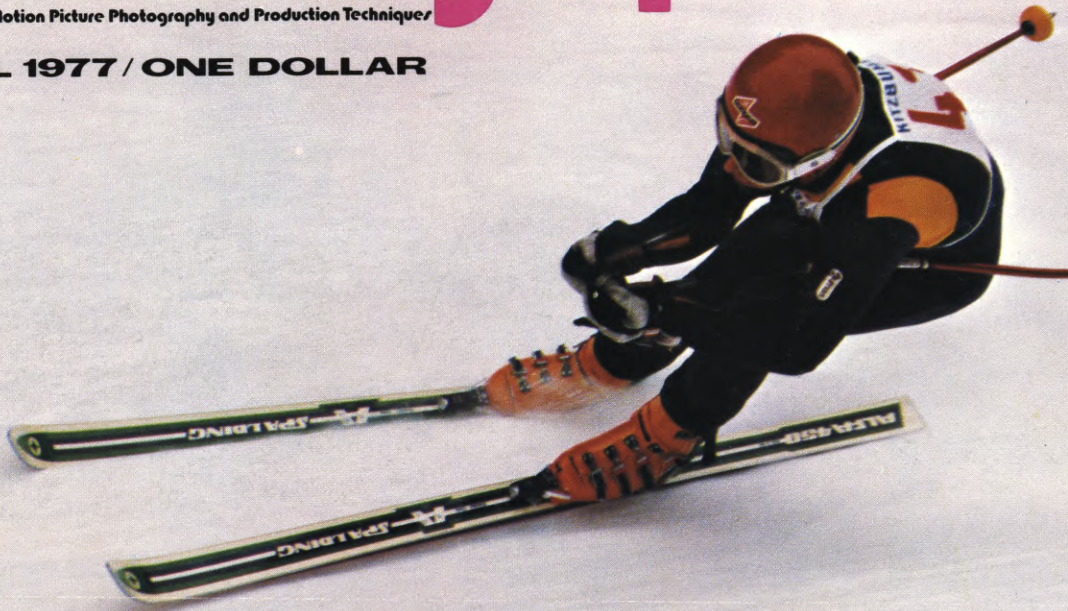


American Cinematographer

International Journal of Motion Picture Photography and Production Techniques

APRIL 1977 / ONE DOLLAR



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ABC'S FILM-PLUS-TAPE SPORTS COVERAGE





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This is the system uniquely designed and precision engineered by CSC to meet the exacting requirements of today's cinematographer. Space-age solid state components supply power to zinc telluride video receiver tubes

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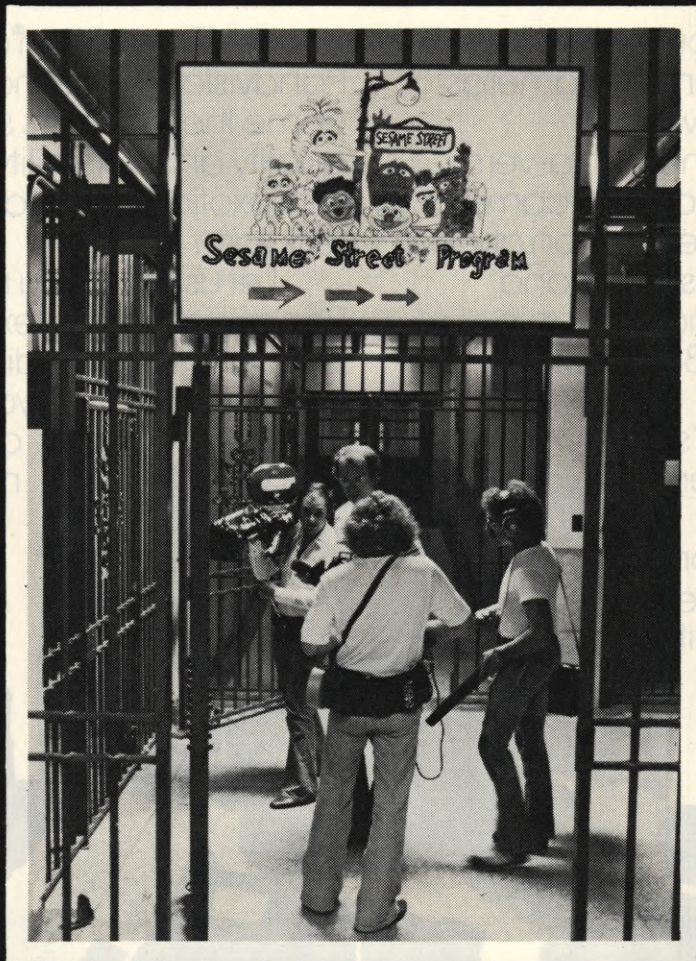
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Peter Rosen just made an "impossible" shot.



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"Filming a TV special for the Children's Television Workshop (creators of Sesame Street and the Electric Company) in two Texas prisons created some unusual production problems.

"What is Sesame Street doing in prison? It seems that many children spend hours in prison visiting rooms. Bored and restless, they add to other visiting room problems.

"It was therefore decided to set up a program where Sesame Street could be viewed, and where trained inmates could tutor the kids in educational activities.

"C.T.W. asked us to make a film on this subject.

"Naturally, prison presented us with terrible lighting conditions. We had neither the time nor the permission to install additional lights, yet we had to shoot inmates' cells, mess halls, shops, recreation areas and down long bleak corridors lit only by a few fluorescents and tiny amounts of daylight

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"Thanks to Chem-Tone we were able to handle the worst lighting conditions without excessive expense and set-up time.

"Chem-Tone enabled us to push ECN 7247 one stop to ASA 250, and even two stops to ASA 500 without grain increase or loss of resolution.

"What's more, TVC's lab color corrections created a soft, natural look without the excessive contrast and brightness associated with 7247.

"And shooting thousands of miles from New York didn't make us a bit nervous. We knew that TVC's daily lab phone call would immediately pinpoint any exposure or color problems.

"The film will be aired in early '77. We think TVC should be as proud of it as we are."

Peter Rosen—Producer/Director/Cameraman
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American Cinematographer

International Journal of Motion Picture Photography and Production Techniques

The American Society of Cinematographers is not a labor union or a guild, but is an educational, cultural and professional organization. Membership is by invitation to those who are actively engaged as Directors of Photography and have demonstrated outstanding ability. Not all cinematographers can place the initials A.S.C. after their names. A.S.C. membership has become one of the highest honors that can be bestowed upon a professional cinematographer, a mark of prestige and distinction.

APRIL 1977

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ON THE COVER: A collage of skiers taking part in the famous Hahnenkamm Downhill ski race, held in Kitzbuhel, Austria last January. The race was covered by means of a unique film-plus-tape technique by camera-men shooting for ABC's Wide World of Sports (see Page 366). Cover photography by ROBERT RIGER.

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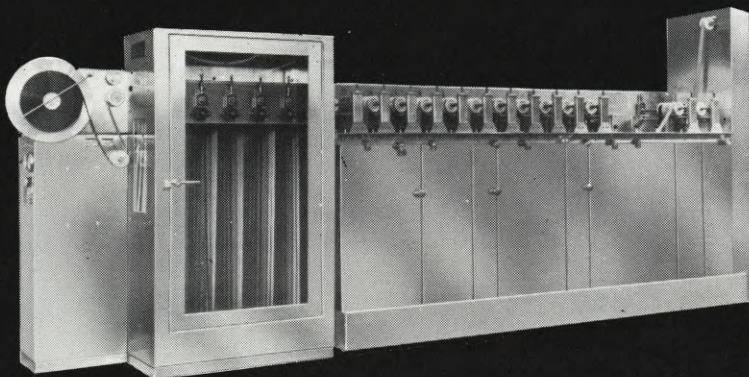


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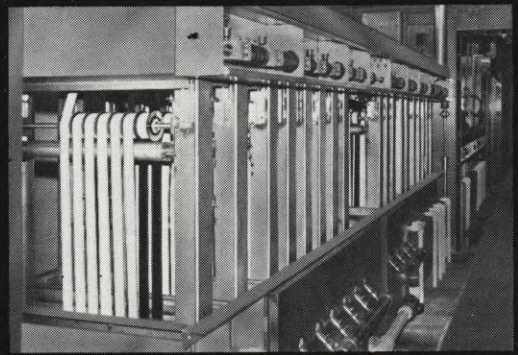
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Micro-Demand has a broad band of self-compensation, is of functional construction and requires minimum maintenance.

There are no fragile, plastic spring bushings, no wobble rollers. No elaborate articulations, of any type. Just sound engineering and the highest quality materials and workmanship.

No other competitive processor or film transport system commercially available has ever achieved the operational speeds and proven reliability of Filmline Micro-Demand Processors.

SIGNIFICANT MICRO-DEMAND FEATURES:

- | | | |
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| Versatility | Any speed, any process. | <input type="checkbox"/> Push-Button operation, and reliability allows operator to perform other functions while the machine is running! |
| Reliability | Rugged construction, quality materials and sound engineering. Always ready when you are! | <input type="checkbox"/> Automatic compensation for elongation and contraction of film during processing cycle. |
| Flexibility | Any format 35mm, 35/32mm (1-3), 35/32mm (1-4), 35mm 5R S8, 16mm — 70MM-105MM etc. | <input type="checkbox"/> Virtually eliminates all film breakage, scratches and static marks. |
| Dependability | Can stand the gaff of long, continuous, top speed runs with "Zero-down-time." | <input type="checkbox"/> All film spools use standard bearings or bushings. |
| Credibility | Ask the labs who own them. Most of them own not one but several. | <input type="checkbox"/> Entire upper film shaft/roller assemblies easily removed. No tools needed. |
| Maintenance | Exclusive Maintenance Monitor tells when and where the machine needs attention. Significant savings assured. | <input type="checkbox"/> Stainless steel construction used throughout. |
| Performance | Every Filmline machine is backed by a superb performance record compiled in over 25 years of continuous service to the industry. Twenty five years in the forefront of processing machine design and innovation. | <input type="checkbox"/> Proper operation can be determined at a glance, while machine is running. |
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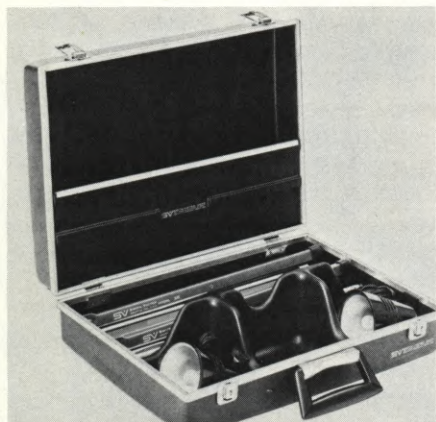


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WHAT'S NEW

IN PRODUCTS, SERVICES AND LITERATURE



NEW QUARTZ LIGHTING KITS FROM SMITH-VICTOR

Smith-Victor Corp., Griffith, Ind. 46319, announces two NEW Quartz Lighting Kits. Both feature 2 600 watt quartz lighting units with stands and cases. They offer an add-on feature so that an extra light and stands can be added at a later date.

The K202 sells for \$137.50 and contains two No. 700 lights with lamps, 2 No. S6 stands and an attache size case.

The K502 sells for \$315.00 and it contains two No. 770 600-watt metal quartz lights and lamps, barn doors, scrims, two aluminum stands and is cased in a sturdy type case.

Available for immediate shipment.

NEW VTR CONTROLLER FROM BTX

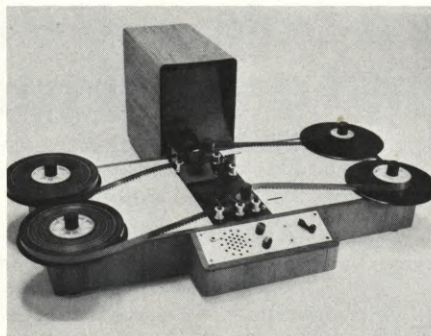
The new 4220 frame accurate edit code comparator from BTX Corporation compares any preset SMPTE time code with any parallel decoded SMPTE data off tape and provides a command signal to start or stop VTRs and audio recorders, and activates an

LED signal light when the dialed-in tape location is reached.

The 4220 comparator operates in both play and rapid shuttle modes, and in both forward and reverse tape motion.

Typical applications include controlling VTRs and audio recorders using SMPTE time code for accurate frame by frame editing, and upgrading existing tone editing systems for SMPTE time code compatibility.

The 4220 is packed in a rugged metal case the size of a transistor radio and is designed to survive the rigors of everyday continuous use in the tape room or production studio. It is fully compatible with all SMPTE time code editing equipment and sells for \$495. For complete information circle reader service number or contact: The BTX Corporation, 438 Boston Post Road, Weston, Massachusetts 02193.



NEW INEXPENSIVE FLATBED EDITORS FOR 16mm AND SUPER-8

Cinematics introduced its new film editor at the SMPTE Convention in New York last fall. The compact flatbed retains most of the convenience features of the large expensive machines in an inexpensive portable unit.

The basic four-plate chassis accepts modular Super-8 or 16mm picture and sound heads in any combination. A single lever controls all film motion in forward and reverse at sound speed and high speed, with instant stop from any speed. The two film strands are mechanically interlocked via individually switch-selectable electromagnetic clutches; they may be hand inched individually or interlocked. Each strand has its own footage/frame counter.

The Cinematics is exceptionally easy to use. The simplicity of the controls described above is possible because of

the hassle-free belt takeup system, which is extremely gentle to film. The threading path is simple, and in spite of its compact size, the top worksurface of the machine is roomy enough for a splicer.

The audio system features two separately controlled input channels for playback from fullcoat or stripe magnetic film. A headphone jack is provided.

The high-contrast rear-projected picture is 4 x 5-1/8 inches for 16mm, and features a low-flicker 12-sided polygon prism optical system. The Super-8 picture is 3 x 4 inches. Either size film may be front-projected on a wall screen by removing the rear-projection screen housing.

Total weight of a complete machine is under 35 pounds. Enclosed in its portable carrying case, it is within size and weight limitations for shipment via any of the common carriers, or as checked baggage.

Price varies according to options chosen. Typical Super-8 machines are priced around \$2200; 16mm machines are about \$2800.

A detailed illustrated brochure and price list is available from: Cinematics, Inc.; Box 16045-B; Baltimore, MD 21218; (301) 889-7900.

UNIQUE SUMMER FILM-MAKING SEMINAR AT U.S.C. AND UNIVERSAL STUDIOS

Filmmaking can be learned in both classroom and studio settings through the University of Southern California-Universal Studios Summer Cinema Program offered June 27 to Aug. 6.

The one-of-a-kind moviemaking workshop — with sessions at USC and at Universal Studios — is open to undergraduates, graduates and non-cinema majors.

More than 450 students from around the world have participated in the USC-Universal program since it began in 1966.

Enrollees in the six-week summer program attend lectures two days a week at Universal and spend the remainder of the week in workshops and classes at USC.

The eight-unit program consists of a seminar in motion picture business conducted by Universal executives and specialists in various aspects of filmmaking and an 8mm film workshop in which each student makes two 8mm films under the guidance of USC faculty.

In addition, students take a course in the history of motion pictures, film

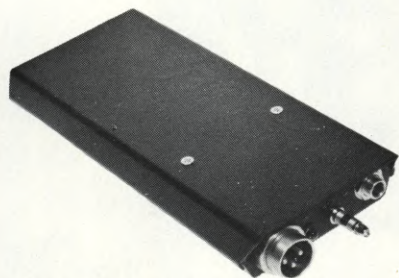
Continued on Page 400

Swintek prides itself on being the leader in its field. Over the past three years Swintek has contributed more improvements to cordless microphone technology than any other manufacturer. Each has been designed not only to provide optimum equipment reliability, but also for greater operational convenience, advanced audio quality and reduction in size and weight of all components, all vital considerations in choosing a RF cordless microphone system.* Check these reasons why professionals prefer Swintek:



✓ **Crystal Front End and Six Pole Filter in Intermodulation Frequency Circuit.**

These exclusive Swintek features allow frequency spacing to be reduced to 50KC with the units in physical contact without interference or spurious noise problems. As many as 35 units have been operated simultaneously. This is not possible with any system except Swintek.



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The usual procedure for setting the transmitter audio level by listening at receiver position is replaced and simplified by utilizing an LED in the transmitter to set the highest possible audio output without compression for the widest dynamic range. The compressor circuit is thus used only to control unexpected peaks.

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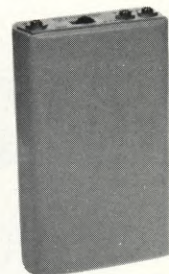


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✓ **Improved Single Wire System for Connecting Battery to Transmitter Board.**

The battery harness system common to most equipment and subject to breakage because the exceedingly small, thin wires are flexed in battery replacement have been replaced by a single wire system which is never flexed, thus eliminating breakage.

Call us today and let us tell you more about the industry's most outstanding cordless microphone system — Swintek. And, see us at the Northwest Film Seminar in Seattle in May and the SMPTE Convention in Los Angeles in October.

* — All Swintek systems are in compliance with the latest FCC regulations for legally licensable radio frequency cordless microphone systems.

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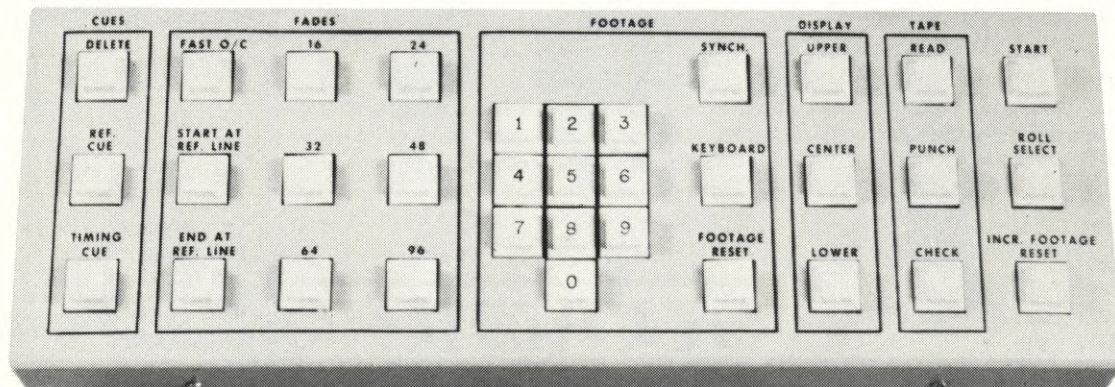
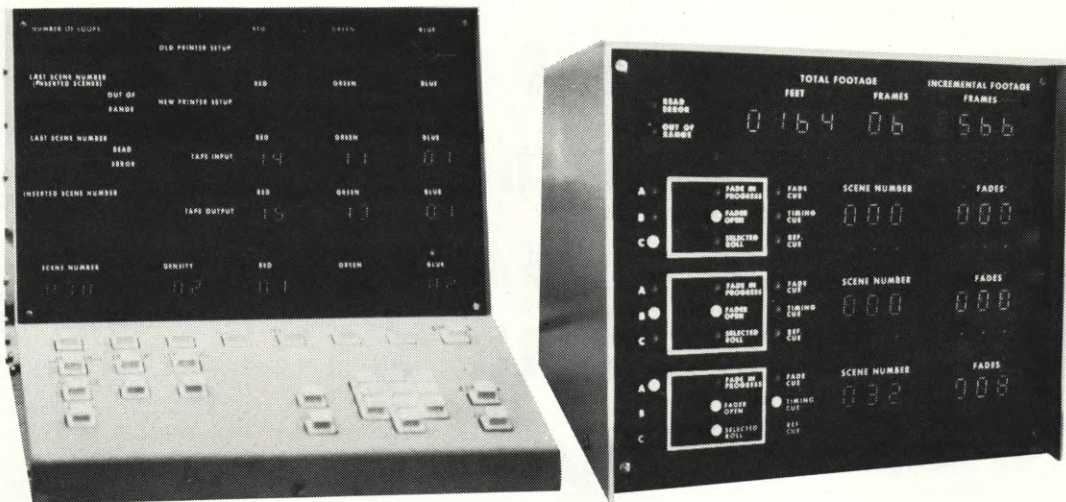
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16SR and Zeiss — a camera system.

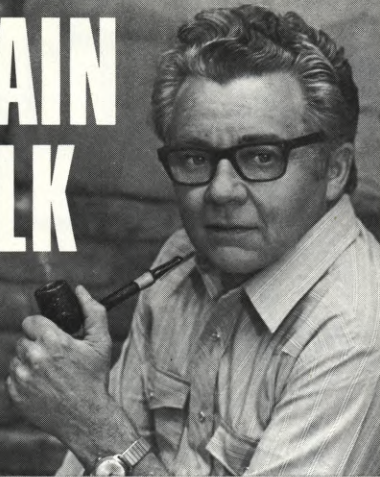


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PLAIN TALK



by *J. Carl Treise*

When money's tight, it's good sense to ask yourself "Do I buy a new processor or rebuild the old one?"

Before you shell out a lot of dough for a shiny new model, I suggest you take a fresh look at your old film processor.

You may discover that you've got more going for you than you realize.

In the first place, your present unit might have plenty of good machinery left in it. Many parts in a processor don't usually wear out. Besides, you've got a big bundle of money tied up in it, most of which you aren't going to get back if you sell or trade it in.

It may be possible to modify your old equipment and give you exactly what you're looking for.

Often all it takes are a few new accessories . . . or a new drive system . . . or a change in the tank set-up.

And the cost is peanuts, in comparison to the price of a new unit.

So, before you take the leap, talk it over with your production people and decide what you want. Then make a few calls around. You might find out that "Old Betsy" will do just fine and you'll keep a lot of money in your own pocket. Which is where it should be.

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QUESTIONS & ANSWERS

Conducted by CHARLES G. CLARKE, ASC.
and WINTON HOCH, ASC.

(Inquiries are invited relating to cinematographic problems. Address: Q. & A., AMERICAN CINEMATOGRAPHER, P.O. Box 2230, Hollywood, Calif. 90028.)



Q I have been working with 16mm for some time now and would like to make a film with the anamorphic system. I have a Bolex H-16 reflex and a Pan-Cinor 17-85 zoom lens which I'm very attached to. Is there any anamorphic lens attachment large enough to cover the entire front element and keep a clear perfect image throughout the zoom range? Also, can I put something in the viewfinder of my lens to unsqueeze the picture and still use my coincidental image focusing system successfully?

A We know of no anamorphic lens attachment large enough to cover the entire front element as you have desired for 16mm application. There is available the Sankor anamorphic attachment for mounting in front of a regular prime lens. I understand this unit must be independently focused. This unit is sold through The Filbert Company, 1100 Flower St., Glendale, CA. It is possible to unsqueeze the picture through the viewfinder. Some professional cameras have this ability. An unsqueezed image for viewing is most desirable but not really essential.

Q When I first arrived in East Africa I used Eastman Kodak ECO 7255 for my filming. However, because of availability, shipping and processing problems I soon switched to Agfa-color CT-13. Now the first few hundred feet of my edited film will have a mixture of ECO and CT-13. Two questions: 1) What problems, if any, will be encountered by the laboratory when a projection print is made from the original edited film? 2) If I were to use the original edited film for projection, how could the ECO be processed? The CT-13 can be used for projection but the ECO cannot. It is too flat and the emulsion unprotected and very easily scratched. If a print were made from the ECO I understand that the emulsion would be on the opposite side of the film and, therefore, the print or copy could not be mixed with the original CT-13. Is there a solution to this problem?

A The answers to both your questions are:

- 1) The problem you will encounter at the laboratory when you attempt to

make a projection print from your edited film could be nothing worse than the difference in contrast that you are already aware of. This variation will be undesirable from the viewpoint of a sophisticated filmmaker like you but will probably be acceptable to the average audience.

- 2) If you can put all your ECO scenes together into a single roll, you could make a print on a low contrast reversal film and use this to make a "print from a print." The reversal film that you use should be of a low or medium contrast so that the "print of a print" will have the right contrast to match the Agfa color CT-13. By going through the double duping process, you will obtain material that can be mixed with the original CT-13.

If you find this kind of manipulation impossible to obtain in Kenya, then you should send your job to a complete service laboratory like those in London where they could solve your problem by methods similar to those I have outlined.

The extra generation necessary to obtain uniform contrast will not cause such a serious loss in quality as to be objectionable.

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for instance**

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When results count in your dailies and release prints, you can count on Mike Crane and Deluxe to deliver what you want.

when you have good people working for you, it shows.

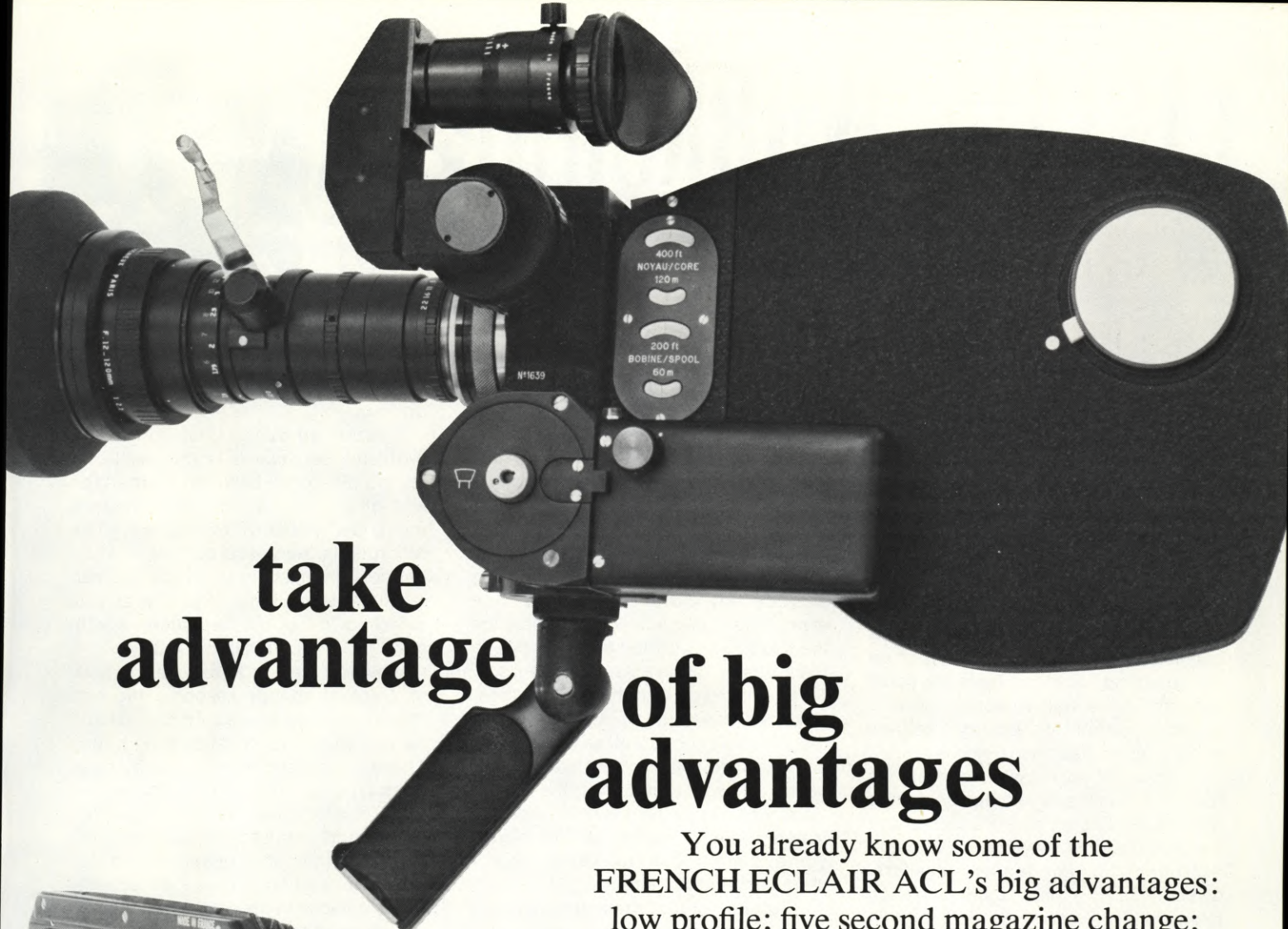
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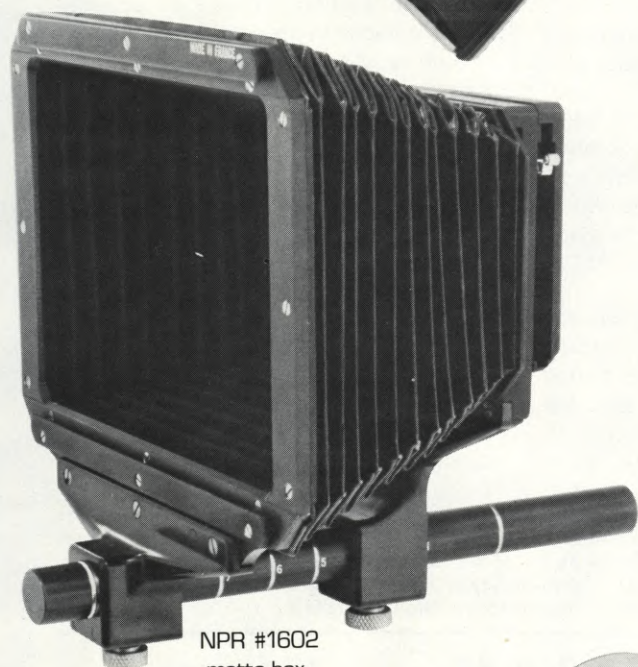




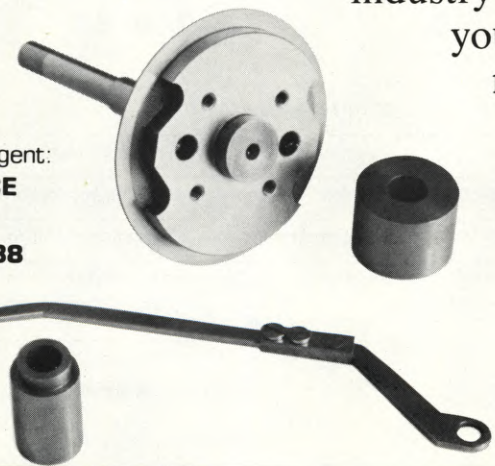
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CINEMA WORKSHOP



By ANTON WILSON

AUDIO BASICS — HEADPHONES

Bless the sound stage. The command is given: "Quiet on the set!", and silence permeates every cranny of the studio. The recordist is in his element, a 24 dB acoustic fortress of thick concrete walls and double doors that protects him from the most severe sonic attacks. In this environment the soundman can forget the mundane sounds that plague the real world. He is free to concentrate on his technical and more creative tasks. What a trauma it is when the soundman is thrust from the sonic security of his walled womb. What a shock to confront the plethora of sounds of a myriad of diabolical devices.

Deprived of his massive fortress, the recordist must now engage in jungle warfare, employing guerrilla tactics and the latest sonic weaponry: shotgun microphones, condenser lavaliers, diversity radio mikes, dynamic-range expanders, et cetera. An entirely new set of problems exist in the outside world and an entirely new set of techniques must be developed to cope with it.

The most important piece of equipment the soundman has is his ears. It follows that the second most important element is his earphones, which connect those ears with the remainder of his sound system. The soundman will undoubtedly spend inordinate amounts of time and spare no expense in selecting a recorder, mixer and microphones. Yet it is the headphones with which the recordist ultimately defines the quality of the recording. It is fairly obvious that good monitoring headphones have a wide and smooth frequency response and low distortion. However, the most important aspect of monitoring headphones is often overlooked; *acoustic isolation*.

By employing directional microphones and close microphone techniques, the soundman can greatly modify existing sonic conditions. In order to evaluate the effectiveness of his efforts, the recordist must be able to differentiate between the sounds coming through the system, and those that hit the ear directly by "leaking" around the headphones. There is really no way to tell which is which. This can

be an exasperating problem. Recently I was shooting a documentary piece near La Guardia airport in N.Y. for a T.V. network. This particular shot was an outdoor interview between a network personality and a single subject. My soundman used a condenser lavalier on each, placed very close to the mouth. One would think that this technique would allow the voices to override any extraneous noises. Yet, every time a plane flew in the distance the soundman aborted the take, due to the intrusion of the noise into the track. This occurred a half-dozen times. Needless to say, this put a damper on the proceedings, as well as wasting film and time. Ironically, upon later examination, it was found that the sound track was absolutely clean. In not one instance did the sound of the planes come even close to being objectionable. What is the mystery?

It turned out that the soundman was using stethoscope-type headsets with foam ball earpieces. These offer *no* isolation whatsoever. The soundman was hearing the sounds of the planes directly, not through the microphones. He obviously could not tell the difference, thinking the sounds of the plane were actually in the sound track. In this case, the soundman thought a noise was in his track that, in reality, wasn't. However, the opposite condition is more disastrous. An unwanted sound can slip by the soundman into the track, masked by a loud ambient condition and headphones with poor

isolation. Back in the preview room these unwanted sounds will be quite obvious.

There is an obvious solution to this problem. Because it is impossible to tell the difference between off-the-tape and direct sounds, the direct sounds must be virtually eliminated. The recordist is then assured that what he hears is definitely in the track and can evaluate accordingly. The first step is selecting a set of headphones with good isolation. This is the ability of the mechanical design to reduce the level of ambient sounds reaching the ear. "Open Air"-type headphones should never be used for location monitoring. These units are characterized by open foam-type ear cushions. While they are quite comfortable and provide excellent sound for later studio or home playback, they offer absolutely no isolation. In addition, they can actually cause an echo in the sound track due to off-the-tape sounds leaking out of the headphones and back into the microphones.

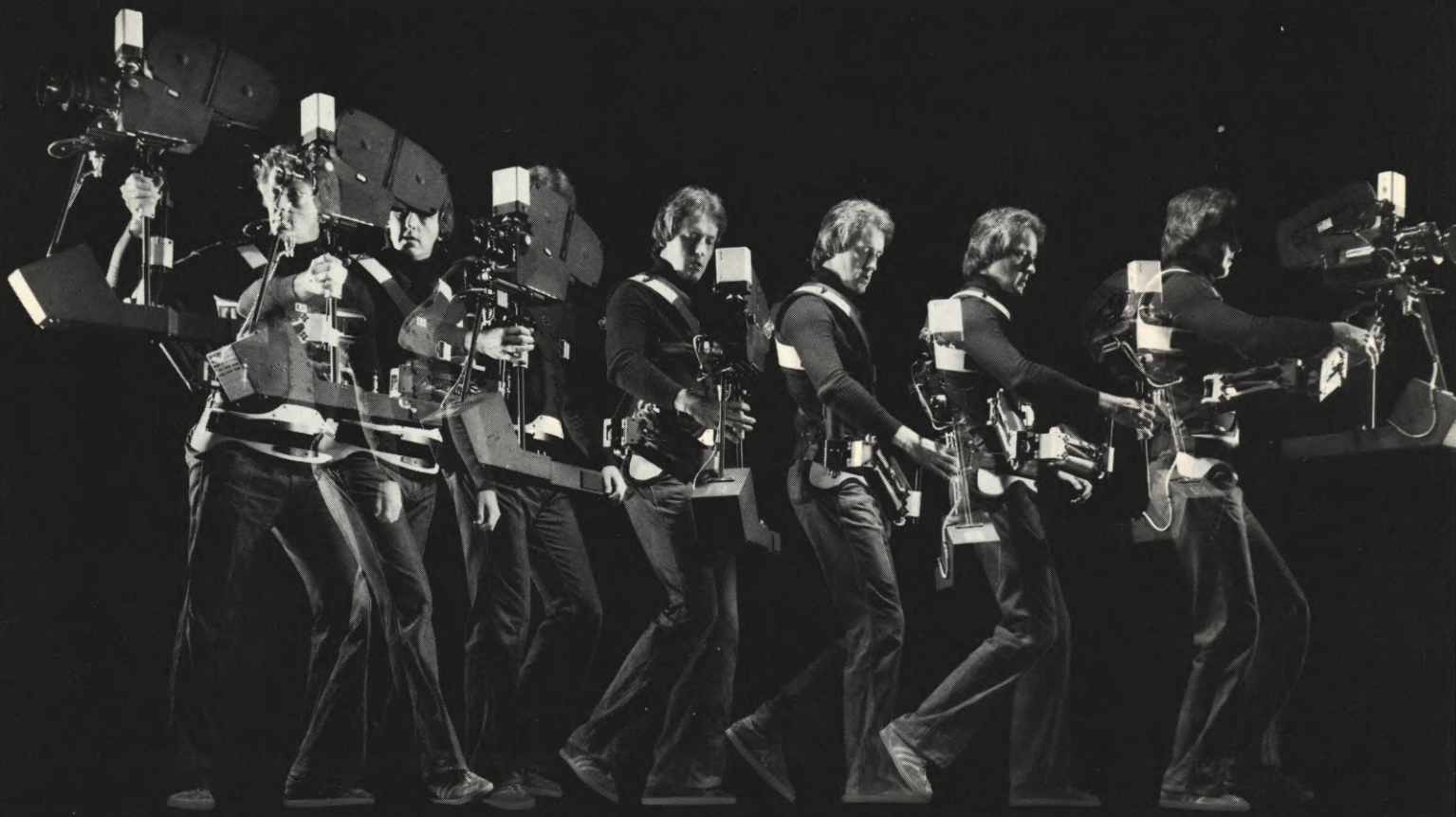
Almost all non-open-air headphones offer at least 10 dB of isolation. For monitoring purposes an isolation of 20 dB or better is preferable. Some headsets provide in excess of 30 dB of isolation. However, a compromise may have to be reached between size, weight and isolation. Certainly a reasonable balance of attributes can be found in a headset that still provides 20 to 25 dB of isolation.

Continued on Page 438

The table below illustrates in numerical terms why some headphones are better than others for monitoring the recording of location sound tracks. The first step is to select a set of headphones with good isolation. This is the ability of the mechanical design to reduce the level of ambient sounds reaching the ear. "Open-air"-type headphones, which offer an isolation factor of less than 10 dB, should never be used for location recording.

TABLE 1

ATTENUATION OF AMBIENT NOISE	DEGREE OF ISOLATION
10 dB	— Minimum isolation for circumaural type headphones
11 — 15 dB	— Fair isolation — not for monitoring applications
16 — 19 dB	— Fair to good isolation — May be acceptable for certain monitoring applications
20 — 25 dB	— Good isolation — Sufficient for most critical monitoring
26 — 30 dB	— Superior isolation — maximum amount of isolation commercially available



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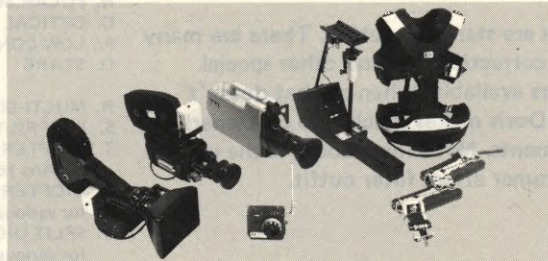
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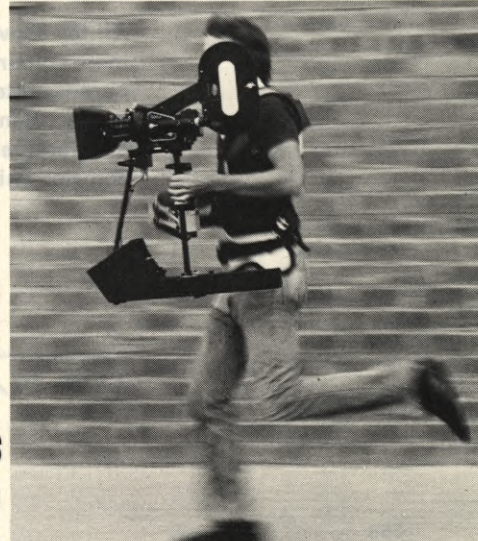


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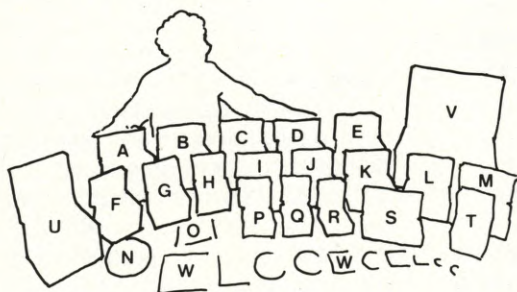
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| C. COLOUR CORRECTION | 81EF, 81EFN.3, 81EFN.6, 81EFN.9 |
| D. GRADUATED | ND.3, ND.6, ND.9 to clear |
| E. NEUTRAL DENSITY | ND.3, ND.6, ND.9 |
| F. DIFFUSERS | 1, 2, 3, 4, 5 |
| G. DIFFUSERS | A, B, C, D, E |
| H. VARIABLE DIFFUSERS | A, B, C to clear |
| I. LIGHT FOG | 1/8, 1/4, 1/2 |
| J. REGULAR FOG | 1, 2, 3, 4, 5 |
| K. DOUBLE FOG | 1, 2, 3, 4, 5 |
| L. BLACK NETS | 1, 2, 3, 4, 5 |
| M. WHITE NETS | 1, 2, 3, 4, 5 |
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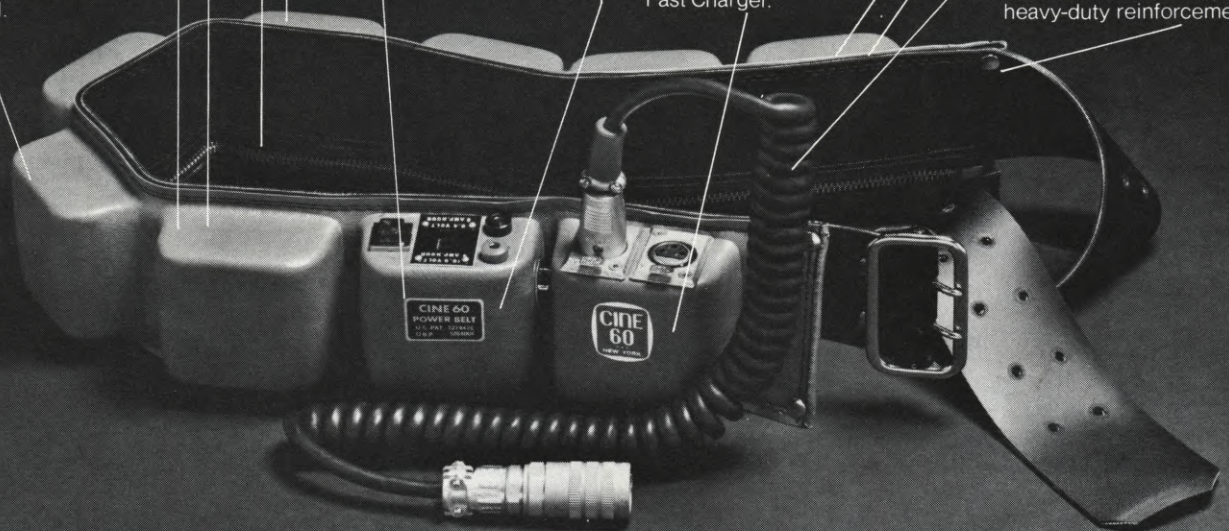
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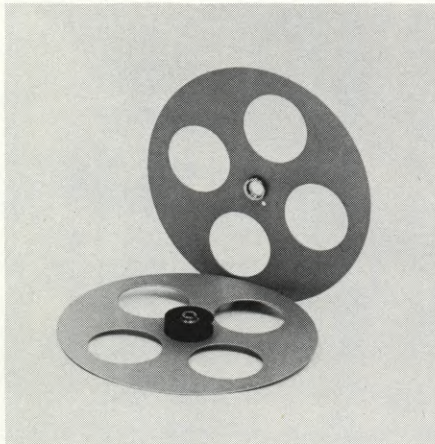
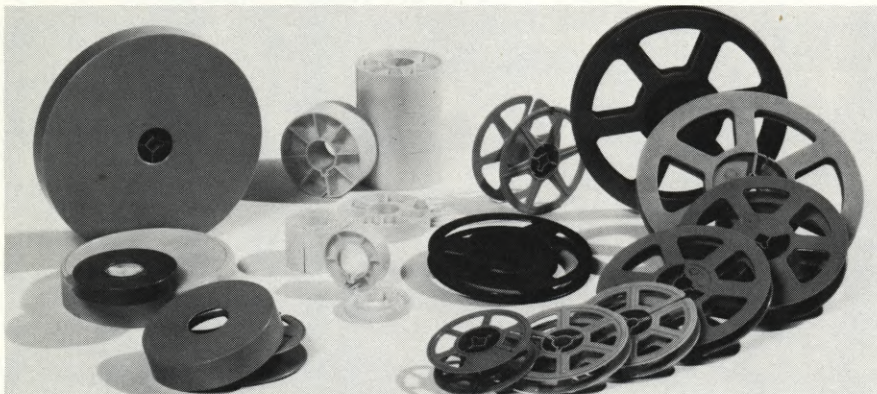
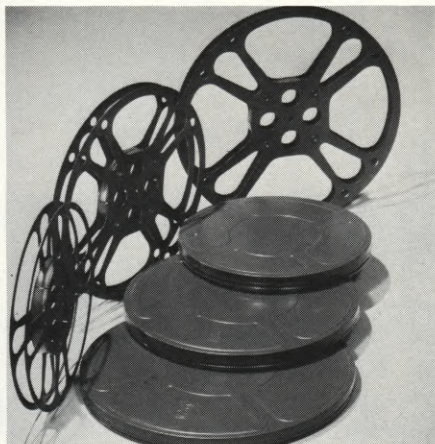
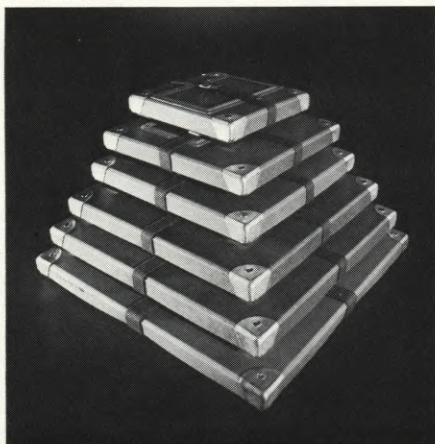
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THE BOOKSHELF

By GEORGE L. GEORGE

HISTORICAL PERSPECTIVES

Bosley Crowther, who served so long with distinction and credibility as film reviewer for the N.Y. Times, has judiciously assembled in *VINTAGE FILMS 50* movies he considered of lasting greatness. (Putnam \$15.)

How U.S. films depict our northern neighbor is rapped in Canadian author Pierre Berton's unsparing book, *HOLLYWOOD'S CANADA*. Inaccuracies, distortions, caricatures and downright libels are fully documented in an indictment that should minimize future misconceptions. (McClelland & Stewart \$13.95)

Indefatigable Kemp R. Niver, assisted by Bebe Bergsten, continues to explore Hollywood's past in a new book, *KLAW & ERLANGER PRESENT FAMOUS PLAYS IN PICTURES*. This fascinating and meticulously researched work deals with K & E's highly successful 1897 film, *The Passion Play*, and their later movie productions. (Locare \$13.95)

In *THE GREAT WESTERN PICTURES*, James Robert Parish and Michael R. Pitts provide a detailed survey of the genre, listing cast-&-credits, plot synopses and critical analyses of over 300 representative films. Data on outstanding Western personalities, radio/tv programs and novels add to the book's interest. (Scarecrow \$16.50)

Alvin H. Marill's comprehensive study, *SAMUEL GOLDWYN PRESENTS* documents the 80 films he produced between 1923 and 1959. Knowledgeable and entertaining, the book includes tills of Goldwyn's stars and principal collaborators. (Barnes \$19.95)

In *CLOSE UP: THE CONTRACT DIRECTOR*, editor Jan Tuska assembles lively and informative essays on 10 directors, among them Howard Hawks, William Dieterle, Lewis Milestone, Walter Lang, Bruce Humberstone, who were under exclusive studio contract in Hollywood's halcyon days. (Scarecrow \$17.50)

Nancy Warfield's *HANGIN' IN WITH THE HOLY GRAIL* reports on the 1976 Sun Valley Western Film Conference. An "affectionate" memoir, perspicacious, well illustrated, it explains the continuing popularity of the genre.

(Little Film Gazette, 227 W. 11 St., NYC 10011; \$4.95)

Henry Random evokes movingly in *MEMOIRS OF A MOVIEGOER* the Depression of the 30's when, as a youth, he could escape harsh reality only in the excitement of the darkened halls. (Editorial Service Bureau, 730 E. 236 St., NYC 10466; \$3.50)

THEORIES AND TECHNIQUES

A substantial and comprehensive guide, John M. Wozam's *THE RECORDING STUDIO HANDBOOK* charts the creative sound engineer's way through today's complex recording technology. Theory, equipment and procedures are thoroughly examined via text and illustrations. (Sagamore \$35.)

The director's personal stamp on a film and the movie reviewer's perception of it are among the points raised by William Luhr and Peter Lehman in *AUTHORSHIP AND NARRATIVE IN THE CINEMA*, a critique of the film reviewers' failure to expand their craft from the merely personal to the generally esthetic. (Putnam \$8.95)

Reviews excerpted from 27 major U.S., British and Canadian periodicals covering some 300 movies released between Fall 1975 and Summer 1976 are culminated from the quarterly *Film Review Digest* in *FILM REVIEW DIGEST ANNUAL 1976*, edited by David M. Brownstone and Irene M. Franck. Over 1500 critiques are thus presented in a meaningful cross-section of leading publications and offer invaluable information to scholars, researchers and buffs. (KTO Press, Rte 100, Millwood, NY 10546; \$35., with quarterly \$45.)

Bruce Bahrenburg, observing from start to finish the production of *King Kong*, records and illustrates this almost incredible story in *THE CREATION OF DINO DE LAURENTIIS KING KONG*. (Pocket Books \$1.75)

Edited by Leonard Wolf, *THE ANNOTATED DRACULA* lists no less than 16 movies based on Bram Stoker's novel and reprints the book itself with a wealth of information on the history of vampirism and other manifestations of the Victorian age. (Ballantine \$5.95)

In *THE SCIENCE FICTION BOOK*, Franz Rottensteiner devotes several informative chapters to sci-fi in films and on TV in this broad study covering themes, authors, countries and a chronology. (NAL \$6.95)

A complete directory of the popular TV series, Bjo Trimble's *STAR TREK CONCORDANCE* gives the plots of its 100 episodes, listing protagonists and s-f gadgetry, and describing them in an elaborate lexicon. (Ballantine \$6.95)

FAMOUS NAMES IN THE NEWS

Actress Liv Ullman tells candidly of her career in *CHANGING*, a perceptive record of her emotional life, but somewhat short on her acting experiences. (Knopf \$8.95)

Deftly transcending nostalgia, Sheridan Morley gives us *MARLENE DIETRICH*, a critical profile and biography of the perennial screen idol. (McGraw-Hill \$6.95)

An unusually insightful biography of six actresses on their way to stardom in the 30's (Ginger Rogers, Loretta Young, Miriam Hopkins, Kay Francis, Ruth Etting and Irene Bentley) is told by George Eells in *GINGER, LORETTA AND IRENE WHO?* (Putnam \$8.95)

In *DALTON TRUMBO*, Bruce Cook writes with understanding and sympathy about the Oscar-winning scriptwriter who broke the Hollywood blacklist, and the adventurous outlook which inspired his activities in and out of the film industry. (Scribners \$12.50)

A documentary portrait by Norman Swallow, *EISENSTEIN*, follows the turbulent life of the Soviet director as seen through the eyes of friends and collaborators. (Dutton \$3.50)

In *KEATON: THE SILENT FEATURES CLOSE UP*, Daniel Moews singles out hitherto overlooked angles, e.g. sexism and racism, in a stimulating and original approach to Keaton's work. (U. of California Press \$11.95)

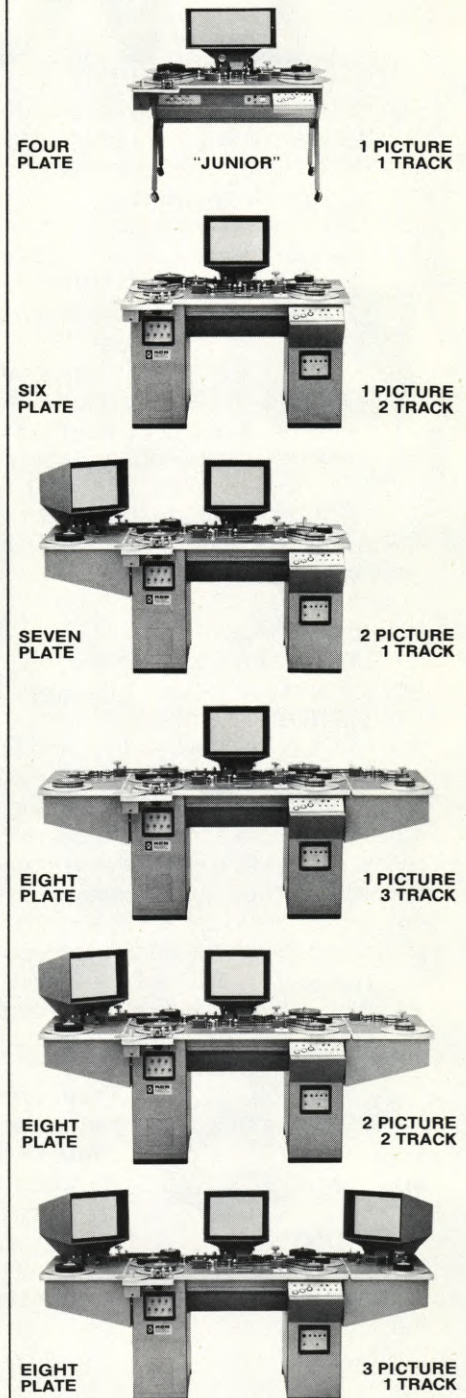
The frenetic life of matinee idol Maurice Barrymore is recounted by James Kotsilibas-Davis in *GREAT TIMES, GOOD TIMES*, a book as rousing as its extravagant subject. (Doubleday \$12.95). Coincidentally, a reprint of John Barrymore's *CONFESIONS OF AN ACTOR*, first issued in 1926, describes humorously turn-of-the-century stage life and the early lure of the movies. (Arno \$9.75)

Doré Previn's harrowingly super-sensitive autobiography, *MIDNIGHT BABY*, reveals the Academy Award winner for song scores as the abused child of a mentally ill father, but who somehow manages to pull through to a fragile adjustment to life. (Macmillan \$8.95)

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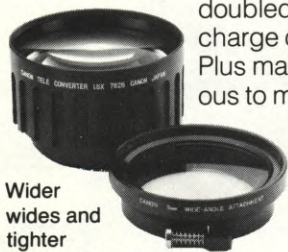


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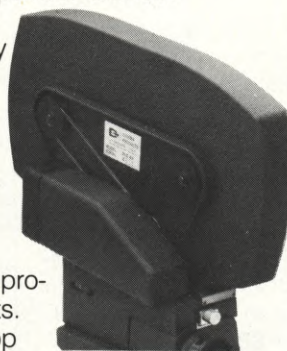
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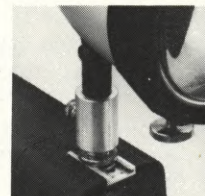
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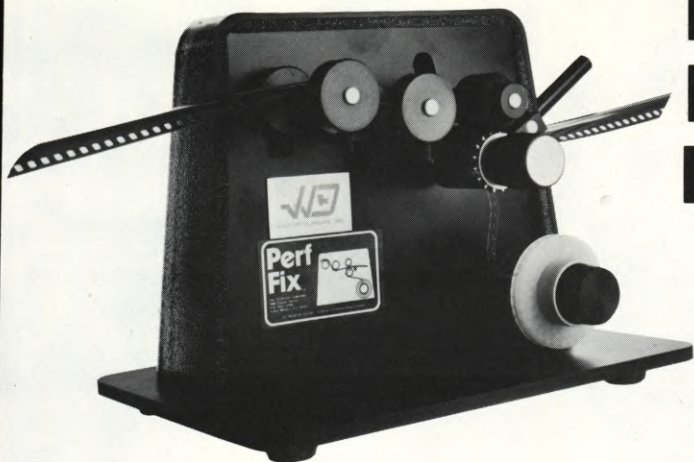
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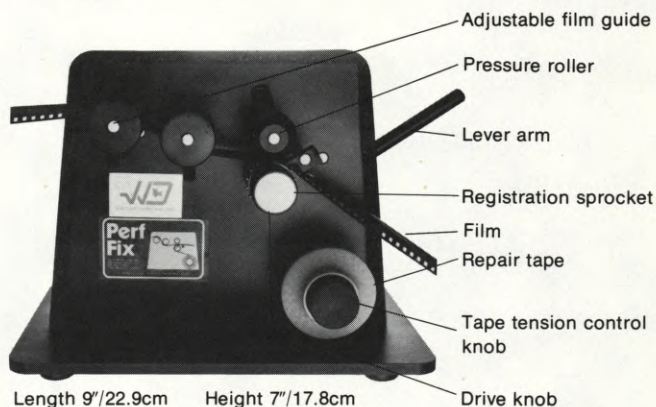


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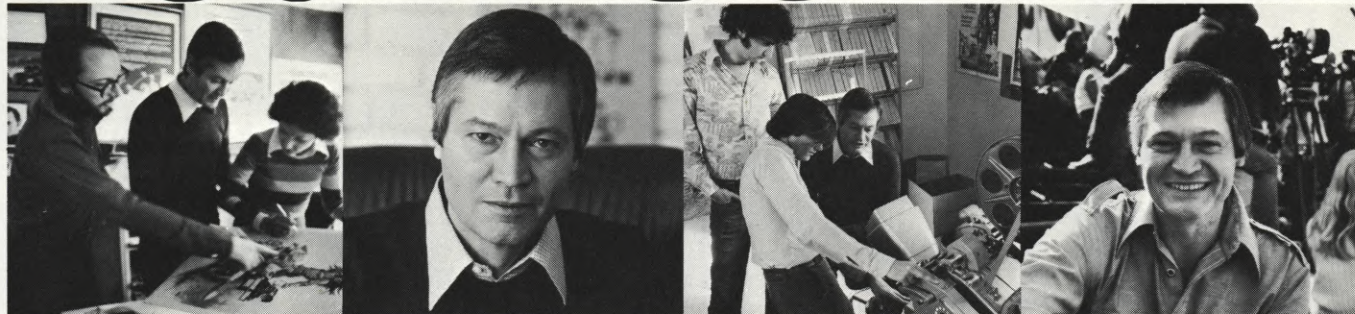


HALLOWEEN

VALVOLINE

HALLMARK

ROGER CORMAN



Coppola, Nicholson and Bogdanovich—these are among the major talents that you helped get started. How about your own career? How did you start?

After graduating from Stanford, I got a job as an engineer. After four days I knew it was a total mistake. What I really wanted was to make movies. So I went to work at Fox as a messenger. It wasn't too long before I was writing screenplays and directing. Then I became an independent producer. And then I opened my own company, New World Pictures.

What do you look for in a new director or writer?

Intelligence. The people I am dealing with must be intelligent. They must also have more than just an interest in films. It's more like a vocation. The best filmmakers have a need to make films.

How about the new young cinematographers?

Because of our budget restrictions, we want cinematographers who can work rapidly and still give us quality. We've had some outstanding cameramen start with us. Several have gone on to win Oscars. I've always liked to experiment with new types of film. I remember using different emulsions for different psychological effects. If I have any questions about film, I just call your local Kodak office. I'm generally the first in Hollywood to work with each successive generation of Eastman film. The Kodak people have always been very helpful,

Les Baker in particular. He also keeps me up to date on Eastman release print stock. This is important because when we distribute foreign films, we make all our release prints here. This way, I can be sure I'm getting the best quality.

How would you describe your company?

New World Pictures, now five years old, has become, somewhat to my surprise, the largest independent producing and distributing company in the country. We've produced and distributed fifty-three pictures. Films that range from "Death Race 2000" to "Cries And Whispers" and "Amarcord." We've won Academy Awards in each of the past two years. Because we distribute fewer films than the majors, we feel we can give each one specialized handling. My lawyer, who is a woman, describes us as a boutique as opposed to a department store.

Is it true you made a bid for "Cries And Whispers" without having seen it?

Yes. When it was first offered, all the major companies passed it up.

I've always admired Ingmar Bergman's work, so when I heard it was available, I made a bid. The film was brilliant and went on to win many awards. Bergman was delighted with our distribution pattern. After the art theaters and regular hard-tops, we put it into drive-ins, bringing his work to audiences that had never seen it before. Incidentally, it went on to become the highest grossing film he's had in this country.

How many projects are on this year's schedule?

I like to give each picture personal attention, so New World will handle no more than ten to fifteen pictures. Again, they're going to be either very commercial or pure art films ranging from a youth-oriented film starring Ron Howard called "The Car," to the new Francois Truffaut film, "The Story Of Adele H." The average run-of-the-mill film is something I'm definitely not interested in. As for the future—we're working with some extremely talented young people, and feel that our best films are still to come.

If you have any questions about film, do what Roger Corman does, call your local Kodak Sales and Engineering representative.

The people who staff the Kodak regional offices are all exceedingly knowledgeable, involved men and women who are constantly aware of the needs and activities of the industry. They are there to assist in every way they can; to provide information, solve problems, or serve as technical consultants.

And for a free copy of this and other interviews, send for our booklet. Write Eastman Kodak Company, Dept. 640-D Rochester, N. Y. 14650.



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BRING BACK A WINNER: ABC'S FILM-PLUS-TAPE SPORTS COVERAGE

ABC Sports combines film and video tape coverage with 14 cameras on one of the most difficult downhill ski races in the world. One camera steals the show!

By **ROBERT RIGER**

Our January assignment sheet at ABC Sports showed a pick-up of the famous Hahnenkamm Downhill ski race in Kitzbuhel, Austria, to be held Saturday, January 15, 1977 and aired on ABC's *Wide World of Sports* the following Sunday, January 23. The program would be produced by Doug Wilson and I would direct the ABC nine-camera coverage and combine it with the tape coverage of five ORF Austrian cameras covering live that day in the host country. Fourteen cameras from the top of the mountain to the finish — eight film and six electronic. My job was to make it look like one race so the viewer would not know which was film or which was tape, not see a change from a cinematography point of view or style to a video point of view or style and not be aware of a quality change on the screen. Our one dedication was to the speed of the racer down the treacherous downhill course and any mis-

fortune he might encounter along the way.

Our discipline at ABC Sports, as developed by Executive Producer Roone Arledge, is dedicated to the integrity of the sport; its particular character and excitement, the accuracy of the event within that sport, and the scope of each performance — from the grandest perspective of the scene to the most personal thinking expression in the eyes of the athlete. The World Cup race in Kitzbuhel was a piece of cake.

Our telecast of the famous Hahnenkamm Downhill World Cup race in Kitzbuhel was covered with eight film cameras along the top of the difficult course where the start drops from 1680 meters (opposite page, top left). Cameras were taken to some positions along the 3.5 kilometer run by helicopter (center left). ORF, the Austrian Network, has its trucks at the bottom of the mountain (lower left) as they covered the final section of the course with four fixed electronic cameras and one hand-held video camera.

The Austrians did a "here they come to the finish" type of live coverage, but had no interest in the drama at the start or in the town (lower right) or close-up stories of the top racers as we did. The world's best downhill racer, Austria's Franz Klammer (No. 1), and

Andy Mill of the U.S. (bottom center) were covered by ABC's ENG unit with video cameraman Bill Sullivan (top right). Producer Doug Wilson (in Stetson), announcer Jim Lampley and engineering head Joe DeBonis watch an ENG interview (top center) and Director Robert Riger plays difficult exit of tough turn to film cameraman Jon Hammond, before race (bottom center). Communications and time between skiers was all-important, as many racers appeared from a blind approach along steep terrain (middle right) and cameras had to be rolling before skier entered frame. (Photographs by Robert Riger.)

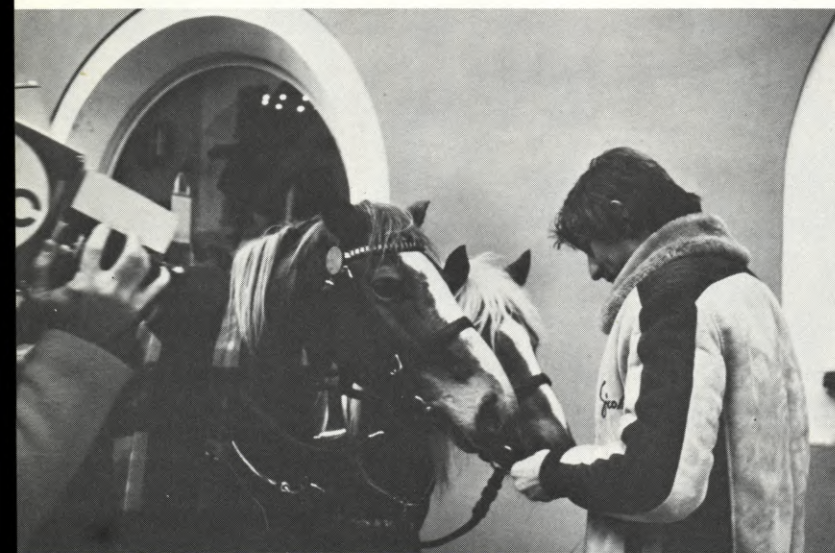
This exciting downhill event was to test for the first time a half-and-half pickup. Film cameras and tape cameras, intercut, covering the action on each racer. Kitzbuhel would also serve the ABC production and engineering people with a critical test for the ENG portable video tape camera. We used an HL-35 and older version of the newest HL-77 portable video camera.

We used an assortment of film cameras, Arri S, Arri 16 BL, Eclair ACL, Milliken, Photosonics and Eclair NPR. Each camera played for the setting so that the racer could be seen against a recognizable part of the course instead of being isolated against snow in a closeup. The wide approach also increased the illusion of speed and proved a better match to the Austrian pickup at the bottom.

The first use of the ENG was from the helicopter and covered the tour of the course. Intercut with this we used a film POV from skier D'Arcy Marsh who was Camera 1 on race day. The viewer could clearly see the downhill course and "feel" the speed of the racer through difficult sections.

Continued overleaf





Our shooting schedule of feature sequences called for a *tour of the course*, to run about two-and-a-half minutes, a *Franz Klammer interview* of about the same length, a *Klammer walk in town*, and a look in the *Austrian ski room* — each to run less than a minute. All three were done with portable video tape — our battery-operated ENG unit.

At top left, commentator Bob Beattie does an interview with Franz Klammer, the Olympic gold medalist, in glass-enclosed restaurant patio at the base of the course. The Austrian ace is seen with sleigh horses as part of the street sequence (PICTURE 2), and both were completed in existing light and built-in sound in less time than it took the camera crew to load its army sled and get up the hill the morning of the race (PICTURE 3). The most successful use of the ENG unit for color, sound and use of available light was in the Austrian ski room (bottom left). Located in a basement room with only the workbench lights, the color mood and sound were superb. The depth of field extended from the ski binding in extreme foreground, to trainer in middle ground, to far wall 30 feet beyond.

It's my belief that no color film or film camera could have done either of these sequences as well or as fast. This HL-35 video camera is quite amazing because it allows you the 6 dB or 12 dB of gain that will give you the extra video signal to achieve an air-worthy picture under very low-light conditions. In other words, it takes the normal video signal and increases it three or four times and stretches it. But it is remarkable, because there is no loss in color quality. In fact, in that magical way the electronic color is enhanced and, since color achieves mood, you record the setting, not a *suggestion* of the setting as you do in a quick film pick-up where you are forced to move lights around, changing the existing light, or are boxed into a corner you "set up" so that the dimension of a place is lost.

At 3:30 on a January afternoon in Europe along a narrow old town street in deep shadow, the reading for 7239 was either wide open, which defeats the whole idea of doing a street scene, or "push two stops", which turns everything to grey gum. The flags of all nations, the pastel colors on the fronts of the 16th-century Inns, the blankets on the horses, the ski parkas were brilliant in color in that subdued light as we watched the playback on 3/4" video tape ten minutes later on the monitor in the hotel bar.

The faces of the film cameramen watching the playback indicated a revealing acknowledgement of the mastery of the hand-held video camera on the sport remotes of the near future. The film camera pickup with lights, crews, slates and special lab developing and then inordinately tedious post production with editing, synching, negative matching and printing is obsolete in sports — when its final use is television.

The electronic instant image, in color quality, clarity and definition, the consistency of sound and maneuverability, is, in my opinion, five times better than on film. The creative guide should be: electronic start — electronic finish, film start — theater finish. Only super slow motion coverage of action at 400 or 500 frames per second requires film origin for later transfer to tape.

I believe the ENG portable video tape coverage in the next 24 months will finally prove totally superior

for the sport remote to any film pickup — especially when adaptors are used that have been developed here in New York for the TKP-76 and the HL-77 cameras to accept all Arri and Nikon lenses. I can have my favorite 5.9mm lens or my pet 600mm. I can have fabulous color and sound, I can see the results in less than a minute and I can play it back fifty times, knowing that when it gets to air it will be untouched, unscratched. And if you want to think conservatively, if there is failure or room for improvement, we can see it, and reshoot it or support the weakness caused by the failure with additional shooting on location and not wait until it comes out of a lab 3,000 miles away — three days later.

I seem to be blessed with the good fortune of being in the right place at the right time when exciting new things are happening in sports journalism. In 1954 my illustrations were published in the first issues of *Sports Illustrated* and after six years I moved over to television and ABC Sports as *Wide World of Sports* began its second year.

I produced and directed for seven years almost entirely in film. I loved film with a passion — and I think the results showed that caring. I did the last black and white film remote, the first color film remote, the first show on the electronic edit tech machines after years of cutting tape with a razor blade on a microscope block. I worked on the first live tape show from Le Mans by satellite and was the first to take an ABC Sports film crew into the Soviet Union in 1967. It was all heady stuff. But in 1971 I stole quietly away to do other television programming because I felt there was little reason to stay with an electronic network when you were working exclusively in film. This year for a special high-speed film assignment at the Montreal Olympic Games I returned to ABC Sports. Now I've returned to network sports as the era of portable tape begins.

1977 should be the last year of film coverage in sports for direct television programming.

I think portable tape should be three years further along than it is, but it takes time for revolutions to get organized. The ENG portable tape unit with a two-man crew using the TKP-76 or the HL-77 is completely maneuverable. They can climb up a ladder, down a mountain, ride a bike, record car-to-car, boat-to-boat, plane-to-plane.

As for the light, portable video tape camera equipment — the cameraman, Bill Sullivan, hand-holds the camera head and wears the backpack and batteries. The video operator/maintenance/tape operator, Bob Hoffman,

handles the slant-track 3/4" tape recorder. To view the 3/4", 20-minute cassette, Hoffman simply plays the recorder directly to a monitor at a base station, which can be at the bottom of the mountain, a small van parked at the curb or in a corner of the "set".

In the near future at ABC we will see a world-wide influence in our ENG portable tape camera installations. Julie Barnathan, the President of Broadcast Operations and Engineering, is very aggressive in all new areas and engineering techniques and the plans are set to expand our ENG equipment in Europe and the United States.

Of course, the cost is a factor, since a network can't combine news and sports; they are two distinct and separate operations. News is always on standby — so if Paris has four ENG cameras it can't give them to Sports to cover a Grand Prix because the Paris bureau must have instant use of all news equipment. Sports is a planned event idea and cameras can be moved from a London base to Amsterdam to cover speed skating or to Tokyo to cover figure skating or to Calgary to do a rodeo — but they must belong to Sports.

On the Kitzbuhel coverage we had two incompatible feeds. One was from ORF which was transmitted from the mountain to Vienna where it was logged by our associate director, Lou Frederick. He then took the ORF tape to London where it was converted on the scan converter from the European lineage (625) to the U.S. standard (525). If you look closely at your television screen you will see that the video picture is composed of hundreds of horizontal lines which give the image its resolution, much in the way dots form the image in a newspaper photograph.

Then the oddball feed of the ENG unit cassette with its 3/4" tape had to be converted to standard 2" tape. The cassette is placed in a time base corrector and the remote tape is transferred to the 2" video tape which is then compatible in all ways with the in-house system.

The 16mm film print and mag stripe is then sent through a film chain and dubber and transferred to the same standards. When all conversions were made from ORF Austria, ENG, and film to our standard broadcast tape, all was compatible and we were ready to edit, which we did in 74 straight hours. All transfers were excellent.

The only thing I would change in the future would be the 7239 film stock, which seems to be the wrong stock for snowscapes. It is much too fast and dull in color. When adding neutral density filters it does not have the snow excite-

ment or beauty that 7252 had — or that 7247 would have. The video film was chosen over the negative stock because of quicker lab service on the Sunday night that we returned from Europe. We locked all racers on the eight cameras at the top and the tour of the course from the helicopter, which was ENG from the air intercut with D'Arcy Marsh POV hand-held while skiing the course, on Tuesday evening — 31 hours after the work print arrived. This included three opticals.

The print was matched Wednesday and printed Wednesday night. The film-to-tape transfer was made Thursday morning. We did our final show edit in 37 hours with announcers layover an additional six hours. Producer Doug Wilson, working with *Wide World* coordinating producer Dennis Lewin, adjusted the show to fit with other action segments and commercials. Most of us flew off for our next assignment as the show aired on Sunday.

In the electronic world you accept more than you do in film. In film a good director will understand — in planning, filming and post production — every single detail of the operation and check on it all. In a complex video tape pickup, the engineering and production support is so specialized that you accept the fact that various conversions must be made — and they are. You are not dealing in creative degrees but in absolute phenomena. You have a picture or you don't; it's air-worthy or it isn't. Once it is perfect you then leave it to the people to get it back to New York so that all components will hold on one system.

It will be interesting to see how the Executive and co-ordinating producers assign directors to use the portable ENG to maximum advantage. There must be a whole new concept of acceptance by producers of the film-oriented camera director, as opposed to the director who has always worked with fixed video cameras. As an example, in football coverage, there would be five fixed video cameras installed in a stadium and one side line hand-held camera that would poke around and get shots on the bench. The producer in the truck might elbow the director and say, "There's a good shot," and it would get punched up, or inversely a well-built cheerleader would get punched up all afternoon. But that is not how the new portable electronic coverage will work. The cameras will work as *coverage* cameras. We are no longer dealing with a "feature" hand-held camera that is not vital to the action.

If we plan our next downhill race to

Continued on Page 401

**ON LOCATION
WITH**



A BRIDGE TOO FAR

**On the Dutch countryside
hundreds of parachutists
jump for the cameras in
reenactment of the worst
Allied disaster of
World War II**

By HERB A. LIGHTMAN

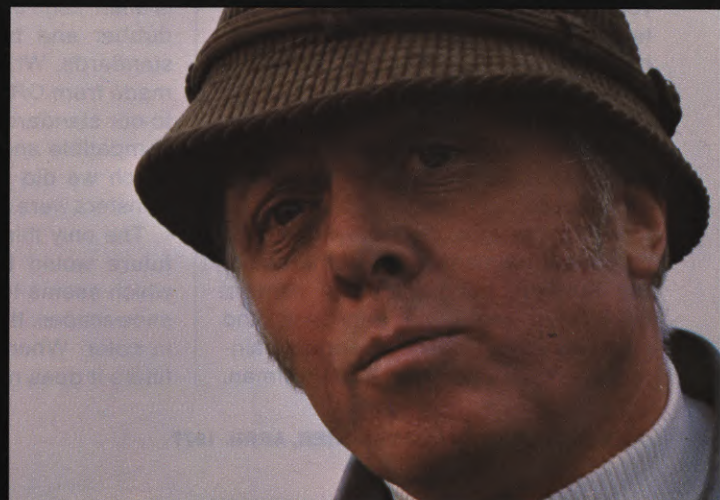
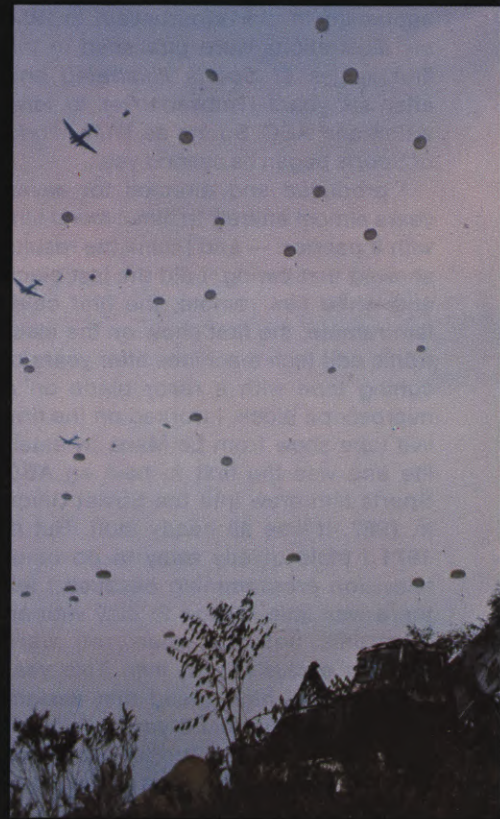
DEVENTER, Netherlands

It's a long haul straight through by air from Los Angeles to Amsterdam, but when I land I find David Samuelson and his daughter, Gail, waiting to meet me and their cheerful company does much to brighten my spirits.

We are all *en route* to witness the filming of massive battle sequences for

Joseph E. Levine's 25-million-dollar World War II epic, "A BRIDGE TOO FAR". Based on the late Cornelius Ryan's international best-seller of the same name, the film chronicles the ill-fated airborne assault code-named "Operation Market Garden" — the largest in the history of warfare — which, during nine hellish days of September,

Planes and parachutes fill the sky over Holland, as one of many jumps is made near Arnhem during the filming of Cornelius Ryan's best-seller, "A BRIDGE TOO FAR". (BELOW LEFT) Old friends meet again. "BRIDGE" Director of Photography Geoffrey Unsworth, BSC, and American Cinematographer Editor Herb Lightman enjoy a reunion on the jump-site location. (RIGHT) Actor-turned-director Sir Richard Attenborough directs the massive war epic.





(ABOVE LEFT) "Sam-Mighty", the giant crane from Samuelson Film Service Ltd. (London) is camouflaged on the jump-site location. (CENTER) Cameraman snuggles among the leaves to man one of the 18 cameras trained on the jump action. (RIGHT) World War II Dakota aircraft in formation to drop paratroopers. (BELOW) In Deventer, Holland, a street of buildings scheduled for refurbishing is taken over for a sequence showing a Nazi patrol moving into Arnhem.



1944, was aimed at terminating the Second World War by the end of that year.

Operation Market Garden, masterminded by Field Marshal Bernard Montgomery and sanctioned by General Dwight D. Eisenhower, was a bold plan calling for 35,000 U. S. and British paratroops to drop into Eastern Holland and to secure the six major bridges leading to the German border. Meanwhile, a formidable British ground force would speed up the 64-mile corridor from Belgium to the last bridge at Arnhem on the Rhine River. From Arnhem, the combined Allied armies would sweep right into the industrial Ruhr section of Germany and smash the already battered war production plants of the Third Reich.

From America came Brigadier General Jim Gavin's veteran 82nd Divi-

sion and Major General Maxwell Taylor's "Screaming Eagles" of the 101st Airborne.

England sent the cream of its "Red Devils" Division and all of the fighting Poles of Major General Stanislaw Sosabowski's Parachute Brigade. On the ground, the tanks and infantry of Lieut. General Brian Horrocks' XXXth Corps were poised for the final drive against a demoralized, retreating German army.

What actually happened — a bewildering mixture of battlefield politics, faulty intelligence, bad luck, worse weather and raw courage — has been grimly documented by Cornelius Ryan. The Allies suffered more casualties in Operation Market Garden than in the entire invasion of Normandy. Field Marshal Montgomery wrote of the men who fought there: "So long as we have officers and men who will do as you

have done, then we can indeed look forward with great confidence to the future. In years to come it will be a great thing for a man to be able to say, 'I fought at Arnhem.'" Others have described the campaign as the worst Allied debacle of the European invasion. Even now, more than thirty years later, military historians continue the debate.

Locations for the film are situated on the real battlefields of Market Garden — at Eindhoven, Grave, Nijmegen and the crucial drop zones surrounding Arnhem. The only newcomer is the 8th-Century city of Deventer, which has become the film company's permanent base of operations. Arnhem itself, with its infamous bridge, is today an ultra-modern bustling metropolis four times its wartime size. Deventer, 40 kilometers to the north, by co-
Continued on Page 398

(LEFT) Second Unit Director of Photography Harry Waxman, BSC (whose previous assignment was photographing "THE PINK PANTHER STRIKES AGAIN"), climbs a ladder to give instructions to camera operator, while filming on Deventer street. (RIGHT) Against a background of billowing parachutes, Director Richard Attenborough is interviewed for the cameras of crew making a behind-the-scenes documentary of the production. (Color photographs by David W. Samuelson.)



GEOFFREY UNSWORTH, BSC DISCUSSES THE PHOTOGRAPHY OF "A BRIDGE TOO FAR"

Academy Award-winning cinematographer discovers a certain beauty in War, as he uses the extraordinary exterior light of Holland to create desaturated—but faithful to the facts—images portraying total disaster

"A BRIDGE TOO FAR" Director of Photography Geoffrey Unsworth, BSC, winner of the 1972 "Best Cinematography" Academy Award for "CABARET", entered the film industry in 1932, at a time when cinematography in English studios was still dominated by the Americans, plus a few Germans who had already slipped the Nazi net.

Starting near the bottom of the camera crew ladder, Unsworth made steady progress from slate boy to focus-puller and camera operator with

Victor Saville and Alfred Hitchcock. He then spent some years with the Technicolor Organization, which, in those heady days, supplied not only the film, but the cameras using it and the crew to run them. At Technicolor, Unsworth was a fixture with ace French lighting cameraman Georges Perinal, whose techniques he still greatly admires.

After the war Unsworth helped fashion MGM's "A YANK AT OXFORD", "THE LIFE AND DEATH OF COLONEL BLIMP" and "A MATTER OF LIFE AND DEATH". He next joined

the Rank Organization, then in fullest flood, and shot most of the early Dirk Bogarde films, staying thirteen years in all.

A triple British Oscar-winner, he has used the same two-man camera crew almost exclusively for the past 12 years. The dozens of films he has photographed include the following outstanding productions: "BECKETT", "CROMWELL", "2001: A SPACE ODYSSEY", "CABARET", "DON QUIXOTE", "ZARDOZ", "THE ABDICATION", "MURDER ON THE ORIENT EXPRESS", "THE RETURN OF THE PINK PANTHER", "LUCKY LADY" and "A MATTER OF TIME".

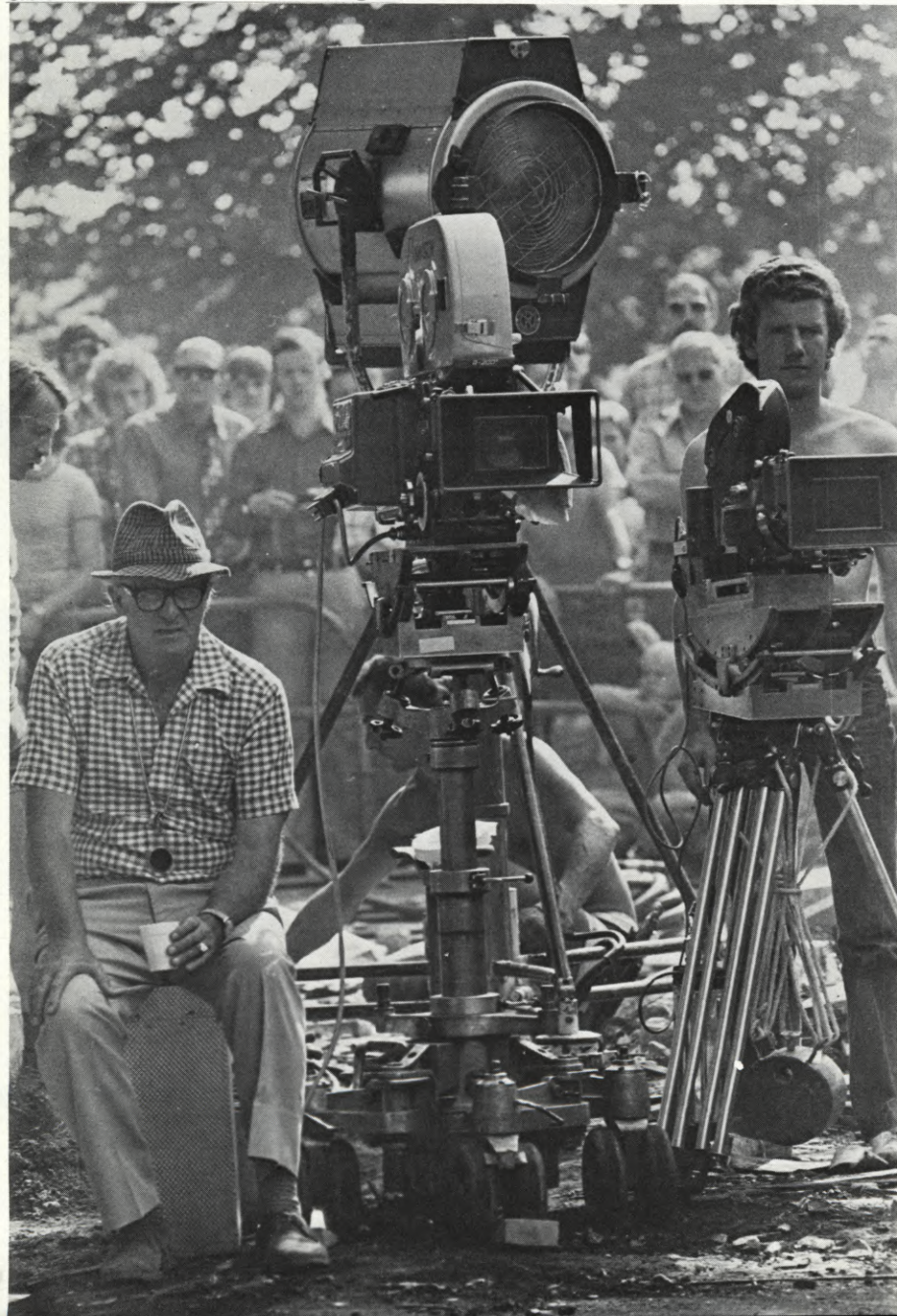
In the following interview conducted on location in the Netherlands by *American Cinematographer* Editor Herb Lightman, Unsworth discusses the photographic style and visual techniques he employed in shooting "A BRIDGE TOO FAR":

QUESTION: In relation to your photographic assignment on "A BRIDGE TOO FAR", have you encountered any special elements that make this film somewhat different from the others you've done?

UNSWORTH: What I've enjoyed most is the extraordinary light one gets here in Holland. It's the kind of light you find very prevalent in Dutch paintings when you study them. Because we are shooting the film in Holland, which is where the original action took place, I haven't tried to make it in any way a hard, harsh, "warlike" representation of nastiness or anything like that. I think that comes out well enough in the story. So I've used Holland as I see it — an extraordinary landscape. I think there is probably more sky in Holland than anywhere else in the world — because it's flatter, some would probably say — but there is this fantastic light, which may be related in some way to the amount of water there is about the country. Everything is desaturated; you don't get harsh colors. This is what I've based the look of the film on. In fact, I've added to it a little more by using certain fog filters and things like that.

QUESTION: It's definitely a diffused sort of light that produces a natural desaturation, but what about the visual heightening of certain dramatic

Much-honored Director of Photography Geoffrey Unsworth, BSC sips a cup of inevitable tea on the Netherlands location of Joseph E. Levine's 25-million-dollar screen version of the Cornelius Ryan Best-seller, "A BRIDGE TOO FAR". The film is being shot as nearly as possible in the actual locales where the greatest Allied disaster of World War II occurred.



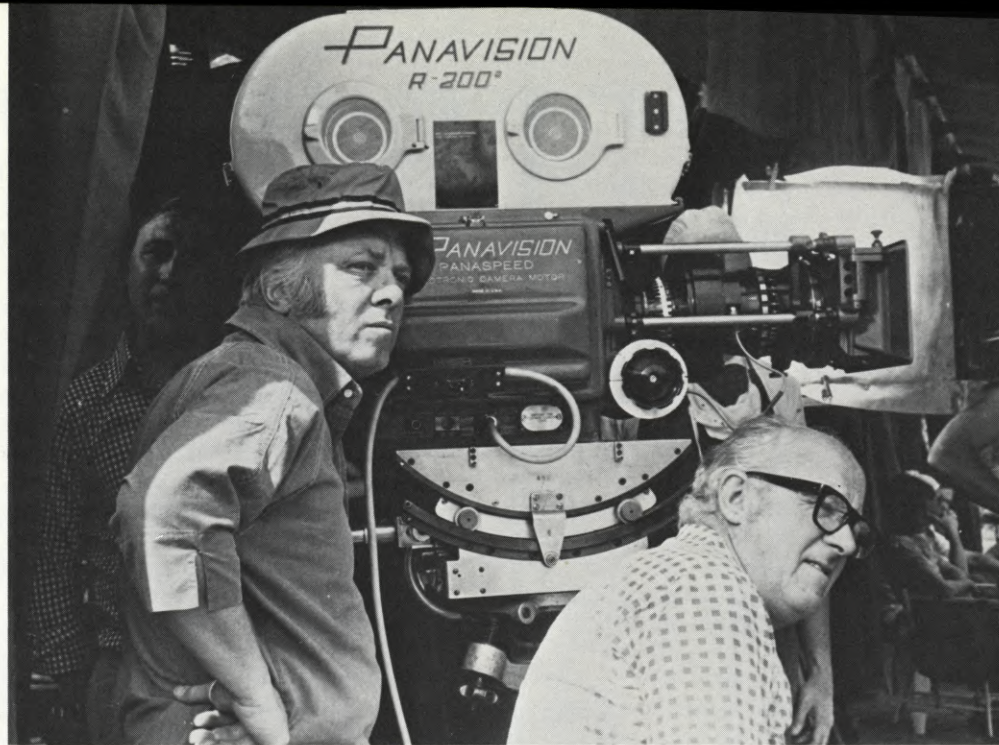
aspects of the action? In other words, aren't there various sequences that call for a bit more punching up?

UNSWORTH: Well, yes — that's true. In the battle sequences, of course, with the guns firing and tanks and buildings burning, you get an automatic build-up of atmosphere. These are the photographically dramatic elements that are mounted against this rather beautiful background. Of course, we've had lots of night exteriors, which automatically take their own shape. Especially dramatic was the crossing of the River Rhine at night. The parachute drop sequence which you are watching now is almost poetic in its approach, because, although you have all the soldiers jumping out of planes, they descend in a very graceful, swinging, floating quiet. There's no noise other than the sound of the planes, which soon disappear. The men come down in batches of 20, so we get about 200 in each drop. The color of the parachutes is this lovely khaki green; it does look very beautiful. We also have another drop to do that will take place almost at sunset, and that will add another dimension. Perhaps I'll be criticized for this approach, but I think you have to show this — because it's there; it's what happened. You see these men descending into a very peaceful scene. They land and are suddenly in the middle of war, with all the thunder and whatever it is that makes wars such a tragedy.

QUESTION: Can you tell me how your cameras are deployed for these parachute drop sequences?

UNSWORTH: On the ground we have cameras on two oversize cranes which are 40-odd meters high when fully extended. The ground cameras provide various different angles of the drop. In the air we have eight cameras in airplanes, plus one in a helicopter. There are long shots which show the full panorama of masses of parachutes descending. Then there are cameras with 1,000mm lenses to hold on one plane with the men all tumbling out. There are cameras trained on men on the ground who have supposedly dropped earlier. By tugging on their lines they are able to hold their parachutes up in the wind. Including those actually jumping and those already on the ground, one gets the impression of at least 1,000 parachutists in action. In the air we have cameras slung under the wings of the Dakotas, which are the planes that the parachutists are dropping out of. We show them jump-

Continued on Page 396



Sir Richard Attenborough, Director of "A BRIDGE TOO FAR" and Cinematographer Unsworth watch a rehearsal on location. The two men had worked together before on several pictures in which Attenborough appeared as an actor, but this is their first collaboration with Sir Richard functioning as Director.

Unsworth walks across the totally deserted bridge at Deventer, Netherlands, which substitutes in the film for the bridge at Arnhem (40 miles away) where the historical events portrayed actually took place. Unsworth, a veteran of 45 years behind the camera, always seems genuinely puzzled when asked about photographic problems. "I don't quite understand this 'problems' business," says he.



THE MAKING OF DOCUMENTARY FILMSTRIPS EXPLORING A NEW AUDIO-VISUAL FORM

A film-maker, harboring certain reservations, applies motion picture production techniques to the making of filmstrips and comes up with a separate and vital, low-cost new medium

By GABOR KALMAN

A few years ago when I was first approached to produce educational filmstrips, I turned it down. As a filmmaker I thought of filmstrips as the poor man's motion picture, an inherently dull medium, a glorified slide show. I was mistaken. Most of us are just discovering the filmstrip as a medium of its own, rather than a slide show in a different package or a stationary movie. Although filmstrips developed from slide presentations, the strip format meant a more compact package. The sound cassette, with both manual and automatic advance cueing presented a further convenience. The overall format, however, remained virtually unchanged: heavy narration, with some music at the beginning and the end — the latter acting merely as a cue that the presentation was over, the audience should wake up. The subject matter varied, but the style was the same both in the classroom and in industrial productions.

A few years ago, a new wave of interest in filmstrips developed. School audio-visual budgets were being cut, and many schools, instead of spending the entire budget on a few films, preferred to cover a wider area of the curriculum by purchasing the cheaper

filmstrips. It was the first time that filmmakers started to think seriously about filmstrips, not only as a source of revenue, but as another medium. In most cases, however, the result was a number of would-be films — still shots in sequential order, separated by pauses, split-screens galore, shots through filters and vaseline, and every other trick known to the motion picture medium.

While some of these efforts turned out to be rather dazzling and effective, most still fell into the category of a gimmicky slide show or a frustrated, slowed-down movie. The heavy narration became a bit more sparse; more and more music appeared; and sound effects emerged, although sometimes seemingly out of nowhere.

During this period, I was briefly involved in an attempt to make some sense of scripts and stills, becoming quite frustrated in the process. I recognized that there was a separate medium there somewhere, apart from slide shows, different from motion pictures, and one which few people seemed to deal with head-on.

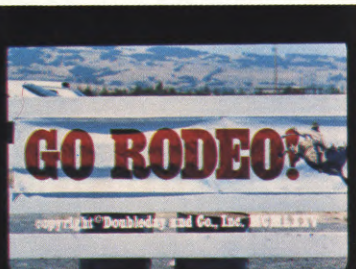
David Adams of Pyramid Films gave me the opportunity to cover a drag race and make it into a filmstrip. I knew little

about drag racing and there was little time to do any extensive research. I was not exactly sure what I was going to do, but I had very strong feelings about what I was *not* going to do. It was not going to be another illustrated lecture. But how was I going to make it come alive? Drag Race was hardly the easiest subject for an experiment, but it was certainly challenging. The cars zip by with incredible speed and the filmstrip projectors most schools use have a three-second minimal time per slide. This presented a further difficulty in editing the sound, for the corresponding sound of a passing car lasted only a second or less, yet the slide had to stay on a full three seconds. But more about sound later.

Visually, I did not want my filmstrip to look like a filmstrip. I wanted to cover the entire event and give the impression of what it is actually like to be at a drag race. The choice of a photographer was an important one, and the more filmstrips at which I looked and portfolios I leafed through, the more certain I became that I wanted someone who had never shot a filmstrip before.

Tyler Thornton turned out to be the perfect choice. Tyler has covered a

Frames from the filmstrip entitled "GO RODEO", one of several in the EVENTS! series made by the author using a motion picture approach. A motor-drive still camera was used on this filmstrip and several others in order to capture fast sequential action. Each subject includes approximately 126 frames and runs 10 minutes on average.





Gabor Kalman, Tyler Thornton (on camera) and Jack Cord (operating the Nagra recorder) comprise the small crew, shown here on location for the shooting of "BIKE RACE", one of the documentary filmstrips that make up the EVENTS! series.

variety of subjects and styles, from album covers to nature photography. He has done portraits and some experiments with infrared photography, but never a filmstrip. His impressive work and great enthusiasm for trying something different established a great rapport between us. We and his assistant (since then Mrs. Thornton) were off to the races (at 4:00 a.m.)!

We shot from sunrise to sunset, shouting over the deafening noise of the cars and cheering crowds and came home with more than 1,000 slides, dead tired but with the curious feeling that we had something exciting. And what fun we had! We used a motor-drive camera to capture motion (we used the same technique on RODEO also) and blurred images to show speed. (We used this in BIKE RACE as well).

The monumental task of editing 1,000 slides down to a strip began. The final version had 126 frames and the strip lasted less than nine minutes. Hardly an illustrated lecture! There was no narration at all. Gabor Szabo, the excellent guitarist who has written the score for several of my films, was so interested in the project that he provided us with an original score. The sounds of the track, with occasional interviews with the racers, comprised the rest of the soundtrack and was certainly different from most filmstrips that I have seen. Indeed, the first audiences responded with "I felt I was there.", and "I could even smell the cars.", etc. We felt we had something new and were anxiously planning to turn our ideas into a set of filmstrips,

each dealing with a different event. We wanted to put all that we had learned during this first experiment into use. Pyramid Films liked the filmstrip very much, but decided not to enter into the filmstrip distribution field, for they were a film company, after all. We won a prize at the Atlanta Film Festival, the only one we entered.

Everywhere I showed DRAG RACE I received an enthusiastic reception, but educational media distributors felt intimidated by the unorthodox treatment and shied away from going ahead with the series. At Doubleday Multimedia, however, the editors were convinced that was the direction in which some filmstrip production should go. DOG SHOW, SWAP MEET, RODEO, COUNTY FAIR and BIKE

Crew requirements for the making of these documentary filmstrips are very similar to those of a *cinema verité* crew. Substituting a couple of 35mm still cameras for the motion picture cameras makes moving around easier and is less obtrusive. The latter factor proved to be a great advantage, especially during the shooting of filmstrips for the "DILEMMAS OF THE ADOLESCENT" series.



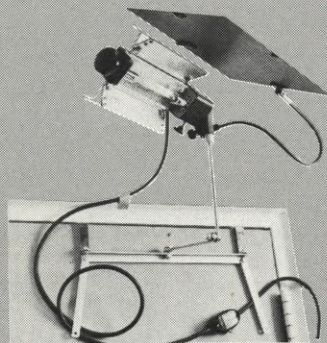
RACE were the resulting titles which, with DRAG RACE, make up the series called EVENTS!, which, the Doubleday editors felt, fully justified their trust and foresight.

We had a tight crew by now: Tyler Thornton on camera, with his wife Bergie assisting, Jack Lord (a filmmaker friend) with his Nagra recording sound, interviews and "sync" sequences, and myself, by now doing extensive research on each subject, directing, coordinating and doing a million other things I had never done while shooting motion pictures and certainly would never do if we were taking stills for a slide presentation. In other words, we were a documentary filmstrip production crew and on each event we became tighter and better and more efficient. Our ratio decreased somewhat; 700-800 became more like the standard number of slides we came home with at the end of the day, and 9-12 reels of 5-inch mag tapes of sound. Each event took place only on one day and we covered it in one day. No going back for retakes; no elaborate setups — in fact, no setups at all.

Our shots required less and less cropping and the feeling became more and more documentary. Editing was still a problem, for Tyler shoots in such high ratio that it was always heartbreaking not to be able to use a favorite shot, a familiar dilemma to most film editors. The length also standardized around 126 frames and 10 minutes. But our sound became more complex, and new problems arose.

No so long ago, in most movie travelogues (still a frequent fare on TV), people took all the trouble to go to remote places all over the world, climbing mountains, descending caves and photographing nearly everything in
Continued on Page 404

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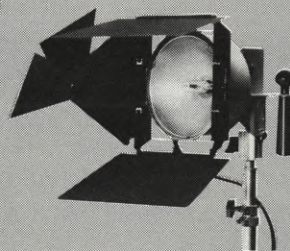
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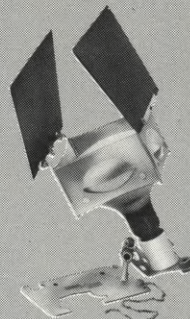
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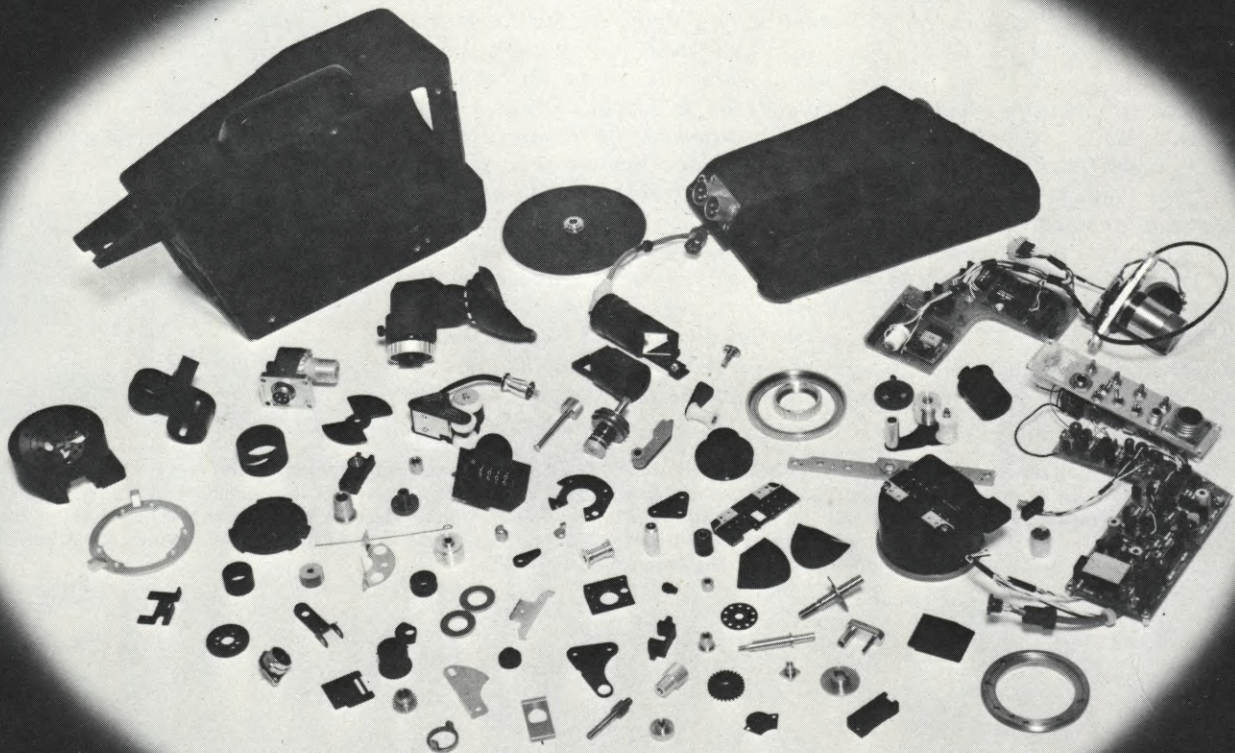
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RESTAGING THE WORST ALLIED DISASTER OF WORLD WAR II

Actor-turned-director Richard Attenborough takes on the task of re-creating the most catastrophic event of the Second World War

Sir Richard Attenborough, the director of "A BRIDGE TOO FAR", has enjoyed successful careers in several aspects of the dramatic and cinematic arts.

Born in Cambridge, England, and a scholarship student to the Royal Academy of Dramatic Art when he was 16, Attenborough's first film experience came in Noel Coward's "IN WHICH WE SERVE". Since then he has never strayed far from a camera. A star of more than 50 films, he also produced — with Bryan Forbes — four of Britain's more successful motion pictures.

In 1968 he changed direction again and took on the task of directing "OH! WHAT A LOVELY WAR". With producer Joe Levine he has devoted the past two years to "A BRIDGE TOO FAR". He was knighted by Her Majesty Queen Elizabeth II in the 1976 New Years Honours List.

What follows has been excerpted from Attenborough's comments to the *American Cinematographer* Editor during filming of the parachute assault sequences for "BRIDGE" on location in Holland:

The physical problems of shooting a film like "A BRIDGE TOO FAR" are massive and a great problem that Geoff Unsworth has had to face on this particular picture is that of having to shoot in almost any weather condition. The star lineup that we have predetermined a time schedule from which we really couldn't depart. Had we done so, it would have put the budget up to an astronomical figure — above the astronomical figure where it is already.

Consequently, Geoff has had not only the requirement of shooting with varying stops, in varying light, under a varying cloud base, in varying degrees of visibility, and so on — which he is more than content to do — but he has had to match all of this variation within sequences, which has been very difficult indeed. But he is a master; he is unquestionably a master and the results on the screen that he has achieved and the operators have achieved and even the laboratories have achieved so far have been absolutely wonderful. Certainly the Panavision cameras and lenses have never let us down; they have been absolutely superb. I can only say that we are now in our 19th week of shooting and we are on schedule to the day — literally, to the day. Bob Redford arrived yesterday, the day that he was contracted to arrive on six months ago, which seems almost unbelievable.

Concerning the visual approach to this picture, I can say that if one had had total freedom, one might have been very tempted indeed to do it in black and white. It is a period piece which depends upon its absolute veracity, on its acceptability as a document of a gallant and tragic episode of thirty years ago. But we have not done the picture in black and white and now I don't regret it at all. On the contrary, we've done it in color and Geoff Unsworth has created an image on the screen which is quite magical.

We talked from the word go about trying to bleed out almost all the color — but only up to a certain point. The main force reached a certain town in

Holland called Eindhoven where there was a massive reception — thousands and thousands of people suddenly in the square, waving Dutch and American and British flags. Much of what had gone on before had to do with the armies — the green khaki of the American forces, the total khaki of the British forces, the greenish-gray of the Germans — and we had really kept color out of it, until suddenly the screen is massively alight with this bouquet, this cavalcade, these pyrotechnics of color, and it has the most extraordinary effect. By taking advantage of all modern concepts, all modern tech-



(ABOVE RIGHT) Sir Richard Attenborough, director of "A BRIDGE TOO FAR", watches a rehearsal on location in Holland. (BELOW LEFT) Attenborough gives a bit of direction to James Caan, playing S/Sgt. Eddie Dohun, who saved his Captain's life in battle. (RIGHT) Attenborough runs through dialogue with Liv Ullmann and Lord Laurence Olivier. Miss Ullmann, the only female star in a film that includes 14 top male stars, plays the heroic Kate ter Horst, who turned her 14-room, 200-year-old house into an emergency hospital for Allied wounded. Olivier plays Dr. Spaander, the leading civilian physician in the Arnhem area.



nology, Geoff has yet given the picture a marvelous period feeling, which is more than one could ask of any cameraman.

I think we have one day-for-night sequence coming up, but everything else we've shot actual night-for-night. If it's night, we've shot night, and we've planned enormously. We have one major action sequence in which 16 German trucks come over the bridge and are totally detonated, blown to pieces, and we not only planned this over a period of four to six weeks, but, indeed, we brought out all of the air force and all of the drivers and we rehearsed solidly on a deserted air-drome of the same dimensions for two weeks with everybody. We story-boarded it about four or five times and shot it with seven cameras.

We've used multi-cameras a great deal, an enormous amount — mostly because of the problem I've already mentioned, the requirement to shoot in any weather. Obviously, if you are able to shoot wide and close at the same time, your problem of matching is solved, and that has been a great factor in maintaining the schedule on the set.

Now, today, for instance, we've had 1,000 or so troops on the ground and a couple of hundred dropping from the sky in parachutes. That is not only a very tricky operation, but it is something which is immensely costly. Obviously, we can't have the British parachute regiment here for very long, so we have had, in truth, 18 cameras on this thing today, on a drop which lasted 35 or 40 seconds. But I don't have any question whatsoever about the principle of multi-camera work on a picture such as this. I'm talking about a major picture, not about an intimate drama or very sensitive love story. Anybody who questions the value of multi-camera on a major picture is absolutely potty.

This is what used to be called an "all-star" production and I'm constantly being asked how I manage to cope with so many big-name stars in the same picture. Well, I think there is an awful lot of nonsense talked about the difficulty of coping with "superstars". In the main, they are superstars because they are pretty bloody good. They know their job, they are highly professional and they are a joy to work with.

There are 14 stars in this picture and they really are stars; they are not just lightweights. They are stars who have been cast because they are supreme actors and they are superbly cast in these particular parts.

I can't recall a single occasion when any of those 14 has been late on the set — not for five minutes. I don't remember any temperament. I don't



Attenborough's Private Army. The director inspects his elite troops the day before they are due to take part in the battle for the Arnhem bridge. Fifty young English actors were hand-picked from more than 500 applicants to form a nucleus "repertory company" trained to act, think and behave like crack troops — hair short back and sides, strictly 40's style.

remember any bombast. I don't remember any conceit. I don't remember a sequence in which they were not totally cooperative and prepared and happy and willing to fall into the concept.

All of these stars are used to having a vehicle built around them. It's a difficult thing for somebody of Bob Redford's or Gene Hackman's or Jimmie Caan's caliber suddenly to come onto a picture and do three or four weeks' work and be subsidiary to a number of other characters in a number of sequences. But never once has there been a measure of resentment of any

kind whatsoever.

I was an actor, and it makes me very proud of my profession. I think that their behavior, expertise and brilliance, on a number of occasions, has been a huge contribution. One does not usually associate quite memorable performances with this kind of movie, but the magical thing about the group of actors and one actress, Miss Ullmann, in this movie is that I really don't believe there has been a performance so far that has been less than superb.

Working on this picture has been a marvelous experience, a really wonderful experience. ■

Director Attenborough and Producer Joseph E. Levine on the set of the Arnhem Bridge, which proved to be a "bridge too far" in the vast Allied airborne invasion of Holland in September of 1944. Costing \$25 million, and with a full six-months' shooting schedule, "A BRIDGE TOO FAR" is Levine's 492nd — and easily most ambitious — production.



SECOND UNIT FILMING FOR "A BRIDGE TOO FAR"

The Director of Photography for battle action sequences on "BRIDGE" talks about long focal length lenses and tanks that plow through real brick walls

Our unit has been shooting mainly battle sequences for "A BRIDGE TOO FAR". The big operation we've just completed has been the breakout of the 13th Corps, as General Horrocks' armored division was waiting for the bridge at Arnhem to be secure in order to break through. Ultimately this developed into a big battle when they were ambushed by the German artillery battery that was hidden up in the woods. They knocked out the first nine tanks in about two minutes and finally called in the RAF to bomb the woods with rockets. The Germans eventually surrendered, but by then the 13th Corps had been brought to a standstill. We've been engaged in shooting all that — the tank battle and the Typhoons and Spitfires coming over. Those aircraft don't exist anymore, but the company has acquired four Harvard aircraft that look very much like them. They've been slightly modified to make the silhouette look like that of Typhoons and they've rigged them with dummy gun racks. They've done a very good job.

The tank battle has involved a lot of real armor. We've been shooting the sequence at a big tank training ground that belongs to the Netherlands Army. They shoot up old tanks with live ammunition, which is scattered all over the range. In fact, there's been a lot of old German tanks which they've dragged out, so we've been able to blow up real tanks and set fire to them. It looks marvelous.

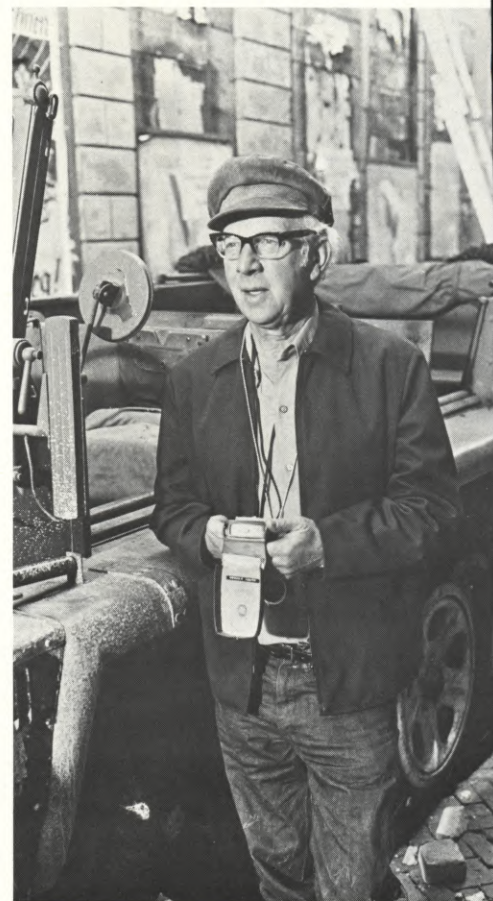
We've employed a technique which Geoff Unsworth has been using throughout the picture — the use of long focal length lenses. I find it a very exciting way to make pictures, because you can reach out and get right into the thick of the action; you really can. It's absolutely incredible. There's a sort of candid camera quality that you get, and stuff that you can't rehearse because it's happening 400 yards away. What's so very exciting about a lot of it is the sort of inverted perspective you get with the long focus lenses. For example, if you have a column of tanks lined up and you are shooting with a conventional lens, the tank nearest you is very big and, as they get further away in the viewfinder, they recede; they get smaller and smaller. But because of the inverted perspective with the long lens, they don't get smaller and smaller; they appear to get bigger and bigger, because the eye expects them to be

smaller and they are not. If you have a column of tanks moving down the road toward the camera, and you reach out with a long-focus lens, they just keep coming at you.

You couldn't do it any other way. You couldn't track in front of them; it just wouldn't work. You get this marvelous inverted perspective and the compression that goes with it. The tanks are right up together and you get the impression of a solid column of vehicles, whereas there might be ten or twenty yards between each tank. That distance doesn't show at all when you compress it, and the effect is really exciting.

I'm not going to say that this technique would work on every picture, but certainly on this subject they are doing some beautiful things with it. The sequence of the charge across the bridge at Arnhem and the ensuing battle on the bridge has been edited and it's quite unbelievable — some of the most beautiful cinema I've seen for a long time in every way. The camera angles, the way it's been shot and the editing are really terrific. Some of the interiors are also just beautiful — real houses, real attics, real cellars — absolutely beautiful.

I came to this project directly from an entirely different type of picture, "THE PINK PANTHER STRIKES AGAIN", but one has to do that in this industry. In shooting the battle sequences for this picture, the challenge of having to match up to somebody else's style carries a lot of excitement and makes it



A top British Director of Photography in his own right, and fresh from functioning as such on "THE PINK PANTHER STRIKES AGAIN", Harry Waxman, BSC, happily agreed to direct photography of the "BRIDGE" second unit for his friend, Geoffrey Unsworth. He found the assignment exciting, because "that's where the action is."

A column of armored vehicles moves slowly but inexorably across an exact replica of the World War II Bailey bridge of the type used by Allied troops in the Operation Market Garden assault. The greatest attention was paid to faithfully reproducing not only the equipment actually used, but battle tactics, as well.



interesting. It's an especially exciting thing with somebody like Geoff Unsworth. You sit in on rushes and wonder if Geoff is going to like what you've shot. Usually he's very happy with it.

Another unusual challenge I've encountered is that of getting operators accustomed to using the long lenses. We've had two new operators this past week and the three operators who have worked regularly with us have been trying to school them away from the conventional approach. It's not easy. I ask an operator to line up an angle with a long lens and he says, "It's too tight. The so-and-so is not in the picture." And I tell him, "That's why it looks good." He just doesn't see it, though, and has a hard time getting used to the idea of having just half of the aircraft in the frame. But it creates an air of realism, a sort of candid camera newsreel style that keeps you right in amongst the action all the time. You're never looking at the full stage, but I've always believed a part of the action is better than the whole.

We had an interesting shot to do in a crashed glider. According to historical fact, the Germans found a complete plan of the operation in a map case among the dead bodies on the glider. It was never established whether the officer who took the map case with him and the soldiers on the glider were American or British. The result was that here we had a glider full of dead soldiers, but we musn't show their uniforms or anything that could identify them definitely as either American or British. This presented an enormous problem. The solution was to keep it a low-key thing and to show just the elements — a hand with blood on it, or the back of a head (but not an identifiable helmet). When I originally saw it I said that we'd have to take the glider into a studio where we could control everything, but we ended up shooting it on location in the middle of an airfield on the edge of a woods. It presented really tremendous problems.

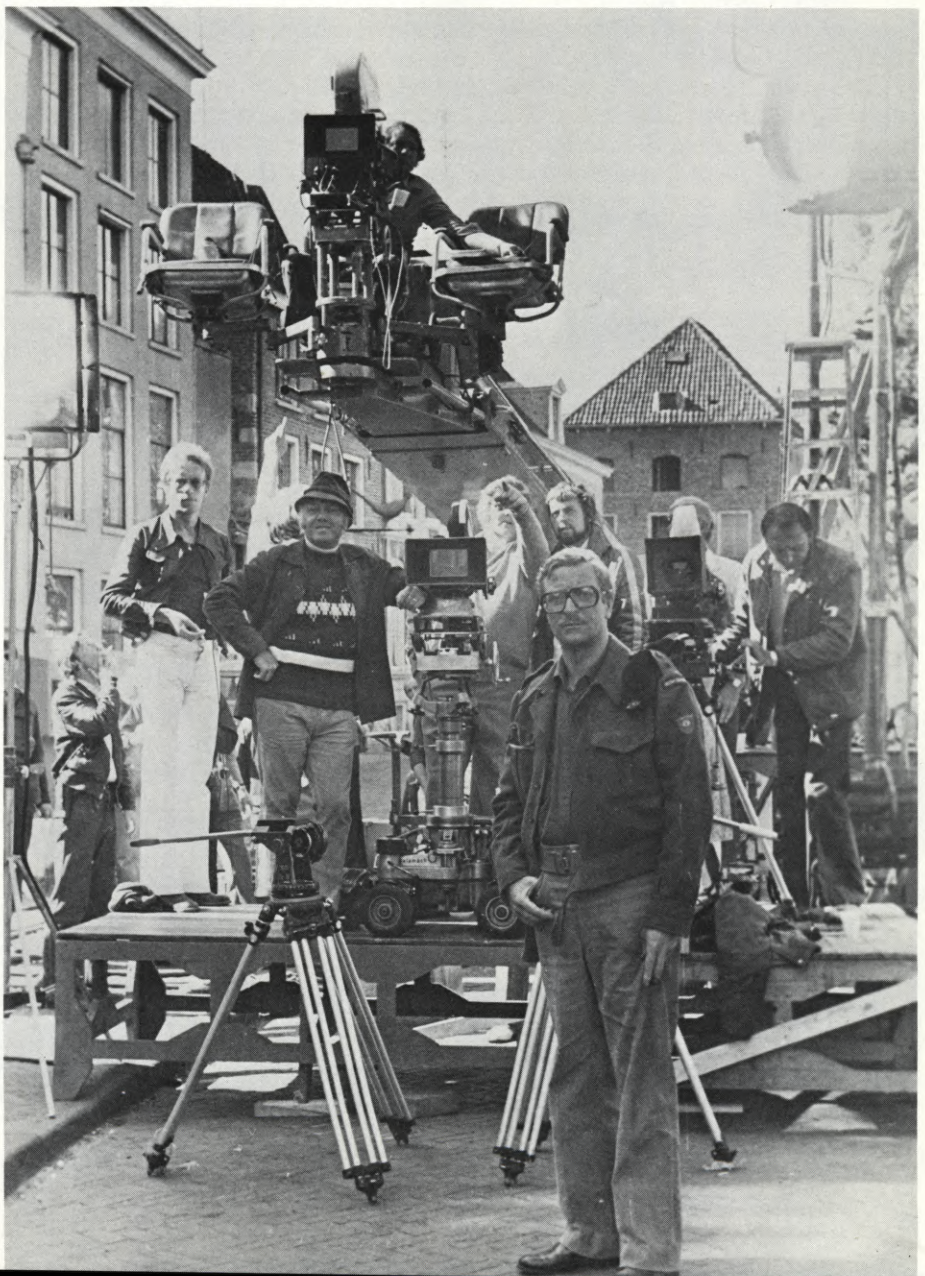
Geoff Unsworth is shooting almost the entire picture with fog filters, and so, of course, I'm doing the same thing in order to match his footage. I'm using them almost exclusively, except on the 800mm lens. We found that as soon as you put one on the 800mm the image falls apart. This is unfortunate only partially. Sometimes when you get a very clear day, with absolute clarity for half a mile, the difference shows. But, generally speaking, if there is any sort of atmosphere, the 800mm will compress it and you'll get a mist. On clear days when we've had to use it, we haven't been able to put anything on it

Continued on Page 442



Wearing an expression that can only be described as one of "joyous dismay", Waxman chats with one of his operators who is crouched in a hole to get a low-angle shot of a Nazi patrol being ambushed while moving down a "bombed out" street. The street was in an old section of Deventer and was scheduled to be historically restored.

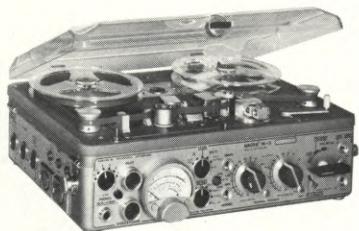
Three cameras, one of them atop the massive "Sam-Mighty" crane, are lined up to shoot a sequence. Multiple-camera coverage was a common thing throughout filming of "A BRIDGE TOO FAR", not only for the purpose of achieving a perfect weather match, but also because it saved having to restage intricate battle action many times for various camera angles.



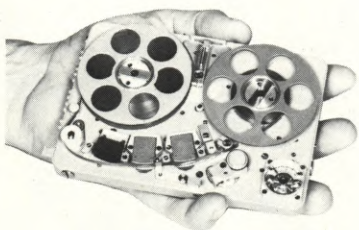
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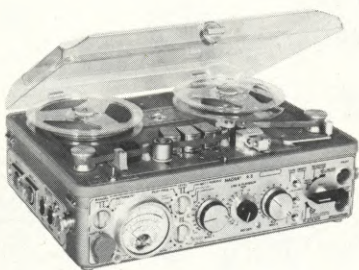
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AND HOW IT WAS PHOTOGRAPHED

An interview with the Academy Award-nominated Director of Photography who accepted a basically uncinematic feature assignment and succeeded in making it a visual work of art

Owen Roizman, ASC, has received three Academy Award nominations in the "Best Cinematography" category for his work on "THE FRENCH CONNECTION", "THE EXORCIST" and "NETWORK". In the following interview for *American Cinematographer*, he discusses the techniques he used in photographing "NETWORK" and the particular problems which that assignment presented:

QUESTION: What was your basic photographic style in shooting "NETWORK" and how did you arrive at it?

ROIZMAN: The style evolved from my discussions with the director, Sidney Lumet. He thought that the style should develop in three phases. The first phase should be "naturalistic", the second "realistic" and the third "commercial".

QUESTION: Could you analyze each of those a bit more fully in terms of how they were actually expressed by your photography?

ROIZMAN: Well, in the naturalistic or "ultra-real" phase I would shoot with whatever light existed in the location. If it happened to be fluorescent, I'd go with the fluorescent — whatever light

was there. In the realistic phase, if fluorescent light existed in the location, I'd go with the fluorescent, but I would then augment it, model it a little more to make it more pleasing and do my own version of realism. I'd try to follow the actual light sources as much as possible, but if they weren't pleasing, I'd make them pleasing. In the commercial phase, I'd create my own sources and my own moods, as far as lighting was concerned.

QUESTION: Was it the lighting alone that varied in these separate phases?

ROIZMAN: No, the degree of camera movement varied, also. For example, in the beginning or naturalistic phase there was quite a bit of camera movement, but that was cut down in the other phases until, at the end, there wasn't much camera movement at all. In other words, at the very beginning we tried to keep it a bit more frantic camerawise, a bit more exciting. Then slowly, slowly, slowly it came down to almost a standstill. The transitions from one phase to the other were very subtle, but Sidney Lumet feels that we accomplished what we set out to do.

QUESTION: What would you say presented your single most difficult

problem in photographing "NETWORK"?

ROIZMAN: The fact that it was basically a script full of words — beautifully written words, but words rather than action, nevertheless. There were a lot of sequences with long speeches in them and the big challenge to me was how to take a basically uncinematic picture — one that really didn't call for a tremendous amount of visuals — and give it a nice photographic flavor, a believable setting and effective mood. My approach was one of trying to give each speech or statement its proper mood, a visual background that was correct for it.

QUESTION: Can you tell me a bit about the sets and locations that were used?

ROIZMAN: We shot most of the picture in the MGM Building in New York. There was one floor that was empty and that was being considered for rental. So we rented that whole floor and built all the office sets right there in the building, using the exteriors outside the windows of the building as backgrounds, rather than doing it on a sound stage with Translight backgrounds. So, actually, all those rooms were constructed by our Production Designer and we made them all practical — dressed them and shot them as though we had gone into actual interior locations. We had no wild walls, except for one room, Bill Holden's office. In all the other sets we shot without wild walls; we just crammed the camera in the same as we would in an actual interior and no matter what the exterior conditions were outside the windows, we had to live with them, as far as balancing light was concerned.

QUESTION: What about the sequences that took place inside the television studio?

ROIZMAN: Those sequences were shot in Toronto in an actual television studio. We shot in their control rooms and on their stages, using all of their technical facilities and mixing their personnel with our own.

QUESTION: Was there anything at all that was shot on a sound stage?

ROIZMAN: There was one set that was built on a stage. It was a motel room for the little sequence where Faye Dunaway and Bill Holden go up to the Hamptons for a weekend. The motel room was built on the sound stage so that they could have a bit of privacy. There

was one more set that was constructed — the newsroom where Peter Finch's office was located. That was built on the ground floor of some building, but not on a sound stage. The walls were up and the ceilings were there. All we did was dress it and put in some fluorescent lights.

QUESTION: What about the apartments — his and hers?

ROIZMAN: Those were actual interior locations. Her apartment was one that was in a hotel in New York. It was a duplex apartment — a very small, very challenging place to work in. We didn't even dress it. Whatever furniture was there was what we used. We just shot it, and that was it. Those were very tiny rooms, however, and again we had the windows to deal with. Bill Holden's apartment was in another building — another actual location.

QUESTION: What about lighting in these various locations?

ROIZMAN: One thing I had to bear in mind at all times was that in almost every place where we would shoot, because of the nature of the story, we would constantly have to deal with TV monitors. So everything had to be thought out and planned around the light that was coming off those monitors. Therefore, automatically, I was immediately locked into low-key lighting, as far as intensity was concerned. So I shot the picture virtually at an average exposure of $T/1.8$ — something like that. Sometimes we would open up to $T/1.1$, even on interiors where I did the lighting and the most I ever stopped down to for an interior was $T/2.3$ — and that very rarely.

QUESTION: But, as you've told me before, you like to shoot wide-open. Isn't that so?

ROIZMAN: I do like to shoot wide-open, although it sometimes doesn't work. I like the feeling of lack of depth and I prefer to work at low levels because I like the way the light sort of fills itself in — but on this picture I had to work that way for other reasons. My gaffer, Norman Leigh, is a very clever guy. Every time I threw a problem at him, he solved it immediately. I told him before the picture started that I wanted to work with very low light levels and that I wanted to be able to control the light, which meant working with really small units. If we were to use big units we would have to use so much diffusion in netting them that it would take a lot of time. Also, placing big units in some of

the locations where we had to work would be impossible. Sometimes you have to nail units up, and there were places we went into where you couldn't nail anything onto the ceiling or the walls. You had to do all your lighting off of stands or something like that. So what we came up with were little 25-watt bulbs, "gimmick" bulbs, that we kicked up on transformers. We used the old Colortran transformers and boosted them up to about 180 volts. This 25-watt gimmick light, which is like a little peanut light, has a color temperature of 2500°K to start with, but when you kick it up to 180 volts that becomes 3200°K . It also has a tremendous amount of output at that voltage, which meant that we were able to use the little bulb as a key light. It was terrific.

QUESTION: As a key light — really?

ROIZMAN: That's what I used as a key in many of the sets. I used those little 25-watt bulbs.

QUESTION: What kind of luminaires did you use them in?

ROIZMAN: We would just screw them into Lowel-Light sockets and tape them to the ceiling or walls. You didn't have to worry about nailing them up, because gaffer's tape would hold anything of that weight. The problem then became one of how to control these lights, because in a lot of the areas where we were working, we wanted to

keep the spill light from hitting the TV monitors and washing out the image. In order to control it, Norman built snoots. One night in Toronto, when I first got the idea of using those little bulbs, I asked, "How can we control them?" Norman went out and bought a bunch of spray deodorants in cans and spent the night spraying them empty and cutting off the tops and bottoms. He painted them black and put in set screws to fit them over the lighting units. Now, if he'd had the proper facilities, this would have been an easy thing to do, but he did it on a Saturday night on his own time in a hotel room, and Monday morning he had everything ready to go. It was terrific, and we used those things for the rest of the picture. It was a matter of using these small units and controlling the light. We didn't use them all the time, but in the cramped locations, such as Faye's apartment and the TV control rooms, we used them a lot. In the bigger locations we could use more normal units.

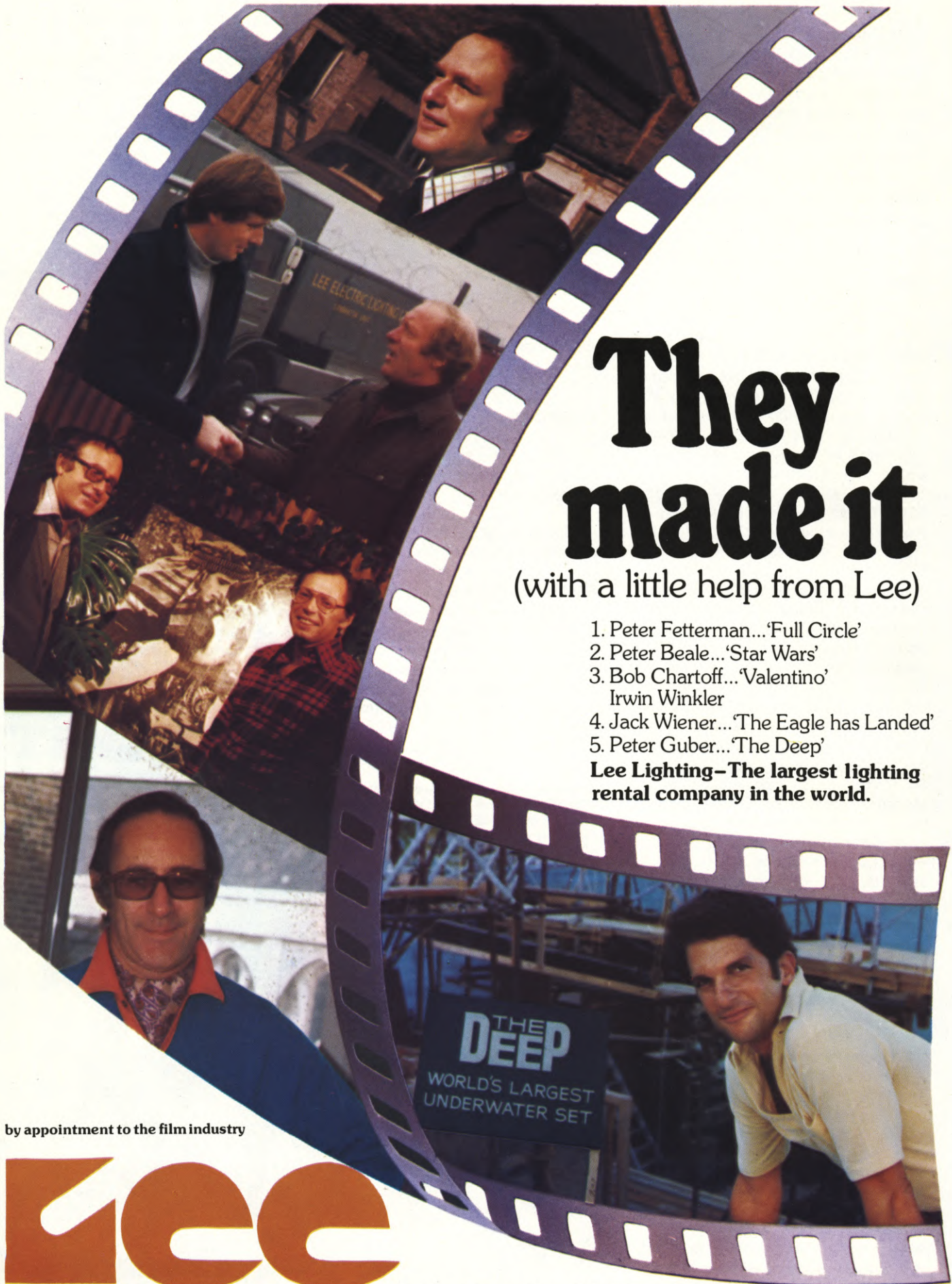
QUESTION: That's quite marvelous. It's so Mickey Mouse — but it worked.

ROIZMAN: It was fun, too. But speaking of lighting problems, there was one sequence in the picture that was probably one of the most difficult things I've ever had to light. That was the sequence that takes place in Bill Holden's office at night, when Faye Dunaway

Continued on Page 392

Owen Roizman, ASC, Director of Photography on MGM's satirical comedy-drama, "NETWORK", shown on the set with the film's star, Faye Dunaway, whom he had previously photographed in "THREE DAYS OF THE CONDOR". "NETWORK" represents Roizman's third Academy nomination for "Best Achievement in Cinematography", the other two being "THE FRENCH CONNECTION" and "THE EXORCIST".





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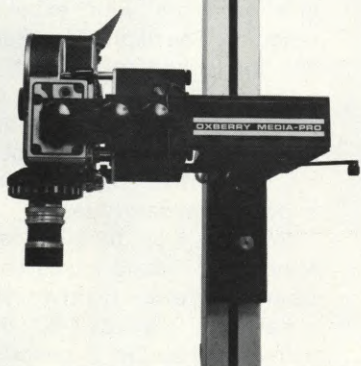
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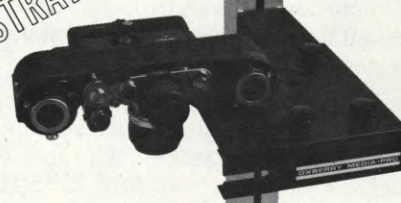
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THREE NEW MINOLTA SUPER-8 XL SOUND MOTION PICTURE CAMERAS

A trio of highly sophisticated new Super-8 sound cameras, priced for the hobbyist, but embodying many advanced features that would make them seem to be suitable for certain kinds of professional work, as well

Minolta Corporation has introduced three new Super-8 sound-on-film movie cameras featuring precise reflex viewing, power-zoom lenses, easy automatic operation and a complete system of accessories providing freedom to film and record with optimum control of visual and audio effects. Besides offering unusual versatility and ease of operation, the new Minolta XL-660, XL-440 and XL-225 Sound cameras are among the lightest and most compact single-system Super-8 cameras. They are designed to take perfectly synchronized sound movies nearly anywhere without special lighting or separate recording equipment. Each camera records the sound on film as it takes the picture and automatically controls both exposure and recording level. Each model has a power-zoom lens and such handy features as an information-center finder and external run light. The XL-440 and 660 Sound models offer 4X and 6X zooming respectively, and many advanced features for even greater convenience and versatility. Besides directional sound pick-up, special optional accessories enable both conventional and wireless recording and mixing of various combinations of microphones and/or other audio sources.

Simple Loading with Drop-In Sound or Silent Super-8 Film Cartridges and Automatic Gain Control

Simply clicking a Super-8 sound or silent film cartridge into position loads the camera and sets it for proper exposure with films from ASA 25 to 160. The built-in amplifier and recording head capture lifelike sound right on the sound film's magnetic track in perfect synchronization with the picture being filmed. An automatic gain control (AGC) circuit automatically adjusts recording to the optimum level at either of two input settings, for good sound quality in normal or noisy environments. An all-directional microphone with stand and wind screen and a monitor earphone are included as standard equipment.

Fast Lenses and Wide Shutter Sector for Low-Light Filming

The extra-fast f/1.2 and f/1.7 lenses, wide 220°-sector shutter, and special light-saving meter and finder systems

team up with high-speed film to enable making movies without accessory lighting. Striking results can be obtained effortlessly in ordinary room light or on streets with lights and signs at night, in theaters or auditoriums, on a twilight beach — even at a candle-lit dinner or birthday party.

Power Zooming with Fingertip Control, Plus Macro Focusing with XL-440 and XL-660

At the touch of a finger, the coated Rokkor lens on each Minolta XL Sound camera model zooms between wide-angle and telephoto for versatile filming possibilities. The XL-225 offers a 2.5-times zoom ratio from 10.5 to 26mm, the XL-440 has a 4X ratio from 8.5 to 34mm and the XL-660 provides a full 6X zoom from 7.5 to 45mm. Besides power zooming, manual zoom control is also possible. And with the XL-660 and XL-440, the simple flick of a switch enables focusing down to the surface of the lens itself for striking, screen-filling extreme close-ups of subjects as small as a postage stamp.

Through-Lens Metering for Accurate Automatic Exposure Control

Whether in dim existing illumination, with movie lights or in bright outdoor conditions, Minolta XL Sound cameras control exposure automatically. A sensitive CdS photocell meters scene brightness through the lens aperture for maximum accuracy, and the servomotor exposure-control mechanism adjusts the aperture continuously to provide correct exposure. A spring-loaded, self-resetting switch allows giving +1.5 EV extra exposure when desired for backlit situations, and returns to the normal exposure setting automatically when it is released.

Accurate Reflex Finders Show All Necessary Filming/Recording Information at Eye Level

Thanks to each Minolta XL Sound's reflex viewfinder, the subject is seen as it is, clear and bright, through the camera's taking lens, with none of the parallax problems of separate viewfinders. Precise framing is assured at any subject distance. Each camera's eyepiece is adjustable to suit individual vision. A split-image rangefinder spot in the center of the XL-440's and XL-660's viewing screen makes clear,

positive focusing easy at any focal length setting. The XL-225 focuses simply by setting the lens distance scale. Besides an accurate view of the scene being filmed, an over/under-exposure warning, safe-run indication, recording signal and battery check lamp are visible while looking through the finder. All necessary filming/recording information is thus at the cameraman's disposal without looking away from the eyepiece.

Additional Built-In Features for Additional Control and Convenience

At the touch of a button on the Minolta XL-660 Sound, professionally smooth in-camera fade-ins and fade-outs can be made automatically. Both picture and sound fade simultaneously during a period of approximately three seconds. A viewfinder signal indicates that the fade has been completed, and the sound-track effect can be heard through the monitor earphone.

All three Minolta XL Sound cameras have a red LED external run light that glows brightly during filming/recording to let subjects know that they're "on camera." A built-in No. 85 filter controlled manually or automatically permits shooting indoor color film outdoors with excellent color rendition. The filming/recording trigger can be locked to prevent accidental operation or to keep the camera running while the cameraman gets into the action. And a convenient cartridge-ejector permits quick, easy removal of exposed film cartridges.

With all their built-in features, the Minolta XL Sound movie cameras are compact and lightweight. They measure 9-3/16x7-5/16x2-11/16 inches and weigh 2 pounds, 10-5/16 ounces.

All three models are supplied with standard microphone plus wind screen and stand, monitor earphone, collapsible rubber lens shade and lens cap. Suggested list prices are: XL-660 Sound, \$400.00; XL-440 Sound, \$360.00; and XL-225 Sound, \$300.00.

Extensive Minolta XL Sound Accessory System for Even Greater Versatility and Creative Control

Besides their built-in capabilities, Minolta's XL Sound cameras offer unusual opportunities for creative and

convenient sound-movie making, thanks to a complete system of innovative accessories. They allow the cameraman complete freedom in handling a wide variety of subjects and situations without compromising either image or audio quality.

FM Wireless Kit for Recording Without Wires Between Camera and Subject

Minolta's XL Sound FM Wireless Kit consists of a small FM receiving unit that attaches directly to the side of the camera and a wireless microphone/transmitter that can be held by the subject. The receiver has a tuning dial and antennas, and connects automatically to the sound system when attached to the camera. It can record music or speech from FM broadcasts or mix them on the sound track with input from the camera's wired-microphone jack. And the receiver can also be used to pick up sound for recording from the wireless FM microphone.

The FM wireless microphone transmits subject sound at line-of-sight distances up to about 50 feet from the camera without the inconvenience or visual intrusion of a cord connection. It is small and light, and has its own on/off switch and antenna. Both the receiver and wireless microphone are available individually or as a kit.

High-Performance Directional Boom and Zoom Microphones

The directional Boom Microphone is

The new Minolta XL-660, XL-440 and XL-225 Super-8 sound cameras boast such interesting features as a 220-degree-sector shutter, automatic in-camera fade-in and fade-out of both picture and sound, a red LED external run light and convenient cartridge-ejector, which permits quick, easy removal of exposed film cartridges. All three models are supplied with standard microphone, plus wind screen and stand, monitor earphone, collapsible rubber lens shade and lens cap.

a high-quality unidirectional condenser microphone (impedance 2,200 ohms) complete with wind screen, cord and plug. It attaches to a Minolta XL Sound camera by means of the camera's accessory socket and can be plugged into either the mike jack or the socket on an auxiliary terminal attachment. It is very convenient for recording and following subject sound from the camera position.

The specially designed directional Zoom Microphone is a 2,200-ohm high-quality unidirectional instrument with dual uses. It can be attached to the camera like the directional Boom Microphone and telescopes so that the mike extends about two feet toward the subject from the camera for better sound pick-up. Alternatively, it can be connected by means of the Microphone Extension Cord and used as a sleekly designed hand mike.

In-Camera Sound Mixing with the Auxiliary Terminal Attachment

The tiny Auxiliary Terminal Attachment mounts directly on the side of a Minolta XL Sound camera. It has an input socket and switch to allow using a high-impedance (600- to 2000-ohm) microphone or low-impedance input (approximately 8 ohms) from such audio sources as tape players, phonographs or TV sets. Using this accessory attachment along with an input to the camera's microphone socket enables mixing two micro-

phones or other sound sources.

Microphone Extension Cord and External Battery Cord

For extending the working range of the standard wired microphone, the optional 15-foot Microphone Extension Cord has a microphone-jack socket at one end and a corresponding plug at the other. It may also be used when the directional Zoom Microphone is removed from its mount and employed as a hand-held mike.

In cold-weather shooting, the External Battery Cord allows keeping batteries warm in a pocket while filming, to preserve efficiency. One end of this 5-foot accessory cable attaches to the battery cartridge after it has been removed from the camera's hand grip, and the other end plugs into the XL Sound camera's external battery jack.

Carrying Case, Cable Release and Filters for XL Sound Cameras

Rounding out the Minolta XL Sound accessory system are a handsome Shoulder Case, the Cable Release II and high-quality, optical-glass filters. The Shoulder Case is made of durable, leather-like material and accommodates a Minolta XL Sound Camera with room to spare for extra film and various small accessories. A pocket holds the standard mike and the monitor earphone.

The high-quality, locking Cable Release II screws into the socket provided on the camera and allows vibration-free triggering for macro or other tripod-mounted filming that requires absolute camera steadiness.

For the XL-660 and XL-440, precision-made UV Haze, ND4X Neutral Density, 80B Conversion and Yellow filters are available in 46mm screw-in mounts. The UV Haze filter reduces ultraviolet transmission and can also be used to protect the front surface of the lens from moisture and fingerprints. The ND4X filter reduces the brightness of light entering the camera by two f/stops to prevent overexposure of high-speed films in very bright light or to limit depth of field. The 80B and Yellow filters may be used for unusual color effects or to change scene contrast with black-and-white film.

MINOLTA XL SOUND MOVIE CAMERA SPECIFICATIONS:

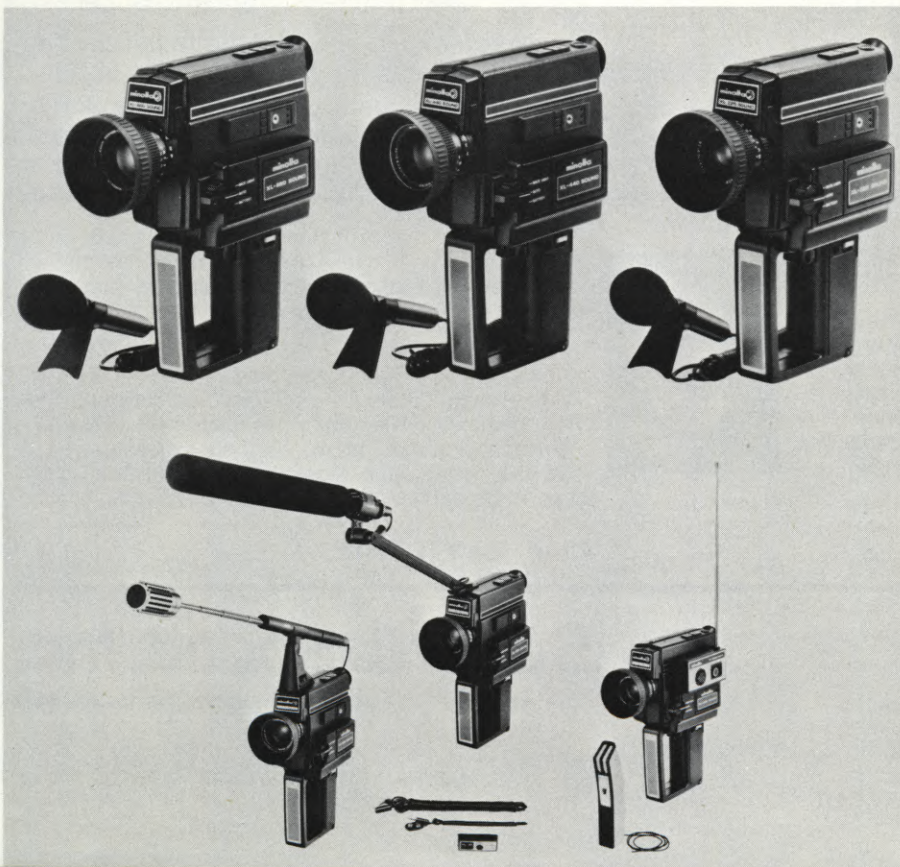
TYPE:

Reflex system movie cameras with low-existing-light filming capability using Super-8 sound or silent cartridges

LENSES:

XL-225 Sound: 10.5 — 26mm (2.5X) f/1.2 Zoom Rokkor, 11 elements in 9 groups

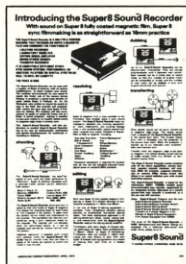
Continued on Page 400



Professional Super 8

In 1973, just six months before Eastman Kodak introduced single-system sound to Super 8, a group of filmmakers, scientists, and engineers in Cambridge, Mass. formed Super8 Sound, Inc. and introduced the Super8 Sound Recorder, the first fullcoat magnetic film recorder for Super 8.

Later, the original group was joined by the engineers who led the \$300,000 development project at MIT to bring every professional



cinematographic technique to Super 8 — crystal sync, quiet cameras, flatbed editing, etc.

Super8 Sound designed complete production systems for Super 8, systems in use in hundreds of schools in the U.S. and abroad, and wrote the definitive "what with" listing of Super 8 equipment — the \$2 Super8 Sound Catalog. More than one thousand of the original Super8 Sound Recorders are now in use by educators, independent filmmakers, and audiovisual departments in government and industry.

Super8 Sound Recorder II

Today Super8 Sound, Inc. is pleased to introduce a second fullcoat magnetic film recorder, smaller and lighter than Super8 Sound Recorder I, yet with a metal case, instant start/stop/pause control, and higher fidelity: better signal/noise ratio and frequency response.

Like Super8 Sound Recorder I, the new Super8 Sound Recorder II combines all the functions of location recorder, laboratory resolver, sound studio dubber, and transfer recorder for stripe-to-fullcoat, fullcoat-to-stripe, and fullcoat-to-video sync transfers.

Super8 Sound Recorder II is compatible with all sync sound systems, including 16mm pilotone, and with nearly one hundred double-system and single-system sync sound Super 8 cameras.

Why You Need a Super8 Sound Recorder

The Super8 Sound Recorder puts into your hands all the capabilities of a 16mm or 35mm film sound studio. You can transfer your own location sound



to magnetic film, you can dub your own music and narration tracks, you can cut separate tracks and mix them without the high labor charges of the sound studio engineer, and because you do it yourself you keep direct creative control of your own sound track.

Unlike 16mm where optical sound is normally prepared by a laboratory, with Super 8 you can then transfer your finished composite master sound track to the edge stripe of release prints, or to the sound channel of a video tape recorder.

Now that Super 8 offers all the professional techniques of sync sound filmmaking at a capital cost one-fifth that of comparable 16mm equipment, isn't it time you got into Super 8?

Whether you're just entering filmmaking, or a veteran 16mm filmmaker trying to lower your film stock and equipment costs, you should be working in Super 8. And if you're already using Super 8 as a silent film — isn't it time you got into sync?



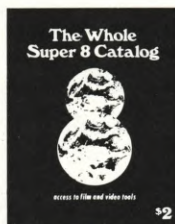
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Super8 Sound will put your name on our mailing list and send you a complete technical brochure on Super8 Sound Recorder II. You may also request flyers on our production accessories — silencers, crystal camera controls, and post-production equipment — editing benches, doubleband projectors, etc. If you're ready to act now, call Patti Maine at 617/876-5876.

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Manual that accompanies each Super8 Sound Recorder II — 24 pages of technical specifications and detailed applications for the recorder that has become the sound standard of Professional Super 8.

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Now, Isn't it Time..... ?

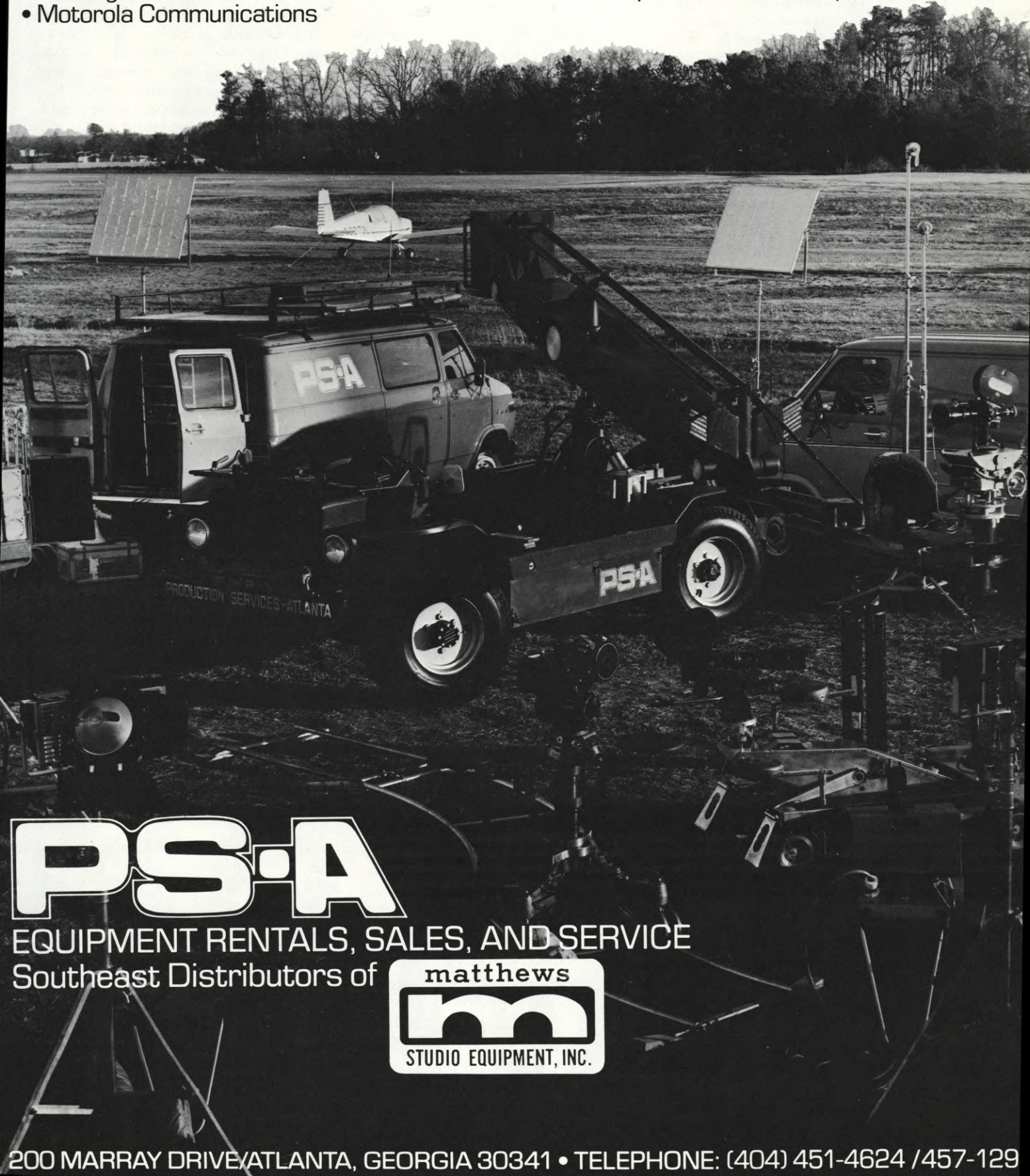


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PHOTOGRAPHING "NETWORK"
Continued from Page 385

comes in and tries to seduce him. I had to deal with lighted buildings outside the large windows. Remember that this was not a set and those were not backings, but actual Manhattan buildings with lights in the windows. The glass in our windows was tinted to the equivalent of an ND6 filter — two stops, so there was automatically a great light loss as far as the background was concerned. I didn't want to force develop anything, so I shot everything for normal development. The only way I could balance the interior to the exterior night background was to keep my light down inside to such a level that I could achieve the necessary lighting ratio and a decent exposure, without having to force anything. The big problem was that, in addition to the two glass windows, there was an interior wall that had glass in it. This meant that every time you panned the camera you picked up a reflection of something. Every time I would think of putting a light somewhere, I would look in the glass and there it was. I couldn't avoid my own lights, so that's where we really started using those gimmick bulbs extensively. We hid them behind everything — up on the ceiling and behind posts. We lit the whole room with those lights and it worked out great, because they were low enough in intensity to be able to balance with the lights of the city background. It was really a very challenging way to light.

QUESTION: In the past few years it has become the vogue to force everything

at least one stop, and sometimes two stops. Why didn't you want to force anything, when you would have had a legitimate reason to do so?

ROIZMAN: It really goes back to a conversation I had with Sidney Pollack a couple of years ago when I was doing "THREE DAYS OF THE CONDOR". Sidney wanted me to shoot "CONDOR" with a look of realism, but he didn't want that kind of deteriorated, gritty look that you get sometimes when you force develop. He had a fetish about force developing; he just hated the look of it, and I tried to convince him at the time that force developing was fine, because I had used it for everything up until then. But we made some tests and decided to shoot the film without forcing and I got to like the look of it so much that I decided to take chances in doing many different things that way. Whereas I'd always force developed, now I automatically did it without forcing, and I found that I could underexpose without forcing and get just as good a look as I had been getting by forcing.

QUESTION: You just underexpose and print it up a stop or two?

ROIZMAN: Well, I never like to go so far under that I have to print up two stops, but I find that, within certain tolerances, you can do it. I have forced certain shots at night where I knew that I could use a little extra punch in the highlights. But I've recently done a lot of tests with the new 5247 film and found that I didn't like the results of the force developing as much as I did the

normal developing. I find that the normal developing gives it a much softer look. At two stops the effect of forcing is almost a myth. Nothing happened for me, except that the stuff deteriorated. When you force 5247 it doesn't grain up at all like the 5254 does, but you get a milkyish that's not very nice. Consequently, when approaching "NETWORK", I knew that storywise it should have a good, clean, crisp look. I pictured full colors and rich blacks and a certain prettiness, because I was photographing stars like Faye Dunaway who wanted to look good. Anything that would detract from that, I thought, would be detrimental to the picture. I found that it was just as easy to work at low light levels with the new fast Panavision lenses and not have to force develop. I knew that I could shoot at T/1.2 and not have to worry about it — that the result would be just as good as if I'd shot at T/4. When you have equipment like that you don't have to push the film.

QUESTION: Can you tell me about the night exteriors in the picture?

ROIZMAN: Actually, there weren't many night exteriors, but for the opening drunk sequence, I made a wide shot with the 55mm lens at T/1.1 without forcing. The closeups I lit, but I used only about six footcandles of light, shooting at T/1.3, and found that it was enough. I was really bouncing light against the available light of the streets. I tried to do it without any added light, but I found that it didn't look good that way. So I added what I needed, which was just a little bounce light to give

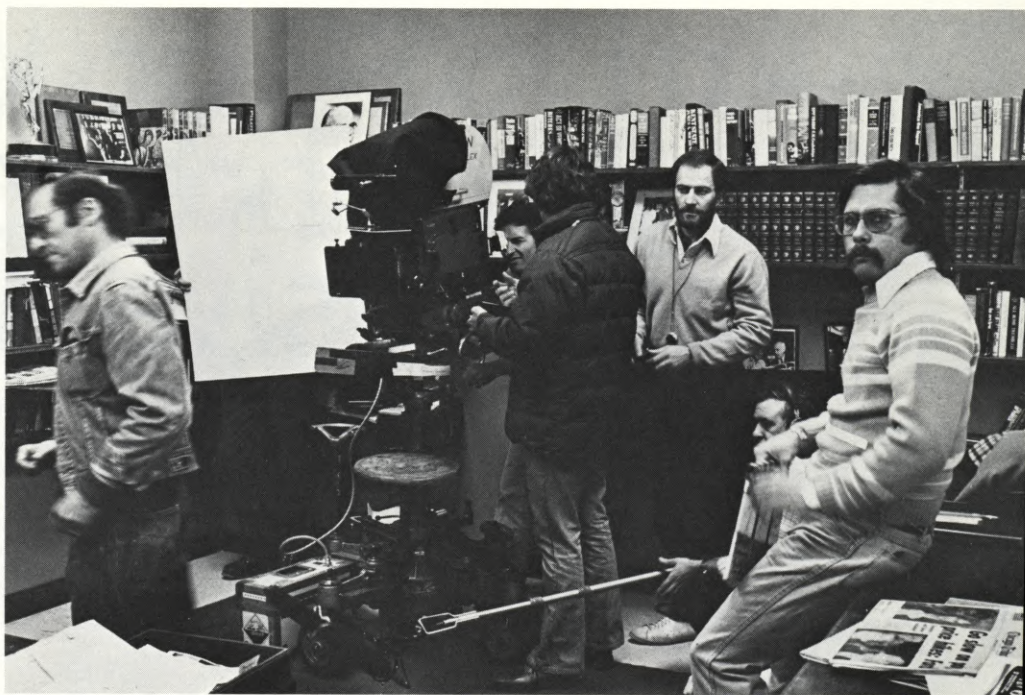
Many of the scenes for "NETWORK" were shot in offices of New York's MGM Building, with actual backgrounds of Manhattan buildings showing through the huge windows. (LEFT) To balance interior and exterior light values for daylight scenes, acrylic neutral density filters were cut to fit the windows and a daylight balance (fluorescents and HMI lamps) was used to light the interior. (RIGHT) At night the interior lighting had to be kept to a very low intensity in order to balance with the lighted office buildings in the background.



modeling to the faces and make them look proper. Then we went into the bar of the Warwick Hotel to do the rest of the sequence and I lit the whole scene with two inky-dinks. I bounced one off a white card and shot the other one through a piece of diffusion as a kicker for separation. My key light there was five footcandles. That was one of the few times in the last couple of years that I've really been nervous about a scene, because I thought maybe I overdid it this time. I shot it at T/1.3 and refused to force it — and it printed right in the middle of the scale. Because of all the blacks in the room, if it had printed any lighter, it would have gone grainy. You might say that I half-lucked-out on it. It was a sort of calculated risk.

QUESTION: Can you tell me how you handled the sequences in the offices for daylight shooting with those huge expanses of glass in the background?

ROIZMAN: I find that we are so limited by what is available to put on windows that it's really a crime. In this day of modernized equipment we have some tools that are very antiquated and one of them is what's available to put on windows. If you put an 85 gel on the windows you have to deal with wrinkles, and if you put on a piece of 85 acrylic it's not the right color; it's much too pale and the outside goes too blue. So, as a general rule, I try not to put 85s on the windows, unless I'm at a distance where the wrinkles won't show. In the case of "NETWORK", we were right on top of the windows and the background was very important. I was also dealing with fluorescent light a lot, and it's very difficult to balance fluorescent light to anything. Well, Norman came up with these fluorescent lamps that are an absolutely perfect match to daylight. So I used these lamps and NDs only and not 85s. I used acrylic neutrals, the hard plastic ones and, by cutting them to the exact size of the windows and then interchanging ND3s and ND6s and sometimes combining them to make ND9s, I was able to use the light in the room. I also used HMI lights to augment the fluorescents and found them to be a perfect daylight match. By using the combination of HMI lights, fluorescents, daylight and the NDs, I was able to keep everything in the kind of balance I wanted. I tried to vary it, however. Sometimes I'd go with the outside brighter and sometimes a little darker, just to give the feeling of different times of day. The acrylics were not the greatest either. Some of the neutrals were imperfect and I would have to cull the best of the lot and switch them around constantly. I hope



Most of the "sets" for "NETWORK" were actual rooms, some of which were very small. In some cases, in such close quarters, Roizman used as key lights 25-watt "gimmick" bulbs in Lowel-Light luminaires, with cut-off aerosol cans functioning as improvised snoots. Only one set, a simple motel room, was actually constructed on a sound stage for the picture.

that someday someone like Rosco or Lee will come up with perfect acrylics or gelatins in matched colors to shoot through — something we can use.

QUESTION: Did you have any flicker problem with the HMI lights?

ROIZMAN: No, none at all. I did some tests with them and had no problem. I found them to be a god-send. They were really wonderful. They threw out a lot of light and were easy to use. All you had to do was plug them into the wall. The only problem with them is that they're enormously expensive to rent. However, if you can find a way to use them and only them, you can eliminate a lot of other things.

QUESTION: In a film like "NETWORK" that calls for carefully articulated mood in various sequences, how handicapped were you by working in small rooms in actual locations where you could not really put lights exactly where you wanted them?

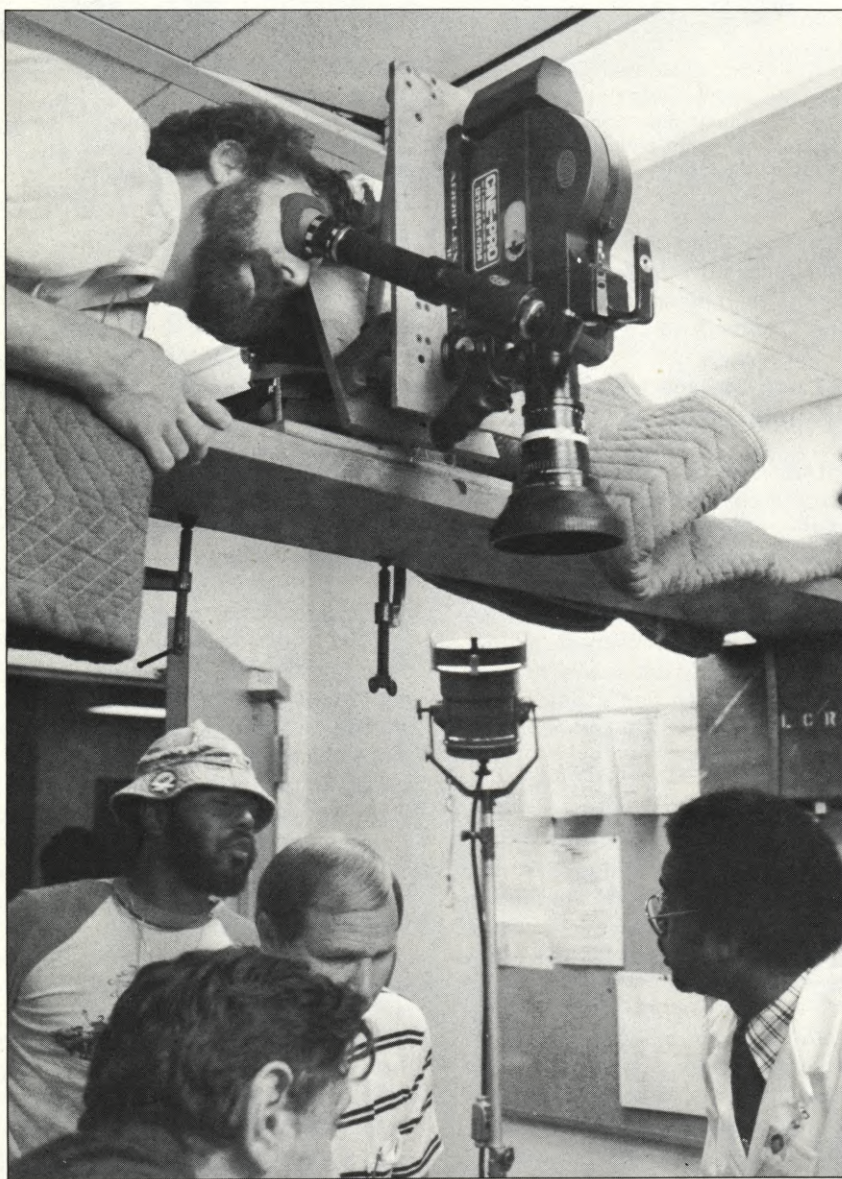
ROIZMAN: I never really felt hampered by it. Small locations don't bother me. Once you learn to work with units the size of the ones we were working with, you can learn to shoot in a closet and there's no problem in creating the mood. Creating a mood in a smaller room, especially if it is a low-key mood, is actually easier. I really didn't find any places that presented any great challenge, as far as that goes. The bigger places were the great challenge.

QUESTION: Can you tell me about those?

ROIZMAN: We had a sequence to shoot in the Grand Ballroom of the Plaza Hotel. That's the room in which Faye Dunaway gets up to give a pep talk to a group. It was a huge room with a load of extras and there was really no place to rig lights. In any case, rigging it would have been an enormous undertaking. So, as usual when I go into places like that, I tried to devise a way that we could utilize a lot of the existing light and then just augment where necessary. So I had the Production Designer get lamps for each table with red shades. We put gimmick bulbs inside those shades and kicked them up on a Variac to the right intensity, so that there was at least a little light to focus your attention on — so that there wasn't just a big black mass in the middle of the room. Then I used a couple of Super-Trouper follow-spots to light Faye and placed just a couple of other lights around to pick up the people on the dais. I bounced a couple of lights off the ceiling to inject a bit of spill light into the room. I discussed that one with Sidney Lumet and we decided to keep the room very dim, so that you knew people were there, you could feel them, but your eye wasn't necessarily drawn to them. It was a challenging room to light. Sidney works so fast that you have to think fast and be fast to keep up with him. Otherwise, you can see him walking up and down behind you and,
Continued on Page 402

Arri 16SR on location in tight quarters: flexible unobtrusive and fast.

"Producers like quality," says Jack Cooperman,
"But most of them like speed even more.
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to get good production quality fast."



"10mm focal length on this one," says Mr. Cooperman.
"I had to keep my body up high, out of the shot. The
camera's small size, light weight and adaptable finder
let me rig the whole thing with *one* plank, and get right
up against the ceiling. A fast setup, and *compact*."

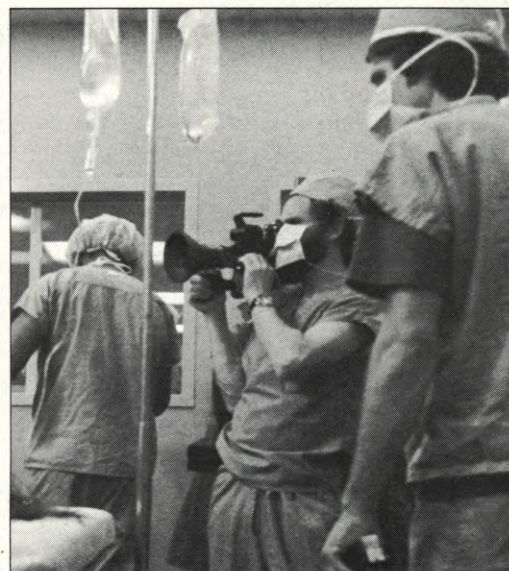
Until he shot this segment of a
March of Dimes documentary Special, Jack Cooperman had never
used an Arri 16SR. Here are some of
his comments:

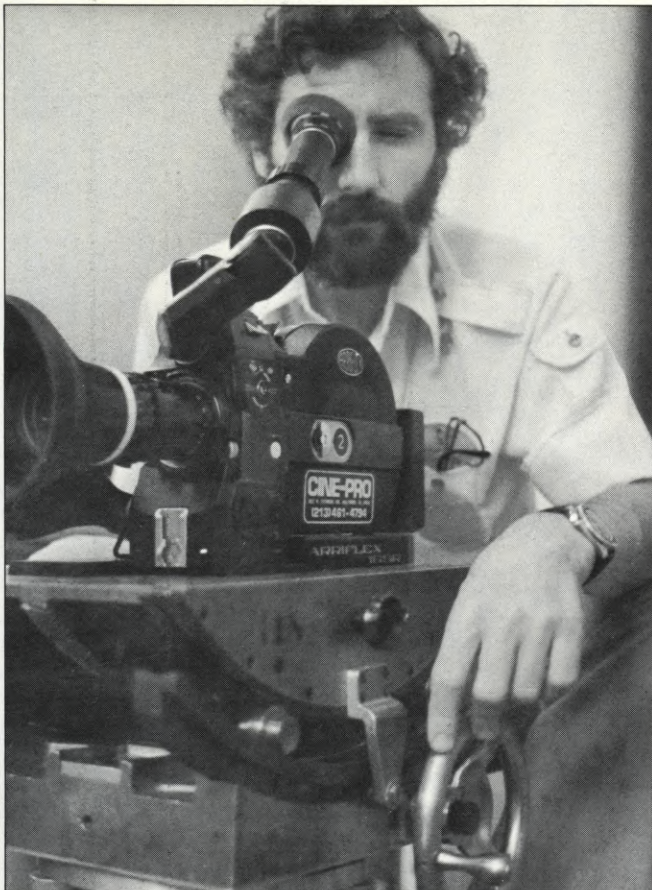
"We were shooting medical staff
and patients at a hospital. To catch
the action while it was spontaneous,
and to keep out of everyone's way,
we had to be fast and flexible."

"I found it *pleasurable* to work
with that camera," says Mr. Cooperman.
"It's a studio-quality tool; and
it does everything you expect, plus
quite a few *new* things."

Produced by March of Dimes Foundation; Ed
Franck, Director; Jack Cooperman, Director of
Photography; Jack Green, Camera Operator.

"Shooting in the crowded Oper-
ating Room, we had to keep out
of everyone's way. No tripods."



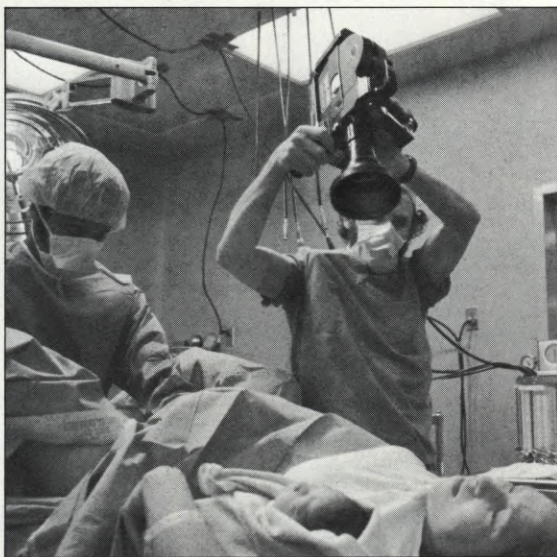


"For one move, I needed to start next to the wall," says Mr. Cooperman. "With the SR's amazing viewfinder, I could put the Worrall head *against* the wall, and still see what I was doing without mashing *my* head."



"What was important to me about this camera was the ability to keep the creative flow going at a *steady pace*. The fast setups and reloads were ideal for unscripted, spontaneous action."

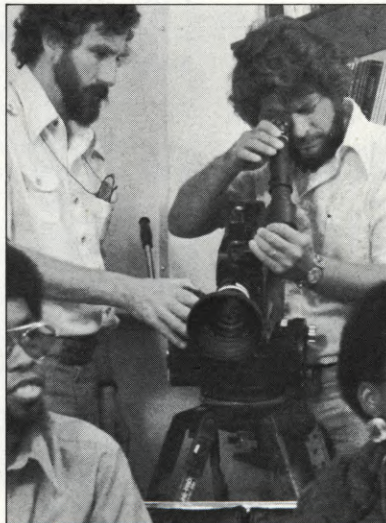
"I'd lock it off, swing the finder over for the Director, swing it back, and we'd roll. *Instantly*."



"The birth sequence required unobtrusive shooting. The cable-free battery on the camera's back helped a lot."

ARRIFLEX

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GEOFFREY UNSWORTH, BSC
Continued from Page 373

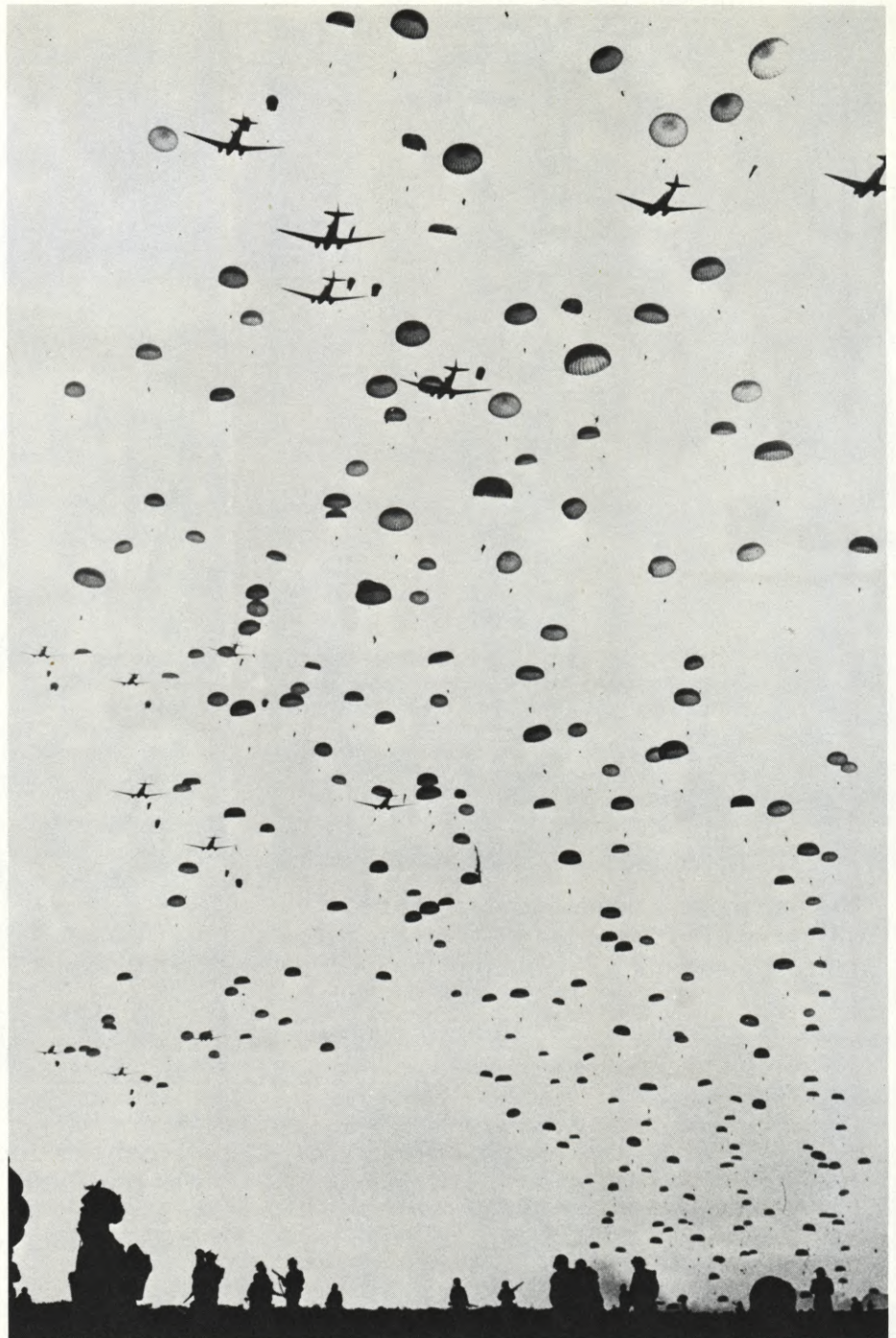
ing out of the door, falling out of the door or being pushed out of the door. Other cameras mounted under the wings are slanted at an angle looking down toward the ground. We have cameras inside the Dakotas showing the men approaching the door and going out; those are terribly exciting shots to see. We have a camera in the dome looking back over the tail, with the formation in the background; that's also another very good angle. There's a camera on the belly of the plane, also at a slight angle, which picks them up after they've jumped and you can see them floating down toward the drop zone. We also have two professional parachute jumpers who wear cameras in their helmets as they fall out of the plane. Everything goes all upside-down until the parachute opens. Then they twist themselves around to best advantage so that you can see the people they are dropping with. These are marvelous angles. All in all, we have about 18 cameras trained on each jump, so I think we are well covered.

QUESTION: This picture is being shot in the Panavision anamorphic format and, since the anamorphic lenses are too heavy for helmet cameras, can you tell me what lenses are being used on those cameras?

UNSWORTH: They are using a 25mm lens on each helmet camera, shooting full frame. This footage will have to be blown up, scanned and squeezed optically to bring it into line with the Panavision anamorphic footage.

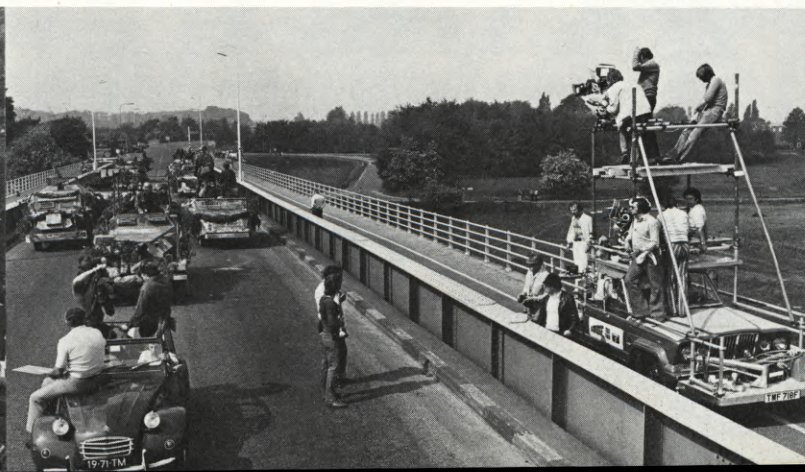
QUESTION: Are you using zoom lenses or prime lenses on your ground cameras?

UNSWORTH: Every camera has a zoom lens on it — either a 10-to-1 or a 5-to-1. One of them has a double extender on it, which brings it up to



The sky is filled with hundreds of gracefully descending parachutists for one of the airborne assault sequences in "BRIDGE". Two of the jumpers wore helmet cameras in order to film subjective angles of the action. Other cameras were mounted under the wings and fuselages of the aircraft, as well as inside.

(LEFT) The giant "Sam-Mighty" camera crane prepares to follow action on the bridge. (RIGHT) A camera car moves along to film a follow shot of an automobile procession. The action of the picture unfolds across a vast canvas, requiring the coverage of multiple cameras for most of the action sequences.



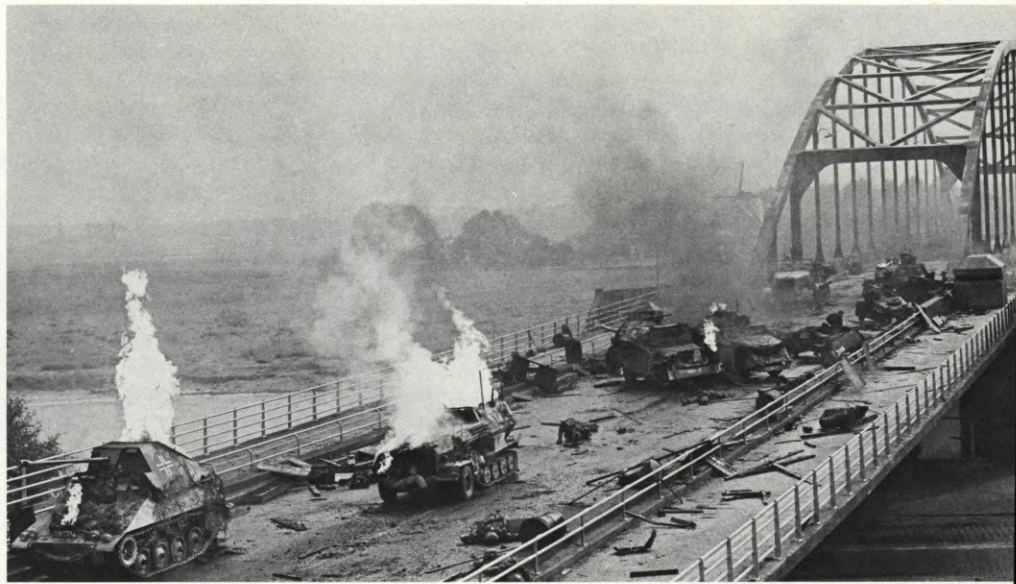
1,000mm at the long end.

QUESTION: And what sort of focal lengths are you using in the air?

UNSWORTH: We have 100mm lenses on the cameras attached to the undersides and wings of the planes. That seems to be the focal length that gives us the correct angle for such work.

QUESTION: Can we talk about the sequences you've shot up to this point — the battle on the bridge, for example?

UNSWORTH: We had to find a bridge in Holland that was similar in appearance to the Arnhem bridge, because since the war the bridge at Arnhem has changed considerably — not in shape, but the area around it has become built up on both sides of the river. Before the war, on the south side of the river, there was nothing but open fields — while on the other side there was the town of Arnhem, with the old traditional houses running along the approach to the bridge. Well, all of that has gone, and the main requirement of the film story was to find a bridge very similar to what the Arnhem bridge was like in 1944. About a half-hour's drive from Arnhem is the town of Deventer, which has a similar-shaped bridge — slightly smaller, but with enough room on either side of the approach for us to recreate the houses that faced the original Arnhem bridge. The town of Deventer has been very cooperative and has allowed us to reconstruct there the houses and the approach to the bridge as they were in 1944. This is where the battles took place. This is where the British 2nd Battalion Paratroop Regiment arrived and was supposed to hold the bridge for two days, but had to hang on for nine days, during which they were either killed, injured or captured. For the filming — because we had our own houses — we were able to shell them, blow them up, destroy them, in fact. We couldn't destroy the bridge, because they would obviously need it again, so we had to create all sorts of effects. We had to make it look as though the entire bridge was in flames — which it had been in real life after certain ammunition dumps were blown up. At night it was much easier, because one could put gas pipes along the superstructure, and so forth. We had quite a big tank battle on the bridge, which almost made it look like we had destroyed the bridge — but when it was all cleared up, there she was in her shining beauty again. I'm sure the townspeople must have thought it was the end of their



(ABOVE) A scene from one of the furious battle action sequences that take place on the Arnhem (Deventer) bridge, as a German tank assault is stopped cold by Lt. Col. Frost's men. (BELOW) Fiery battle action on the bridge, as troops dodge in and out of the burning German tanks. Fire and powder charges were so skillfully rigged that the bridge appeared to be almost destroyed, although it was actually not damaged.



bridge. But no. It was all backed up by asbestos sheeting and very cleverly designed. Of course, the initial explosion was terrifying — sheets of flame and the ammunition shooting off into the night sky. It was really a horrifying spectacle, but I think it worked and it looks good on the film.

QUESTION: It sounds like you loved every minute of it.

UNSWORTH: Well, I don't like noise

and bangs, but it was a pretty good display actually.

QUESTION: Now, of course, this was night-for-night, the real thing. What about lighting such a spectacle? What kinds of lights did you use and how were they deployed?

UNSWORTH: Well, we used Brutes and 10Ks, of course, but I also used a lot of photographic flares — which one had
Continued on Page 428

"BRIDGE" LOCATION
Continued from Page 371

incidence had a similar circular arched bridge and period architecture that escaped war damage. When the film company's proposal to use their town was approved by 90 percent of the population in a citizens' referendum, Levine and his 300-man production team moved in.

The casting for "A BRIDGE TOO FAR" became something of an obsession with producer Levine in his desire to mount an all-star cast that would be recognizable by surnames alone. Listed alphabetically they are: Bogarde, (Dirk); Caan, (James), Caine, (Michael); Connery, (Sean); Fox, (Edward); Gould, (Elliott); Hackman, (Gene); Hopkins, (Anthony); Kruger, (Hardy); Olivier, (Laurence); O'Neal, (Ryan); Redford, (Robert); Schell, (Maximilian), and Ullmann, (Liv). To this galaxy have been added other talented cast members bringing the number of speaking roles to well over 100.

The screenplay was written by William Goldman, a best-selling novelist and screenwriter of "BUTCH CASSIDY AND THE SUNDANCE KID", "ALL THE PRESIDENT'S MEN" and "MARATHON MAN", to name a few of his impressive film credits. Director Richard Attenborough chose his technical crew with equal care: Director of Photography Geoffrey Unsworth, BSC, and his regular camera team; production designer Terence Marsh and staff; film editor Anthony Mendleson and special effects expert John Richardson. All have won top honors in their respective fields.

The film will be released by United Artists.

In housekeeping terms, the film's statistics are staggering: World War II uniforms came from every costume house in Europe; aircraft, tanks, armoured vehicles, jeeps, cannon and guns of every description were culled

Continued on Page 439



The airborne assault sequences, staged over a vast area and involving 1,000 paratroopers, presented enormous logistical problems. It was necessary to assemble World War II uniforms, aircraft, tanks, armoured vehicles, jeeps, cannon and guns of every description. The jumping was done by a new generation of British "Red Devils" (the 1st Battalion of the Parachute Brigade), brought over from England for the stint.

Robert Redford visits the location a few days ahead of the start of his filming assignment, in order to watch shooting of the airborne assault sequence. Redford portrays the role of Major Julian Cook, hero of the water assault across the Waal River at Nijmegen in eastern Holland. Dressed in denim jacket and jeans for his informal visit to the set, he looked anything but the superstar that he is.

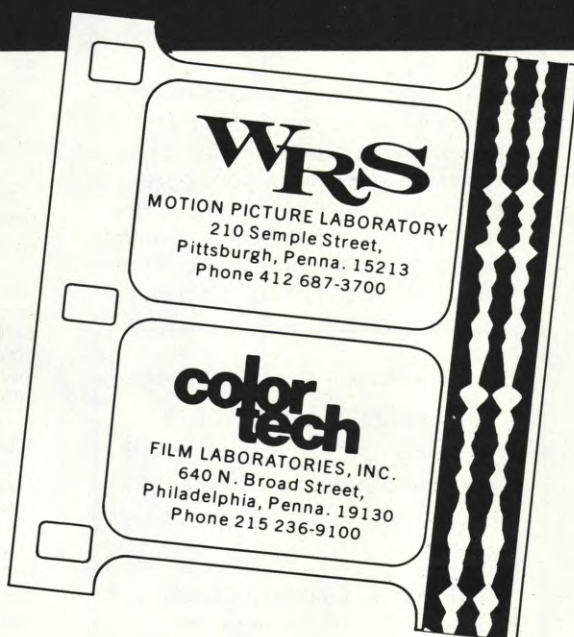


(LEFT) Attenborough explains an upcoming scene to Ryan O'Neal, who plays the role of 37-year-old Brig. General James M. ("Jumping Jim") Gavin, commander of the entire 82nd United States Airborne Division, youngest commanding general of the Allied forces. (RIGHT) A scene from the sequence portraying the water assault across the Waal River near Nijmegen. Much of the shooting was done in and around the town of Deventer, permission having been approved by 90% of the population in a citizens' referendum.



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WHAT'S NEW

Continued from Page 348

genre or film documentary. Each of these three courses involve discussions-lectures and screenings of film classics.

The on-campus program curriculum covers lectures and group discussions on script writing, story analysis, camera and sound techniques, set design, laboratory procedures, motion picture production and studio management.

Last summer the students saw Universal's then recently completed "THE HINDENBURG" and "CAR-WASH", and talked with the cast and crew involved in the making of these movies.

Enrollment to the program is limited to 50. Early registration is suggested.

Brochures and applications may be obtained by writing Mrs. Mona Kantor, director, USC-Universal Studios Summer Cinema Program, Division of Cinema, University Park, Los Angeles, CA 90007, or by telephoning (213) 746-2235.

PMPEA MEMBERS AVAILABLE FOR SPEAKERS TO INTERESTED FILM GROUPS

The following members of the Professional Motion Picture Equipment Association have made themselves available for seminars, lectures or informal discussions on various film-making subjects:

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Arrangements as to availability and other details should be made directly with the individual member of the PMPEA.

Most have indicated that they will address groups at no charge, but according to the situation, some may wish reimbursement for travel and expenses. For further information, contact your local PMPEA member or write: Victor Duncan, Inc., 2659 Fonden Dr., Dallas, TX 75206.

A SYMPOSIUM on HIGH SPEED PRINTING AND PROCESSING IN FILM LABORATORIES.

On Saturday, 9th July, 1977 a Symposium in London will give manufacturers of high speed printing and processing equipment the opportunity to present the technical and commercial basis of their products. The basis of the Symposium may be extended to cover other high output laboratory procedures.

It is expected that delegates will be primarily from film laboratories and it is hoped that there will be some papers from laboratory technicians on their own experiences in the area of high output equipment and techniques.

Scheduled as it is, just prior to FILM 77, it is hoped that many delegates will attend both events. The following international companies have already agreed to make presentations at the Symposium: Bell & Howell Ltd., Hollywood Film Company, Photomec (London) Ltd.

The committee organizing this Symposium would be pleased to hear from any company interested in making a presentation. They, and potential delegates, should contact Paul Read, Chairman of the Symposium Committee at 110-112 Victoria House, Vernon Place, London WC1B 4DJ England.

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MINOLTA SUPER-8 CAMERAS

Continued from Page 389

XL-440 Sound: 8.5 — 34mm (4X) f/1.2 Zoom-Macro Rokkor, 13 elements in 12 groups

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POWER SOURCE:

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XL-225: 5 ft. to infinity by distance scale
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Single lens reflex type, with split-image focusing aid in XL-440 and XL-660: LED sound-recording/battery-check and over-/underexposure indicators and mechanical safe-run signal outside finder frame; +1 to -4 diopter eyepiece adjustment

FILM-SUPPLY INDICATOR:

Moving-needle type, automatic reset when cartridge removed

OTHERS:

External LED run light, automatic picture-sound fade device (XL-660 only), built-in No. 85 filter (for using film balanced for 3400°K illumination in daylight) removed manually by switch or automatically when Type G cartridge is loaded, trigger-lock/continuous-run device, cartridge-ejector device

ACCESSORIES AVAILABLE:

Standard omnidirectional microphone (impedance: 500 ohms; with wind screen, stand, cord); standard monitor earphone (magnetic type, impedance: 2000 ohms); fixed and telescoping unidirectional microphones; FM-wireless receiver; FM-wireless microphone; auxiliary (input) attachment; shoulder case; microphone extension cord; 46mm filters (UV, ND, etc.); cable release

DIMENSIONS:

9 3/16x7 5/16x2 11/16 in.

WEIGHT:

2 lb., 10 5/16 oz. without batteries

BRING BACK A WINNER
Continued from Page 369

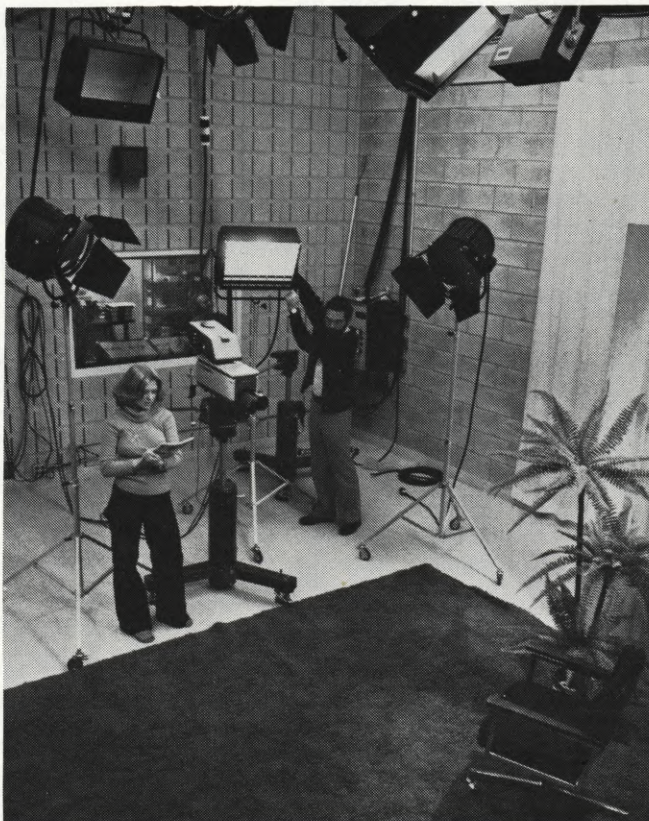
incorporate ENG coverage and decide to cover it from top to bottom, then the eight hard cameras at the lower sections may be augmented by one ENG at the starting gate, five more ENG units along the top of the course, and one at the finish. These will all operate independently and could be assigned to an ENG director — exactly as the communications were set for all of our film cameras in Kitzbuhel. I can then change the opening framing of camera three, change his move as the racer goes by, or *move him* up on a crest or low in the snow. As a story develops we can explore it — move after it — actually chase it!

In the starting area in Austria a minute before his start, Andy Mill, our best downhill racer, broke the key second buckle on his left boot. D'Arcy Marsh, Camera 1, at the top, developed the story brilliantly with a 9.5-57 on an ACL. The sound was intimate and critical. Each move that Marsh made was exact for the shorthand emergency actions of the racer and trainer — first trying to remove a lesser buckle from his opposite boot, then trying to secure it with a leather strap the trainer had tied to his knee for emergency purposes. Nothing worked. Mill got his call and moved instantly across the snow and into the side door of the starting shack, as Marsh made one of the greatest moves I have ever seen a cameraman make. Going in after him, he took him around a barrier and up in position with all the concern and nervousness of the racer's face there on the screen.

I then did a match cut to Camera 2 (Dedo Weigert from Munich who was set up in the normal start camera position outside the starting gate on the snow), and Mill was gone — out of the gate — down and into a sharp left turn. Harry Hart, from London, well back on a snow field, 100 meters off, took Mill over the Mausfalle drop and through a long left turn and a sweeping right turn where the racer sailed at 60 mph through the picket fence of skiers who had lined the course at the top and the feeling of speed was increased. Hart followed him down until he entered my Camera 4 position on the dreaded Steilhang turn and, as Mill appeared in my finder, I could see he was dangling his left boot, like a lion with a thorn in its paw, not carving with it, not holding the vital high line he would need for his exit. His speed was very great as he set up for the long traverse onto the narrow road lined with hay bales. Jon Hammond was there. I had placed him

Continued on Page 426

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PHOTOGRAPHING "NETWORK"
Continued from Page 393

even though he never pushes you, he works at such an extraordinary pace that it's always a challenge to keep up with him.

QUESTION: What about that huge exterior of the building where you had lightning and all that?

ROIZMAN: We actually did that after we'd finished the major shooting on the production. We did a sort of second unit thing and it was supposed to be a lot of intercuts for the sequence in which Peter Finch yells out the window, "I'm mad as hell and I'm not going to take it anymore!" We decided to give it a little extra visual punch by having it take place just after a rain, with lightning still in the distant sky. Well, that became the biggest shooting of the picture. We went out and did the whole thing in two or three nights and ended up by having fire trucks with water hoses to wet down all the buildings, so that we could get a little sheen from the water dripping off the windowsills. There were huge cherry-pickers with lightning machines on them and we used one lightning machine to light each building. What you do is take a cluster of maybe five carbons and put them together on one machine, and when you strike that you could practically melt the generator with all the current that it draws. It really creates a

Roizman takes a light reading in preparation for shooting a closeup of Faye Dunaway. Says he, "The stars of the picture wanted to look good." The consensus: Miss Dunaway never looked better on the screen. Extremely versatile in his use of light and the camera, Roizman adopted entirely different photographic styles in the three features for which he garnered Academy nominations.



terrific effect. Then I had to light the people in each room of the building, which wouldn't have been so bad had it been a normally operating building. But our widest shot was of this huge building that was actually abandoned. There was no electricity and no elevator, so the electrical crew had to carry lights and cable all the way up to the top floor and spread out and get in there and put up lights in the rooms. What we used in there was strictly a Baby and a Lowel-Light in each room — one to bounce off the ceiling and one to backlight the people at the window. There were a couple of arcs on the street just to wipe the buildings, so that they had some light on them between lightning flashes. Then there were these huge lightning machines which we mounted either on a cherry-picker or on a roof across the street. We would shoot a section and then jump to another area and maybe do two or three a night. It was really a lot of fun, because it was so well done, so well coordinated. Freddie Caruso, the production manager, had everything laid out perfectly. He always knew where the lightning machines should be, where we needed the wet-down and everything. It turned out to be a really massive job of coordination and it went very smoothly. We worked for just a couple of hours each night and knocked it off.

QUESTION: What kind of carbons did you use in the arcs and the lightning machines?

ROIZMAN: We used two different kinds — one for the arcs cross-lighting the building and another kind for the lightning machines. I had to keep the color temperatures a little different in order to go for a bit of extra effect. I would normally use yellow-flame carbon for the lightning effect, because it still goes a little cool without a correction and that's probably a color that's truer to what real lightning would be — if you could say that real lightning has a color. But, in this case, we used a little white-flame carbon and made it blue, so that the lightning looked blue. Sometimes you go overboard and just go for an effect, and that's what we did in this case. It's something that I normally don't like to do, but in this instance it didn't bother me. That's a bizarre sequence anyway.

QUESTION: You mentioned camera movement earlier. Could you comment a bit more on that?

ROIZMAN: There was nothing extraordinary about the camera movement in "NETWORK". Most of the movement came in wherever we had the space, and that was mainly in the TV studio. We did a lot of it there. In general, Sidney likes to work a lot with cuts, but he will put in definite moves — and very important moves — when they're dramatically called for. But he's not a believer in moving the camera just to move it, and I agree with that theory totally. I don't think the camera should ever move unless something makes it move, an actor or a situation. In that respect, our camera movement in this picture was very straightforward. I don't think there was anything that would catch your attention so you would say; "Wow! What a great camera move that was!"

QUESTION: What about the more stylized aspects of the picture — like that stunning dramatic sequence between Ned Beatty and Peter Finch?

ROIZMAN: That was an interesting situation, because we shot it in the conference room of the New York Public Library. It's an old room with beautiful carved ceilings and tapestries on the walls. There are gorgeous chandeliers and furniture and rugs. One of the stipulations was that we couldn't rig anything in there, so I couldn't hang anything on the ceiling, which considering the size of the area, made things very difficult. So we again fell back on the theory of taking what was there and augmenting it. For example, there is a big light change at the start of

Continued on Page 436

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DOCUMENTARY FILMSTRIPS

Continued from Page 375

sight in order to bring all of these remote places to audiences at home, but they rarely recorded any sounds. They brought the films back, went into a sound studio and narrated it, telling us all about the things they had seen and now we were seeing. Sometimes, they played a record or two of the music of the country where they shot their footage. Filmstrips had been made similarly. With more portable equipment becoming available, location recordings became easy, but travelogues and filmstrips still stuck to minimal and re-created sounds. In our series, we were trying to give the feeling of an event, a place and people, as close as we possibly could to being there. Sounds are just as integral a part of an experience as sights, and we recorded accordingly. Backgrounds, interviews, dialogues, spectators, participants, animals, everybody!

Editing this large amount of sound was tedious. Having been used to 16mm magnetic sound editing, I found that handling 1/4-inch tapes was not a pleasant experience at first. The temptation to transfer everything to 16mm was quickly overcome by computing the cost involved. Therefore, we decided to mix down by transferring 1/4-inch to various tracks on a multi-track recorder, and down from that, much in the way that it is done in popular music production.

Mixing the various tracks presented another problem. While we enjoyed working with a number of engineers around town on our 16mm productions, we could not utilize their skills now, because they lacked the necessary equipment for multi-track mixdowns. On the other hand, the studios accustomed to mixing tracks for filmstrips had never seen such a complicated mess of sound (basically documentary motion picture tracks) and were uncomfortable with the mix, which at times took days to complete — much too expensive for the limited budgets of filmstrips. (I constantly had to remind myself and the people who worked with me that filmstrip budgets are considerably lower than film budgets, a hard fact to face when most of our sound elements were identical to those of a film production.)

John Mayer, an old friend, came to the rescue. John, an M.A. in Film from UCLA, was the cameraman on my first independent film some 12 years ago. Since then, he has made a whole new career for himself and his versatile voice is frequently heard on TV commercials and films. His love for and

great interest in all aspects of anything audio-visual has never faded. He had just bought a new TEAC four-channel recorder, and after hearing about my problems with mixing my tracks, he offered to attempt a trial mix on his new machine.

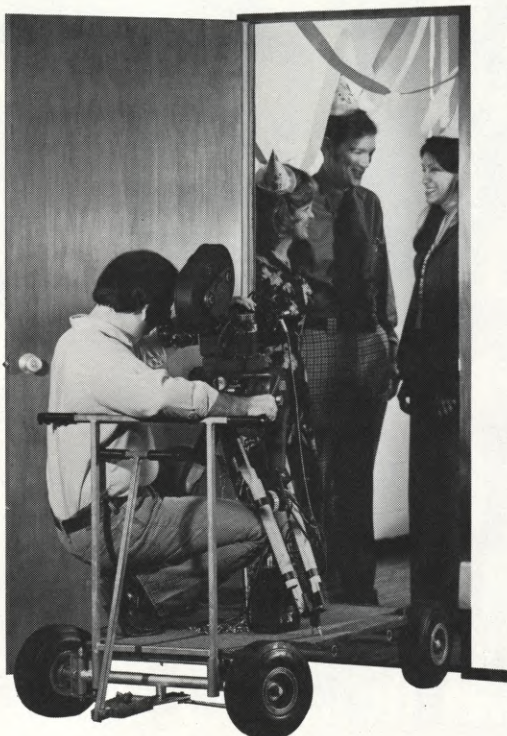
It was a great success, due, I think, to John's technical knowledge, but also to the fact that he shares our enthusiasm for creating a new medium — minimizing the pauses between slides, putting the advance signals where the natural flow of conversation allows and not stopping the sound, mixing dialogue, background effects and music so that we would have a feeling of being there. Gabor Szabo wrote and played the original score for all subsequent strips. On RODEO we used a wonderfully appropriate song by Roger Miller.

How do you make a filmstrip usable in the classroom? We felt that our experience-like approach would have tremendous teaching value on many levels. People of all ages with a variety of interests would plug into our strips and derive different experiences, learn something on a different level. But how to communicate this to teachers and potential buyers? One way was to prepare a teacher's guide and other supplementary materials that reflected the nature of the filmstrips, and here Doubleday was very helpful.

We have gotten some taste of how our intended audience will receive the strips. During the testing of the first few strips in a variety of elementary and secondary schools, we received unanimous acclaim from both educators and students. At one point I was handed 32 drawings and 32 letters drawn and written by the members of one fourth-grade class who had seen DOG SHOW. Some pictures depicted dogs and people at a dog show, but several students drew their own dogs. The letters commented on the strip, several saying that it "felt like being there"; others told stories about the students' own dogs, or dogs they knew or would like to have. From these and the results of some more carefully set up tests, we feel that the filmstrips succeed in communicating the actual experiences of an event — the sights, pace, smells and feelings of having been there — and that they stimulate a variety of activities which develop aesthetic awareness, as well as conceptual abilities, thus supporting specific curriculum objectives.

Shortly after the completion of EVENTS! we had the opportunity to develop our documentary technique even further. Concept Media, which
Continued on Page 408

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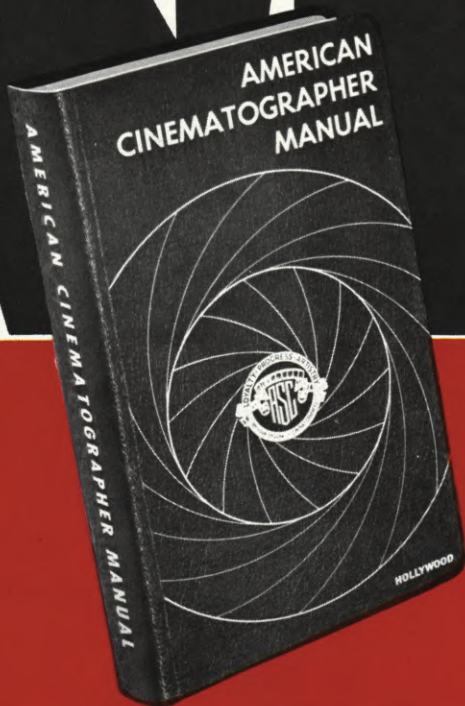
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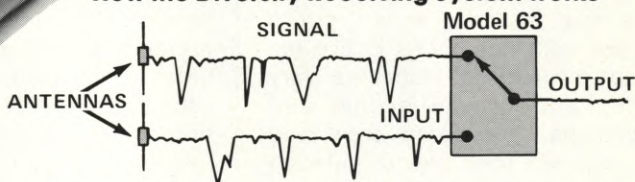
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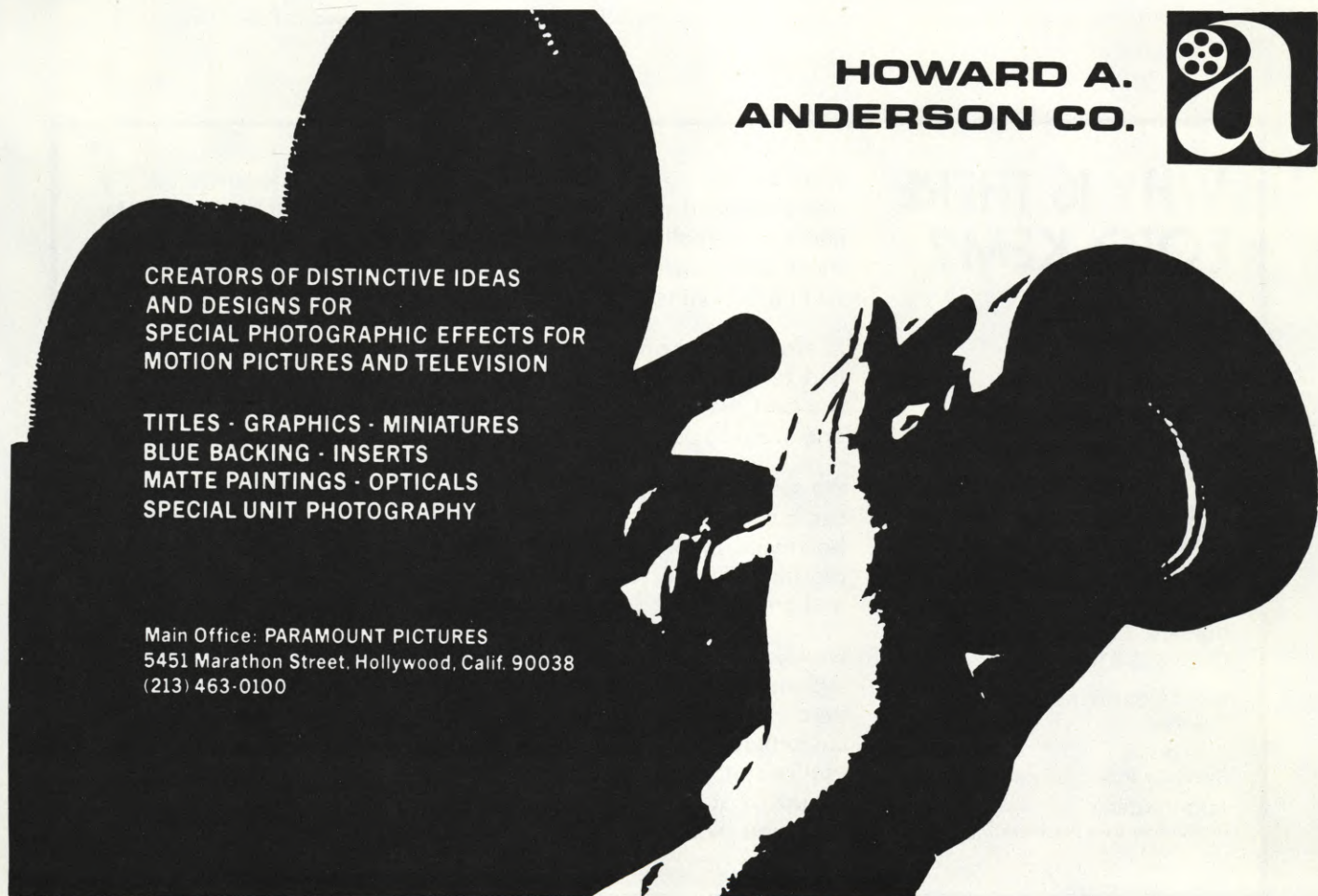
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DOCUMENTARY FILMSTRIPS

Continued from Page 405

distributes an extensive and well-known series of filmstrips on Human Development, asked if we would be able to develop a complementary series portraying teenagers facing certain problems — a girl who finds herself pregnant, an alcoholic boy, a loner, an obese girl, a runaway, and the children of divorcing parents.

I set about trying to locate people who were really facing (or had just faced) each of the problems we wanted to discuss — that of the unwed mother, for example. Weeks were spent on the telephone talking to guidance counselors, social workers, teachers. A whole network of contacts was developed. As a result, I interviewed a number of girls. None seemed exactly right, but at last one was right.

Instead of exploring a brief public event, we were now trying to use the filmstrip medium to illuminate very complex and private events and relationships. The same crew and techniques were used, except that each strip required many days of shooting. We frequently made interior set-ups, but they were done with high-powered strobes and took much less time than a similar set-up for film would have. We had to work fast and, above all, we had to be as unobtrusive as possible. The

small number of people on the crew proved to be a definite advantage. Less than a week after the girl had told her mother she was pregnant, we were reenacting the scene with the real people — and real tears.

The American Family notwithstanding, I doubt that such a production could have been done on film, and certainly not on a typical educational film budget. As a filmstrip, not only was it feasible, but the results are very, very satisfying. ■

DOCUMENTARY FILMSTRIPS— NOTES ON THE PHOTOGRAPHY

by Tyler Thornton

All photographs were taken with 35mm Nikon equipment, my standard for many years now in still photography, both because of versatility and quality. All manner of lenses were used from 24mm wide-angle to 500 mm mirror telephoto. The film used was Ektachrome commercial (ECO) with an occasional roll of High-speed Ektachrome for those impossible dark interiors and very, very early morning shots. A light "Tiltall" tripod was frequently carried, and mobility was held at a premium. I wore a fishing vest, keeping only those lenses which I had a projected use for stuffed in its small pockets. My wife carried the tripod, the larger lenses, and the bulk of the film.

The motion picture stock (ECO) was the main departure for me from my normal use of Kodachrome for reproduction on paper. The ECO is much less contrasty than Kodachrome and, therefore, reproduces better from film onto film. However, it is not nearly as sharp as Kodachrome and, therefore, somewhat disappointing. ECO comes in tungsten color balance only and must be used with an 85 filter in daylight to give a normal color rendition. This is somewhat of a nuisance when one has a whole battery of lenses; therefore, I bought 85 gelatin filters and cut them to fit under, and be retained by, my skylight filters. In this way I had the conversion filter on all of my lenses, a considerable saving in dollars from fitting all of the lenses with glass filters.

The smaller format of the filmstrip had to be considered at all times. This is the same height as the horizontal 35mm frame but about 3/16" less in width. Thus, the vertical shot was eliminated (my favorite) and the width had to be allowed for in all shots. Frequently Gabor would look my way, notice that I had the camera in the vertical position and shout, "No verticals!" After a couple of times, I learned, but the temptation was always there.

The actual shootings were all done in a single day per event. This required
Continued on Page 410

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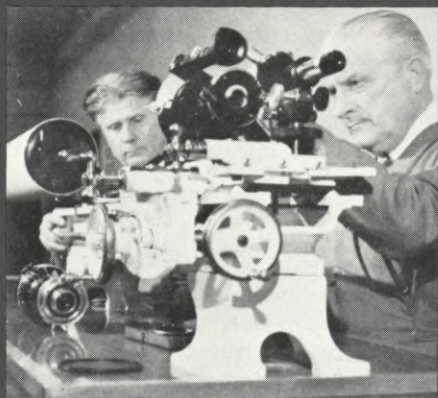
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DOCUMENTARY FILMSTRIPS Continued from Page 408

early starts and late finishes. At times we worked for 16 hours straight with only a small lunch break. When you're carrying around a bag full of lenses, etc., and wearing two or three cameras and walking as much as 15 miles on concrete and trying to see, digest and record an event that may be entirely new, these then are days that will remind you that your body indeed does have muscles and your feet, in fact, have bones. Ouch!

The coordination between the three of us was the only thing that really allowed us to finish the projects. Even though Jack and I might be in entirely different places we met frequently and consulted on the work we were doing, feeding each other ideas. He would say what sounds he had recorded, where they were, and how important, and I would do the same with the visuals. In this way, the two of us covered far more ground than either one of us could have alone. The master coordinator remained Gabor. He was always in the forefront searching for new happenings, guiding us towards the scheduled events, lining up the next shot, so that I was free to concentrate on the moment.

The main agent to the camera was the tripod. I used it frequently: during the rodeo to hold the 300mm lens used in most of the action shots (allowing me to remain outside the arena and blur the backgrounds), during the county fair for dark interior exhibits, during the drag race to get smooth pan shots at slow shutter speeds. The motor drive also proved invaluable during the fast action events allowing me to get a more complete series of shots of, let's say, a bucking horse or a speeding bicycle. I might also mention that all exposures were made with the assistance of the camera's through-the-lens meter, a system I have complete confidence in and a very time-saving convenience. And finally, I must mention my wife, who was an invaluable assistant. It was she who carried the tripod, the film, the 500mm lens, snacks, and also ran for coffee, hot dogs and root beer. It was she who stayed with my tripod-mounted camera while I climbed fences, ran into the grandstands and arena, chasing a fleeting smile, a gooey-fingered child, a clowning clown, or a mounted troop of parading peace officers.

I really didn't think it could be done all in one day, but the team effort worked and the results are very gratifying. ■

DOCUMENTARY FILMSTRIPS — SOUND EDITING AND MIXING

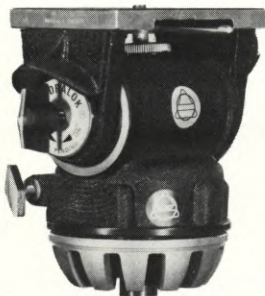
by John Mayer

When I first saw Gabor Kalman's film strip, DRAG RACE, I was very impressed by the complex sound track. It was a mixture of sound effects, music, and interviews that sounded very much like a documentary film track. When Gabor explained how difficult it had been to combine tracks in the mixing session I suggested he try mixing onto four-track half-inch tape and then mix down from that format. This eventually led to our collaboration on the final sound of four of the strips in the EVENTS! series. Not long ago I purchased a four-track TEAC tape recorder capable of sync recording. I felt it would also be capable of mixing with a quality comparable to that of studio equipment of a larger format. Combined with a TEAC Model 2 mixer and a full track recorder, it proved the ideal machine for editing and mixing sound for Gabor's filmstrips.

First, let me explain sync recording (sometimes called sel-sync or simul sync). Simply described, it is a record/playback system which allows the gaps of the record head to either record or playback. With a four-track head, any gap can be set to either record or
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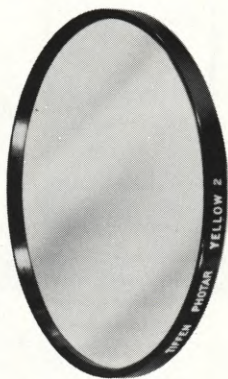
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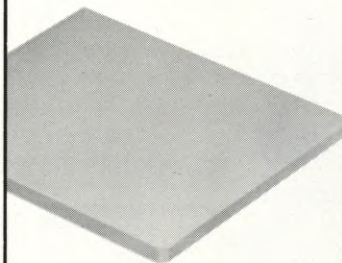
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playback — in any combination with the others. For example, I might record a signal on track one. I then rewind and play back the signal in the sync setting (gap one of the record head playing back) while I record another signal on track two. When I play both tracks together on the playback head they are synchronized. This system is often used in music recording, but it is also ideal for assembling a complex documentary soundtrack.

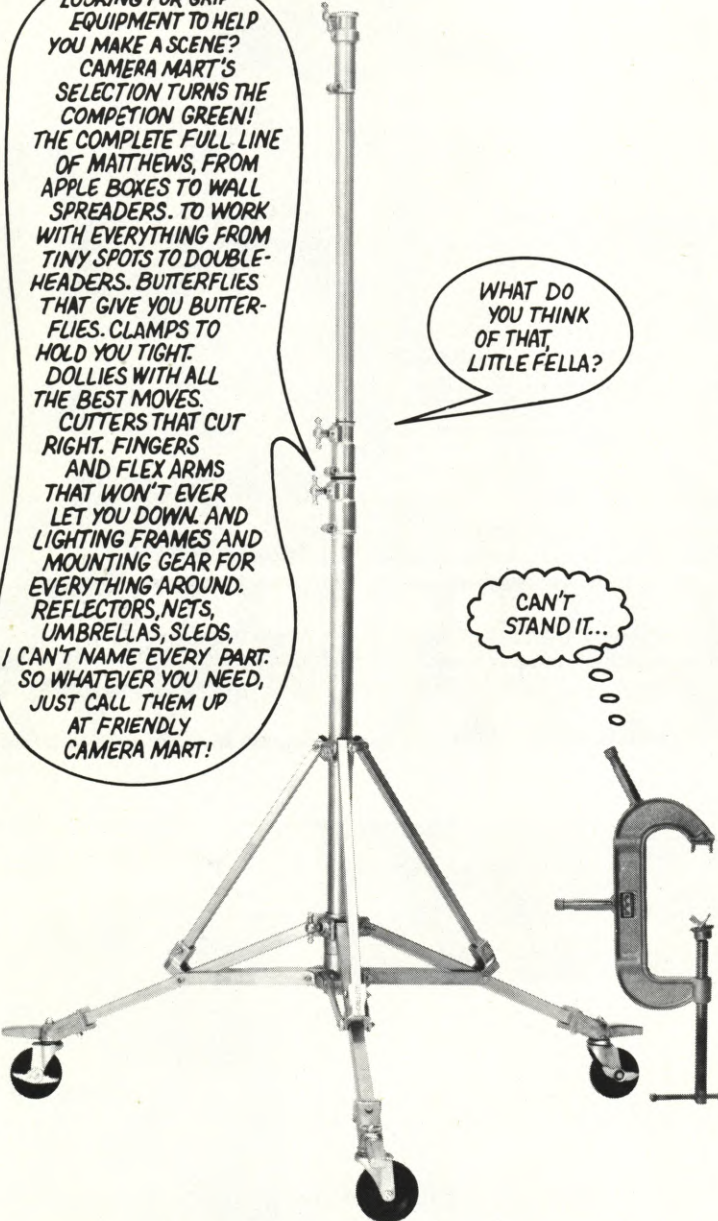
The preliminary editing was done by Gabor Kalman, who took the hours of material recorded by Jack Lord and pulled out the important lines from interviews, as well as the proper sound effects. Occasionally the material was enriched with a stock effect or two. The rough-cut tape was then threaded onto an Ampex 501 recorder and patched into one channel of the Model 2 mixer. This compact and complex little board was capable of assigning the signal from the channel to any or all of the four tracks. The channel also has some equalization, allowing high and low-frequency attenuation. As an example, we might take a line of dialogue, roll off the low frequencies at 200 hz, set a proper level and record it on track one of the TEAC recorder. Next, we would cue and equalize and set a level for the next line or effect, set the TEAC for record on channel two, sync playback on track one, assign the signal to channel two. We would roll the machine and listen to the sync playback of track one and, as soon as it ended, we would roll in the line for track two from the Ampex and it would record on track two.

This would go on and on until the entire track was assembled. Sometimes we would make edits using this system. The first part of the line would be recorded on one track and played back in sync, the second half would be spun in at the appropriate time, allowing us to edit without cutting the original tape. Lines did not always follow each other back-to-back. Often we spaced them for proper timing and then added a bed of sound effects in the background. The four tracks could get used up pretty quickly this way with voices, effects and music, but we never had to pre-mix tracks in any of the strips we did.

Another valuable feature of the TEAC system was the ability to "punch in" while recording. This meant we could record a track with something like background presence, and if it ran out before it was supposed to, we would simply re-cue it on the Ampex,

Continued on Page 444

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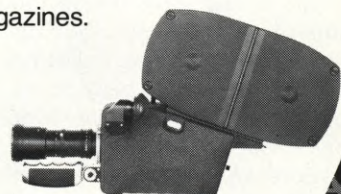
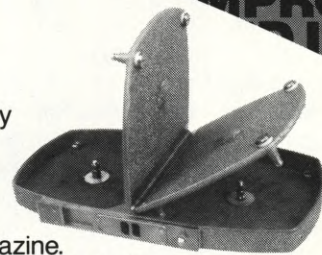
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THE PANAVISION STORY

This latest in a series of tributes to manufacturers of outstanding motion picture equipment honors a company that started by making a better anamorphic projection lens and went on to become a major force in the industry

By SCOTT HENDERSON

The classic *cliché* of the American Dream runs something like this: A bright young man with an idea (and preferably little or no money) clears a place in his garage and begins to tinker with whatever he can scrounge or scrape together, in order to turn his idea into reality. With Horatio Alger-like determination and clarity of vision, he works day and night, experiencing failure after failure and enduring the ridicule of loutish onlookers. At a point where despair would have driven the ordinary man to drink or suicide, Our Hero is still hanging in there, believing more than ever in the feasibility of his idea, bucking the odds, burning ever more midnight oil. Until finally, one day — *Voilà! Eureka! Halleujah!* — his idea becomes reality. His better mousetrap (or whatever) not only works, but solves one or more of Society's burning problems. Our Hero goes on to achieve Fame and Fortune beyond his wildest imaginings.

A *cliché* to be sure, but *clichés* become *clichés* because they are so often true, and the above fable, be it ever so corny, might well be the saga of Thomas E. Edison or Henry Ford or, for that matter, one Robert E. Gottschalk, who literally began in his garage by cobbling together a home-made underwater motion picture camera and is today President of Panavision, Incorporated, a towering giant among manufacturers of camera and lens systems to the professional motion picture industry.

Panavision, Incorporated was founded by Robert E. Gottschalk in the fall of 1953 for the purpose of manufacturing anamorphic projection lenses for the then brand new Cinemascope process.

Panavision anamorphic projection attachments differed from the ones

Bausch and Lomb were making for 20th Century-Fox in that the optics were prismatic rather than cylindrical, thereby allowing a change in the anamorphic power, or squeeze ratio, of the lens by merely turning a knob on the lens itself. Panavision anamorphic attachments became the most popular projection lenses in the world and more than ten thousand pairs were sold. Panavision, at that time, was small, but the tremendous sales of its lenses brought sufficient capital into the company to allow it to expand into the photographic end of the motion picture industry. MGM Studios were making their most expensive pictures in Cinemascope but they were unhappy about having to go to 20th Century-Fox for their taking lenses, so they came to Panavision with the hope that Panavision could design a system for them on a non-exclusive basis. Panavision accepted the challenge and developed Ultra-Panavision 70 which MGM first used on "RAINTREE COUNTY", then "BEN-HUR" and "HOW THE WEST WAS WON".

Concurrently with developing the Ultra-Panavision 70 process, Panavision was working on a new lens design for 35mm photography to compete with Cinemascope and, shortly afterward, brought to the studio for testing an all-new anamorphic lens designed to eliminate the troublesome closeup distortion and general lack of definition of Cinemascope lenses. MGM immediately adopted this system and stopped using Cinemascope. As soon as the word was out that MGM was using Panavision lenses, others quickly began to use the Panavision process. The Mirisch Company and Columbia Pictures were the next to use these Panavision 35 lenses. A few

years later, 20th Century-Fox itself abandoned their own Cinemascope process in favor of Panavision.

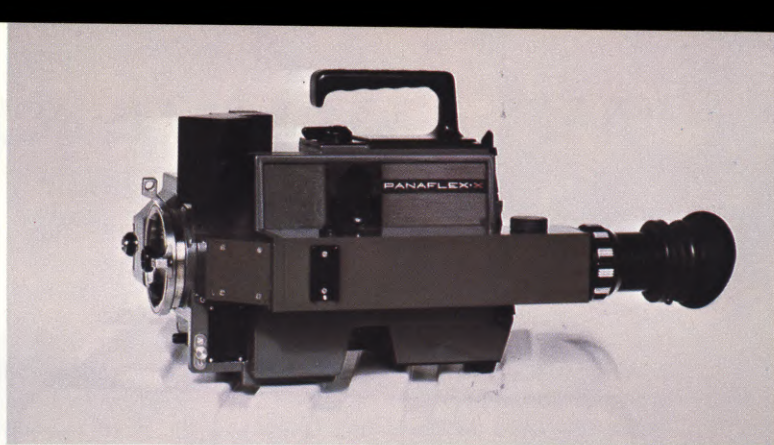
While this was going on, yet a third process was being developed by Panavision: Super Panavision 70, which utilized the same 70mm cameras as Ultra-Panavision, but with new spherical lenses. The first picture to use Super-Panavision was "WEST SIDE STORY" and then "LAWRENCE OF ARABIA" and many others followed. Of course, it was obvious that the 35mm Panavision system would be the most popular and Panavision had designed its lenses to fit the BNC cameras which all studios were using, but it was not long before the urge came to design and build a silent reflex camera which appeared to the company to be the next logical step in camera evolution. It was not long, therefore, until the company displayed what it called its Panavision Silent Reflex camera or PSR, as it became known, the first silent studio reflex camera.

To produce this camera quickly and at the lowest possible cost, Panavision used NC and BNC camera boxes which they converted to the reflex system and altered the movement to allow for a 200° shutter. An all-new lightweight blimp was designed to hold the camera box and a very sophisticated viewfinding system was incorporated. The PSR camera weighed in at just under 100 pounds and was in immediate demand. Zoom lenses were just coming into vogue at this time and zoom lenses desperately needed reflex cameras.

The popularity of Panavision lenses and the PSR camera grew dramatically during the early 1960s and, as television became more and more important, Panavision began to design and build spherical photographic

How it all began. Robert E. Gottschalk started Panavision, Inc. because he felt the industry needed better anamorphic lenses for projecting Cinemascope, and proved it with the comparison below: (LEFT) Closeup projected through Bausch & Lomb Cinemascope lens exhibits a bad case of the "anamorphic mumps". (RIGHT) The same scene projected through a Panavision lens exhibits no distortion.





(LEFT) A set of Panavision Super-Speed and Ultra-Speed lenses, including: 14mm, T/1.9; 20mm, T/1.9; 24mm, T/1.2; 29mm, T/1.2; 35mm, T/1.3; 40mm, T/1.3; 50mm, T/1.4; 75mm, T/1.6 and 100, T/1.6. (RIGHT) The new Panaflex-X camera, which is similar to the standard Panaflex, but minus the 360° rotating viewfinder system and variable shutter. It accepts all of the Panaflex accessories, plus a small television camera that attaches to the viewfinder. It was designed as a second or "spare tire" camera to the Panaflex.

lenses for both television and 1:85 spherical photography.

Panavision produced its PSR camera in ever-increasing numbers and the camera rapidly became the most wanted studio camera in the world.

In 1968, Bob Gottschalk decided that the PSR, while very much in demand, did not represent Panavision's full design and production potential. He reasoned that it was still a conversion. It was a camera in a blimp and, while lighter than other studio cameras, was still relatively heavy. He then launched an intense and highly secretive research and development program to produce what he calls "a totally new generation of cameras" which would have to be light enough to be comfortably carried by hand and yet serve all the functions of the studio camera. The company worked for four years, during which time no rumor of the project became known to the industry. Then, suddenly, in the fall of 1972, Panavision unveiled its Panaflex camera. Production of the PSR had been quietly discontinued, as it was apparent from its initial debut that the Panaflex was the camera of today and tomorrow.

The year before the Panaflex was shown, Panavision realized that in order to produce this camera efficiently and in quantities it needed a new factory much larger and more modern than the one that had been its home since 1953. The company then designed and built a new factory in Tarzana, which was conceived expressly with the Panaflex production in mind.

In little over four years, 100 Panaflexes have been produced and production has increased at a steady

pace. The company could have produced many more cameras in the past four years if it had not been for Panavision's policy of constant engineering improvement and retro-fitting these improvements to the cameras. The design of the Panaflex, as well as all other Panavision equipment, is never frozen and the company is constantly engaged in research to develop improvements in their products.

In the four years since the Panaflex has been in use, it has undergone more than 100 modifications and these modifications were made to all the cameras, not just the latest ones.

Therefore, if a cameraman rents a Panaflex camera, he can be assured that his camera will be indistinguishable from the very highest numbered camera in both performance and appearance.

Over the years, Panavision began acquiring representatives throughout the world: The first being Samuelson Film Service, Ltd. which represents Panavision exclusively throughout Europe and Australia. They were followed by General Camera in New York, Cinevision in Canada, Salon in Hong Kong and Southeast Asia, Toho

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(ABOVE LEFT) The new Panaglide floating camera mechanism, with Panavision-adapted Arriflex mounted. (RIGHT) The Panaglide with special lightweight Panaflex mounted and shaft partially telescoped. On the lower end of the staff is attached the electronic control system housing, with the battery pack in a separate container. (BELOW) A series of sequential still photographs showing the operator running with the Panaglide to film fast action sequence.



"MR. PANAVISION" SPEAKS OUT

A candid and informative interview with the man who built the company from the ground up and who still provides its leadership

It is almost axiomatic that behind every successful organization there lies the vision, inspiration and determination of a single person. In the case of Panavision, that person is Robert E. Gottschalk, who, in David and Goliath fashion, decided to compete with the giant optical companies of the world in designing and manufacturing anamorphic projection lenses — and who did it so successfully that he parlayed his company into the position of foremost purveyor of advanced professional camera and lens systems to the motion picture industry.

Robert E. Gottschalk was born in Chicago, Illinois, and attended and graduated from Carleton College in Minnesota. Immediately upon graduation, he came to Los Angeles with the idea of entering the motion picture industry.

He first produced and directed short subjects in color which were blown up to 35mm and released by Warner Bros. He then entered the field of medical photography and produced and directed a number of scientific and

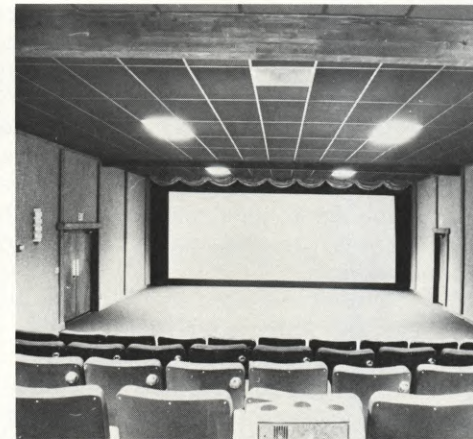
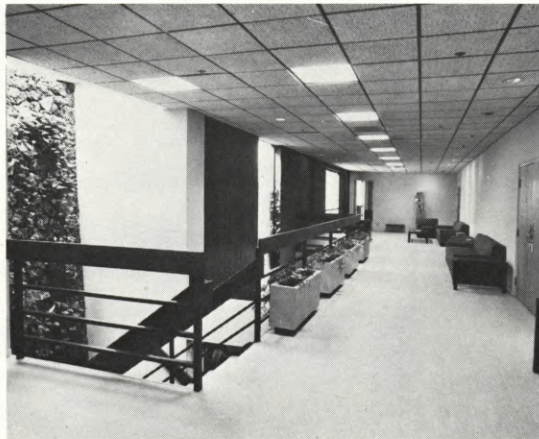
medical films. By chance an acquaintance of his acquired the first Aqualung imported into the United States from France where it had been developed by Jacques-Yves Cousteau. After his first experimental dive with the Aqualung he decided to build an underwater movie camera so that he could make underwater films with this new device. With his home-built under-

water camera he shot footage for the major studios and, in searching for wide-angle lenses, he hit upon the idea of using the then practically unknown system of anamorphic lenses.

At this time 20th Century-Fox was secretly experimenting with anamorphic lenses and subsequently announced to the film industry that all their pictures would, henceforth, be



(ABOVE RIGHT) The ultra-modern Panavision plant in Tarzana, California was built a few years ago specifically to accommodate the expanded production facilities needed to produce the Panaflex camera and its accessories. (BELOW LEFT) Reception foyer of the Panavision plant. (CENTER) Gallery and theater foyer. (RIGHT) The Panavision theater, which features superb projection equipment for all professional formats.



(LEFT) The Electronics Department at the Panavision Plant. (CENTER) The Panavision machine shop. (RIGHT) Another view of the machine shop. The Panavision plant, considered one of the most technically advanced in the world, regularly runs multiple shifts in an endeavor to keep up with the demand for the highly popular Panaflex camera, which is rapidly becoming the standard of the industry for professional 35mm production.



made in Cinemascope. Because of Gottschalk's experience with anamorphic lenses, he decided to compete with 20th Century-Fox in providing projection lenses to theaters throughout the world. He then started his company, which he called Panavision, and which grew into what it is today.

A member of both the Directors Guild of America and the Hollywood cameramen's union (IATSE LOCAL 659), Gottschalk, as President of Panavision, is attuned to the practical requirements of technicians working in today's film industry. In the following candid interview, granted exclusively to *American Cinematographer*, he discusses the philosophy of his company and the development of its latest products:

Q. Today a large proportion of motion pictures are photographed with Panavision equipment. What is your opinion as to why this is so?

A. There are several basic reasons for this—the first being that Panavision's philosophy is to design and produce photographic equipment of the very highest quality regardless of price. Since Panavision does not sell its equipment, no compromise is made in quality. Secondly, and equally important: Panavision spends a great deal of time with cameramen, camera operators and assistant cameramen researching their desires and needs. In other words, the company makes a real effort to produce equipment to make the camera crew's job easier and to help them achieve a better looking picture on the screen. Thirdly, Panavision's policy of constant updating of its equipment insures the user that his equipment incorporates the latest developments and innovations.

Q. How long ago did you decide to make the Panaflex Camera and what motivated you to build it?

A. We had produced the first Panavision Silent Reflex Camera approximately ten years ago and it was received with tremendous enthusiasm because it contained many of the features desired by cameramen, operators and assistants. Even though it was a conversion, it was highly sophisticated, extremely quiet and had a superb viewing system. It far surpassed any studio camera available. In spite of the demand for it and its success, I felt that it did not incorporate all of the features that were required in today's method of making motion pictures, nor did I feel that this camera represented Panavision's full technical

capability. So, seven years ago, we started on the design of a whole new kind of camera which we felt would better fulfill the needs of modern movie-making.

Q. What were some of the changes in movie-making techniques which made you decide to build the Panaflex?

A. For one thing, movie-makers were moving out of the studio sound stages and shooting their films largely on natural locations and this required a much smaller, much lighter camera. The practical locations often made it difficult or impossible to use cranes or dollies and, therefore, a truly silent hand-held camera was desperately needed. The result of this thinking, of course, was the design of the Panaflex which weighs less than one-third as much as the PSR in the Panaflex's studio mode and converts in less than one minute to a hand-held camera which can be used for sync sound photography without compromise.

Q. What special techniques were used to achieve such a small and silent camera?

A. The manned space program spawned a great many electronic innovations and a number of these new technologies were incorporated into the camera, allowing us to miniaturize and effect tremendous savings in weight and bulk. Its extremely low sound level is achieved without a camera blimp or a lens blimp by extremely high precision in the manufacture of its drive components and, since we were not building this camera to sell competitively, we were not hampered by cost-cutting manufacturing techniques which would ultimately penalize the sound level of the camera.

Q. What is your reaction to seeing other motion picture cameras using electronic digital display since you pioneered it in the Panaflex four years ago?

A. Since imitation is the most sincere form of flattery it doesn't bother me. Anyway, putting a winged-lady radiator ornament on an Edsel does not a Rolls-Royce make.

Q. Since the Panaflex Camera costs twice as much to rent as other movie cameras, has this created any problems in its acceptance?

A. The relatively high rental price of the Panaflex Camera is the result of two

factors: the first being that it is an extremely expensive camera to produce because of its precision and versatile features. The second reason is that all Panaflexes from #1 on are constantly being improved and updated and new features are retro-fitted into earlier cameras so that the renter of a Panaflex is assured that his camera, no matter what its serial number, includes Panavision's latest features and improvements. This policy, of course, costs the company a lot of money and is reflected in its rental price.

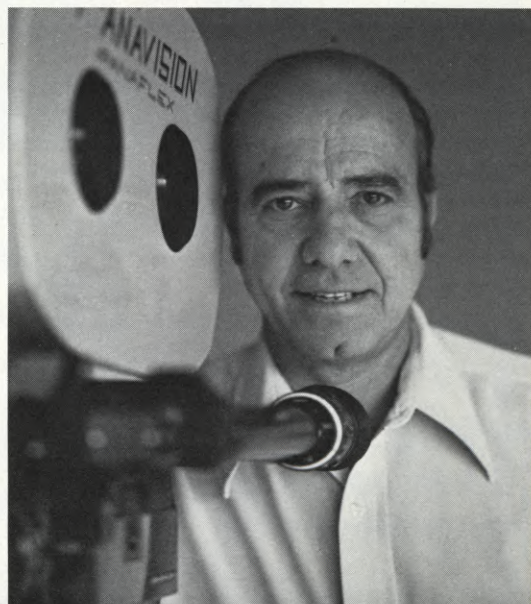
Q. Do you anticipate that in time the rental price of the Panaflex will be reduced?

A. I think there is little doubt but that the rental price of the Panaflex will be reduced and for a number of reasons. Firstly, the camera has had over four years of experience on a great number of major motion pictures and television films and has been shaken out, so to speak. Like any new product there were a number of changes and improvements made in the camera and it is now operating so successfully that future changes will become fewer and fewer. Secondly, Panavision has been tooling up to produce the camera in larger quantities and the result of this tooling will mean a lower production cost and, of course, a lower production cost will mean a lower rental price.

Q. Since it is now a fact that many motion pictures are made in natural locations, what is your feeling about the quality of photography of movies made this way, as opposed to those made under studio controlled conditions?

Continued on Page 424

Robert E. Gottschalk, founder and President of Panavision, Incorporated, is the "spark plug" behind his company's surge to prominence in the industry.



THE "HAUNTED" EXPERIENCE

By **WILLIAM E. HINES**

Director of Photography

A feature full of mood and special effects, filmed in Hell-hot locations, provides the cinematographer with a challenging, but rewarding, experience

"A telephone booth in a cemetery!"

So I was told when I had asked Michael de Gaetano what "HAUNTED" was about. But, of course, it was more than that. Fascinated by our wired technological society and its sometimes morbid effects, he was in the process of finalizing the script for this contemporary Gothic Western, touched by reincarnation and death, with the Superstition Mountain as background.

"We've all become prisoners of the copper wire, and the telephone symbolizes the villainy that's strangling us," he told me.

"HAUNTED" promised to be a picture packed with challenges both artistically and photographically and I was looking forward to the experience of working with Michael de Gaetano, the writer, producer and director, and with his twenty-eight-year-old associate, Nicholas Nizich, who was functioning as co-producer on this, his first picture in that capacity.

I became involved with the film in its formative stages when Michael was writing the shooting script. During that time, we had many meetings to discuss the various photographic equipment and procedural requirements of the

picture. I felt comfortable with his thinking and visual conception of the story and had no doubt that I could help him realize this on film. Michael had finished "UFO: TARGET EARTH", his first feature (see *American Cinematographer*, July 1974), a couple years before and was looking forward to this, his second and more ambitious film.

During our discussions of lighting and mood, he requested chiaroscuro lighting for the interiors, which is a very contrasty, moody effect comprised of stark light and dark shadows and with a few or no mid-range tones. In the filming although the nature of the interiors and the placement and type of the practical source lights opted against a true chiaroscuro result, we did approach this low-key effect, particularly on night interiors and exteriors.

Michael and I had concurred on not pushing the film unless absolutely necessary, in order to maintain optimum film quality. As it happened, because of the extensive scope of the master shots in each of the exterior night sequences, pushing the film was necessary for all night shots. However, only one stop of forced development

was required, and the black areas held full and rich. To achieve this visual mood, all interior and most exteriors were shot with a relatively wide lighting ratio and brightness range.

To film this feature, we had a shooting schedule of four six-day weeks to make forty major moves, some of them as far as sixty miles from our central base. There were fifty-five establishing lighting setups and approximately 450 camera setups. Our aspect ratio was 1.85, film stock was Eastman 5254, and our total film consumption was 56,000 feet of film. Not much film for a feature of this scope.

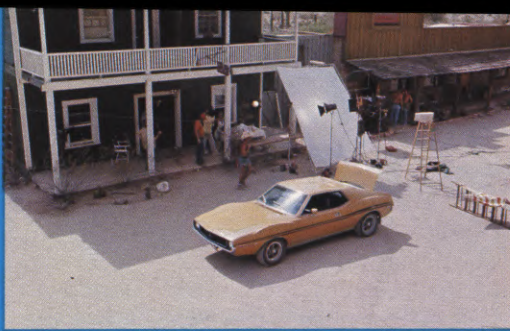
Arizona in summer has to be almost as hot as working in hell. Temperatures ranged from the high nineties to nearly 125°. In fact, during one exterior sequence, Michael's crepe soles melted from his shoes, sticking to the hot black pavement in downtown Phoenix. In some of the smaller interiors at the movie ranch, with the lights on, the temperature would rise to 140° — and with high humidity as a result of the perspiring cast and crew. In addition to heat, we had blowing sand and rain storms to contend with. But we ate plenty of bananas for potassium and

(LEFT) Preparing to shoot the complicated opening sequence of "HAUNTED", which involved a 60-foot dolly move, plus the movement of more than 50 extras. (CENTER) An overhead view of kitchen set shows camera crew in upper left corner shooting with Arriflex 35BL. (RIGHT) Second assistant cameraman measures camera distance for focus in preparation for shooting scene in bedroom set.



(LEFT) Director of Photography Bill Hines modifies ram's head to shoot cutaway "insert" in living room of the McCloan mansion. Note riggings and "greens" above set. This was part of a complex rigging which provided more than 500,000 watts of usable light and was permanently rigged for sequences shot on this set. (CENTER) Hines moves a diffusion paper over a key light illuminating Virginia Mayo. (RIGHT) An overhead view of living room and staircase set constructed at Southwest Studios in Carefree, Arizona.





(LEFT) Camera crew prepares to pull back from closeup in gasoline station sequence shot in Mesa, Arizona. Light was mixed from gelled FAYs to provide daylight fill. (CENTER) Gigantic butterfly scrim was used to diffuse lights from deuces and FAYs for porch sequence. (RIGHT) Crew makes ready to shoot a 40-foot dolly move. Because of the extreme brightness of the sun, it was necessary to provide a tremendous amount of fill light to keep the shadows from going black. Hence the FAY lights and reflectors used here.



(LEFT) Director Michael DeGaetano rehearses actors for beach sequence, as crew sets up lights. A moonlight effect was used here, as with all night exteriors. The orange glow from left of frame came from a special light to provide fill for Coleman lantern. (CENTER) The crew sets up to shoot pool table sequence in local beer hall. (RIGHT) The crew moves a 40-foot section of dolly track through Apacheland.



(LEFT) Rain interrupts the shooting of a night sequence. (CENTER) Spectacular flames engulf stuntman Bill Couch, as he moves from phone booth and runs through the cemetery. Note dummy of actress Ann Michele in phone booth. (RIGHT) Couch in full flame. Note safety men with extinguishers in upper right corner. Couch was painted with flammable glue. His special costume contained a body-fitted oxygen suit which provided him with three minutes of oxygen.

enough salt pills to keep our muscles from cramping and to avoid heat prostration.

"HAUNTED" was a big picture to do photographically. It demanded multi-camera coverage at times and the use of large lighting units.

Our lighting equipment included two Brute arcs and five 10Ks with Molevators, two nine-light units, twelve seniors, twelve juniors, eighteen babies and eight dinkies — most units with quartz bulb capability — and a couple of Lowel kits. In addition to twenty-four 2K and 1K quartz units with dichroics, we used FAY and mushroom bulbs to augment, plus the usual light control accessories, including a ten-channel dimmer board, remote boards, spiders, several thousand feet of cable, etc.

Grip equipment consisted of a McAlister dolly, eight reflectors, assorted screens, scrims, solids, cukalorises and butterflies, grip stands, polecats, lumber, apple boxes, wedges, cup and step blocks, ladders, chairs, umbrellas, walkie-talkies, etc.

Four 35mm reflex cameras were used: the BNC pellicle reflex, a heavy studio sound camera, and the ARRI 35BL, a lightweight sound camera (both with crystal sync motors), and two ARRI II-Cs for MOS ("mit out sound") or "wild" shooting. One of these had a hard front for the Mitchell lenses and the other had a three-lens turret and used ARRI lenses. Both ARRIs had high-speed capability. The two sound cameras and the two wild cameras were also backup cameras for each

other in the event one or the other malfunctioned.

In the spacious and modern Southwest Studios at Carefree, the McCloan home interior was constructed. It was a four-room set with a center stairway and measured 45'x45' overall. Proserpina's wickiup and a small confessional were the other two sets put up on the stage. All other interiors were real location environments.

Our electrical crew, under Gaffer Larry David, did a remarkable job in getting the lighting in place and operating it at the various locations under extremely difficult conditions. Heavily snooted studio lights, deuces, fivers and tenners, were hung and used for our stage work. We directed blue-gelled 10K or nine-light FAY units

through windows and doorways for the appropriate daylight or moonlight effect.

Michael wanted each set to have a distinctive ambience, so colored light was used throughout the picture. I used gelled babies and deuces to reproduce the colored light emitted from the practicals. All these were diffused to provide a soft ambience, and the gels were used to bring the color temperature of particular lighting units into correlation with each of the practical light sources used so that in effect, these practical light sources appeared to actually light specific areas of the set. Michael desired a distinct blue moonlight cast to all night exteriors, so all of the luminaires simulating moonlight were gelled to 5600°K. The torchlight effect in the opening sequence was one instance, the fire sequence near the end was another, in which "flame"-colored gels were used. The effect of the Coleman lantern lighting the lake scene was achieved with a light yellow gel.

Michael and I decided on night-for-night sequences rather than day-for-night in order to attain deep, rich blacks and thereby maintain a consistent and believable look and mood throughout the picture. Each scene was bathed in a blue moonlight effect with colored light added to simulate emission from obvious practical sources. The moonlight effect was kept at a level

approximately two to two-and-one-half stops less than that of the key light for appropriate balance.

Because of the low level (to avoid halation) of the practical light (in relation to the selected T-stop) at the freight depot in the western town, we had to augment that light by a nook light placed above the roof and directed downward. The light hitting the roof was objectionable and next to impossible to completely gobo off, so to keep the light and stand out of the Academy aperture, we lined up a cutter with the roof line, in relation to the camera, and secured the cutter with two C-stands, effectively blacking out and blocking the roof, and made the shot.

The lake sequence worked with quartz, FAY and baby units. Since we did not have enough power or equipment to light the lake, Michael placed a lone fisherman in the distant background and we directed a yellow-gelled baby on him, simulating the light from his Coleman lantern which was beside him. The reflection from him and the lantern, across the gently rippling water, effectively established the scene.

The nook lights and Lowels came in handy in the tight confines of the phone booth where we used bounce light, as we had done in several other sequences. We had to replace the circular neon tube with a tungsten bulb in

order to justify the fatal spark which was to emanate from the bare filaments of a broken bulb.

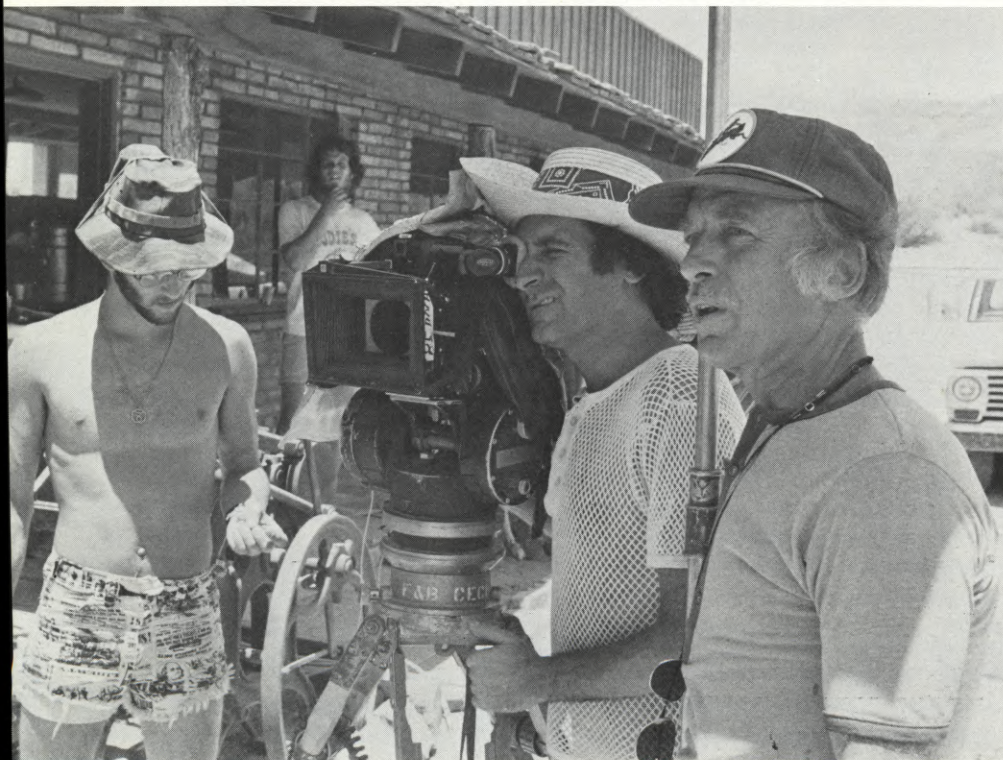
If a practical moved — such as a torch or lantern — we panned an appropriately color-gelled luminaire with that action. This was done in the opening sequence, our most extensive lighting setup, where we had extras, horses and principals lighted by a torchlight effect and had a sixty-foot dolly move to make. We also panned colored light during the fatal fire sequence, and when Andrew approaches Proserpina's place with his lantern. The lamp operators deserved credit in not only panning with the action, but also simultaneously flooding or spotting the lamps in order to keep the intensity of the light on the subject consistent. At other times we "floated" diffusion or open-end scrims to control the intensity of the light falling on subjects passing near luminaires.

The opening night-for-night sequence, which was bathed in a moonlight effect with each of several action areas keyed by torchlight effect, did not present the lighting problem for multiple camera shooting which might be imagined. Even with the two sound cameras shooting at angles up to ninety degrees of each other as they panned with the action, we were able to maintain proper lighting balance, because we utilized snooted key lights gelled with "flame" color, one covering the area around each torch, panning with, and varying the intensity on, each torchbearer as he moved. It was a wide shot with plenty of depth to it, and had principals, extras, and horses working. The weather was threatening and we had to get the sequence in the can, because we had already been rained out once before after having lighted this, the most extensive setup of the picture, so Michael asked for two sound cameras to provide two angles of coverage for each take.

In the bar/poolhall sequence, we had two problems: the first was the limited time we had to shoot in the business establishment; the second and deciding factor was an actor who could not remember his lines. Again Michael decided to use two cameras, shooting at a sixty degree angle from each other. The lighting was pooled and moody with bounce light fill, and we made it work. The forgetful actor's lines were dubbed in later in Hollywood.

In the fire sequence, where Andrew burns like a torch, we utilized both sound cameras and the wild cameras, all of them panning with the fiercely blazing stunt man, shooting at an angle which varied during the panning move-

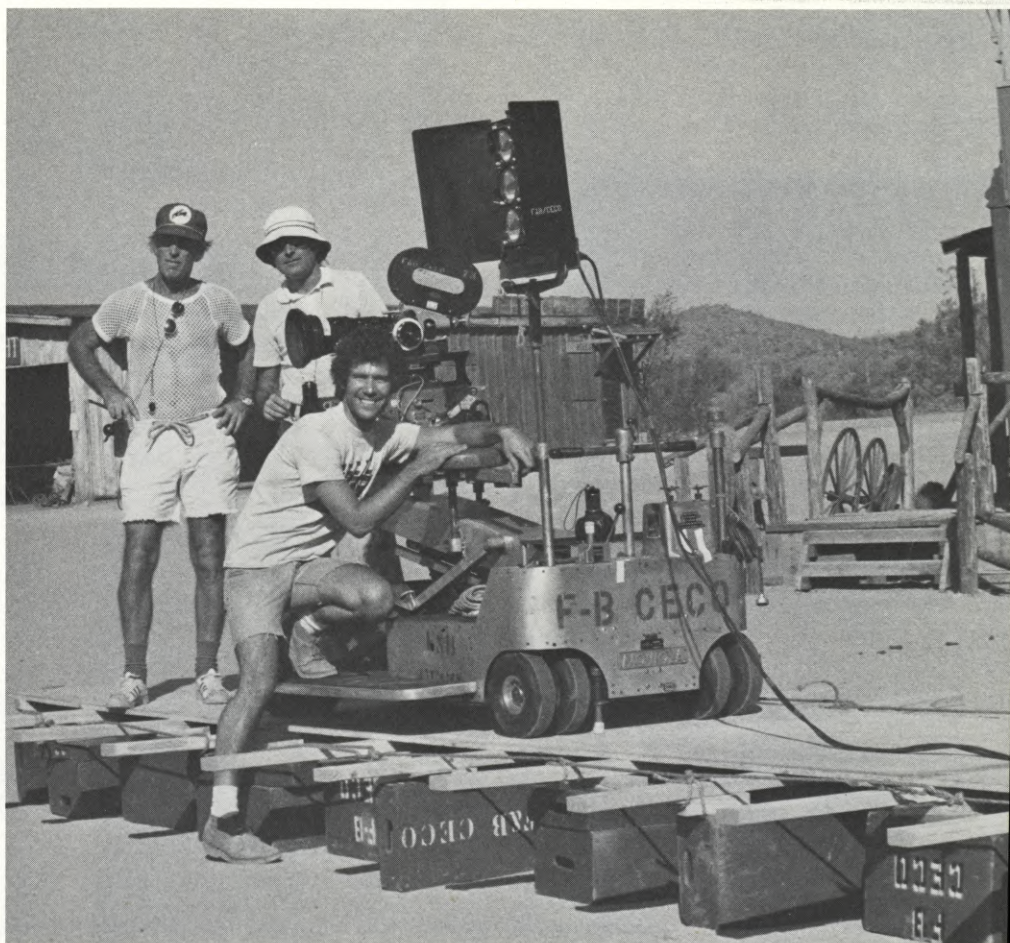
Director Michael DeGaetano checks camera angle, as Director of Photography William Hines (right) prepares to shoot the scene and 2nd assistant cameraman Rick Plautz waits for start cue. Arizona summer temperatures ranged from the high nineties to 125° — hot enough, in fact, to melt the crepe soles from the director's shoes.



ment from forty-five degrees to one hundred sixty degrees of each of the outside cameras. But again, the pooled light, the brightly burning subject and the panning key lights with flame gels worked well. The cameras were spaced along the line of action in order to get it coming and going, each appropriately placed to get us, respectively, an extreme long shot, a high medium long shot, a medium close shot, and a low close-up angle. The two cameras holding the wider angles were running at standard speed (24 fps), the camera with the medium view was running at 32 fps and the low angle closeup camera was filming at nearly three times normal speed. We got two rather spectacular takes.

I had other lighting challenges and semi-challenges, such as those sequences requiring interior-to-exterior and exterior-to-interior angles. We had one day and one night exterior-to-interior, and although we had no night interior-to-exterior setups, we did have two day interior-to-exterior to shoot. In addition, I had an interesting but quite unexpected problem to face and that was a day-for-night interior-to-exterior shot. It was a matter of balancing the exterior light coming through the window to the interior lighting. We could not increase the light inside the small attic space without making it a sauna or burning the place down. The exterior background in view consisted of dark-colored buildings and dark green terrain which was about three-quarters backlit by afternoon light, so there were many dark values apparent. The approach to balancing interior-exterior lighting is always one of keeping the light values (brightness range) within acceptable visual parameters in order to achieve the visual effect desired. To reach this intensity/brightness balance on location interiors, light control and/or color correction gel material can be placed over the windows. In preparing the attic setup, it was necessary to maintain the consistent blue moonlight effect, which was used in all night exteriors throughout the picture, so we covered the window with two .60 and one .30 neutral density gels, without using an 85 gel, which brought the exterior brightness down to a level two stops below that of the interior. The result was quite satisfactory. Later on we treated the bar/poolhall sequence in a similar manner.

The only day-for-night sequence (simply because we could not go to the great expense of getting enough equipment there to light the action and the extensive background) was when Andrew was on the lake in his boat,



Hines and DeGaetano (in background) discuss upcoming scene to be shot at Apacheland studios in Arizona, while 28-year-old co-producer Nicholas Nizich, working for the first time in this capacity, seems oblivious of the overpowering heat. All night sequences were shot night-for-night, except one which was reluctantly filmed day-for-night only because the area was too vast for the number of lights available.

traveling to Proserpina's.

As I mentioned, the weather was a problem — in more ways than one. The monsoon season was upon us, and thunder showers were periodically appearing; fortunately for most of our shooting, late at night. However, we had the big opening sequence to do at night, and the evening that it was scheduled, after getting our lighting setup thoroughly rigged and arranged and sixty feet of dolly track leveled and secured, as we began camera rehearsal of the rather intricate action, the lightning began flashing in the distance and moving rapidly in our direction as the wind picked up in intensity. Suddenly, as we were about ready for our first take, the storm was upon us with gale-force winds, driving rain and lightning bolts. The wind blew over and smashed two nine-light units and cracked the fresnel lenses on two tenners before everything was pulled down and/or covered by the rain-drenched crew. We all retreated to the operational saloon for a few well-deserved libations while the thunder crashed and boomed overhead and the lightning bolts struck all around us, including the building we were in. It was

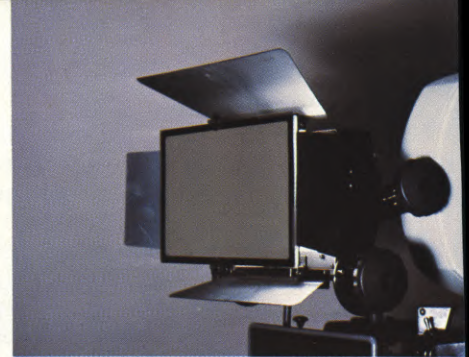
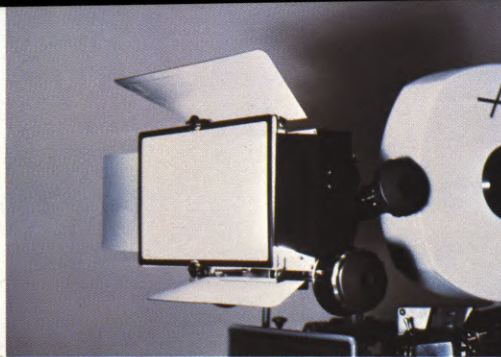
like war. Well, that finished the shooting for the night as one thunder storm after another passed through. We would have to set up for the sequence another time. *C'est la guerre.*

Despite all the trials and tribulations, "HAUNTED" was put in the can and we returned to Hollywood to recuperate. There Michael and Film Editor Jack Hofstra began cutting what we had wrought. In seven weeks they had a fine cut ready for sound effects and music timing.

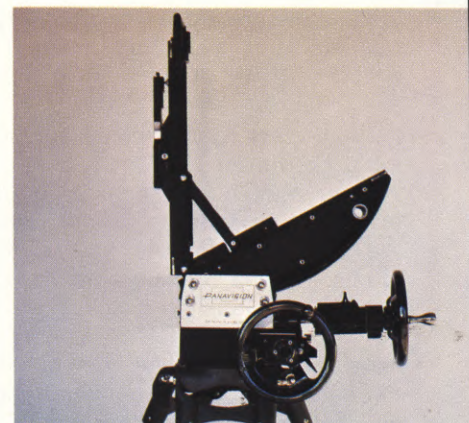
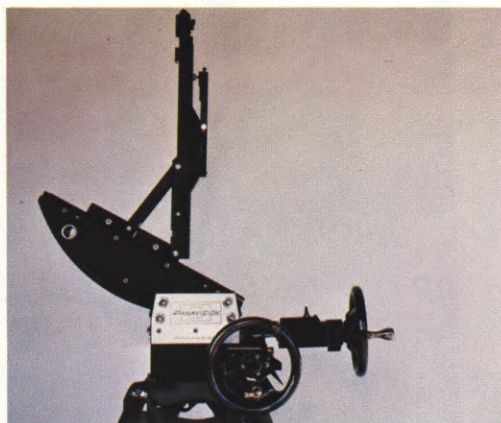
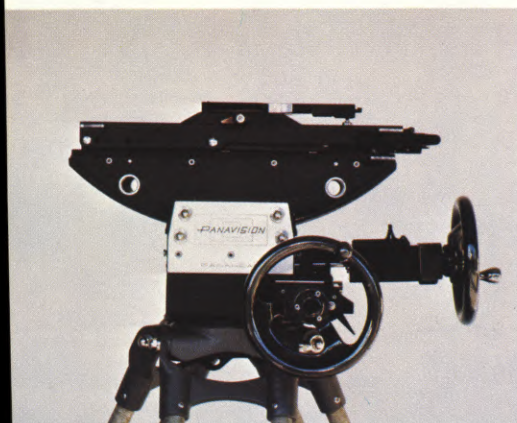
An excellent score was composed and conducted by Lor Crane, who worked from a 1/2" video cassette transfer from the edited workprint. Necessary voice looping was also done using video tape transfers from the workprint as audio-visual guides. All post-production was done at Denny Harris, Inc. of California, which has complete facilities from editing through dubbing.

F & B/Ceco, Alan Gordon Enterprises, and Ray Baxter Enterprises were most helpful in filling our equipment needs at all times.

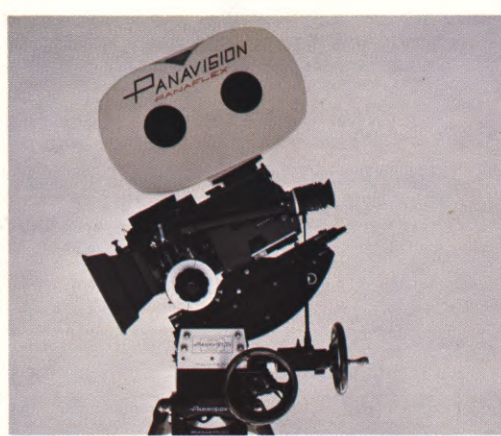
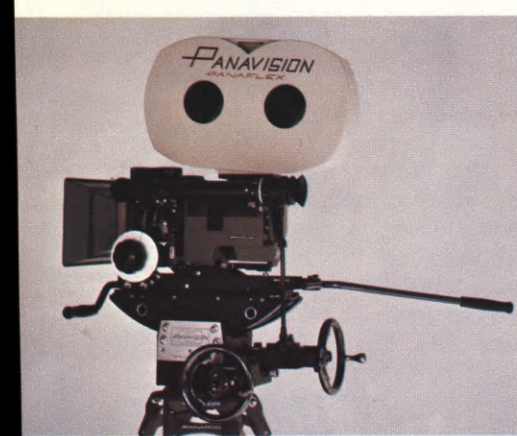
I can only say that "HAUNTED" was a tough but worthwhile experience — one which I shall long remember. ■



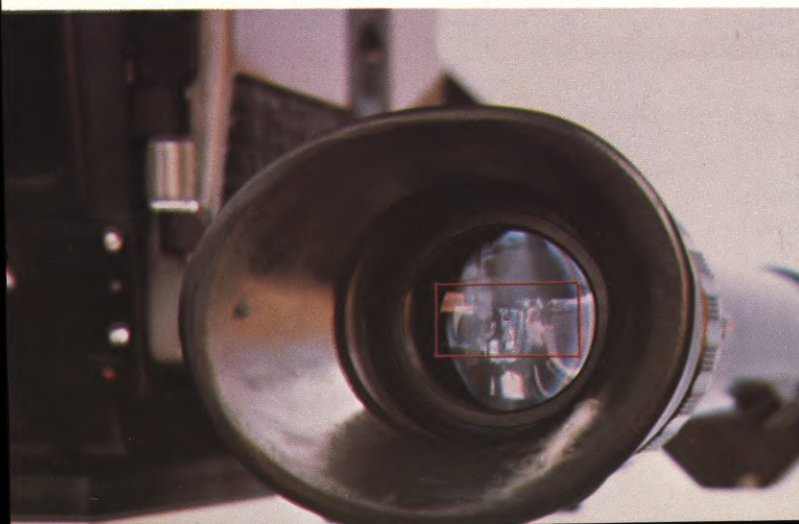
(LEFT) The Panalite dimmable basher or obie light, holds a 1000-watt quartz bulb with the intensity being infinitely variable at the turn of a knob, with no change whatsoever in color temperature. The light from the Panalite is absolutely even. Rear view here shows back of housing, control knob and light-limiting doors. (CENTER) Panalite front view, showing light at full intensity. (RIGHT) Panalite, showing light considerably dimmed.



(LEFT) The new Panahead gear-head for 35mm motion picture cameras weighs only 30 lbs and features three speeds, plus neutral or "free" head. In addition, the Panahead can also be used as a gyro head. A built-in tilt plate raises the camera 90° to permit pointing it straight down, or, by reversing the plate, straight up. (CENTER) Tilt plate elevated to point camera 90° straight up. (RIGHT) Tilt plate elevated for shooting straight down.



(LEFT) Panaflex on Panahead with handles attached for "gyroing" the head or "free heading". (CENTER) Panaflex on Panahead tilted down, showing viewfinder kept almost level automatically. (RIGHT) Panaflex on Panahead, tilted up, showing viewfinder kept almost level automatically. (BELOW RIGHT) The Panaglow illuminates the ground glass markings in the viewfinder, in order to eliminate the loss of those lines when viewing scenes at night or in subdued light. The lines glow red in dim light, changing to black when the camera is panned to a lighter area.

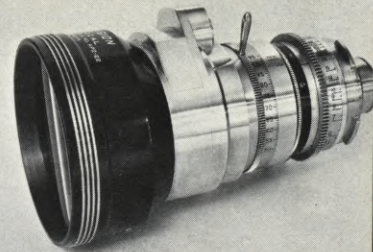
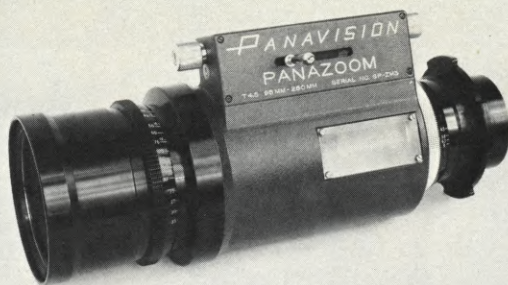
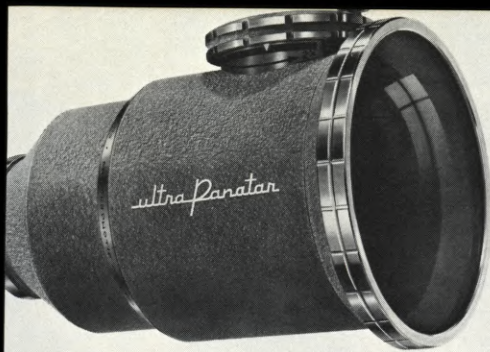


THE PANAVISION STORY Continued from Page 415

in Tokyo, Churubusco in Mexico, and Victor Duncan in the Midwest.

The company has received eight technical awards from the Academy of Motion Picture Arts and Sciences and Gottschalk has received the British Society of Cinematographers Annual Award on two separate occasions—one for the PSR camera and recently for the Panaflex camera.

Panavision has been used by every



(LEFT) The Panavision variable projection anamorphoser, made in 1957. Since the optics were prismatic rather than cylindrical, a change in the anamorphic power (or squeeze ratio) could be achieved merely by turning a knob on the lens itself. (CENTER) An early Panavision zoom lens. (RIGHT) Another early design of Panavision zoom lens.

major motion picture studio in the Western World and, in fact, has been employed in Russia, Poland and Yugoslavia. The number of feature pictures made with Panavision equipment totals more than 2,000.

According to Gottschalk, Panavision's policy has always been, and will continue to be, the production of motion picture equipment which facilitates the photographic process, resulting in improved quality and the saving of time in production. ■

PANAFLEX CAMERA MODIFICATIONS AND NEW EQUIPMENT

The Panaflex camera, since its initial introduction in the fall of 1972, has undergone constant modification for the purpose of improving its performance and versatility. Approximately nine months after its initial appearance, its viewfinder system was redesigned to increase its brilliance by over 200%. Since then, all earlier Panaflexes have been modified to utilize the more brilliant viewfinder.

Another important change brought about a reduction in the sound level of the camera which started at 27dBs and is now between 24 and 25 db with film.

Another new modification is a built-in, thermostatically-controlled heating system for both magazine and camera which allows the camera to be used efficiently in sub-zero temperatures.

Another important addition to the Panaflex is the heretofore unannounced feature which is a conversion kit. This kit allows the Panaflex to be converted from a 35mm camera to a 16mm camera in less than one hour, thereby making the Panaflex the most quiet and sophisticated 16mm camera in the world today.

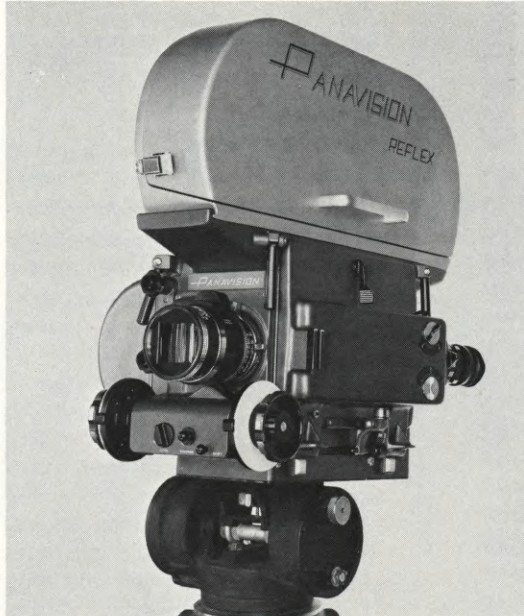
In addition to the modifications and improvements in the Panaflex camera itself, Panavision has a number of new lenses which are as revolutionary as the camera itself. Among these is a new

Continued on Page 432

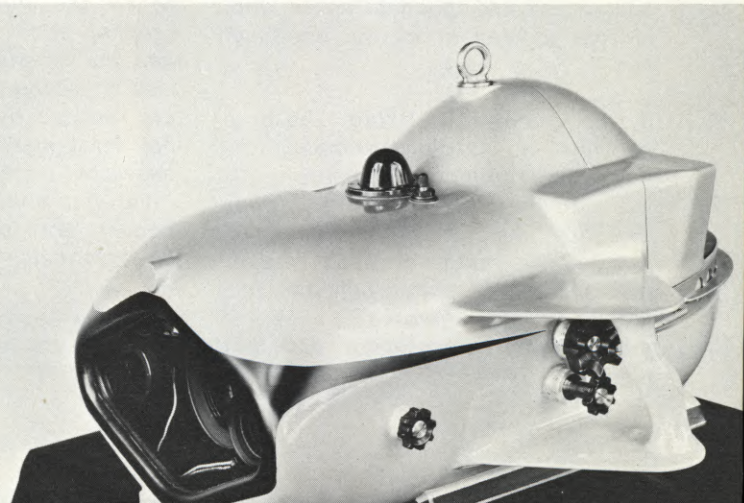
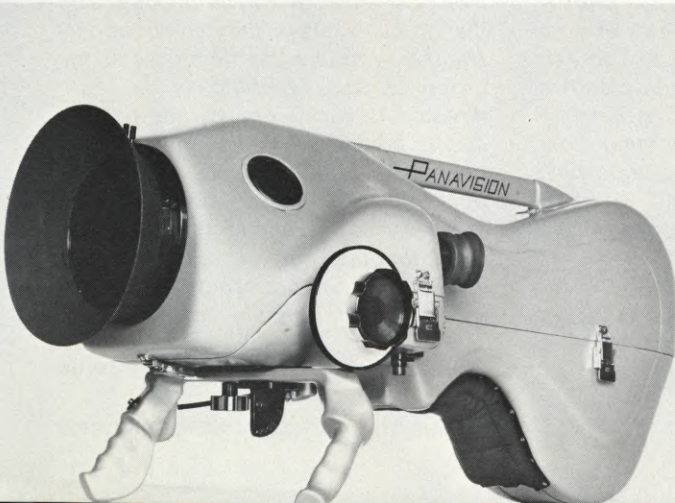
NEW FROM PANAVISION

As indicated above in the history of the company, Panavision started in a very small way with the manufacture of a single product — a set of deanamorphosing projection lenses for theaters showing films in Cinemascope.

Since those early days, the company has not only added a series of lenses and cameras (including the unique Panaflex) to its product line, but an extensive array of accessories, as well. Following are descriptions from Panavision of some of the latest developments and innovations to come off the drawing boards and into production:



(ABOVE LEFT) The first Panavision silent reflex camera. To produce the camera quickly and at the lowest possible cost, Panavision used Mitchell NC and BNC camera boxes, which they converted to the reflex system. (RIGHT) The Panatron 12V-120V, 60 Hz transistorized power supply for cameras. (BELOW LEFT) The world's first silent hand-held camera, a Panavision-adapted, crystal-controlled Arriflex in a Panavision manufactured blimp. A Panavision magazine extension adaptor is used to move the magazine back, in order to counterbalance for shoulder holding. (RIGHT) Panavision's underwater housing for its 65mm hand-held camera.



"MR. PANAVISION" SPEAKS

Continued from Page 417

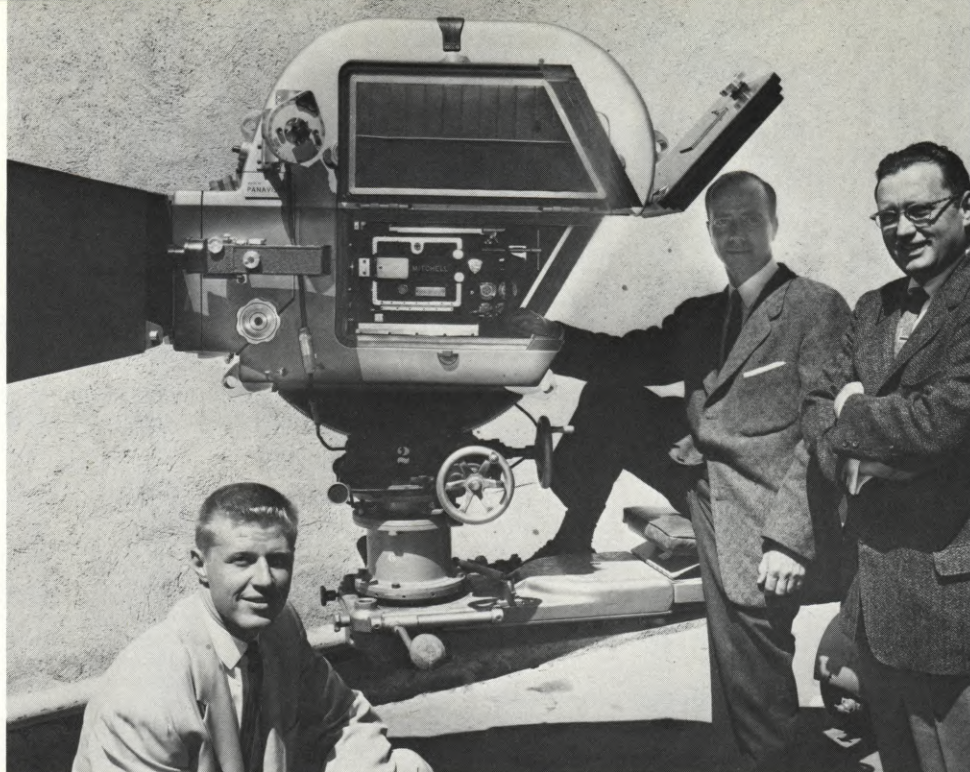
A. There is no doubt that photographing in natural locations imposes some very special problems for the cinematographer and his crew, but on the whole, I think that films photographed in this manner have forced cinematographers, operators and assistants to become more expert and to develop new photographic techniques which are extremely interesting to audiences. It has made movies more real and much more interesting.

Q. As a designer and producer of photographic equipment, are there any trends that you find disturbing in today's movie-making?

A. Of course, it's a matter of personal taste and I am sure that a number of people will disagree, but I am often disturbed by movies that are overly diffused. I realize that directors today often request that cinematographers give them heavily diffused images and sometimes it is effective. But, one of the problems that occurs is that the director and cameraman often judge the effects of their diffusion by viewing the dailies on small screens in a studio or on small screens on location. The effect may be excellent under these conditions, but what happens when these films are projected in theatres on big screens is often overlooked. It is a well known and unfortunate fact that theatre projection leaves a lot to be desired. Projection equipment in many instances, even in flagship houses, is old and not well maintained. Lenses and projection ports are often neglected. Projector gates become warped and misaligned from heat and millions of feet of film passing through them and the result of these factors further degrades the image quality, with the result that audiences are subject to eyestrain, which detracts from the reality and enjoyment of the picture.

Q. Since Panavision produces both anamorphic and spherical lenses, what is your opinion about the merits of each?

A. Technically speaking, there is absolutely no question that motion pictures photographed anamorphically will be sharper and have higher definition than those projected in a 1:85 format. The reason for this is pure mathematics. An anamorphic print has 63% more area than a 1:85 spherical print. Therefore, the image does not need to be enlarged as much and, of



A benign monster — Panavision's huge Ultra-Panavision blimp, designed to render completely quiet the 65mm standard movement Mitchell camera. (Left to Right:) Richard Moore, ASC (a Panavision executive of the early days who went on to become a top-ranking Hollywood cinematographer), Robert E. Gottschalk and Meredith Nicholsen. The equipment shown here was first used for filming MGM's "RAINTREE COUNTY".

course, the less enlargement, the sharper the image. There is yet another important reason and that is that theatres can use long focal-length projection lenses when projecting anamorphically because there is less requirement for screen magnification. An optical law comes into effect and that is that longer projection lenses are less critical to keep in focus than short focal-length projection lenses. In other words, when the projectionist is projecting a spherical picture there is much less margin for error in that critical distance between the film and projection lens. As an example, drive-in theatres with their extremely long focal-length projection lenses usually have no focus drift to speak of, whereas some flagship houses with very large screens and short projection throws have a severe problem of keeping the picture in focus, especially when projecting non-anamorphically. There is yet another reason why photographing anamorphically has an advantage. Since the anamorphically photographed print is much greater in area and the magnification on the screen less, inevitably the dirt and scratches are reduced by 63%. Our experience has been that directors coming from television are wary of the anamorphic ratio, but once persuaded to try it become enthusiastic advocates of the larger format.

Q. Since Panavision leases its equipment, do you find, in general, that it is well taken care of?

A. Generally speaking, camera crews take good care of our equipment. However, there are times when the cameras are returned that show inexcusable abuse. It is a Panavision policy to require the assistant cameraman to come to Panavision and spend four to five hours learning about the Panaflex before we will rent this camera. There are many excellent assistant cameramen who have a lot of respect for the Panaflex and treat it accordingly. Occasionally, however, the cameras are banged up and scratched and are returned in a very dirty condition. But this is an exception, rather than the rule.

Q. Since the Panaflex camera is a very small and versatile camera, is it your opinion that directors in general are using it imaginatively and taking advantage of its potential?

A. It is my opinion that a large number of directors are woefully ignorant of the technical end of movie-making and that, in many cases, they do not understand how to use the camera to its full potential. If a technically ignorant director is lucky enough to have a strong cinematographer, then he can be guided into using the advantages built into the camera. In many cases, however, the cinematographers are loath to point out the many interesting ways the camera can be utilized, for fear of antagonizing the director.

Q. Since Panavision photographic

equipment has the reputation of having a higher rental price than other equipment, do you find this a problem in renting the equipment?

A. If a production manager really knows his business and takes all things into consideration Panavision equipment costs no more than equipment available elsewhere and, in many cases, due to the interchangeability of lenses and numerous other factors, less equipment need be rented for a given picture from Panavision than from others. Of course, Panavision loses some business because other equipment is often heavily discounted, but knowledgeable producers and production managers find that the dependability and versatility of Panavision products far outweighs any small difference in cost. In the case of the Panaflex, which rents for more than any other camera, it is significant that at this time over 100 Panaflexes have been manufactured and not only are these in constant use, but we are turning down requests for the cameras if not booked well in advance.

Q. How long did it take to design and build the Silent Panaglide?

A. We started on the project over five years ago. When I was visiting Japan at that time I became intrigued by the devices food delivery boys carried on the backs of their bicycles. These consisted of a gimbal and a spring suspension system holding several stacked trays which allowed the bicycle to swerve through traffic and over bumps without spilling the open bowls of soup carried on the trays.

Q. How does the Panaflex used on the Silent Panaglide differ from the standard one?

A. It is a very different camera because it is very, very much lighter than the standard Panaflex. This is apparent when one considers that the standard



Noted for his somewhat astringent sense of humor, Gottschalk is not above poking fun at himself. Wearing a bit of having the Panaflex described by others as "the Rolls-Royce of motion picture cameras", he had this high-camp gag photograph taken. It was published in the Directors Guild of America journal (*ACTION!*) with the caption: "The Panaflex of Automobiles".

camera weighs approximately 30 pounds and the Panaglide model only 13 pounds.

Q. How did you manage such a saving in weight?

A. By utilizing lightweight materials and redesigning all the parts of the camera to reduce mass. It was the most difficult part of the whole project and is only practical in the Panaglide application.

Q. What do you enjoy most in your

work as President of Panavision?

A. By far, my greatest enjoyment is working on the design of equipment. It is my feeling that manufacturing trends in recent years have been away from very high quality products and towards mass production with an obsolescence either built in or inherent in the design, fabrication and material composition. There are a number of reasons for this including inflation, stiff competition and the relentless emphasis on higher and higher profits.

It is a source of great pleasure and satisfaction to me to know that Panavision's products are designed with quality as the prime consideration and that our products enjoy the reputation, by the people who use them, as being the best in the world.

Q. But isn't Panavision also affected by the same factors you just mentioned?

A. To some extent, yes, but to a lesser degree because of our policy of renting instead of selling. This allows us to spend more money on our products
Continued on Page 434

PANAVISION FIRSTS

1. NON-DISTORTING ANAMORPHIC LENSES
2. 65MM HAND-HELD CAMERAS
3. SUPER-SPEED 35MM CAMERA LENSES
4. ANAMORPHIC ZOOM LENSES
5. CRYSTAL CONTROLLED CAMERA MOTOR. (PANASPEED)
6. 35MM SILENT REFLEX CAMERA. (P.S.R.)
7. 200-DEGREE REFLEX CAMERA SHUTTER
8. SILENT PORTABLE 120V, 60 HZ CAMERA POWER SOURCE. (PANATRON)
9. ELECTRONIC CONTROLLED SILENT ZOOM MOTORS
10. STUDIO SILENT, BLIMP-FREE, HAND-HOLDABLE 35mm MOTION PICTURE CAMERA. (PANAFLEX)
11. DIGITAL READOUT FOR CAMERA FOOTAGE AND FRAMES PER SECOND.
12. ILLUMINATED GROUND GLASS MARKINGS. (PANAGLOW)
13. CONSTANT COLOR TEMPERATURE DIMMING CAMERA LIGHT. (PANALITE)
14. 3-SPEED AND GYRO ACTION LIGHTWEIGHT GEAR-HEAD. (PANAHEAD)
15. SILENT BODY SUSPENDED FLOATING CAMERA. (PANAGLIDE)

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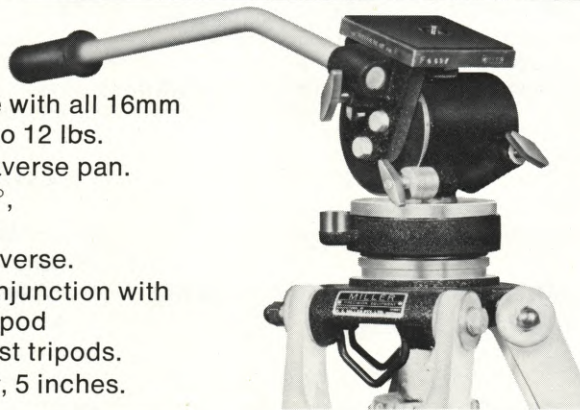
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PREFERRED BY PROFESSIONALS**

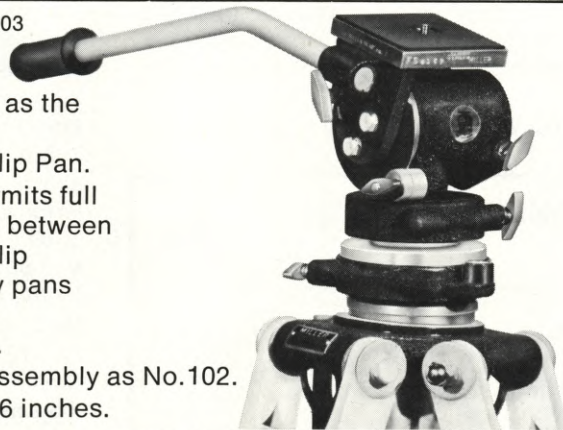
Miller "F", No. 102

- Medium weight for use with all 16mm cameras weighing up to 12 lbs.
- Full 360° horizontal traverse pan.
- Full fluid action tilt, 90°, in either direction with positive lock in any traverse.
- Made to be used in conjunction with Miller Ball Leveling Tripod but can be fitted to most tripods.
- Weight, 5 lbs. — Height, 5 inches.



Miller "F" with Slip Pan, No. 103

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BRING BACK A WINNER
Continued from Page 401

to the inch where I had seen trouble in training and with little control of his left ski because of the broken buckle, Andy Mill smacked the hay bales, did a 360 and landed at Hammond's feet. Mill got up, stood for his portrait, as he looked back to his skis on the course and we dissolved to the replay.

Now, if Andy Mill tells the New York Times what happened, people read about it the next day and agree it is a vital touch and they could say you're not expected to get *that* little inside story on TV.

Well, film got it and ENG will get it. The guy on the tower with a 300-pound camera and tripod never will. Or if Mill falls between cameras when you're not linked properly and the commentator is forced to say, "Mill has fallen somewhere on the course" — then you have a radio show. We don't do radio at ABC Sports.

Well, if our film cameraman did such a great job with his ACL at the start, why do we need an ENG there? Because the ENG would have done it better technically. Five times more brilliantly. But that is not the key. The future success with the ENG, portable tape is to understand that *cameramen* make the shot, not the camera.

But D'Arcy Marsh is an extreme exception. As a member of the Canadian team he raced in the Hahnenkamm in 1959-60-61. He knows that mountain like his own face. He's been to three winter Olympics as a cameraman and fifty important World Cup ski races and he has all the instincts of a competitive racer. It's happened to him. He knows exactly the move that the racer in his viewfinder will make next, he feels where the trainer is by his voice and can pan over and back and achieve a more remarkable take — live — with one chance than most cameramen and directors could work out in an hour. But where are you going to find the ideal cameraman for every sport in every position?

Well, they are available. If directors will develop them. I think there will now follow a period of great energy in this transition from film to portable tape — where the best film cameramen in the world will move over to portable tape and learn to work with the HL-77 as easily as they would with an Eclair. And if they work a car race with the ENG unit on Saturday, they can be back in the studio with the Eclair on Monday or on location with Panavision on Wednesday.

Meanwhile, the portable tape cameraman, who has been some sort

of a maverick misfit without careful direction, now will be directed properly by film directors or electronic directors who understand the portable camera idea and they will in turn develop very quickly a whole new awareness of what can be done and what must be done with ENG.

They are expert people who up to now have never really seen or been allowed to study what they have been recording. Remember that the sideline cameraman's work disappears unless it is put on the line and makes a show. The viewer sees only that. Since the game is live and football games are not replayed the hand-held cameraman almost never sees his work. Nor does the hand-held man in boxing or in the pits at Indy. In Kitzbuhel, I watched the faces of D'Arcy Marsh and Bill Sullivan as they watched the playback of the ENG's 20-minute cassette and in their eyes I saw they were seeing and beginning to understand, both in their own way, the marvelous possibilities of the new era of sports journalism.

Post Script: Just as we were about to send this article off to the Editor in Hollywood, I received the assignment to leave immediately for Switzerland to do a major downhill race on the same schedule as Kitzbuhel with 14 film cameras. This doesn't mean that the ENG revolution is canceled, but the emergency points up an important idea. On February 5, ABC had 14 electronic cameras at St. Anton in Austria for their biggest electronic downhill coverage since the Olympic race at Innsbruck. A three-day blizzard canceled the event while I was directing the National Figure Skating Championships. The cost and logistics of holding 14 electronic cameras and engineering crews another week in Europe could not be arranged, so a major film force is being moved in. Film for large scale coverage will be ideal for theater and in the future will be the electronic backup for the two reasons just mentioned, logistics and budget. It is in the area of the normal, three or four-camera remote where I see portable video tape taking over next year. ■

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GEOFFREY UNSWORTH, BSC DISCUSSES "BRIDGE" PHOTOGRAPHY

Continued from Page 397

the license to do because of the explosions. Actually I didn't need too much source light, because the effect was all coming from the explosions. The smoke silhouetted the bridge. We were also quite lucky in another way. For example, during the real-life event, when the British were trying to cross the Rhine, the Germans were firing flares into the air so that they could see them. Accordingly, I was able to hang flares in mid-air by simply suspending them from huge cranes over the river. So, again, one didn't need all that amount of artificial light in order to create the effect.

QUESTION: Did you use ultra-speed lenses for this sequence?

UNSWORTH: Yes, we used the Panavision fast lenses in focal lengths of 50mm, 100mm and 150mm. We didn't use any really wide angle lenses.

QUESTION: Why was that?

UNSWORTH: It's just the style one decided to adopt in order to make the audience feel part of the action — not just standing back and looking on.

QUESTION: Usually, in something with the scope of war, you almost have to use wide-angle lenses to get it all in, to get a feeling of the vastness of the action. But you don't think that will be missed here — right?

UNSWORTH: I don't think so — no. Really there were not that number of people involved in any one place. Although the total operation employed an airborne division of 34,000 men (including glider people and parachutists), they were all in small pockets as they covered five bridges. Our story, of course, is that of the last bridge — the "bridge too far".

QUESTION: Can you tell me a bit more about these photographic flares that you used?

UNSWORTH: I ordered them through Special Effects and they are very, very bright. They burn for a good two-and-a-half minutes and obviously there is a good deal of smoke that comes off of them. However, if you use them in the right places and higher up, there's no problem. When they do suddenly wheel around, due to the natural eddying of the wind, it's great; that all adds atmosphere to it. Actually we've used a

great deal of smoke and stuff — black smoke and white smoke — to mush it all together, you know.

QUESTION: Was that part of your desaturation approach, or were you simply trying to re-create the smoke that occurs in war action?

UNSWORTH: Mainly it was to re-create the effect of battle. It also helps in the illusion when you're not firing real stuff. When you see guns going off, followed by tremendous explosions, there's a great deal of atmosphere about it.

QUESTION: Even when blank ammunition is being used there is sometimes a certain amount of wadding or whatever that comes flying out of the guns. Did this present any problem for you?


UNSWORTH: With normal rifle fire the blanks are perfectly safe. It's when you get up into the Sten gun range of weaponry that a certain amount of stuff comes out front. Even though blanks are being used, when there is mortar action it can give you a nasty pain on the face if you are silly enough to stand near it. Actually we had optical flats cut for all our Panavision cameras and lenses so that they would not be harmed, and we had 1/2-inch plastic sheets made to fit around the matte box to keep the operator and assistant safe from anything that might be coming out of the guns.

QUESTION: Can you tell me a bit about lighting the interior sequences for this picture?

UNSWORTH: There are a great many sequences that take place in houses — not the houses which we built (which were unlivable in), but real houses of the type that were taken by both the German side and the English side for use as command posts. Some were the stately home type of places. Others were farmhouses and barns. The Dutch barn is a marvelous place to work. Where we've had windows it hasn't been possible to put daylight correction materials over them because people were either shooting out of them or jumping in and out of them. So I've had to go along with a daylight balance — building up the interior light to balance with the exterior light. Sometimes this has been a bit difficult to do, because our interior shooting has seemed to coincide with the days when the light outside was very hot. It all seemed to work out quite well, however, but I still look forward to being able to correct windows.

Continued overleaf

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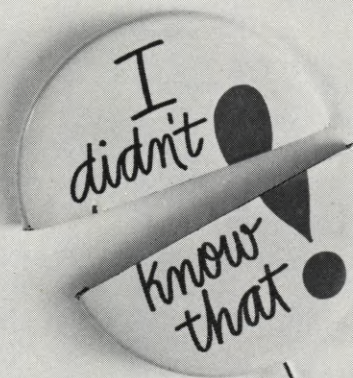
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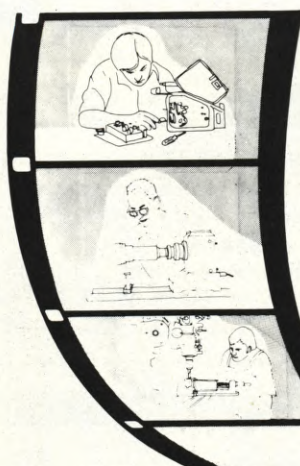
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QUESTION: In other words, if you had your choice you'd rather do it the other way around?

UNSWORTH: Yes. I think it's easier on everybody if one can correct the windows and keep the interior lighting down to a reasonable level.

QUESTION: Did any of your interiors call for what might be termed "effect lighting"?

UNSWORTH: Right at the beginning of the picture there is a sequence showing the activities of the Dutch Resistance and, in agreement with the Art Department, we had bought these window blinds of the type you pull down. I had them made in the natural biscuit color because I think we shall be treating the film, in the early stages, with not exactly sepia, but a very desaturated color effect. The lighting is very subdued and it looks like it's just coming through these shaded windows. It has a very interesting character.

QUESTION: Is this the first time you've worked with Sir Richard Attenborough?

UNSWORTH: I've worked with him many times in his capacity as actor, but this is the first time with him as director — and the collaboration is a very happy one. He's terribly interested in the photographic side — in the setups, the look of the film and all things to do with the presentation. That makes things much easier, you know. He goes out of his way to help, if that's the right word — help in the sense that he says, "Well, you must get it the way you want it, and that's what I want you to do." That's a great deal of the battle — having somebody back of you like that.

QUESTION: Did you go through a lot of pre-planning discussion in regard to the visual aspects of the film, the photographic style and so forth?

UNSWORTH: Oh, yes. We talked about it, off and on, for more than six months — continuing right up until the start of shooting.

QUESTION: In a previous discussion you and I had in Morocco I recall your telling me that you like to force-develop because it raises the fog level and that this is a characteristic that suits your style of photography — isn't that so?

UNSWORTH: Yes, that is absolutely true. We have forced an awful lot of



material on this picture, but because of the way I'm shooting the film it doesn't jump at all; everything seems to blend in very naturally. I normally force one stop because I think that's about right, actually, and it doesn't detract too much from the quality of the rest of the stuff I'm shooting — in fact, hardly at all.

QUESTION: You are using the 5247 negative stock on this picture, of course. Would you like to comment on this film, as compared with the 5254?

UNSWORTH: Well, I much prefer it to the 5254 actually.

QUESTION: Why?

UNSWORTH: Because I think it's a much smoother film in several ways. It has finer grain and better definition. In terms of latitude and shadow detail it is at least as good as 5254. I would say that it's a much better negative altogether, considering what I like to do with negative. It suits me very well.

QUESTION: Earlier on you said that the unique light of Holland has been captured very faithfully in the work of Dutch painters. Have you had an opportunity to study their work since you've been in Holland?

UNSWORTH: Yes, I've been to several of the museums. Actually, I'm very fond of the work of a Dutch painter named Goyen and I've followed him for years. He has really captured the quality of this light. I think he has it right down to a T.

QUESTION: Would you say that cinematographers have a lot to learn from studying the paintings of the Masters?

UNSWORTH: A great deal. Our shapes are so different these days. In cinematography we are locked into certain aspect ratios; whereas, they had a choice of whatever canvas size or shape they wanted to paint. They also had a wonderful knowledge of light and shade.

QUESTION: What do you think are the characteristics of the light here in Holland that make it special and unique?

UNSWORTH: I think it's the beautiful desaturation quality. Nothing sticks out in vivid color; it's all very subdued. There's a natural diffusion. There is a luminosity from the sky, and it almost gives me my fog level, actually. It's light with a built-in fog filter. ■

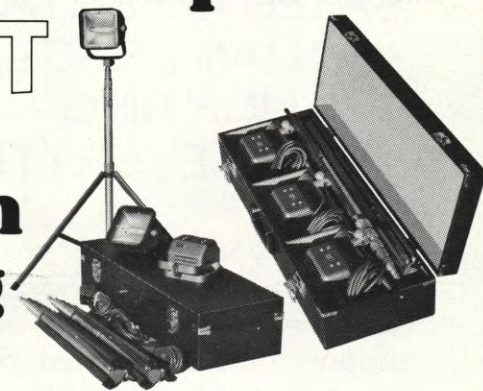
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AUSTRALIA

THE PANAVISION STORY
 Continued from Page 423

series of very fast spherical wide-angle lenses which Panavision calls its "Ultra-Speed" series. The series starts with a non-distorting 14mm wide-angle lens with a speed of T/1.9. Next is a 20mm lens with a speed of T/1.9. Then there is a new 24mm lens with a speed of T/1.2 and a 29mm lens with a speed of T/1.2 and a new 40mm ultra speed lens with a speed of T/1.3. Panavision has also produced two new zoom lenses one of which is a 10-to-1 with a speed of T/4 which has definition and accuracy far surpassing standards of existing 10-to-1 zooms. Another is a 5-to-1, T/1.3 with a focal length of 20/100 spherical and 40/200 anamorphic. Also available are 75mm, T/1.6 and 100mm, T/1.6 lenses.

NOTE: The 10-to-1 range is from 25/250mm spherical and 50/500mm anamorphic. Both of these lenses have built in torque motors which operate the zoom silently.

PANAFLEX-X

The Panaflex-X is a new camera based on the Panaflex design, but without the 360° rotating viewfinder system and variable shutter. It accepts all of the Panaflex accessories. It also accepts a special small television camera which attaches to the side of the viewfinder. The purpose of the Panaflex-X is to accompany a Panaflex on a production as a second camera. It borrows from the Panaflex package the necessary accessories, such as magazine, follow-focus, matte box, battery, etc. It also serves as a "spare tire" in the event of damage to the Panaflex. It is silent like the Panaflex and will rent for considerably less than the Panaflex. The television camera accessory is optional. The advantage of the Panaflex-X camera is that it occupies one small case requiring no accessories of its own.

PANAVISION PANAGLIDE

There are two Panaglide models available at this time. The first is the Panaflex Panaglide. This unit incorporates a specially built, extremely lightweight Panaflex camera and operates silently for sync-sound photography.

The second incorporates an extremely modified Arriflex camera and is approximately nine pounds lighter than the Panaflex model. Since this camera is noisy, it is not practical for sync-sound photography when the microphone is near the camera. Except for the above two camera differences, the rest of the Panaglide features are identical, as described below:

The Panaglide floating camera mechanism consists of a lightweight reinforced vest which straps onto the operator's body with over-the-shoulder and hip-padded supports. Attached to the front of this vest is a quick-release device for convenience and safety, which has attached to it an articulated suspension arm containing a combination of a gas and hydro-pneumatic shock absorbing system. On the upper end of this arm is attached the camera system.

An adjustment mechanism at the base end of the arm allows the unit to be adjusted to suit the individual operator, relating to his stance and posture. Both segments of the supporting arm contain mechanisms to increase the tension of the members of the arm to accommodate a variety of lens weights and ambient temperature variations.

The shaft, which attaches to the arm and hangs below the camera, telescopes to allow the unit to photograph at lower heights or to be used in vehicles, etc.

Viewfinding is achieved by a small built-in television camera which is reflexed through the lens of the camera and displays the image on a four-inch TV monitor which can be mounted to the camera and arm in a variety of positions.

The television image can be electronically de-anamorphosed by a flick of a switch and can also be reverse-scanned to facilitate the operator shooting over his shoulder while walking forward.

The focus and T-stop controls are accomplished by either radio or via an electric cable, which is supplied where radio interference may be present.

On the lower end of the staff is attached the electronic control system housing, with the battery pack housed in a separate container.

The battery system consists of a nickel-cadmium 24-volt battery pack which instantly plugs in and will run the camera for the duration of two 500-foot magazines. A charger is supplied that will simultaneously charge six 24-volt battery packs which are supplied with the unit.

Both camera drives are crystal controlled with digital readout for both footage and frames per second.

The speed of both cameras can be varied between six and 32 frames per second. A plug is supplied for the purpose of transferring the video image to the video recorder.

PANAHEAD

The Panahead is the name for Panavision's all-new lightweight gear head for 35mm motion picture cameras. The new head weighs but 30 lbs and features three speeds plus neutral or "free head." In addition, the Panahead can also be used as a gyro head. This is accomplished by attaching two handles, one to the left front side of the cradle of the head and the other to the rear right side of the cradle. By holding onto these handles the head can be "gyroed" in each of the three speed settings. When the gear selector is set to neutral, the head can be moved freely with no drag. A novel feature is the reversible knob on the tilt wheel which, when reversed, moves it out of the way so that it won't touch the operator when it is spinning at high speed as the head is gyroed.

The Panahead also contains a built-in tilt plate which can be raised 90 degrees to allow pointing the camera straight down. The tilt plate can also be removed and reversed so that the camera can be pointed 90 degrees straight up.

A novel feature of the Panahead is automatic viewfinder leveling when used with the Panaflex. No longer does the operator have to raise up when shooting down at an angle or stoop when shooting up at an angle. The viewfinder simply remains practically level during the full movement of the Panahead's cradle.

The Panahead incorporates several more features new to gear heads. The head does not contain a cradle gear which, on conventional gear heads, always wears in the central section of the gear and eventually develops play in the worn area. The Panahead has two knobs which, when turned, will remove all play from both the Pan and Tilt movements which might develop during shipping or impact. Cleaning in the field is easily and quickly accomplished by removing two covers which protect the rail guiding rollers.

PANALITE

The Panalite is a dimmable basher or obie light. The light is infinitely variable by the turn of the knob and produces no change in color temperature whatsoever. It holds a 1000-watt quartz bulb and has a special knob which directs full reflection of the bulb forward in the event extra light is needed. When this is done the dimming feature is negated. The light from the bulb, however, can be directed to the ceiling as a bounce light and it still retains the dimmable feature. A frame is provided for the front of the unit, in case special diffusion or color filters may be needed. An attachment will be available syncing it to the focus knob so the light will dim as the lens is focused for a closeup. The light from the Panalite is absolutely even. No shadows can be observed while it is being dimmed. It is small and compact and operates silently.

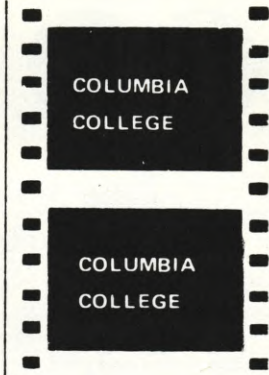
PANAGLOW

Panaglow is the name Panavision uses to describe a new feature now appearing on the Panaflex cameras.

Essentially it is the illuminating of the ground glass markings in the viewfinder. Its purpose is to eliminate the loss of these lines in the ground glass when viewing a scene at night or in subdued light.

When a small switch is turned on the black lines on the ground glass glow a dull red and a small dot glows in the center of the frame. As the camera is panned from a very dark area to a lighter one, the lines on the ground glass will change from glowing red to black and vice versa.

No longer will an operator need to worry about where the edges of his framing are or whether the microphone will show up on the screen. Changing ground glasses from one format to the other does not affect Panaglow. ■



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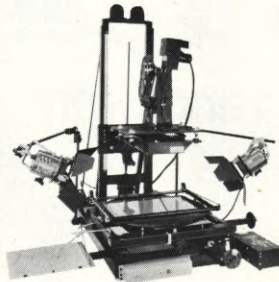
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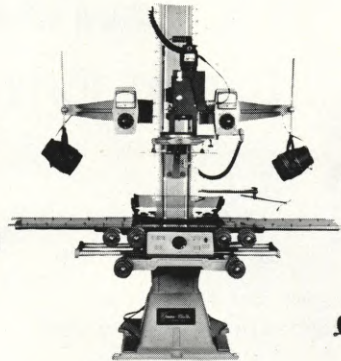
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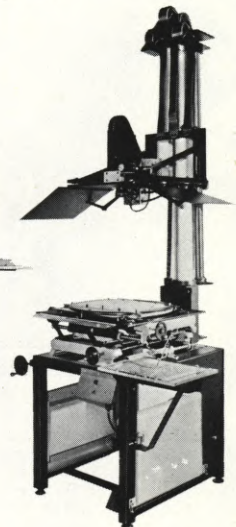
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"MR. PANAVISION" SPEAKS Continued from Page 425

and to keep updating them, rather than spending that money on sales commissions and extensive advertising. In a nutshell, that is the philosophy behind our engineering.

Q. Does Panavision manufacture all of the products it rents?

A. Practically everything with a few exceptions. Our Arriflex Cameras are, of course, purchased, but we alter them considerably to meet our specifications. We call that Panavizing.

Q. Do you make all the parts of Panavision equipment in your plant in Tazana?

A. Certainly not. If we did that we would employ about 500 people and have a most inefficient operation. Efficient manufacturing today is far different than it was say only ten to twenty years ago. Today it's the world of specialists, and knowledgeable manufacturers take full advantage of this trend.

Q. Would you elaborate on that please?

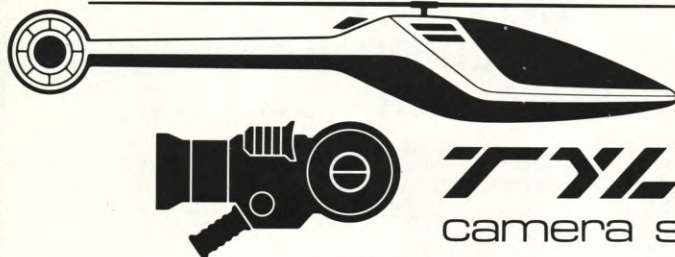
A. To be specific, take painting, for example. Panavision subcontracts all of this work to painting specialists. These people have the latest, highly sophisticated equipment and personnel trained over the years to be experts. Of course, we set the quality specifications and exercise strict quality control. We also subcontract many of our high-quantity parts which do not require any special skill to manufacture. Many of our parts are cast in outside foundries and we do no anodizing or plating either.

Q. What about Panavision lenses?

A. I think there have been more misinformation and false rumors circulating about our lenses than any other part of our business. In the beginning Panavision had its own in-house optical engineer who designed many of its earlier lenses. As the company grew it became necessary to go outside the company for additional optical engineering and that practice has continued to grow as the need developed for an even greater variety of lenses and other optical components.

Q. When you decide to build a new lens just what is the procedure?

A. It begins at Panavision where we



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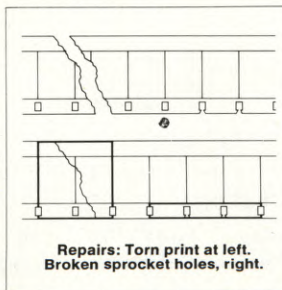
No frame loss

If you change the cut, there's no frame lost, of course. And since you made the original cut on the CIRO's block, ends match exactly.

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Broken sprocket-holes can be rebuilt with no tape in the image

area! (See illustration.) With the CIRO, film libraries can repair torn release prints without a jump cut.



Repairs: Torn print at left. Broken sprocket holes, right.

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discuss just what kind of a new lens is needed. Meetings are held in our optical department where we decide on the basics, such as focal length, speed, approximate size, focusing range, etc. It is then decided which optical designer or team of designers we feel would be most likely to arrive at the best design. We then begin a series of consultations with the chosen designer and these continue until the completed design on paper gives us, via computer readout, the expected performance of the lens.

Q. Is it difficult to find optical engineers who can satisfy Panavision's demands?

A. There are relatively few who qualify, so, in addition to our local designer, Panavision utilizes designers who work for some of Europe's most prestigious optical companies. And since there is no selling price limitation on the designers, Panavision's lenses are the most sophisticated and, of course, costly in the world.

Q. How many of the lenses are manufactured in Panavision's factory?

A. Almost all of the metal parts, but none of the glass. This is subcontracted largely to local aerospace firms who specialize in glass fabrication. Some glass is fabricated in Germany and some in England and the elements are then fitted into the metal mounts in our factory, where they are then calibrated, engraved and tested. Only those lenses which equal our original design specifications are released. Those which do not are reworked until they do.

Q. About how long does it take from the decision to make a certain lens to the production model?

A. From two to four years in most cases.

Q. What are some of the things you would like to see changed in the production of motion pictures?

A. I would like to see producers, directors and production managers become more photographically oriented, so that the camera crews would have better rapport with them. I would like to see more young people have an opportunity to get into motion picture photography and I would like to see the cost of movie-making stop escalating. All these things must be accomplished if the industry is going to continue to advance. ■



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"NETWORK"... AND HOW IT WAS PHOTOGRAPHED

Continued from Page 402

the sequence, when he dims the lights down. For the initial lighting scheme we clipped a couple of Lowel-Lights onto the chandelier and bounced the light off the ceiling. Then we used a little bit bigger bulbs in the sconces to get more intensity, and we used lights on stands to pick up the tapestries in the room. We also had bulbs in those green lamps that were strewn along the table. That was the basic lighting before the lights went down. There were chandeliers all around the room and we had those lit with nothing extra, just what was in them. I was shooting at probably T/1.6. When the lights dimmed down, we just left the lamps glowing on the table, and I had one light, a Super-Baby, coming down on Beattie from the chandelier. It was like an inkie with a Baby-sized bulb in it — a small but powerful unit, just like a spotlight. In addition, we left the wall lights on and one chandelier on the wall. When Beattie walked down the length of the table I wanted to keep him in total darkness, but where he would go black against a black wall, I would just take a bit of light from the floor and backlight him. Where he walked past the marble fireplace I silhouetted him by throwing a little splash of light on the fireplace. Then when he came around and stood over Peter Finch and was supposedly lit by the big chandelier, we placed a light directly behind his head and put it on a Variac and when he stepped into position we brought it up so that his head was glowing, like he might be God — as he was stating that he was. That sequence presented an interesting challenge — working with light and shadow and trying to get it very dramatic. That's probably the one that I'm the most proud of in the picture. It was interesting and fun to do.

QUESTION: Earlier you mentioned the problem presented by having TV monitors in so many of the scenes. Could you discuss that a bit more?

ROIZMAN: The most difficult thing is to keep the proper balance of light on the faces, while maintaining good color temperature on the TV tube. You have to keep the ambient light from hitting the tube also.

QUESTION: What have you found the color temperature of the average TV image to be?

ROIZMAN: It's about 6500°K off a TV monitor — somewhere in that area.

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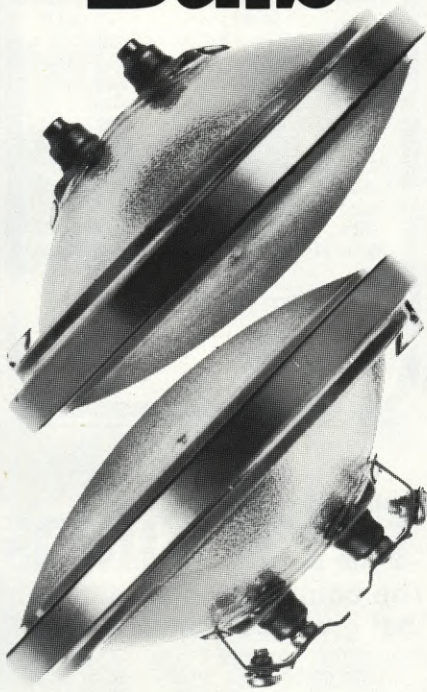
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There are four different methods of handling the color temperature problem. One is to work with a color corrector. You can hook this device up to the set and balance up by eye. You can change your balance to 3200°K and then flip the switch back and forth from normal to 3200°K. However, I tried some tests with that and found that it's not that accurate. Another method is to adjust the controls on the TV monitor to 3200°K. You can just take them all the way down and make the picture very red. I've tried that method in the past and it works, but it's not consistent. Then there is a third method of adding an 85 to the tube and that works fairly well, but it's not quite a full color correction, since you are correcting from 6500°K. I would suggest using an 85+ in the Rosco series. The method that we used in the TV studios was to take a video camera which is set at 3200°K and aim it at a TV monitor, so that you have the image from the monitor on camera. Then you can adjust the TV monitor to 3200°K electronically by using a scope and match it perfectly to the camera. This method is very, very accurate.

QUESTION: What about the flicker bar problem?

ROIZMAN: Well, that's always a big problem, but the basic solution is to shoot with a 144° shutter. I've tried many different things to solve the problem and I finally settled for a 144° shutter that Panavision installed for me. Instead of simply adjusting the shutter down to 144°; they actually ground the shutter to exactly 144°. So we used that camera when we were shooting the monitors, which was most of the time anyway, to make sure that we always had 144°. But, even so, we would still see the bar every now and then. It was the craziest thing, but I think it was due to a variation in the frequency of the video system that occurred from time to time.

QUESTION: Were there any other photographic challenges on "NETWORK" that we haven't discussed?

ROIZMAN: Sometimes Lumet would want to do a very slow, difficult, concentrated moving shot in order to point up a strong story point. He's the kind of director who, once he's rehearsed and the actors are swinging, would love to get it in one take. He doesn't need protection. He's got a lot of confidence. So, when you shoot it, you've got to get it the first time. Fortunately, I had a great operator, Fred-

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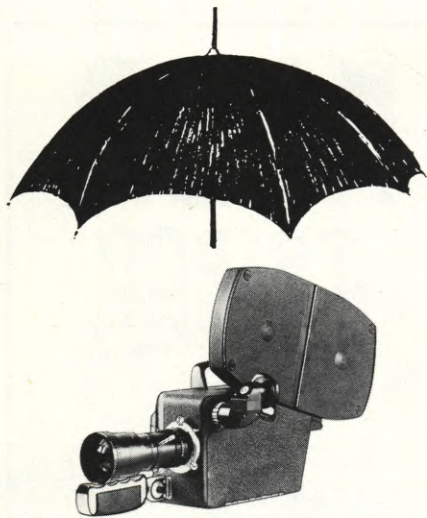
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die Schuler, and a great assistant, Tommy Priestley, and between the two of them they could jump in and do the shot with one rehearsal, or without any, and they'd have it. It makes things so much easier when you have guys like that working with you.

QUESTION: And what kind of working rapport did you have with Sidney Lumet?

ROIZMAN: The very best. Sidney is the kind of guy who is pretty hard not to get along with. He's terrific. He knows his stuff and he's so professional and so well-prepared that I can't say enough for him. He's great fun and he controls everybody so well. Working with him is really a pleasure.

CINEMA WORKSHOP Continued from Page 356

While isolation figures are seldom published, a close physical examination should provide a reasonable idea of isolation effectiveness. The ear cushions will have substantial padding, effectively sealing the area around the ear. The pads should be covered with soft leather or vinyl. The cushions should be ruggedly affixed to the headset. Most important, the headband should be metal and offer a substantial clamping force between the two earpieces. A good seal is impossible if the headband does not compress the ear cushions against the head. Lastly, try the headphones on, without connecting them to any device. The ambient sounds in the room should be substantially reduced. This last test is best accomplished in a relatively noisy environment and by trying several prospective headsets in succession.

Reduction of ambient sounds is both a function of headphone isolation and monitor volume level. In general, I usually crank the monitor volume up as high as I comfortably can. (Of course, too high a level is also undesirable, causing distortion and acoustic fatigue.) Discretion and experience will usually determine the optimum level. As an example, employing headphones with 25 dB of isolation and a monitor volume about 15 dB above actual ambience yields a total of 40 dB between the monitored signal and leakage of room ambience. This is quite a significant amount and should allow the off-the-tape sound to stand out easily from the almost insignificant ambience.

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"BRIDGE" LOCATION Continued from Page 398

from museums, veterans organizations and private collectors.

In addition, the defense departments of the United States, Great Britain, the Netherlands, Belgium and Denmark pooled their knowledge and expertise in assembling the necessary equipment to restage this great military operation for the screen.

Leading survivors of Market Garden like Horrocks, Maj. General Robert Urquhart, Gavin and Lieut. Colonel Johnnie Frost (the hero of Arnhem Bridge) fine-tooth-combed the final shooting script. Upwards of 1,500 Dutch extras — mostly local villagers — have been on standby call for battle scenes throughout the production. An important contingent of 104 hand-picked young actors was signed in London to perform the minor speaking roles of the British troops. Called "Attenborough's Private Army," they live in barracks, wear their hair short sides and back in 1940's style, and have been drilled to think and act like crack troops. Finally, a whole new generation of British "Red Devils" — the 1st Battalion of the Parachute Brigade—is on hand to perform four spectacular mass drops for the 18 cameras which director Attenborough is using for the aerial assault sequences.

The Big Drop

After checking in at our hotel in Apeldoorn (where a maid breathlessly confides: "Ryan O'Neal is staying here!"), we head out for the location where the main unit is preparing to shoot the massive parachute assault sequences. It is a vast flat acreage very near to where the actual event took place, and tight security has been posted to keep the curious at bay.

The nerve center of the operation is a camouflaged dugout that serves as a communications command post from which the director and production manager can keep in contact with the crew — scattered from hell to breakfast, as they are, all over the landscape. As far as the eye can see, the surrounding real estate is dotted with young paratroopers in full battle gear, with parachutes unfurled. They are the troops who have presumably already landed, and they will be joined later by a few hundred more of their buddies dropping out of the skies.

Speaking in a *mélange* of English and Scottish accents, these lads are the real thing, a new generation of British "Red Devils" (the 1st Battalion of the Parachute Brigade), brought over from England to perform for the cameras

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that which some of their daddies quite possibly did for real in the actual Arnhem assault.

I am introduced to the film's director, Richard Attenborough, who, having been knighted last year by Queen Elizabeth II, is addressed by crew members either as "Dickie" or "Sir Richard". There doesn't seem to be any in-between. Very genial and obviously enjoying the immensity of it all, he welcomes us to his "set".

Then a familiar figure comes striding across the landscape. This is the picture's Academy Award-winning Director of Photography, Geoffrey Unsworth, BSC, one of my favorite people. It is a warm reunion all around, and I recall that the last time I saw him we were sprawled on huge pillows eating a native-style Moroccan dinner in a Marrakech restaurant during filming of "RETURN OF THE PINK PANTHER". The night before I had watched him skillfully light up half the labyrinthine bazaar for a short scene in that film.

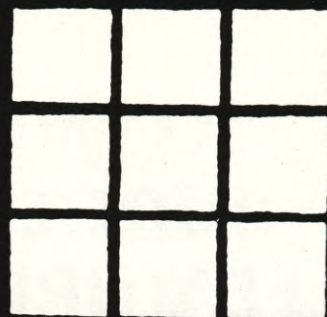
The quintessential gentleman cinematographer, and blessed with a sly and dry sense of humor, Unsworth is a delightful bloke to know and one of the acknowledged great artists of the camera. He seems to be hugely enjoying his current assignment and when I ask him about the problems of shooting on such a vast canvas, he looks at me as if to say, "Problems — what are *they*?" It figures. With his almost five decades behind the camera, there's very little in the way of problems that he hasn't encountered and solved by now.

We are soon joined by another arrival. It is Robert Redford, reporting in a few days ahead of his scheduled filming stint. Dressed in a slightly scruffy denim jacket and jeans, he looks no different from your average All-American boy-next-door, but Gail Samuelson almost swoons at the sight of him — a reaction I've noticed to be almost epidemic among young ladies catching an in-the-flesh glimpse of the unassuming Redford.

Scattered all over the landscape are cameras and their crews, carefully camouflaged to conceal them from the airborne cameras that will be mounted on some of the drop aircraft and a helicopter. The huge "Sam-Mighty" crane from Samuelsons', swaddled in leafy tree branches, rears up from the flat Dutch terrain like some preying monster out of a Japanese movie.

Then the signal goes out that the air assault is about to begin. We are asked to scoot back under the camouflage netting in order to stay out of the shot. Soon the droning of engines can be heard and eleven antiquated, but newly

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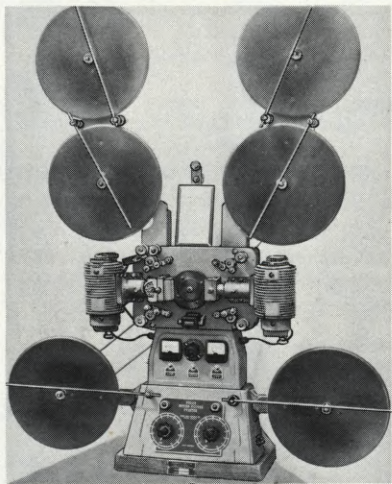
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refurbished Dakota aircraft soar into view. I watch spellbound as, at some predetermined signal, they begin spewing hundreds of paratroopers into the sky. The chutes billow open and the men, with pendulum-like movement, come floating lazily down out of the blue. They look beautiful and I forget for the moment that their real-life counterparts in the actual assault came floating lazily down into Death. But I understand now what Geoff Unsworth had meant when he told me, just a few minutes ago, that there was great visual beauty in some of the stuff he'd been shooting for this picture. My memory is jogged and I recall from my own war experience that — yes, there were occasional images of beauty like this flashing through the horror of it all.

Tearing Up the Town

The next morning we find ourselves in beautiful downtown Deventer, where the second unit is busily shooting street-fighting sequences. Deventer is a pleasant mini-metropolis, neat and clean as only a Dutch town can be, but the area where the shoot is taking place is in shocking disarray. It is a narrow street of old buildings (real ones) with their facades shattered and pock-marked, looking authentically war-torn. It is explained to us that this is a historical section of town in the process of being restored, so the film company has been allowed to tear it up a bit more for the cameras. Convenient!

On hand, supervising a busy crew, is another old friend, Harry Waxman, BSC. A top British Director of Photography in his own right, he is happily directing photography of the second unit for his good friend, Geoff Unsworth. He confides to us that he's having all the fun "because this is where the action is!" A very warm and friendly man, whose eyes fairly twinkle with the excitement of it all, he is obviously turned on full-blast by what he's doing. Now he's down in a pit helping an operator set up a low-angle shot. The next moment he's scurrying up a ladder to have a look through the viewfinder of a camera shooting out of a shattered second story window. With roadrunner agility, he seems to be here, there and everywhere.

Everything is ready for a take. The Brute arcs are turned on, the signal for "Action!" is given, and the scene unfolds. Around the corner at the far end of the street comes a Nazi patrol vehicle. It inches its way down the street, flanked by German foot soldiers with rifles at the ready, cautiously probing. As they draw nearer, the effect is so realistic that a chill runs through me, sparking memories I'd just as soon not

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recall. They are ten yards from the main camera when all hell breaks loose. Ambushing Allied soldiers hurl grenades, firing from doorways and second story windows. There is a violent eruption of carnage and then all the Nazi soldiers lie "dead" in the smoking debris.

"CUT!" Everybody gets up and dusts themselves off. The scene is repeated twice more and then we all troop off to enjoy a very good stand-up location lunch, with soldiers from both sides fraternizing freely.

Watching "A BRIDGE TOO FAR" in the making has been a fascinating — and somewhat sobering — experience. I have the feeling that, like "THE LONGEST DAY" (which preceded it by 15 years) it will turn out to be a document of human tragedy and courage on an epic scale — but, in addition to that, a tribute to the hundreds of skilled artists and craftsmen who have been laboring so diligently to get it onto the screen — the only canvas vast enough to tell such a story.

SECOND UNIT FOR "BRIDGE"

Continued from Page 381
except a straight 85 filter.

Geoff generally stays with a #2 fog filter, but I've asked if I can have the flexibility on occasion to use a #1, because, like him, we have to shoot irrespective of the weather. Last week we were shooting in the pouring rain at T/3.5 and having to force develop, but it came out extremely well.

It's interesting what a variation there is in the light. We did a whole sequence of the German artillery holed up in the woods. When I went in there for the first time I thought we were just never going to get anything. It had to be a bit low-keyed, so eventually, instead of using prime lenses, I stayed with the long end of the 10-to-1 and 5-to-1 zooms (which have a maximum aperture of T/5.6, but which gave me T/4 when force developed), and it was just right. But then again, a few days later, I was shooting right out in the open at T/3.5 and forcing. That's the sort of range of conditions under which we work.

Geoff has had this same problem, too. I saw some of his rushes last week when he was shooting on the same tank range with the principal artists. He'd had the most appalling weather. We were at full aperture and forcing, but he had much worse weather.

The 800mm is the longest lens we've been using in the second unit, but we are using the 50mm-500mm zoom a lot, mostly near the end, 300mm and upwards. We also have two 10-to-1 zooms which we are using a lot, again near the end of the zoom. We've been

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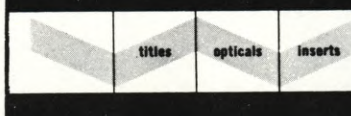
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using prime lenses — 150mm and 100mm — when we've been stuck for aperture on a number of occasions. But generally, what we do is line up a shot with a normal lens (a 75mm, for example) in order to find out basically what we want. Then, if it looks good, we say, "Alright, go way back and line it up with a 450mm to get the same basic elements, but with all that added compression." This is the sort of thing that Geoff's been doing lately. They line up a shot with the prime lens initially to see if it's what they want. Then they just go back 200 yards, if they have the room to do so.

There's a most effective long lens shot which Geoff's unit got during shooting of the battle for the Arnhem bridge. Like most bridges, the one at Deventer that was used rises in the middle and then drops down. A low-angle shot was set up, using, I believe, a 1,000mm lens. The shot starts with a more or less empty road and then, literally up out of the road, come two tanks. It's a striking shot and one that you could only get with a long focal length lens. Time and again you get these exciting things. You line up a shot from a conventional sort of camera position, using a 100mm lens. Then, if there's room, you drop back with the 800mm lens and shoot it.

We've been quite lucky in being able to shoot some very realistic battle action for this picture. The script calls for a tank to plow right through a building in one sequence, and in Deventer it happens that there's the remains of a factory that burned down two or three years ago, a complete factory complex with roadways between the buildings. It's just been standing empty since the fire, so they let us have it and we staged a big street-fighting sequence in the ruins.

Eventually, we pushed a tank right through one of the buildings. It was supposed to be a German Tiger tank, but it was, in actuality, a Leopard tank from the Netherlands Army, with an extra plating put down the side to make it look like a Tiger tank. This tank pushed through a brick wall and right out the other end of the factory, and down came the roof. We had it planned so that real bricks and burning beams came down on top of the tank. Very exciting stuff.

We're getting some tremendous production elements into "A BRIDGE TOO FAR" — the battle sequences, the tanks, the vehicles, masses of soldiers and all the intricate special effects. You can really see that it's a big expensive production and what is so marvelous is that somebody can afford to make a picture like this. It's very exciting. ■

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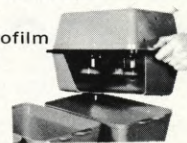
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Continued from Page 412

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I have really simplified the procedure here in order to give an idea of what we went through. In the beginning there was a complex procedure to remember: where to assign the signal, which heads to set in record, which in playback, which in sync, etc. After a while it became almost automatic. on the first strip I was not too consistent in setting levels when recording on the TEAC and had to do several takes in order to get a good blend on the master. After that experience, I made sure all levels were pretty much the same when recording on the four-track; I even put some fade-outs and segues in as we assembled, which really made the rewind mix easier — with more time to pay attention to small details.

All in all, Gabor and I used a variety of techniques we had already learned from editing sound in 16mm and recording on 1/4-inch tape to come up with a new method of editing sound and mixing for film strips. With equipment such as ours readily available to the experimenter and small-budget producer, I can imagine some really interesting sound work will be done, greatly expanding the state of the art of filmstrip production . . . and the art of communication.

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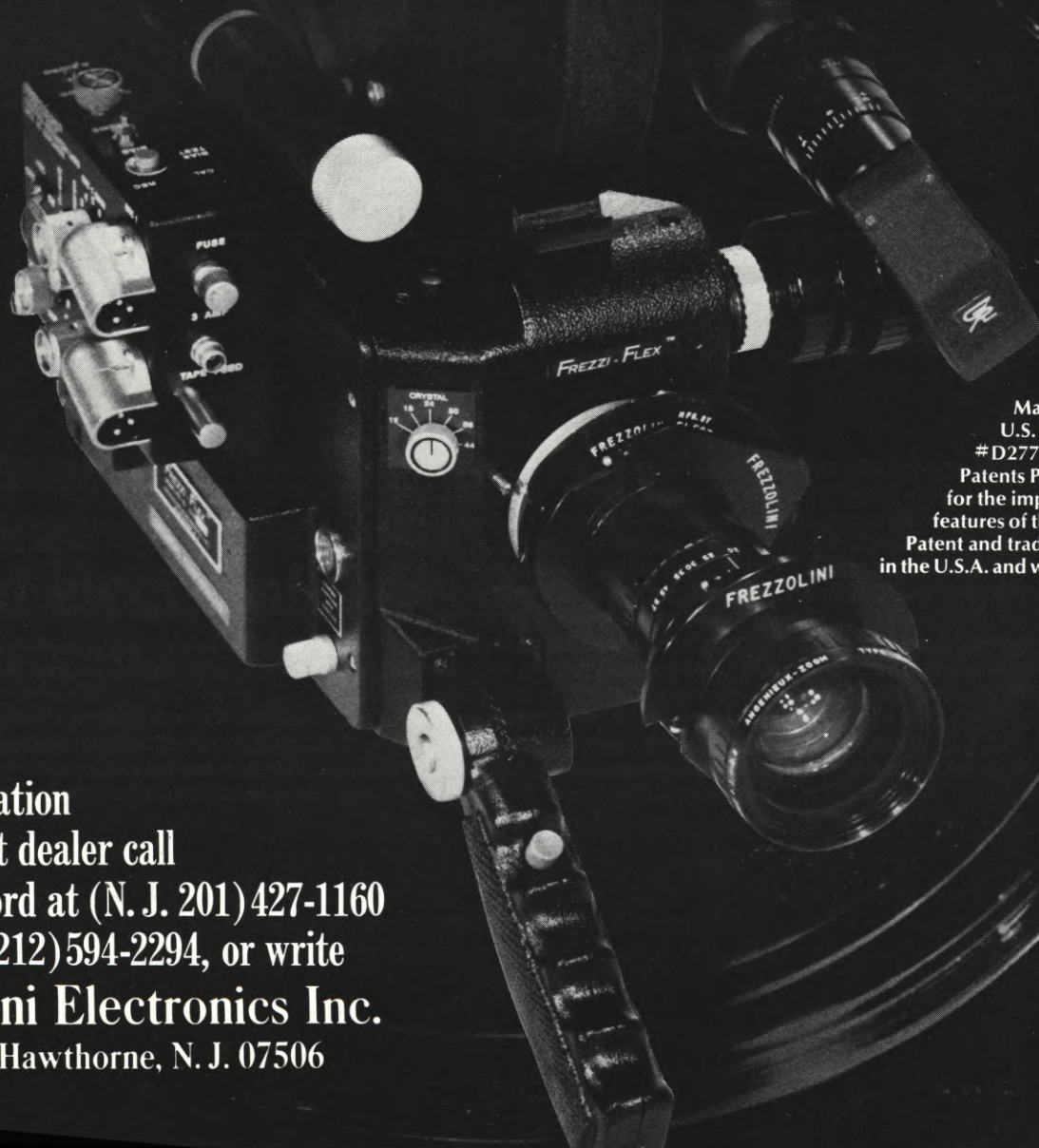
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