect depth of field?
3. What is the relationship between the speed of motion picture film and the sensitivity of a television camera pick-up tube?
4. What is selective depth of field? When could it be used in a production?
5. What can be done to the camera to increase the depth of field?
6. What is done to decrease depth of field?

19. The Video Signal

TELEVISION THEORY - AN OVERVIEW

A television camera is very much like the human eye in that they both function in much the same way. A television camera has a lens which focuses light onto a light-sensitive surface, which could correspond to the retina in the human eye. This photosensitive layer, or “target”, is made up of thousands of light-sensitive elements which, when struck by light, are charged electrically. As the electron gun in the tube scans this electrically charged faceplate, it neutralizes each picture element in its path and produces a varying electrical current. This signal is then amplified, combined with synchronizing information, and may then be viewed on a monitor, or sent to a videotape recorder. If there is more than one camera, the signal is sent through a series of switchers, amplifiers and mixing equipment.

Finally, this composite signal may be either routed to a transmitter for broadcasting or sent to a modulator for cable distribution. At the

receiver end, the signal is demodulated and the “electron gun” process is reversed. Electrons are sprayed on the phosphorescent television screen with which most consumers are so familiar.

MONITOR AND TV RECEIVER. At this point it is necessary to understand the difference between a monitor and a receiver. Monitor is the name for a television set that receives its signal only by cable (video frequency). Receiver is the name for a set that picks up a radio frequency through its tuner via the antenna or through its demodulator via cable. In a receiver, the sound information is also mixed in with this signal, but is separated from the picture information as soon as the signal is in the set.

With this basic overview it is possible to look a little deeper into the area or the process most people understand the best — the picture. After that it is possible to discuss the studio equipment that originates and records the video signal.

THE SIGNAL AND THE PICTURE

The television signal enters the set as a steady stream of sequential bits of electronic information. Within this stream is contained information about the picture itself, and synchronizing information which tells the television set how to convert the signal back to a picture. When the camera’s electron gun scans the tube’s faceplate, the original picture is broken up into many horizontal lines. The incoming television signal contains all these lines in a continuous stream. The video signal is sent to another electron gun inside the picture tube where it is broken down into individual lines. These lines are then sprayed, line by line, from left to right, and from the top of the screen to the bottom. The coating on the inside of the picture tube glows whenever the spray strikes it. The brightness of the glow at any one point on any line depends on the strength of the signal hitting at that point. If that part (element) of the picture is to be dark, the signal is weak and the screen just barely glows. If that part of the picture is to be bright, the signal is strong and that point on the screen glows brightly.

SYNC PULSE. The signal entering the set is a continuous stream of bits of picture information, with synchronizing information mixed in. It is this synchronizing information which tells the electron gun inside the picture tube how to break up the stream into individual lines.

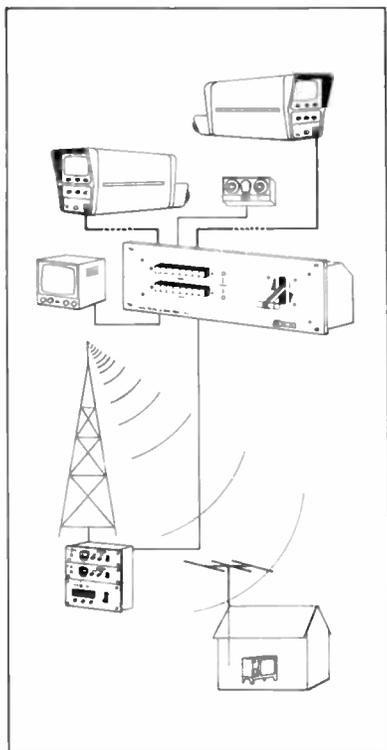


Illustration 19-1. A possible broadcast TV distribution system.

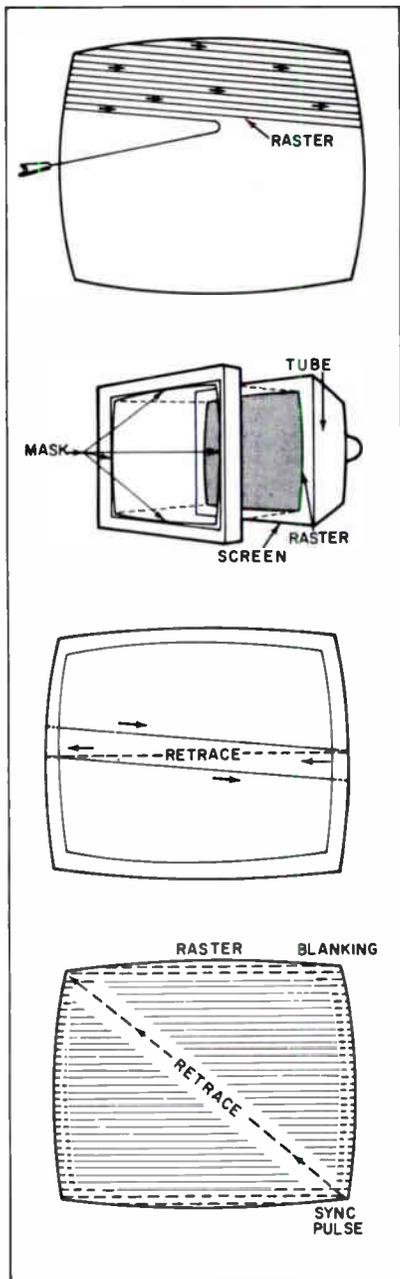


Illustration 19-2. Compare vertical retrace with horizontal retrace.

There is a sync pulse at the end of each line. When the gun encounters that pulse, it knows that it is time to begin the next line.

BLANKING. The gun begins on the left, and sprays a line across the screen. At the end of the line, it turns almost completely off. Then, when it encounters the sync pulse, it snaps back to the left of the raster, turns up to normal strength, and begins spraying the next line.

The period during which the gun is turned down in intensity is called blanking. During this period, the signal sprayed is not strong enough to cause the screen to glow. This is done to prevent the returning spray from interfering with the picture just sprayed across the screen.

RETRACE. The term “retrace” describes what the beam does when it returns to the left. Note that blanking begins a short time before retrace, and continues for a another short period after the retrace has been completed.

RASTER. The pattern of lines formed on the picture tube screen as the beam scans successively is called the raster.

FIELD. One complete spraying of the screen, from top to bottom, consists of $262\frac{1}{2}$ scanning lines, and is called a field. Near the end of the last line of a field, the electron gun encounters another type of sync pulse. This sync pulse tells the gun to begin blanking, and then to begin its retrace to the top of the raster. However, the gun does not go into retrace immediately as it did at the end of each line. It goes into blanking first and remains blanked until well after the retrace has been completed. These delayed retrace times are “porches,” and are provided for a special purpose which will be explained later in this chapter.

One field, then, begins when the electron gun sprays the first of its $262\frac{1}{2}$ lines at the top of the raster, and ends when the gun is turned down or blanked just before it retraces to the top again to start the next field.

PERSISTENCE OF VISION. Every $1/60$ th of a second the viewer is presented with a new field, but he or she is not aware of it because of the law of persistence of vision. The law of persistence of vision says that what a person sees on a television screen or on a motion picture screen and calls motion is really an optical illusion. Actually, the audience will see an object for a fraction of a second after that object has in reality passed from its sight. Television, then, like motion

pictures, fools the eye into believing that figures on the screen are actually moving. And, as frames of motion picture film progress from one still picture to another, so does television present the illusion of motion.

FRAME. There is time every $1/60$ th of a second to spray $262\frac{1}{2}$ lines on a raster. As a result the audience sees a smooth, flickerless picture. However, one field presents only one-half of the total picture. To complete the picture, a second field fills in the lines the first field skipped. In other words, field one would spray the odd-numbered lines (1, 3, 5, 7, . . . 525), and the second field would fill in the even-numbered lines (2, 4, 6, 8, . . . 524). Two complete fields, which make up the complete picture, are called one frame. One complete frame, then, is presented every $1/30$ th of a second and is made up of 525 lines. This works out to be 15,750 lines sprayed on the screen each second.

INTERLACE. The lines of the second field are sprayed slightly offset so as to fall between the lines of the first field. In Illustration 19-3 consider the heavy lines as the scanning lines of the first field and the lighter lines as the lines of the second field.

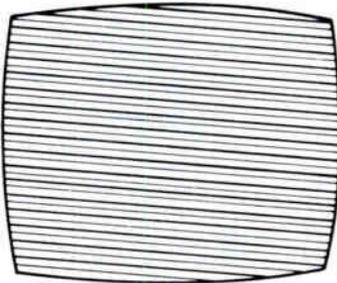


Illustration 19-3. This example of positive interlace shows the odd field as dark lines, and the even field as the light lines.

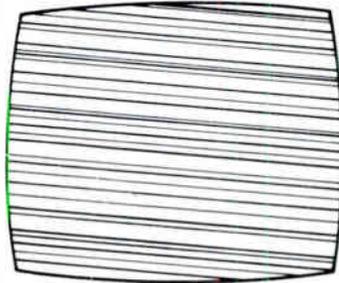


Illustration 19-4. Random interlace.

When the lines of the second field fall exactly between the lines of the first field, positive interlace occurs. With positive interlace, every line is seen by the audience and the resulting picture is sharp or has a high resolution.

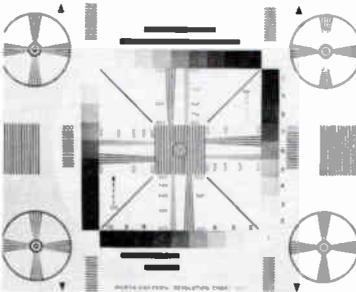
RANDOM INTERLACE. In less expensive television systems, lines of the second field fall at random and so the picture is fuzzy and

lacks detail. This is called random interlace and is a less desirable form of video synchronization. With random interlace, the position of lines varies with every field sprayed.

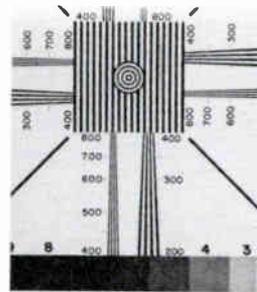
The blanking period between fields can be seen by adjusting the vertical adjustment on a television set. By adjusting the brightness and contrast, it is possible to see a grey line with a darker line running through the middle. This part of the picture (normally falling below the screen and out of the viewer's sight) is made up of blanking areas where the gun is spraying no picture and of the sync pulse that triggers retrace. The grey area below the sync pulse is the part of the blanking after retrace, and before the first picture line of the next field.

MEASURING THE SIGNAL

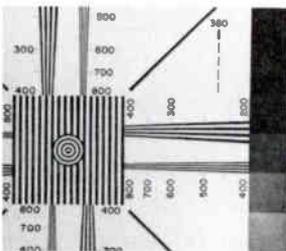
Since the eye is an inaccurate means to determine television picture quality, video engineers have devised methods to determine how accurately a television system can reproduce the original image.



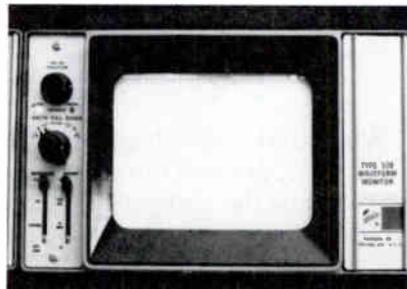
Picture 19-1. A typical test pattern.



Picture 19-2. Vertical wedge.



Picture 19-3. Horizontal wedge.



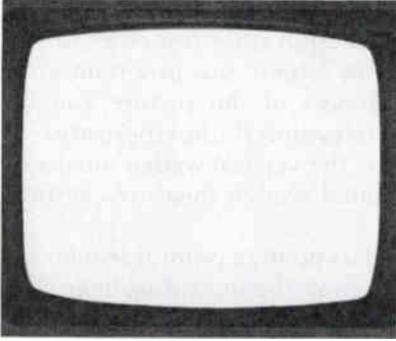
Picture 19-4. A typical waveform monitor.

RESOLUTION. Resolution is the term used to describe the accuracy of the television image. Resolution does not refer to the actual number of lines of the television screen, but to a numerical standard against which the completeness of the picture can be measured. On the test pattern used in television studios there are two wedges used for measuring resolution. The vertical wedge measures horizontal resolution and the horizontal wedge measures vertical resolution.

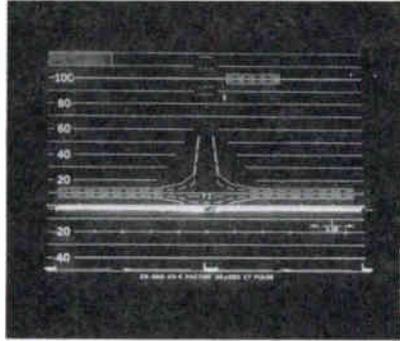
As each wedge is followed toward its point, a point is reached at which it is no longer possible to distinguish the individual lines. The number alongside that point indicates the resolution for that particular video system. This is the standard mechanical means used to measure the quality of a television picture.

WAVEFORM MONITOR. Although a test pattern does give a fairly good idea of a television system's resolution, it cannot tell the whole story. The television signal can only be displayed graphically by means of a special oscilloscope, a waveform monitor. A waveform monitor displays the variations in strength and structure of a television signal. It displays the strength of brightness of the signal and the sync pulses along the vertical axis and time along the horizontal axis. By comparing the displayed signal with the template on the surface of the waveform monitor, control room personnel can measure how much of an entire field is picture, how much is sync, how much is blanking, where the sync pulse falls and how strong (in volts) any part of the signal is at any point. Both the strength and the structure affect the quality and the stability of the final picture. A video engineer uses a waveform monitor to examine the signal, and to then adjust the cameras, control equipment and videotape recorders to achieve the best possible picture.

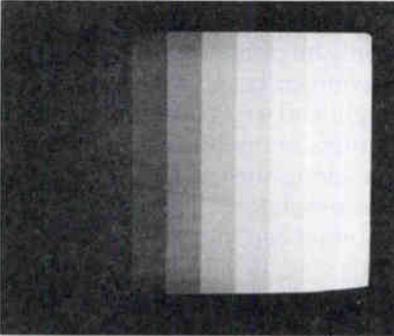
WAVEFORM OF A SCANNING LINE. A black picture on a television screen is very easily seen on a waveform monitor. In Pictures 19-5 and 19-8 it is possible to identify the base line, the areas of blanking and the sync pulses. Since there is no light on the TV screen, the waveform shows nothing above the base line because all luminance information is represented above the base line. This base line is normally considered to be the blanking lines (front and back porches) or zero voltage where no luminance video information is sprayed. These porches are the areas of blanking before and after sync. They serve to separate picture from sync, and to give the electron gun a chance to stabilize before it reaches sync, and again before it has to



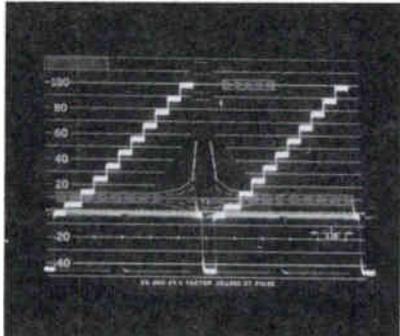
Picture 19-5. Blank TV Screen — no picture information.



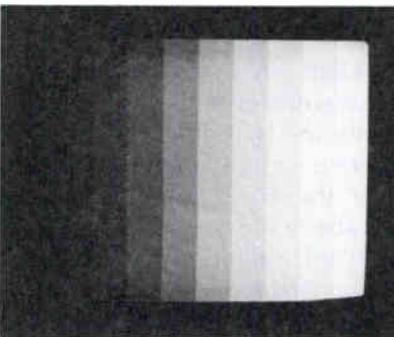
Picture 19-8. Waveform of black screen with sync pulse. Note blanking.



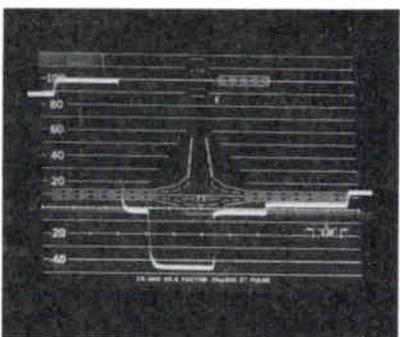
Picture 19-6. Stairstep test signal.



Picture 19-9. Line waveform of stair step test signal. Note how blacks appear near blanking.



Picture 19-7. Stairstep test signal.



Picture 19-10. Magnification of line waveform, showing blanking and sync pulse.

spray the next line. With this understanding, it is possible to measure the relative strength of any part of the signal by seeing how much above or below zero (blanking) it occurs.

Pictures 19-6 and 19-9 illustrate the relative strength of a video signal in showing what the engineer calls a staircase test signal. As the horizontal bars gradually go from black to white in the picture, the waveform shows a stair-step pattern. These graduations of black and white can be compared with the percentage scale printed on the faceplate of the waveform monitor. The waveform should be positioned so that the blanking line falls on the "0" line of the scale. The 100% line then shows the strongest level (brightest picture) that should occur anywhere in the picture portion of the signal. The sync pulse must always fall below zero.

The strength of the picture part of the signal varies from almost zero volts to 0.7 volts. The bottom part of the picture signal, near zero, is black (tube does not glow). The top part, at or near 0.7 (or 100%) is peak white (brightest possible glow). The strength necessary to make the faceplate of the picture tube glow at maximum brightness is 0.7 volt. If any part of the picture falls too far above 0.7 volt (100%), it is too strong. When recording a video signal on a VTR, it is vital that the video input be properly adjusted for no more than a 100% reading. Any reading above that level could result in an improperly recorded signal.

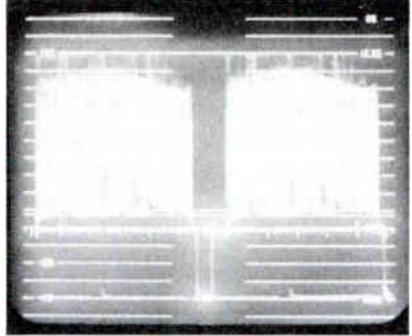
As has been mentioned, the blanking line is zero voltage. But, while the picture is positive signal and is normally above the blanking line, the sync pulses fall below zero, and are negative. The proper position for the sync pulse is 0.3 volt below zero. The sync level adjustment on the camera or on the sync generator controls the strength of the sync pulses. These sync pulses should have a strength of .3 volt below the blanking line. It is possible to get a good idea of the structure of the sync signal by looking at the magnification of the staircase waveform in Picture 19-10.

A waveform of a field is really the sum of many line waveforms. Compare Pictures 19-12 and 10-14, with Pictures 19-6 and 19-9. It is important for the student to remember that the blanking between lines in a line waveform is horizontal blanking while the blanking between fields is vertical blanking. Also, the first staircase waveform shows two lines taken at random from the television screen; the corresponding field waveform shows the odd and even fields, or the changing frames.

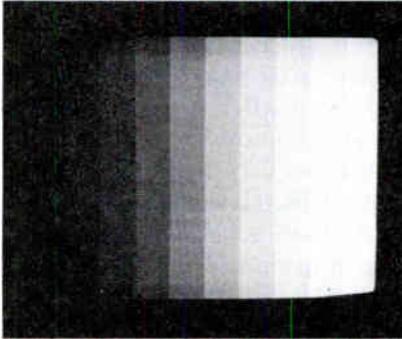
One of the most basic concepts of the video signal is an understanding of the difference between a line and a field waveform



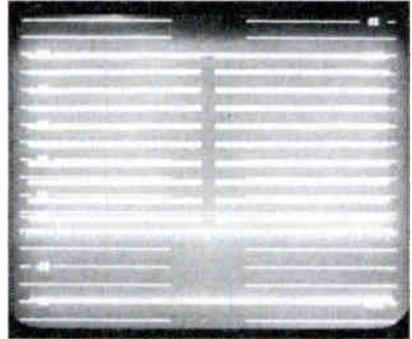
Picture 19-11. Camera shot.



Picture 19-13. Line waveform of camera shot.



Picture 19-12. Stair step test signal.



Picture 19-14. Field waveform of stair step test signal.

illustrated on the preceding pages. As has been mentioned, the proper position for the sync pulse is 0.3 of a volt below zero and the brightest portion of the picture should not be above 0.7 of a volt. Together, the picture strength of 0.7 volts and the sync strength of 0.3 volts add up to 1 volt and make what is known as a composite signal.

CONTROLLING THE SIGNAL

After a student has a basic understanding of how a video signal is made, it is necessary to then consider the methods used by a video technician to control that signal. The primary controls to adjust a video signal appear on a television camera. Inasmuch as the topic of the video signal is new to many persons, it may be necessary for some students to study the controls on a studio camera.

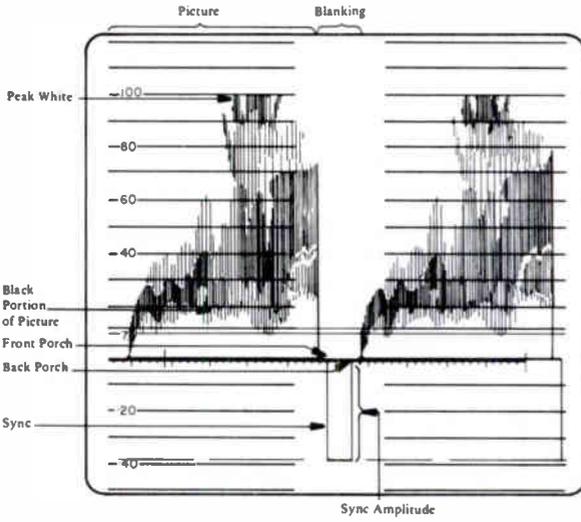
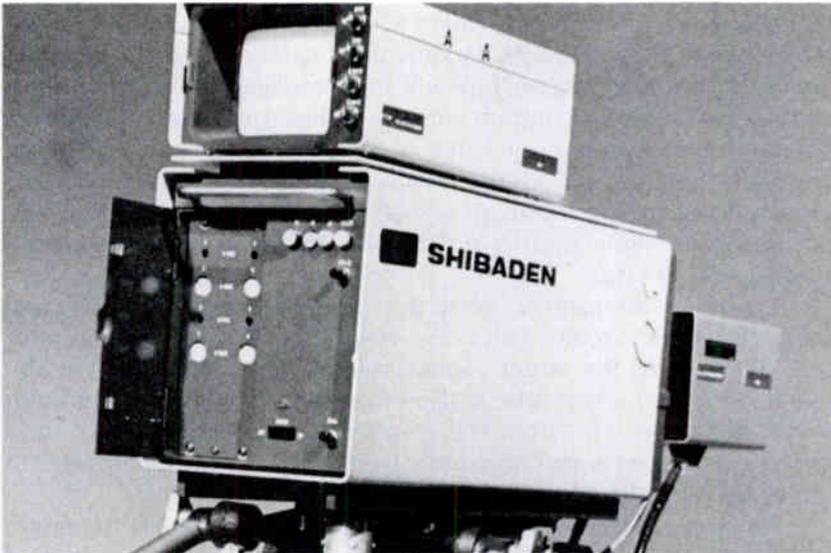


Illustration 19-5. Television waveform.



Picture 19-15. Back view of a camera showing camera controls.

BRIGHTNESS. The brightness of the scene seen on a receiver or a monitor is dependent upon the quantity and quality of light hitting the subject, the size of the lens aperture, and the electronic camera controls.

TARGET CONTROL. The first of these camera controls is the target adjustment which affects the sensitivity of the pickup tube's target. By increasing or decreasing the voltage to the target, it is possible to increase or decrease its reaction to the light striking it. If there is too little light and/or if the aperture must be closed down for greater depth of field, there may not be enough light coming through to generate a good picture.

If there is not enough light entering (and this will show on the waveform monitor), the technician can increase the voltage to the faceplate by adjusting the target control. When this is done, the faceplate becomes more sensitive, and reacts more strongly to the light hitting it. If the video technician adjusts the target control to compensate for an inadequately lighted scene, there is a possibility of undesirable side effects, namely, noise and lag.

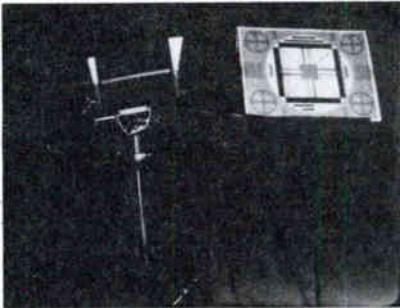
VIDEO NOISE AND LAG. Every electronic system generates within itself a certain amount of unwanted, but unavoidable, miscellaneous information, called video noise. If the video noise mixes in with the video signal to any great extent, the picture quality diminishes rapidly. An analogy will help explain this situation. In a concert hall there is a constant amount of unwanted noise (coughing, whispering, movement, etc.) that is very noticeable until the music starts. If the music is loud, the unwanted noise is almost completely drowned out by the music, or signal. The relationship between the strength of the signal (music) and the strength of the noise is called the signal-to-noise ratio.

In a television camera, noise is generated by the amplifiers and other electronic circuits. This noise shows up as "snow" on a monitor or a receiver. As the target voltage is increased on the camera, the signal from the pickup tube is also increased. As the signal increases above the noise level from the amplifiers, the signal-to-noise ratio improves. In other words, the signal from the pickup tube drowns out the noise from the amplifiers.

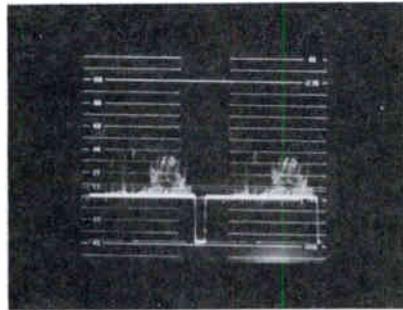
However, as the target sensitivity in a vidicon camera is increased, the tendency to lag is also increased. This is especially true of inexpensive cameras with noisy amplifiers. A camera's tendency to lag shows up when the camera or the subject moves. In such a case,

brighter portions of the picture tend to remain burned in, and cause a lagging or smearing effect, a “ghost.”

The quality of the television picture increases as the target sensitivity decreases. And, to decrease the sensitivity of the target, the video technician must see that there is sufficient light in the studio. Higher light levels in the studio will also allow the technician to “close down” the camera’s aperture and thus increase the depth of field. Once the video technician has found the best compromise between lighting, depth of field, noise and lag, the controls should be set and then left alone.



Picture 19-16. Camera shot with improperly adjusted controls.



Picture 19-17. Waveform showing Picture 19-16.

BEAM. The target control increases the voltage to the faceplate of the pickup tube. The beam control affects the strength of the beam which is scanning that faceplate. Each time the target is changed the voltage relationship between the faceplate and the scanning beam is also changed. To re-establish the proper relationship the beam control is adjusted. Every time the target voltage is increased, details will wash out in the white areas. The beam control is then adjusted until the washout of detail in the white areas is eliminated.

VIDEO GAIN. Once the beam has scanned the faceplate and created the signal, that signal passes through the camera. However, before it leaves the camera it can again be boosted with the video gain (or contrast) control. This control is the one most frequently used to make minor adjustments in the strength of the signal. Although video gain does not affect lag, it is another means of electronic boosting, and, as such, does add noise to the picture.

On a waveform monitor, the video engineer sets the blanking line at zero on the scale, and then adjusts target and video gain (as well as

the lights and the camera's f-stop), until he or she achieves a clear, lag-free signal that is 0.7 volts strong at its brightest part.

PEDESTAL. Referring back to the waveform for a moment, the lower part of the video signal consists of the black or dark grey points on the screen, and the upper part shows white and light grey, or what is called luminance. A careful examination of the waveform reveals that the darkest part of the picture falls slightly above the blanking line. The distance between the blanking lines and the darkest part of the picture is called the pedestal or set up level, and is controlled by the camera's pedestal control. Under normal conditions the set up should take up 7% of the distance between zero (blanking line) and 0.7 of a volt or peak white. On most waveform monitors, there is a scale marking to assist in the proper adjustment of the set up level. At this 7% level, the camera will have a normal sensitivity to blacks and dark greys.

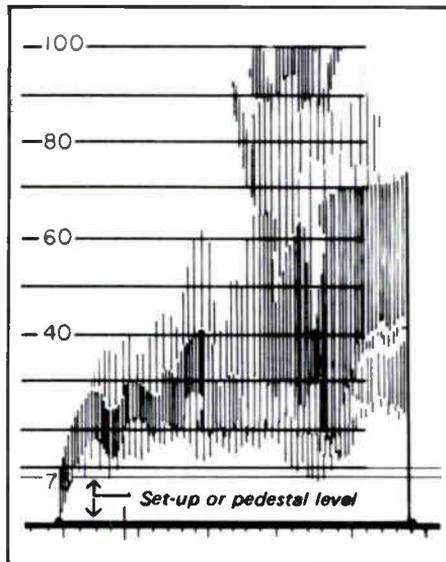


Illustration 19-6. Graph illustrating proper pedestal level or set-up level.

There are situations when the video technician may want to alter the set up away from the standard 7% level. For example, when shooting a super card (white lettering on a black art card), an

adjustment of the pedestal control to a level lower than the 7% point will make the camera less sensitive to shades of dark grey, and help achieve a white-on-pure-black picture.

VTR VIDEO GAIN CONTROL

By the time the video signal gets to the videotape recorder, it is a composite signal (0.7 volt picture plus 0.3 volt sync). All recorders have a video gain control which is normally adjusted until the VTR's video input meter reads 100%. This means that the recorder is recording a composite one volt (0.7 plus 0.3) signal.

If either part of the incoming signal (picture or sync) is not at proper strength, the VTR's video gain control should not be used to correct the problem. Since the incoming signal is composite, increasing the VTR's video gain will affect both picture and sync levels. If, for example, the incoming signal is only 0.4 of a volt of picture information, but 0.3 of a volt sync, increasing the VTR video gain will increase both the picture and the sync levels. Increased to 100%, there would be enough picture level, but far too much sync level.

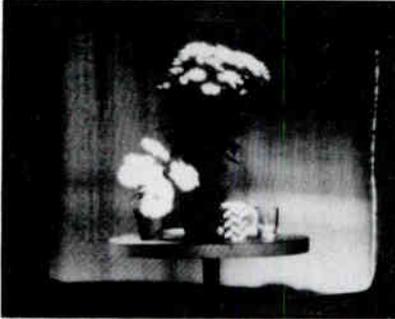
Therefore, the use of a waveform monitor in a television facility is critical for the proper adjustment and control of video and sync levels.

MONITOR AND RECEIVER ADJUSTMENT

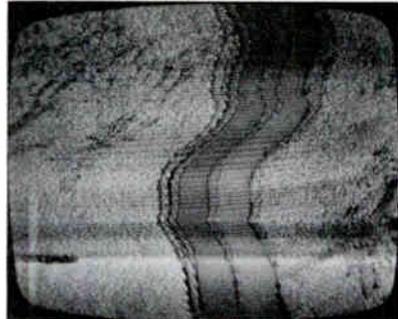
The main adjustment problems of a monitor or a television receiver are brightness and contrast, fine tuning, vertical hold and horizontal hold. Pictures 19-18, 19-19, 19-20, and 19-21 illustrate these common problems. Usually, the careful adjustment of the contrast and brightness knobs can sharpen up an otherwise grey, muddy picture. If the picture is still snowy, has ghosts or rolls after the fine tuning and vertical hold knobs have been adjusted, more than likely outside help is needed.

SUMMARY

It is common to hear an self-proclaimed expert in television production say something like, "I don't touch that technical stuff; leave it for the engineers, they deserve each other." Yet, it is interesting to find that most network television directors and



Picture 19-18. Improper contrast adjustment.



Picture 19-19. Improper fine tuning adjustment.



Picture 19-20. Improper vertical hold adjustment.



Picture 19-21. Improper horizontal hold adjustment.

producers have a good understanding of the technical side of television. And they use that knowledge to communicate with technicians and engineers.

Perhaps it is fear that prevents some “experts” from learning what makes a video signal tick. Regardless of the reason, the basics of a video signal are simple enough that all television personnel can learn them.

CHAPTER NINETEEN QUESTIONS

1. Define the following: scanning line, interlace, raster, retrace, sync pulse, blanking, field, and frame.
2. What is the difference between a television receiver and a television monitor?
3. What part does persistence of vision play in the projection of a video signal on a receiver?
4. Explain the difference between a line and a field waveform.
5. What is the purpose of the horizontal sync pulse? The vertical sync pulse?
6. Define composite and noncomposite as used to describe television signals.
7. Define synchronous and nonsynchronous as used to describe television signals.
8. What is the relationship between the following: target, lens opening, beam, video gain, and lag?

20. *The Audio Signal*

Chapter Six discussed generating elements and pick-up patterns of microphones. It was mostly concerned with operational considerations, and said very little about the technical side of the audio signal. The purpose of this chapter is to outline the basic information necessary to understand the components and wiring of an audio system in a typical television facility. But first a brief review of microphones may be necessary.

MICROPHONE IMPEDANCE

The two basic kinds of microphones are high impedance (Hi Z) and low impedance (Lo Z). Hi Z microphones range from 10,000 ohms upward, and Lo Z microphones range from 50 to 250 ohms.

HI Z MIKES. Hi Z microphones lack the dynamic qualities of Lo Z microphones. Hi Z microphones are typically inexpensive and are

used on consumer-quality audio tape recorders. A Hi Z microphone has a two-conductor cable consisting of an outside shield and a center conductor. The maximum cable length of a Hi Z microphone is approximately 15 feet.

LO Z MIKES. Lo Z microphones are medium-to-expensive and are the standard for professional television, radio and recording studios. They have excellent audio pick-up quality, making them highly desirable for educational and industrial television facilities.

A Lo Z microphone has a three-conductor cable consisting of two center conductors and one outside shield. Unlike the Hi Z microphone, the Lo Z microphone's cable length is not critical. Cable lengths of up to 1,000 feet produce no apparent problems.

TYPES OF MICROPHONES

Four types of microphones are available: crystal (primarily Hi Z), dynamic (sometimes Hi Z), condenser and ribbon.

CRYSTAL MIKE. A crystal microphone is inexpensive and of consumer quality. It produces a thin sound which makes the crystal microphone undesirable for professional television. Its greatest asset is that it is rugged.

DYNAMIC MIKE. The dynamic microphone is the industry standard for professional television. It has excellent quality, rugged construction, and is reasonably priced.

CONDENSER MIKE. The condenser microphone has excellent quality, is moderate-to-expensive in price and is very fragile. Until recently, the condenser mike required an external power source to make it operative. Many condenser mikes that work on a small battery are available. These small, battery operated mikes, are some of the most widely used mikes on network television.

RIBBON MIKE. The ribbon microphone is very fragile, quite expensive, and rarely used professionally. Years ago the ribbon mike was used extensively in professional television. But because it was so fragile, it became almost obsolete as dynamic and condenser microphones were made available.

MICROPHONE PURCHASING CONSIDERATIONS

When purchasing a microphone, there are six major considerations to keep in mind: warranty, Hi Z or Lo Z, type, pick-up pattern, ruggedness and price. The prime consideration for most television facilities is warranty. A good warranty demonstrates the manufacturer's confidence in their product, and it saves the buyer expense and worry if something goes wrong with the microphone. As for price, it may be worthwhile to spend more money to get the right microphone than to be burdened with one which will not do an adequate job.

PICK UP PATTERNS. The two most common pick-up patterns of microphones used in television today are omnidirectional and unidirectional. Most users think that the omnidirectional microphone has a wide pick-up pattern from the front of the microphone and relatively no pick-up from the sides or back. This is incorrect. An omnidirectional microphone is sensitive almost equally from all directions (front, back, and both sides). (See *Illustration 6-1.*)

A unidirectional microphone, on the other hand, is sensitive from one direction, the front of the microphone only. One of the primary purposes of a unidirectional microphone is to eliminate sounds from unwanted sources.

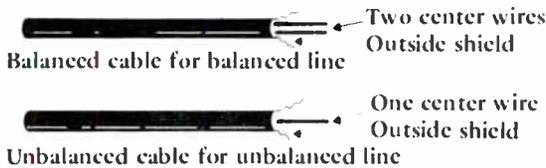


Illustration 20-1. Balanced and unbalanced audio cables.

BALANCED AND UNBALANCED LINES

BALANCED LINES. A balanced audio line is a cable which contains three conductors: two center wires and one outside shield. (See *Illustration 20-1.*) Because the audio signal is carried entirely on the two center wires and because they are equally insulated against most electrical interference, the line is said to be "balanced." The outside shield does not carry part of the audio signal. Lo Z microphones use balanced lines or cables. Because the lines are

balanced and because Lo Z microphones by definition are low impedance cable lengths may be remarkably long with no impairment of audio quality.

UNBALANCED LINES. An unbalanced line, on the other hand, is an audio cable which contains two conductors: a center wire and an outside shield. Because the outside shield carries part of the audio signal, the line is unbalanced and therefore susceptible to interference from many sources.

For this reason, an unbalanced line must be kept short and away from power lines. Hi Z microphones always use an unbalanced line. Most microphone manufacturers recognize the cable length limitation of Hi Z microphones and supply the longest possible length. Consequently, the buyer should not add cable to that provided by the manufacturer for a Hi Z mike.

LEVELS

The strength of the audio signal is known as its “level.” Three different audio levels are used in the audio system of a television studio. These three levels relate to the audio signal at its point of origination, its transmission and its amplification.

MICROPHONE LEVEL. The first level is the microphone level. This refers to the strength of the audio signal at the output of the microphone. This is a low level signal because there is no electronic amplification in the microphone.

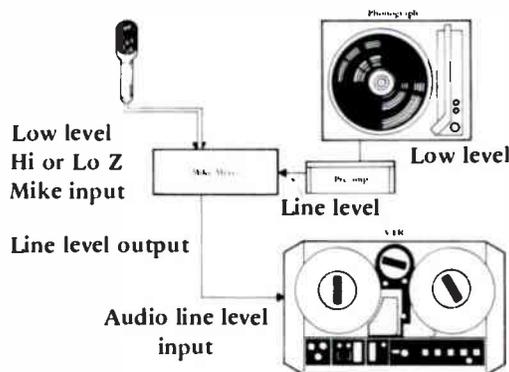


Illustration 20-2. Different audio levels in a television system.

LINE LEVEL. The second level is line level, which is sometimes called “high level.” This refers to the output of a preamplifier and is the standard level when routing audio signals throughout a television studio. Examples of line level are VTR audio output or the output of an audio mixer.

POWER LEVEL. The third level is called “PA” or “power level.” It is the output of a power amplifier which goes to a speaker. An extremely high level, it is rated in watts.

All three of the audio levels can be balanced or unbalanced, depending on the circuitry of the system and the type of cable and connectors used.

MICROPHONE MIXER

A microphone mixer is a device which combines several audio sources, such as microphones, tape recorders and phonograph, for mixing or fading. (See *Illustration 20-2.*) The microphone inputs on the mixer may be either high or low impedance, and may use balanced or unbalanced lines. Some mixers have switchable level inputs labeled high or low level. The inputs of the audio mixer may be balanced or

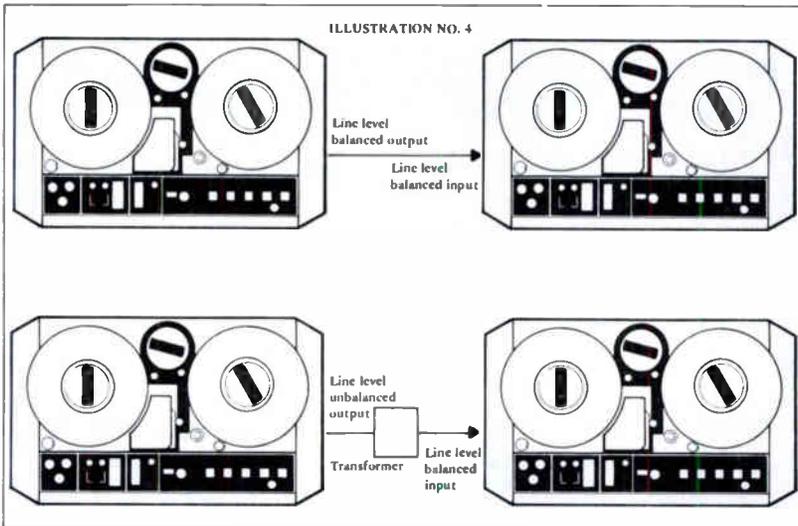


Illustration 20-3. A transformer can be used to change unbalanced lines to balanced lines.

unbalanced depending on circuitry and type of connectors used. Two-conductor plugs are for unbalanced inputs and three-conductor plugs are for balanced inputs.

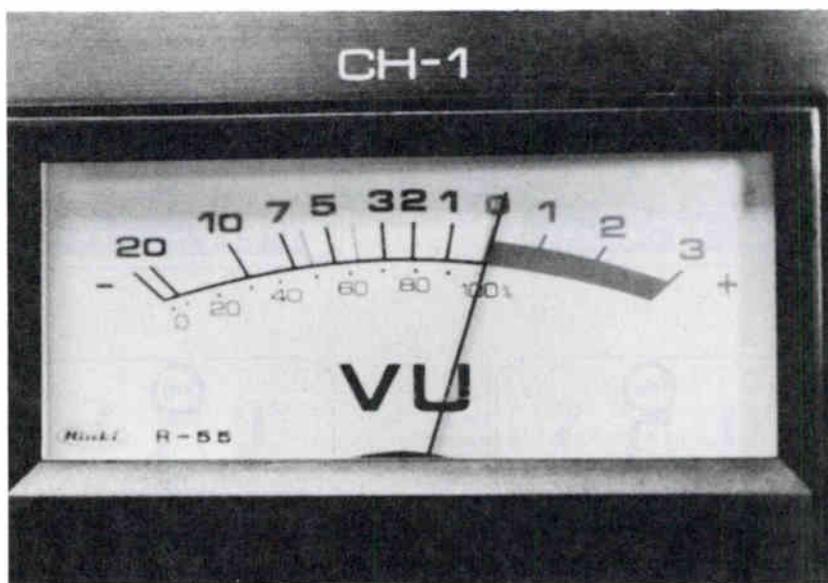
The output of a microphone mixer is line level, but line level also may be balanced or unbalanced.

A transformer is a device frequently used in audio systems to change balanced lines to unbalanced, or unbalanced lines to balanced. Thus, a transformer can change Hi Z to Lo Z, or Lo Z to Hi Z.

VU METER

A VU meter is a device used on an audio mixer which gives the operator a visual display of the level of audio sources. The meter is either divided into percentages (0% up to 100%), or into db (decibels). A db is a unit of audio measurement which indicates the relative strength of the signal. "0" db is a point which represents 100% on other meters.

A mistake which most beginning audio operators make is to insist that all peaks of an audio signal reach 100% or "0" db. By "riding the



Picture 20-1. Audio VU meter.

levels” to the point where every peak is reduced or stretched to the 100% level, all dynamic qualities of the program are destroyed. In musical programs this practice can be particularly disastrous.

BALANCING AUDIO LEVELS

The audio engineer must be aware of two considerations when operating an audio console. First, he or she must balance audio levels against each other. And second, the entire console (all inputs) must be balanced against the audio input of the videotape recorder.

If the program being recorded consists of three microphones, then it is necessary to achieve an acceptable audio balance among all three participants. Each person must sound natural as compared to the other speakers regardless of what indications are read on the VU meter. It is interesting to note that it is not always possible just to have each person’s audio level peak up to 100% and then forget any balancing for the rest of the taping session. Quite often the correct “natural” balance among three participants (particularly if there is a combination of male and female voices) will be a setting other than a uniform “0” level setting.

All of the proper procedures of audio level setting on a microphone mixer can be wasted if there is not a unity of levels between the console and the audio input of the videotape recorder.

It is vital that the 100% or “0” db mark on the audio console be equal to the similar setting on the VTR. Because each element in the audio chain has a gain control (master gain on the mixer and audio input control on the VTR), the operator must set one level against the other to achieve a properly adjusted system.

The most common method of making this adjustment is the use of a 1000 cycle tone. In fact, many audio consoles have such an oscillator built in the console. The 1000 cycle tone oscillator is turned on and adjusted with the master gain control on the mixer so that the VU meter reads 100%. Then the audio input gain control on the VTR is also adjusted so that the meter on the VTR also indicates 100%.

At this point there is a unity condition between the audio console and the input of the VTR. If the operator only adjusts the individual inputs for each preamplifier, and uses the 100% point on the mixer VU meter as a maximum point of audio level, then the unity condition will continue during the taping session. It should be noted, however, that as soon as either the master gain control on the mixer, or the audio

input gain control on the VTR is altered, then the unity condition will not exist, and the setup procedure must be done again.

CHAPTER TWENTY QUESTIONS

1. What is the difference and purpose of balanced and unbalanced audio lines.
2. Indicate at what point in an audio system the following audio levels could be located: microphone level; line or high level; and power level.
3. What electronic device can be used to not only change unbalanced lines to balanced lines, but also change a Hi Z microphone to a Lo Z microphone?
4. Explain the purpose of a microphone mixer.
5. What is the purpose of a VU meter?
6. What procedure is used to balance the audio levels of a two-person interview program?
7. What procedure is used to balance the audio levels between a console and the input of a VTR?

21. Makeup for Television

Is it worth the effort to use makeup for instructional or industrial television programs? Yes, absolutely! Makeup should be used by virtually everyone who appears on camera. The real questions are what kind of makeup and how to use it. In this chapter, the basic principles of makeup for television will be discussed. Specialized character makeup will not be covered in this text.

This chapter should be followed by much experimentation and guided application in makeup techniques.

When applied with skill and care, makeup can bring out the best facial qualities of almost any person who must appear on television. It can cover up blemishes, even out skin tones, add color to pale faces, soften harsh features and make weak ones more prominent. These all become important considerations when the director calls for a closeup of the talent's face or eyes. The only people who probably should not wear makeup on television are children. Many adults

object to children with makeup, because it makes them appear older than they are, and perhaps less innocent. These are all aesthetic reasons for using makeup.

On the technical side of the matter, makeup is an important tool in balancing normal facial features with lighting and camera requirements. Balding or bald headed men, for example, create havoc with reflection from lights unless makeup has been applied to dull the shine. The bright lights required for color television production tend to wash out facial features and cause them to appear pale and flat. Makeup can restore the colors and features to the face and produce a “natural” look. And that is the goal of makeup: to maximize the good, minimize facial faults and provide for the television camera the best possible picture for long shots and closeups.

Most people who appear as talent in educational and industrial programs are not professional actors or television personalities. They rarely have any knowledge of television makeup and generally do not know how to apply the various products. As a result, every television studio, no matter how small, should assign one person to be in charge of makeup, to order supplies of the appropriate products, to be responsible for keeping them in order and to learn the techniques of makeup for television.

EQUIPMENT AND SUPPLIES

Before purchasing makeup supplies, consideration should be given to where they will be stored and used. Designate a corner of the studio or a room nearby as the makeup area. It should be equipped with a wash basin, countertop, mirror, lights, towels and a chair or stool. A barber chair is ideal, but a bar stool with a back will suffice.

The makeup supplies should include: tinted or translucent powder, powder puffs and brushes; bases and blushes or rouge in a variety of colors; lipstick; moist or dry eyeshadow, eyebrow pencil, eyeliner; a natural sponge, a moist/dry sponge; a selection of small brushes; cleansing cream, tissue; and soap and towels. Other useful materials include mascara, false eyelashes, a rubber sponge, astringents or alcohol and after-shave, lotions, acetone, shampoo and wig cleaner.



Picture 21-1. Proper makeup application is essential for good results.

HOW TO PROCEED

Before applying any makeup to a performer, have him or her remove any makeup already on the face. Cleansing creams, soap, water and towels all come in handy at this point. Next, apply a base makeup over the entire face. It should be one or two shades darker than the talent's skin tones if the person has light skin. Conversely, the base makeup should be one or two shades *lighter* for a person with darker skin tones. Be sure to smooth the makeup on gently and evenly, and don't apply too much of it. The goal is an even skin tone, not a heavy mask of color.

If the talent is bald or balding, you may want to apply makeup to areas of the head where there are large patches of hairless skin. And if the hands, arms and neck will be seen on camera, these areas should be made up, too. A performer with a nice, tanned look on the face and neck should have that same look on the hands and arms.

Next, apply makeup to the eyebrows, eyelashes and eyelids. Apply enough eyebrow pencil to the eyebrows to make those features



Picture 21-2. Every studio should maintain a good supply of makeup materials.

complement the face. Too much makeup on the eyebrows will make them dominate the face. The same is true of eyeshadow. Use shades of eyeshadow that will add depth to the eyelids or highlight them, whichever the individual being made up needs. Again, the eyelids should complement, not dominate the face. Line the eyelids with pencil and apply mascara as needed to make these features visible.

A bit of rouge or blusher applied to the cheeks along the line of the cheekbones adds color and dimension to the face.

Lipstick and lippgloss colors should be coordinate with colors of the rouge and eyeshadow. Very glossy lipstick should be avoided, because it tends to catch the lights in the studio and on the set and creates a glare in the camera.

After makeup has been applied, dust the face lightly with face powder, either from a puff or a brush. This sets the makeup and dulls shiny areas on the talent's face (and head, in the case of bald or balding talent). A translucent powder is best for this purpose, since it adds no color of its own and does not detract from the color of the makeup already on the talent's face.

During an entire day of production, it is usually necessary to freshen or touch up the talent's makeup once or twice. Hot studio lights or sunshine invariably cause the makeup to "melt" and become shiny. So, a reapplication of powder from time to time is necessary for a consistently pleasing appearance in front of the camera.

After videotaping is completed, supply the talent with cleansing creams, more soap and water and towels, astringents and, for the men, aftershave lotions. If costumes were worn, make sure the performers have a place to change into their street clothes. The goal is to help the performers — especially if they are "in-house" or non-professionals — through this aspect of television production with a minimum of hassle.

After the performers have left, clean up the makeup table and take a quick inventory of what was used. This will aid in planning for restocking for future productions. And keeping the makeup area clean and orderly will enable the entire production to flow just a little more smoothly.

CHAPTER TWENTY-ONE QUESTIONS

1. Why is makeup a necessity for a television production?
2. List several specific examples of what makeup can do to enhance the talent.
3. What basic makeup supplies are necessary for a medium size studio facility?
4. What basic equipment should be in the studio for the application of makeup?

Part V.
Teaching With Television



22. *Television Program Formats*

One of the reasons television is such a fine communications tool is its inherent capacity for variety. Whether the script calls for a panel discussion, an interview, role playing, a lecture-demonstration or an off-camera narration, television can handle the format effectively.

But what many industrial and educational television directors do not realize is that selecting the right format for a particular TV production may determine the ultimate success or failure of that program.

A producer/director on the West coast has learned how important it is to select the right program format. His biggest headache was an American History series he produced for a university. The lecture portion of the script was usually prepared in advance by the professor who taught the class. The same professor was also the talent or lecturer. After 48 episodes of the series, the director and professor had tried every format imaginable and could not find one format that

would work in every situation. Furthermore, they learned the hard way — and often at the expense of those taking the class — that some formats do not work as well as others for their application. Most of their problems could have been avoided, if they had considered each episode individually and had given greater care to the selection of a production format as they were planning the production.

BASIC TELEVISION PROGRAM FORMATS

There are five basic formats into which almost every production can be made to fit:

- 1) Lecture or lecture demonstration
- 2) Panel discussion
- 3) Interview
- 4) Off-camera narrator
- 5) Dramatic or role playing sequence

The program format of a production should be selected early in the planning stages when the program is just an idea. It is important for the format to be well defined before the work begins on the script. The producer and scriptwriter should consider two or three production approaches and then make the final selection after all the pros and cons have been weighed.

There are numerous considerations which must be analyzed before the program format can be determined. The producer, director and scriptwriter must have a good understanding of the elements of each common format.

TALENT. Amateur talent can ruin even the best script if the format is selected incorrectly. Nervous talent should be used only in specific applications, while professional talent can adapt to any program format. If, for example, all the talent for a production must be in-house, then a role play or dramatic sequence would not a proper format selection.

AUDIENCE. Depending upon the audience — their likes and dislikes — one format may be more successful than another. An audience of Certified Public Accountants, for example, will expect a different type of program construction than a group of diesel mechanics.

PRODUCTION CREW. The size, experience and ability of the production crew must be considered along with the quantity and quality of the studio equipment. A five-person panel discussion, for example, is almost impossible to produce effectively with one camera and a two-person crew.

SUBJECT MATERIAL. The subject matter of the program has an important bearing in determining which format should be selected. A lecture-demonstration, for example, may be the only effective way to deal with some topics and may not be at all suitable for other subjects.

BUDGET. Money speaks just as loudly in format selection as it does elsewhere. The budget often determines what kind of a production is possible. Just as important is the time involved in putting a program together. Some formats may require only a few minutes of preparation, while other formats demand days, weeks, or even months of extensive preparation.

MULTIPLE-FORMATTED PROGRAMS

When a program is longer than ten minutes the producer and scriptwriter should consider using more than one format within the program. People tend to become restless if they have to concentrate for longer than about ten minutes without a change or at least some variety. This is perhaps due in part to commercial television, which has conditioned audiences to expect a commercial break (which is a format change) about seven times every hour. Trite as it may seem, the saying that “a change is as good as a rest” really is true in this case. By changing the program format at the natural breaks in the program, the audience can endure long programs. Care must be taken, however, that the subject matter is suitable for multiple formats and that the change from one format to another is well motivated.

The accompanying chart will help the beginning producer to determine the relative merits of each format in terms of the factors discussed above. The format that ends up with the most plusses for a particular program idea is probably the one which should be used.

Above all, a beginning producer should remember to decide on a format early in the planning stage of the production sequence. By doing so, problems or questions that arise as the production nears the taping date can be resolved with the total program in mind.

FORMAT	TALENT	AUDIENCE	PRODUCTION CREW
Lecture Demonstration	Most commonly used by the talent, so it is usually easy for them. All of the performance pressure is on the talent, so it is not good for a nervous talent.	The typical lecture demonstration is long, lacks variety and is boring. L-D's have been used so often that many people tune out. Should be used only with interest, variety, and limitation on length.	Easy to produce because it is straightforward. Even with a small product to display it is easy. One camera can be tight for close ups, and a second for wide shots.
Panel Discussion	Very easy because the panel has little preparation & usually give their opinions. Performance pressure is divided among the members. One member can monopolize the discussion.	Normally not enjoyed by the audience because traditional panel discussions are vague and theoretical. The audience can get lost easily.	With 2 cameras, 3 or 4 panelists provide a moderate challenge. More people on the panel make it difficult. A single camera show is always difficult with more than 2 people.
Interview	The most important member of an interview is the interviewer. Without good questions, the message will not come across. Performance pressure is 60% interviewer and 40% interviewee.	Can be good if the correct questions are asked. Content can create interest, but many interviews get boring because of a poor interviewer and only average content material.	Usually easy unless props and graphics are used. Without additional elements, the visualization is only the faces of the talent.
Off-Camera Narration	Very easy because the talent is not concerned with visual appearance, only with aural performance. There is a tendency for amateur talent to try to read a word-for-word script.	Excellent potential for content retention due to high visualization. Audience interest can be high if variety is maintained. This format is used so often by commercial TV that audiences are accustomed to it.	Usually very difficult to produce. Requires multiple cameras or good VTR editing. This is not a format for an inexperienced director.
Role Play	Very difficult for the talent. Requires good to professional talent or the program may look amateurish and be ineffective.	Good for audiences because they can identify with the talent. This helps in the communication process. The audience will usually accept short segments of corny humor if the situation is instructional.	Very difficult to produce. Inexperienced directors think it is easy and find out too late that it is one of the most difficult to produce. Also requires a large area for the set and either several cameras or editing.

SUBJECT MATERIAL	TIME FOR PRODUCTION	COST	COMMENTS
<p>Not good for abstract or general information. Best for specific material with something to operate or demonstrate.</p>	<p>Can be very fast or as complex as time will permit. Usually, the more time spent, the better the lecture demonstration.</p>	<p>Can be a very low budget production. It will cost more if many visuals are used or if the content requires a remote shoot. The complexity of the shoot will determine the final cost of the program.</p>	<p>While in many respects this format is the easiest and least expensive, it is also the most common. Most beginning directors and scriptwriters think of an L-D first before considering alternate formats.</p>
<p>Good for abstract philosophies where opinions are given. Props or models can be used, but are cumbersome. Panel members tend to go off on tangents and wander.</p>	<p>Same as the lecture demonstration, except that large panels require more time for planning and preparation than small panels.</p>	<p>Same as the lecture demonstration format.</p>	<p>Most beginning directors do not stage a panel discussion with any imagination. The result is visually boring. It is also vital that the program have a good, strong moderator.</p>
<p>Material can be general or specific depending on the visualization. Specific material requires detailed visualization.</p>	<p>Same as the panel discussion.</p>	<p>Same as the lecture demonstration.</p>	<p>A very good format for educational and industrial TV, but not used enough. Very good for visiting authorities or for a talent who is very nervous.</p>
<p>Good for specific, finite topics or where many visuals are presented.</p>	<p>A good off-camera narration requires a great deal of time to plan, research, script and produce.</p>	<p>Can be expensive, because every word must have some form of visualization such as close ups, graphs, charts, pictures, etc.</p>	<p>All of the talent narration can be put on audio tape and assembled later. Can be an inexpensive way to use professional talent. This format is one of the best for communicating.</p>
<p>Can be used with general or specific content. Very good for social problems. Can be good as a vehicle to produce interest or humor. Specific subject matter requires very good talent.</p>	<p>Time to write, plan, rehearse and produce is very high. This format cannot be used for a quick and dirty production.</p>	<p>Outside talent can be expensive. Inside talent could make this format fairly inexpensive.</p>	<p>Movement of cameras and talent is difficult for an inexperienced crew. Yet movement is a common ingredient of this format.</p>

CHAPTER TWENTY-TWO QUESTIONS

1. List the five basic program formats.
2. In your opinion, which format would be best suited for a “how to” program on the adjustment of an automobile transmission? Why?
3. In your opinion, which format would be best suited for a cooking program in a kitchen? Why?
4. Which formats are best suited for a nervous and inexperienced talent? Why?
5. Which formats are best suited for an inexperienced production crew? Why?
6. Which formats are best enjoyed by the viewing audience? Why?
7. Which formats require the least amount of production budget? Why?
8. What are the advantages of a program which uses more than one program format?

23. *Viewer Interest*

Into the employee classroom of a large company in the Midwest files a group of fifteen truck drivers and equipment operators. These men and women have been called together to view a vehicle safety training videotape prepared by the firm's safety department.

When everyone is seated and the television monitor has warmed up, off go the lights, and someone starts the videotape program. The company's transportation manager appears on the screen and introduces the topic in standard, semi-somber tones. Everyone watches attentively. Next comes a serious segment on seat belts. One of the viewers looks away from the monitor and turns his attention to the walls and ceiling for the better part of a minute. Then, a half-minute filled with slap-stick, corny humor shows the lighter side of seat belt safety and brings home the message of the serious segment. Everyone watches with interest.

Six more cycles of straightforward vehicle safety, followed by a humorous version of the same thing, march across the television

screen. During the serious portion of each cycle, more and more people lose interest and turn away from the monitor for several seconds at a time. In fact, during the fourth non-humorous episode, fully one-third of the class ceases to pay attention to the videotape. On the other hand, in only one of the humorous segments does a viewer indicate loss of interest in what is on the screen.

Summing up the presentation is a brief conclusion which everyone watches. Running time for the entire tape is twelve minutes. In dozens of locations where this videotape was shown, the reactions of the viewers were almost identical with those reported above.

VIEWER INTEREST AND CONTENT RETENTION

The importance of gaining and keeping viewer interest is usually one of the last considerations affecting an educational or industrial presentation — if, indeed, it is considered at all. But, as the videotape program on vehicle safety suggests, where there is a lack of viewer interest, there is also a probability of a lack of audience content retention. It is very unlikely that anyone will learn and retain information from a videotape if he or she is not paying most of his or her attention to what is seen and heard. Even when the employee or student is motivated by “need to know” material, the student may still find it difficult to learn, if the information is presented in a manner that does not hold interest, that in fact is absolutely boring. And since the goal of educational and industrial television is content retention, continuous viewer interest is highly important.

MEASURING VIEWER INTEREST

For our purposes, viewer interest can be measured informally by continuity of the viewer’s eye contact with the television screen. This is an indication of interest to the extent that the viewer is at least giving attention to the visual images on the screen. Looking away from the screen for longer than fifteen seconds at a time, or repeatedly for short intervals, can be taken as an indication of lack or loss of interest. Admittedly, eye contact is not an absolute method of measuring interest. A viewer may be watching the television screen and may also be day-dreaming. Perhaps the only true method of measuring viewer

interest is effective pre- and post-testing. But even here, many “authorities” point out discrepancies in apparent and actual results.

METHODS OF GAINING VIEWER INTEREST

From commercial television, successful industrial training programs and motion pictures, we can learn a number of techniques to create and sustain viewer interest.

HUMOR. As the producers of the vehicle safety tape can attest, humor is a useful tool in creating interest. Even slap-stick or corny humor can succeed at grabbing a viewer’s attention. And insulting humor can stimulate interest to a limited extent. Experienced television producers have learned that humor is one of the most difficult moods to create on television. The inexperienced producer and writer tend to create corny humor at first and as has been mentioned above, even this type can create temporary interest. It



Picture 23-1. Audience interest can be determined by measuring the eye contact between the viewer and the screen.

should be noted, however, that ineffective or corny humor may detract from a professional or sophisticated program.

VARIETY. Variety also played a major role in the success of the vehicle safety tape. The general public has been conditioned to watch television in ten-minute segments. However, many educational or industrial training tapes expect an audience to watch programs of up to 60 minutes in length. If it is absolutely necessary to have the program run that long, break it up with variety. Try to vary the talent, format, staging, program structure and especially the camera shots. Planning for variety should be an integral part of program planning for all closed-circuit television programs.

INVOLVEMENT. Audience interest can be stimulated by involving the audience in the program. By asking the audience to answer questions, requiring a written response following the tape, requiring the viewer to stop the videotape recorder and answer questions before continuing, or having a handout which must be used in viewing the program, you are creating involvement. In fact, any method of viewer feedback should be considered as beneficial, because it allows the possibility of two-way communication.

UNUSUAL CONTENT. Any program which contains highly unusual and/or relevant material will be inherently interesting to the viewers. A totally “new” idea, a famous or important person, a piece of equipment that “answers all problems” — these provide unusual content. Programs of this nature are rare, but when they occur, they are usually met with instant success.

A manufacturer of television equipment in the West had produced a number of training tapes of average or below average interest to the branch office personnel. But then the president of the company and chairperson of the board of directors appeared on a program. Even though the format was nothing more than a “big talking face”, the program was unusually effective. It seems that most branch employees were familiar with the president’s name, but had never met him. The videotape provided an unusual method to “meet the president.” Consequently, there was a high element of viewer interest and the message was effectively communicated.

The president’s appearance constituted unusual content. However, if the president were to appear on several successive programs he would have become “just another face.” At that time the producer of the program would have to resort to other methods to engender viewer interest.

GIMMICKS. Any unusual gimmick — humorous or otherwise — will stimulate interest. Some industrial training tapes have used dancing girls every ten to fifteen minutes in a 60-minute tape as a gimmick to gain interest. Besides being sexist, the technique is a gimmick and may distract from the purpose of the program. It is possible for a director to use gimmicks which can interfere with an important message which needs to be communicated to an audience.

A major university produced 33 half-hour programs to supplement the Biology 1 classes. Even though the principal instructor had a pleasing television personality, the producer used a gimmick to help maintain viewer interest. In the first program the instructor introduced Amoeba to the audience. Amoeba was a puppet which was operated by a theatre student. The instructor explained to the students that from time to time Amoeba would drop by to see how they were doing with their assignments.

In each episode Amoeba dropped in to review any new words that had been used in the lecture and to explain the new reading assignment. Amoeba also kept the students up to date concerning upcoming events such as mid-terms.

The chairperson of the biology department commented that the entire project was a resounding success. He further stated that the test comparisons between televised classes and the “live” instructor classes indicated an improvement in the televised classes over the traditional classroom situation.

We can conclude that the success of the biology series was at least in part due to the high viewer interest which apparently resulted in increased content retention.

TALENT. The performing ability of the talent can help create interest. The ability to verbalize, to move on camera, maintain eye contact, execute expressions and gestures dramatically — all will add to the viewer interest in a program. Unfortunately, the reverse is also true. An inept performer in front of a camera will require other strong measures in the program to maintain viewer interest.

To illustrate the importance of the talent in the formation of a television program, consider the following example. Prior to 1971 there had been several attempts to market a videotape package on speed reading. Most of the attempts utilized similar techniques and devices such as handbooks, workbooks, time exercises and a tachistoscope. None of these early series met with much success. A few, in fact, were disasters.

Then Time-Life Films, Inc. introduced a new series with many of the established techniques and devices. The series was professionally produced, but was far from a “slick” production. The production techniques used were just average, and in some instances the switching and/or VTR editing was only fair.

But the Time-Life Films series was, and still is, a fantastic success. What did Time-Life do in their speed reading series that the previous producers of similar programs did not? Time-Life used Dick Cavett as the talent.

Dick Cavett’s informal but knowledgeable style added believability and simplicity to an otherwise dull subject. His seemingly off-the-cuff jokes created enough viewer interest to sustain each program in the series.

Granted, few educational or industrial television producers could afford the talent fee commanded by a Dick Cavett. The Time-Life example points out the important role of the talent, and how the talent can make an average program a big success.

VISUAL MATERIALS. Creative, well-motivated, interesting, unusual or fast-paced visuals can stimulate viewer interest. The human eye will follow movement and high contrast objects on a television screen. When the eye follows, the possibility of interest is increased. Planning every visual element of a program — including camera shots — in advance is a must if the program is to maintain viewer interest.

A lecture demonstration program with few visuals will be nothing more than a Big Talking Face (BTF) program. An experienced talent can carry a program with few visuals, but the average in-house performer needs the support of good visuals to maintain viewer interest.

SHOCK. If all else fails, and the producer is in creative desperation, shock could be used to stimulate interest. Screaming or jumping off a table will certainly gain the attention of the audience. Their interest will increase immediately, but it will also diminish rapidly if a follow-up motivator is not used.

CONCLUSION

Viewer interest is usually not considered when a television program is planned and produced. After the videotape has been distributed, viewer feedback may give positive or negative indications

concerning interest. Unfortunately, it is only then — after the time and money have been spent — that many producers first recognize the lack of interest in a program. Viewer interest tends to be neglected in planning and producing a program because there are so many other seemingly more important things about which to worry. But by planning for viewer interest together with other aspects of a program, a producer will have greater control over the final product. And that equals greater control over the success or failure of a videotape as a communicating tool.

CHAPTER TWENTY-THREE QUESTIONS

1. What is viewer interest? How important is it in an instructional television program?
2. Describe a method to measure viewer interest. What would be a good score? What would be a bad score?
3. Discuss several methods of gaining viewer interest.
4. Discuss several methods of maintaining viewer interest.
5. In your opinion, what is the single best method of establishing and maintaining viewer interest?

24. *Performing for Television*

Relating to a piece of dark glass and communicating with an unseen audience are talents requiring special training, practice and instruction. TV performers of such talent and experience are rare in most industrial and educational studios. Directors usually have to make do with people from inside their organization, people not trained in the art of talking to a camera. Predictably, this often results in amateurish, artificial performances that detract from the material being presented.

The situation need not be as hopeless as it seems, though. There are at least seven areas in which a director can help the performer or “talent”. This chapter will deal with those areas.

SCRIPTS TO HELP THE TALENT

Avoid a word-for-word script. An amateur may ask for one, thinking that an exact script of what is to be said will bring a feeling of

security. The truth of the matter is, most amateurs are not prepared to use that type of script. An outline or format script in general topics is usually best for a novice. These types of scripts force the performer to think on the spot, but they also give both the talent and the audience the feeling of sincerity and spontaneity. The audience will excuse minor mistakes by a performer when they feel that he or she is sincere. Another way of looking at it is this: if the talent is presented as a professional, the audience will expect professionalism. But if the talent is presented as he or she is — the company president, teacher, manager of a department, etc. — the audience will not expect professionalism, just a good job.

For technical information, a word-for-word script may sometimes be required. But use this only as a last resort. Consider hiring a professional talent, who should be able to handle any kind of a script, before allowing an amateur to use a word-for-word script on a technical program.

If, for whatever reason, it becomes apparent that you will have to resort to the word-for-word script, the best method of delivery is a teleprompter. A teleprompter is a device usually mounted near or on the lens of a floor camera. A roll of paper which has been typed with a special large-letter typewriter is rolled through the device by means of a motor. Professional teleprompters may even provide the talent with a button which controls the speed of the motor. But they are also expensive. Homemade variations of the same device can be effective for the ELBO (extremely low-budget operation).

An alternative to a teleprompter is the idiot card or cue card. These can be used near the camera lens with reasonable success. One caution: a nervous novice and poor idiot cards can be a bad combination.

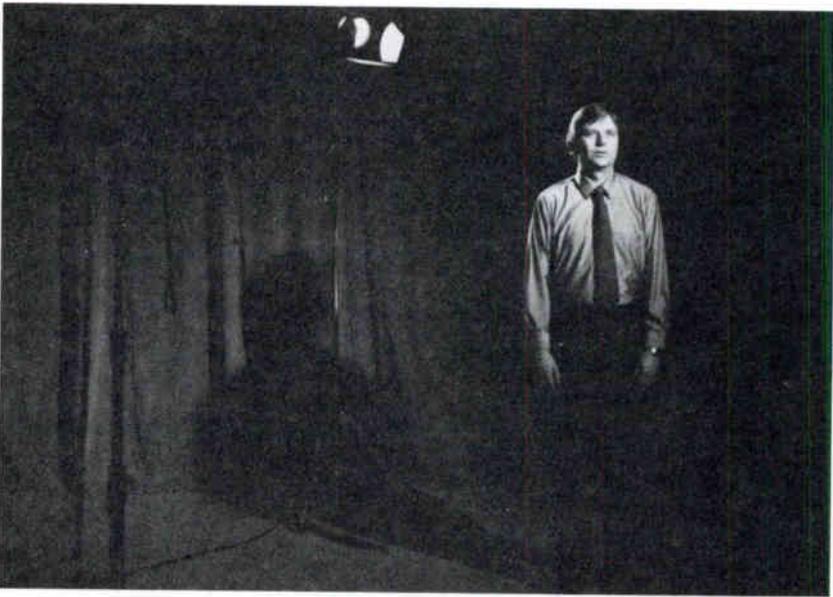
There is a difference between scripts for verbalization and thesis writing, although some scriptwriters have yet to learn that fact. If a word-for-word script must be used, it should be written in broadcast style rather than thesis style. Broadcast style uses short sentences with only one thought per sentence. It uses fewer prepositional phrases and dependent clauses. Keep sentences simple for broadcast style. The amateur performer will find it difficult to follow any word-for-word script, and one written in thesis style will be totally uncomprehensible.

Following are two scripts, the first in (exaggerated) thesis style and the second in broadcast style.

STAGING THE TALENT

The placement of a performer in a studio can affect his or her performance. For example, a nervous teacher asked to give a segment in a biology program may feel even more nervous if staged in a standing position in the middle of the studio, with the camera too close for comfort. Such a performer tends to feel more at ease when the elements of staging are conducive to a relaxed situation. And, generally speaking, the more relaxed the performer, the better the performance.

Most people who have received no training in performance find it difficult to stand before an audience. And they find it especially upsetting to stand before a television camera. The problem of what to



Picture 24-1. The talent can feel alone without props or scenery.

do with their hands is enough to bother most people seriously. And to ask a nervous and inexperienced performer to “just sit there” can compound the nervousness into a lack of communication.

The following techniques can help the talent to feel at ease on the set. Position the camera from 10 to 15 feet away from the performer. A

camera that is too close — or too distant — can impair the performer's ability to communicate.

Where should the performer be seated? A stool or chair can give the talent a sense of relaxation, but a chair that is too soft can make the talent feel apart from the subject. So, keep chairs upright, comfortable, but not too soft.

A few props such as end tables, lamps, flowers or decorations help the talent feel at ease. Staging the company president in his or her office for a remote telecast can help the person communicate because he or she is on "home ground," in a familiar setting. Props on the set will affect an uncomfortable performer the same way.

Nervousness can also be relieved if someone else is on the set, such as an interviewer or members of a panel. Consequently, an interview or a panel discussion is much more relaxing for a nervous performer than a lecture-demonstration. A beginning director should remember that a lecture-demonstration places all of the performing pressure on the talent, while the interview format reduces the pressure to perhaps 40% on the interviewee.

The placement of seemingly unimportant production hardware can intimidate the talent. For example, a boom microphone is threatening because it hangs overhead and moves with the talent, while a small lapel-type of microphone with a miniture cable can soon be forgotten. If the performer needs to work on the set with any charts, graphs, or props, design the staging around the most convenient method of pointing and demonstrating. Is the talent right-handed or left-handed? Is he or she in a good position to point out the part of the product that is being featured? Can the talent feel at ease with graphics while seated, or would he or she be more relaxed standing? Some performers would prefer to stand while gesturing to a chart, because they feel restricted while seated and pointing to a large chart to one side.

If the talent is staged behind a lecturn or desk, not only will the audience feel the air of authority, the talent will, too. Suppose, for example, the mayor is to speak on the cable system and is nervous about the presentation. Staging him or her behind the barrier of a desk or lecturn will reduce the tension somewhat.

Occasionally the talent will perform better when there is a "security blanket" between him or her and the camera. Be careful, though, that the security blanket does not become a barrier to communication. While a desk may add dignity or an air of authority, it



Picture 24-2. *The talent will feel at home in a chair.*

can also be a barrier if it is seen too much on camera. It is possible to use a desk or lecturn as a security blanket and yet see it only two or three times during a ten-minute presentation.

TALENT MOVEMENT

We learn from the theatre that any movement on stage — or on the television set — must be backed by motivation. Otherwise it may appear out of place and could distract from the information being communicated. And yet, movement is valuable because it creates viewer interest. Add to these concepts the practical consideration that amateur talent usually does not move well on camera and we begin to understand why helping the talent move is so important. The performer's ability to move smoothly and convince us that it is part of the script determines how effective the move will be in creating interest.

Discovering the motivation for a movement in a dramatic presentation may be difficult. But in most industrial or educational

programs, the motive may be as simple as the need to get from one graphic to another. The traditional method of staging graphics, for example, would be to place the talent beside the charts, which are resting on an easel. A creative director might stage the same scene differently. Each of the graphic charts would be enlarged to three feet by four feet and placed in a frame which is suspended from the lighting grid. If the frames are four to five feet apart, the talent will have to walk from one to the next. Not only will this increase visual interest, but the talent will be moving because of a real motivation, i.e., the need to walk from one chart to the next. Other forms of motivated movement may include directing the talent to walk from a bookcase, where he or she is looking at a book, to the desk, where he or she sits down. In this case the motivation is more subtle, but it is nevertheless, a motivation. It is simply that the talent wishes to sit down.

There is a hidden problem with talent movement on camera. It is the difficulty to make the move appear natural, smooth and properly paced. Professionals learn these techniques through practice and experience. New performers learn in the same way, by experience. A good practice technique is to rehearse the move on videotape and play the tape back to the talent. Most beginning performers can make adequate adjustments in just two or three rehearsals.

Some moves are more difficult than others. For example, it is more difficult to stand up or sit down than it is to walk from one point to another. If a beginning performer needs to stand up, demonstrate the correct way to do it and then practice it several times. The correct way to do it is to move forward in the chair as much as possible without altering the elevation of the head, then pause briefly and rise slowly. To sit down, the procedure is reversed. The purpose of the forward, or backward, movement is to give the camera operator ample warning that the move is coming. A camera operator must compensate for every move made by the talent. If the moves are fast or jerky, the camera framing will suffer.

A small move by a well-rehearsed amateur can do a lot to relieve the normal tensions and nervousness which all performers experience. A nervous performer confined to one spot because of the laziness — or lack of imagination of the crew — will probably remain tense. But a performer who can move even three or four feet will find a good release for the built-up tension. When planning movement for a new performer, remember that diagonal or lateral movement is better — and usually easier — than forward or backward movement.

HELPING THE TALENT TO RELAX

Appearing on television for the first time is a frightening experience for many people. For some, it is so terrifying that they refuse to step in front of a camera. Others appear on television only with grave reservations.

Often, a person who holds a top position in an organization — such as a company president, vice president, manager, professor or department chairperson — is scheduled to appear on a television program. Off camera, such people command authority because of their job status. They have no fear or apprehension concerning their job performance. But behind the camera, that self-confidence is reduced because they must suddenly become a television performer. Many of these “authority” figures are unable to admit their inadequacy as a performer and rather than do so, they try to fake being a television performer.

The vice president of engineering, for example, may seem outwardly calm, but may be terrified inwardly for fear he or she may do something wrong. He or she may project an impression of false self-confidence so strongly that he or she refuses help from the producer or director.

In these cases, the only thing the director can do is to be gentle and give as much information as he or she can about what to do without insulting the talent.

More open, but just as terrified, is the person who refuses to be on television or who agrees to be on camera but is very dubious about the whole situation. All of these situations call for the director to do what is known as “first-time conditioning.”

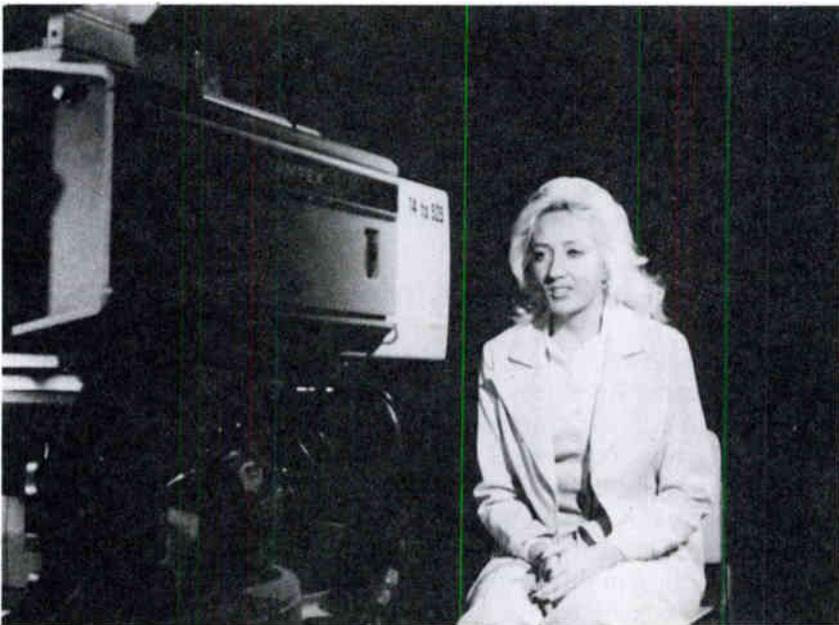
First-time conditioning is a process whereby the extremely nervous performer can be adjusted to the role of a performer gradually, not during one experience. The following is an example of the conditioning process. Several days before a taping session, the talent should be introduced to the studio and the equipment. It would be a good idea to demonstrate the camera, switcher, videotape recorder, mike mixer and lights. Next, the director should work with the talent outside of the studio on at least one occasion regarding the script and movement. And one or two days prior to taping, the talent should have a rehearsal in the studio with cameras, microphone and lights — but no crew, just the director. In this rehearsal the talent should be counseled about all the things he or she is probably worrying about — clothing, make-up, what to do with hands, how to

sit, what cues look like, etc. The talent will become more accustomed to the studio, the lighting, to the equipment, etc., with several experiences on the set.

During the rehearsal it is wise to record three to five minutes of the program. Director and performer should then play back the tape. It will provide good mirror feedback and it will give the director an opportunity to reinforce the talent's performance on the program in a positive way. Smoothing the way by first-time conditioning, as described above, helps build genuine self-confidence on the part of the performer by replacing fear of the the unknown with knowledge, practice and experience.

LOOK ME RIGHT IN THE EYE

One of the most obvious traits of a professional television performer is the ability to establish the illusion of eye contact with the audience. Many cultures expect two individuals who are in communication to have frequent eye contact. And a skilled television performer



Picture 24-3. Eye contact with a glass lens is difficult.

knows how to relate to that piece of dark glass that is a camera lens as though it were a person. In many if not all Native American cultures it is considered rude to look directly into another person's eyes while conversing. In these situations the performer must adapt the expectations of the audience while appearing on television.

New performers in a lecture-demonstration format must understand the importance of eye contact and work at it constantly. Lack of good eye contact may cause audience frustration and hinder communications.

On certain types of television programs eye contact is less important. For example, in a panel discussion the talent (panel members) are not expected to have extensive eye contact with the camera. Rather, they are expected to look at the other panel members. However, it is still a good practice for the talent in a panel discussion to look at the camera as much as 20 to 30 percent of the time.

Another television format which requires less eye contact than a lecture-demonstration is the interview format. By its nature and application, the interview format is usually better for most educational programs than the panel discussion. So, it can be used effectively with the new television performer. It is good training ground for new performers to get a few programs "under their belts." When the initial fear of TV has subsided, a lecture-demonstration will not seem so frightening to a new performer.

The off-camera narrator format is also a good training program because the talent does not have to worry about being seen on camera. However, avoid long uninterrupted segments narrated by a new performer with an unexpressive voice.

TRAINING THE CREW

The crew of a television facility frequently becomes a clique. Such is to be expected where several people work together as a team over a period of time. But cliques can cause problems.

When a new, non-professional performer enters the studio, he or she is an outsider as far as the crew is concerned. Inside jokes, and indifferent treatment can make the talent feel unwanted, unsuited for television performance and very lonely.

The solution to the problem is two-fold. First, the director should set a good example for the crew when dealing with the talent. The director should always speak with respect concerning the new

performer and stifle the temptation to compare the talent with Johnny Carson. Secondly, the director should expect the crew to do the same. It may be necessary to discuss the problem in pre-production meetings. One way to help improve an already bad situation is to have a special training day in which the roles of the crew are reversed so that a camera operator is the talent and the engineers are the production crew. By doing this, the camera operators, who frequently deal with the talent, get the opportunity to experience the loneliness of the performer first hand. As a secondary benefit, the engineers experience the problems of the production crew.

Obviously, the goal of any production is best met when the crew functions as a team. Too often though, the talent is excluded from this goal. When the talent is from the same company or organization that owns or operates the studio, it is very important to make him or her a member of the team. Each person on the crew should be familiar with the talent's television performance problems and do everything in his or her power to help the performer. When this atmosphere exists in a studio, the talent will immediately feel welcome, relaxed and part of the team. And that's the secret of extracting the best performance from amateur talent.

BLUFFING YOUR WAY TO ADEQUACY

There are situations in an educational/industrial/cable studio when a nervous person who has little or no experience in front of a camera must take a major role in a program. If there is not enough time for "first-time conditioning", or several rehearsals, there is a "secret" technique which can be used.

If the talent is typical, he or she will have many unanswered questions: how will I look, where to sit, where to stand, when to stand, where to look, etc. The director and crew should take the time to answer each of these questions, even if only briefly. If this is done with an air of confidence and reassurance, the talent will feel better. If, on the other hand, the director rattles off the answers quickly with a feeling of disinterest, the talent will hear nothing and end up being more nervous. It is critical that the director be firm, friendly and direct.

Beyond the information given by the director and crew — and, of course, the actor's natural ability — his or her self-confidence probably plays the biggest role in the success of the program. A terrified performer may convey the message well enough, but the

audience is more receptive to a somewhat relaxed, but energetic talent who displays a feeling of sincerity. The question, then, is how does the director give a nervous, unprepared, novice performer a feeling of purpose and importance sufficient to make of him or her an effective television communicator? A technique that works is called “the bluff” and here is how it is done.

The talent must feel important, that he or she is going to do a good job. To accomplish this, the director must do and say things which convince the talent of his or her own importance. For example, the director can point out the lighting with something like, “We only had a few minutes to set up today, but we were able to do special ‘Dick Cavett-type lighting’ for you. It will flatter your hair and facial features and make you appear friendly and knowledgeable.”

Now, in fact, there is nothing at all like “Dick Cavett-type lighting,” and probably never will be. But the talent doesn’t know that. If the statement is made sincerely, the talent will believe it. And that’s what the program needs, a performer who believes that he or she knows what’s going on and how to do it.

Other elements of the program, such as the staging, can be used to reinforce the mental attitude of the talent. “As you can see, we have a large desk for you to sit behind. This will help you because you will not need to be concerned with your hands and feet. Also, the desk will convey an atmosphere of authority and believability to the audience. It should make your job much easier as a television performer.”

Here is another one. “We have included some items on the set which will paint an interesting picture for the audience: the U.S. flag says you are patriotic; the photograph of your family says you are a loyal, devoted parent; the bust of Lincoln indicates that you are honest and trustworthy; and, the picture on the wall, the one of our current president, says that you are probably a personal friend of the president. All of these seemingly insignificant items will create a positive image for your presentation.”

Now, in fact, many of the items mentioned will do what the director said they would do, but perhaps not so specifically as the director indicated. Nevertheless, they will help the talent to feel that the entire crew, even the set, is working for him or her — not against the performer. What the talent does not know will not be worrisome. But what he or she does know about many of the things going on in the studio can mean the difference between a program with an ineffective talent and one in which the performer has a positive attitude and is trying to communicate.

PROFESSIONAL VERSUS AMATEUR TALENT

One of the first questions to be resolved in the planning stages of a program is whether to place someone from the staff in front of the camera or to pay a professional announcer to appear on the program. Vital factors to consider in this decision are the importance of the program, the target audience, and the size of the budget.

The idea of using a professional performer may seem ridiculous to producers in studios that are “low budget” operations or “no budget” operations. Under such circumstances, the producer is forced to use inside talent. Only when the program is of great importance will such a producer look for professional talent.

The real costs of using professional talent for a training or educational television program may not be as high as many producers think. The executive producer of a program should consider the following facts. If the person selected as a talent is a staff member with an annual salary of \$45,000.00, and that person spends seven hours in the preparation and taping of the program, the real cost to the organization or company is \$151.41 plus salary overhead such as taxes and benefits. That means that the actual talent cost for the program could be as much as \$186.43.

An experienced professional talent will be able to read lines and make the necessary movement in much less shooting time than the inhouse amateur. The reduced production time using professional talent is also a cost saving over an amateur who requires 20 takes to read one scene.

In many cities where the performing unions are not strong, a semiprofessional (a person who is a good radio disk jockey or second string television news announcer) will charge as little as \$75.00 to \$175.00 to announce a 15-minute program. Some administrators argue that outside talent is an added expense which would not be paid if the program were not recorded and that the inside talent's salary will remain the same. Both of these arguments have merit, but it is important that each producer understand both sides of the question.

Remember also that outside talent must be much better than any of the inside talent to justify cost. Many CCTV operations have found it best to select two or three people within their organization and train them to be adequate performers. Not professionals, but good by inside standards. Trained inside talent is probably better than low budget outside talent. Most CCTV studio would be wise to train at least two inside people as talent.

A few years ago, a trucking company in the West produced monthly training tapes for distribution to its branch terminals around the country. The usual host for the programs was the marketing services manager who had no previous television performing experience. He was a good communicator with a pleasing sales personality. Over the period of several months and numerous programs, the manager asked for help, critiqued himself, watched commercial TV, experimented with different techniques, and worked hard to perfect his performing ability. After a year of performing on the programs, this marketing services manager was as good a television communicator as any second string “Downtown” talent. Every CCTV studio should take a lesson from him. After all, even the professionals had to learn how to be fine television performers.

An accounting firm in the Midwest has a different philosophy about inside and outside talent. They think that their company is a professional organization with sophisticated employees who expect not only very good professionals as talent, but also the highest technical standards as well. So they produce programs on the level of commercial broadcasters. All talent is the best from commercial television. They seldom use inside staff members because of the image they wish to present. Obviously, they are not in the Category of ELBO (extremely low-budget operation) productions. Naturally, their training programs cost more than other smaller operations.

A chemical company on the East coast has yet another point of view. They frequently use inside “authority” talent on productions. Their reasoning is that their viewers are familiar with the name of the talent and recognize him or her as the authority on the subject. The company surmises that the audience will excuse the fact that the talent is not professional and will excuse small blunderings he or she might make during a program.

A utility company on the West coast always features the direct supervisors of the intended audience as the talent. Their philosophy is that members of the audience will relate to their immediate boss and hold the boss in high regard because they see him or her on the television screen.

Of these many different points of view, which is correct? Who has the answer? What should the small, medium or large CCTV studio decide concerning the talent on a program? No one answer will meet all situations and circumstances. But the considerations are usually the same.

INTENDED AUDIENCE. A program for the board of education or the board of directors will probably seem more important to the producers. If so, more expensive talent may be appropriate.

PROGRAM IMPORTANCE. A program which embodies and promotes the corporate image or a program which will be used to sell a new and expensive product the company plans to market is obviously more important than the weekly policy tape produced by the industrial relations department.

BUDGET. When a television department is restricted to ELBO productions or “Whatever I can talk the boss into”, the budget is usually very small. These facilities work under a different set of rules than large industrial or educational studios which almost classify as a broadcast television station. Actually, the budget limitations in a television facility play a more significant role in determining who the talent will be than any other consideration.

CONCLUSION

It has been said that one of the most important factors in the overall success of a television training or educational program is the ability of the talent to effectively communicate the message. When the talent has the ability to bring the audience into a discussion, and when the talent can maintain viewer interest, the potential of success for the program is greatly enhanced.

CHAPTER TWENTY-FOUR QUESTIONS

1. How is it possible for a script to help the talent communicate the message in a program?
2. Why has our society pushed the use of academic writing, rather than a verbal writing style?
3. What are the basic characteristics of the verbal style of writing?
4. What can be done with regard to the staging of the talent to increase the content retention of the audience?
5. What happens to the talent when movement is required in a scene?
6. Discuss several methods of assisting the talent to relax.
7. Discuss the importance of the talent maintaining eye contact with the camera lens.
8. What can the production crew do to help an inexperienced talent?
9. When should professional talent be used? When should amateur talent be used?

25. *Visualizing for Television*

In the earliest days of motion pictures, the camera was a voyeur, a peeping tom surveying the world from a fixed position. But after the initial novelty of moving pictures subsided, directors became more creative with their cameras. They moved them around to follow the action and to create feelings in the minds of the audience. Close-up shots gave the audience a more intimate view of the message being communicated. And the use of different camera angles, zoom lenses and special effects allowed the audience to feel they were experiencing what they were seeing.

When television came on the scene, it struggled through many of the same developing stages. Early television users, especially in non-commercial situations, thought of television as nothing more than a surveillance medium. They recorded classroom lectures in surveillance fashion with one camera in the back of the classroom and wondered why the audiences disliked the viewing and retained so

little of the content. Gradually, television users discovered what motion picture directors had learned half a century before: Television — like the movies — is more than radio with pictures. It is a medium in which the subject matter must be communicated visually as well as aurally.

VISUALIZATION AND CONTENT RETENTION

It has been estimated by researchers that as much as 85% of what our brain retains comes through our eyes. Television programs which pay too much attention to the aural element are missing the greatest medium of communication: the visual element.

The process of selecting, timing, composing, and relating the visual elements in a television program is known as *visualization*. The process requires the scriptwriter and director to see every camera shot and special effect in his or her mind and then to produce the program so the audience sees what they saw. Creative visualization allows a program to communicate more than the sum of its parts. Without it, a production will communicate ineffectively, if at all.

VISUALIZATION IN INDUSTRY AND EDUCATION

Visualization receives little attention in most industrial and educational television programs. The beginning director usually feels fortunate just to get the program on videotape, regardless of the quality of the production. New directors are often overwhelmed by verbalization, organization and hardware and consequently find it almost impossible to be conscious of shot selection, timing, and composition. Once the mechanics of productions are mastered, the challenge of effective visualization should occupy the director's attention. This involves planning programs around visualization and not convenience.

In many television programs produced by education and industry, too much emphasis is placed on the verbalized portion of the script. Granted, the verbal content of the script is important. But consider what often happens: a word-for-word script is drafted and sent to appropriate individuals for "approval." Weeks may then be spent by this reviewing committee changing words or simple sentence construction. And through the entire tedious process, the visual portion of the program receives little or no attention. This method of

producing a television program all too often leads to a finished product using the “Big Talking Face”, or BTF as it is often called.

Even in the most technical of programs, where a word-for-word script may be a necessity, a director has no license to forget the visual elements. The director should analyze each thought in the script and ask, “What visual can best explain this specific example or thought?” There will probably be some instances in which there is no available visual material to support the narration. In such cases, the only thing left is the Big Talking Face. But even then, visual interest can be stimulated with either talent or camera movement. Another technique which is commonly neglected is staging the Big Talking Face in some location other than the studio or at a desk. Creative staging in a factory or other such location can help the audience visualize the message.

HOW TO VISUALIZE

One thing a director of technical programs can do is to work closely with the person writing the script. Usually an inexperienced scriptwriter will write for neither the spoken word nor the visual element. The experienced director will attempt to get the writer to “see” the program as he or she writes it. Experienced scriptwriters will constantly ask themselves, “What picture, demonstration, illustration or visual process will best describe the solution to the problem?” Writers will have a much better chance of producing an effective script if they will train themselves to think in visual terms rather than with words alone.

The following two examples illustrate the point. A community college in the Midwest produced a program for the school’s art department. The purpose was to introduce the craft and art of pottery, and the director visualized the program in a creative way. First, she watched the potter throw a pot to see how it was done. She then organized her thoughts, and the crew videotaped the potter throwing a pot. There was no audio recorded, just the visual element.

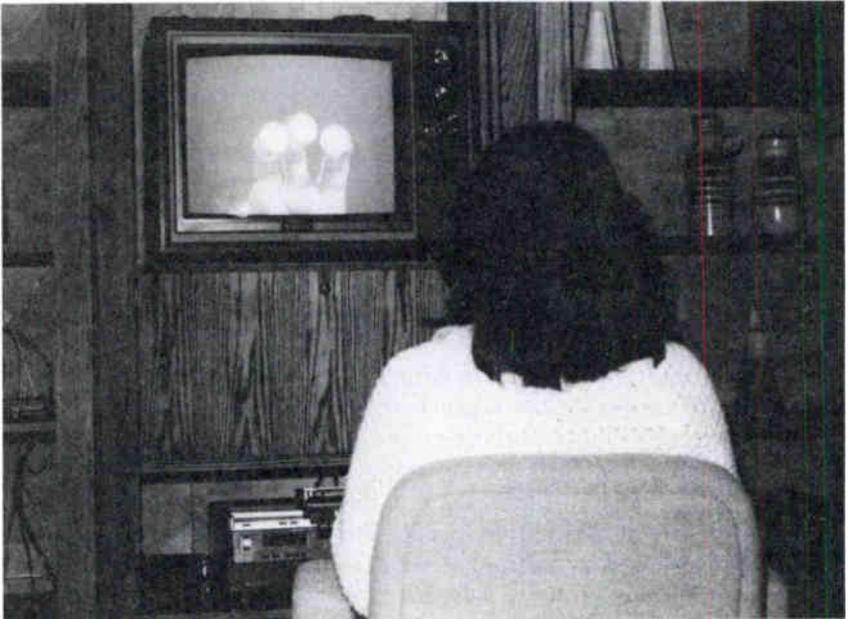
When the potter finished, the director asked him to repeat portions of the process for closeup shots. That done, the director edited the tape into a concise visual documentation of the art process. She then selected music which matched the program content. She called in the potter and played back the videotape several times while the artist made notes about the important verbal comments which

should be made. The potter recorded the comments onto audio tape and they were edited into the program with the music as a bridge where no comments were necessary. The result: a program which was extremely well visualized.

Contrast that with a rather uninspired director attempting to record the same program. He or she might use a panel discussion of three artists describing the process. Or the director might stage a lecture demonstration with emphasis on the lecture. Or it might even be possible to script the entire program in the word-for-word format. Any of these methods would be ineffective compared with the technique of the first director. Her creativity in visualizing an obviously visual process made the program a success.

VISUALIZATION AND VISUAL INTEREST

At this point it is necessary to distinguish between visualization and visual interest. Take, for example, a three-person panel discussion in which the first 60 seconds of the program is a wide shot with no



Picture 25-1. Good program visualization can result in not only audience interest, but also content retention.

movement. During the first 15-20 seconds the viewers feel that nothing is wrong. But as the two panel members begin answering specific questions and the camera shot remains the same, the viewers become frustrated and bored with the program. A single camera shot — however well planned — may become stale after even 15 to 20 seconds depending upon the subject matter.

Likewise, in the same three-person panel a 60-second medium close-up of the moderator while the panelists respond to questions will also frustrate the viewer.

On the other hand, a three-minute medium shot of a “Muppet” routine in which only the Muppets move will likely captivate the viewer. This is probably because the Muppets are inherently more interesting than a panel discussion. It is possible, therefore, for the content of a program to maintain viewer interest.

Viewer interest, then, is the absence of viewer frustration. Visualization emphasizes communicating within the visual element. All good visualization incorporates the use of visual interest, but not all programs with visual interest are also well-visualized.

SHOT SELECTION AND VISUALIZATION

CLOSEUP SHOTS. Television is a close-up medium. Without the use of composed close-up shots a program may be ineffective and boring to the audience. When the talent says, “As you can see, the gear cap is adjusted by this control”, the director must have a good close-up of that part of the mechanism. A wide shot in this instance would frustrate and probably confuse the audience. As a general rule close-up shots are needed when the program content is specific.

Too many close-up shots, on the other hand, can also confuse the viewer. If the camera sees everything close-up, the viewer becomes disoriented and cannot relate the small views of the object or person to the overall setting.

WIDE ANGLE SHOTS. Wide shots orient the audience and provide contrast; close-ups take a more intimate look and are generally instructive. Either used to excess will frustrate, not enhance.

SHOT MOTIVATION

In attempting to visualize a script, the director should be sure that all camera angles are well motivated, especially the close-up shots.

This does not mean, though, that a director should use only wide shots to cover the action on the set. Experience teaches the director to commit a camera for a close-up shot and quickly solve any problem as a result of that commitment. This may be difficult for a novice director, but it is essential in producing well-visualized programs.

THE BIG TALKING FACE

When a script does not lend itself well to creative visualization, the Big Talking Face may be the only alternative available. But even a BTF program can be well visualized if the scriptwriter selected words which create visual images in the minds of the audience and if the talent uses effective expressions and gestures. A series of television programs on psychology, for example, was highly successful because the performer — a psychologist — created lucid visual impressions. He related a series of personal experiences and stories in such a manner that the audience was able to visualize them in their own minds. Moreover, between stories he presented the audience with other visual elements, such as film, slides, pictures, charts, etc.

Unfortunately, not all television performers have the ability or training to hold an audience with the spoken word alone. It often takes many years to cultivate and perfect such a talent and make it effective. Frequently, non-commercial television operations are limited in availability and variety of talent in front of the camera. In such cases, the producers must make the best with what they have.

TOTAL VISUAL COMMUNICATION

There are some topics which must be described visually because they are almost totally ineffective as an aural demonstration. For example, suppose three persons are assigned to form a panel and discuss the topic, "The proper procedure for backing a car and trailer into a garage." If none of the participants uses visual aids, the result would be a disaster. The audience needs to "see" in order to understand this topic; just hearing is not enough. The use of film or videotape may teach the necessary concepts and mounting a camera above the car may also be helpful. In all honesty, even this approach probably would not be as effective as putting the student in the driver's seat and giving on-the-spot instructions in the art of backing the car and trailer into a garage.

CONCLUSION

Visualizing a television script before a single camera is moved into place is a must for at least two reasons: First, it saves time and energy once the talent, crew and equipment are on the set. Potential problems come to light as the director thinks through each shot and camera angle. Second, careful visualization brings greater impact and more effective presentation of instructional materials. We learn more if the program has been thoughtfully visualized. And since we learn more from our visual sense than all other senses combined, visualization is absolutely necessary for an effective program.

CHAPTER TWENTY-FIVE QUESTIONS

1. What is visualization in a television program?
2. What is the relationship between visualization and content retention?
3. What happens to most audiences when they watch a program which uses a Big Talking Face for 20 minutes?
4. Which crew members must be capable of good visualization?
5. What is the difference between visualization and visual interest?
6. Which camera shots are most helpful for proper visualization?

Part VI. Conclusion



26. *The Future of Television Production*

Dear Readers:

In the 1970's I conducted a series of television production workshops around the country titled "Beginning and Advanced Television Production." The first two days consisted of many topics about production for entry level persons, and the last two days were designed as an "advanced" course for persons with at least the experience of the first two days.

One of the more unique approaches I used in the advanced course involved the students voting upon which topics would be covered the last day of the workshop. I would list a dozen or more topics on the chalkboard, and the class would vote on which topics concerned them most. I learned a lot from the voting during those classes.

The most important topics to those students were videotape editing, electronic special effects, the video signal and the audio

signal. Perhaps you can see why this text is arranged as it is from the voting many years ago.

But there was one topic which almost always received a large number of votes: the future of television production. It was a short session where I would speculate upon what types of equipment and techniques would be available in the future. For that reason I thought it appropriate that this text end on the same subject.

TELEVISION EQUIPMENT

The greatest advance in television hardware in the past twenty-five years was the invention of a conversion process which enabled an analog video signal to be converted to digital pulses, and then be reconverted to an analog signal again. That break-through led the way for the invention of the time base corrector. TBC's literally changed the way we do production. Without them the film style and editing techniques which we now take for granted would be impossible.

Another area of recent advance was the development of large scale integration (LSI) from the U.S. space program. LSI provided a method to miniaturize electronic components and gave us such things as electronic videotape editing systems, small, lightweight cameras, stable VTR's, and much more.

Now for the future.

The single greatest limitation to the television recording process today is the electro-mechanical device called a videotape recorder. Because it is a combination of both electronics and mechanics, it has many inherent problems which limit its effectiveness. If it is ever possible for scientists and engineers to eliminate videotape and all moving parts from a VTR, the problems we see every day with VTR's will be gone.

Astute readers may say that what I have just described is something similar to a video disk recorder. You're right.

Video disk recorders (and players for that matter) still have a few moving parts, but not nearly the number that a videotape recorder has. Perhaps the future of VTR's is nothing more than a break-through in the technology of recording audio and video signals on a disk. Or perhaps the future is in the development of holograms or some other such device. Regardless, I predict further developments concerning VTR's which will reduce our frustrations with them.

Another area which will see improvements is color cameras. In 1968 a 25-pound black and white camera was a hit at a trade show.

Today, a 25-pound color camera is considered heavy. Not only are today's color cameras physically lighter, but the technical quality of cameras has also improved to the point that a \$1000.00 camera today compares directly with a \$15,000.00 camera of just a few years ago.

I predict that television cameras will continue to get smaller, and the technical quality will continue to improve. Additionally, several manufacturers have introduced cameras with a solid-state pick-up device which replaces the last vacuum tube in a camera: the pick-up tube. These solid-state pick-up devices will not only increase camera reliability, but they will also improve a camera's ability to operate in low light levels. And that option is a pleasant relief to every person who has appeared in front of a camera.

As a natural conclusion to the discussion on equipment, it should be mentioned that the possible result of what has been presented above is a single unit device which is a VTR and camera combination.

TECHNIQUES

Television production techniques in the future will center around improved editing and post production devices. The crazy techniques of the broadcasters such as video manipulation (where a video picture can be twisted, turned or tumbled) will become available to smaller studios. Technology will soon provide low cost equipment which parallels that which the commercial broadcaster uses.

Time code editing will be used extensively as a means to speed up the editing process. We have seen electronic editors become "very smart devices." In the future they will become "very intelligent devices."

VIDEO ART

With the improvements in television equipment there will be more attempts at creating "video art." Video art is an artist expressing himself or herself on videotape. It may be electronic special effects creating static and moving visual images to accompany music. Or it may be something totally different than any of us has ever seen before.

What is important is that we all keep in mind that video art is not a television program in the conventional sense. It is something like an oil painting or some other artistic expression. Therefore, program

producers should be careful not to evaluate or judge video art as anything more than it is, art.

A FINAL WORD

My employment for many years has required me to teach television production at many locations. I have taught production in Point Barrow, Alaska; San Juan, Puerto Rico; Halifax, Nova Scotia; Mexico City, and in 55 different cities in between. There have been many cities, many workshops, many students, and many friends. One interviewer estimated that since 1965 I had taught production topics to more than 6000 persons, not including convention speeches. I guess that is a lot of students when it's put that way.

In hundreds of workshops I concluded my remarks with a question, and a challenge. The question was, "What is the definition of good television production?" Typical answers included, "Well motivated techniques", "What the crew likes", "What works", "Following the textbook", and many more.

I've thought about the answer to that question for a long time; and my answer is different than the typical responses listed above.

Good television production to me is, "The elimination of viewer frustrations."

When a crew member does not follow good production techniques, the audience becomes aware of the problem, not as a result of any technical knowledge, but rather because they have been conditioned by "good production techniques" for many years. In fact, most television audiences have spent more time viewing television than they have attending formal schools. So when an audience can watch a program and not be disturbed or frustrated as a result of the production techniques used, the program uses "good production techniques." On the other hand, when a crew member uses a technique which calls attention to itself, and distracts from the message of program, then that technique is not good production.

And now the challenge. Reading a textbook, or attending a workshop, or taking a class can't make a person a good camera operator or a skilled director. There is something required beyond learning. It's doing. It is the responsibility of each student who learns production to take the knowledge to the equipment and try. Don't just do it: try hard!

I have met many successful people in the television industry, and the one quality which they all have in common is an ability to dig in and to make what's impossible today, tomorrow's standard technique. Good luck.

GLOSSARY OF TELEVISION TERMS

- Ad-Lib** — Dialogue or action which has not been previously rehearsed.
- Ambient Light** — Illumination from sources that may interfere with planned lighting. It is the natural light before television light is added.
- Amplifier** — An electronic device ordinarily employed to boost the intensity of an electrical signal without undue distortion. The most common types include, audio, video, line, and booster.
- Amplitude** — The strength or range of an electrical signal.
- Animation** — Combining individual shots, still drawings, or photographs to create the illusion of movement.
- Antenna** — A conductor or system of conductors with which radio and television signals are received or transmitted through space.
- Aperture** — The opening of a lens through which the light passes.
- Art Director** — Individual responsible for designing the setting for a production and for establishing the overall visual “look.”
- Aspect Ratio** — The numerical relation or proportion of the picture width to the picture height. It is 4 to 3 in the present television system.
- Audio** — Involves auditory effects or the components of a system handling the sound frequencies.
- Auto-Iris** — A device which automatically varies the aperture of a camera lens.
- Back Light** — Illumination from behind the subject used to emphasize the effect or depth in a scene.
- Barn Doors** — Hinged metal plates attached to certain light fixtures which permit better control of the light beam.
- Bicycle** — To send taped programs between stations by various means of transportation.
- Blanking** — A process of cutting off the beam of the picture tube while it is returning to begin a new scanning line.
- Blanking Pulse** — A pulse from the sync generator to accomplish blanking.
- Bulk Eraser** — A device which produces a strong magnetic field, used to quickly erase audio or video magnetic tapes.
- Burn-In** — Image retention by the camera pickup tube, caused by excessively bright subject, extreme contrast, or televising a static scene for extended period of time.
- Call Sheet** — Schedule indicating talent, production, and technical personnel needed for rehearsal and production.
- Cameo** — Lighting technique in which the foreground subject is televised in front of a black background.
- Camera** — In television, a unit that contains an optical system and a light-sensitive pickup tube that converts a visual image into electrical impulses.
- Camera Control Unit (CCU)** — Equipment containing the various controls necessary to set up, align, and regulate camera operation.
- Cardioid Microphone** — Microphone with a heart-shaped, directional pickup pattern.
- Cathode Ray Tube (CRT)** — Specially designed vacuum tube in which a series of electrons are focused into a beam and strike a phosphor-coated surface, which glows to create the television image.
- C-Clamp** — Device used to fasten lighting instruments to a lighting grid.
- CCTV** — Abbreviation for closed circuit television.
- Channel** — A specific band of frequencies assigned to each radio or TV station.

- Character Generator** — A device which electronically produces alphanumeric information directly on television screen for use in production.
- Chroma Key** — Method of electronically inserting the image from one video source into the picture from another video source.
- Closed Circuit** — A system connecting television cameras to television receivers in a manner that limits reception to the sets that are connected.
- Close-Up** — A camera shot in which the principal subject is seen as relatively large and dominant in the screen.
- Coaxial Cable (Coax)** — A special cable designed to carry radio, telephone, and television signals. It is used to connect many of the individual components of a television system.
- Color Bars** — A standard color test signal which is generated electronically by a “color bar generator.”
- Contrast Range (Contrast Ratio)** — The difference between the brightest and darkest portions of a picture.
- Control Console** — An equipment console that incorporates monitors, production switching, and remote controls of film and VTR equipment. It is usually located in the control room and allows easy access by crew members.
- Control Room** — Usually located adjacent to, or as part of, a television studio. It may have a glass panel installed to permit visual contact between the two areas. It contains the control console, audio equipment, and other accessories employed by the director and other crew members.
- Control Track** — The area of the videotape which contains information used to control and synchronize the playback and videotape editing operations.
- Cradle Mount** — A carefully balanced attachment for the base of a television camera that permits a tilting movement. The cradle mount is fastened to the top of the tripod or pedestal.
- Credits** — Names and responsibilities of program personnel given as recognition at beginning or end of a program.
- Cue** — The signal to begin a program.
- CU** — A close-up shot from a camera. It fills the screen with a portion of the available scene. For example, it could be all of the face of a performer.
- Cut** — An instantaneous change from one shot to another.
- Cyclorama (Cyc)** — A continuous piece of canvas fabric which runs around the edges of a studio and is used to produce the illusion of infinite depth.
- Decibel (DB)** — A standard measure of relative intensity or power which is expressed on a logarithmic scale.
- Definition** — The appearance of sharpness of an image when it is in focus.
- Depth of Field** — The latitude or range within which a lens will keep an object in sharp focus at a given setting.
- Dimmer** — Device used to vary the amount of electric power reaching a lighting instrument.
- Director** — The production team member responsible for creating the sound and picture of a program.
- Dissolve** — A transition between two cameras where one camera's picture is decreased while the other image is increased. Usually used as a gentle transition or to indicate a change in time, scene, or place.
- Dolly** — A platform or frame equipped with wheels or casters on which the tripod or pedestal supporting television cameras are mounted.

- Dolly In or Dolly Out** — To move the camera toward the talent or away from the talent.
- Down Cut** — Cutting off the end of a segment through improper switching or editing.
- Drop-Out** — The loss of a part of the video signal during VTR playback.
- Dry Run** — A studio rehearsal.
- Dub** — A videotape copy of a tape recorded program.
- EIA** — (Electronics Industry Association) A set of criteria and standards worked out by research committees to arrive at a working basis for commercial broadcast television equipment for both transmission and reception.
- Editing** — The process of selection of portions of a production and fitting them together from film, tape, etc.
- Electron Beam** — The electron stream emitted by the electron gun in a cathode-ray tube, or pick-up tube.
- Electron Gun** — A device in a cathode-ray for producing, controlling, and directing a beam of electrons.
- ETV** — An abbreviation for educational television.
- Fade** — A gradual decrease of the video or audio signal.
- FB** — An abbreviation for feed-back.
- Fade** — A function of a production switcher where-in the camera's image is reduced to black.
- Fader Handle** — The device on the production switcher which enables supers, dissolves, and fades.
- Field** — Half of a television frame composed of either all of the odd or all of the even scanning lines.
- Fill Light** — A soft form of light used to soften the shadows created by the key light.
- Film Chain** — A device used to transfer projected sources such as 16mm film and 35mm slides through a multiplexer to a television camera.
- Floor Manager** — Assistant to the director who works in the studio during a program. This person is often called the eyes and ears of the director in the studio.
- Focal Length** — The distance from the center of a lens to where the image is in focus.
- Focus** — The point where the light rays converge to produce a clear, sharp, and defined image.
- Foot-Candle** — A unit of incident light equal to the light from a one-candle power source at a distance of one foot.
- Frame** — The complete television image containing (in the U.S. system) 525 lines or two interlaced fields.
- Freeze-Frame** — To stop the action on a single video frame.
- Frequency** — The number of complete cycles per second of any wave motion (such as an alternating current or sound wave).
- Friction Head** — A mechanical device mounted on the pedestal which permits the camera to be tilted or panned in any position.
- F/Stop** — Refers to the "speed" or ability of a lens to pass light. It is labeled on a lens in numbers such as 3.5 or 11.
- Generation** — The number of dubs away from the master original tape.
- Graphics** — All visuals prepared for a production.
- Gray Scale** — Variations in value from white, through shades of gray, to black on a television screen.
- Head Room** — The space left between the subject's head and the top of the screen.

- Headset** — A device consisting of one or two telephone receivers connected to a headband for individual listening to audio sources.
Most headsets also have a small microphone to enable two way communications.
- IFB** — A type of communications to the talent called interrupt feed back to enable the director to talk to the talent through a private system.
- Intercom** — The internal communication system, using telephone-type headsets, between production personnel in the control room and crew members on the studio floor.
- Interlace** — Television line scanning in which the image is alternately scanned in two sets of lines in successive frames, the lines of one frame falling midway between the lines of the next.
- Jeeping** — A switch modification to a television receiver which permits a video source to be fed to the receiver.
- Jump Cut** — An unnatural or jarring transition between two camera shots.
- Kelvin Scale** — A unit of measurement used to indicate the color temperature of a light source.
- Key Light** — The principal source of light used in lighting. It is usually a spot light.
- Keystone** — Picture distortion caused by a camera that is not at a perfect right angle to the surface of the object or graphic being photographed.
- Kicker** — An off center illumination behind the subject.
- Kinescope** — A film recording of a television program.
- Lag** — Persistence of an image on the face of the television camera pickup tube.
- Level** — The magnitude of a controlled or variable quantity as measured by its difference from a reference value. It is applied particularly to audio, video and radio waves.
- Light Meter** — Meter designed to read light intensity using either reflected or incident light.
- Limbo** — A lighting approach in which background is light gray with foreground subject prominent on screen.
- Lip Sync** — The synchronization of the visual and aural elements in a production such as the voice and lips of the talent.
- Location** — A production site outside the normal studio.
- Logo** — Symbol used to identify a station, program, sponsor, company, etc.
- LS** — An abbreviation to indicate a camera long shot.
- Matched Dissolve** — Dissolve from one picture to another which is closely related in appearance.
- MCU** — An abbreviation to indicate a camera medium close-up shot.
- Microphone (mike)** — A device employed to pick up sound frequencies and to convert them to electrical variations for transmission.
- Monitor** — A high definition television set connected to a video source. A true monitor does not incorporate channel selector components.
- Monochrome** — Describes the images reproduced on a black and white television system.
- Montage** — A rapid sequence of shots used to produce a particular image or mood.
- Multiplexer** — A device which directs projections from a number of film sources into a camera through the use of mirrors or prisms.
- Noise** — Unwanted audio or video signals which interfere with program information.
- Off-Line** — A form of editing where the director makes editorial decisions out of the control room with the use of off line dubs and time code.

- On-Line** — The traditional form of videotape editing where the director makes decisions with the program and segments tapes.
- Oscilloscope** — A test instrument similar in some respects to a television receiver, that shows visual patterns of voltage and current characteristics.
- Pan** — A panoramic effect achieved by pivoting the television camera from left to right or right to left across a scene.
- Pan-Tilt Handle** — An extension rod attached to a camera mount to enable the camera operator to pan or tilt the camera.
- Pantograph** — A suspension device for lights with provision for raising and lowering the light source.
- Patch Panel** — Refers to an audio or video routing system.
- Pedestal** — A support to which the camera and head are attached. Some pedestals are capable of movement up and down.
- Pick-up Tube** — Used in a television camera for transforming the optical image into an equivalent electrical signal.
- Prop** — Furniture or objects used in a set.
- Quartz Lamp** — Lamp which provides a high-intensity illumination with a constant color temperature.
- Raster** — The illuminated area of the television screen which is produced by the scanning lines.
- Rear Screen Projection** — Projecting slides or film on a translucent screen with the projector positioned behind the screen.
- Remote** — A television production produced outside the studio.
- Resolution** — The ability of a television system to distinguish and reproduce fine detail in the subject picked up by the camera.
- Scoop** — A floodlight employed to illuminate large areas.
- Script** — Written copy of the audio and video portions of a television production including directions for the presentation of the program.
- Segue** — To begin next sound source immediately after preceding sound without interruption.
- Set Light** — Illumination on the background or set which does not extend to the subject.
- Signal To Noise Ratio** — The proportion between the television signal and the noise or interference which generally accompanies it.
- SMPTE** — Society of Motion Picture and Television Engineers.
- SMPTE Time Code** — Eight-digit address code used to identify each videotape frame by hour, minute, second and frame number for precision editing.
- Snow** — White spots in a television picture indicating a result of noise that is high in relation to the strength of the video signal. (See Noise)
- Special Effects Generator (SEG)** — Electronic device, usually installed in the video switcher, which is used to produce wipes, split screens, inserts, keys, and mattes.
- Stop Down** — To close the aperture of a lens to permit less light to enter the camera.
- Super** — Short for superimposition.
- Super Card** — White lettering mounted against a black card for use in supering.
- Superimpose** — The process of exposing the picture from one camera on that of a second camera.
- Super Slide** — 35-mm slide with white lettering against black background for use in supers.
- Sweetening** — Postproduction audio production to add, modify, and enhance the program audio.

- Switcher** — A set of push buttons mounted on a box or panel that allows selection of the television image from any of several cameras.
- Sync Generator** — An electronic component which produces various synchronizing pulses necessary for the operation of the television system.
- Talent** — Refers to the studio performer or any guests which may be present before the cameras.
- Tally Light** — Signal lights installed at the front and back of television cameras to inform performers and crew members when each camera is on the air.
- TD** — Technical director.
- Technical Director** — Individual responsible for the technical aspects of a production. Often operates the production switcher during rehearsal and production.
- Teleprompter** — A prompting device which uses either a long roll of paper or a closed-circuit television feed to display script copy to talent.
- Tilt** — Movement of the camera swinging up or down on the camera mounting head.
- Transmitter** — A term applying to the equipment or process of radiating signals into space for reception at locations within the service area.
- Tripod** — Three legged support for a television camera which can be mounted on a dolly for mobility.
- Truck** — Horizontal or lateral movement of the camera on its pedestal.
- Up Cut** — The cutting off of the beginning of a segment or program through improper switching or editing.
- Vectorscope** — A specially designed oscilloscope which is used to set up and align color equipment.
- Video** — From the Latin word, see. Used as a word or prefix when referring to the visual portion of television.
- Videotape** — A special type of plastic tape used in video tape recorders.
- Video Tape Recorder (VTR)** — A device capable of recording both the audio and video signal of a television production on a special magnetic tape, which can be played back to reproduce the entire program.
- Vidicon** — An inexpensive type of television pick-up tube.
- Viewfinder** — A small television monitor built into a television camera and connected to the camera output which enables the camera operator to see what is being scanned by the camera.
- Voice-Over (V.O.)** — Using an announcer of performer's voice over visual material, so that the speaker is not shown on camera.
- VTR** — Short for videotape recorder.
- VU Meter** — Audio meter which measures the intensity of sound in volume units.
- Waveform Monitor** — The graphical representation of the shape of the video signal when plotted on rectangular coordinates showing variations in amplitude against time. Used in the set-up of cameras and other television equipment.
- Wing It** — Slang term refers to improvising or ad-libbing the production with out prior rehearsal.
- Wireless Microphone** — A microphone that transmits a low-power radio signal which permits cable-free operation.
- Zoom Lens** — A special camera lens whose focal length or angle of view is continuously adjustable and can always be in focus on an object. This is the most practical type of lens for television production.

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