

**TELEVISION
NEWSFILM
STANDARDS
MANUAL**

RTNDA



*television
newsfilm
standards
manual*

Library of Congress Catalogue card number 64-66057

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Printed in USA

*Published by Time-Life Broadcast
Time Inc., New York*

*a guidebook
and working manual
for students
and professionals*

*based on
presentations
by leaders
in the field
made at the*

Newsfilm Standards Conference

*a joint project of
The Radio Television
News Directors Association
and
Time-Life Broadcast
Inc.*

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PREFACE

by Edward F. Ryan, President, Radio-Television News Directors Association-1964

In September of 1963, the management of Time-Life Broadcast made this suggestion to the Board of Directors of the Radio-Television News Directors Association:

"In the belief that a real need exists for the establishment of a set of standards for television newsfilm reporting at the station level, Time-Life Broadcast suggests to the RTNDA that a joint project, designed to satisfy that need, should be undertaken."

It was undertaken. In February-March of 1964, the RTNDA Newsfilm Standards Conference was held in the Time & Life Building, New York City, attended by 230 delegates. Represented were 94 television stations in 37 states, 7 universities and 29 other organizations vitally interested in newsfilm technique. A faculty of 21 recognized experts made presentations and conducted discussions.

This Conference was the first attempt ever made to establish standards in this all-

important field of public information and communication. Never before had so many top experts in our field come together to communicate to their peers what their actual experience has taught them. The professional appraisal of practical — sometimes difficult — problems, the clash and exchange of ideas, the candid, constructive criticism of current inadequacies — all made this not just "another conference" but a seminal event of major importance to all who are dedicated to television newsfilm excellence. This book, which puts the results of the Conferences in permanent form, is designed to help you see your chosen field in broader perspective and to be of workaday benefit to you in your particular job. It is also designed to accommodate material on future advancements in technique and execution as they are made in laboratory and studio.

I take pleasure in commending this book to you.

Edward F. Ryan

“We will need a new language, a new vocabulary, to express the non-verbal reality of human relationships.”

THE NEED FOR

Charles Siepman, in the chapter titled *The Missing Literature of Television* in *THE EIGHTH ART*, suggests that so much has come and gone already, so many-faceted is television, that attempts to assess what it was and is and what it has done to the public are inevitably written in water.

“Television’s present is already past,” he wrote. “It has only a future.”

Siepman concludes that television’s true literature has yet to be written; that facts and figures—when it comes to human affairs—are no better than raw material; that we need to find out all we can about what television “is” but that there remains a larger task: to determine what it *should* be and take steps to bring it nearer to that eventual purpose.

We are concerned here, not with television as a totality, but only one of its components; not with that component in its entirety, but only one of its elements: newsfilm reporting.

Our commitment was drafted originally by Richard Krolik of Time-Life Broadcast. It

is . . . “that a real need exists for the establishment of a set of standards for newsfilm reporting at the television station level.”

We do not think the proposition to be arguable.

We do not know all there is to know about what we are doing, why we are doing it, how best to do it, or what comes of it when we do it, to say nothing of the subtle implications of whether we do it well or badly. But even if none of these assumptions was relevant, the fact would remain that there is no stated agreement among us as to the essence of what we are attempting to do and the body of knowledge required of those who would attempt to do it competently.

Without these we deceive ourselves and delude others at a time when the exercise of external judgment regarding *public* responsibility threatens to make it impossible for us to determine our own standards of *individual* responsibility.

We deceive ourselves as professionals because we have yet to formalize the charac-

teristics, both technical and ethical, of our occupation.

We delude others because we have yet to make an open declaration of our intent to conduct ourselves in accordance with the formal characteristics which we believe to be compatible with our role in contemporary society.

“Television’s present is already past. It has only a future.” I herewith submit to you the concomitant questions of whether those who are engaged in television newsfilm reporting at the station level have acquired a basic competence in the past which adequately serves us in the present; and—perhaps of greater consequence—whether the knowledge we possess at the present can be codified to assure both ourselves and the public that newsfilm reporting in the future will be less of an *experiment* for those who engage in it, and more of an *experience* for those who are influenced by it.

Consider first, if you will, what Siegfried Kracauer calls “the redemption of physical reality.” Only through some elementary dis-

NEWSFILM STANDARDS

by Robert Shafer *News Director - WRCV-TV Philadelphia*



discussion of film as film can we come to any penetrating conclusion regarding the use of film to report day by day, hour by hour, on the condition of the human environment.

There is a tendency to regard what we call newsfilm reporting as something quite new and different. Perhaps this is because we wish to persuade others that if television newsfilm reporting was not without precedent we would know more about it, and would be more nearly able to practice the skills we have acquired with predictable result.

Perhaps it is only that we are preoccupied with the fascinations of television in general and have not yet recognized that the intrinsic nature of newsfilm reporting is *film* reporting. Television makes it electronically possible to deliver the report with incredible speed, to a staggering number of people. But the essential influence of television on how we construct the report has to do with the conditions under which it is received, more than with the conditions under which it is transmitted.

The environment in which the report is received figures in determining the degree of constancy between what the report intends to communicate and what it actually accomplishes. It establishes the commitment of the viewer to the moving image. This introduces factors of image size and complexity to any consideration of television newsfilm reporting. These factors differ to a certain extent from newsfilm reporting which might be transmitted to its audience by arc projection in a theater environment. I would hesitate, however, to assign them more than secondary importance in this introduction.

The intrinsic nature of television newsfilm reporting is film reporting. Film reporting is not new, or revolutionary. Reviewing its history might give us a better perspective than can be drawn from the twenty-three years of scheduled television programming.

The history of photo-chemistry and photography traces the origin of the trichrome color reproduction process now in universal favor to a Frenchman, Louis Ducos du Hau-

ron, who published his first paper on the theory in 1869. It may well be that du Hauron made an even greater contribution to the science of photographic reproduction five years earlier, when he applied for a patent for a device which would reproduce photographic images on a continuous strip of something approximating what we now call celluloid.

As it turned out, he soon abandoned the idea and concentrated on a color reproduction process, but his patent brief gave an inventive later generation sufficient inspiration to pursue the earlier suggestion. What is most remarkable about all of this is what du Hauron said in his brief:

"There will be a living representation of nature. I am especially enabled to reproduce the passing of a procession, a review of military maneuvers, the movements of a battle, or public fete."

That has the ring of film reporting to it. It was written 100 years ago by the man who should be credited with the first patent for

a motion picture reproduction device.

It was nearly thirty years before experimentation by Edison, Lumière and a few others resulted in both a mechanism which would record a continuous strip of images and a device for reproducing the moving images so that they might be seen with the naked eye. When they did, those who could avail themselves of the early cameras began to produce what were called "one-shot news events," among them President McKinley's inauguration, the Columbia and Shamrock Yacht Races, the Jeffries-Ruhlin Sparring Contest, the Galveston Cyclone and McKinley's Funeral Cortège.

Most of the early films were catalogued and distributed as simple reports of international events, world figures, headlines of the moment. According to Lewis Jacobs in *The Rise of The American Film*, "film journalists expressed the prevalent optimism, the pride in American progress, the new interest in the common man, the rising assertiveness of labor, America's mounting interest in foreign affairs, and the foibles of the newly

recognized machine age."

It is worth mention in passing that the lot of the cameraman was not all that he might have liked it to be. The Edison Catalogue of 1901 offers the Galveston Cyclone report with this supplementary information:

"At first news of the disaster by cyclone and tidal wave that devastated Galveston on Saturday, September 8, 1900, we equipped a party of photographers and sent them by special train to the scene of the ruins. Arriving at the scene of the desolation shortly after the storm had swept that city, our party succeeded at the risk of life and limb in taking about a thousand feet of moving pictures. In spite of the fact that Galveston was under martial law and that photographers were shot down at sight by the excited police guards, a very wide range of subjects have been secured."

As luck would have it, one of the very early motion picture photographers in Eu-

rope was a professional magician. He roamed the streets of Paris with his camera, shooting people, trains, soldiers — anything that moved — in hopes that something would happen which would make a salable news report on film.

One day when he was photographing a street scene his camera jammed. The film was caught in the gate. Film was expensive, so the cameraman draped himself and camera under a cloth, cleared the gate, rewound the film a few feet, and resumed the shot.

When the film was processed and projected he was startled to see what had happened. A wagon on the Paris street had suddenly been transformed into a hearse!

The man's name was George Melies. He had been a cartoonist, a theatrical producer, an actor, a scenic painter, and a professional magician. His instinct told him he had stumbled upon some rather remarkable photographic possibilities by unknowingly creating a dissolve from one scene into the next. What happened after that is legendary.

The motion picture became a novelty, a highly lucrative one, and one-shot news events—already largely dependent upon the element of luck at the outset—were no longer as attractive to producers and distributors. As a matter of fact, had it not been for Pathé in Europe, the whole concept of film reporting might have been lost.

American film manufacturers had little or no interest in distributing newsreels. If a public event happened in a city where some studio was located, a man would be sent out to make a picture, which if it turned out, would be spliced on any reel that happened to be short by a few feet.

Pathé, who was then regarded as not only the largest producer of moving pictures in Europe but of the world, introduced PATHE WEEKLY in the United States in 1911. It seemed to help his feature film box office, so he stationed cameramen around the world with instructions to make one-shot news events of anything they thought would lend impact to a theater advertisement.

Other producers and distributors were re-

luctantly beginning to follow his example when World War I broke out, and then they could not turn back. The newsreel became recognized as a method, although a crude one, of reporting.

The end of the war did not mean the end of the public's interest in non-fiction motion pictures. The film report had somehow established an appreciation for witnessing actual events in their actual surroundings. Skill had not been a real factor. Speed, perhaps, and hazard and impudence. But newsreel cameramen had little or no time during the war to improve either technique or product. Speed, and the "scoop" which could be merchandised, were the only criteria.

The leap-frogging technology of the post-war years began to change all that. Spring-wound and motor driven cameras were developed, sound was added, and as the depression approached, there were six newsreels under twice-weekly production and distribution.

Even the literature of the cinema, which had been more concerned with the theatri-

cal implications of film production, found cause to consider the merits of film-reproduced actuality. One writer of the period, C. A. Lejeune, wrote what must have been regarded by her contemporaries as a rather shocking appraisal.

"The presentation of fact has always had a fascination of its own, and the presentation of fact in pictures has to many people an added conviction that the printed work can never achieve.

That this is the natural journalism of today cannot be denied. Ours is not a reading age; words are too tardy for us."

C. A. Lejeune's enthusiasm may not have been altogether justified at that time, but five years later the "natural journalism" took on a form and substance all its own. Until then, except perhaps for Pathé in its early days, no reputation—good or bad—had ever been made with film reporting.

On February 1st, 1935, *The March of Time* was released publicly for the first time.

It was a monthly series, but it gave film reporting both concept and design. Until then, newsreels had never been produced. They merely happened.

Andrew Buchanan, in *The Art of Film Production* in 1936 could not have been more devastating in his criticism of the contemporary film report:

"Each reel appears to copy its competitor and they all seem terrified to break away from a conventional form of presentation which they themselves have established. My temperature rises when I am confronted with annual stories which appear with clockwork regularity: Cup Finals, Ascot, The Derby, Armistice Day; and in the case of football and racing, I am quite sure that the majority of people would be no wiser if last year's events were shown next year."

With the notable exception of *The March of Time*, film reporting spanned another decade, a period including World War II, before the advent of television provided an incentive for qualitative concern. "What is the good of expecting fine film construction or well-balanced sequences or first-class photography?" Buchanan wrote. "That is impossible, and explains why the newsreel cannot be judged according to the standards reached by any other type of film production."

Let us examine, momentarily, Buchanan's assumption that it was impossible to accomplish fine film construction, well-balanced sequences or first class photography. His assertion is relevant to the very questions with which we must deal here. He used it then to explain why the newsreels of that period could not be judged according to

the standards reached by any other type of film production. Others will use it today to cast aside any suggestion that now, twenty-five years later, it is any more possible.

There are essential differences, and it would be well to consider several of them.

In the last great years of film reporting for theater presentation, cameramen were still shackled with heavy, unwieldy studio equipment transported to the field. Even the handheld "Eyemo" was a beast, and I doubt that anyone could carry more than one spare roll of 35mm film and an empty can in his pockets.

Needless to say, cameramen were no less aware of the severe limitations imposed on their mobility by the equipment available at that time than we are today. But their attitude about physical restriction was apparently more justified than ours. One cameraman, Austin Lescarboursa, wrote in *The Scientific American*:

"It is not surprising that inventors have been at work on the problem of evolving a better camera. Several types of hand cameras which do not require a rigid tripod support, thanks to automatic driving means and gyroscopic stabilizers, are being used. They operate from a portable storage battery and are held firmly by two handles.

Another type comprises a number of compressed air flasks and a pneumatic motor which replaces the hand crank as well as a gyroscopic arrangement for maintaining the camera on an even plane."

Sound recording was a rarity except when it seemed necessary to portray a statesman "by backing him up against a wall and letting him stand there and jaw at the camera

for thirty seconds." Hand-held single-system sound recording was, indeed, an impossibility.

The lenses? The lighting equipment? It required more footcandles of artificial light to penetrate the average newsreel camera lens in the early forties than an entire station newsfilm operation has at its disposal today, plus a bigger truck, a stronger back, and an absolute genius of an electrician on the crew.

The film emulsions were hardly more than one step beyond glass plates in light sensitivity. Processing was not only agonizingly slow, but so hazardous that mere survival entitled Mr. Houston to be so "fearless."

The second section of this book will concern the creative attributes of cameramen who work in three distinct environments as today's film reporters. There were only two types of cameramen in the heyday of the newsreel: those who had learned to get it the first time and those who lost it. Those who lost it soon found themselves behind a counter somewhere slinging hash.

The creative requirement was much the same as it is today, an army of intrepid cameramen who not only understood the essentials of cinematography but knew how to tell a news story in pictures. But there was little, if any, reason for a man to want to be a film reporter.

Few had good staff jobs. Most worked on speculation. The odds were against a good photographer turning down a studio assignment to remain a free-lance cameraman.

Was there an incentive for the cameraman to engage in the subtleties of technique? Certainly not. Speed was of the essence. Ingenuity in outsmarting the competition to get one's own film shipped, while at the same time trying to block the shipment of



the competitor's film, or even destroy it if possible, was taken for granted by an editor when he gave a cameraman an assignment.

Film editing, until the immediate post-war years, was largely a matter of determining how many cuts and splices could be made between the time the negative came out of the processing tank and the time it had to go into the printing room. Again, the exception to this was *The March of Time*, which was "produced" as a film report.

Editorial influence? Could editorial influence in any way make it impossible to utilize fine film construction, well-balanced sequences or first-class photography? Mr. Buchanan did not suggest that it might have been a factor, but another writer, Terry Ramsaye, said in *The Motion Picture Herald*:

"For a great many years, newsreels suffered from a relative unappreciation at the hands of the trade. They were considerably more important to the more intelligent and influential fraction of the audience than the boys of the film were aware. With the coming of sound an opportunity presented itself to reestablish newsreels on a new basis. Nothing of the kind happened.

The zest is gone out of the newsreel cameramen and their editors, chiefly because the fate of the product is being decided not by the performance in the field, but around the tables in sales conferences and trade-offs of playing time."

The editorial influence was seen by some as the result of competitive, rather than distribution, factors. Editors called for, and cameramen shot, "something different, anything different, as long as the competition doesn't get it too."

A *Time* editor later reflected, "Cameramen might risk their necks to get an occasional scoopshot, but the scoops cancelled each other, leaving one newsreel's baby parade almost exactly equal to another newsreel's sea-lions."

And there was still another concern which must have depressed the creative spirit of both cameramen and film editors. The newsreel, it should be remembered, had long since ceased to be an independently produced film report. It was irrevocably dependent upon a fiction-creating industry. That industry was, in the late thirties and early forties, dependent upon an unalienated audience for the success of huge financial investments in studio production. Those responsible for the investments feared that newsreel coverage of some of the events which were taking place in Europe and here in the United States would so antagonize portions of the audience in newsreel coverage that the feature film might be thrown into financial jeopardy.

There was an unofficial but strikingly thorough ban on Hitler's voice and picture in theaters in this country for some time. Jacobs was concerned about the implications of this in 1939 when he wrote:

"Various forms of editing or omission by producers have made it possible for newsreels to propagate a particular point of view, or to refuse to recognize a particular point of view. The commentator can twist the meaning of the accompanying picture. The deletion in part or whole of some portion of an event can have a distorting effect on news for some propaganda purpose."

He was particularly concerned about the treatment of one incident that would seem

rather commonplace to some of us now. Footage of the industrial riot in the Republic Steel strike in Chicago in June of 1937 was shelved by a producer-distributor.

That happened also to be the year when Gilbert Seldes wrote:

"There is no great tradition of the impartial recording of news on the screen as there is in the press. A newsreel proprietor who also has large investments in a motor-car factory might omit all pictures of accidents on the road, and perhaps make a special showing of accidents in the air."

Seldes, too, was concerned about a particular incident involving labor-management disputes. He charged that "an unimportant episode in the newsreel of a strike in New England was staged for the cameras. A private guard fired a tear-gas projectile at a striker and severely wounded him — entirely for the benefit of the newsreel."

Lewis again, for a final comment. It all "had an unfortunate result in that patrons of theaters are offered newsreels in many cases containing records of events of no particular interest to anybody. Being limited by the scope of its organization and the finances at its command, as well as by the inability of those responsible for the service to sense events of public interest, the exhibitor and patron were confronted by newsreels of very mediocre quality."

Given all these factors, it is doubtful whether Buchanan's assertion — that film reporting could not be judged according to the standards reached by any other type of film production — concern the real questions we face today. The fact is that both time and technology have worked to our advantage.

The advent of television radically altered the diversionary habits of the American public, and in so doing brought an end to the influence of the fiction film-maker and his box-office problems on non-fiction film making. At the same time, television itself made possible a "living representation of nature" beyond the wildest fancy of a 24-year-old Frenchman named Louis Ducos du Hauron one hundred years ago. It was the advent of television which put new meaning, an element of truth with evidence, into the words of C. A. Lejeune that "ours is not a reading age. Words are too tardy for us. In a good film report there is always something to touch one's personal experience, some point of contact with the individual."

Television may not have found the film reporter as fully equipped or adequately prepared as we think we are today. Our principal sync-sound recording tool is, after all, no more than our modification of a camera which was being marketed for amateurs until we had need of it. We have done much to develop our own lighting equipment and editing devices, and we have encouraged — by an insatiable appetite for improvement — a host of advancements in lens capability, film sensitivity and processing systems.

Conversely, television has given the film reporter his greatest gift. We are only now beginning to recognize it for what it is. It is what Reuven Frank calls "the highest power of television, its unique ability to transmit experience."

Television transmits experience. The experience must first be defined, isolated and photographically recorded by the cinematographer and his associates. That is, as it has always been, the professional role of the film reporter.



He may concern himself with the implements, devices and techniques of this profession in hopes of arriving at his own standards of performance, or he may disregard such considerations entirely. In either event he ought to be aware that he must soon be prepared to have his influence measured against a new body of scientific knowledge about human behavior.

It is called *non-verbal communication*, and those who are exploring it in great detail . . . Jurgen Ruesch and Weldon Kees at the University of California School of Medicine and Langley Porter Clinic in San Francisco and R. L. Birdwhistell, a senior research scientist at Temple University in Philadelphia . . . are impressed with the communicative significance of the ways in which human beings actually move and act.

In his notes on the Visual Perception of Human Relationships, Dr. Ruesch reveals that time may be running out for the film reporter who is concerned only with camera position, choice of lens and exposure:

"Few are trained to look steadily and searchingly at the visual world and really see what passes before the eyes. The nature of action is inherently transitory, and our very familiarity with our everyday surroundings prohibits us from forming an accurate estimate of them.

The highly consequential act of putting a frame around a person or group or an object concentrates and emphasizes, and there are not many films that deal honestly and directly with real events . . . films that permit us to look at human beings as they actually are.

In a culture of action, symbolic and verbal expression is not usually re-

garded as an end in itself but tends to be implemental and practical. Political speeches, newspaper reports and the remarks of commentators consequently may not reflect what their writers actually believe. Hence, implicit non-verbal communication as it is used by the American "man in the street" is of the essence. The photographic technique is ideal for conveying to the observer topics, factual representations and details of the "how" that words are incapable of expressing. Although most people are familiar with the rules that govern communication — logic, syntax, and grammar

— few are aware of the principles that apply to non-verbal communication."

Dr. Ruesch and his colleagues in this remarkable research have already hinted at the influence their findings must eventually have on our own work.

Their concern with human action and reaction — especially the conduct of social behavior which results from uniquely human expression — may well confront us with an entirely new consideration in film reporting.

It is not what most of us would recognize or define as today's television newsfilm, not a pictorial estimate which attempts to satisfy an essentially verbal consideration of fact, but a film redemption which more effective-

ly transmits the experiences of non-verbal reality.

We will need a new language, a new vocabulary, one which expresses the non-verbal reality of human relationships.

And we will need a set of standards — the logic and syntax and grammar — with which to become both competent and consistent in the application of this non-verbal communication in television newsfilm reporting.

Khrushchev has said, "Picasso paints like my small son."

"Perhaps," says Reuven Frank, "but first he taught himself to be the most accomplished draftsman alive, and then he began to paint like Khrushchev's son." ■



*tools of
the trade*



CHAPTER 1

THE SILENT CAMERA

Robin Still
NBC News



The Bell & Howell 70 DR, the "Filmo."



The Bolex H16

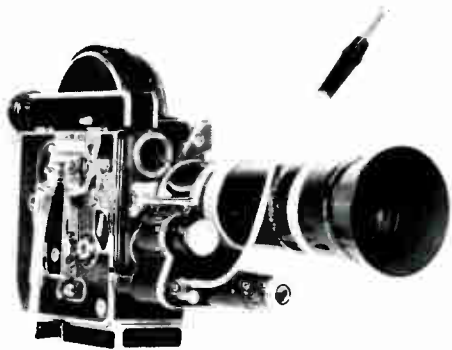


The Arriflex

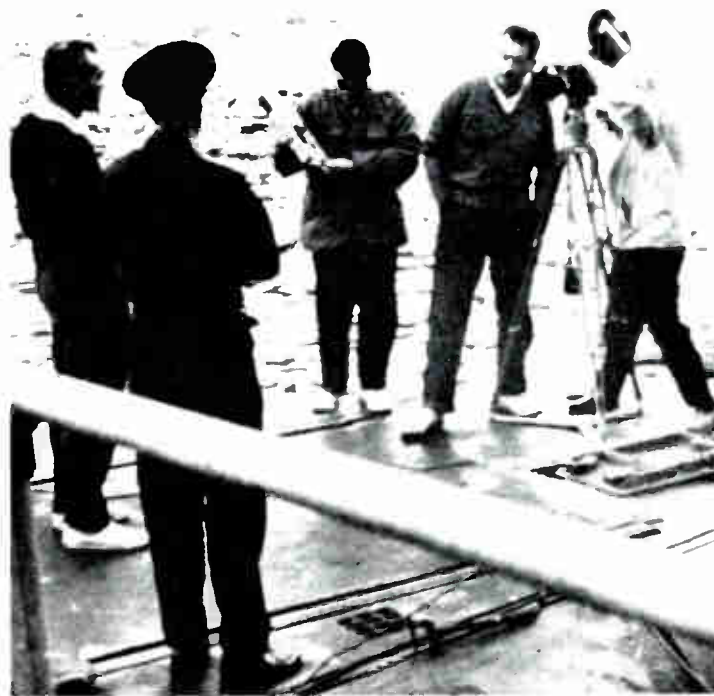
The three standard silent motion picture cameras generally associated with professional newscameras are: 1. Bell & Howell, 2. Bolex and 3. Arriflex. The camera most widely used for silent newscameras is the Bell & Howell 70 DR, sometimes referred to as the "Filmo." Advantages of this camera: it's rugged (I've dropped mine many times and it still comes up shooting). It needs little maintenance—clean the gate after each roll and oil it twice a year. A filter slot can be cut into it which is rather essential when you are shooting quickly. The slot enables you to slide filters in and out instead of having to screw them on. The present day film emulsions of 250 ASA, at which we are rating most of our DuPont 936 now, require a filter for exterior photography. As for lens complements, the average network cameraman prefers a 10 millimeter lens for wide angle shots, a one inch lens and either a two or a three inch lens. I prefer the three inch lens because it gives me a lens which, in emergency I can get close ups with. It is not ad-

visible to hand-hold the "Filmo," when using the 3" lens but you can usually brace it on a wall or fence when you want semi-telephoto shots. The "Filmo" is a basic all-around camera issued to all NBC cameramen for their personal use.

The second camera, the Bolex, is more widely used for local station work. I used one for a couple of years when I was with the British Commonwealth International Newscamera. Its major advantage over the Bell & Howell is the reflex viewfinder, but this has a drawback that causes some cameramen to dislike using it. When filming inside you need high speed film (250 ASA). When you go outside you have to use a filter. If you put an 8N5 filter in that camera and shoot at F16, you can barely see the image you are pointing it at. The Bolex is excellent for local station coverage because you can do dissolves, fade-ins and fade-outs. It has a variable shutter to help you gain extra light which is another advantage over the Bell & Howell, with its fixed shutter. One feature



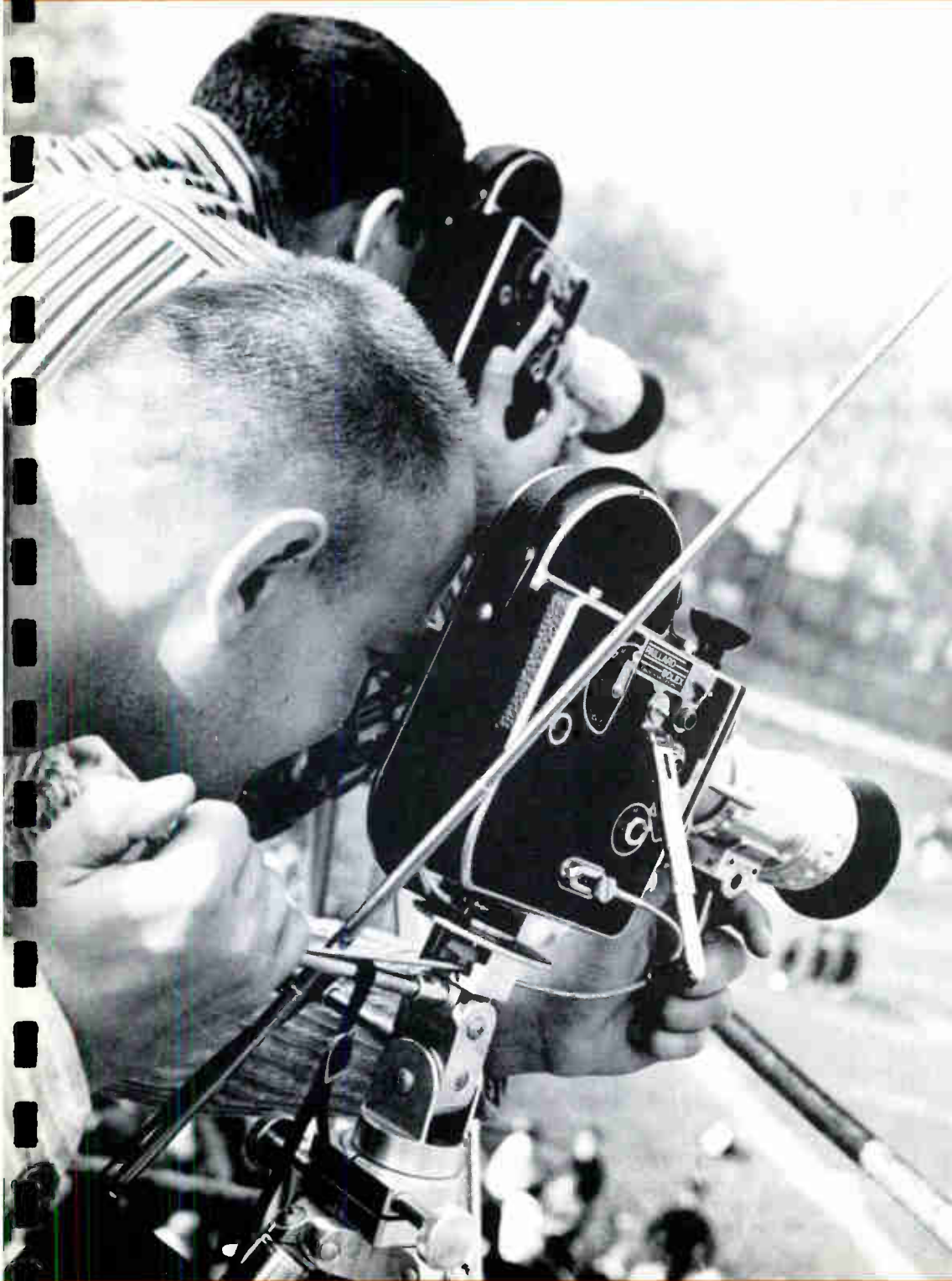
The new Bolex H16 Rellex electric eye camera with automatic 86EE Vario Switar zoom lens



of the Bolex that I personally dislike is the fact that it is a hand-crank camera. I've wrecked more knuckles winding the handle than I ever have fighting!

The new Bolex H16 Rex 3. is an electric eye camera, and, I believe, the camera of the future. I have seen a couple of hundred feet of film shot with it by Bolex themselves, going from F16 down to wide open (F22) and I was amazed at how quickly it changes and how good it is. They have fitted the electric eye right underneath the lens so that results are not affected by top light. I believe it is going to be extremely useful to me, especially where I cannot have an assistant cameraman continually pulling exposure. A lot of people shrug their shoulders and say "electric eyes are for amateurs." They used to say this about 16mm when we used to carry 35mm Mitchells around. I believe the electric eye camera is going to come and it will be useful. If anyone is interested and wants to drop me a line, I will send them a full report on this new camera. At this writing, my plan is to shoot some test films on DuPont 937, which will be rated at 600, 800 and 1000 ASA for any interior which we cannot light. I'm going on a documentary into a hospital where the available light is bad and I'll have to work with it the whole time. Shooting with available light, so as not to distract the person you are filming, will be the method of documentaries of the future.

The third silent camera, the Arriflex, is, in my opinion, the finest camera made for news or documentary filming. If you are going to raise standards in silent newsfilm coverage, you must invest capital in this kind of equipment. The Arriflex is reflex—that is, everything you see through the eyepiece goes on the film. The gate mechanism, the registration pin, gives you the steadiest pic-



ture of any hand-held camera. It can be adapted for a 400 ft. magazine, you can have a synch pulse on it for sound, zoom lenses can be fitted and, as I mentioned, everything is reflex. Some cameramen will say the Arriflex is fine for documentary but not for news—it's too cumbersome, with a battery slung around your shoulder and no filter slot. But you can buy a 9-volt dry cell battery (the size of a pack of cigarettes) and run a lead from this to the bottom of the camera. This battery will run 6 100 ft. rolls of film. The only time I use the regular Arriflex battery is when I am using a 400 ft. magazine.

As for comparative costs, the Bell & Howell is the cheapest. Basic camera (without lenses) \$300 - \$350, depending on what complement you want. You can buy a good Bolex from a franchised dealer, set up with 3 lenses for around \$900. The Arriflex is the most expensive. A basic Arriflex, without magazines and with the three lenses, will cost about \$1800 to \$2000. I have about \$12,000 invested in my own personal Arriflex because I have a lot of lenses and auxiliary equipment. These are not really necessary and are little "luxuries of the trade."

In newsfilm, camera prices should be a secondary consideration to results. These days, the cameraman does not have enough control. He is given a camera and told to go out and shoot. He is not allowed to say "I need an Arriflex for this job," or "I need a Bolex for this job." Each cameraman has his own camera preference. I prefer an Arriflex, but sometimes working in New York with Gabe Pressman on sound interview, with a 400 ft. Auricon will sling a Bolex or "Filmo" around my neck, just to get any little cut-aways. Then it's not necessary to take the Arriflex. But, in my opinion as a cameraman, every station should own an Arriflex. ■

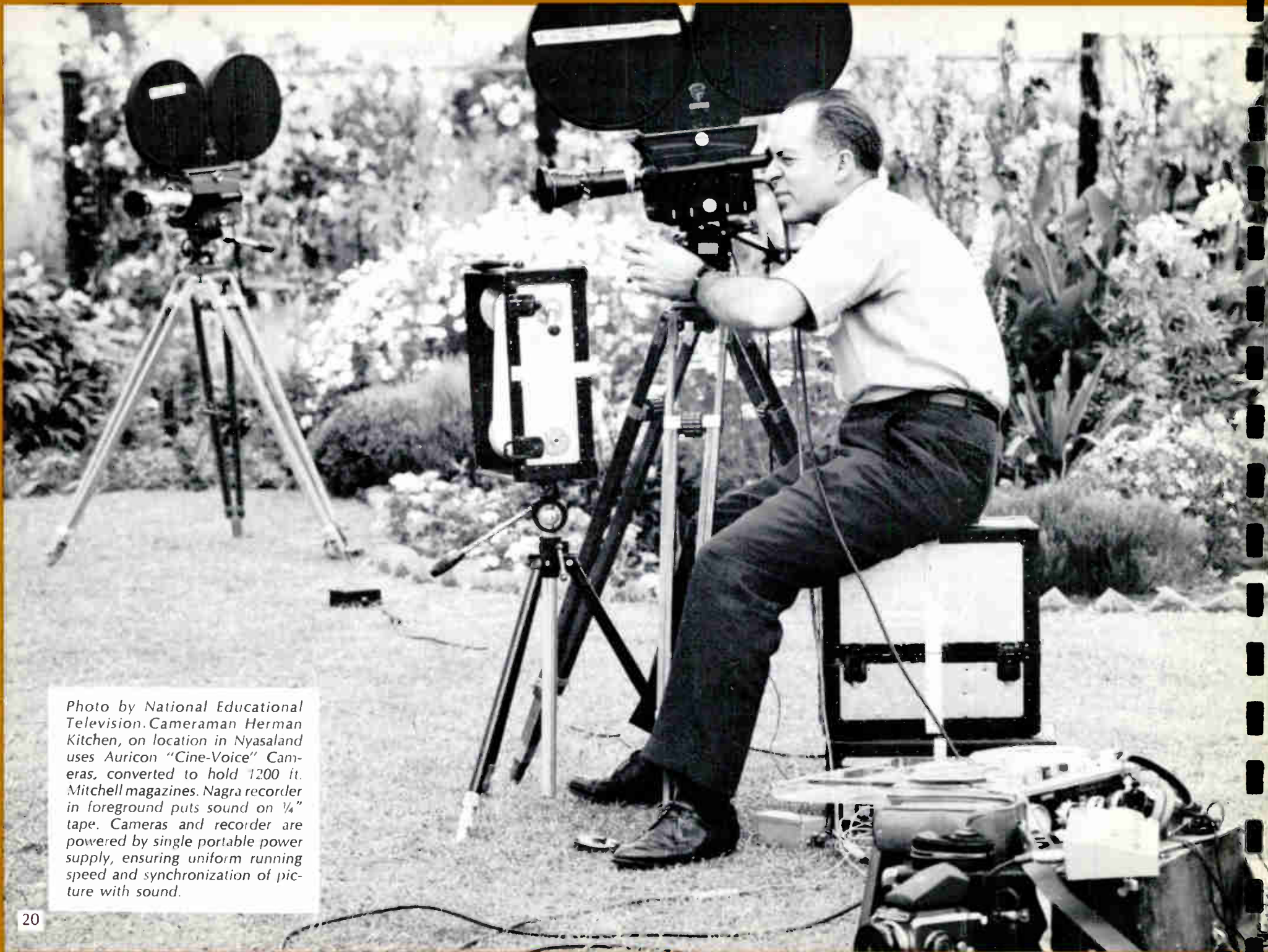


Photo by National Educational Television. Cameraman Herman Kitchen, on location in Nyasaland uses Auricon "Cine-Voice" Cameras, converted to hold 1200 ft. Mitchell magazines. Nagra recorder in foreground puts sound on 1/4" tape. Cameras and recorder are powered by single portable power supply, ensuring uniform running speed and synchronization of picture with sound.

CHAPTER 2

tools of the trade RECORDING SOUND

John Fletcher*
ABC News



Much of the impact of television newsfilm reporting — the force with which it imparts the essence of reality even though scarcely more than a fragment of it in actual time — comes from what has been characterized as “sight and sound” reporting. It commands the attention of the viewer because the sense of actuality, reinforced by seeming immediacy, is inherent in the method. The viewer accepts and believes because this sense of the actual instance has been retained.

The image he sees is lifelike and natural. The accompanying sound he hears is lifelike and natural. Taken together, they achieve an ultimate compatibility as an approximation of human audio-visual perception. The method, competently employed, makes it possible to bore through even the subconscious prejudices of the viewer and so involve him that he does not question whether the substance of the report was intended to be accurate or responsible; participation, delayed as it may in fact be, enables him to engage in a personal en-

counter with the situation, and personal involvement is rarely less than authoritative for the individual concerned. Neither his immediate response nor his eventual exercise of human judgment, if one is required, are significantly more influenced by the quality of the experience, its validity, than they would be had he actually been present when it happened.

The evolution of this remarkable reporting concept, unique as a means of communication, has never been carefully studied. The camera which makes it possible, the 16mm CINE-VOICE single-system synchronous recording camera manufactured by Bach-Auricon, Inc., of Hollywood, may have become the workhorse of television newsfilm reporting but it was never intended to be. It was first marketed in 1948 as a “talking movie” camera for amateur enthusiasts, and even today its basic design makes few concessions to the widespread use it now enjoys in the hands of professionals producing newsfilm for television.

The CINE-VOICE is a spool-load, 100'

capacity camera designed to be externally powered by 115 volt, 60 cycle current. The running speed is 24 frames per second or 36 feet per minute, the standard speed for 16mm synchronous sound projection. The shutter opening is 175 degrees, providing an exposure of 1/50th of a second, and standard 16mm “C” mount lenses of any focal length may be used.

Using single perforated film, sound is recorded through a battery powered external amplifier. An optical image of the sound modulation is exposed by a hair-line of light coming from a Galvanometer. It is focused on the film’s unperforated edge as the film passes around a sprocket. The light source in the Galvanometer is a small bulb rated at 7 volts, .2 amperes.

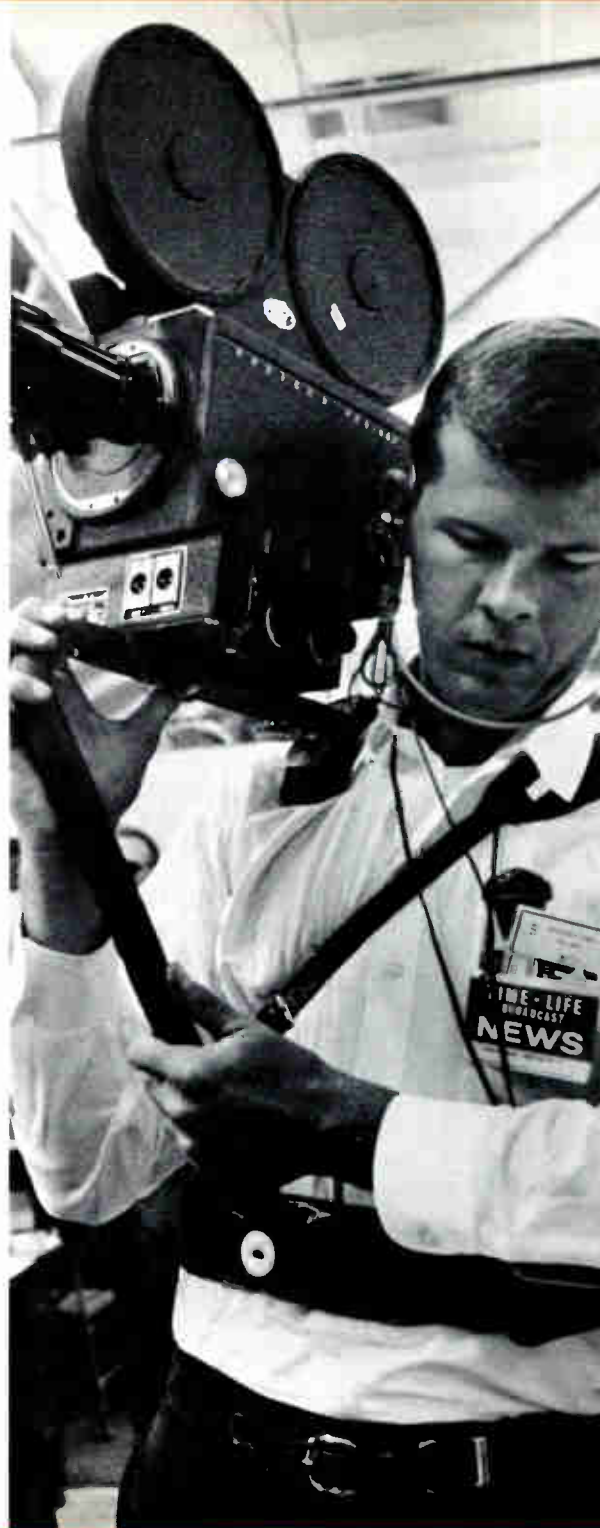
The CINE-VOICE may be purchased fitted with a Galvanometer which records *variable area* modulation, a track which varies in width in response to the modulation; or fitted with a Galvanometer which records *variable density* modulation, a track which does not vary in width but does respond to

* with Robert Shafer and Richard di Bona, General Camera Corp.

the modulation by affecting variations in the light density capability of the track exposure itself. Both types of optical sound track recording have been employed in the production of television newsfilm, *variable area* primarily with reversal films and *variable density* with negative films, but the applications have not been equally successful in terms of consistently optimum quality.

Variable density sound recording achieves maximum results on negative film reproduced through the printing process as a positive release print. It requires exact processing, with particular attention to both gamma and density, and the most minor fluctuations in either processing time or temperature result in variations in both gamma and density which have a marked effect on the quality of the recording. *Variable area* sound tracks are adversely affected by major processing variations, of course, but under normal conditions offer a higher degree of reliability in local station newsfilm recording, processing and projection.

Neither form of optical sound recording can, however, approach the considerations of reproduced quality or reliability in handling that are possible with single-system magnetic soundtrack recording as it is now being adopted throughout the industry. An optical sound track, even when recorded under the ideal conditions which are seldom — if ever — present in newsfilm production situations, is exposed on the film without any certainty that either the modulation or the exposure itself is satisfactory. Difficulties within the amplification or recording systems, incapacitated batteries or exposure lamp or intermittent line break-up between the amplifier and the Galvanometer, frequently remain undetected until the film has been processed and projected. The mag-



netic stripe recording system provides for monitoring exactly what is being recorded; this by monitoring playback rather than input.

And there are other considerations. Because of the great latitude of the film emulsions now in use in newsfilm production, there are occasions when the picture quality may be improved in processing by over or under-development. This literally destroys an optical sound track unless compensation for this variation was taken into account in determining the exposure for the original track recording. Also, because an optical sound track is in fact an image on film, its fidelity may easily be affected by scratches, dirt, chemical deposits or any other matter which will interrupt the flow of light through the track during projection. This is seldom, if ever, a factor in reproducing a magnetic stripe recording.

But the basic difference in the quality of the two types of sound recording (and this is more important than we may like to think because of the manner in which it may enhance or detract from the illusion required in "sight and sound" reporting) involves the respective frequency response of the two methods. In optical recording, frequency response is between two and six thousand cycles. In magnetic, it is from three hundred and fifty to as high as ten thousand cycles. For our purposes, the frequency response obtainable in magnetic recording more nearly approximates the range of the human in audio-visual perception, and it should be our goal to approach any question such as this in terms of how faithful to life itself we can be.

As local stations convert from present optical to magnetic recording and projection systems, it will be necessary for them to undertake minor modification of the studio

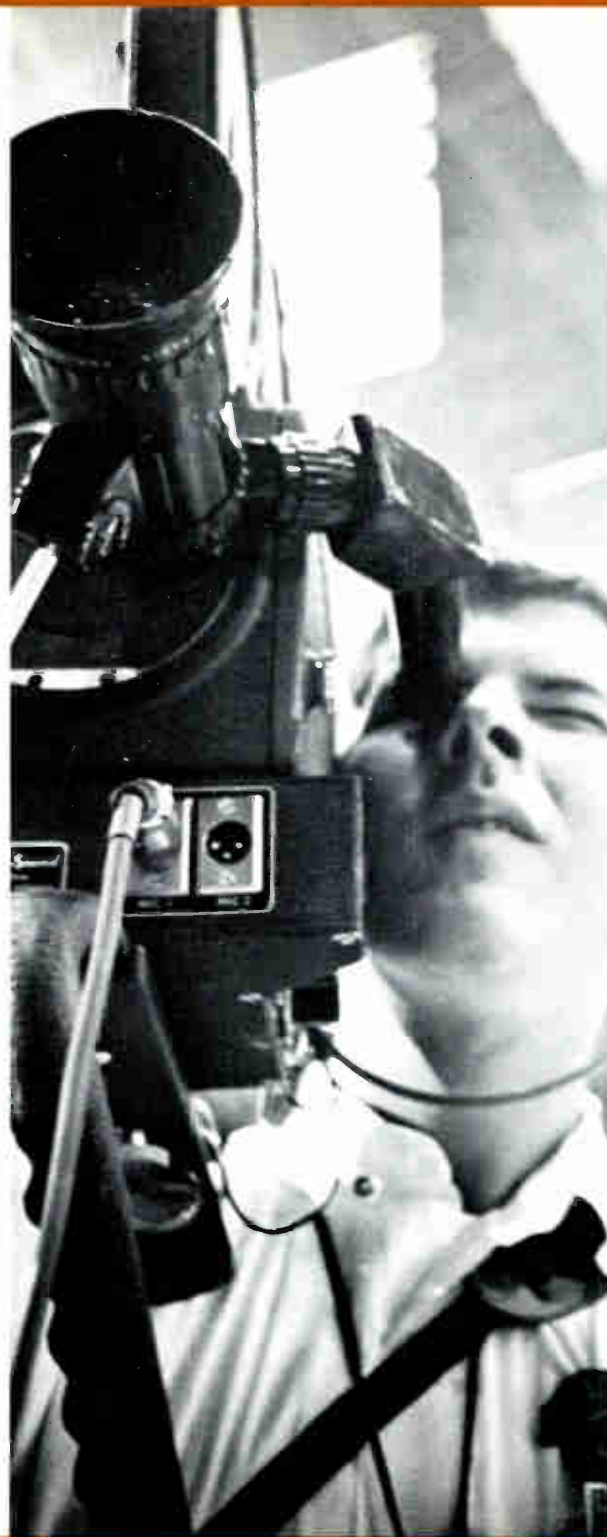
projection equipment used in the presentation of newsfilm on the air. This modification costs between \$600.00 and \$1,600 per projection chain, depending upon the type of original equipment and the specific modification desired.

Converting existing optical sound-on-film cameras to magnetic recording systems costs in the neighborhood of \$1,000 per camera, and there are a number of different modifications available through Bach-Auricon and reputable camera service organizations.

New cameras equipped with magnetic systems, rather than optical, price out at only slightly more than optical units. However, new cameras equipped with both optical and magnetic recording systems, which some stations prefer, cost from \$800.00 to \$1,000 more than those equipped for only one type of single-system sound recording.

The factors suggested for consideration until now in this discussion concern the basic equipment as designed and marketed by the manufacturer, and the standard operating procedures consistent with the use of the original equipment. Because there has been a considerable independent effort to improve upon this equipment by those who use it, reflecting not only some shortcomings in present design but also the realization of a much greater potential, the modification of the CINE-VOICE will be outlined here. However, considering that both competitive factors and the absence of knowledgeable technical publications regarding these modifications severely restrict an evaluation of known performance characteristics, what follows is no more than a rough sketch of what has been attempted.

Perhaps the earliest modification, and still the most common, is to increase the capacity of the CINE-VOICE. Even though 600' capacity and 400' capacity versions of the



Auricon SUPER 1200 have been available for some time, design features incorporated in them add considerable weight over the basic CINE-VOICE, and the urge to make better use of synchronous sound recording with a hand-held camera makes weight a primary factor.

The CINE-VOICE was not designed to be a hand-held camera, but there is little question but that its basic weight has encouraged widespread use of the camera in this fashion to produce the candid picture which is characteristic of television newsfilm. The early professionals who adopted the CINE-VOICE for television so that they might record voice and picture at one and the same time quickly discovered that the potential was far greater. The camera, hand-held, could do much of the work of the smaller Bolex, but it could do something the Bolex could not do: it could record sound as well.

As an optical recording camera, however, mobility is severely restricted by the weight and size of the amplifier and of the power supply required to free the camera from the common electrical outlet. The introduction of magnetic sound recording made it possible to transistorize the amplifier and considerably reduce both size and weight, especially when the optical Galvanometer in the camera itself is replaced by a tiny, almost weightless, magnetic recording head. Wholesale improvements in types of power supply for both camera and amplifier have all but given the newsfilm cameraman his freedom in sight and sound reporting.

Using either Mitchell or Auricon 400' magazines, then, modifications have been designed which either tap the camera case and mount the magazine externally or shave off the top of the case and install a completely new mount. The first method makes it possible to continue to use the CINE-

VOICE as a 100' spool load camera; the latter converts it to 400' core-wound loads on a removable sleeve, which permits insertion of 100' spool loads within the magazine itself when required.

Either modification approach reduces the reliability of the factory installed take-up motor, which was not intended to cope with a 400' load and also drive the camera mechanism, so several approaches to this problem are also in evidence. They either involve a separate, external, take-up motor of a type which will adjust itself to the transfer of tension from unexposed to exposed chambers of the magazine, or replacing the original internal motor with one which has the capability for both camera drive and take-up with 400' loads.

The addition of the 400' magazine also makes it necessary to install a new footage counter, usually of the Veeder type, and again it may either be externally mounted somewhere on the case or internally mounted by tapping the case at the rear, near the power switch.

To increase operating reliability in rough and tumble newsfilm production situations,

especially when the camera is being handheld, it appears to be advisable to have the original factory-installed power and amplifier male and female plugs and receptacles replaced with heavy duty types.

The form of matt-box viewfinder which comes as original equipment on the CINE-VOICE door has not proved to be as accurate or easily operated for lenses of varying focal lengths as newsfilm cameramen require. Modifications in this area have involved the installation of optical viewfinder devices within the barrel of the viewfinder similar to those used on Bell & Howell FILMO cameras. Some newsfilm operations prefer to install just one lens on the CINE-VOICE, a lens of the ZOOMAR or variable focal length type, in which case the reflex viewing device for the lens is used, rather than a matching viewfinder. Bach-Auricon now markets a flat door for use on the factory version of the CINE-VOICE and it has become customary to shave this door off to conform to the modified camera body and install it on hinges when the camera is converted for a user who prefers the through-the-lens reflex viewing of the variable focal

length lens.

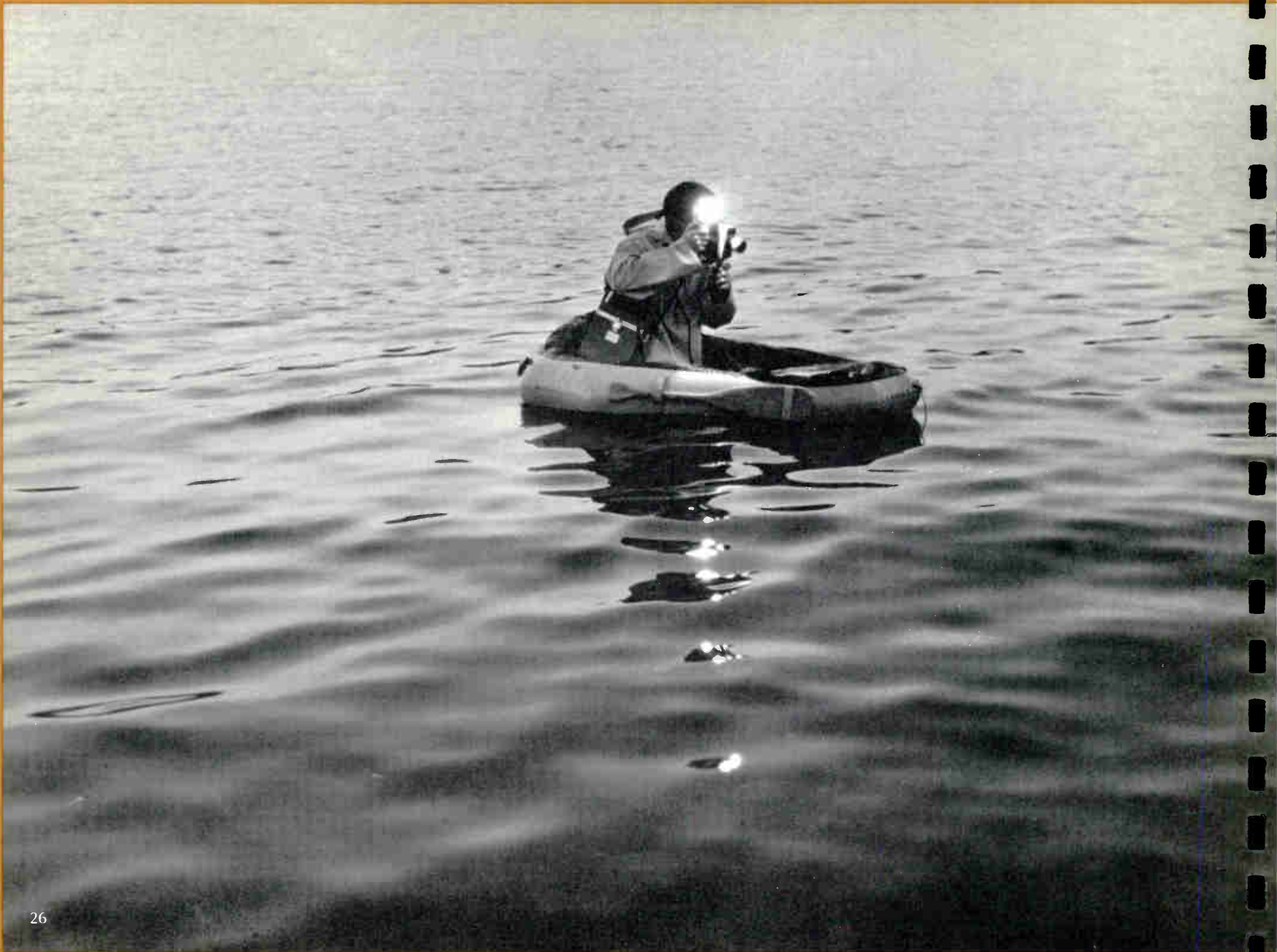
Modifications of the amplifier to make it more portable are generally accomplished by the use of transistorized circuitry. The range of accomplishment is considerable, in both optical and magnetic systems, from one which mounts the circuit inside the camera door so that the VU meter is actually visible to the cameraman as he composes and shoots his picture, to others which make an entirely new but quite small cable-connected unit. Between these extremes are several approaches which mount the amplifier on the camera case itself, on the bottom or the side, and arrange the necessary indicators so that they are within glance of the cameraman as he works.

For the past ten years, Bach-Auricon, Inc. has made an effort to study each and every modification made by others to determine whether it merits consideration as a basic design change in the factory version of the CINE-VOICE. During the same period the company has come out with its PRO-600 and PRO-600 SPECIAL, which is actually a 400' magazine version with some reduction in weight through the elimination of some

operating refinements which are helpful in studio production but may only be unused and unusable weight in newsfilm situations. The research and development which lead to the magnetic recording system has also taken place during this decade, along with turret modifications in the CINE-VOICE and some relatively unnoticed functional changes in the operating mechanism itself.

The CINE-VOICE as modified by others and the PRO-600 SPECIAL as marketed by Bach-Auricon offer the newsfilm cameraman cameras which, for the moment, satisfy his requirements in the production of single-system synchronous sound-on-film recording. As he becomes more skilled in this technique, however, he will need a camera which combines the best of the modifications with the utility weight of the CINE-VOICE and the built-in heater and thermostat control and synchronous motor drive, and other refinements available with the PRO-600 SPECIAL. Hopefully, Bach-Auricon, Inc. is aware of the need which is rapidly developing and is prepared to meet the new demands of the newsfilm cameraman in the near future. ■





CHAPTER 3

tools of the trade NEWSFILM LIGHTING

Richard Roy*

ABC News



What follows is intended to provide basic information on newscast lighting equipment and its use. Since the fine points of lighting technique are best left to the discretion of the individual cameraman, only the most basic points are discussed.

Certain brands of equipment have gained wide acceptance in our field and are mentioned in this report; however, in many cases, comparable equipment is available from other manufacturers. The rule to follow is to select rugged, reliable professional equipment in all cases. Hard news coverage in particular does not allow rehearsal or re-take and so equipment failure results in loss of the story.

Specific types of lights most used for news purposes are: scoops, quartz lights, Lowell lights, Cine Kings and portable battery-operated lights. Scoops and portable battery-operated lights are standard equipment for the average mobile camera crew covering hard news. The other lights are mainly used

for planned, static situations and for feature stories.

SCOOPS are the most commonly used lights in news coverage. The scoop has a standard porcelain socket which accommodates photoflood, photospot and medium beam light bulbs up to 500 watts. Bulbs are manufactured by both General Electric and Westinghouse and are readily available. Scoops can be fitted with adapters which permit use with standard telescopic light stands.

Most newscast organizations have evolved what is known as a kit or "case of scoops." This kit typically consists of five scoops, five stands, three 25-foot extension cords, one 50-foot extension cord, six spare bulbs and clip type "ears" or "barn doors." The average case of scoops weighs approximately 50 pounds and is therefore fitted with casters to facilitate handling.

Scoops are fairly versatile. They are used to light average-size rooms, groups of people

and face-to-face interviews. Three scoops can be used to light the typical news interview as follows: One, a key light to illuminate the subject; two, a fill light to illuminate the general area; and three, a back or side light to separate the subject from the background.

To go into more detail, let us take a newsreel situation in which the interviewee sits behind a desk in a small office and the interviewer is in a chair beside the desk. There is limited electric power available. A back key light would be used to serve three purposes: as a key light for the interviewee, as a "kicker" (accent light) for the same, and as a fill light for the interviewer. The main fill light is placed close to the camera and serves a dual purpose: a key light for the interviewer and a fill light for the interviewee. It is best to use a medium beam or spot for the back key, and a flood, or a medium beam placed far back, for the fill. If the power is available, it would be advantageous to use a

* (with Robert Yostpille, NBC News)

separate medium beam strictly as an accent light for the interviewee, who is, of course, the most important person in the film.

THE FREZZI: Perhaps the most essential lighting equipment for newscast work is the portable, battery-operated light commonly called the "frezzi" (although it is made in practically identical configuration by both Frezzolini and Sylvania). The frezzi consists of a rechargeable nickel-cadmium battery unit fitted with a shoulder strap and a scoop or sun gun light unit which is hand-held. Battery output is 30 volts DC and charging power required is 110/115 volts AC.

The scoop light unit accommodates a 250 watt photoflood bulb and the sun gun utilizes a quartz-iodine bulb of approximately the same wattage. The photoflood light unit provides a softer light over a

wider area in comparison with the sun gun which generates a more intense light. In any case, use of the frezzi often results in a cave-like effect since the subject is illuminated and the background is left dark.

The main advantage of the battery-operated frezzi is its lightweight portability in moving situations where setting of fixed lights would be impractical or in emergency situations where no source of electrical power is available. Its principal use is to maintain a constant light intensity upon a subject. It is also useful as a fill light outdoors when the subject is in shade and the background is bright. The battery can be relied upon for approximately 15 minutes of operation, so it must be conserved as much as possible.

Operation of the frezzi is not just a matter of turning it on and playing it upon the

subject. It is helpful to take a meter reading at a given distance to the subject prior to the filming of the story, then maintain the preplanned intensity by either moving with the subject or feathering it off and then fanning* it slowly on the subject to full intensity. If the light is not feathered as a subject approaches the camera and light sources, he will tend to be washed out by over-exposure. In the hands of an experienced light man, quite uniform light quality can be achieved in most moving situations.

Always try to recharge the frezzi between stories, and never ship the frezzi with light unit attached to the battery. The latter practice can be a serious fire hazard.

QUARTZ LIGHTS are used in much the same manner as scoops, but provide higher intensity illumination over a longer distance. Hence, they are often useful in

covering speeches, when lights can be positioned a reasonable distance from the subject. The typical quartz light employs a quartz-iodine bulb of 650 watts. By changing the position of the bulb in relation to the reflector, a medium or full flood beam can be selected. The lights are often provided with a variable-tap transformer (push-button arrangement) which allows control over intensity.

Quartz lights are somewhat more elaborate than scoops, since they are fitted with refined barn doors and have provision for the use of light diffusers.

Like scoops, quartz lights are used in kit form. The typical kit consists of three lights with stands, accessories, sufficient extension cords and spare bulbs. The quartz light kit weighs about half that of a case of scoops. They are somewhat more

fragile, however, and require higher current for operation.

The Quartz-King is among the best basic lighting equipment available today. It features a rheostat which enables you to control the intensity of light. With the Quartz-King, the light man can work in cramped quarters and still control the amount and quality of the light. If there is not enough room in front or in back of the subject to properly place fixed-intensity lights, he can still operate quite efficiently by using variable intensity Quartz-Kings.

LOWELL LIGHTS consist of a flat, felt-backed bracket on which is mounted a swivel-hinged standard-size light socket. Lowell lights employ the same type of light bulbs as scoops, that is, photo-flood, photo-spot and medium beam bulbs up to 500 watts. Barn doors are provided and may

be fitted by means of a bracket which slips over the bulb.

Lowell lights may be clipped onto stands or taped to walls, ceilings, columns, etc. This adaptable quality is, in fact, their main advantage, since they can be used in crowded rooms or in situations where stands would be visible. Taped to the ceiling in a regular pattern, Lowell lights provide an even light over an entire area. They are also very useful as a back light fixed out of the camera frame, above and behind the subject.

The CINE KING is a larger, heavier light commonly used for covering speeches where a long throw is required, and for elaborate set-ups. Cine Kings employ a sealed-beam bulb rated at 500 watts. A selection of spot, medium flood or full flood

**Feathering or fanning: Moving unit containing light source on or off the subject so as to control its intensity.*

bulbs is available. The light intensity of the Cine King may be boosted by means of variacs or variable-tap transformers; 500 watts therefore is minimum power consumption. A safe current allowance would be eight amperes for each light in use. The use of Cine Kings in news coverage is somewhat limited since time must be allotted for setting up running lines and insuring an adequate source of power.

SETTING LIGHTS. Lights are positioned by direction of the camera man. However, the light man's attention to certain details is of prime importance in getting superior results. Light stands should be set firmly and securely in positions where they are not likely to be toppled. If necessary, stands may be taped to the walls without extending the supporting legs. Extension cords should be run over doorways and accessways, under rugs, and taped to the floor so that plugs aren't kicked out in the middle of a story. Attention should be directed to undesirable shadows to the rear of the subject or on the subject's face. Avoid "kicks"—the reflection of lights on shiny objects. Once the lights are set they should remain in their exact positions, except when change is desired by the cameraman.

CURRENT REQUIREMENTS. To insure ad-

equated current for electrical equipment in use, a good rule of thumb is to allow one ampere for each 100 watts of power. This system will provide a comfortable margin of safety. The average house, hotel or office is fused at 15 amperes per room. Therefore, it is wise to split lines, that is, use about 10 amperes in one room and then run lines to distant sources as required. (Appliances are often separately fused.) A certain amount of ingenuity is required in locating sources of power. A male to female adapter which fits the standard light socket is quite a useful item in this respect. With experience one develops a "sixth sense" for locating electrical power sources. For example, phone booths, vending machines and external building lights can provide very handy ones.

MAINTENANCE. Since newsfilm equipment takes a lot of abuse in transit and in use, it is important to work out a system of periodic maintenance. A program of regular equipment inspection wherein each light, cable, plug, etc., is examined and repaired if necessary will do much to avoid malfunction at critical times. Another worthwhile step in keeping equipment up to par is to assign each light man or electrician a specific set of equipment. In this manner, each set is constantly checked

and maintained and a man knows what he has when going out on the job, and he acquires a set of favorite accessories as he goes along.

ACCESSORIES. The accumulation of various electrical accessories often proves quite useful in newsfilm operation. Depending on the particular area of operation (outlying district, foreign country, etc.) adapters, converters, pigtails, or any device to allow use of equipment with unusual sources of power, are essential. Meters and electrical testers to determine the value and type of power available (AC or DC) are also necessary.

The efficient and successful use of lighting equipment for newsfilm purposes is largely a matter of common sense, coupled with experience and discretion. Discretion is important when using lights in delicate situations: the sudden illumination of a subject often ruins the candid quality of a shot. If possible, it is a good idea to leave lights on for a time to allow people in the vicinity to forget about them. As previously stated, it is often wise when using a frezzi to feather it off and then fan it slowly on the subject to full intensity. This is also good procedure in dark areas where emer-

gency crews are working. Sudden, blinding light in the eyes of police, firemen or emergency workers laboring in a critical situation often results in the sudden removal of the entire camera crew from the story site.

The quality of light is too often overlooked in newsfilm lighting. The tendency is to flood a subject with as much light as there are facilities for. This leads to a washed-out quality in the scene, a lack of separation and of highlights. Many lightmen and cameramen as well seem unaware of the differing characteristics of the various types of light sources. There is a simple do-it-yourself experiment to illustrate these differences for yourself. Shine a reflector spotlight onto a plain light-colored surface. Place your open hand between the light source and the surface. You will see a very sharp outlined shadow of your hand. Now, repeat this, but this time use a reflector flood-light. You will notice (if all variables have remained constant) that the shadow image is much less distinct; in fact, it is quite fuzzy around the edges.

Good contrast in a scene gives it more life. Using tests like this, judiciously selecting your light source and its texture and frequently checking and analyzing your results will help you create livelier, more interesting newsfilm. ■



CHAPTER 4

My purpose is to describe the evolution of film-making equipment and technique as it applies to documentaries, and, by extension, to news coverage.

Unlike live and video tape television, during the past 20 years virtually no large-scale effort in terms of research and development on the part of any large manufacturers has gone into the development of better film-making equipment.

This is so, despite the fact that in the television industry—entertainment, news and so on—about 42% of all network programs on the air in 1962 was originally produced on film.

Up to very recently, just about everything we were working with was designed in the '30s or even earlier. The German Arriflex camera was actually a newsreel camera developed during World War II. And, except for basic accessories, the design of that camera has not really changed. The Auricon camera also was basically designed in the 30's. These are the same tools that we are working with today. What I am going to try

to do is bring you up-to-date on what others have done to improve or change the tools that are now available.

Actually, these devices worked pretty well until the hard-hitting, penetrating kind of documentary, based on capturing the real thing as it happens in sync-sound, came along. Out of these efforts have come new developments in equipment.

Sync-sound is the key. To get sync-sound of the real thing as it happens without destroying or changing the very thing that you are trying to get on film, you need completely battery-operated equipment that is both lightweight and reliable. You need cameras that are unattached to anything else, and which are light enough to carry around for hours.

The thrust toward this kind of film-making has been enormous these past few years. Since there is no single organization involved in developing these devices, most of the money spent on them has come out of the pockets of the film-makers themselves. Some of them have been designed

tools of the trade

NEW HORIZONS

Robert Rubin

CBS News



and built by engineers at local stations or at the networks, and others, without engineering staffs use anyone of any competence at all. I have a bootleg operation going at M.I.T., with graduate students working for me during their off hours. Others have conscripted all kinds of electronic, optical and camera engineers who "moonlight" for them as mine do for me.

Because there isn't very much money available in this research, there has evolved here in New York a kind of underworld where we trade information so that we don't end up making the same mistakes that others have made. Anybody who cares enough and is willing to talk a little and listen a lot can learn much about the current level of things that work and, more important, about the dead end ideas that have been tried and discarded.

You might call it a process of grabbing and adapting; you grab whatever equipment is available, combine it with current ideas of your own and others, and adapt it to your scheme of making pictures. Out of this

seemingly haphazard process there has evolved during the last 5 years a very clear direction in which this kind of equipment is definitely moving.

Most documentary production is based on the double system method of shooting film. What we have been discussing up to now is single system optical or single system magnetic recording. By double system, we mean that the camera photographs pictures only; a separate recorder is used for the sound track. There are a number of advantages to double system operation over single system. The chief one is that the cameraman and the sound man can be completely separated, with no wire between them so that the cameraman in a fast moving situation can move right in to where his shot is best and the sound man can go for sound without in any way being tied to the camera. With this arrangement you can also add a second camera or a third camera, or a second recorder or a third recorder. The range and flexibility increases, in double system, whereas in single system you are tied in pairs—a camera

with a recording device.

Another advantage is that generally, at the current level of the art, the sound quality of the recording made on double system is far superior to that made in even the best magnetically striped single system operation. For example, with most of the single system equipment available now, you wouldn't want to record anything that contained music . . . the wow and the flutter would, in my opinion, be intolerable. Double system also permits much more flexibility in editing. The track being separate from the picture allows you to use voice over picture that isn't necessarily tied to it.

The serious disadvantage of double system production is the necessity for slating, that is, having some synching point recorded both on the track and in the picture so that the track lines up with the picture.

In our need to evolve a better system of shooting double system films, we wanted a light weight camera that would be well-balanced, battery powered. It should have through-the-lens viewing and focusing and

it should be able to shoot sync-sound without generating any noise. And it should have ten minutes as minimum running time.

The camera that evolved from this need was the basic \$900 Cine-Voice camera as originally modified by NBC. We bought a camera that had no turret, no lens and had a 100 ft. magazine on it. What we did then was to cut the top off the camera, put in a footage counter and installed an Aigineaux zoom lens which has the marvelous facility of both direct viewing through the lens and focusing. It has a focus spot in it, so, in effect, you have a kind of inexpensive reflex viewing system. We gave this camera a most important advantage by cutting a hole in the side of it and putting in a very powerful synchronous motor. This synchronous motor is about 3½ times more powerful than the motor the manufacturer ordinarily supplies with the camera. With this motor it is possible to drive this camera at zero degrees Fahrenheit. It is also powerful enough to drive the take up of the film magazine without any difficulty, through a slip clutch. The

clutch has the double advantage of not making any noise and not absorbing any power and is also adjustable. This little rig is so powerful, you can put a 1200 ft. magazine and run it a half hour, all with the basic \$900 camera. Thus we have a camera that weighs, completely loaded with film, lens and everything, no more than 16½ lbs. It shoots both double system documentaries and single system. The magnetic head was left in and if you want to use it for regular newsreel work, just plug in your MA-11 amplifier and you have a perfectly usable newsfilm camera. At NBC they're used interchangeably, for both documentary double system and for single system work. I understand that the other networks are getting the same kind of equipment. This camera, complete with the new Aigineaux 12 to 120 zoom lens, costs slightly under \$3,000 with all the conversions built into it.

In the area of double system sound recording devices, the swing is almost universally to quarter-inch machines, making most of the 16mm sprocketed equipment

obsolete for location work. The standard tool in the industry is the Swiss Nagra and it is an incredibly good recorder. This machine runs off its own batteries and even has an automatic volume control position in it so that in a crash situation you can just turn it to automatic and it will compress any overload. This recorder has a synchpulse device on it called Neo-Piloton and I want to explain how this machine running off its own batteries can maintain sync with a camera running off its own batteries.

Although the Nagra was basically designed for high quality radio work, there has been such extensive use of it in film production that the factory new equips it with a Neo-Piloton synchronizing head, specifically for motion picture work.

In all cases, the camera is driven by a synchronous motor. By definition, a synchronous motor is controlled by the frequency of the power driving it, exactly the way an electric clock works. An electric clock is as accurate as the frequency of the generator that feeds the power to the clock motor. By

the same token, the camera with a synchronous motor will run 24 frames per second as accurately as the generator or the battery power supply you have available to feed it. To simplify the explanation of maintaining sync, I think it would suffice to say that the sync head on this recorder simply puts electronic sprocket holes on the quarter-inch tape, using the frequency of an external generator or battery power supply to maintain and control the accuracy. The quarter-inch tape is subsequently transferred to 16 mm sprocketed film for editing purposes and the quarter-inch is held for subsequent transfer. If you should destroy any sound material in editing, you can then re-transfer on another track. What happens is that, no matter what this recorder is doing, no matter how wild the motor is, a record of the sync pulse is made through this sync head. Those electronic sprocket holes are recorded on the tape for reference during transfer.

Another Swiss recorder is the Stellevox. It's really compact and of excellent quality. It costs around \$800 including the synchro-

nizing head. It does just about everything necessary to record good film sound, including a built-in sync head and automatic volume control.

Some of us have gone in for secret shooting. I installed a sync head in a high fidelity Minifon recorder. This is a cartridge type device and the quality is not what I'd like it to be but it's fine for a situation where you want to stick the thing in your pocket and not have anybody know you are shooting or recording. It also has a sync head and without difficulty will maintain sync with a camera that is across the room running off its own batteries.

So now we have a camera and one of any number of recorders that are capable of running synchronously and maintaining sync with each other because of those electronic sprocket holes and the synchronous motor. The next step is to arrange things so that the camera and recorder can both run off batteries, be completely independent of each other and still maintain sync.

What might be called a tuning fork synchronous power supply, designed for the camera motor, drives the synchronous motor to an accuracy of one part of 250,000 parts because it puts out a frequency of 60 cycles, 110 volts, AC, accurate to one part in 250,000. It can drive it all day long on one rechargeable battery.

This unit also plugs into the recorder sync head and supplies the current for those electronic sprocket holes I mentioned, also accurate to one part in 250,000.

We thus have 2 pieces of equipment running independently of each other, but each running accurately, to one part in 250,000. So although there is no connection between the 2 pieces of equipment of any kind, they are both controlled to such a high degree of accuracy that they are running in virtual

sync. Remember the old maxim: all things equal to the same thing—that is, one part in 250,000—are equal to each other.

These tuning fork controlled power supply systems are made by several small companies here, such as Cambridge Converter of New York, and in Europe as well. They cost somewhere between \$1800 and \$3000 depending on the sophistication of the equipment and how many batteries, chargers and accessories you want.

Pursuing this whole idea of a free floating camera and a free floating recorder, several film companies and film groups have taken a significant step by combining the camera and the tuning fork power into one package. They have taken the electronics from this tuning fork control power supply and put it in the camera itself, so that only the source of power is left outside. It is not unusual for the cameraman to be wearing a belt that contains batteries in it. He has his tuning fork control power supply built right into the camera, so he is completely free to move anywhere he wishes and be in sync with any recorder that is also controlled to that degree of accuracy.

Some of the newer cameras that have evolved in this area have a 1200 ft. magazine to be slung over the back, so that the camera really balances. I have seen cameramen hold them for 4 or 5 hours without any difficulty at all. To rest it he just takes it off and puts it down. But having a half-hour continuous run is very helpful because it seems you always run out of film just when you need it most. A half hour makes a big difference.

More recently, the thrust in this area has been toward research into getting better sound. The highly directional microphone like the Electrovoice 642 and the Beyer 160 have helped considerably, but these are a long way from reaching the level of sound

that we would all like to hear.

Another new development is the use of radio microphones. Comrex Corporation makes the best one. Its receiver is a completely DC powered device so that the sound man can wear it over his shoulder and pick up anything being said in the vicinity by a reporter or one of your principals wearing a transmitter. We use them in another way too. A reporter might have the transmitter in his pocket and hold a microphone in his hand, thus eliminating the wire between himself and the cameraman. When you start getting into riot situations, this becomes a valuable device. The cameraman can move anywhere he wishes and the reporter is completely free to interview or hold his microphone anywhere he wants, without the danger of tripping over wires. By being DC powered, it is completely independent of any power source.

Let me go back to a previous point. The problem with double system shooting in this kind of fast-breaking situation is always the matter of slating. How do you get that sync point bang between the sound and the picture when cameras are starting and stopping independently of each other? Many of us have looked back to single system—the kind of equipment most have now—as a possible solution to this problem.

Since 1956, we at CBS have been involved in a very elaborate research project to build an entirely new camera, a single system camera, in conjunction with the Mitchell Camera Company. CBS News engineers and Mitchell Camera engineers have come up with the ultimate in a 16mm camera. I've seen the latest production model and I understand that CBS has ordered 25 of these cameras. For the first time, the sound quality will be equal to, or close to, what you get in a quality recorder.



Also, it uses the Mitchell Movement, the standard pin registered movement, which is just about the best in the world. It also has the marvelous feature of being completely reflex viewing, where you actually see the full light (as you do in the Arriflex) of what is going on film. It comes with a 12 to 120 zoom lens or any Arriflex lens will fit into it.

As an accessory, this camera will have a synchronous motor so that it can be used with this kind of equipment in double system production if you wish. It even has a synchro-tac pulse generator built into it, so that even on a 12 volt battery with a governor controlled motor, you can feed a sync pulse to the synchronizing head directly through a wire. It is a very flexible camera and we are looking forward to using it. The CBS-Mitchell camera, complete with the 12-120 lens, is \$12,500 each.

With a camera with good quality single system sound now available, we are trying to find some way to combine the best of single and double system production. If we could only get the single system camera completely free from the sound man, then we would have the best of all possible worlds, and we are now trying to develop a device which will do just that. The sound man will have a small mixer and be connected to the camera through a wireless radio mike. The cameraman will hear what's being recorded on the film. The sound man will hear what's going directly into the mixer. This is now in research.

We are also working on a project that will take that receiver and combine it with a mixer now used on locations. The sound man would then be free to mix conventional microphones with wireless microphones in the same facility, plugged right into the camera head.

I am going to conclude by pointing out



that much of the equipment discussed is essentially home-made. Our experience at the networks should encourage others to grab and adapt to suit local needs. A lot of this can be done in the station shop by station engineers or at the local university or in the local machine shop. I would encourage you to use them.

One of the best investments we have made was to release some of our engineers from daily maintenance work and let them work out some of their ideas on improving equipment and developing new devices. We think this has paid off. ■

CHAPTER 5

tools of the trade **FILM CAPABILITIES**

Calvin Hotchkiss
Eastman Kodak



On October 28, 1927, the first newsreel with narration and lip synchronization was shown in New York and later all across the country. Produced by Fox Movietone News, this first newsreel brought movie house patrons face to face with King George V and Edward Prince of Wales, Marshall Foch and Raymond Poincare, the Swedish Crown Prince, Lloyd George and many other notable figures of the day. To be sure, synchronized sound on film had actually existed for 37 years — since October 6, 1889 when Laurie Dickson, 26-year-old assistant to Thomas A. Edison, had succeeded in building a working model of Edison's "Kinetophone." It was Dickson who had already built the first photo lab for the shocking sum of \$517 and who later, in 1893, built the first movie studio, for \$638. In a revolving shed, dubbed the "Black Maria" because it was painted black inside and out, the first "movies" were shot on the 50 foot lengths of 35mm nitrate base flexible film, manufactured for Edison by George Eastman.

When you look at early newsreel films

today, you're impressed above all by their photographic quality. As compared to present day product, they were sensitive only to the blue end of the light spectrum; they were extremely slow in emulsion speeds (at 16 frames per second they were still often underexposed); they were grainy, lacked sharpness, and were annoying to handle; they were spokey or fluted, they curled and did the twist; they jammed in the camera, broke or split down the middle; and they usually gained or lost speed in the most important sequences. Worst of all, if the fellow handling them happened to casually and carelessly light up a cigar, he might have a time bomb on his hands — a half-second one, that is — whoosh!

By 1931, the physical and light-sensitive properties of film had improved to the point where on-the-spot news coverage could be made with it. On October 9th of that year, Movietone released a sound newsreel showing the assassination of King Alexander of Yugoslavia.

Thanks to the newsreel cameraman, who

soon established the reputation for being Johnny-on-the-spot where history was being made, the newsreel contributed greatly in making the "talkies" the most popular form of entertainment and current events education.

Today the daily television newsreel and the weekly TV news-documentary film have supplanted the weekly movie-house newsreel and the monthly "March of Time"-style documentary. The standards, however, remain the same; only the film product and the equipment to shoot and record on it, process and print it, and to project and view it in its final release form — only these have changed.

The two big changes in the film product have been:

- 1—the production of panchromatically sensitized film and constant improvement in the speed/graininess relationship of these films and
- 2—the constant improvement in the physical characteristics and behavior of the film product.

The result of these improvements has been the universal acceptance of the 16mm format for camera films and equipment, enabling the newsreel cameraman to be an even more efficient and effective Johnny-on-the-spot. Today the newsreel cameraman can obtain very acceptable pictures under available light conditions early or late in the day, with color as well as black-and-white films, and he can record fantastic pictures at night on dimly lighted streets, on a moonlit country lane, or in a darkened theater, using high speed films, some of which are sensitized out beyond the visible ends of the spectrum.

A brief word about film speed and graininess is in order at this point. There is a difference between the *speed* of a film and its *exposure index*. Speed is an inherent characteristic of the film and is specifically associated with emulsion sensitivity and its relationship to the development process. Speed must always be expressed in *absolute* terms and is usually based on the *minimum exposure* required to give a result of high quality in the projected or printed image to be viewed.

The *exposure index*, on the other hand, is merely a practical guide to the most suitable exposure required to produce a desired photographic effect. It involves not only the speed of the film but also the latitude of the emulsion, the characteristics of the camera, printer or recorder in which it is exposed, the characteristics and calibration of the exposure meter, and the purpose and technique of the film's use.

With regard to graininess and definition, what we are really talking about has a fancy new name now, called "modulation transfer of films." Recently, Eastman Kodak published a little booklet showing this modulation transfer curve on all of its black and

white films, including all of the still films and many of the specialized products. It is very interesting to see that our release print film, which we call "fine grain release positive," compared with some of the newer and improved duplicating films, really hasn't the definition that we thought it had before we ran the modulation transfer test. Actually some of the duplicating negative films which are quite slow, such as the 7234 or 7235 dupe negative films, have a very high modulation transfer characteristic and have "overtaken" the release positive in this respect. They are very sharp and the graininess begins to appear only when you start printing them onto the release positive. We are doing our best right now to come up with a new improved release positive, which will thereby exhibit this improvement in the duplicating films.

Besides the inherent characteristics of an emulsion and the properties of the developing solution, the factors that affect the granularity of the negative and resulting graininess of the prints (or reversed image in a reversal film) are:

- 1—the degree of development of the negative (granularity increases with developing time).
- 2—density (granularity increases with negative density — thus it is important to avoid over-exposure).
- 3—processing conditions — a) a difference in temperature between solutions can cause reticulation in the gelatin and apparent graininess in the print; b) "pushed development" to achieve greater "film speed" can cause excessive contrast; c) high developer solution temperature increases granularity, and
- 4—a) the overall reproduction contrast — excessive print contrast tends to make graininess in the negative more appar-

ent; b) type of image — graininess is more apparent in large areas of uniform density, especially if these areas are in the middletones; c) the granularity of intermediate materials.

Finally, a release print made on a reversal film is less grainy than a positive made on print film printed from a negative. Also, when a reversal film is used as a negative, the film speed is sacrificed and the graininess is more apparent.

With all these facts in mind (and I call them facts since they are the result of careful observation and study based on many thousands of exposure and processing tests on many different films over the past forty years) we can quickly review the different kinds of film which the cameraman has at his disposal:

In the black-and-white camera film field there are five distinct speed groups. Any of the films in these groups can be exposed over or under the rated index suggested by the film manufacturer with resulting sacrifice of overall quality in the final print.

I—In the slow speed/very fine grain group E.I. 40 daylight, 25-32 tungsten; 14 Auricon setting

a) Dupont Negative Type 914A
Eastman Background-X Negative Type 7230

b) DuPont Rapid Reversal Type 930A and
Eastman Plus-X Reversal Type 7276 (both processed as negative).

II—Moderate speed/fine grain group (Documentary) E.I. 50-100 daylight, 40-64 T.; Auricon 13

a) DuPont Superior II Negative Type 936A
Eastman Plus-X Negative Type 7231

b) Ansco Super Hypan Type 296

DuPont High Speed Rapid Reversal Type 931A

Eastman Tri-X Reversal Type 7278 (All processed as negative)

c) DuPont Reversal 930A

Eastman Plus-X Reversal 7276 (processed as reversal)

III—High speed/moderately fine grain (Newsreel) E.I. 250-400D., 150-300T.; Auricon 11½

a) DuPont Superior 4 Negative Type 928A

Eastman Double-X Negative Type 7222

b) DuPont Reversal 931A

Eastman Tri-X Reversal (improved) 7278

Ansco Super Hypan Reversal Type 296

(processed as reversal)

IV—Very high speed/slight graininess

E.I. 600-800 D, 500-700T., Auricon 10
Ansco Super Hypan Negative Type 266

DuPont Superior III Negative Type 937A

Eastman Negative (no type number assigned)

V—Finally, in the 5th or specialized category we have films of exceptionally high sensitivity (such as Eastman's Royal-X Pan Recording or High Speed Infrared). These, because of their graininess, may be objectionable for use in any but the most unusual conditions where it is a choice of using these films or not getting your picture.

In color we have, briefly, also five general speed categories:

I—Slow speed/very fine grain (Documentary)

E.I. 25 T, 16 D.

Ansochrome 242 and Ektachrome Commercial 7255

II—Intermediate speed/very fine grain

E.I. 32-40T, 25D; Auricon 14

Ansochrome 231 and 232

Kodachrome II

III—Medium speed/moderately fine grain (Newsreel)

E.I. 50 to 64 D or T

Ansochrome "50"

Ektachrome MS Type 7256 (Daylight only) and Eastman 16mm Color Negative SO-216 (Tungsten 50)

IV—High speed/moderate graininess

E.I. 100-125 T, 80 D

Ansochrome 100

Ektachrome ERB Type 7258

V—Very fast/noticeable grain

Ansochrome 200

Ektachrome

In color, as in black-and-white, the aim is to produce a sound picture of the highest quality for projection screen or television

screen viewing.

The discussion of speed and contrast parameters I shall defer to Dr. Harry Knop in his discussion of the processing of films. As for sound quality, you know already that single-system optical sound, recorded on film manufactured to produce optimum quality of the picture image, will not be of very high calibre. That is why you can obtain most camera films today with a magnetic pre-stripe put on by the emulsion manufacturer — specifically those of the newsreel category.

As an answer to automatic or built-in control of speed and contrast, Eastman Kodak now manufactures a 16mm processor that handles a special negative (of the third speed category or Double-X Negative type) and other recording or print films. Films processed in the Eastman Viscomat Processor have fixed speed and gamma which cannot be radically altered under normal operating conditions.

In color, as in black-and-white, a) underexposure and overdevelopment will produce higher speed with slightly increased granularity and considerable increase in contrast and possibly in fog.

b) underexposure without pushing development will produce a veiled effect in the final "corrected" print.

c) overexposure and normal development will produce very objectionable granularity.

d) normal exposure and underdevelopment will produce a washed-out appearance in the final image.

As far as standards for newsreel film are concerned, we must state flatly that they should be *exactly the same as for the rest of the professional motion picture industry*. There is simply no substitute for a steady camera, proper exposure and careful attention to the physical treatment of film and equipment.

The newsreel cameraman should be subject to the same admonitions as any other

cameraman:

1. Rawstock film, especially if it has been exposed, should be kept at 55° F or below whenever possible.
2. Rawstock temperature should be allowed to reach equilibrium with the temperature of the camera or magazine loading location before the film can be untaped.
3. Film should be processed as soon after exposure as possible.
4. The degree to which these three rules are not kept will determine the extent to which the film will become susceptible to electrostatic charge being built up in the rawstock, and also to moisture adhesion between base and some emulsion resulting in film backing transference on color films and ferrotyping or moisture droplet marks on black-and-white films. Poor keeping can also induce loss of film speed and contrast as well as increase graininess and fog.

A brief word about static markings. These result primarily from the action of the light rays on the emulsion when the electrostatic discharge occurs. Higher speed films are therefore relatively more sensitive to the light given off by static discharges than are slower materials. The prevention of electrostatic charge build-up in a roll of film is treated in the technical literature, copies of which we shall be glad to provide you on request.

To summarize briefly, then, the newsreel cameraman should adhere to the standards already set up by the professional motion picture industry as regards picture taking and recording techniques. He should carefully check his lens and sound recording settings, basing these on results of tests he has run on various film types using his cameras and light meters. He should not be content with looking only at the rush prints of his day's shooting nor should he base his

success or failure on the report from the lab man on what "printer light" would have to be used to make an acceptable print from his camera negatives. He should look at his processed negative and attempt to improve the quality by adjusting exposure at the source. Finally, he should adhere to the manufacturer's recommendations about proper handling and storage of film rawstock and not risk losing quality by loading camera magazines the day before using the film, or storing the film in his car where it may be subjected to extreme changes in heat and cold. Despite even the best possible film and equipment manufacturing, despite the best possible laboratory processing, despite the best possible projection technique, do not forget that the picture that is telling the story is *your* creation. Just add to your creative skill the few criteria of camera steadiness, proper exposure, and care in the handling of film and equipment, and you've "got it made"! ■

CHAPTER 6

tools of the trade

FILM PROCESSING

Dr. H.W. Knop, Jr.

E. I. du Pont de Nemours & Co., Inc.

Photo Products Department



The quality of television newsfilm depends on the characteristics of the film stock used and the manner in which it is exposed and processed. For any given film, characteristics, such as speed, contrast and graininess, which determine picture quality, can be adjusted over a significant range by changes in processing conditions. This range can exceed the compensation range capability of television systems. Therefore, for consistently good results, standardization or correlation between and control of film exposure and processing are necessary.

Books, such as "Control Techniques on Film Processing," published by the SMPTE give a detailed treatment of the subject of processing control. Many details, however, go beyond the equipment capabilities of many television newsfilm processors. This discussion will therefore be limited to simplified methods of processing control. In addition, there will be some discussion of what can be done by changes in processing

to compensate, at least in part, for exposure deviations. Finally, there will be a brief mention of the type of processing control assistance available from film manufacturers.

Every television newsfilm processor should first acquaint himself with the capabilities of his processing facilities and the film he is called upon to process. This can be accomplished by exposing the film in a camera at its published speed and at several ratings above and below. Film exposed over the range of speed ratings should each be processed over a range of processing machine speeds or solution temperatures. The films should then be viewed to determine the optimum processing conditions for a given film speed or exposure level. Having determined this relationship between film speed and processing, the processor is equipped to adjust his processing to the cameraman's exposure of the film. The only additional requirement is that he be able to reproduce his processing conditions. In

other words, that he exercise control.

Processing control procedures can be classified as either sensitometric or chemical. A sensitometric procedure involves exposing film in some reproducible fashion, processing the film in the process being evaluated, and comparing the results with results obtained previously. Any deviations between current and previous results indicate that the process has changed and that adjustments should be made to return the process to its previous level. The objective is to control the process within certain limits by detecting changes and correcting the process before these limits are exceeded. Chemical control procedures involve chemical analysis of the processing solutions and addition of chemicals, if necessary, to keep solution compositions within certain limits.

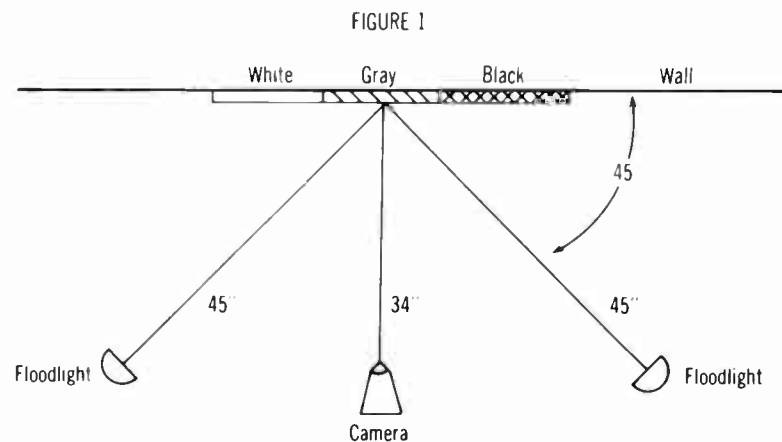
A simplified sensitometric control procedure which is applicable to either negative or reversal processing contains the following six steps:

1. Mount three cards (white, gray, and black) on a wall.
2. Illuminate the cards in a known, reproducible manner.
3. Photograph the cards using appropriate camera settings for the film speed and illumination level.
4. Process.
5. Read the film densities if a densitometer is available.
6. Compare the densities or make a visual comparison with results obtained on a similarly exposed strip of film processed when pictorial results were found to be satisfactory.

Densities should be reproducible to about $\pm 5\%$. Visual comparisons should show no differences between strips from one processing to another.

A white card of 90% reflectance, a gray card of 18% reflectance and a black card of 2% reflectance have been found to be suitable. An adequate arrangement for the cards, lights and camera is shown in Figure 1. Pictures of processed negative and reversal films are shown at the bottom of this figure.

One can expose a short length of control film at the start or end of each roll to be processed. Or, one can pre-expose a whole roll of control film to the cards and splice a short length of this film to each batch of film processed. The latter is desirable since better exposure and film uniformity are more probable. The pre-exposed control roll should be stored under cool and dry conditions, preferably in a refrigerator, to minimize latent image fading. A second roll should be exposed before the first is used up and strips from the first and second rolls should be run simultaneously to establish the results for acceptable processing of strips from the second roll.

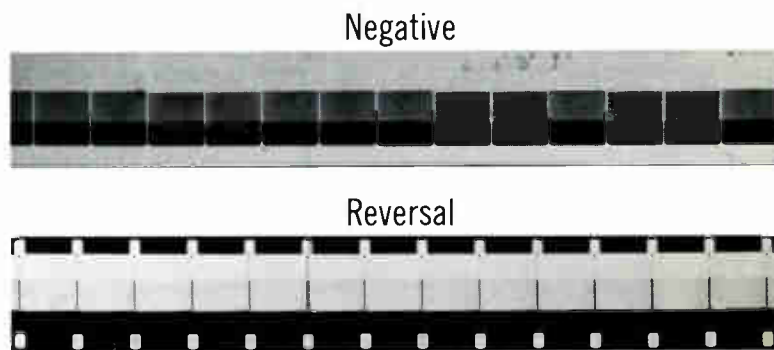


Light Intensity: 400 foot candles at copy board.

Films Used: Du Pont Type 936A "Superior" 2 Pan Negative (Tungsten speed 100)

Du Pont Type 931A High Speed Rapid Reversal (Tungsten speed 125)

Typical Processed Strips:



It is important that the processor establish his own control values for his test conditions, monitor the control strip results and make adjustments, if necessary, to keep the control strip variations at a minimum. Control strips should be processed with each roll if the machine operation is intermittent or about every 1,000 feet of 16mm film if the machine operation is continuous.

Quantitative chemical analysis of processing solutions is the preferred method of chemical processing control. However, since many television newsfilm processors are not equipped to carry out such analyses, some simplified chemical controls will be discussed. A measurement of specific gravity using a relatively inexpensive hydrometer is a good check on the total concentration of chemicals in a processing solution. Specific gravity values for Du Pont reversal and negative processing solutions at 70°F are shown in Table 1. Temperature is a critical factor in specific gravity measurements. In general, for newsfilm work a $\pm 10\%$ variation in the total concentration of chemicals in developers is possible without serious deterioration of picture quality. In other solutions, such as bleach, clear and fixer, a $\pm 20\%$ variation in total concentration is usually acceptable. The specific gravity values of the solutions at these total concentration limits are also shown in Table 1. Such value can be determined for any processing solution by mixing samples of known chemical concentration.

The activity of processing solutions can be readily checked by film strip tests. To check reversal first developer activity, develop an unexposed strip by hand for 1½ minutes with vigorous agitation. Fix, wash and dry, read the density or visually compare the strip with a fog strip similarly proc-

essed when the process was known to be under control. Typical fog strip densities for Du Pont Type 931 in 107-D at 68°F range between 0.30 and 0.75 from processor to processor depending on the purity of the chemicals used. Having established a normal value, a density variation of more than $\pm 15\%$ usually indicates a significant change in developer activity and suggests that the developer should be replaced or adjusted to insure consistent results.

To check bleach activity, expose a strip of reversal film to room lights for about 3 seconds. Develop this strip in reversal first developer at 68°F for about 1 minute and 50 seconds. Rinse the strip and wipe off the surface moisture. Immerse the strip in a sample of the bleach, and in room light observe the time it takes for the bleaching action to occur. A satisfactory bleach will produce a change in the color of the strip in

30 to 40 seconds. After 40 seconds remove the strip from the bleach and wipe off the surface moisture. A normally bleached test strip should be pale yellow. An exhausted bleach will leave a black residue of silver in the strip. An excessively strong bleach will leave a residue of silver salts in the strip with a characteristic brown color and grainy appearance.

To check the clearing bath activity, immerse the bleached strip from the above test in the clearing bath and note the time required for the pale yellow color to disappear. The normal time is 30 to 40 seconds.

Bleach and clear activity can, of course, be checked during processing machine operation by noting the strand in the machine at which the color changes mentioned above take place. If these changes are observed after more than two-thirds of the total immersion time, the activity of these

TABLE 1 SPECIFIC GRAVITY OF PROCESSING SOLUTIONS

	SOLUTION	SPECIFIC GRAVITY AT 70°F.				
		80%*	90%*	100%*	110%*	120%*
R E V E R S A L	1st Dev. 107-D		1.065	1.072	1.078	
	Bleach 3-B	1.013		1.017		1.021
	Clear 3-C	1.048		1.062		1.074
	2nd Dev. 129-D		1.057	1.063	1.070	
	Fixer 31-F	1.065		1.079		1.095
N E G	Dev. 6-D		1.081	1.089	1.098	
	Fixer 22-F	1.071		1.093		1.108

*% by weight of chemicals relative to amount contained in solutions mixed as recommended.

TABLE 2

REVERSAL PROCESSING TROUBLE-SHOOTING GUIDE

(Some possible causes of poor reversal picture quality, assuming film exposure is correct).

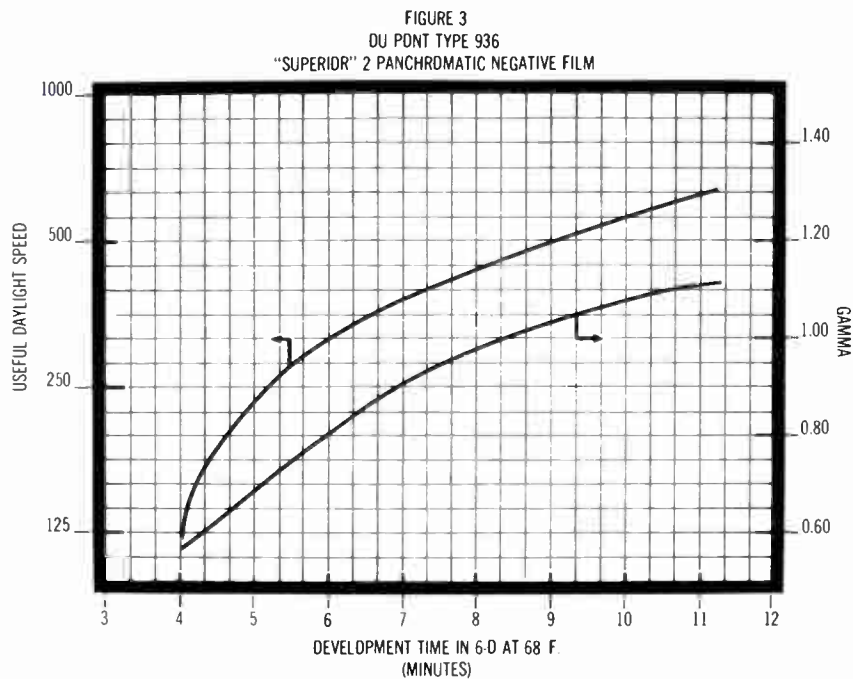
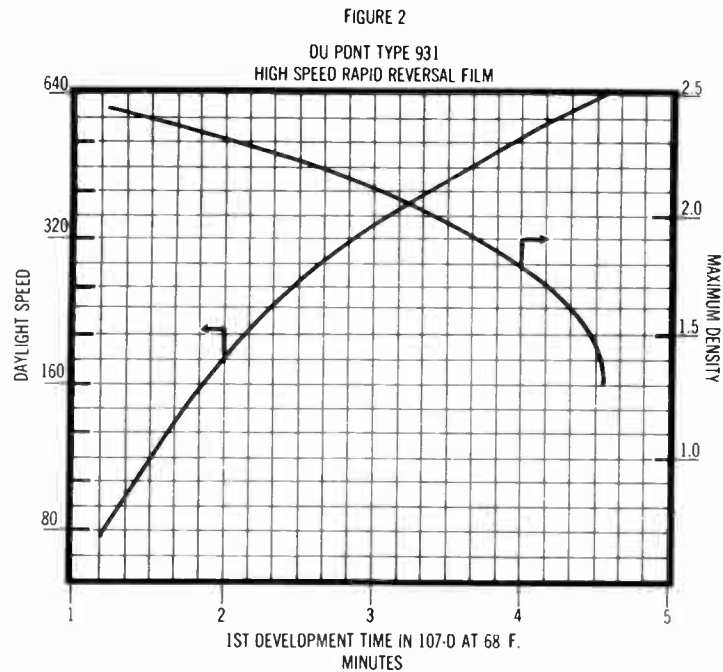
SYMPTOM	POSSIBLE CAUSE
High highlight and shadow densities	Insufficient 1st development (time, temperature, exhaustion)
High highlight speed and low shadow density	Excessive 1st development
Normal highlights and low shadow density	Light fog or chemical fog in 1st developer.
High highlight and normal shadow densities	Insufficient thiocyanate and/or excessive bromide in 1st developer.
Dense and discolored highlights, yellow stain and streaking	Bleach trouble (exhaustion, weak composition) Insufficient clearing.
Streaking	Inadequate wetting of film by 1st developer. Inadequate agitation of 1st developer.
Excessive graininess	Excessive development
White specks	Drying marks (inadequate removal of water droplets) Static
"Rain"	Inadequate agitation of bleach Excessively strong bleach
Inadequate drying	Hardening action of fixer inadequate.

solutions may be dangerously low.

Fixer activity can be checked by developing an unexposed strip for two to three minutes, rinsing, and immersing in the fixer. Room lights can be turned on after the strip is in the fixer. The yellowish silver halide color should disappear within two minutes. In reversal processing, only a small amount of silver salts remain to be fixed out. If the fixer activity is inadequate to remove these residues, a hazy appearing film may be the result. However, in reversal processing the hardening ability of the fixer usually causes trouble on exhaustion before the fixing rate becomes too slow. Inadequate fixer hardening causes film drying problems, especially in high temperature, rapid-processing machines.

Table 2 is a trouble-shooting guide which lists the symptoms and possible causes of some reversal processing abnormalities.

In many situations it is necessary or desirable to expose film at ratings which differ from those supplied by the manufacturer. Figures 2 and 3 show that this is feasible and indicate how film speed changes with degree of development. For example, some



stations have settled on 80 as the daylight speed of Type 931. This is its rated speed under normal negative processing. If Type 931 exposed at 80 daylight is reversal processed, its first development time in 107-D at 68°F is shortened to about 1 minute and 20 seconds to obtain a satisfactory picture. Other stations expose Type 931 at 250 daylight and extend development accordingly.

Useful negatives for television transmission can be obtained from Type 936 exposed at speeds higher than 500 daylight. Some stations have settled on 250 daylight as their speed rating for it and have adopted as normal the processing which yields this speed. The important aspect is the correlation between exposure and processing. For consistently good results the cameraman must expose film to fit the processing and the processor must process the film according to the way it is exposed.

Most film manufacturers offer a variety of technical assistance to television newsfilm processors. One such item is supplying pre-exposed sensitometric strips and picture material for checking a process. In such cases the processed films are usually returned to the manufacturer who examines and appraises the processing quality and supplies the processor with suggestions for improvement, if the need for improvement is indicated. To intelligently appraise processing quality the manufacturer must know the film speed rating which the processor is trying to obtain. In cases where a larger supply of sensitometric control strips is wanted for continuing use by the processor, manufacturers will supply rolls of sensitometrically exposed film at a nominal cost. When processing difficulties are encountered, film manufacturers will supply processing trouble shooting assistance. Chemical analyses of solutions are also provided on request.

CHAPTER 7

PROCESSING AT THE STATION

tools of the trade

Carroll McGaughey
WSOC-TV, Charlotte, N.C.



As News Director of WSOC-TV, Charlotte, North Carolina, I am neither a professionally trained photographer, a photographic chemist, nor an electronic engineer. I am a newsman, specifically a television newsman. I think of myself as a reporter and a writer and a transmitter of thought.

But it happens that I am in *television* news, and that particular medium, for the transmission of thought, demands the use of motion picture photography, photographic chemistry, and the miracles of electronics.

The time is past when, as newsmen, we can say, "Leave the technicalities to the technicians." Not that the newsman or the photographer need become a chemist, or an engineer, but he does need a simple understanding of the specific factors in each of those technical fields which affect his product directly — and over which he, as a newsman or photographer can exercise control.

How many times have you heard a pho-

tographer or a newsman say to his processing lab: "Our film lacks snap. Can't you boost the contrast so that the blacks look blacker and the whites look whiter?" Or to an engineer after seeing film on the air: "That had beautiful quality when we looked at it in the newsroom. It looked lousy on the air. What's the matter? Can't you guys shade film properly?"

Those are direct quotes from the News Director of WSOC-TV, Charlotte, North Carolina. The answers I received, when I first started asking the questions, were a mysterious series of technical terms which I interpreted as excuses. In recent years, however, I have mellowed sufficiently to be able to admit that I do not know everything, that I am not always right, and that engineers and lab technicians can teach me something if I will just take the trouble to learn and understand. Now that I do understand I find I am able to tell an excuse from a genuine reason.

What I have learned — and am still learning — has helped immeasurably in improving the quality of our film on the air, and that is what I want to share with you.

We are discussing objective quality of film; those specific and measurable values by which we can grade film for its technical quality. We must start with one governing factor, the density of the developed image. Density, as used here, is a measurement of the percentage of light a specified area of film will transmit. If we talk about film that has been processed to a positive, we obviously want little or no density — or maximum transmission — in the bright or highlight areas; and we want considerable density — or light-blocking ability — for the shadows or blacks.

In using unspecific phrases like "little or no density" or "considerable density," we are certainly a long way from quality control. "Little" to you means one thing, "little" to



fig. 1

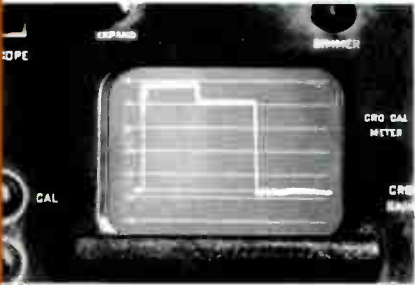


fig. 2

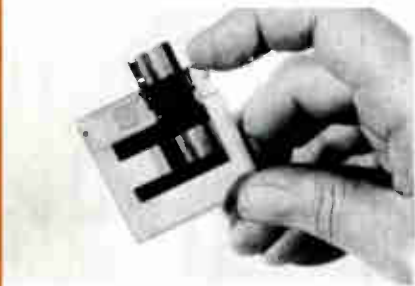


fig. 3

me may mean another; therefore, we must assign a specific value. I must be able to say, and know what I mean when I say it: "I want a density of point three in the highlight areas."

And the eye alone is not good enough to pinpoint the precise density of a given area on a piece of film.

We need some method of accurate measurement. The laboratory uses an instrument called a densitometer. A really good one is a fancy piece of equipment which requires a trained operator, a lot of time, and a lot of money. But almost every television station has a device which, for its purposes, is just as good: a film chain or projection system.

Precise measurements of the light it is transmitting can be read from an oscilloscope or wave form monitor in the control room. (See fig. 1) Properly calibrated it will measure density in specific or comparative terms simply and accurately.

For example, project a test slide through your film chain. The slide should range from clear glass on one side — no density at all — to maximum density, or opaque, on the other side.

When its image is viewed on the oscilloscope (as in fig. 2), the peak on the left represents the least density, a hundred percent transmission of the light falling on the slide. The center peak represents the density of a .3, or approximately 82% of the maximum transmission, read from the white scale on the face of the scope. And the reading of the dark area against the scale will be found to be just about the blanking or black level. The measurement is electronically accurate and repeatable, provided the monitor is properly calibrated.

I have used that phrase "properly calibrated" several times. It sounds like an engineering term, and it is. It just means re-

lating the scale on the face of the scope to standard density values. Don't bother with books and slide rules. Do it the easy way. Buy yourself several Kodak neutral density filters. Any camera store should have them. They are just little pieces of gelatin with known and precisely measured density values.

I have selected a set of these neutral density filters to represent the maximum (2.0) and minimum (.3) brackets within which I want all areas of my film to fall. The mid-scale (.5) is a guide to proper flesh tones. The selection of these targets is not an arbitrary decision on my part and I will explain this further along.

Make up a slide with thin vertical slices of each of these three densities side by side in one half of the slide area (see fig. 3). Put the slide in the chain and tell your engineer to run his video gain up until the .3, or highlight density, represents 100% transmission. He'll know what you mean. The picture on the scope will show the low trace at or near the zero line represents 2.0 density, the middle trace indicates a guide for recommended flesh tones, or a density of .5 and the high peak represents a density of .3, the desired minimum density for highlights.

These figures come from a pamphlet available from the Society of Motion Picture and Television Engineers. This particular paper is called *S.M.P.T.E. Recommended Practice Number 7*. It was hammered out over a period of three years by a group of men from all phases of film and television production, whose combined technical knowledge and experience is so staggering that if they tell me this is the way to get best results from television film, I am prepared to believe them.

And what they tell me is that for optimum results on film intended for television transmission, the minimum density in highlight areas shall have a value of between .4 and .3, but no less than .3; and that maximum density in lowlight areas should be between 1.9 and 2.0; and that the density of flesh tones should fall somewhere between .8 and .5. And lastly, they tell me that I may use a properly calibrated oscilloscope to measure those densities.

For our own usage in practical application we have made up a test slide. One half of that slide has samples of these known densities in it. The other half is reserved for sample strip tests shot in our own cameras. (see fig. 3).

We also make use of an instrument which (despite the laughter that will come from the lab technician) we call our "sensitometer." It cost us ten dollars. A commercial sensitometer is a complicated device which permits the precise exposure of film to known and controllable amounts of light. Ours would never pass S.M.P.T.E. specifications, but it does give us a practical easily used yardstick which is as much as we need to keep our film quality within bounds.

It consists of a plywood box with four incandescent light bulbs mounted at one end. Fluorescent tubes would probably be better. (see figs. 4 and 5). At the other end is a target which consists of a grey card with a vertical black stripe and a vertical white stripe in the middle. Our only claim to ingenuity is a cardboard pointer which enables us to indicate on the face of the target which F stop that particular test was shot at.

A test consists simply of turning on the lights, taking a meter reading from the grey portion of the card with a spot meter — (which we use as a standard and to which our

other meters are calibrated)—and setting the pointer on our target and the lens itself at the F stop called for. We then poke a regular 16mm camera (focus setting is always 18 inches) through the front hole and shoot a couple of feet of film. We then change the F stop and shoot a couple more feet at one stop above, then at one stop below the recommended. The strip is then sent through for processing, usually spliced into the next regular run of film scheduled in our lab

A snip of the tests is inserted in the open half of our test slide (see fig. 3) and projected through the film chain. We further mask it to examine only a narrow horizontal band. On the scope we should get a pattern as is shown in figure 6. On the left is the recommended black — our own black is at the right. Also shown is the recommended white or highlight and our white or highlight.

The first time we did this we discovered that our whites were almost on the money but our blacks were far darker than the recommended. In other words, our film had a most pleasing contrast when viewed on an optical projector, but it was losing detail in the shadow area when projected through the television chain.

It took a session with a patient engineer to explain why this could not be otherwise, but once understood, it helped us fight for hewing to the standard. Let me at least attempt to pass this along, in even simpler terms than the engineer explained to me.

When an opaque slide is in the gate, the indicator line on the oscilloscope is straight across the blanking level — and the home television set receiving such a signal has a screen that is as dark as it can get — or as black as it can show.

Now punch a hole in that opaque slide and project it again. The wave form monitor will show a line with one sharp peak (see

fig. 4

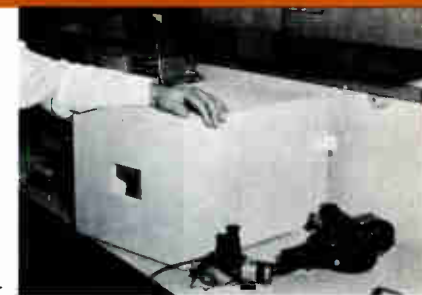


fig. 5

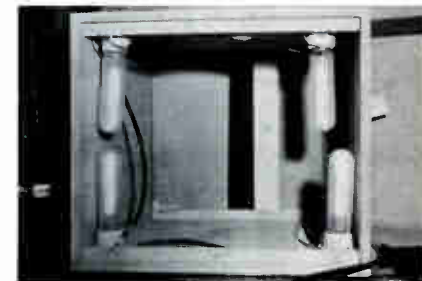
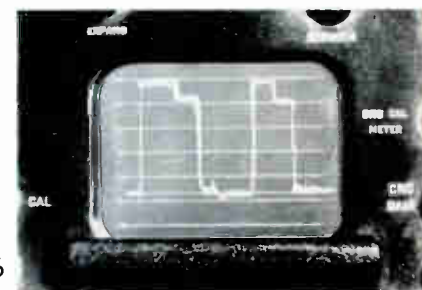


fig. 6



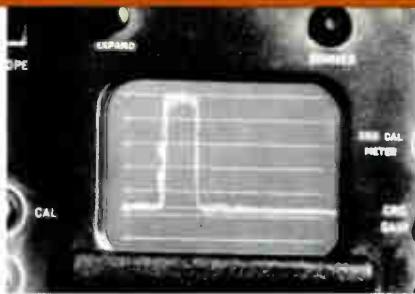


fig. 7

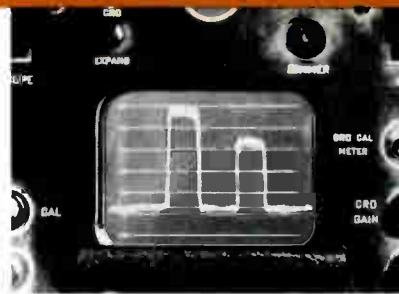


fig. 8

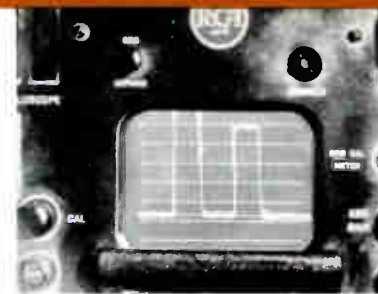


fig. 9



fig.10

fig. 7) at the point where the light is coming through. The peak reaches the 100% transmission index and your home TV screen has the brightest spot it is capable of producing.

Now, punch a second hole in the slide and cover this one with a density filter of .5. With the wave form monitor controls set exactly as they were for figure seven, the new two-hole slide will, of course, show two peaks on the screen, one (representing the density of point five) somewhat below the 100% transmission line (see figure 8).

This is where the engineer can come in and change the picture. But he has limitations. It is true that if he wants the second hole, which is covered with the .5 filter, to appear white on the screen at home, he can boost the video gain and the transmitted signal of the .5 density area brightens. But when he does that, our previous no-density spot is boosted clear into the upper regions

of the scope (see fig. 9). If the engineer would permit such a picture on the air — and he won't for a very good reason — you'd see two spots on your home screen all right, but both of them will be at the identical level of brightness. Remember that we said that the 100% transmission level is the brightest signal the transmitter will put out. Therefore, any other shades which might have been on your slide between the first density (.5) and the second density (zero) are going to be received as identical whites.

The second, and even more disturbing factor to the engineer, is that a peak which rises above the 100% transmission line can actually interfere with the *audio* reception of most home receivers. What we have said is that the highlight area of any film cannot be transmitted at a higher level than 100%. If the signal does go above the line, the engineer must shade it down. When he

does, the grays on the same piece of film also shade down correspondingly. Is this bad? it can be.

Let's take a theoretical slide with density shading up from the blackest four, then three, then two, one and on up the scale to no density at all at the upper limit. In *theory* the trace on the scope should show a neat stairstep pattern diagonally across the face of the scope (as in figure 10). But there is a fallacy here; when density reaches the reference line level, just above zero that's all there is. No signal is being transmitted. So any density differences which appear below this line are simply transmitted as black and any tonal ranges in such shadows are lost to the viewer. Correspondingly, any density differences which appear above the 100% transmission index are simply transmitted as white and any tonal ranges in such highlights are lost

We now arrive at the reason for the standard. With a density of .3 set as your brightest level on the oscilloscope a density of 2.0 (which represents the blackest areas of your picture) will show up on a normally adjusted oscilloscope right at, or only slightly below, the blanking point. The entire grey scale, between jet black and pure white, is thus not only captured on your film but is being transmitted that way. The tonal differences are being received at home in their proper relationship to each other.

What have we done at this point? We have told you only how to set up standards, what those recommended standards are, and how to measure your own production to see how close it comes to those standards or how far it misses the mark. Obviously, attaining the standards you set for yourself is probably going to require some precise adjustment in your own exposure standards and processing techniques and controls.

We cannot attempt, in this brief presentation, to get into the variations of processing possible even with one emulsion and one machine. To try to cover those same variations as applied to various machines and emulsions would be an almost never-ending task. But, the job is not hopeless. As a matter of fact, others will do most of the work for you.

The man to start with is the man who manufactured your processing machine. Run a carefully controlled test, measure your results electronically and write or telephone him what those results are in terms of specific density — and what you would like them to be. He'll then recommend exactly what to do about changing time, temperature and chemistry for his machine. At each change you have a precise measurement of results. You and he are talking identical language and a few such controlled experi-

ments and exchanges of information and suggestions will bring you within range of your target. If you run into further trouble, Eastman or DuPont's labs stand ready to help, provided you will give them this sort of precise information.

And finally, to hold tight control on your processing, to keep it within the limits you finally set, I cannot recommend too highly a small volume also obtainable from the S.M.P.T.E. called *Control Techniques in Film Processing*. It covers all types of processing setups from the smallest to the largest lab. Go through it, underlining the portions which apply to your own operation and adopt it as your bible of processing control.

When we are all doing that, the millenium will have arrived in the objective quality of newsfilm, and we can all concentrate on what interests us more — the subject material and its effective presentation. ■

*picture
making*



CHAPTER 1

I'm sure you have experienced mixed feelings when shown the first picture of a new born child by the assumed father and alleged photographer, who then waits around for a compliment. You think: should I destroy the guy and tell him what I really think of the nine pounds of smeared ugliness? Should I react in the usual hypocritical way and say "Oh!" Or, should I play it safe and say with feeling: "That's a baby!"

We will raise the standards of quality acceptance only if we are more honestly critical of each other's performance and better yet, more critical of our own.

One of the primary roles of the motion picture news photographer is to capture an event on film which, when televised, will permit the viewer to unconsciously imagine himself as a participant. But the illusion of realism can be destroyed at any of several steps in the production of the filmed news event.

Step one—the cameraman. If he underexposes, shoots it out of focus, mis-threads his camera, scratches it or misses the action, the viewer's attention will be distracted. The moment the viewer says to himself "What's that?"—he has missed the picture and the illusion is destroyed.

Step two — laboratory processing. If the cameraman got everything he was supposed to but the laboratory technician fogs it or develops it in a chemical equivalent of borscht, the film will make better ukulele picks.

Step three — editing. Here's where the nervous, over-zealous film editor, who feels he must justify his contribution to the news story by compressing 15 scenes into a 30 second cut, may ruin the story.

Or the writer may merely caption the scenes with innocuous descriptions informative only to those viewers whose television tubes have blown out.

picture making **PICTURE MAKING**

Jack Bush
ABC News



Step four — poor television projection chain and video control can accomplish the same loss of message by distraction as would be obtained if the cameraman has not performed correctly or if the film had been processed badly.

Step five—the home viewer. This is the last step. If our friend is not interested in keeping his set tuned, he won't care how good or bad your photographic essay was. We must assume this type is in the minority or at least out of our control.

The first four of the above five steps represent quality control areas which can be improved by the station. The station management can provide the funds for the tools and the news staff must become proficient in their use. But no matter how good the tools may be, it's the news cameraman who makes the difference. A cameraman who consistently errs in exposure, misses his focus, or neglects his equipment should be



encouraged to seek another trade. He may be a good reporter, but he's not succeeding at being a good television reporter if his picture cannot be seen by the viewer.

The following chapters are by three cameramen, each of whom operates differently, depending upon the size of their station's news staff and the allotted budget.

One can call upon additional technical assistance when he needs and therefore can concentrate to a greater degree on his craftsmanship and artistry. The second is required to handle all elements of photography and sound recording. He is a trained specialist but his news director must learn to understand the outside limits of practical quality accomplishment. The third is a so-called "one man band" who is required to photograph and report. He may do them both satisfactorily if he and his boss recognize the limits under which he can work. Each will explore the general limitations or practical quality performance under his particular set of working conditions. ■



CHAPTER 2

THE CAMERAMAN WHO WORKS WITH A FULL CREW

picture making

Houston Hall

WRCV-TV



We have an attitude problem. Producers seem to think that the newsfilm cameraman who has the most help on the job will always turn in the best performance. They reason that if all the cameraman has to do is take the picture, and other members of a crew are responsible for sound recording and lighting and all of the incidentals, the cameraman enjoys the best of all possible worlds and his work ought to show it.

This gets to be a problem because the logic of it all gets lost somewhere between the assignment desk and the location, or the location and the screening room, or the screening room and the cutting bench. Producers cling to the belief that the crew-assisted cameraman's work will be of superior quality and high professional standards for no other reason than that he has a number of advantages over non-assisted cameramen even before he arrives on the scene. This is only momentarily shaken by the agonizing process of screening twelve hundred feet of original footage so worthless that, no matter what is done with it, the story is utterly unusable.

This gets to be an attitude problem because the longer it continues, the longer it will be before we find out what the newsfilm cameraman who works with a full crew can honestly be expected to accomplish on his assignment. All things considered, until we know that, we really can't have a set of practical guidelines or newsfilm standards which reflect a qualitative, rather than quantitative, approach to film reporting.

The newsfilm cameraman who may rely on other members of a crew to string the cables, set the lights, record the sound, and even assist in the operation of the camera itself when necessary, may fail — when he fails — because of a unique handicap. It is unique because it would not be a problem at all if he worked alone.

The crew-assisted cameraman works largely by his instinct, his ability to anticipate, decide and execute. That's also true of most newsfilm cameramen who work alone. But the newsfilm cameraman who works with a full crew must somehow make certain that everyone else in the crew knows precisely what he is thinking, what he wants

to do, how he wants to do it, and when.

That may all sound fairly obvious, but it is probably the least recognized of all the problems the crew cameraman encounters. He may work instinctively, but unless he can also communicate instinctively, quickly and clearly, even under pressure, he will not be able to execute even the simple camera techniques which should consistently distinguish his performance from that of the cameraman who must not only *think* of everything at once but also *do* it all at one and the same time.

Techniques? How did that word creep into the discussion?

Yet, isn't that really what this is all about? Are we not concerning ourselves with known film-making principles which have application in newsfilm reporting, the ways we can best make use of the camera to tell a story which actually happened and be reasonably secure in the knowledge that the story we told was the one we were trying to tell?

The newsfilm cameraman who truly cares about his work is neither afraid to ask those

questions, nor to try to provide answers for them, in theory and in practice. The news-film cameraman who works with a full crew, and is relieved of much of the burden of the technical execution of the story idea, has an obligation to pursue something more than a random exercise in exposure settings and focus. To do that he must come to some understanding with himself about the nature and purpose of his work. Then, even though he will be no more able to control the action taking place before his lens than any other newsfilm cameraman, he will be able to determine for himself what he wants to do with it, how he wants to do it, and when. More importantly, he will also find that his ability to communicate all of this to others whose assistance he must utilize in the execution of the idea is greatly improved and, as a working unit, they will anticipate

and act rather than wait and react.

We probably have to acknowledge at the outset that there is a considerable prejudice against this approach. Because we are trying to tell the people what the "news" is, we tend to think of pictures as facts. We think that a newsfilm story establishes visual fact.

It doesn't. The film image doesn't present fact; it REPRESENTS physical reality. That's all any photograph can do.

We won't agree on this, I'm sure, because in news reporting there is a tendency to make "accuracy" and "truth" synonymous and to declare the essence of either, or both, to be fact. Unfortunately for those who would be more comfortable if that were the case, photographic reporting is no more objective in the purest sense of the word than is the scribbling of a pencil or the imprint of type.

Photographic reporting is subjective because a photograph is one photographer's impression. It is his statement of what he thinks he saw and what it meant. What the photograph actually represents is seldom, if ever, absolute. The validity of the impression is what should concern us most, then, and that depends upon a known set of limitations.

First, it is limited by his understanding of what was happening when he took his picture.

Secondly, it is limited by the decisions he has made about the relative importance or meaning of each of the things he could see, and therefore include in his picture at the time it happened.

Thirdly, it is dependent upon his technical skill, and discipline, and control, in photographically recording the essential details of

what he saw with the naked eye, so that the result is predictable.

And the key word here may be "predictable," because the photographer should know beforehand what he wants his picture to say to one who sees it.

But there is still another important variable — and it is one the photographer cannot do anything about: certain factors may have an unpredictable effect on what a given person sees when he looks at the picture — such things as his educational background, his attitude about the general subject of the picture, the economic, social and political conditions of his own environment — even the distractions which may be working on him at the very moment he looks at the picture. Any of these can affect what the picture means to the person who looks at it.

With motion picture photography, the

representation of reality is more life-like because it is kinetic. It moves. Motion and movement appear as motion and movement. Motion and movement, action, involve us in forms of non-verbal communication about which we know very little. Certainly, we do not know how to predict, in every instance, what influence it will have on the person who witnesses it.

So that the impression created by photographically recording motion and movement is much different than the impression created by stopping all motion and movement in a single photograph. Film reporters who want to be accurate with their account of reality should realize that the mere technicality of stopping motion and movement 24 times each second does not result in a series of photographs that, when projected at the same rate of speed, tell exactly the

same story as a single still photograph.

The point is, we can tell a better story most of the time than a still photographer can, but it won't be a very valid impression of what happened unless we begin to concentrate our attention on what makes the difference — the motion and the movement.

One of the most difficult things we must take into account is that motion and movement add what you could call a second dimension to the photograph. As the action transpires it gets us involved in *time relationships* as well as space relationships.

If there is any one thing that's holding us back, that's keeping us from establishing any real standards for our work, to make it as effective as it can be, it's that we believe nothing is required of us but to take pictures of motion and movement just as they are seen by the naked eye. It isn't that simple.

The eye sees what it sees instinctively. It selects things to look at instinctively. We don't have to tell the eye what to look at or whether to look at all of a scene or just part of it. That just happens, because that's the way the eye works — instinctively — without being told what to do.

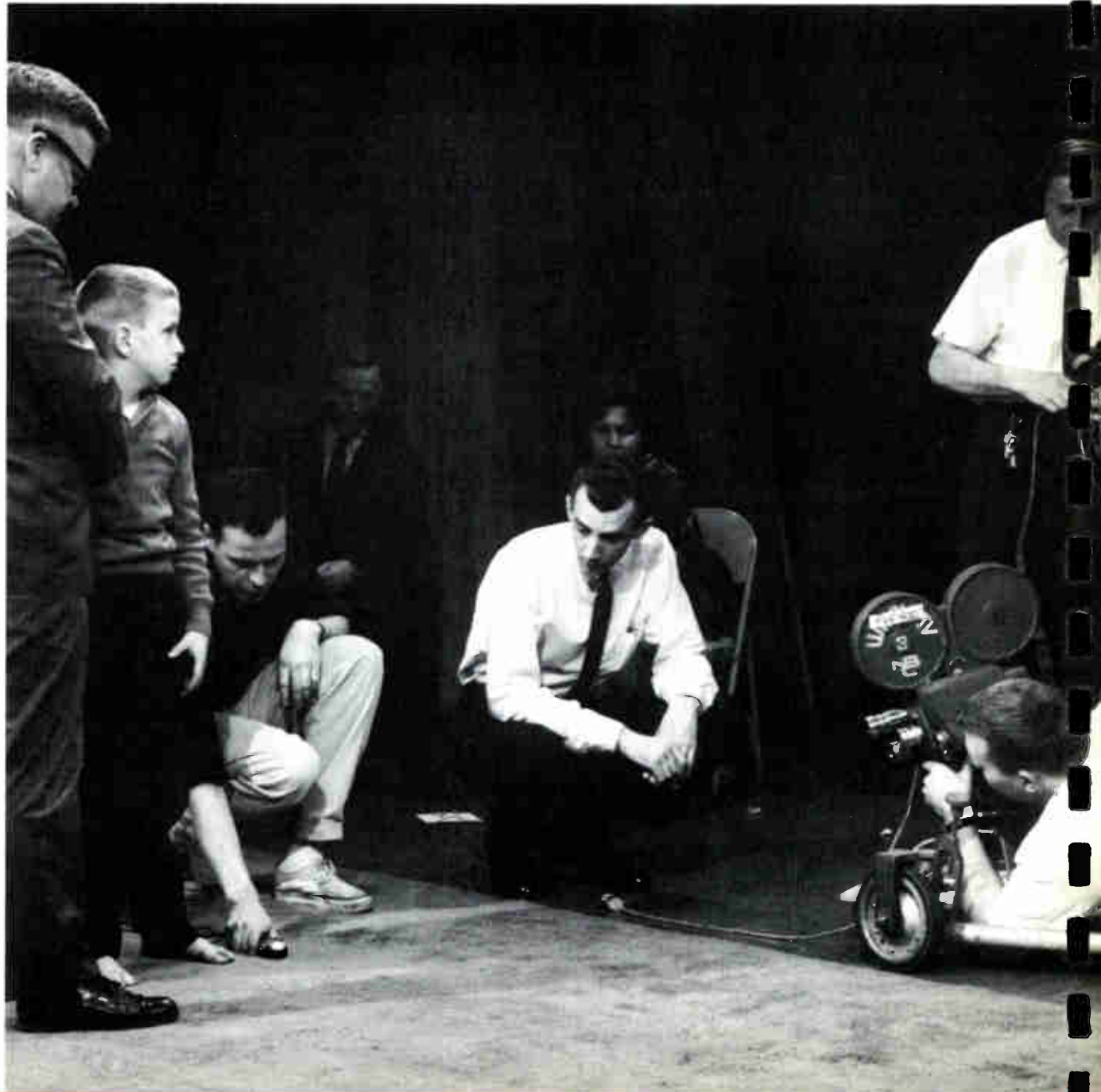
But when the naked eye is looking at a photograph — whether it is a still photograph or newsfilm — it is not instinctively selective. It must be told where to look, somehow; and not only where, but when, and in what order it should see different things to get the intended meaning out of the composite impression.

So it follows then that the cameraman must direct the eye's selectivity. He must discipline his camera so it will direct the viewer's attention from one detail to the next. He can't leave anything to chance. His camera must substitute for the instinctive selection mechanism of the human eye.

This creates several basic problems for the cameraman, and, while the solutions may be as old as the craft of making pictures itself, cameramen shooting newsfilm today often refuse to accept these solutions. They seem to feel that the audience doesn't expect to be able to understand the pictures and what they mean, so the cameraman need not bother doing the things which have to be done to tell a story well with pictures.

What are they? Two which are essential. First, of course, is maintaining continuity in selecting scenes which make a sequence.

Second, and perhaps as a consequence of the first, maintaining consistency in the orientation of camera positions, so the viewer understands instantly his own relationship to the principal action in the picture.



A well developed sequence details more about an event or about people and what they are doing than a single scene. But a good sequence needs more than a random sample of scenes. The sequence needs continuity. It needs a logical progression which does not confuse the viewer, or make it difficult to determine what is happening.

A viewer instinctively assumes left and right directions when he first looks at a picture. He takes his cues for this from the positions of the people in the picture.

A newsfilm cameraman can either take advantage of this, or run the risk of abruptly changing those positions. One way makes it easier for the viewer to remain oriented. The other may confuse him long enough to keep the story from being as effective as it might have been.

If a cameraman did not want to show movement to the left or right in the picture, or even any indication of movement left or right, he would take his pictures anywhere on an imaginary line running perpendicular to the body position of his subject; in other words, the "full front" or its reverse, and the only movement would be directly into, or away from, the camera. But a motion picture confined to action that simple wouldn't be very interesting.

So, to work with left-to-right or right-to-left movement and whatever implications the movement itself may have, the cameraman must take his position from the imaginary line. He must decide whether to make

his first scene from the subject's left or right, but in either case the first scene will now give the subject pronounced direction in his movements. From the subject's right side the movement will be toward the right edge of the frame, and from the subject's left it will be toward the left edge of the frame.

Whichever he chooses, the cameraman is now committed to a direction of subject movement. To make it easy for the viewer to follow, the direction should remain constant throughout the sequence, unless there is a commanding purpose to be served by reversing it suddenly. The direction will remain constant as long as the cameraman selects camera positions on the same side of the imaginary line as was the scene which first established the direction of subject movement.

If the cameraman crosses the line, he is in trouble and so is the viewer. If he has been shooting from the subject's right side and then takes a shot from the subject's left, the scenes — when edited — will show the subject suddenly moving in the opposite direction. If that action is not relevant, the viewer will be confused, and the situation will become even worse if, for the next scene, the cameraman has moved back to the other side of the imaginary line.

There are times, of course, when the cameraman will end up across the line whether he wants to or not. The problem then is to minimize the abruptness of the change in direction. One possibility is to use an inter-

mediate front shot which has no direction. That technique may be acceptable, but it has a limited application.

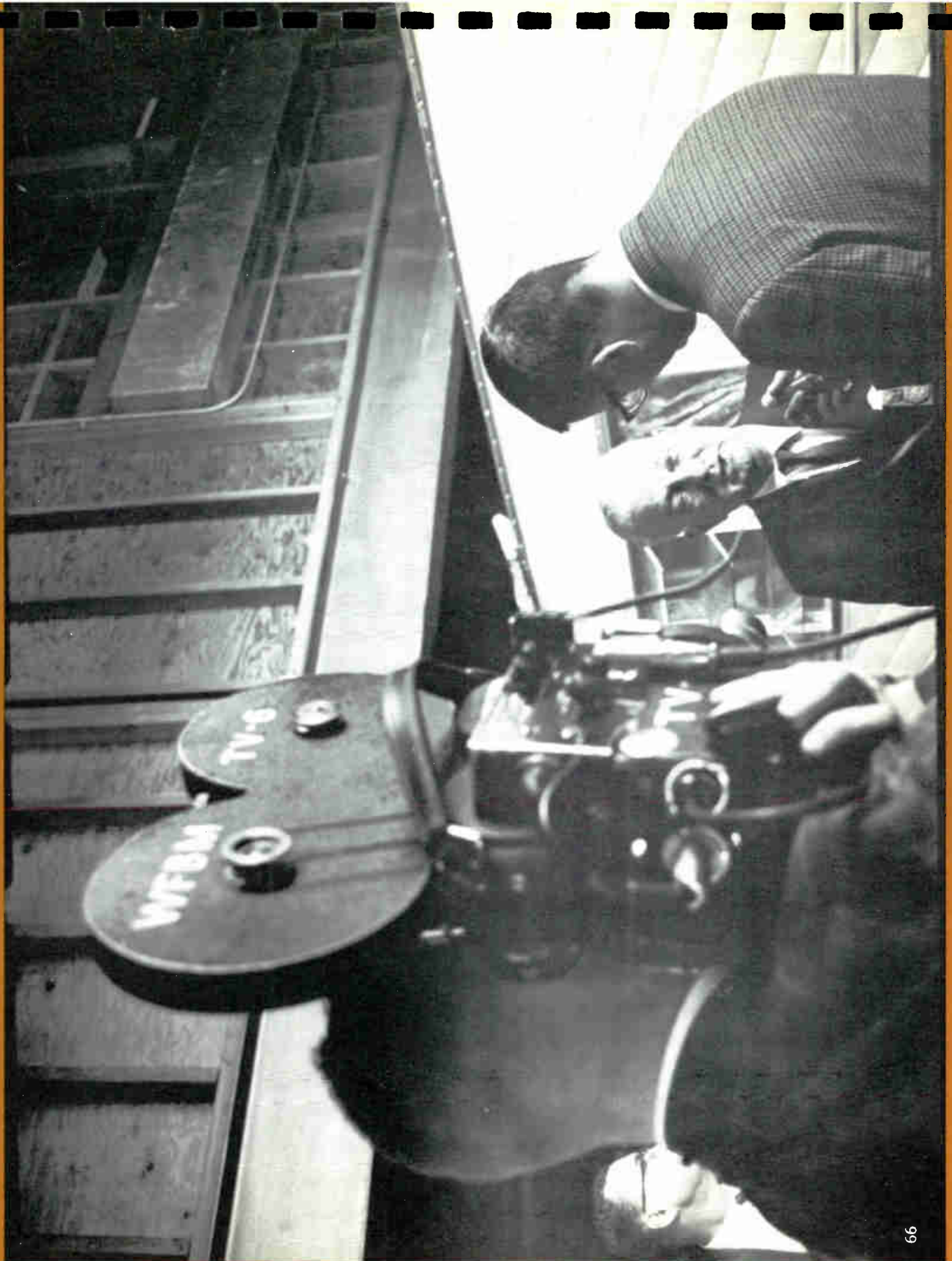
When we are dealing with more than one subject, and the body positions establish opposing directions, it is virtually impossible to cross the line without confusing the viewer, to say nothing of the film editor.

Any series of scenes taken on the same side of the imaginary line will maintain the original relationships, but crossing the line for close-ups, or even for a two-shot for that matter, will suddenly reverse the respective positions of one, or both, of the subjects . . . and the continuity of the sequence will be momentarily interrupted, if not totally destroyed.

A newsfilm cameraman's ability to build sequences and maintain continuity will vary considerably, depending upon the kind of a story he is shooting and how much self-discipline he exercises, because he has little or no control over the action.

We do not show much respect for our own work, or the viewer, if we think of these problems only in terms of a means to an end, a justification.

Unfortunately for us, television has made that virtually impossible to do because the "justifier," the lap dissolve, the fade-out fade-in, the optical effect, the heavy music, impose a time compromise in which we cannot indulge ourselves. But then, opticals never were very creative. How could they be; they were made by machines. ■



CHAPTER 3

THE CAMERAMAN WHO WORKS WITH A REPORTER

picture making

P. J. O'Connell
WIC, Pittsburgh



In Pittsburgh, I am responsible for the film only. Somebody else does the reporting that is necessary. I carry the gear, set up the lights, record the sound, shoot the film and edit it. In doing all this I cannot avoid the question of quality. In most cases I can't duplicate the results of a full crew operation but neither can I use this as an excuse for poor basic film technique, mixed-up continuity, bad screen direction, etc.

My film may not have the "extras" that additional help would give but it has to be basically correct.

If I can, let me give you an idea of what O'Connell, as an unassisted cameraman, is expected to do and what you should expect from the guys that are in your shop.

Stories in the field of general news are often predictable as far as time and place but you can seldom control the action. A city council meeting, or a speech by the Governor as good examples. About all I expect out of myself on this type of story is to get good exposure, framing and sound with enough cover and cut-away material to edit

a smooth piece when it gets on the air. If I apply the principles of basic film technique and a little craftsmanship, I should have a smooth product.

What can I expect of myself on a feature story where I have complete control of the action? Well, it should be, at the very least, technically correct as to screen direction and continuity. If possible, I add a little twist to the shooting or the cutting to make it different.

Take, for example, a film on a routine subject that we handled in a different way. On Christmas day everybody in this business is long on features and short on everything else. One year, we decided in advance to review Christmas day on film. We took the Christmas features that we shoot every year, cut them into a long package and put music behind it. We opened with midnight mass and Silent Night; my kids opening their presents and some toyland music; then a big family, a big dinner, a big bird on the table and Perry Como singing *Home for the Holidays*. In this film I ignored the formula ap-

proach of wide shot, medium shot, closeup, cutaway and so forth. There was contrasting screen direction and very irregular continuity. This was done deliberately to call attention to the film and to break through the sameness in our coverage of this subject year after year.

Spot news is uncontrollable as to time, place and what will happen. But lack of control over it doesn't mean that the basic principles of good film can be abandoned. Spot news should have screen direction. It should have shot continuity, if at all possible, and usually it is. In covering spot news in our operation, we try to use a sound camera whenever possible, because we feel sound-on-film is the most accurate reporting tool TV has. With all the editorial limitations we work under, film with sound gives the audience the most complete information on what happened. It takes extra effort for one man to get spot sound, but it's well worth it.

As an example, let me cite a film we shot recently at a civil rights demonstration. The

negotiating team for the protestors was going in to meet the negotiating team from the company. The charge was discrimination in hiring and the pickets had gathered to give their negotiators a nice send off. We shot with sound while the other stations in our market shot the same material silent and provided abundant descriptive adjectives to the viewers. I believe that we were both more accurate and more interesting.

Here is another situation, in which we covered a group of city firemen picketing a Democratic party meeting. It was at night so we simply added light to the gear. The fight was over wages. Most of the firemen are also registered Democrats because Pittsburgh has a very effective patronage system and the friction between them and the party agitators finally developed a free-for-all. I ran out of sound film and had to grab the silent camera to keep shooting, but the loss of sound damaged the coverage as far as I am concerned.

We try to use the best film techniques in all situations. There are compromises of necessity because of the lack of gear or the lack of help, time or of ability. We try to be technically correct and then add something to break the habit of routine. We don't succeed every time, but we try. ■



CHAPTER 4

THE CAMERAMAN WHO WORKS ALONE

Fred Mooke, Managing Editor

WTVJ, Miami, Florida



Picture this: A man arrives at the scene of a bank holdup. In his hand, he carries a movie camera. In his jacket pocket, a notebook and pencil. He looks around for the most authoritative person—a policeman, a detective. Down goes the camera on a chair or a table; out comes the pad and pencil. He asks a few quick questions. Who did it? Any description? How much did he get? How did he do it? Which teller gave him the money? He makes notes as the answers are given.

Back into the pocket go the pencil and pad. Up comes the camera. Now he begins filming general scenes of activity . . . investigating officers . . . fingerprint dusting . . . the teller . . . the teller's empty cash drawer, and so on.

The teller, he learns, is willing to talk about it on sound film. Out to the car he goes. A minute or two later he's back through the door wheeling in sound equipment, carrying a set of bar lights and a tripod. Another few minutes, the camera and lights are ready . . . a reading is taken . . . the

lens is set, and the sound pot turned on. The camera is flicked on. With the teller framed in one half of the picture, he steps into the other half, microphone in hand. The interview is on. When it's over, more information recorded on the pad—perhaps a few more shots with the hand camera. Then he packs up and he's on his way again.

What is this phenomenon I've just described?

In local station operation, he's known as the newsfilm-reporter; more specifically, the type of newsfilm reporter we jokingly refer to as the "one man band." It's no joke, really, because it's his type which dominates the American television industry, as we know it today. He's employed, for instance, in every TV station in Florida and in most stations throughout the country. The man I'm talking about is a solo performer; he shoots film (sound and silent), gathers story information and, in many stations, is capable of processing the film, editing it and even preparing the copy to go with it.

In the early days of television, when local

stations were popping up across the country like so many bean sprouts, the trend in hiring newsfilm reporters was this:

Get hold of a professional photographer with still or motion picture experience—someone who'll come back with decent exposures 90 per cent of the time—and send him out to cover the town. The idea was to fill one nightly program, two at the most, with as many film stories as possible. If it wasn't on film, it just didn't happen. And so, we covered ground breakings, ribbon cuttings, luncheon meetings, award presentations, auto accidents, just about every type of story we consider today to be dull film! As long as the exposure was okay, it became TV news.

Of course, every once in a while, perhaps by chance, perhaps through the law of averages, a real news story came along—or maybe even a good feature story. What happened then? We found out that this newsfilm reporter, this professional photographer of ours, working alone, wasn't really telling the story on film or, for that matter, bringing

back the information necessary to tell the story on paper. We discovered, with his good exposures and all, that he was simply collecting a series of still pictures on motion picture film, nicely framed, but without a thread of continuity. Now, it's true that for lurches and accidents you don't need much continuity. But be less than creative on a story that requires ingenuity, and you've blown the story. And so, it was presumed there was something wrong, not necessarily with the type of stories being covered, but with the type of man covering them. We need someone who can exercise editorial judgment, came the cry—a reporter, a journalist taught to shoot film.

Out went the plain old photographer and in came the new breed, so to speak, recruited from newspapers, enlisted from college campuses. They were handed a 16-

millimeter Bell and Howell, told which direction to point it, shown which button to push, and became the second generation local station newsfilm reporter.

You can imagine what happened. The lurches and the groundbreaking and the car wrecks looked roughly the same as they did before; except, that is, for the exposure and framing. These were worse. But there did appear a trace, at least, of storytelling on film and there was a definite improvement in the collection of raw facts for the writer; or, if the same man did the filming and the writing, there were more rounded scripts for the newscaster. From this start, then, evolved our present-day newsfilm reporter.

How does the "one man band" operate within this scope? It definitely has its humorous side, occurring mostly when our solo

performer films and conducts a sound interview, both at the same time. Sometimes the interview subject just stands there dumbfounded and speechless, apparently awed at the physical dexterity of this man who has just piled a pyramid of equipment in front of him, and has raced around it with microphone in hand, firing questions practically on the dead run. When the subject stands mute, the reporter, rather than make that gruelling trip again, continues his line of patter, hoping the individual will regain his faculties. He seldom does. The result looks like a newsman interviewing himself before a one-man audience. Or the cameraman may have a dramatic interview situation going and muff it due to his technical concerns. In one such case, the subject was the former sheriff of Dade County, Florida, who had just lost the election and was on

the verge of tears. The "one man band" interviewing him suddenly thought to himself, "Do I have the sound pot on?" and in going out of the frame to check it, left the Sheriff high and dry and twice as upset, wondering miserably if the cameraman had run out of film.

But these are exceptions. Recently we got a fine one-man job from a cameraman sent out to film the story of an Air Force base near Miami at Homestead, Florida. It turned into a good report on American air defense, particularly valuable because of Florida's role in the 1962 Cuban missile crisis. In another, "The Plight of Pepito," filmed and written by the same man—myself—we examined the problems faced by Cuban refugees trying to adjust to a strange land, as seen through the eyes of a six-year-old boy.

From time to time, in documentary film-

ing mostly, it becomes necessary for the newsfilm reporter to stage his subjects; that is, tell them not to look at the camera, tell them what to do and how to do it. In short, become director and photographer both at the same time. People, you see, have a natural reaction toward cameras and the reaction looks anything but natural.

Aim a lens at anyone and you'll find him looking right back at you, smiling, perhaps, waving and sometimes making funny faces. If you left your subject strictly on his own, chances are you wouldn't capture much on film worth using on the air. It helps in the continuity, too, when you can set your subject where you want him.

As an example of this, I cite a documentary we did some time ago about fallout shelters. (Remember them?) The standing question at the time was "What would

happen if the siren suddenly went off and there was only one shelter on the block?" We enlisted the aid of an entire neighborhood, and staged their spontaneity, so to speak. The results looked quite natural and it was valid sociology, if somewhat in the direction of psychodrama.

I hope I have demonstrated the mobility and creativeness of the single television newsman on assignment. I should add, though, that wherever convenient, wherever possible, whenever available, we do deploy two or more men to cover exceptional stories, such as the visit to Miami of the Beatles and the Clay-Liston fight at Miami Beach. And we attempt to send two men on sound stories when we know in advance that an interview is forthcoming. Sometimes we don't know in advance.

There's much to be said for the man

whose journalistic training helps guide his camera. He is naturally more aware of what he needs on film to tell the story. The photographer, without knowledge of reporting, might very well overlook pertinent visual material for the sake of aesthetics.

What it boils down to is this: how do you best utilize the men you have? All things being equal, which is more desirable—the one-man or two-man system? Let's use as an example two local stations each having a four man staff. Station A is like our station—it has the combination photographer-reporter. Station B has reporters and photographers, neither duplicating the other's function. I think you can easily see that at any given time, Station A is capable of covering twice as many stories as Station B. What's more, if Station A decided to send two men on a story, it would automatically have the benefit of two cameramen to film it, as well as two newsmen to report it. Station B, on the other hand, would have to send three or four men out to achieve the same end.

The newsfilm reporter, therefore, gives us greater versatility on the local level. This is important. If you're a chess player, you'll appreciate the following analogy: You know that the Queen is the most valuable piece on the board. This is because she is able to move in all directions. A Castle can duplicate one half the Queen's maneuvers... and a Bishop the other half. Together, their movements are identical to the Queen's. But consider this. Would you sacrifice your Queen for a Castle and Bishop? If you're a chess player, the answer must be no.

I'm a chess player...and I'm also an assignment editor.

I'll take the versatility anytime. ■

*the editorial
influence*

CHAPTER 1

editorial influence

THE ASSIGNMENT

Ralph Paskman

CBS News



What is a good television assignment and what is not? There are many variables involved: the editorial values of a story; your resources, in terms of personnel and equipment to do the job; and the cost, in terms of money, time and effort. Also, much depends on what you are trying to do, in your over-all approach to the responsibility of covering news for your station.

You may not completely control this over-all approach. Much depends on the basic attitudes and policies of the station management, and it is necessary to work within that framework. If your operating budget is small and your staff is limited, your coverage necessarily reflects such limitations. If your station uses calliope whistles and bells for station breaks, chances are you will be expected to chase fire engines.

There's nothing wrong with a good fire, but this kind of coverage can be overdone. It can also be underdone. We used to have a news executive at CBS who apparently had a low tolerance for smoke. He issued orders that no more fire stories were to be

used. This was unfortunate because we could count on the city of Boston to give us a really good fire at least once a month. Too little attention to a particular kind of story is just as bad as too much.

There are several basic points to keep in mind about assignments. The most important one is: People are more interesting to people than are inanimate things. A building may be impressive but when a person comes into the frame, your attention shifts to that person. We should exploit this natural curiosity about other people because, whether we realize it or not, all of us are constantly seeking to understand one another.

But an interest in people doesn't mean that all interviews will be interesting. All too frequently interviewing somebody in the news is used as the easy way out. We are not covering a story if we get somebody to say on camera what has already been published in the press and broadcast on radio. Unless the interview carries the story further, provides new information or sheds

new light on a development, there's little reason to use it. Of course, one cannot always know whether a film interview will carry the story one step further, so we often have to try it, and see what happens. But just because it has been shot doesn't mean it must be used.

Nor is interest in people justification for indiscriminate interviewing of the so-called man in the street. What purpose is served, what information is gained by asking somebody's mother "Should Red China be admitted to the United Nations?" You are not providing news or information when you ask somebody to be an expert on something they cannot possibly be qualified to discuss. Man in the street assignments are really not valid unless you are asking people questions they are qualified to answer.

What makes a good television film story? I believe it is the writing of the story. Good writing can make a striking piece out of routine visual elements. And the fact is, most of what one can film is quite commonplace and routine. And though an imaginative ap-

proach by a good cameraman can make something interesting out of a Rotary Club luncheon, there's a limit to what he can do visually.

One picture is not necessarily worth a thousand words. It depends on the words, how they are put together, and most important, the idea behind them.

Another important aspect of assignments: Know your staff and use them to the best advantage. Certain men can do better with a certain kind of story than others, because of their own individual make-up. The special talents of a reporter or cameraman should be taken into consideration in making an assignment.

Too frequently, we are content, because of the various pressures on us, to settle for what is really token coverage of an important story instead of doing the kind of job television can do. The city, state or federal government passes legislation or undertakes some project. So we interview the man who sponsored the bill or heads the project. In doing so we are being dull. We are guilty of not taking advantage of the very special capability of this medium.

When President Johnson announced Shriver to head up a campaign to combat poverty, it would have been simple to interview Shriver and let it go at that. Newspapers are limited to doing this—but we are not. Instead of having somebody talk about it, we can show it. And we did. We sent a crew to West Virginia and spent three days filming what we actually found there. It produced a fascinating report for the Cronkite program.

Of course, this kind of dramatic material is not present in every community. But you

do have other situations that have inspired legislation or proposals before the city council or state assembly. Why settle for an interview with the city councilman or a state representative when there's a wealth of meaningful stories to be had by digging a little.

When we assign a story at CBS, we don't try to spell out in detail how it should be done. We expect that the team doing the story will know what to try to include in the piece. If there's a special angle in which we are interested, we tell them what it is. But on the whole, we leave it up to the men in the field to figure out what is the best way to do it. By being on the scene, they know what the local conditions are and what the problems are.

The success of an Assignment operation depends mainly on the people who must execute those assignments. Take political coverage. An exciting story is possible but more often than not it settles into rather dull routine. We staff the campaigning more for protection's sake—in the event something unexpected or unscheduled happens—not because the daily actions of a candidate are that interesting. So it is up to the correspondent on the assignment to come up with an angle that will be interesting, informative and will put the story in perspective.

Again and again, this is done with adequate but less than extraordinary visual elements coupled with good writing.

A good assignment should both involve a good idea and good men to execute it. But the fact is that even when the idea isn't so good, if the men who handle it are skilled and imaginative, chances are you will come up with something worthwhile. ■

CHAPTER 2

editorial influence

CONTROL IN THE FIELD

by Walter Dumbrow & Phillip Scheffler

CBS News



The chief asset for covering a newsfilm story is a perceptive and sensitive cameraman who knows something about the content, and above all, who knows what his equipment can and cannot do. Without a good cameraman, forget about good results.

One of the problems in television news-making is the feeling that any kind of image will do. About 95% of the film that appears on television news programs is not professional.

Someone once asked me, "Which is more important — the picture or the story?" My answer is neither — the news is more important. But in covering news you can also create film that is interesting, informative and does more than merely tell the story. One way that this can happen is through a team composed of a reporter who knows a great deal about photography and the cameraman who knows a great deal about content.

A second problem is attitude. Too many in our business believe that a news story is

merely something that takes place in front of a camera with the cameraman doing the best he can with it. But I believe that to a certain extent, circumstances can be adjusted to tell a story better in order to bring forth the points you are trying to make and to give the audience a clearer understanding of the meaning of the news.

One of our assignments (for "Eyewitness") was to cover the visit of President Kennedy to the Strategic Air Command headquarters at Omaha, Nebraska. There were the usual things we could have covered—the visit of the President, his speech, filming him as he went around. But we felt that this would not illuminate the reason for his visit there, which was the inspecting of the underground control center in the basement and sub-basement of SAC headquarters. So we went down there and spent 22 consecutive hours trying to get the regular man who was on duty to explain to us what he did. It was quite difficult, but eventually we elicited a story which in its simpli-

city and authenticity was far better than any professional reporter could have given us. It was the dramatic story of the red telephone.

This film gave people who never thought much about it a clearer picture of what we would do in the event of an attack. Also, we had filmed essentially the same briefing that the President received when he visited the base.

Team operation in the field sometimes involves risks, if you want a good and not just a routine piece of film. Recently, we went to Orange, Mass., to cover the new sport of sport parachuting. After we arrived, we decided there wasn't much of a story to tell about the sport. However, helping the viewer participate in it could be interesting, and worth network use. Since the cameraman part of our team was afraid he might drop the camera if he jumped out of the plane, the reporter half had to do so. The result was an exciting film.

We had a similar problem and solved it

in a similar way when we were assigned to do a program on the tenth anniversary of the Korean armistice. One of the most important parts of the story, of course, was the continuing involvement of our Army in Korea. We agreed that only by going out on a patrol ourselves and filming it would we involve viewers in the problems and hardship of our soldiers on duty there. We did go, both of us this time, and got some fine footage.

Team cooperation goes hand in hand with team versatility. In an emergency, any one of our team at CBS can shoot, record sound and do a fair job of reporting. Let us stress that that happens only in an emergency. We have very strict union regulations in networks. But when we are out on a story, the story comes first, and other problems second.

Full, beforehand briefing of the crew helps everyone know the content of the story, as far as it can be known. When a reporter says to a cameraman in the field, "Forget the briefing—it doesn't make any difference. Do what I tell you to do," he may be violating the content of the story and doing a real disservice to the viewing public. ■

*film
editing*

CHAPTER 1

I recently saw a film book which broke down the fundamentals of film editing into a viewing device, scissors and a splicing machine. There were photographs of these devices, but nowhere could be seen a piece of film, or a film editor.

There are two extremes in attitude toward the editor. Many students of the motion picture single out the editor as the true film creator. They hail his choice of rhythm and pacing, his clever montages, his skillful use of flashbacks and referential cross-cutting. The cutting room floor has become almost as famous as some of the stars it has helped create.

At the other extreme are those who regard editing as a merely mechanical process and the editor as the man who gets rid of the flash frames, pastes the scenes in order and whacks them to time. Unfortunately, people in the television newscast field frequently take the latter view. I say "unfortunately" because in ignoring the role of the creative editor, a tool vital to a successful story-telling film is lost.

Somewhere between these extremes the actual modern film editor is found. He is, to be sure, the final molder of a film. But it is just as true that the mold had to be well-planned and cast long before it reached the editor's bench.

There is no formula for cutting a film story, any more than there is a formula for shooting it in the first place. And I believe the very search for a formula is helping to produce the sameness and blandness so often seen in television newscast today. Editing is individualistic. Just as a cameraman uses his personal judgment in selecting the scenes to be photographed, so the editor uses his judgment to select the scenes to be used in the final film. The selection varies from cameraman to cameraman, from editor to editor. It defies formulization.

There is one fundamental premise of any film story, the premise that makes telling that story possible. It is the special relationship from shot to shot, from groups of shots to groups of shots, that makes a story a motion picture story and not a series of still

film editing

FUNDAMENTALS

Marty Smith

Capital Film Laboratories, Washington



photographs. This seems simple, and perhaps it is, but unless we understand its impact, we cannot understand film or use it correctly. Even when all the shots are *concerned* with the story, you do not have a motion picture story unless they are put together with some meaning, with some motivation.

Here is a film editor's typical problem. Visualize a film of a train coming into a station, requiring about 30 seconds to chug in and stop. It has little intrinsic meaning and is too long. So I must cut it somehow. This I do by cutting in three shots from stock footage of a girl watching the train come in. By doing so, I actually shorten the film and change it by introducing a relationship. The secret of the power of motion pictures is this human need to relate things. Before, you had a train and a girl. They meant only themselves. Cut together, the two are related and a third meaning arises. In reality, they were not together at all. But relating them in the eye of the viewer gives them a brand new meaning unto themselves. Every editor

must use this technique to be successful in telling a story with economy and impact.

The important thing is not whether films actually represent reality. The principle may seem like a paradox, namely, that you can better inform and *interest* your audience in the truth of a story by using film techniques which in themselves can be thought of as deception or illusion. Without freedom to use such techniques, you have talking news-films, and nothing more. These are fine, when the writing is good or the personality is interesting, but there is much need also for visual story-telling.

Let me give you an imagined example to contrast the two. An orphanage is burning down. About 60 orphans have to run out

into the night and stand in the corner of the yard, shivering and watching their home burn down. Now, the typical coverage of this story would be several shots of the fire and of the building burning. The reporter would say that the fire trucks came at 3:05; at 3:42, it was decided the building couldn't be saved; and at 4:19, the building was consumed. You would cut to shots of the orphans shivering, and then back to the reporter saying 67 orphans were now without homes and if you want to take one, write to the station. In effect, you have shown the story "as it actually happened."

But I wonder if it might be more effective to just establish that there was a fire and give the location, and then let the editor

take over. He might use a long shot of the building burning, long in time because time is the basis of rhythm and pacing and building the emotion of a story. He would intercut short shots of a small child's face, tears running down his cheeks. Then back to the fire and back to the children, but staying longer on the children and shorter on the fire to intensify the drama of the situation. As a newsman, I do not believe this is cheating, because life *is* drama.

Sometimes editing is hardly needed to get this kind of dramatic impact. A film I saw on television not long ago showed a group of Negro demonstrators chanting "Freedom." It seemed to just run on, with the actual sound of the Negroes chanting and moving.

The cameraman moved in at one point with great skill and caught a white man spitting in a Negro's face, and the look on the Negro's face as he continued to sway and sing and ignore his assailant. Then the camera panned in at the moment another white person kicked a demonstrator. It was so movingly dramatic and effective that I couldn't talk for 15 minutes afterward. This, I thought, is true reporting, and little editing was required because of the cameraman's skill and luck. But I believe that such a film could have been shot by other means and edited skillfully to be almost as effective and just as truthful.

As in every other skill or art, film editors must know what the rules are in order to

break them. One rule that cannot be broken is: all shots must be motivated. You fail in your editing if you fail here, because you cannot reveal your story with a series of pasted-together, unmotivated shots. The viewer's eye is jarred, his mind is confused — you've lost him.

An example of a rule you can break to build excitement is to intentionally change screen direction. For instance, you usually establish an airplane going right to left, and to avoid confusion, you keep it going that way. But it's possible, if you know how, to change the direction. This heightens the drama and changes the pace. This is not a monumental example of the possibilities, but at least it indicates that the rules are not

so rigid that they can't be broken, provided you know the rules to begin with.

My purpose is not to teach how to cut newsfilm or become an editor. So much of editing is an intuitive feeling about what looks good and feels good, a talent for deciding how to best build a story. Of course, there are a lot of techniques — maybe it would be better to call them tricks. But the purpose of film editing, whether of a Hollywood film, a newsfilm or a documentary, is to communicate a story or information clearly and dramatically to your audience. And the two principles for doing this are clear motivation from shot to shot and a meaning derived from combining all the different shots into a film unity. ■

CHAPTER 2

How and why to edit film? In the first place, the fact that we are seen as well as heard so often, leads us too often to use film for the sake of film. How often we hear: give me anything, so long as it moves. So the first test of a good film editor is his ability to say "no" to a film that should never have been shot, or was so poorly shot it does not deserve time on the air. You simply cannot make a silk purse out of a sow's ear in our medium.

How to edit a story? It depends on the individual story, and on what the cameraman gives you to work with. Whenever possible, it is valuable to have his approach to the story from the cameraman himself.

Film editing should be a joint effort of a writer, editor and producer. (Often, these are all the same man, who is also news director, graphic artist, reporter and sometimes even cameraman.) It is vitally important for the writer to work closely with the producer and editor on a film story. There are times when neither the writer nor the editor agree with the producer, but it is

their job to produce what he wants.

When a cameraman "bombs out" on a story, it can be saved sometimes by the cooperation of writer, producer and editor. Recently, a cameraman was assigned to film one of those one-man "Buck Rogers" rocket suits in action in Rio de Janeiro. Instead, he sent us 180 feet of crowds and reaction cut-aways, while barely getting the rocket man taking off. After we had screened it, I was ready to throw it out. But one of our writers suggested we just cut a "what's going on here?" piece. We did, and the result was excellent.

I want to discuss the value of getting the natural sound of a news event. When the Diem government in Saigon was overthrown by force, our correspondent on this job (Peter Kalisher) brought his cameraman as close to the action as possible. The camera cut loose on every action in sight. Peter, meanwhile, went into the heart of the action with a quarter-inch tape recorder and succeeded in getting the natural sound of this violent and significant event.

film editing

HOW AND WHY

Robert M. Brennan*

CBS News



The use of a quarter-inch recorder for picking up natural non-sync sound is a most valuable asset to coverage of news stories. All you need do is play it back over system against the film on air. When possible, a reporter should carry a small recorder on every job in which he is likely to find natural sound. I will admit, however, that you can't beat the sync when it's possible to get it.

A major film editing problem is making single-system sound look good. A long interview we shot recently illustrated this. The film was shot in a small room, a not uncommon situation. All of the footage was shot on the sound camera in two positions. The opening establisher was shot with the sound pot open to establish room tone or presence, thus avoiding the transition from totally dead air to sound. The reverse questions by the reporter were shot in the same chair used earlier by the interviewee, with a slight change in camera position to create the illusion of proper relation. We used several simple techniques. By cutting right at the end of the reverse questions, we cut the last

*with Tom Phillips

few words of the question over the interviewee's face. We also cut part of the question in reverse in some cases, and used the balance of the questions from the original off-camera question to create the impression of a double system cut. No jump cuts were used.

Had we used a jump cut, we would have used a 3- or 4-second lay-over on the action shot, or a second projector of the interviewee listening or nodding; or perhaps a two-shot, with the interviewer watching; or one with the interviewee's lips moving. Here you need not be concerned about lip-sync if you have the right angle on it and are far enough away. A few words out of sync won't be noticeable. I was a victim of this for years, when cutting an interview using the 28-frame cut-away. It's distracting to suddenly see a man who doesn't mean anything to the story looking into a camera. I prefer to jump the cut and let it go at that.

The use of the second projector can make coverage of speeches much easier. You can shoot the entire speech on one close-up lens, a two or three inch, depending on your throw or whether or not you are using a zoom all the way down. Since you are using a particular part of a speech for its news impact, you should be as tight in on the speaker as you can be. I am not discussing routine speeches. Nor am I referring to an event like a civil rights rally, where you need audience as much as speaker. I do mean a situation where you are justified in using the close-up lens all the way through. You

can jump-cut the entire film, lay in another picture on your second projector, get reverse angles of the speaker at the rostrum and extreme long shots on a silent camera where lip sync doesn't matter. Where you have crowd shots with applause, you can even throw in a silent picture of people applauding and make it look as if they are in sync. None of this is too difficult to do. But, I want to re-emphasize, get away from the 28 frame cutaway, as I did, and make your life easier and your film look better.

For many editors, myself included, editing sports film has always been a problem. How do you get the film to move? Whether you're shooting a baseball story or a horse race, you want to keep things moving or you will lose your audience in the middle. But there's more than one way to skin that cat. When the great Bob Cousy played his last regular season home basketball game in Boston, we decided, in cutting the film of the game, that the heart of the story was the Cooz himself. He passed off a couple, Russell made a couple of fine baskets and so did Ack-Ack, but basically the story was the Cooz. So we ran a series of what you might call still pictures because of the jump cuts. Yet the action was maintained with the help of good writing, and as a result we got a good and an unusual piece of action film — even though we violated the cardinal principles of direction, jump-cutting and everything else.

But again let me say, if you cannot get from the cameraman what is essential to tell the story, you have nothing to edit. ■

CHAPTER 3

film editing THE WRITER'S ROLE

Patrick Trese
NBC News



"How should you write a film?" Do you cut the picture first, then write, or do you write the script and then cut the picture? Probably the basis of this endless argument is a conflict within the film industry itself. But the answer, I believe, is a melding of personalities and talents. In a location operation the roles of writer, director, cameraman, editor and commentator are sometimes played by one man, sometimes by two or three. Responsibilities are not as separate as they are in a network situation where so many people cooperate to produce one piece of finished film.

The cameraman-editor is essentially the director on a story. He has the responsibility of selecting the shots and of collecting the material that is necessary to make a film. He determines the main action and the specific details which give it flavor. He decides on the setting of the story, and on how the various people concerned with the story react.

Setting aside sound statements, interviews and straight sound pieces, what we have basically to work with are the silent film story and something we call the "stand-upper."

The film story is basically a picture story. The "stand-upper" is basically a talk spot illustrated by pictures. The "stand-upper" is something to which the purists—writers who make their living writing to film—object. I agree they are certainly not the best thing we do in television. The basic film story is where we really score. We have two basic tools to work with in television journalism: authority, which we have inherited from radio and newspapers; and impact.

When someone on the screen says "The disarmament conference collapsed today," no one doubts him. We also can use motion picture film to involve the audience in a story, to make them *feel* a famine, a strike, a war, an accident. With the proper use of film, we can draw people from their living

rooms into the event itself. This is where the writer's function becomes very important. In an impact story, a story of involvement, the main function of the writer is to be quiet. This is a difficult thing for a writer to do. It is even more difficult when the man who writes the film is the same man who puts it on the air, since he makes his living by presenting his personality to the audience. But in film writing, as in any good writing, the writer must eliminate his personality as much as possible.

The old newsreel writers felt they had to be "cute" in order to keep the audience around for the second feature. It was awful writing, and we've carried too much of it over into our business. We tend to forget that the best style in writing is no style at all, that there is nothing to match the simple declarative sentence in writing to a film.

Nor can anything replace the writer's deep respect for the visual image. The picture, if it's worth using at all on the air, is going to

tell most of the story. The picture is what is going to have the impact. Sometimes the writer must realize he has nothing to say that will add to the picture. More than that, he must realize that he can—by being verbose—actually destroy the effect of the picture. This is the hardest thing to learn in film-writing.

We have absorbed from radio the tremendous fear of dead-air. I know one radio station where two men are on the air at the same time. If one pauses for a moment the other leaps in and starts talking. Sometimes they're talking over each other. There is absolutely no dead-air on *that* station. There is also no sanity. More important, for the audience, there is often no clear idea of what they are trying to convey. What happens orally can happen visually, too. If you talk about something that has no relation to the film, the audience will get no clear view of the picture. You will have talked the film to death.

We have a rule of thumb in writing for Chet Huntley: he reads two words to each foot of 35mm film. If you're writing a film script for Huntley, you know from a spot sheet that you have, say, twelve feet of film, so you can write twenty-four words and they all will get in over that scene. The temptation is to write all twenty-four words over those twelve feet of film. It's fine if the film isn't particularly good or if the action is off-stage someplace and you have to impart the information without really having the picture, and thus save some cameraman's career. But it doesn't make for a very good motion picture film. You have to restrain yourself so that you do not use all twenty-four words, but only those few words needed to set up the scene.

I can think of one splendid example of beautiful writing—absolutely impeccable writing—that had to do with a live television shot. It was the night we stayed on the air all night long and kept a couple of cameras live in the capitol rotunda while the people filed past the President's coffin. With the exception of a few breaks for station identification, not one word was said over that scene all night long. You just can't write it any better than that. There was absolutely nothing more you *could* say. The picture carried it. It carried it for four or five hours.

You must come to the realization that there are pictures that can move without words. Often you have to supply some narration, but here you talk about what is on the film; at least, you do not talk about things that bear no relation to the film.

For example, we had some splendid footage flown in to us from Cyprus. It showed British soldiers all over the island. There happened to be no significant story about British soldiers on Cyprus that day; but the picture was so good, we started thinking of ways to use it. What we came up with was an essay on the British presence in Cyprus, why they were there, and what they might be called upon to do in the future. But it was written from the point of view of the ordinary soldier standing guard on that island.

A silent film I saw recently showed some children up a tree watching the shot of a rocket. An accompanying script could probably give you an awful lot of information about that particular type of rocket. But you've shown the audience appealing children, obviously interested in something. The audience has identified with them, wants to know who they are, wants to know, not

information about rockets, but what those children, who are watching the rocket go up, are thinking. So you try to look through their eyes — and do so without trying to write *Winnie The Pooh*, but just tell their story very simply.

The use of cut-aways clarifies a story's point of view. A girl watching a train coming into the railroad station *must* be mentioned in the script. Who is she? What is she watching? What is she waiting for? This can be said with a line, but it must be said. The point is, in making a film, you must spend enough time with the editor so that both of you agree on the point of view of the film. Is the point of view going to be that of the girl watching the train come in, or is it going to be two children up a tree watching the train come in? Either way could be valid, depending on what the writer wants to report.

I believe the writer should have the first crack at cutting the story because he has the editorial responsibility, in the journalistic sense, to fit the story into the show. He knows the time limitations. It's obvious that brushing off a disarmament conference in thirty seconds and then showing two kids up a tree watching a rocket for six minutes, does not make sense, journalistically, and creates a wrong balance to the program as a whole. But the idea should not be the arbitrary, "we're going to cut forty-five seconds or a minute or a minute-thirty," but rather, "we're going to try to cut this story running about a minute-forty-five to a minute-thirty, depending on how much the film is worth or how long the story will hold up." This judgment—how long is a story good for?—is what both writer and editor have to determine editorially and visually.

To inflict the writer's script on the editor, right from the beginning, is an injustice to the editor. The editor can take an *outline* from the writer and start cutting to the flow of the story. The writer is limited only by language and his own imagination, while the film editor is locked physically to the film and the image that he has available to him on celluloid.

In a local operation, which must fight deadlines without the manpower to always meet them, a great deal of time can be conserved by giving the film editor more responsibility for the story's editorial content.

Most of the film editors I've worked with on the network level are highly skilled and intelligent men who can put a story together. News directors and writers should spend more time with the film editors, involving them in the total news operation, educating them in our particular end of the business, and learning their particular skills as well. Then when you come to grips with a story, you will be speaking the same language, looking at the stories the same way, from the same point of view.

Then it will be much more meaningful to say to the editor—"get me something around a minute-thirty for use tonight." The editor has his own ways of saying things with film just as a writer has his own way of saying things with language.

I believe some writers are much too concerned with making the story exactly as it happened chronologically, and are too reluctant to use the tools of juxtaposition an editor might use. As my boss, Reuven Frank, says, film is a symbol and not a fact.

Good editing can enhance a story. It can save a poor piece of film. It can make a good piece of film superior. As Eisenstein taught

us, when you take two concepts and put them together in juxtaposition, you automatically get a third idea, a third concept. The use of sound gives you yet another dimension and the use of language adds still another. But the basic burden is on the film itself. The writer can really do nothing more than help the film along where it needs help and explain things that are not explained by the film. He must always work, as a writer, within the limits of that piece of film the editor has cut.

If there's one fault I've found with writers generally, it is that on the one hand they deal in empathy, in sympathy, in having a respect for the heroes and the villains and the ordinary folk with whom they come in contact, whose stories they tell. Yet with their own people in the shop, they adopt the "Front-Page Farrell" approach: "what a tough guy I am!" The writer cannot be a "tough man."

It seems strange to me that a division has grown up in our business between cameramen and editors, and writers. The writer should not only have a deep respect for the people about whom he is writing but should

also manifest the same respect for the talents and abilities of the people with whom he works. Many problems in film-making can be solved on a human level, by the writer talking to the editor, and then listening to what the editor has to say. For one thing, the editor probably has a better sense of when the writer should "shut up" than the writer has himself. Great films are made through this melding of the two personalities and skills so that one complements the other. The writer should always listen to his film editor.

It's difficult to teach anybody to write. Writing is learned by sitting down for long periods of time at a typewriter. Most of what I've learned about film-writing has come from film editors, who have taught me how to cover a splice, how to leave scenes open, how to get the maximum impact from the film, and therefore, from the language. One book I would recommend is a small volume called "Strunk's Elements of Style," which can be purchased for ninety-five cents now. It can make you more money than a subscription to *The Wall Street Journal*. ■

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