

CABLECASTING SESSION NO. 3:
Studio Lighting and Program Sources

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"Basic Television Lighting Techniques"

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Television lighting usually poses daily challenges to the imagination and the professional skill of the experienced lighting technician and various producers and video engineers. However, most technicians and aesthetes work from a simple basic lighting formula--base, key, back, and fill. This is called the photographic principle with the key, back, and fill generally establishing base light level minimums. The basic technical lighting objectives are providing enough base light and limiting the contrast between high light and shadow so acceptable pictures can be produced. Nontechnically, lighting and production personnel continually attempt to enhance form and dimension and to create an illusion of reality or nonreality, as well as mood.

This paper is an attempt to provide general information for accomplishing the above objectives. It is directed towards the beginning professional, you who have had relatively little experience in television studio originations, and who do not have the time to study and practice at great lengths perfecting the art of television lighting. Many of my suggestions and much of the information-content are not original. My concepts are a composite gathered from contacts with many instructors, authors, and some experience.

I would recommend to all of you involved in television origination to haunt the professional publications for additional material. Four such publications, which have ample instruction and descriptive illustrations and which will provide you with most answers for your work in cable casting, or cable television origination, are Herbert Zettl's Television Production Handbook and his Workbook, second edition; Rudy Bretz's Technique of Television Production, second edition; and Robert Hilliard's Understanding Television. Don't forget the weekly and monthly journals, such as TV Communications, for ideas and illustrations, which might be helpful in your operation.

Lighting Philosophy

Since the television screen is only two dimensional (height and width), proper control of light and shadow is essential for revealing three dimensions or a three-dimensional concept. Objects must be given form by positioning in space and time and in relation to each other. Selective lighting helps to reveal the nature of an object, to give picture composition, or to give an illusion of reality. But as Zettl, professor of radio-television-film at San Francisco State College, states in his Television Production Handbook, "illogical lighting can effectively create the impression of nonreality," or, for you, cause subscriber dissatisfaction.

The specific purpose of this paper is to familiarize you with basic television production lighting principles, terminology, and equipment, so you can go back to your studios more equipped to develop your lighting plans and to provide reality and picture quality to your subscribers. For this purpose, I have assumed a studio for black and white (monochrome), vidicon camera television production.

Studio Layout

The lighting grid is the skeleton around which is laid the electronic nervous system and upon which are hung the arms and muscle extensions of studio lighting--the lighting instruments. Studio ceilings should be high enough to permit mounting a lighting grid, connector strips, and lighting fixtures so that lights are at least seven feet above the floor. A lighting grid normally consists of metal piping, usually one and a half to two inches in diameter, and ideally should be mounted from ten to eighteen feet above the studio floor.

If your budget cannot sustain a professional lighting grid, then ordinary galvanized water pipe will suffice. Jack Rickels in TV Communications states that the pipe grid normally costs about fifty cents a foot and can be self-installed. The grid pattern is usually set on six-foot centers or less and can normally be attached to walls with floor flanges. The cross-junctions of the pipe can be held together with double "C" clamps. The pipe itself normally has both ends threaded and couplings attached, so you can join as many pieces together as you wish. Again, because light intensity is influenced by ceiling height, an ideal height is approximately sixteen feet, but an operable minimum is possible at twelve feet and sometimes ten.

The studio itself should be air conditioned for comfort. Normally, basic adequate electric power requirements for small studios are either two or three wires of 40,000 to 50,000 watts. Ideally, installation for small studios should be four wire, three phase, 500 or 600 ampere service.

Generally, strip outlets, or connector strips, are installed over the grid. In some cases, however, you might need to have the power outlets installed above in the ceiling. Rickels in the May, 1969, TV Communications periodical describes in detail the rigging of a power source and outlet. His description, while general, can serve as a guideline for primary installation of electric conduit and wiring necessary for the lighting instruments.

He suggests that a contractor install conduit from the primary power box located near the floor to a breaker panel located at a convenient wall, preferably inside the studio. This breaker panel should be equipped with at least twenty 30-amp breakers, which can be used for switching on and off until a control board

is installed. Conduit and wire can be installed from the breaker box to three wire twist-lock outlets located above the lighting grid. Each outlet should be capable of handling at least 30 amperes, and there should be one for each light you intend to use. In addition, at least two 20-amp outlets should be installed on each wall near the floor to provide power for floor lamps, floor monitors, test equipment and the like. Of course, incandescent lighting should also be installed for normal lighting of the studio when the production lights are off.

Lighting Instruments

Television lighting employs two types of illumination--directional and diffused. Directional light illuminates a very small area with a light beam, e.g., a spot or spotlight localized on Sammy Davis, Jr., singing at the Hollywood Palace. It produces clearly defined light and shadow areas. Diffused light, unlike directional light, illuminates a relatively large area with an indistinct beam. It produces soft, undefined light and shadow area as compared to the hard, directional light. Both directional and diffused illumination are needed and obtained in a television studio through spotlights and floodlights--directed and diffused respectively--used as key, back, and fill lights.

Three types of light-producing elements are used for these two illuminations: the incandescent bulb, like the one used at home; the quartz-iodine bulb, which produces an extremely bright or high beam; and the fluorescent tube, which is seldom used now for monochrome or color lighting.

Light element choice. The choosing of lighting elements depends on several factors--the scene to be lighted, the lighting objectives, the background, and so forth. Quartz-iodine lights are now being extensively used for both directional and diffused lighting. However, if you have a limited budget and are not going to be immediately concerned with color production, perhaps you should rely on the incandescent bulb. Costs average about three to one with a "long-lifer" quartz-iodine tube costing from \$20 to \$25, as compared to the incandescent bulb costing around \$5 to \$7. The "long-lifer" has approximately the same life as an incandescent bulb.

Normally, a selection balance between the quartz-iodine and incandescent will provide enough alternatives to satisfy your lighting demands. Quartz lights illuminate at an extremely high efficiency. For example, a 1,000 watt quartz floodlight (scoop) provides the same illumination (in foot candles) as at least three 1,000 watt incandescent scoops. This light output does not decrease with age. Incandescent bulbs, however, gradually blacken with carbon and decrease their output with use. Also, the size and weight of quartz lights are less than those of equivalent incandescent instruments and require less bulky housing.

On the other hand, the quartz lights are less directional than the incandescent bulbs; they get extremely hot and radiate more heat than the incandescents; and they are destructive for attached parts, such as barn doors and lighting scrims. The most serious disadvantage of the quartz lights is the comparative difficulty in controlling the light beam. It cannot be shaped as precisely as the incandescent light beam; and when the spotlight is pinned to a narrow beam, quartz light has an annoying tendency to leave a dark spot in the middle of whatever is being lighted. For these reasons, a combination of both quartz and incandescent elements is recommended.

In any event, quartz lights demand extra caution. You should never touch the bulb with bare hands as the skin's chemical composition can cause bulb deterioration. Hot bulbs should be handled only with asbestos gloves. Just as with incandescent bulbs, quartz bulbs can explode and spread shattered glass. Installing a protective scrim or wire-mesh screen in front of quartz instruments will increase the safety factor without cutting down excessively on light output.

Spotlights. For the normal cable television studio use, I would recommend the Fresnel spotlight, which can be either incandescent or quartz lighted. It is light, flexible, has a high light output, and is easily spot focused. The spotlight can be spread to a wide flooded beam or can be pinned to a very sharply and clearly defined beam.

Another spot which is used is the ellipsoidal, which has an intense directional beam. It can be utilized as a projection spot or to play a shadow pattern on a backdrop or cyclorama. For example, if you wanted to create a certain mood for a production, perhaps using an ellipsoidal spotlight for background shadow pattern, or a grillework pattern, would suffice rather than using a much more expensive constructed background. In black and white television, in small studios, the ellipsoidal spotlight is very useful for simple effects.

Remember that the choice of lighting instrument is dependent upon such factors as camera used, camera tube sensitivity, the studio ceiling height, and the reflection of scenery and costumes.

Lighting intensity is affected by ceiling height--the higher the ceiling, the more light required; the lower the ceiling, the less light required, and thus a smaller instrument can be used with less heat radiation. Also, scenery which is highly reflectant requires less light. Even though identifying accurately your precise needs for studio lamps is difficult, I would recommend for most cable television studios from 750- to 1,000-watt spotlight lamps, in a combination of both quartz and incandescent.

One other light, which you will probably utilize, especially for remotes, is the "sun gun." This is a portable, 1,000-watt quartz light which can be handheld, or fastened to flats, door frames, or some other convenient object. These sun guns, a replacement for the older but still used internal-reflector spotlight, are used extensively at schools, community service projects, hospitals, and other remote locations.

Floodlights. So far we have only basically identified the source for directional light, the spotlight. The requirement for diffused light is fulfilled generally by floodlights, which play an important, yet really a secondary, role in monochrome or black and white television. They are very essential for color television.

Quartz lighting is recommended for floodlighting because of its size and efficiency. Five basic types of floodlights are the scoop, the pan or broad, the floodlight or flood-clip bank, the strip light or cyc lights, and the fluorescent bank. For the primary television work which you will be doing, I would recommend the scoop and the quartz broad with barn doors. The scoop has no lens; and the 12-inch scoop with a 500-watt quartz lamp will deliver almost as much light as the 1,500-watt incandescent scoop. If you are working with color, the 16-inch quartz scoop with 1,000 watts is the more popular floodlight.

The broad or pan is used most often for color production, but even for monochrome lighting, one or two broad scoops, whose reflector looks something like a baking pan, might be recommended. They come in various sizes from 400 to 1,000 watts. For a normal cable television operation utilizing vidicon cameras, and where the studio is approximately no larger than fifteen by fifteen feet, two or three flood quartz lamps of from 750 to 1,000 watts will produce a sufficiency of diffused light for most productions.

Lighting Control Equipment

Lighting control includes two basic maneuvers or steps, one visibly physical, the other electronic. Lighting control can be as simple as a panel box with off-on switches, or as complicated as a very expensive dimmer control board with transformer and electronic dimmers.

Controlling the lighting once the instruments are hot or turned on depends upon either movement of the instrument itself (directional control) or upon varying the light intensity (intensity control). Usually, in a small studio operation, where lighting equipment is minimal, greater flexibility of this equipment is needed. The lighting operation should be flexible enough to allow one man to change the studio lighting with a minimum of time and energy.

Directional controls for basic television lighting include basic mounting devices, basic hanging devices, mounting devices for floor lights and sometimes beam controls. The grid work is the basic structure upon which lights are mounted and moved. In some cases, the grid is so hung that it can be moved vertically up and down so the lights can be changed around without using ladders or other awkward contrivances for reaching the lighting devices. I recommend for the general, most inexpensive use, the stationary grid, which was described earlier in this discussion. Other modifications are available, but they are generally associated, because of cost and nature, with much larger studio operations than the typical cable television studio.

Basic Hanging Devices. For the needs of most studios, the "C" clamp is the cheapest and simplest light-mounting device, and I recommend it as standard hanging equipment. It can be attached to the overhead grid, which, in turn, can be clamped either directly to the light instrument, such as a scoop or Fresnel spot, or to a hanging device known as the pantograph.

The pantograph is a highly flexible hanging device as it is counterbalanced and adjustable quickly and easily from the studio floor within its more than 12-foot range. More than that, it eliminates the need for using bulky ladders. Some modern pantographs have a small pipe extension which permits mounting two separate lighting instruments on one pantograph. In most small studios with ceilings of 18 feet or less, the instrument attached to a pantograph can be pulled down quickly and easily to floor level to enable swift adjustments.

For your studio then, I would recommend for directional lighting control, lighting instruments attached to pantographs, connected by "C" clamps to the overhead grid. In addition, you will probably hang your diffused lighting instruments, such as the scoops, by "C" clamps. Floor lights are usually mounted on roller-caster stands with a three-wheel base, allowing quick repositioning.

Beam controls, such as the Fresnel spot-focusing device, the ellipsoidal shutter device, and the Fresnel spot barn doors, help control directional beam and spill light. Boom shadows, for example, can be eliminated by partially closing a barn door.

Intensity controls through dimmer and patch boards are now very common, even in small studio operations. However, for the neophyte cable television operator, dimmers are not essential. If your budget can accommodate dimmers, your entire lighting operation can be enhanced, especially in the area of special effects. Dimmers are usually used to balance over-all lighting, saving you time in changing lights of different wattage. For example, if you find one lighting instrument, such as a Fresnel spotlight, to be too intense or bright, you can dim it or turn down its voltage.

Many very successful studio productions for both live and taped programs are being done in all size studios, from the smallest closed-circuit educational studio to the larger professional on-the-air operation. For the CATV producer, better cameras and an increased sensitivity and aesthetic awareness by the audience compels technical sophistication. Dimmers and patch boards can enhance the cablecasting origination productions, but without a thorough understanding of the techniques of television lighting, the lighting director can use neither to his advantage. Television lighting techniques are the sine qua non of cable television origination.

Techniques of Television Lighting

The remaining portion of this discussion probably will mean the most to you on a day-by-day basis. That is, selecting lighting instruments and constructing grids are one-time efforts with lasting value for a considerable period of time. But, lighting the set and solving lighting problems are day-by-day challenges, which, at critical times, are harassing. As Zettl states, "a universal lighting recipe for every lighting problem is really not probable," but what is possible is an understanding of basic lighting principles. Again, I am speaking mostly to television producers working with black and white, but the basic principles apply to both monochrome and color. There are distinct variations here, especially in the area of operating light level, contrast between light and shadow, and the color of light itself, but these are factors unique mostly to lighting for color television.

Lighting terminology. For this discussion's purpose, the following terms and definitions will be used.

Base light: An extremely diffused, over-all illumination in the studio coming from no apparent source. A certain amount of base light is necessary for technical and aesthetic picture acceptability.

Key light: The apparent principle source of directional illumination falling upon a subject or area.

Back light: Directional illumination coming mostly from behind the subject.

Fill light: Generally diffused light to reduce shadow or contrast range. It can be directional.

Background light: A separate illumination of the background or set.

Side light: A directional light which illuminates the front side of a subject; usually opposite the key light.

Kicker light: Directional illumination from the back off to one side of the subject--usually low angle.

Camera light: Directional front illumination used for additional fill, eye sparkle.

In television lighting the base light level and the signal-to-noise ratio are corollary. Every television picture has a certain amount of "picture noise" generated by movements of electrons. Snow, which sometimes appears on our television screens, is the visible picture noise. However, if the station is carefully tuned in, the noise usually disappears; and the signal literally drowns out the video noise, while the picture appears very clear. This same problem occurs in television lighting if the studio light base level is not equal to the operating level of the camera tube. If the base light is too low, the noise will outweigh the picture signal, and the picture will appear unclear with degrees of snow. This is generally called a poor signal-to-noise ratio.

What is the proper base level of light for camera tubes? Generally, these following light levels have proven to be most satisfactory for ordinary television productions:

- I-0 monochrome camera75 to 100 ft-c (foot candles)
- Vidicon camera.200 to 250 ft-c
- Plumbicon camera.75 to 100 ft-c
- Color camera.285 to 500 ft-c

As you can see, the vidicon camera, the kind being used by most of you and in most CATV studios, requires hotter lights, or more high lighting, than the black and white image orthicon cameras or plumbicon cameras. Color requires the most. The vidicon camera is subject to "lag," that is, the image retention of a subject when one pans away. Fairly high base light levels are needed to produce a high quality, lag-free picture.

Base light levels will vary considerably at times from these figures, but these are the standard optimum levels. Since lens, f-stop, and lighting contrasts have much influence on the base light level these must be considered, too. Base light, to repeat, is the overall diffused illumination in the studio, which comes from the principle lighting sources of key, back, fill, sometimes background, side and other directional or nondirectional lighting instruments.

Lens opening, as previously mentioned, is a significant factor in lighting. When the base light is low, the lens opening must be wider to allow enough light to strike the camera pickup tube.

Conversely, high base light levels call for small lens openings to keep excessive light from striking the camera tube. Remember, however, that depth of field decreases with wide lens opening; and if you need a great depth of field, you must operate with a small lens opening and a high base light level. You must also remember that the vidicon camera uses 16 mm film lens, and the f-stop-focal length relationship differs from that of the I-0 35 mm-lens system.

At this point, we should perhaps discuss such concepts and technical realities as contrast, contrast ratio, shadow, reference white and reference black, but they might have more meaning if we first constructed a typical lighting problem.

The basic television lighting setup for monochrome, as well as color production, utilizes three main light sources--key light, back light, and fill light--which will largely determine your picture quality. Other lights will be added later, but right now, let us concentrate on these three. They are directional and diffused, providing the base light, as well as the proper signal-to-noise-level ratio.

The key light is the principle source of illumination and is usually positioned first above and in front of the subject. If key light is moved slightly to one or the other side of the talent, then form is enhanced; and three sides of the talent become visible. Key light is the motivating source of light and must be directional. Most lighting professionals recommend a Fresnel spotlight with a medium spread.

The back light is next set directly behind the talent and above the set's back wall. Now talent's position is important because if he is too close to the background wall, the back light won't hit the top of him, and dimension will be lost. Generally, lighting angles of 45 degrees are considered ideal for normal lighting situations. In other words, by not placing the talent too close to the backdrop, and constructing the sets nearer the middle of the studio areas, more dimension will be gained, and you will have less trouble with shadows on walls and reflection annoyances. Again, a Fresnel spotlight is ideal for back lighting. Directional beam is needed, and the Fresnel furnishes the capacity.

The third light to position is the fill light, which will help illuminate, with key and back light turned on, a rather unnaturally dark and perhaps indistinguishable right side of the talent. Your challenge now is to lighten up this dark side by eliminating shadow altogether and thus curtailing what can be called the "modeling effect" of your key light. Placing a floodlight or a scoop to fill in some of the dark shadow just to the left and front of the talent opposite the key light will help you gain the effect you are looking for.

Fill light sometimes spills into too many other areas and erases too much shadow, so contrast is lost. If this happens, a Fresnel spotlight should be used instead of a scoop. In this case, adjust the spotlight for maximum spread beam by pushing the bulb-reflector unit towards the lens. This will soften the spotlight and perhaps eliminate the problem of washing out the shadow completely. Using controlled fill lights, such as spread spotlights, is very important for small studio operation.

Now we can look at the completed basic lighting structure with key, back, and fill in these positions. This is your principle lighting setup: key--a Fresnel spotlight just to the side and in front; next, back--a Fresnel spotlight, positioned at a 45 degree angle hitting on top of the talent; finally, fill light--either a scoop or spread spotlight, positioned left of the talent and opposite the key light to dampen shadow and illuminate the dark side.

Once your basic photographic principle requirements are satisfied, you can ascertain your base light. The most accurate way is to use a very inexpensive GE, or some other comparative-cost foot-candle meter to get your incident light reading--that is, the light striking the subject or, in this case, the talent. Remember, for vidicon cameras, approximately 250 f-candles base lighting is required. Color requires from 450 to 500 f-candles.

Light intensity ratios vary among the key, back, and fill lights, depending on shading of the talent, his clothes, the set, and so forth. Generally, a back light is equally or slightly more intense than the key light. A typical lighting setup employing the photographic principle of key, back, and fill for vidicon cameras could assume these ratios: 1 to 1-1/2 to 1/2. For example, a key light intensity of around 150 to 200 foot candles with a back light of about 1-1/2 times the key light intensity or about 250 foot candles, with the third light, fill, turned on at about 1/2 of the key light's intensity, or about 75-100 foot candles. The resulting base light illumination should be around the 200 to 250 foot candles desired for a vidicon camera high quality picture.

In addition, if more diffused light is needed, a side light can be added, as well as a background light. Background lights can accentuate drapery folds or perhaps make an otherwise unappealing cyclotron quite pleasing. A kicker light, such as a pin spot, can be added for special effect.

In summary, in all television lighting, the photographic principle of key, back, and fill light is used. For special effects and over-all lighting effect, additional sources, such as side and kicker lights, are used. Generally, a Fresnel spot with either an incandescent or quartz iodine bulb is used for key light. Back light is a Fresnel spot throwing off about 500 to 1,000 watts. Fill lights can be either scoops or Fresnel spots,

depending upon the studio make-up, the set, and the subject. For vidicon cameras, a base light of from 200 to 250 foot candles is desired with back light measuring about 1-1/2 times greater than key, and fill light about 1/2 as intense as key. When on remote telecasts, quartz scoops may be the best lighting sources. A general recommendation would be to integrate your general programming formats so that lights will be fairly stabilized at all times.

Lighting is as important a function of cable television origination as the audio and camera functions. One does not need years of experience in television production to light a set competently for cable television origination. All of the basic television lighting principles have been identified, and now you should be able to utilize them for your operation.

WILLIAM C. SCHWEIZER

Modern Talking Picture Service--that sounds like a very strange name. In order to explain it, I will have to give you a little bit of the history.

In 1927 the Western Electric Company set up a division to handle non-telephone products. In 1937 the FCC told them they should divest themselves of this line of business, at which time an employee purchased this division and called the company Modern Talking Picture Service. At that time they were distributing both films and equipment. A few years later they divested themselves of the equipment and stayed as a free loan film company. Now in its 32nd year, Modern has 30 non-theatrical offices across the country, six of which serve both TV stations and CATV stations.

I have mentioned the word "free-film." If it is free, where do these programs come from? Well, they come from companies both large and small. Therefore, we call the product "sponsored films." They are used in schools, clubs, theaters, TV stations, and recently in many CATV stations. You may be asking yourself how a free loan company can stay in business 32 years. They have to make money somewhere. This is true--and we do. The sponsors of our film pay us an "x" number of dollars to get their films distributed to the public. This allows us to send you the film on a free basis and to bill the sponsor for getting the film shown to your subscribers.

We have found that CATV stations are using the films in the same way television stations are. They can be used as filler material; for example, you may have purchased a show to run from 4:00 to 4:30 and you may have a local news show from 5:00 to 5:30, and rather than spend the money for another show you can use our films

to fill the 4:30 to 5:00 gap. We have series available in case you find your open slot is on a regular basis. Or you can use free films in your own series. An example would be if you had a series called "Travel, USA." There would be no reason why you could not use one of our films in a live show, where a guest has failed to appear, or in some cases actually program them into the live show.

The subject matter varies from sports to religion; with travel, general interest, and women's films all included. Most series are half-hour in length and run approximately 28:30 minutes, giving you time to put in spot announcements. We have even found some enterprising people contacting the local representative of the sponsoring company and selling them time around the film.

We do require two things of you: 1) is that you return the film promptly after it is played. By this we mean the next day; 2) that you fill out and return a telecast card indicating date and time the film played. This is the way we make our money, for we do not bill the sponsor until we get the card back from you saying the film was shown. We also have places on the card where you can indicate why you may not have shown the film, if this was the case. As the card is returned to the sponsor, any comments you wish to make will be seen by the sponsor.

Although Modern is the largest free film distributor, there are other places to get film. The U.S. government and its various agencies have many films which are available to you. This includes, of course, the Army, Navy and Air Force. There are also many companies who do their own distribution and we do have competitors. There is also a book out called "The Free Film Source Book" which lists firms by title, subject, and distributor which are available free to television stations. Consequently, most would be available to you. You can get a copy of this book by writing to "Free Film Source Book," 535 Fifth Avenue, New York, N. Y. 10017.

Modern also has available free video tapes. These are one-inch tapes, in both black and white and color on Ampex and sony tapes. There are not at this point a lot of films available on tape. However, in the future we hope to have more. Our requirements are the same for you people. They are free, but you must return them immediately and fill out the telecast card. For your information, the only library which handles the video is our New York office. However, your local office can give the address.

In summary, there are many free films available to you CATV operators.

They vary in both subject and length and are sponsored by many different companies. Although Modern is the largest distributor, there are other sources of free film. The "Free Film Source Book" lists most films which are cleared for television and when you can get them.

MORTON J. FINK

There's an old saw about a speech being like a woman's skirt -- long enough to cover the subject but short enough to hold the interest. My assigned subject -- sources of automatic programming -- could be covered, I think, by a speech no longer than the shortest micro-mini you have seen on the lovely, breezy hills of San Francisco this week. I am changing the subject -- slightly -- not because I didn't want to deliver a short speech but because like the recent seventh husband of one of America's famous beauties said on his wedding night -- I know what to do but I don't know how to make it interesting.

I also doubt that I can tell you gentlemen anything you don't already know about the different kinds of automatic programming available -- unless the selling arms of the companies which have been making these automatic systems are much shorter than I think they are.

I am, as you may know, President of Television Presentations Inc. which is a subsidiary of Sterling Communications Inc. Inside Sterling is another company called Sterling Movies and Sterling Communications is also the majority stockholder and manager of Manhattan Cable Television. I mention all this not to take advantage of free commercial time but it has a lot to do with my being invited here and with the validity of some points I'd like to make.

Sterling Movies is a leading supplier of free films to the cable TV industry. Television Presentations supplies both hardware and software via our alphabetic news and our converters which now makes possible reception of 26 clear channels. Manhattan Cable Television is a leader in origination and has taken on the ambitious program of cablecasting virtually all Madison Square Garden events previously not available to TV broadcast audiences. So many hockey and basketball fans in New York are unable to squeeze into the large garden that we are certain subscribers will stand in line to get the cable and until they do friends with our cable will have to keep their refrigerators stocked with beer. We know of one system near Detroit that has many subscribers primarily because blacked out Red Wings games are brought in from a distant station.

The point of all this is: all of us at Sterling Communications are deeply committed to the success of cable television. Virtually everything we do relies for its success on the success of cable television. When an FCC ruling or sub-ruling or sub-sub-ruling makes you hot under the collar you can bet our temperature matches yours.

Now that I have established, I hope, our credentials I think the time I have would be best spent by sharing our experiences with you concerning program origination particularly via automatic

means. Along with our experience I can call on two surveys we have made -- one of a system's subscribers and one (currently being conducted by a Ph.D. in market research) of system operators.

The name of the game, gentlemen, is "Add Subscribers and Reduce Overhead." How do you add subscribers? Our experiences and our surveys all tell us one thing -- give 'em something (almost anything) they can't get elsewhere. It seems that once the human being has invested in a television set he reacts to the soft grey of an unused channel the way a bull reacts to the matador's red cape. Every respondent commented on the extra channels the cable system gave them. The simplest vidicon weather scan is infinitely better than a dark channel in the subscriber's view. I think a picture of yesterday's local newspaper lying on the chief engineer's desk at the headend would be worth carrying at some cost over leaving the channel blank.

After reading the replies of subscribers to our questionnaire and adding the results of some telephone interviews I think a case could be made for your automatic programs (of any kind) reaching more people regularly on your system than network spectaculars. Not everyone likes song and dance programs, not everyone likes heavy drama -- but who doesn't check the weather or the news without waiting for the next scheduled report. Think of the telephone company; it has its own weather system which requires dialing seven digits. The company even advertises suggesting travelers dial long distance for weather. That's evidence of the strength of, perhaps, your simplest automatic channel.

On our alphabetic news we find that if, for any reason, a subscriber loses the signal, the loss of the New York Stock Exchange ticker draws a lot of vocal fire and that's true whether it is a small system or a large system.

The history of automatic cable television origination equipment is as well known to you as it is to me. In one way I think we may have reached some kind of ultimate in 24-hour all-electronic news and weather channels with equipment such as our alphabetic news systems which involves pushing a button to give subscribers the United Press International news report, the New York Stock Exchange ticker, and local message input capability. This is really a long way from the first scanning of a teletype printer. Suppliers of every kind of automatic equipment -- including TPI -- are here this week and are willing -- perhaps I could even say eager to sell you the equipment best suited for your situation.

But what about program origination? It seems certain that no matter how much backing and filling is done cable TV systems will be supplying a variety of programming from sheer entertainment to controversial public affairs. Our own Manhattan Cables now originates a substantial film entertainment package as well

as many hours of live origination -- all this in addition to the upcoming Madison Square Garden events.

We really think that one channel origination and more is a certainty in the future of cable television. We also know, as many of you do I'm sure, what a chore it is to fill up with a variety of programming just 12-hours on one channel. Simple arithmetic shows that 12-hours a day seven days a week requires 168 half hours of programming. Anyone who has been faced with the job of providing that much programming -- no matter how the package comes knows what a chore it can be -- riding gain on an old flick -- standing by in case a sprocket hole tears -- even video tapes has its needs -- and always there is the sheer work of coming up with 168 half hours of programming that your subscribers didn't see last week, or the week before....

I mentioned reaching something like an ultimate in one kind of automatic programming -- the all-electronic alphanumeric read-outs that present 24-hours of news and weather seven days away with the push of a button. Well, ultimate is a tough word to live up to but I think we may have another near-ultimate in convenience programming.....Perhaps, some of you visited with us yesterday and saw a demonstration in which we were joined by CBS and Motorola. The demonstration showed the simplest and best method of presenting recorded television programming imaginable. A player, that works perhaps even easier than a phonograph, and gives pictures of greater resolution and clarity than even videotape. The film with a magnetic sound track is virtually foolproof and wear proof. Your secretary could replace the 50-minute cartridges which carry the film between paragraphs on the typewriter. A brief slide can be shown in the few seconds it takes to make the change. You can't be more automatic than that.

And what can be put on EVR film for this automatic origination? Anything that is on motion picture film, anything that is on videotape, anything that is presented live -- can be transferred to this relatively low cost easy-R system. Instead of shipping bulky films and videotapes and chancing the tearing of one or the wiping of another -- a small cartridge weighing a few ounces is shipped and reshipped. The film within the cartridge rides on air and resists damage and deterioration...

When it arrives at your headend, the nearest person slips it on its spindle -- as easy as playing an automatic phonograph -- and pushes a button when it is time to cablecast.

To get back to the name of the game -- "Add Subscribers and Reduce Overhead" -- we think CBS' EVR system is the perfect answer. It can bring you everything that the mind can imagine and it is push-button simple. We think so highly of this at Television Presentations -- this I admit is a short commercial but the possibilities are so dramatic that hope for your indulgence -- we think so highly of this at TPI that in order to become the first supplier of EVR

to the cable industry we have placed firm orders for large numbers of EVR players with Motorola -- the exclusive licensed manufacturer of the player? And we have committed ourselves to processing time with CBS' EVR Division -- needless to add the time demands on CBS are similar to the earliest days of the computer when corporations stood in line to get an hour on a computer even if it was at midnight. We think EVR is the future of cable television origination -- along with those local events you will do with your present equipment. None of your regular equipment incidentally has to be changed to use EVR. Its installation is just about as "automatic" as its use. We at TPI are so certain of EVR as the automatic origination of the future that we have formed TPI EVR Cablecast Service which will be complete program service created specifically to fill the technical and economic requirements of cable television systems.

With EVR as the latest addition to the cable television operators' automatic channel fillers there are no limits to the worlds which he can present to his subscribers economically. I believe that all of us here will see the day when cable TV systems are presenting 20 channels full time and perhaps offering an automatic shopping service via a two-way converter.

And now I would like to say thank you -- and that isn't automatic.