

# VIDEO CAMERA TECHNIQUES

*basic methods  
for improving  
videotape production*

Criticism concerning the quality of closed circuit television production is numerous and varied.

One only has to read the many articles appearing in training and personnel journals to determine the overall quality of some of the productions that are being produced in the industrial situation. One often hears the complaint that the closed circuit TV picture is not of the quality of commercial broadcasting. This is as it should be within certain limits depending upon the particular equipment being used. Overall, the bad qualities of these productions are really due to a lack of professionalism and know-how on the part of the camera man or program director. Normally in an industrial situation there is a one-to-one relationship between the man who is running the equipment and the talent. Very seldom will you find the full complement of people necessary to run TV equipment adequately. It is usually left solely to the talent and one other person. Professionalism in this critical manpower situation is very obvious. The purpose of this article is to remind the would-be camera man or program director of the professional techniques that are employed regardless of the equipment being used.

TV equipment, regardless of size, is not to be confused with home movie equipment. The use of a sun gun is inadequate in most cases for proper lighting. TV equipment is not a toy. The thing that lends our thinking to the toy concept in TV equipment is probably the miniaturized size of modern equipment. It is possible with smaller equipment to get very professional productions.

Below are some techniques that can be used for both studio and smaller portable equipment to obtain quality productions.

## NOISE FILTERING

Filtering out audio and visual noise is prime to any good reproduction. Efficiency in this area can be increased

at minimal cost by purchasing two or three AC line filters from the local electronics wholesale dealer. These will, for the most part, eliminate the annoying affects of AC arcing, etc. Smooth power is often overlooked in the use of TV equipment and this is one of the basic reasons for a bad picture through the camera. This is often overlooked by industrial firms just getting into TV. Many times the training director doesn't have the technical background to produce the picture quality that the set was actually designed to produce.

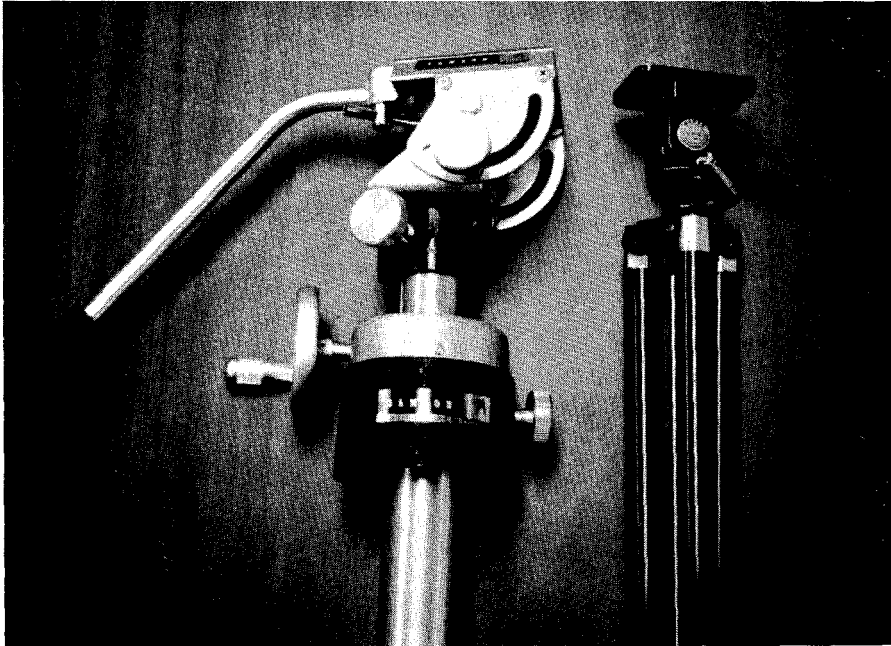
## THE TRIPOD

Probably the next consideration in camera work is the tripod. The tripod has to be of adequate bulk to support the uneven weight of most TV cameras when used with a zoom lens. In studio equipment the size of the tripod is dictated by the bulk of the camera. However, this point is often overlooked because of the deceptive weight in terms of leverage of a smaller unit using a zoom lens. The tripod normally furnished in a complete set is not really a heavy-duty camera tripod and cannot be used to attain satisfactory camera movement in this situation. (See Figure 1.)

The tripod and its controlling lever should be adequate enough to give a smooth pan or to elevate and depress the camera without jerking. The tripod itself should be equipped with walking casters so that the tripod and camera can be trucked in and out for focusing or increasing the size of the camera shot. Adjustable friction locks are certainly desirable. Some manufacturers produce an electrically-controlled tripod platform which allows you to electrically pan, elevate and depress the camera. Naturally, this increases the smoothness of operation, but with this feature the cost goes up considerably.

Most people use a single camera. This places a great demand upon the director and again we are speaking of the one person who is running all of this equipment. It is fairly impossible for

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Comparison Between Stock Tripod and Heavy Duty Tripod

the camera man-director to focus, adjust, truck, pan and depress a single camera, alternately switching from the talent to any visuals he might be using. In this situation we should have one camera on the visual aids and another camera solely for the talent. For consistency, the cameras should be numbered and camera No. 1 should always be on the talent and camera No. 2 always on the displays or visuals or whatever else is needed in the presentation. Obviously, this requires the purchase of another camera, hardware and a switching arrangement so the two cameras can be controlled from a single point.

### LIGHTING

Lighting for photography and TV is a science of its own. Too many times the training man overlooks this very important aspect of a TV presentation. TV cameras are unlike photographic equipment in the sense that you are ruling out one variable—that is film speed. In photography you can compensate for poor lighting by using a faster film speed. We now have film speeds up in the thousands. This allows us to increase our mobility and de-

crease the lighting requirements. This situation is not present in TV. However, you do have flexibility of lens openings. These limits are soon reached and it is at this point that the production starts to fail in terms of lighting and contrast. Without proper lighting there is a tendency to drive the camera to its extremities of lens openings and reproductive abilities. Ideally, we would like to use a lens opening of 5.6 under all conditions. Flat lighting is required so we don't have any shadows. This lens opening can be most generally used under proper lighting conditions such as fresnel lighting of three lamps minimum. One should be behind or directly above the camera and the other two placed at 45 degree angles. (See Figure 2.) Lamp values in the lighting should range from 650 watts to 1000 watts.

Lighting not only contributes to the clarity of the picture but also supports the picture contrast.

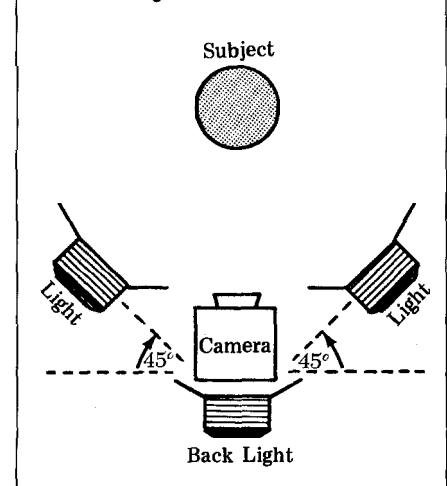
### TONE AND COLOR

Aside from lighting, another important factor in contrast is what is commonly referred to as the Gray Scale. This

Gray Scale is an indicator of the range of tonality on black and white television. In black and white television, colors are telecast in shades of gray which vary from extremely dark (black) to extremely light (white). Purple transmits a solid black; red, dark blue, and dark green transmit as dark gray; yellow comes off as a medium gray and light blue and light green, as light gray. Now while the range of shades is considerable, only five or six tones (including black and white) can actually be distinguished on a TV receiver. This is the Gray Scale.

In choosing colors for graphics or costuming, there must be contrast, but not too much contrast between the tonal elements. For example, black lettering shows up well on a yellow card but black lettering on a white card would cause shading problems. This Gray Scale is usually handled well in the studio, but becomes a bit more complicated when we get out into the plant or other industrial settings. Here we are unable to change the colors. We can modify or alter the coloring of the talent to provide greater contrast but this is about all you can do with color in the industrial site. Bear in mind that lighting can make up for some of the difficulty you might experience in coloring.

Figure 2. Schematic Layout with Three Lights.



## ASPECT RATIO

One of the problems in taping television scenes is the aspect ratio. This is especially apparent when taping graphics. All graphic material for television must conform to the 3 X 4 proportion of the TV screen. The training director should also be aware of the serious loss of picture on all sides of the TV screen that is created by poor adjustment of some TV receivers. Printed or other matter must be kept within the safe area. The total area for the picture is the camera field. Information not essential to the total picture such as the background material may be included in this area.

The 1/6 rule of determining the safe area of the TV screen is easy to understand and a useful guide. If a card 11 X 14 is divided vertically and horizontally into 6 subdivisions to form 36 rectangles, each with a 3 X 4 ratio, the central 16 rectangles formed by this division will be the safe area. (See Figure 3.)

Visuals must be small enough to handle easily enough on camera or large enough to use as a background. For example, camera cards that are to be shown on close ups generally should not be smaller than 11 X 14. Charts or easels seen in a wide shot with a per-

former should not be smaller than 27 X 36. Whether the visual is large or small it should look simple and uncluttered and certainly should conform to the proper aspect ratio so that the safe areas will be projected uniformly on the TV receiver. This safe area allows us once again to compensate for differences in the tuning and alignment of various TV receivers.

Lettering of visuals also has its ratio. A rule of thumb might be that when using a 15 X 20 inch card use a one-inch letter, for a 30 X 40 card use a two-inch letter. Determine how much of any 3 to 4 ratio card will be seen in the screen. You can again use the 1/6 rule or the proper aspect ratio for the particular visual aid.

## AUDIO-VISUAL AIDS

A-V aids should be projected on a rear projection screen. These range in price as well as size. The ideal situation would be to have the full-size studio projection screen. However, this is not practical for two reasons: (1) space limitations and (2) the purchase price. Reasonably-priced rear projection screens can be obtained with 3' X 5' dimensions or larger. The smaller ones are limited to use with slides, film strips and motion pictures. Overhead

transparencies are not suitable for the smaller units—you will have to shoot directly from a front-view projection screen. If you are using a positive transparency, glare can be reduced by a yellow acetate sheet. The recommended procedure is to produce transparencies in the negative form, using such film as the 3-M No. 129 or the Tecnifax diazochrome KBKD with reversing film. This will give a clear image with a black background, thereby providing the proper lighting. Keep in mind, when preparing transparencies for TV, that you should obey the 1/6 rule of aspect ratio. You may have to compromise due to the lack of available lettering facilities.

## TV EXPECTATIONS

Many small items are overlooked in TV production and it is these small items that contribute to a professional looking presentation on the TV screen. Justifiably or not, the viewer will be comparing it to commercial productions and you can measure up to his expectations by implementing these suggested procedures. You owe to yourselves as training people and to the great potential of the medium not to overlook the many very simple professional techniques in use.

Figure 3. The One-Sixth Rule Determines the Safe Area of a TV Screen.

