

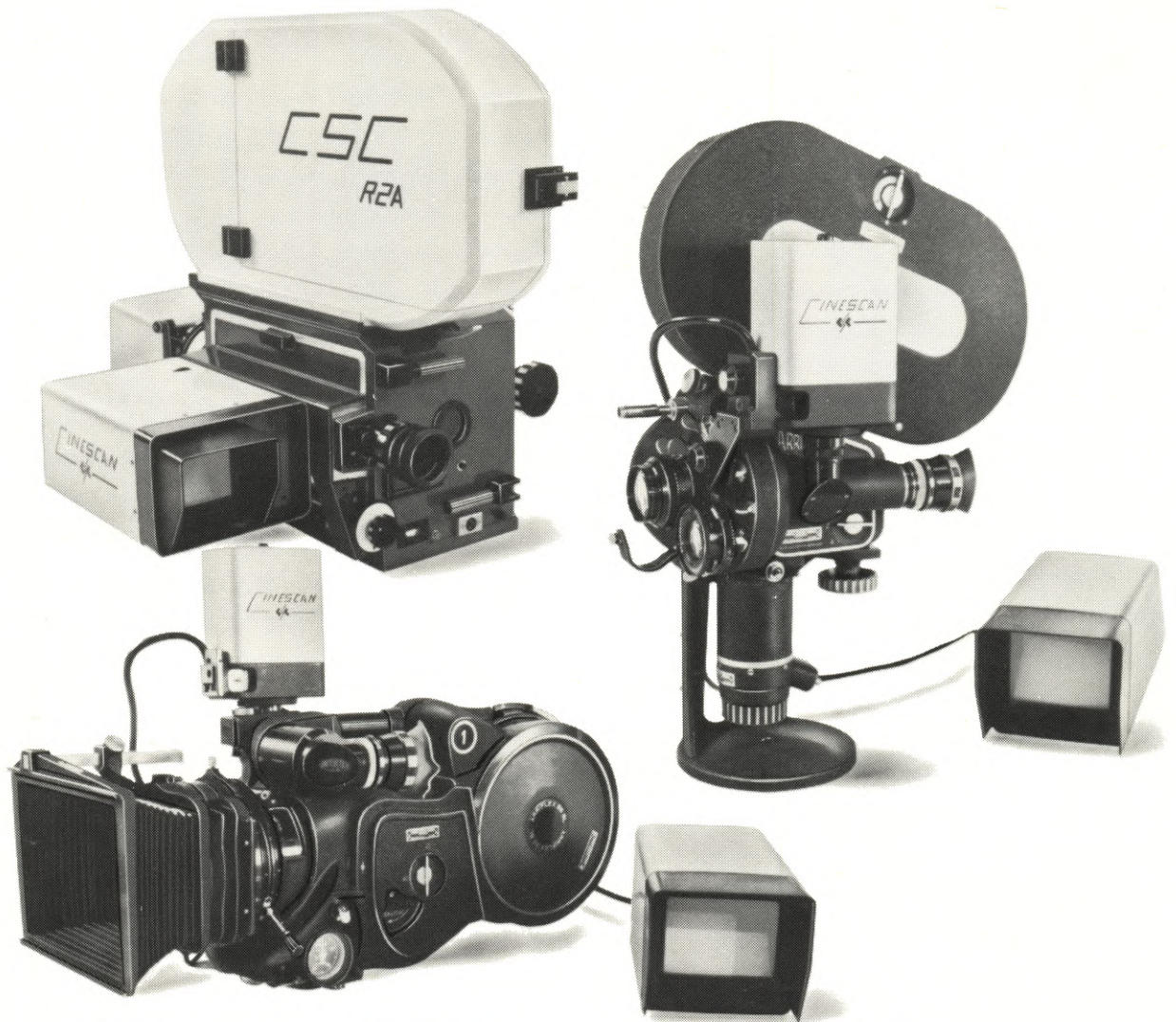
American Cinematographer

International Journal of Motion Picture Photography and Production Techniques

JUNE 1977/ONE DOLLAR

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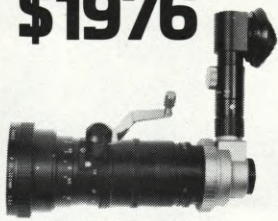
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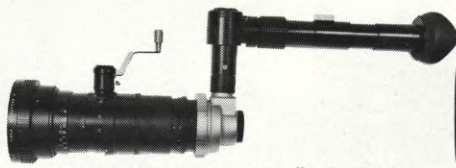


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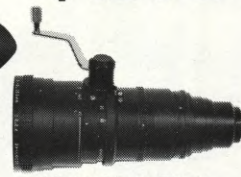
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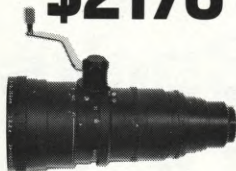
12-120mm F2.2 WITH 7 1/2" VF AVC

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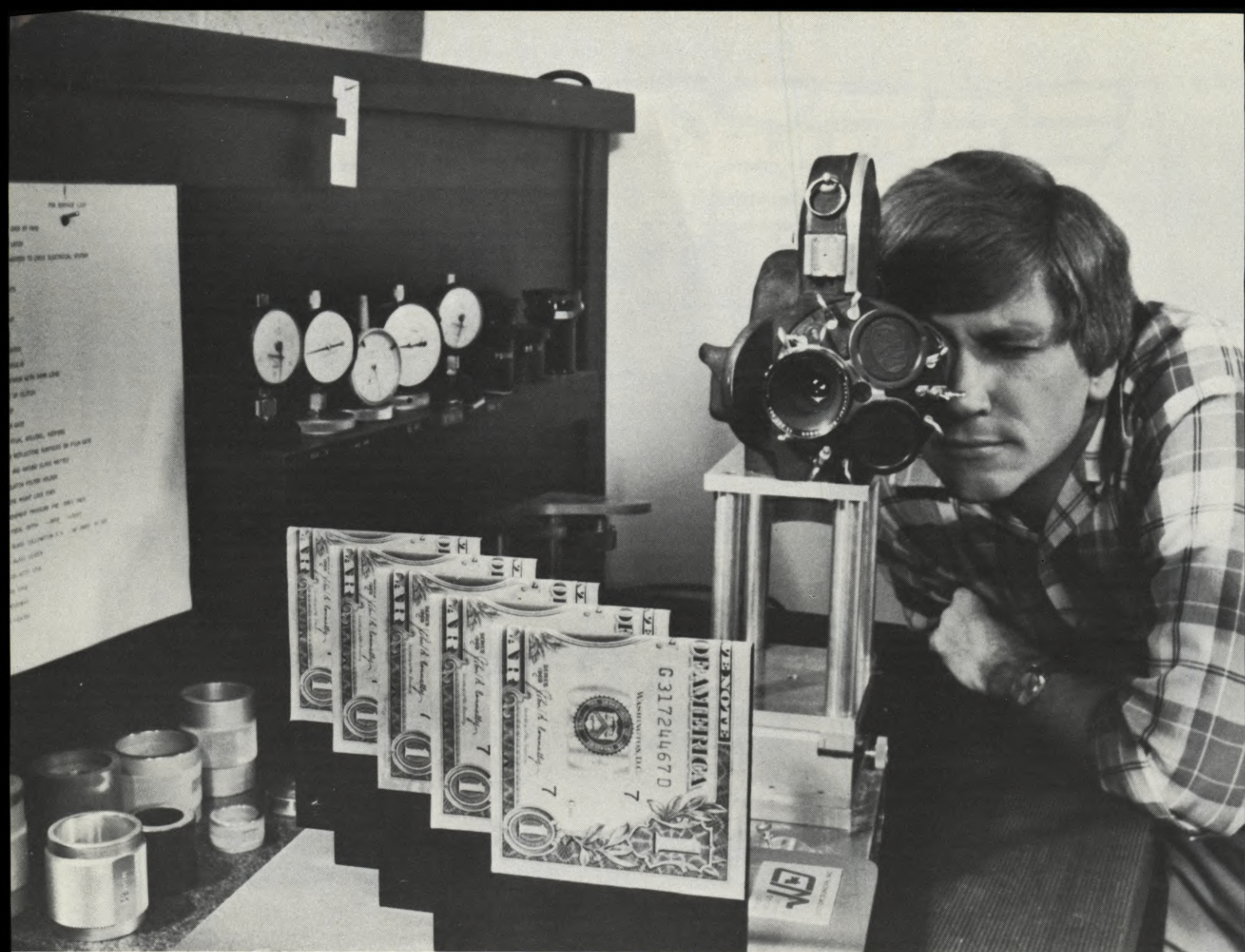


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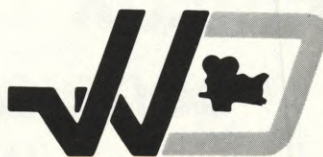
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American Cinematographer

International Journal of Motion Picture Photography and Production Techniques

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JUNE, 1977

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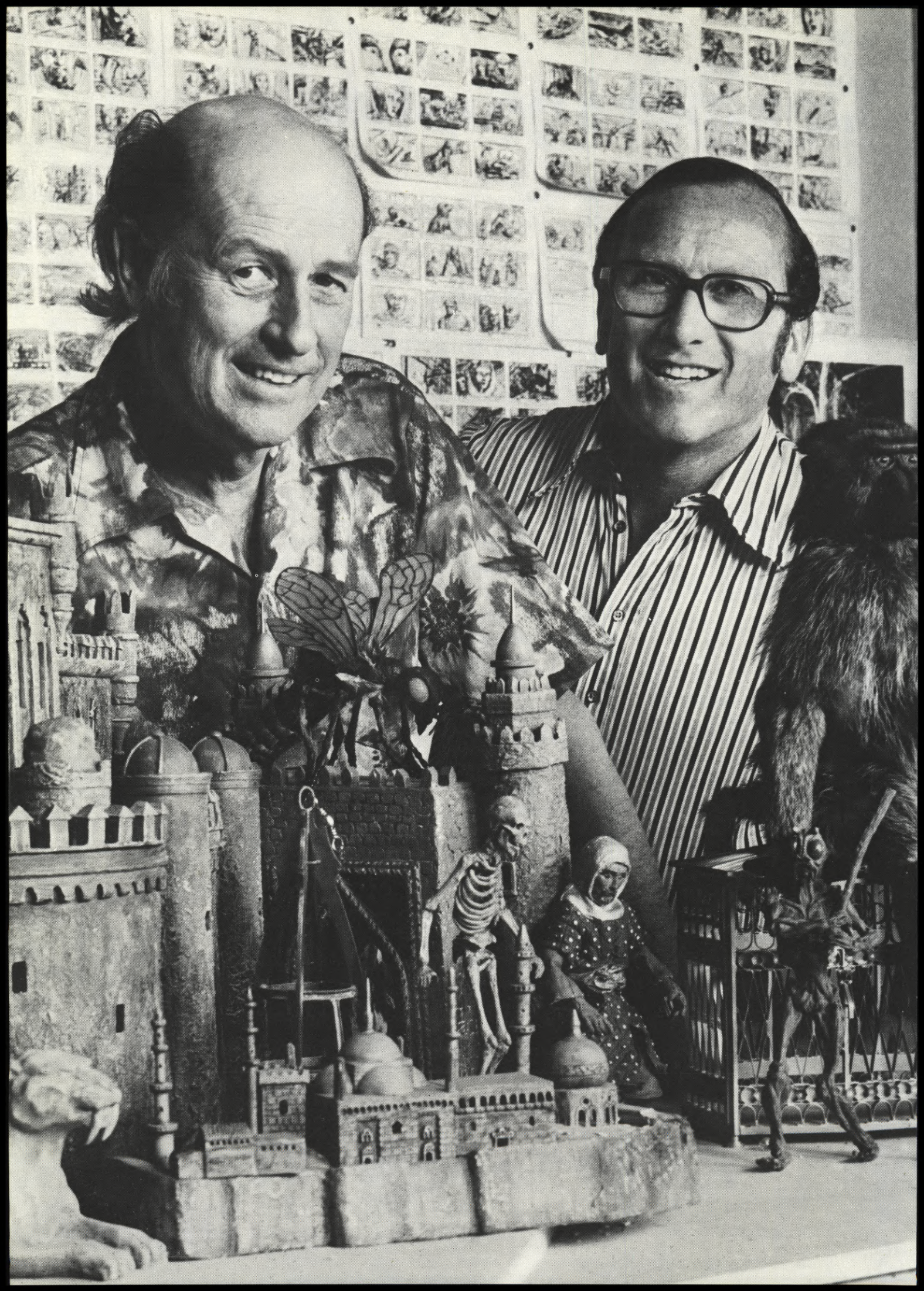
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ON THE COVER: At Magic Mountain Amusement Park in Valencia, California, a camera crew, supervised by Director of Photography David Walsh, photographs a wild action scene for the Universal release, "ROLLERCOASTER", a Link & Levinson/Goldstone Presentation, produced by Jennings Lang and directed by James Goldstone.

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SCHNEER & HARRYHAUSEN



While Hollywood is busily rediscovering the fantasy adventure film, the two masters of the genre, Charles H. Schneer and Ray Harryhausen, are putting the finishing touches to their eleventh feature, "Sinbad and the Eye of the Tiger."

Producer Charles Schneer and Special Visual Effects Creator Ray Harryhausen have discovered the secret of making movies that attract worldwide audiences and can be redistributed periodically, with ever-increasing box office results.

Films such as "Jason and the Argonauts," "Mysterious Island," and the "Sinbad" series.

A large part of their appeal can be attributed to the quality and high production values inherent in each of their films. This team spends as much as three years on a feature.

Harryhausen has advanced the state of his art to the point where he has a cult following, complete with a fan magazine.

Exotic locations also contribute to their films' success—but like "Murphy's Law," they don't usually prove accessible. These are problems a creative producer like Schneer has become especially adept at overcoming. Principal photography on their most recent film, co-starring Patrick Wayne, son of John Wayne, and

Taryn Power, Tyrone Power's daughter, took place in remote Jordan, Almeria in Spain, and in Malta.

"During those six months," says Schneer, "we worked in locations never used in feature films before—like the rock tombs of ancient Petra, and Picos de Europa, the glacial region of the Spanish Pyrenees—and under all kinds of conditions. I even remember one sequence where we shot a day-for-night snow scene in the strong Mediterranean sunlight. And the footage turned out beautifully."

Cinematographer Ted Moore ("A Man for All Seasons" and most of the James Bond specials) shot with Eastman color negative II film 5247. "We were delighted with the results. I noticed far better definition than we had ever gotten before."

While most conventional movies would be sent for editorial completion at this stage, the work on "Sinbad" was only beginning. It was now ready for Harryhausen to do his magic in London studios. From his imagination emerged some creatures never before seen on earth. With a combination of stop-motion photography, travelling mattes, and rear projection, his three-dimensional "Dynarama" process brings them to menacing life.

"Here's where the fine film grain of 5247 on the live action sequences pays off," says Ray. "Because even after I lay on all my multiple optical effects, it still delivers a print that looks like a first-generation print.

"I've also found that Eastman colour TV print film 5638, made for British television, is ideal for my kind of work because of its low-contrast characteristics."

Charles Schneer sums up, "Kodak's latest developments have given a new potential to Ray's fantasy sequences which, together with our original casting and use of exotic locations, should make 'Sinbad and the Eye of the Tiger' our most sophisticated film to date—and hopefully, a worldwide box office smash."

In our publication, "Kodak Professional Forum," Schneer and Harryhausen explain their work in more detail. Future issues will contain interviews with other interesting film personalities as well as news of our latest technical developments. If you would like to be included on our mailing list, just write Eastman Kodak Company, Dept. 640, Rochester, New York 14650.



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CINEMA WORKSHOP



By ANTON WILSON

OPTICS

A lens is basically a curved piece of glass, not unlike a Coke bottle. So how come a Coke bottle is cheaper? To find the answer to this and other profound mysteries, I contacted my good friend, Paul Foote, at Angenieux Corp. Paul is a living legend in the optical field and is a virtual walking encyclopedia of optical information. He has been involved in motion picture optics longer than I've been alive and can usually shed more light on my optical problems than an f/0.95 lens.

Of course, not everyone asks the above question in so eloquent a fashion. However, the implication is always the same. Why must a lens be so complex and costly, and what is the big deal about forming a simple image? In a word: ABERRATIONS. True, a simple single-element lens, like Sherlock Holmes' famous magnifying glass, will form an image. However, the quality would be totally unacceptable for photographic purposes. The reason is aberrations. The simple single-element lens does not form a perfect image. The image is distorted and impaired by several optical phenomena inherent in a spherical lens element. The more dominant of these imperfections include spherical aberration, coma, astigmatism, field curvature, image distortion, longitudinal and lateral chromatic aberration. After considering all these problems, it's a wonder that a lens can form any image at all. This is where the science of lens design begins, to minimize or cancel these aberrations

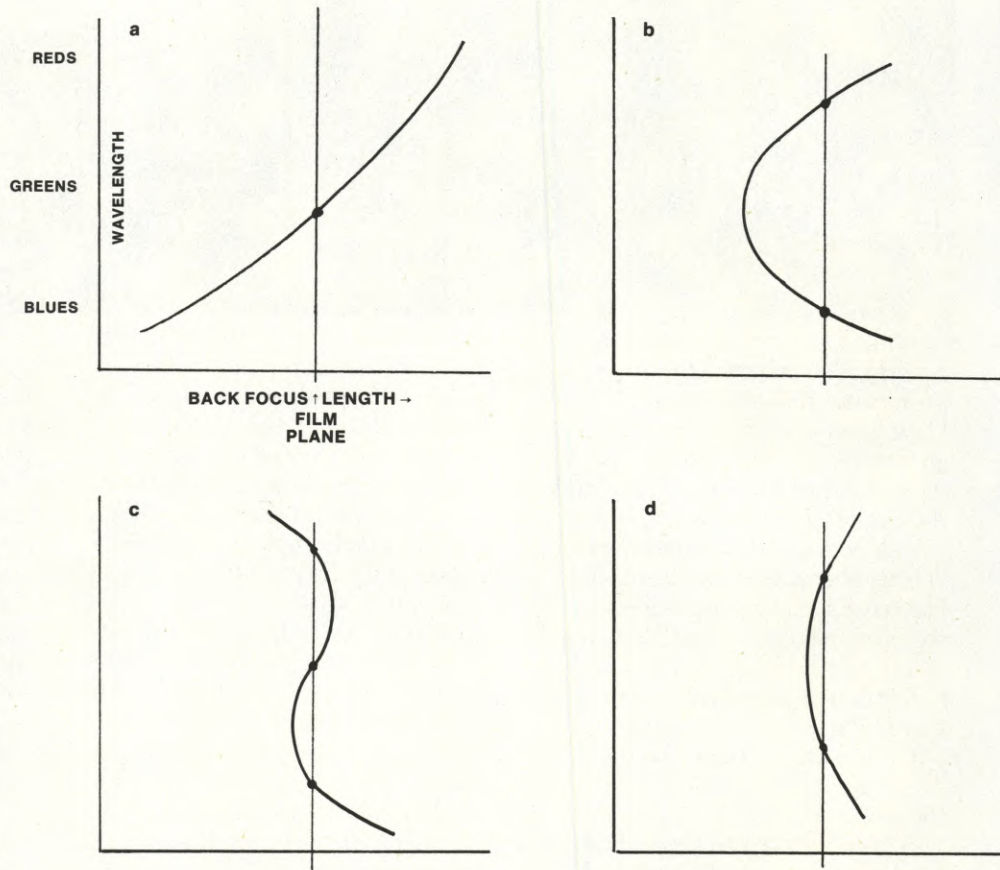
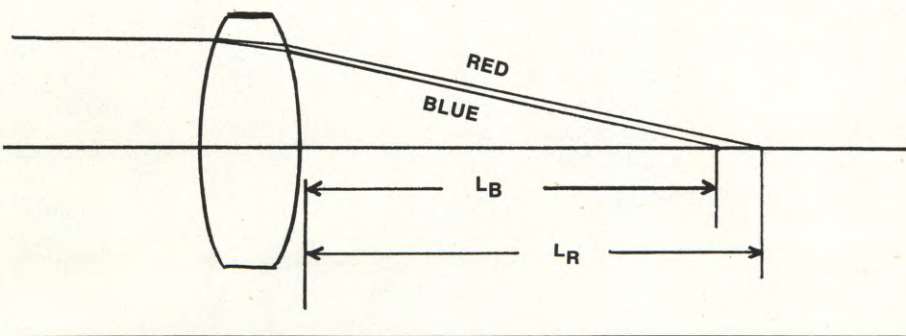


FIGURE 2 — (a) A simple lens has no correction for longitudinal chromatic aberration. As a result, the short focal lengths will focus short of the film plane, while the longer wavelengths will focus beyond the image plane. Only one color will be in sharp focus. **(b)** An "achromatic" lens is corrected for sharp focus at two specific wavelengths. However, wavelengths other than these two will still fall outside the film plane. **(c)** The "apochromatic" is corrected for three specific wavelengths. Even though all other wavelengths are still outside the film plane, the maximum deviation is much less than that of the achromatic lens of 2b. **(d)** The latest generation of achromatic lenses are still only corrected at two specific colors, as in 2b. However, the maximum deviation has been held to a minimum. As a result, the new achromatic designs exhibit correction on the same order as previous apochromats.

FIGURE 1 — Like a prism, a lens will bend various colors by different amounts, resulting in a color spread. As a result, every color will come to focus in its own image plane. This is known as longitudinal chromatic aberration.



that are inherent in all optical systems. This topic should be of interest to all motion picture and video cameramen and identifying the various aberrations seems the best place to begin.

Chromatic aberration is probably the easiest to comprehend. Almost everyone has played with a simple prism and is familiar with the fact that white light is broken into all the colors of the rainbow as it passes through a piece of non-parallel glass. This phenomenon results from the fact that glass exhibits different indices of refraction for various wavelengths. Each wavelength or color is bent a

Continued on Page 664

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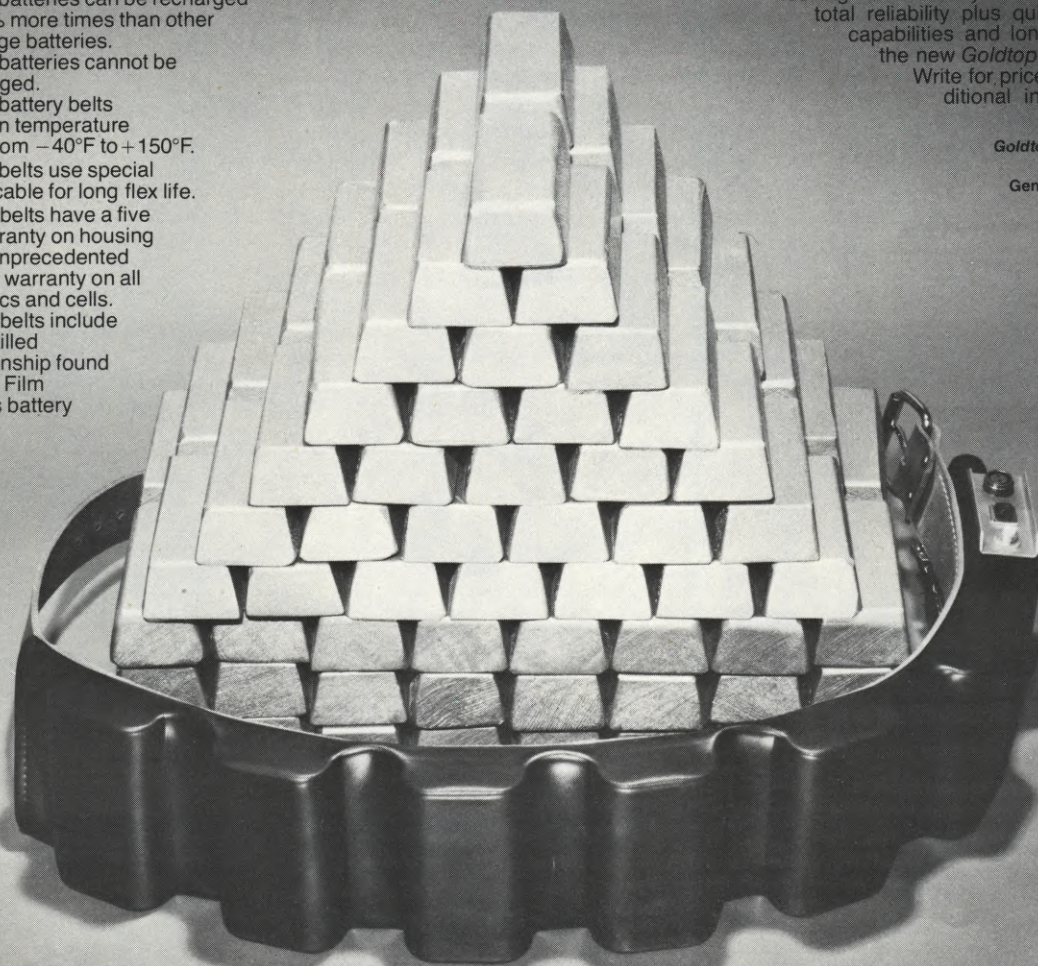
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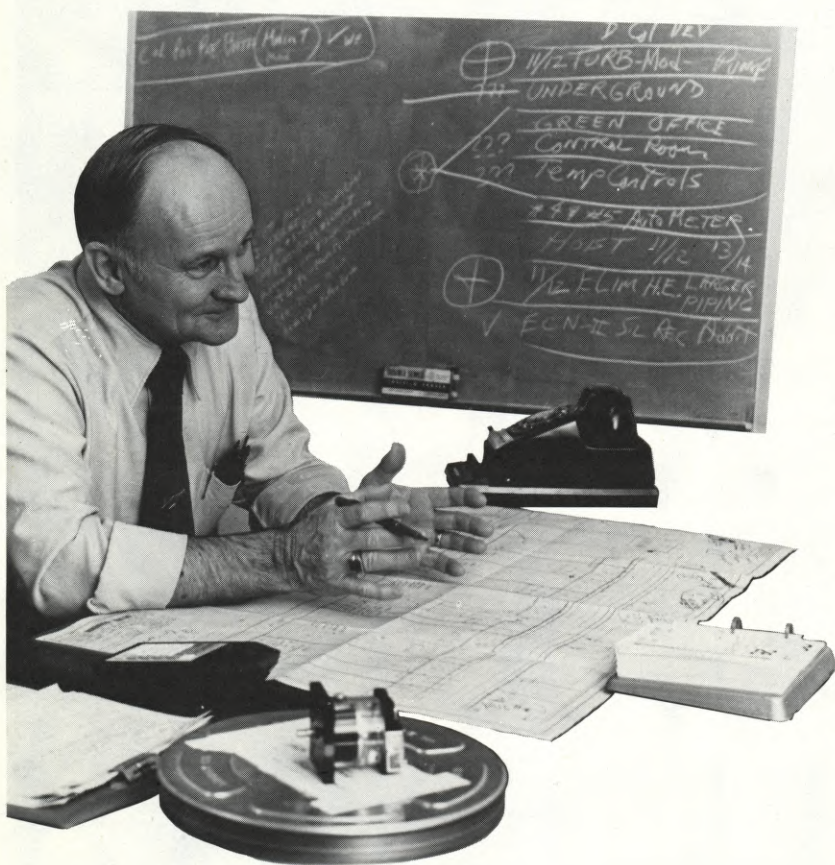


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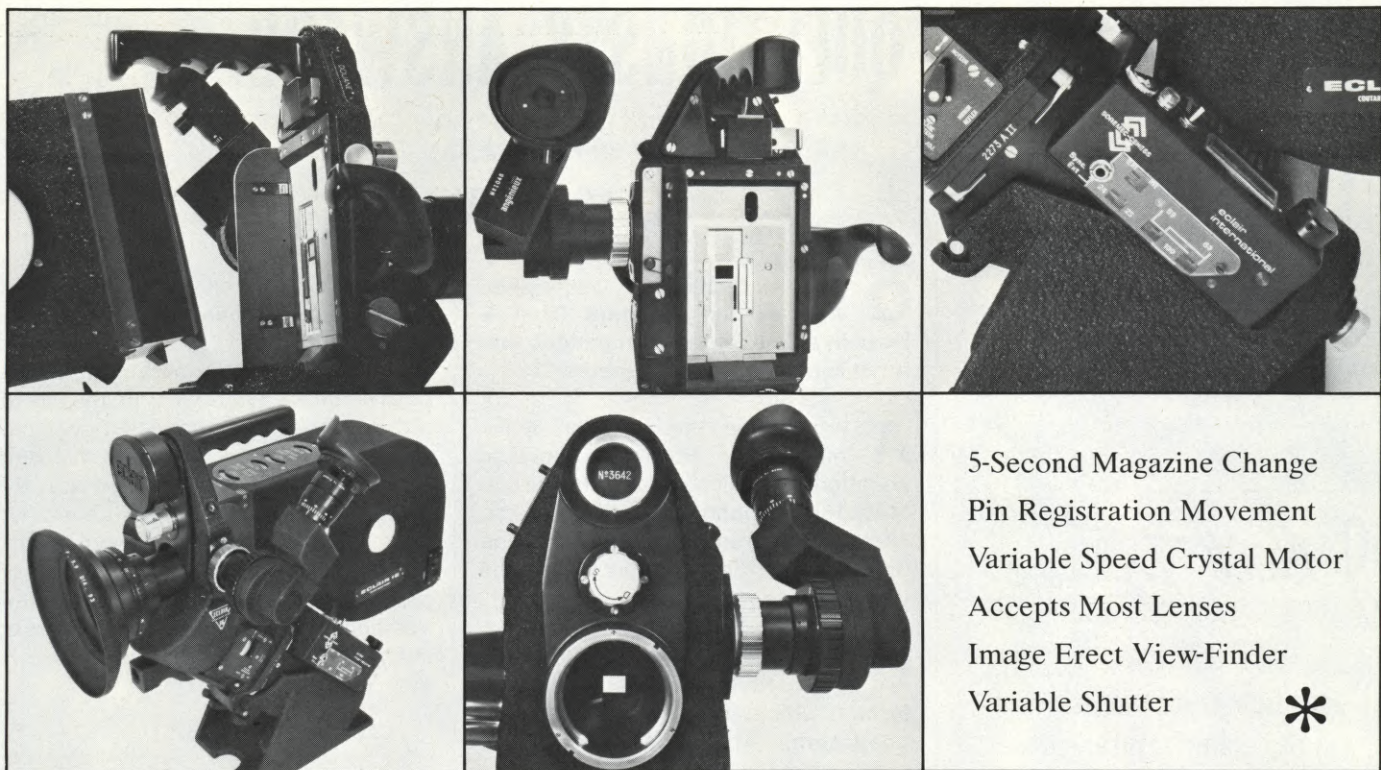
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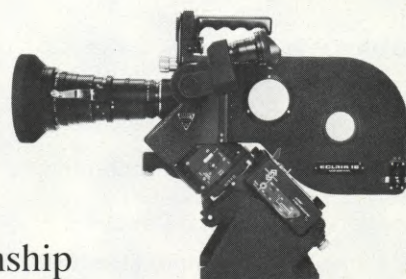


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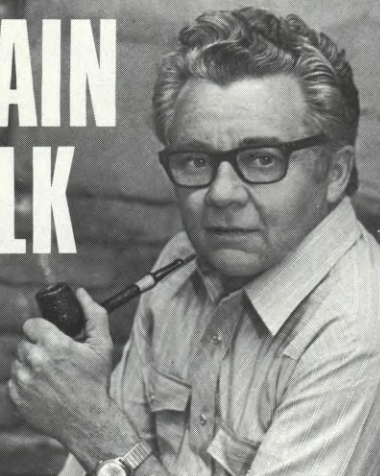
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PLAIN TALK



by *J. Carl Treise*

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I get a little tired of hearing film equipment manufacturers talk about how much they care . . . and then not coming to your help, when you really need them.

When you have a problem, can you reach a top man in the organization, or are you shunted aside to some lackey? If your problem is serious, will they hustle someone out to see what's wrong and help you on the spot?

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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 Does it make any difference whether the diagonal (Bell & Howell) splice for 16mm magnetic film is cut in one direction or another?

A As long as the emulsion is removed from the splice it makes no difference which way the slant is cut. Most 16mm sound film splicers are so angled that the splice can be only made one way with the emulsion side of the film up.

Q I have recently seen a number of productions projected in the 1.85 format which appear to have little headroom. Are cinematographers composing pictures to fit both Academy and widescreen aspect ratios or is this just a matter of the camera operator's preference?

A Some producers have decided that they want productions filmed in the 1.85 aspect ratio so that they can first show their product in the theaters as a widescreen production and then on TV. In order to show on TV, they must have the full frame aspect. This means that all scenes must be framed for the full aperture, keeping out lights and microphones, etc., but the action must be confined to the 1.85 ratio. This is a difficult and unsatisfactory compromise, but it is the decision of the producer and not of the camera operator.

Q For a 16mm black-and-white film I am making, I want to have white titles superimposed at the head over a live-action background. The film is being shot on negative.

If, in preparing my A and B rolls for print, the titles are black on white (as they would be in the negative stage), the white portion would print through so that the background on the other roll would not appear.

What alternatives are there for producing the white title text superimposed?

A It is possible to attain a white letter superimposed on a background through the process of negative-positive printing. It is necessary, however, to superimpose the title and print the background in one pass through the printing machine. This

method is commonly used to superimpose English titles on foreign pictures.

Inasmuch as this operation is more costly than for a normal print, the use of a dupe negative is suggested, with the superimposition incorporated into one record of film for final release use. By using the first method the problems of title movement, proper synchronization of title over background, and of picking up dirt and dust particles on the additional record of the film, makes a clumsy and hazardous operation. However, it can be done.

Q Is there any difference in shooting color film for television transmission than in shooting color for theatrical or industrial films?

A There is no basic difference in actual production techniques, lighting (although lighting ratios should be short, on the order of 2 to 1 or even 1½ to 1), or general camera work. Of course, long shots should be held to a minimum and closer shots used as much as possible, as with all television work. The principal problem encountered is how viewers will see the picture on black and white sets. Great care must be taken that the monochromatic, or gray scale values, of the colors employed are not alike or the black and white television picture will lack contrast. Players' costumes, titles, furniture may be "lost" against the background if they both reproduce in the same shade of gray. Pre-production black and white still photos should be made or the various color combinations actually filmed in color and checked on a closed-circuit black and white television receiver to be certain they will reproduce properly. I might emphasize that this is an area in which there is greater and greater laxity although a substantial amount of the viewing public is still obliged to look at TV in black and white.

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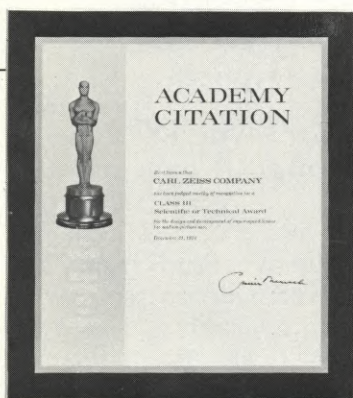
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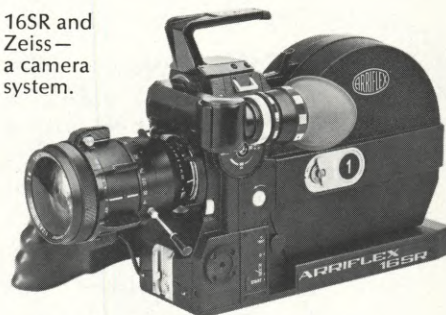
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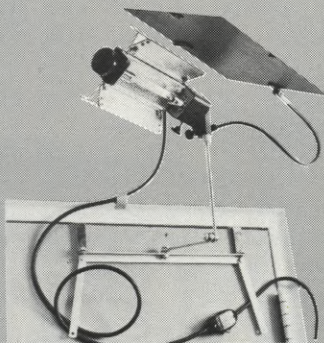


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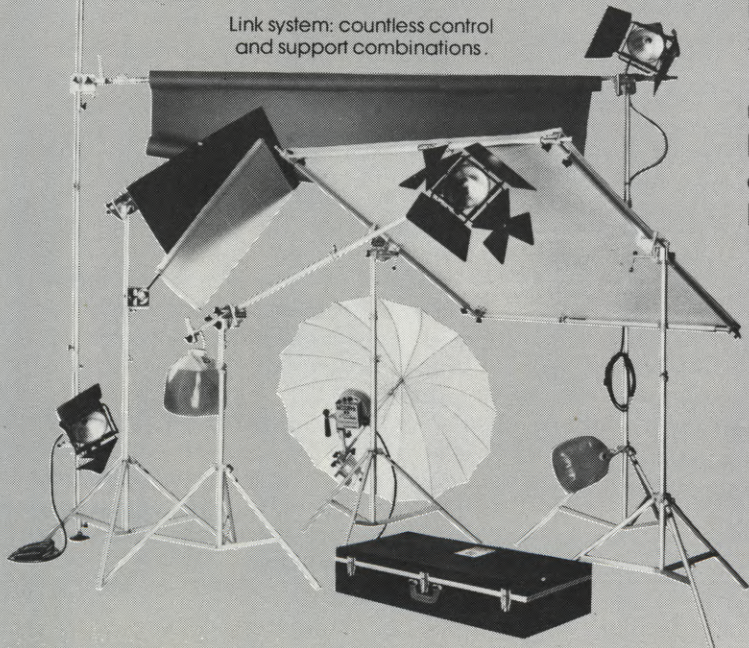
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Tiny Tota-Light. More than a small 1000, 750 and 500-watt light with an ultra-wide, even pattern: it's the first professional quartz light built like a system camera, with lock-on mounting and control accessories.

Modular Link System. Solves grip and control problems as they occur on location. Rugged, light-weight components interlock to form flags, booms, diffusers...dozens of other rigs. Outstanding stands: with unusually high strength-to-weight ratios.

Link system: countless control and support combinations.



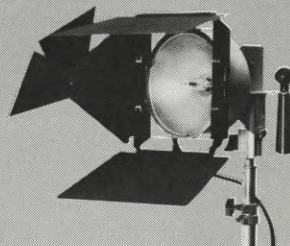
Variflector II: the only roll-up, flood-out reflector.

Folding Softlight 1500. Only a fraction of the weight of studio units, it makes soft-shadow location lighting a reality. Delivers more output than most 2K softlights

with two 750-watt lamps. Mounts or clamps anywhere...folds into compact case for travel.

Roll-up

Variflector II. The only truly portable, professional reflector. Complete flood control through 3:1 ratio, to adjust brightness and spread. Rolls up to fit in compact case with stand.



Quartz "D": 7-1 focusing plus high intensity.

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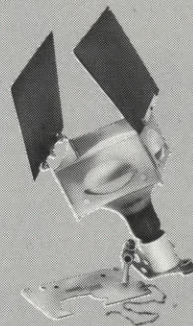
Lowel-Light. The tape-up, clamp-on light that helped change the industry's approach to location lighting, and introduced Gaffer-Tape™. Some of the original units are still going strong, after 15 years of rental.

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PROFILE: A.S.C.

By JOHN ORMOND

WILLIAM A. FRAKER, A.S.C.

Only a handful of cinematographers have added movie directing to their list of accomplishments. William (Bill) Fraker, a man of great zeal and creativity, is one of this small fraternity. Yet, today, he's back doing the job he likes best — photographing motion pictures.

"I enjoyed directing, but my most satisfying efforts have been as a director of photography," says the tall, lean, quiet-spoken Fraker.

For the record, Fraker directed two films: "MONTE WALSH", with Lee Marvin, Jeanne Moreau and Jack Palance, and "REFLECTION OF FEAR", starring Robert Shaw.

He has registered his greatest impact, though, as director of photography. Perhaps his best effort was "BULLITT", the Steve McQueen film, which won him the National Society of Film Critics Award in New York in 1968. In 1976, he was one of three cameramen who photographed the Oscar-winning movie, "ONE FLEW OVER THE CUCKOO'S NEST".

Fraker, an impressive-looking man with white hair and beard, comes from a growing group of cinematographers who studied at University of Southern California. One of these USC grads, Conrad Hall, is a close friend.

Fraker's first full-time working association with Hall came in the television series, "STONY BURKE", with Jack Lord. Hall was director of photography on that series, and Fraker was camera operator.

Later, when Connie Hall moved on to photograph feature films, Bill Fraker moved on, too.

"A milestone for both of us was a pic-

ture called 'THE WILD SEED' at Universal," Fraker recalls. "It was Connie's first movie, as director of photography, and it was my first film, too, as his assistant."

That 1962 film was completed on location at Stockton, Calif., in 35 days for \$280,000.

"I think it did a lot for both of us," says Fraker, smiling.

From 1954 — when Fraker got his first camera assignment as second assistant on "THE LONE RANGER" TV series — to 1965, when he won his stripes as director of photography, he worked on more than a score of films and series.

They included the "OZZIE AND HARRIET" show — a program which proved to be the happy training ground for four or five potential directors of photography.

"I started with Ozzie as a second assistant, and left the show seven years later, as a camera operator. It was a great experience."

During that pre-1965 eleven year span, Fraker also worked on the highly-successful "OUTER LIMITS" TV series and on a Marlon Brando film, "MORITURI".

The big step forward in 1965 came when production manager James Pratt called him over to Universal to award him his first job as director of photography on a feature film. The film was "GAMES", with Simone Signoret, James Caan and Kathryn Ross.

"It was a 15-day picture, but it was pretty important for me," reminisces Fraker.

In quick succession, Bill was hired to direct the photography of "THE FOX", a D.H. Lawrence story filmed in Canada; "THE PRESIDENT'S ANALYST", a Paramount feature starring James Coburn and "FADE IN", also at Paramount, starring Burt Reynolds.

Since then some of his more notable credits have included "ROSEMARY'S BABY", "BULLITT", "PAINT YOUR WAGON", "DAY OF THE DOLPHIN", and "GATOR".

His two most recent stints have been "THE HERETIC — EXORCIST II", at Warners, and "LOOKING FOR MR. GOODBAR", at Paramount. He has high hopes for the success of both pictures.

His move into directing came in 1968, when he accepted the new chal-

lenge with "MONTE WALSH", a feature for Cinema Center Films.

Subsequently, he directed "REFLECTION OF FEAR" at Columbia.

"I was reasonably pleased with my directing jobs," he recalls, "but I don't believe either picture made a lot of money."

Fraker credits an aunt with his getting in to the film business in the first place.

Los Angeles born-and-educated, Bill Fraker received most of his encouragement from the aunt. "She pushed me along in photography," he notes.

After leaving school, Bill Fraker, at 18, joined the U.S. Coast Guard during World War Two. He participated in invasion assaults on islands in the North and South Pacific, from the Aleutians to the New Guinea area.

The war over, he attended the USC Cinema School, where he won his BA degree. While at the college, he worked part-time for Tom Kelley, the portrait photographer who became noted for his famous calendar photo of Marilyn Monroe.

"After my mother and father died, I stayed with my grandmother," he recalls. "My grandmother had been a photographer, and she and my aunt both prodded me along towards a photographic career. I don't think I would have done it without their constant encouragement."

That encouragement eventually led to him winning admission to the Hollywood cameraman's union local, and his initial career assignment at General Service studios on the "LONE RANGER" series.

In 1968, he also won admission to the American Society of Cinematographers, a membership of which he is justly proud.

"I think the ASC is one of the greatest organizations of its kind, anywhere in the world," Fraker enthuses. "Every man in it is top class."

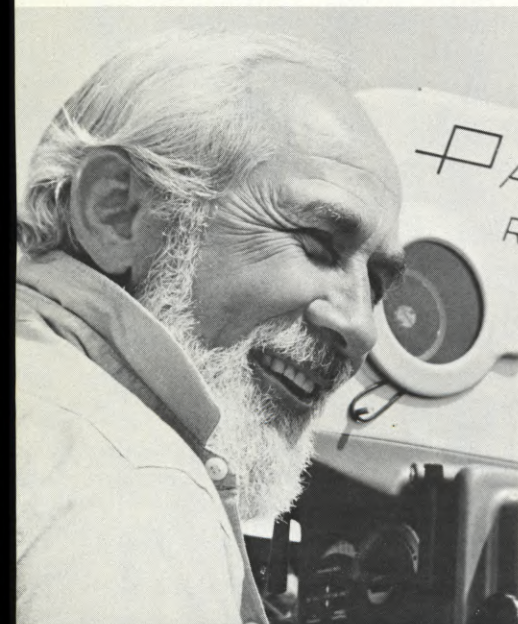
In private life, unlike many other cinematographers, he does not pursue photography as a hobby. Nor does he express much interest in travel.

"Unless, that is, we're talking about a round-the-world, first class cruise on a big ocean liner," he grins. "That might be more my cup of tea."

He and his attractive wife, Denise, live in a rambling, old-Spanish three-level home in one of the canyons overlooking Hollywood. His chief hobby is gardening.

The Fraker property spreads over almost an acre, and affords ample opportunity for as much vegetation as they wish. Bill's favorite item is his orchids, grown at the base of a tree in

Continued on Page 666



Introducing the all-time 16mm *quiet* champ!

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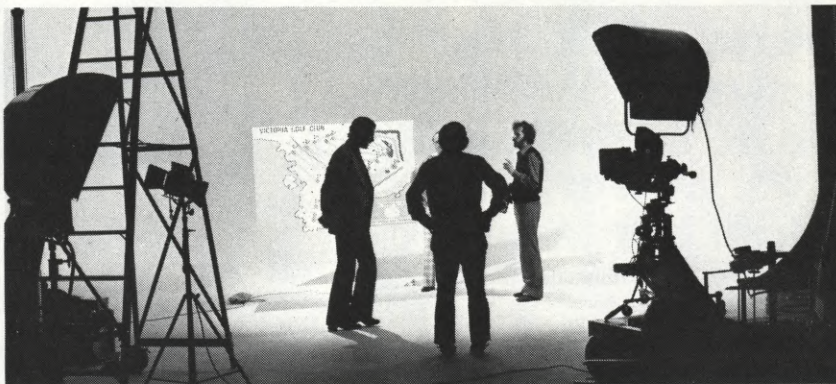
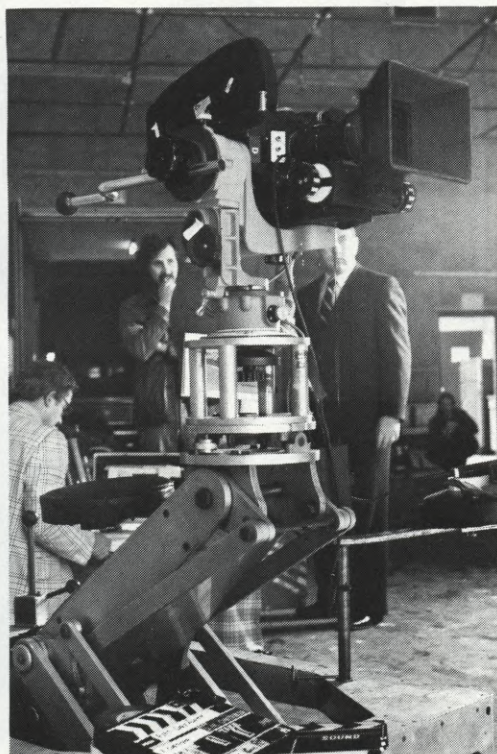
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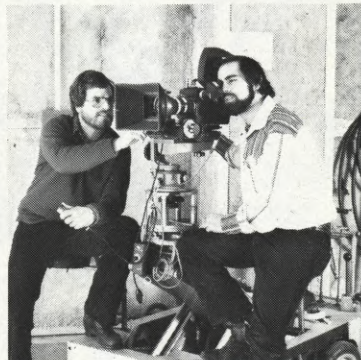
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Canadian cinematographer David M. Ostriker (at right) shooting a television commercial with his own CP-16R and Studio Rig.

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
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- Accepts accessory 1° spot attachment for direct Foot-Lambert (luminance) readings, plus all other Spectra Series II accessories.

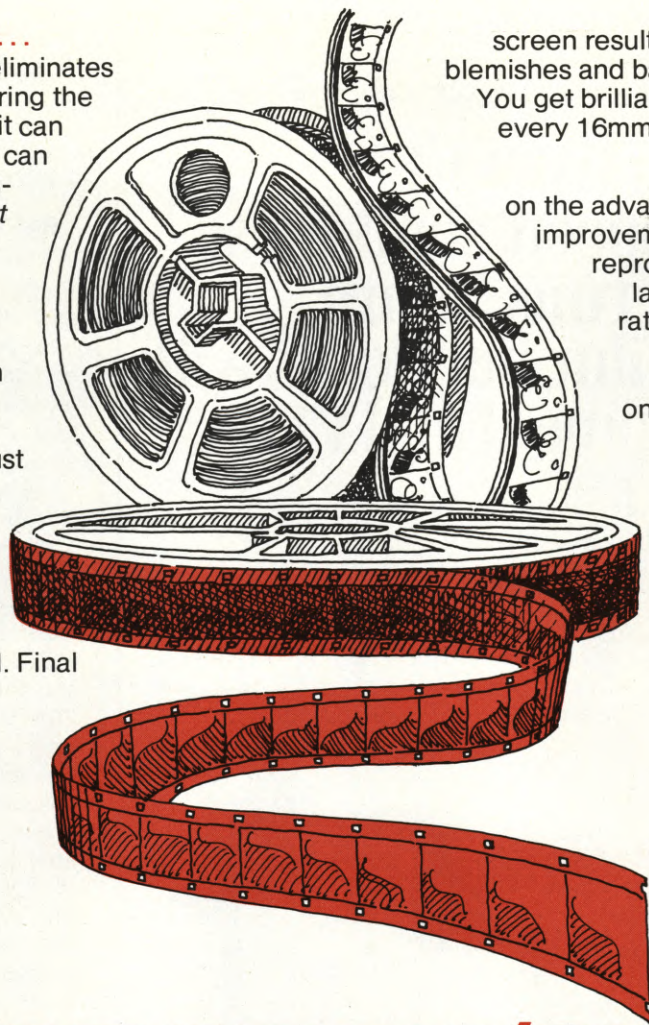


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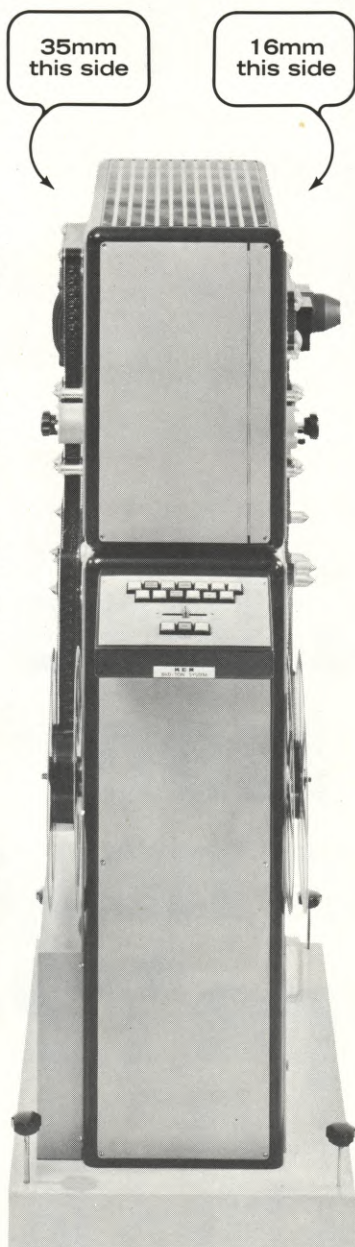
Frame-line continuously adjustable. Manual inching. Electronic film tension sensor. 3,000 foot reels. Two-minute rewind.

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With the PR1000/16+35, you buy one drive mechanism, one electronic system, all run by one control panel. But you get, in effect, *two* projectors.

Information

You can get more facts from KEM Editing Systems in Hollywood, at (213) 461-4143; or from MM Editing Systems in New York, at (212) 697-5865. Or please contact us at the address below.



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THE BOOKSHELF

By GEORGE L. GEORGE

CRAFTS AND TECHNIQUES

The standard text by H. Mario Raimondo Souto, *THE TECHNIQUE OF THE MOTION PICTURE CAMERA*, now in its 3rd revised and enlarged edition, provides significant data on the latest developments of the cinematographer's tool. The new material, extensively illustrated with precise line drawings, tables and charts, covers exposure control devices, mechanical camera design, film shooting systems plus fresh data on the latest Soviet and Czech cameras and 8mm equipment. (Hastings House \$22.50)

The first book ever written on the subject, *FULL LENGTH ANIMATION FEATURE FILMS* testifies to Bruno Edera's thoroughgoing research and his ability to assemble a remarkable collection of material. History and technique are given comprehensive attention, from Argentina's *El Apostol* (1917) to Richard Williams' *Raggedy Ann and Andy* (1977), with more than 150 excellent color and b&w illustrations providing a stunning visual element. (Hastings House \$35.)

How to shoot homemade Hollywood-style movies is explicitly detailed in *FILM MAKING* wherein Mik Derks and Steve Poster describe the component parts of a project from idea to completion. (Petersen \$3.95)

Recent developments in the 8mm field, especially the rapid evolution of Super-8 from amateur to professional status, are reviewed in *SUPER-8: THE MODEST MEDIUM* by Jonathan F. Gunther, a knowledgeable educator and researcher. (Unesco, NYC \$3.30)

In a slim but substantial volume, *NOTES ON CINEMATOGRAPHY*, French director Robert Bresson has jotted down thoughts, precepts and aphorisms concerning the art of cinema, the directorial function and related subjects. (Urizen \$6.96/3.50)

James Monaco's *HOW TO READ A FILM* is an encyclopedic look at today's cinema, situating it at the crucial crossroads of contemporary mass communications. All aspects of the medium — history, economics, technique and esthetics — are synthesized into a complete perception of its dynamics. Particularly valuable is the chapter on the language of film with its analysis of the theories of cinema. (Oxford U. Press \$15.)

The contents of 150 general professional and scholarly periodicals are

indexed under 1,000 subject/name/film headings in the annual cumulation of **FILM LITERATURE INDEX 1975**, edited by Vincent J. Aceto, Jane Graves and Fred Silva. (Bowker \$65.)

* * *

BLUEPRINTS FOR FILMS

Over 1,000 frame-by-frame blow-ups of the funniest scenes of Laurel and Hardy films convey the essence of their comedic gifts in **A FINE MESS!**, Richard J. Anobile's screenplay-like compilation of the verbal and visual gems that highlight sequences of the team's most memorable feature films. (Avon \$4.95)

The complete script by Lorenzo Semple, Jr. of Dino de Laurentiis' production, **KING KONG** gives a full measure of the film's heady mixture of preposterous camp, unabashed nostalgia and entertaining fantasy. (Ace \$1.95)

Marguerite Duras' screenplay of her dreamy film, **INDIA SONG**, features an imaginative use of voices creating an echo chamber effect that perpetuates the past. (Grove/Random House \$3.95)

The flexible form of the "film novel" by François Truffaut of his delightful comedy about children, **SMALL CHANGE** comes very close to a full-blown script with its precise and moving descriptions of the problems of growing up. (Grove/Random House \$1.95)

A collection of television and radio scripts, edited by Sylvia Z. Brodtkin and Elizabeth J. Pearson, **ON THE AIR** offers well known shows from such series as *The Twilight Zone*, *Star Trek*, *The Waltons* and *Studio One*, followed by "questions for discussions" meant for school seminars. (Scribners \$4.95)

For research on screenplays, Gordon Samples' **THE DRAMA SCHOLARS' INDEX TO PLAYS AND FILMS** provides a broad international coverage of anthologies, series and periodicals, including critical essays, excerpts of reviews and bibliographical data. (Scarecrow \$12.50)

* * *

THE THRUST OF FILM HISTORY

In **HIS MAJESTY THE AMERICAN**, John C. Tibbetts and James W. Welsh analyze the films of Douglas Fairbanks, Sr. as embodiments of the American Way, of faith in our society and the natural optimism of the suc-

cessful man. (Barnes \$17.50)

Collected by Bryan B. Sterling in **THE WILL ROGERS SCRAPBOOK** are the homespun philosopher's views on topical subjects from politics to show business, a nostalgic excursion full of chuckles and common sense with appropriate sepia-tinted photographs. (Grosset & Dunlap \$12.96/6.95)

An extensive and engaging history of the genre, **THE FABULOUS FANTASY FILMS** by Jeff Rovin reviews over 500 movies that include all classics dealing with ghosts, vampires, witches, giant monsters and other magic, supernatural and fantastic subjects. (Barnes \$19.95)

A pictorial survey of film sequels, Michael B. Druxman's **ONE GOOD FILM DESERVES ANOTHER** capitalizes on the industry practice of spinning off successful movies, from *Don Q*, *Son of Zorro* to *The Godfather, Part II*. (Barnes \$15.)

Henry Ephron's **WE THOUGHT WE COULD DO ANYTHING** is a lively and witty memoir of his and his late wife's career as a successful play and script-writing team in glamorous Hollywood and Broadway days. (Norton \$8.95)

James Phelan, in **HOWARD HUGHES: THE HIDDEN YEARS**, bares the unbelievable last decade of the man whose pervasive influence reached across U.S. industry into the heart of Hollywood. (Random House \$7.95)

Relying mainly on information supplied by Howard Hughes' security chief, Richard Mathison's **HIS WEIRD AND WANTON WAYS** pictures the tycoon's bizarre behavior during the Hollywood and Las Vegas years as that of a tortured and unhappy megalomaniac. (Morrow \$8.95)

* * *

PERSONALITIES

In **PREMINGER: AN AUTOBIOGRAPHY**, the redoubtable Otto writes a fascinating life story filled with unequalled anecdotes about filmdom's biggies and his own explosive movie-making methods. (Doubleday \$8.95)

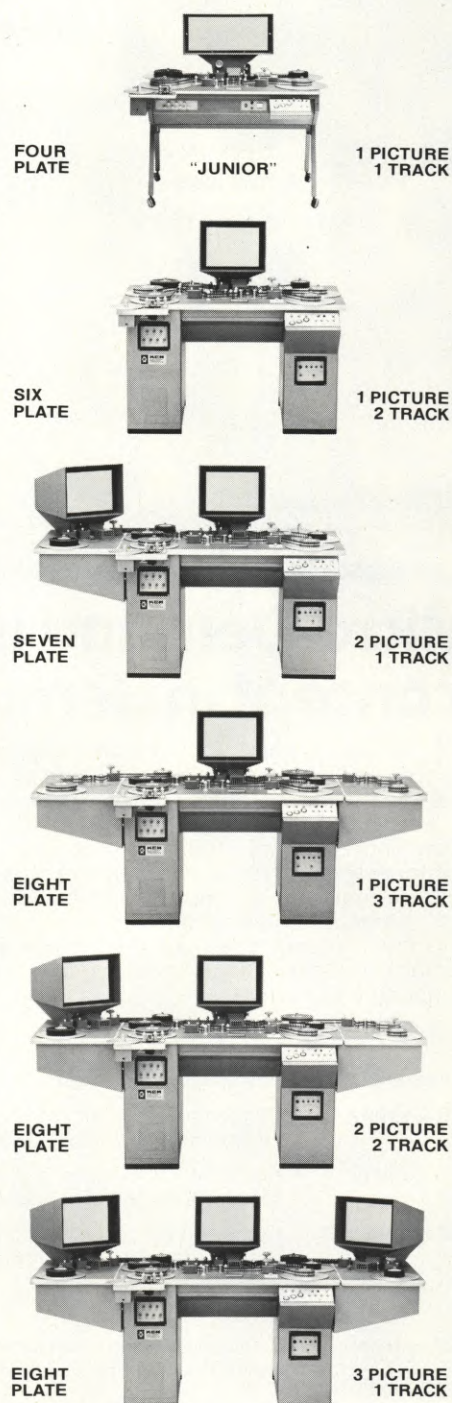
Brooke Hayward, the surviving daughter of actress Margaret Sullavan and producer Leland Hayward, unveils in **HAYWIRE** a haunting memoir of the traumas that upset the family's life and her personal acting career. (Knopf \$10.)

Jack Stewart's **THE FABULOUS FONDAS** recaps the lives of Henry, Jane and Peter, one of the most successful and controversial screen families in Hollywood. (Belmont Tower \$1.50)

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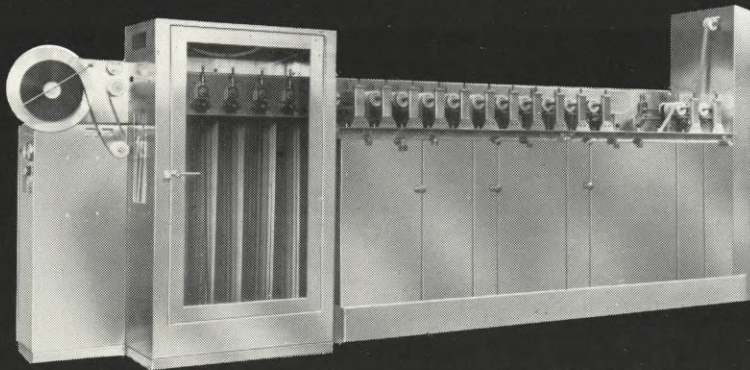
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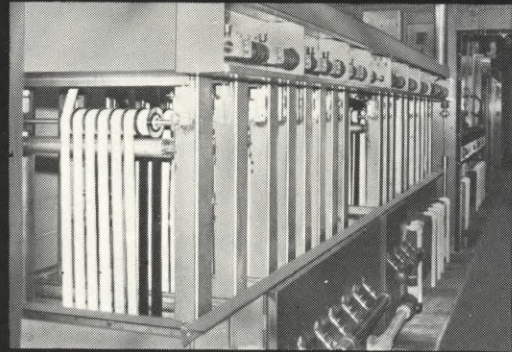
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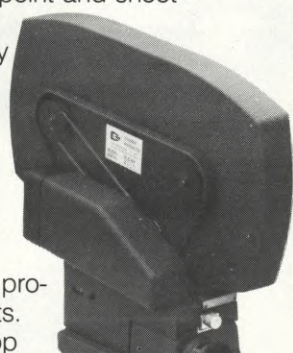
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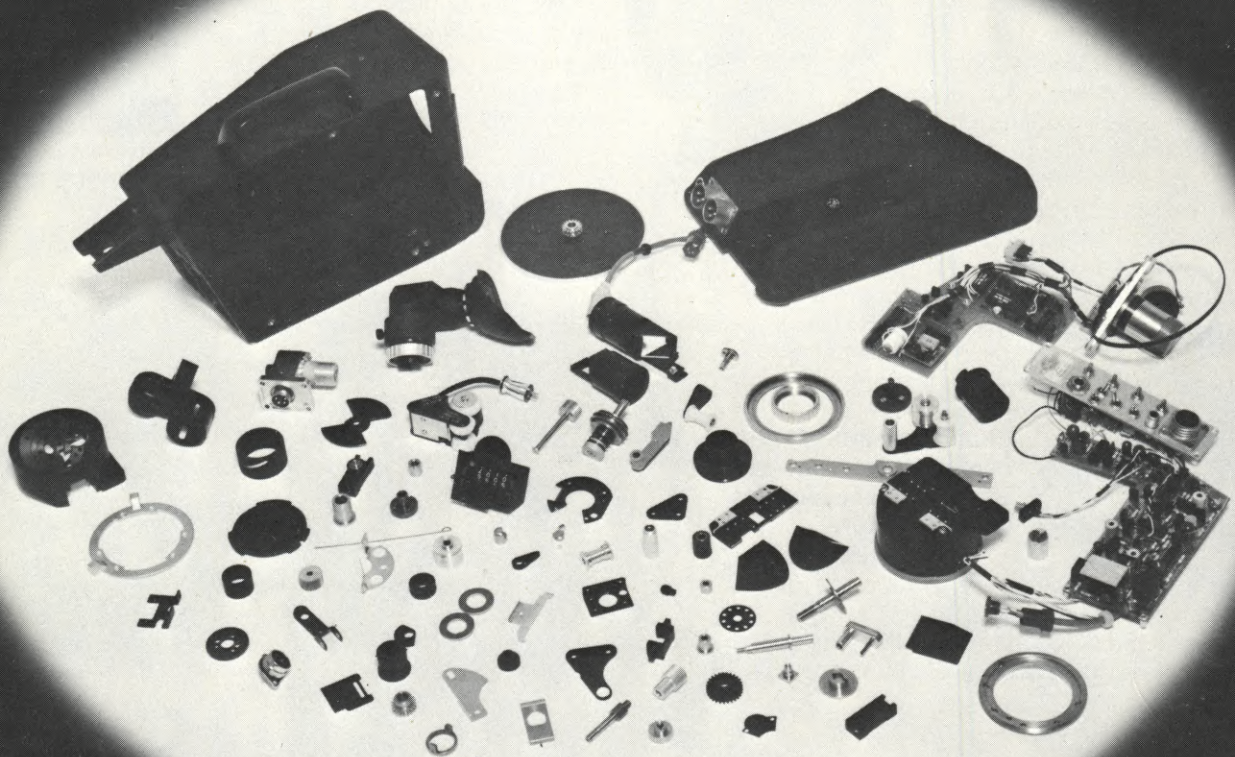
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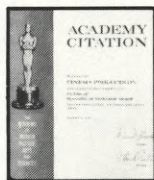
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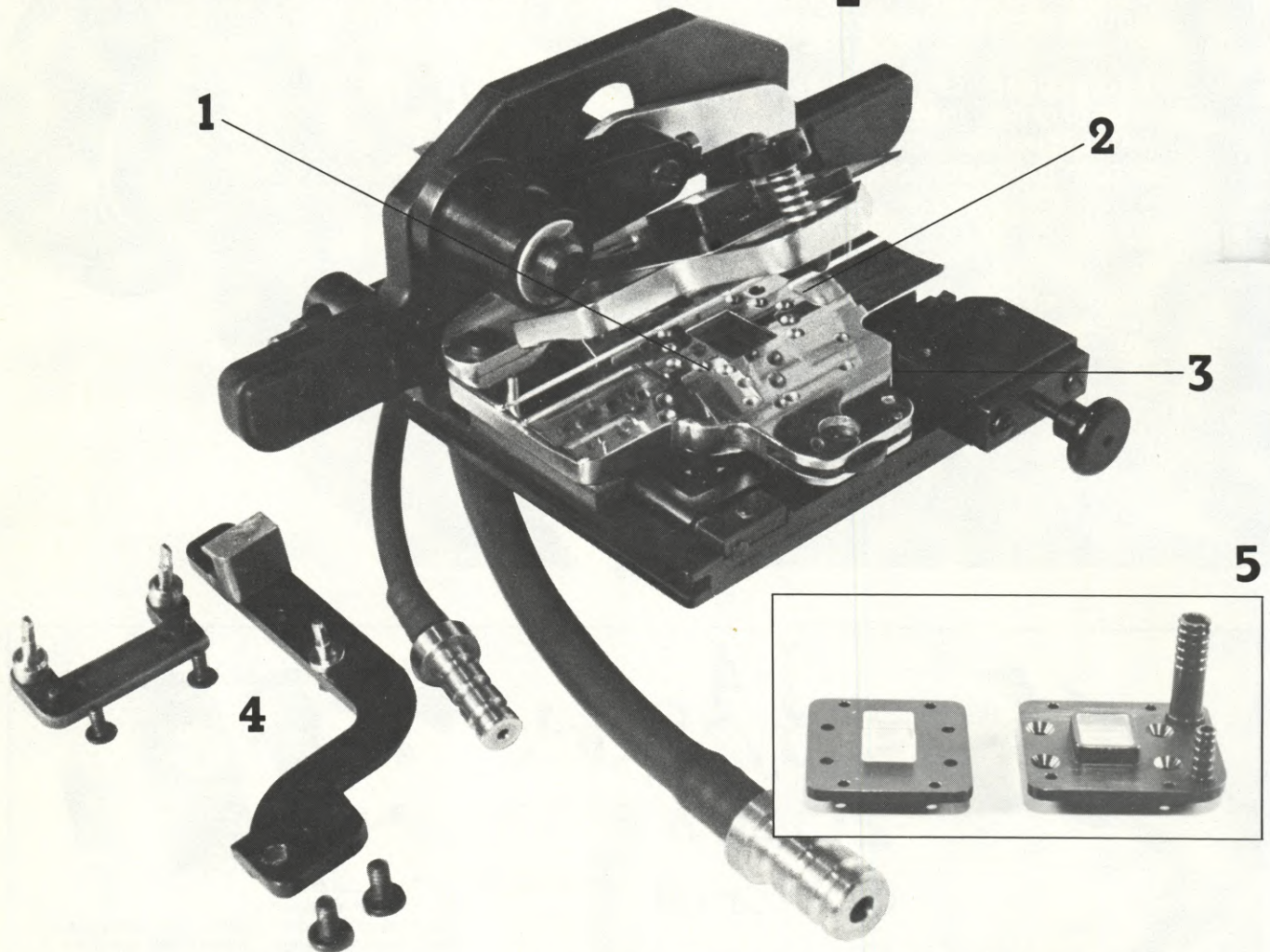


J-4 Zoom Control shown in use with XR35 Studio Camera, Canon K-35 Macrozoom 25-120mm Lens, and 150XR Fluid Head.

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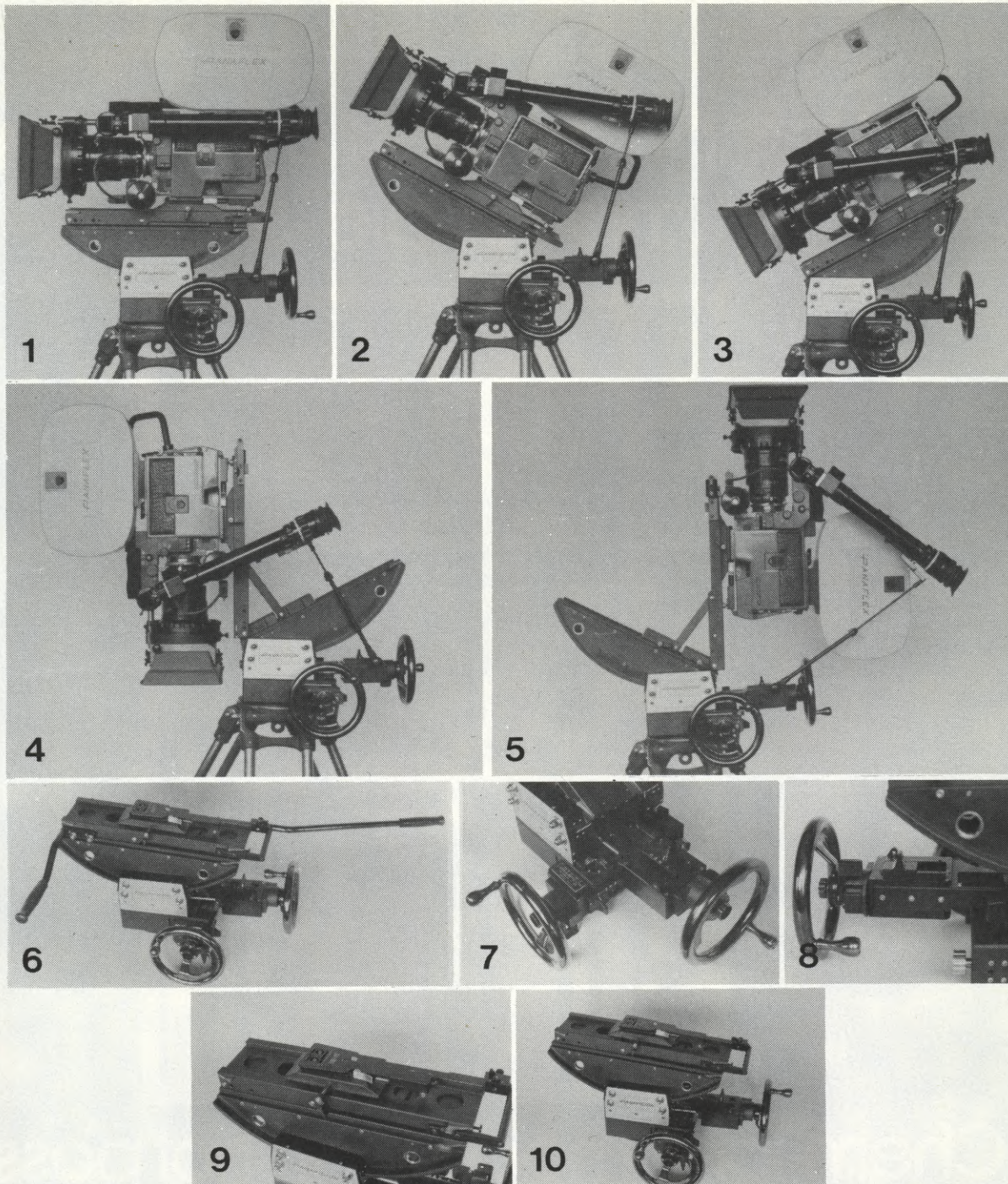
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"The film will be aired in early '77. We think TVC should be as proud of it as we are."

Peter Rosen—Producer/Director/Cameraman
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BEHIND THE SCENES OF **ROLLERCOASTER**

**Not another disaster film, as one might suspect,
but a cat-and-mouse suspense thriller set against
unique and technically challenging backgrounds**

"ROLLERCOASTER", a Jennings Lang Production for Universal in Academy Award-winning *Sensurround*, wide-screen Panavision and Technicolor, is a large-scale theatrical motion picture played against the exciting background of American amusement parks. It stars George Segal, Richard Widmark, Timothy Bottoms, Harry Guardino, Susan Strasberg and Henry Fonda, and was directed by James Goldstone for producer Jennings Lang. It was photographed by David Walsh.

Basically, "ROLLERCOASTER" is about a young man's attempt to extort money from several amusement parks under the threat of sabotage. "It is a suspense thriller, not a disaster film," says director James Goldstone. "It is in the classic Alfred Hitchcock and Carol Reed tradition in which the criminal

challenges the police, and a surrogate, an innocent man, is drawn into the maelstrom."

"ROLLERCOASTER" is the third motion picture in *Sensurround*, following the highly successful box-office films, "EARTHQUAKE", and "MIDWAY". This is the first film in which actual location sound effects were recorded in *Sensurround*. Previously, the *Sensurround* sound was added to the picture after filming. A separate *Sensurround* sound crew recorded on prototype equipment designed for extremely low and high frequencies to give "ROLLERCOASTER" a dramatically realistic multiple-perspective sound. Even Lalo Schifrin's music for the film utilizes, for the first time, the multiple-perspective *Sensurround* sound and opens up some low-frequency basses, as well as some

Thrilling riders in spectacular fashion by looping them upside down, the Great American Revolution, a futuristic rollercoaster-type ride at Magic Mountain Amusement Park in Valencia, California, serves as a giant prop in the hair-raising final sequence of Universal's "ROLLERCOASTER".

high-frequency notes never before heard in films.

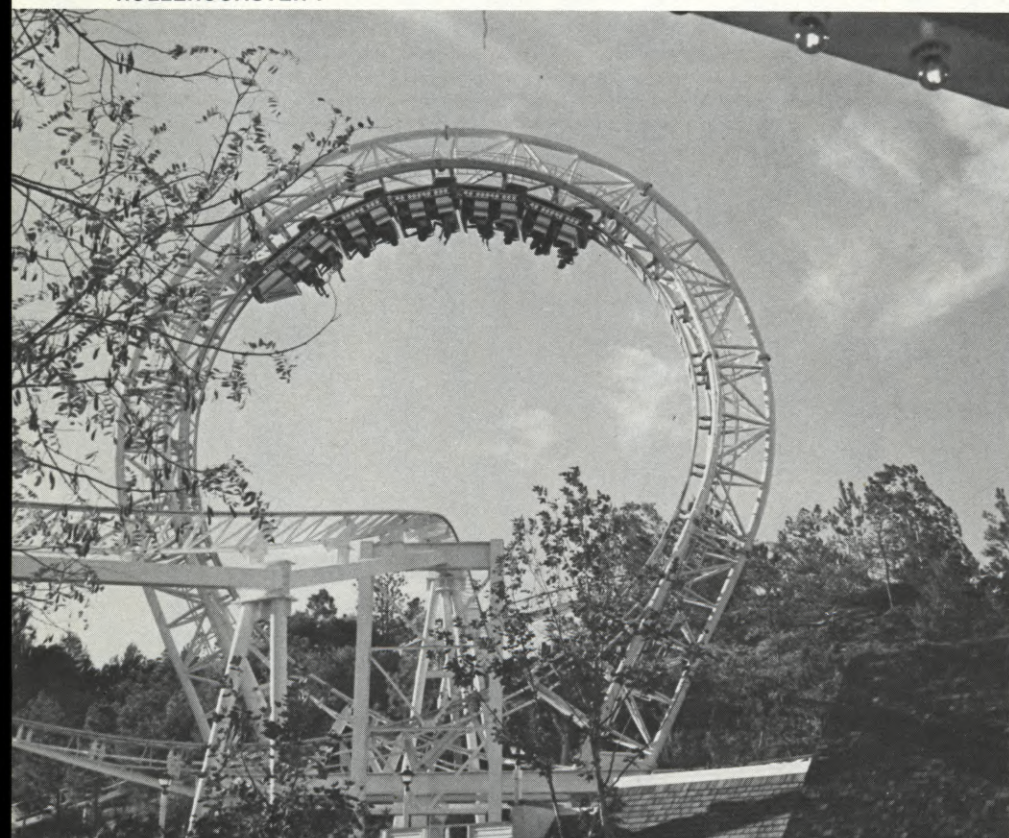
As much of the "ROLLERCOASTER" action unfolds in amusement parks, director Goldstone scouted more than 20 of them throughout the country before finally selecting the three that are actually used in the film. OCEAN VIEW Amusement Park in Norfolk, Virginia, is the first one seen in the picture. It is supposed to be on the West Coast in the film, but this 76-year-old park, located on Chesapeake Bay next to a fishing pier, was the old-fashioned, picturesque, beach-boardwalk type of park the director wanted. The park's famous old Southern Belle rollercoaster, considered by some experts to be one of the nation's most exciting, had its name changed to "The Rocket" for the film.

It was here at OCEAN VIEW that one of the most dangerous and spectacular motion picture stunts in recent years was captured on the screen. The scene called for 24 passengers to be killed when The Rocket hurtles through the air and crashes. When the scene was filmed, one of the coaster cars plunged from the tracks as planned into the balsa-wood building below and five stunt people sailed through the air. But despite planning, preparation and rehearsal, two of the stunt people went to the hospital with injuries. The unusual scene was recorded by five cameras.

The second amusement park in the film is KINGS DOMINION, near Richmond, Virginia, where George Segal reluctantly attempts to deliver one million dollars in cash to the extortionist as Special Agent In Charge Richard Widmark, and various police try to set a trap for him. One of the newest and most beautiful parks in the world, KINGS DOMINION has the famous Rebel Yell twin-racing rollercoaster, a replica of the Eiffel Tower, a Lion Country Safari monorail, and an antique wooden carousel. George Segal rides many of them in his attempt to help capture the extortionist.

The crucial confrontation in the film occurs at MAGIC MOUNTAIN, in Valencia, near Los Angeles, where the suspenseful cat-and-mouse duel between Segal and the extortionist unfolds with dramatic finality. One of the newest and most imaginative parks in the world, MAGIC MOUNTAIN boasts a wide variety of rides including the world's largest steel coaster, The Revolution which features the first 360-degree vertical rollercoaster loop ever built. This world-famous ride is the focal point of the exciting climax of the film.

Jennings Lang, one of the motion



picture industry's most innovative and creative talents, who conceived the idea of *Sensurround* for "EARTHQUAKE", is producer of "ROLLERCOASTER". Lang was executive producer of three of Universal's recent top box-office hits — "AIRPORT 1975", "EARTHQUAKE", and "THE FRONT PAGE". Besides "ROLLERCOASTER", Lang currently is executive producer of "AIRPORT 77".

Director James Goldstone continues his association with Lang, for whom he helmed "WINNING" and "SWASHBUCKLER". Among other theatrical features he directed are "RED SKY AT MORNING", "JIGSAW", "A MAN CALLED GANNON", "BROTHER JOHN", and "THE GANG THAT COULDN'T SHOOT STRAIGHT". Among his television credits are the pilots for "STAR TREK", "IRONSIDE", and "THE SENATOR", as well as many award-winning specials.

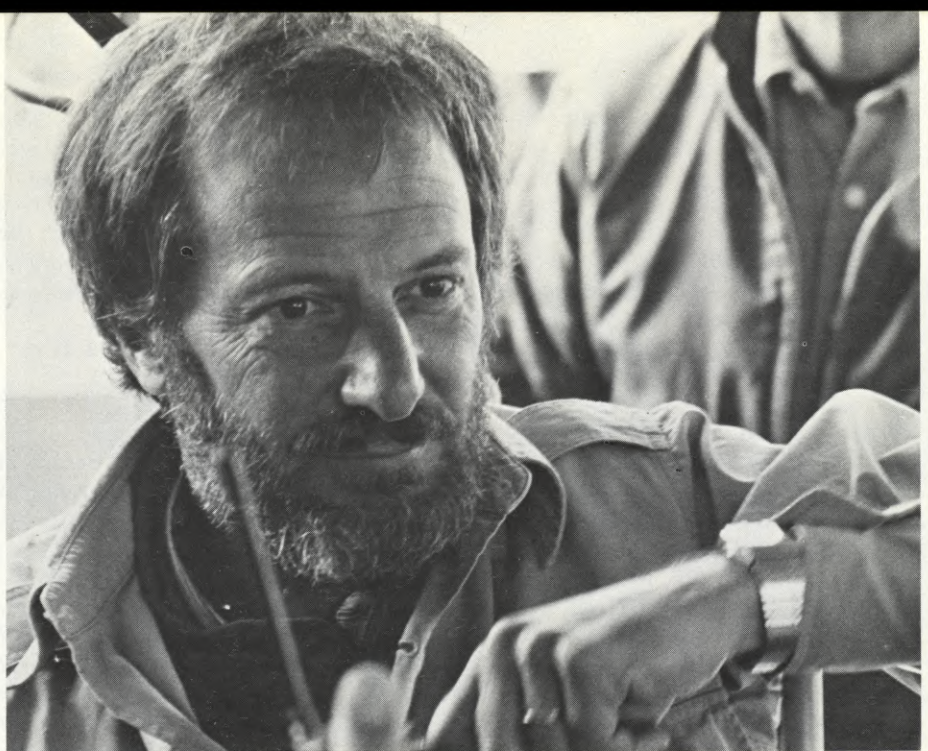
In the following interview for *American Cinematographer*, Goldstone discusses some of the facets of his direction of "ROLLERCOASTER":

QUESTION: Can you tell me what special problems you may have had in directing a picture as unique as "ROLLERCOASTER"?

GOLDSTONE: Every picture, big or small, has its own specific problems. The major problems in "ROLLERCOASTER", as in any large-scale production, were those relating to logistics. That's the norm for a picture that has thousands of extras and a lot of principals. But the main problem, for me, was not logistical. From an aesthetic point of view, it was one of creating believability for a tension thriller-kind of melodrama going on against a background of amusement parks. The challenge was to play the two against each other and keep them looking very real.

QUESTION: You shot in three actual amusement parks. How did you manage to control the people who were actually visiting those parks?

GOLDSTONE: We had to shoot in the amusement parks when they were not open, because you could hardly stage chase and suspense scenes in parks where people have paid their \$6 and bought other tickets to go on rides. So, since the people were hired, there was the problem of getting them to look real from the camera point of view, while emphasizing what the central element of the scene was — be it tension or melodrama or action or explosions or



James Goldstone, Director of "ROLLERCOASTER", faced the challenge of manipulating the audience with technical and dramatic devices in order to achieve a (hopefully) Hitchcockian level of excitement and suspense — but without calling attention to any of the devices to the extent that they might become self-conscious or obtrusive.

what-have-you — in order to counterbalance all that with the joy and fun and color of people having a marvelous time in a place where they pay to spend their time and have thrills. I think my major goal was to create a sense of verisimilitude, of reality, because it's only when you believe the people and the circumstances that you get carried along with the story. If, indeed, your audience doesn't believe the people, the places or the circumstances at any given time, you're dead. The Director of Photography, David Walsh, who is an old friend, was equally concerned about those very things, as were the sound people and everybody else on the crew. We were using Sensurround in a way that it had never been used before — to achieve a sense of reality, rather than to go beyond reality. All sights were on the same target, that of making a Hitchcockian-kind of thriller work in a very realistic setting of fun and joy, counterpointed against tension and melodrama.

QUESTION: What would you say was your most demanding technical challenge?

GOLDSTONE: That of creating an illusion of speed and participation in a ride. I've had a lot of experience in creating a sense of speed for an audience in a theater. I did a picture called "WINNING" which involved speeds up to 180 miles an hour, with Paul Newman driving a race car. But in this case, the thrill was to come from the speed of going up and down hills on a roller-

coaster. Rollercoasters are a theatrical form of entertainment, with the thrill based as much on anticipation as on the experience itself. If the rollercoaster looks terribly dangerous and thrilling, then you get hyped up for it, and when you get on it you enjoy it more. If it looks placid and calm, or you can't watch the other people screaming their heads off, you're not set up right; you're not thrilled. We had the challenge of creating the illusion of speed and participation, while telling a dramatic story. It wasn't "THIS IS CINERAMA" where all you did was give the audience a thrill ride. We put cameras in just about every imaginable position on the three rollercoasters that we shot. We mounted a camera in the struts of a helicopter and had Jim Gavin, the best helicopter pilot in America, fly it along the tracks, right where the helicopter would be, so that he could fly off the end and do a 180-degree turn and look back at it.

QUESTION: Can you tell me about the rollercoaster crash that occurs in the film?

GOLDSTONE: There is one crash in it and intricate mechanics were required in order to create the illusion that a car goes off the tracks because of a broken rail and crashes into a park full of hundreds of people having a marvelous time on a warm night. It was especially trying because we shot it in Virginia during a series of very cold nights. Rather than undercranking the action of the crash in order to create an effect

of greater speed, I chose to overcrank it slightly — 28 frames instead of 24 frames — so that you could see things happen that you wouldn't see at normal speed. That's taking a gamble when you can shoot it only once, but it worked out. I had made a decision early in the preparation of the film that I was going to do everything within my power — and the powers of those working with me — not to use matte shots or miniatures, not to trick it, but really do it. Indeed, there is not one matte shot in the picture — nor is there any trick shot where we started something and ran the film backwards, or anything of the kind. In some of the cars in the crash sequence there were dummies intermixed with the stunt people — true — but we shot every scene in this picture.

QUESTION: Some might call this "purity for the sake of purity". Do you think it's wrong, in principle, to use matte shots and miniatures in order to gain a realistic effect?

GOLDSTONE: There is a tremendous difference, even if an audience doesn't know technically that one thing is real and another thing isn't real. In many, many pictures, in my opinion, it becomes quite obvious that they were using miniatures and mattes and things. In "ROLLERCOASTER", especially since the crash is not the climax, but comes at the opening of the film, it's very important that the audience

believe that they are seeing something that is really happening — and, indeed, that is the case. There are some dummies in the cars, but there are also real stuntmen and extras and actors on the ground that it hit amongst. Hopefully, it's a thrillingly terrifying experience, although this is not a violent film. It's a cat-and-mouse thriller, not a blood-and-guts thriller.

QUESTION: Can you tell me about the collaboration between the Director of Photography and yourself in arriving at a visual style for the film?

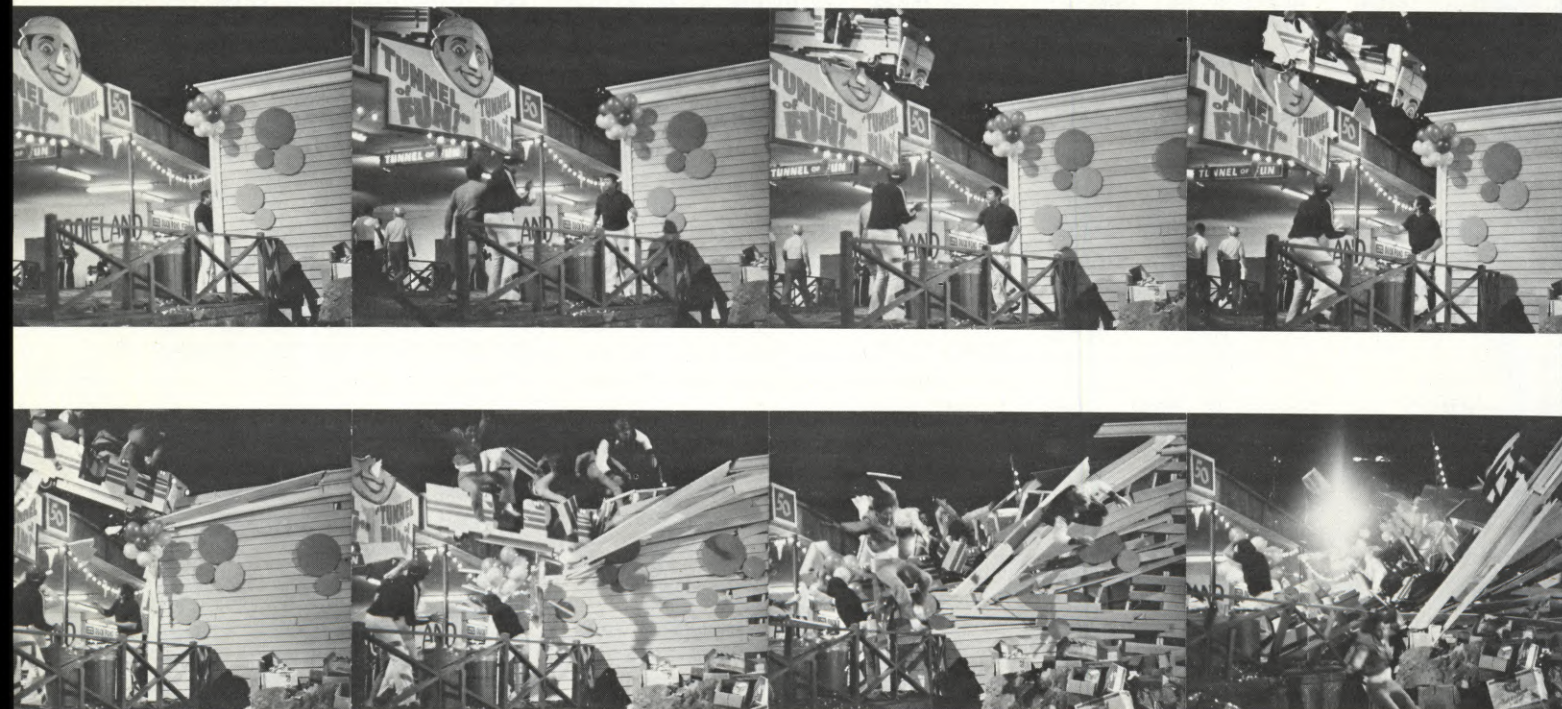
GOLDSTONE: From the point when we first held discussions on the project, David Walsh and I worked to arrive at an aesthetic look that would vary with the different sections of the film. The opening sequence, which takes place under credits, is supposed to be happening very early in the morning on the West coast — but since we were actually filming on the East coast, we had to shoot that sequence late in the afternoon (so the sun would come up on the right side of the world). We were shooting in Panavision anamorphic and we tested many filters to get the feeling of early morning, when we were actually shooting in late afternoon. In the amusement park sequences we elected to go with the heaviest infusion of color imaginable, but Nature didn't do us any good there. Out of 21 shooting days, 14 of them were cloudy or threatening rain. Davie shot with all

different kinds of things, trying to get color into it. He's marvelously knowledgeable and came up with something resembling a silk purse, I think, considering the weather.

QUESTION: The last sequence certainly has a different look from the rest of the picture. I assume you planned it that way.

GOLDSTONE: Yes, the last sequence takes place at Magic Mountain, which is an ultra-modern park centered around the Great American Revolution rollercoaster (steel painted white). We did a lot of testing of silks and filters to get a kind of glare, to get the feeling you have on a hot summer day when you have to squint. It had to be just the right thing, because I didn't want it to look like we were shooting through a lot of silks and filters. I just wanted it to be different from the opening park and the middle park, where the glare comes from bright lightbulbs on camera. Davie Walsh is the kind of cameraman I love to work with because there is a marvelous creative interaction there. In my opinion, the director is responsible for where the camera is and how the shots are set up, but I was open to any kind of suggestion on other ways of doing something and Davie was keyed in on the same wave-length, because we had spent a good deal of time going through the script, scouting locations and special applications of the equipment. **Continued on Page 620**

Sequential photographs of the horrendous crash of a derailed rollercoaster car, which takes place in the opening sequence of the film, and sets off a cat-and-mouse pursuit of the cold-blooded extortionist responsible. The building shown being destroyed by the hurtling car was built of balsa wood. Some dummies were used in the cars, but two of the stuntmen involved were injured in the crash.





Director of Photography David Walsh (extreme left) observes, as Director James Goldstone (right) blocks the action for a scene. Goldstone speaks of the "marvelous creative interaction" of their working relationship. They were on the same wave length because of extensive time spent going over the script, scouting locations and discussing special applications of the equipment.



(RIGHT) Leslie Goldman, Director of Photography for the documentary film made of the shooting of "ROLLERCOASTER", is shown disguised as a tourist, complete with beanie hat and overstuffed teddy bear. Thus camouflaged, he was able to shoot his Canon Scoopic camera right in the middle of an actual scene for the film. Director Goldstone cooperated fully in aiding the documentary crew. (See story on Page 600.)

(LEFT) In a slight change from rollercoasters, a camera and lights are rigged onto the hood of a car. (CENTER) Preparing to film a sequence aboard the famed "Rebel Yell" twin-racing rollercoaster at Kings Dominion Amusement Park near Richmond, Virginia. (RIGHT) Multiple cameras are rigged to car of renamed "Rocket" rollercoaster at Ocean View Amusement Park. During the course of filming, cameras were mounted in every possible position on the cars.



(LEFT) The "Rebel Yell" twin-racing rollercoaster at Kings Dominion Park, with its undulating dips and curves, provided the backdrop for an exciting sequence in "ROLLERCOASTER". (CENTER) Multiple cameras are set up to shoot the rollercoaster crash sequence, by its very nature a "One Take" situation. (RIGHT) Cinematographer Walsh (center) observes action during a rehearsal.



RECORDING "ROLLERCOASTER" SOUND IN

SENSURROUND®

A new and vastly more dramatic approach to recording this sensationally unique type of low-frequency sound that shakes the marrow in your bones

By **ROBERT LEONARD**

Sound Engineer, MCA/Universal

The first feature to utilize *Sensurround* was "EARTHQUAKE" and the second was "MIDWAY". At that time we did a fairly extensive modification of the *Sensurround* system in that we changed our control system so that we could have the transducers that are up in front of the screen operating, and/or the ones at the rear of the theater — but separately from each other. This made possible a front-only *Sensurround*.

This was quite important to us, because there were times, during dialogue sequences, when we wanted to have the *Sensurround* running, but did not want to have dialogue coming from the rear of the theater, because that is quite distracting. So we modified the equipment to maintain the perspective of sound at the front of the theater. At the same time, we incorporated a noise reduction system as part of the *Sensurround* equipment. All of the prints of "MIDWAY" and "ROLLERCOASTER" include the noise reduction system, which gives us a much larger dynamic range on the print.

For "EARTHQUAKE" we had a noise generator which was part of our control electronics in the theater, and that noise generator produced the large rumbling sound of the earthquake. At the time, that was the only way we could get a much louder sound than we required, but now we are able, on the optical track itself, to combine the normal sound track, the control frequencies (to control the frequent turning on and off of the *Sensurround*) and also have a dynamic range that allows us to put additional signals on which comprise the sound track that you hear, but expanded signals when played back, and many times louder than the normal sound track.

We've increased our headroom (or our added loudness) by about 20 dB and, at the same time, we've picked up about 15 to 20 dB margin to our noise floor, so that our track is much quieter. In both "MIDWAY" and "ROLLERCOASTER" there are some portions where, for an optical track, it's very, very quiet. Another good aspect of using this noise reduction system is

that we are less bothered by scratches and film abrasions that occur on release prints. We don't hear as many of the scratches and ticks of the kind you usually hear on an optical sound track. As a result of that, we have been able to remove the traditional Academy Roll-off Filter (dating from the Research Council days), which is used as a standard roll-off on all optical reproduction systems. As a result, we've increased the frequency range of these optical tracks, producing an optical track that sounds more like a magnetic recording. We have a much better high-frequency response. Those are really the major improvements that we have made in the *Sensurround* system, from the technical standpoint.

All noise reduction devices work on what is basically a compression-expansion system. The tracks are compressed to a degree when recorded and, on playback, they are expanded. We tried the Dolby system, which is a very fine system which we use on certain music scoring sessions and that sort of thing, but for this particular application, the dbx system was found to be excellent. It gave us nearly a doubling effect of our dynamic range, so that instead of having the typical 45 to 50 dB dynamic range (which you have on an optical track, if it is really a good one), we wind up with about 65 to 80 dB — a considerable improvement.

We dub the picture in a normal fashion and wind up with a 3-strip magnetic track that includes sound effects, dialogue and music. That's a very normal sound track of the type that we can use to make a normal optical track for a release print that is destined for non-*Sensurround* exhibition. When we make the *Sensurround* version, we reduce the level; we treat the mixed track with the dbx encoding process and then we add back onto that optical track certain effects — for instance, in "MIDWAY", the gun blasts — or, in "ROLLERCOASTER", the rumbles — and these effects are not treated with the dbx compression system which you would normally use in recording.

What happens when you play back

this track is that the normal sound track is expanded by a ratio of 2-to-1 to give you its normal dynamic feeling and range. Then, of course, when something comes along that has not been compressed and is normal, it also gets expanded to being twice as loud — so you get a sort of doubling-up, a double expansion of those things that you want to be really loud.

From the beginning of *Sensurround* we realized that we had to reproduce very low frequencies, and for "EARTHQUAKE" we were generating these frequencies electronically within the theater, so it was no problem. But when we decided that we wanted to do the whole thing on the optical sound track, we had to do some extra research into optical sound tracks in order to find out how low a frequency we could put on.

We found out that, fortunately, an optical sound track can go down to very low frequencies — sometimes 10 Hz and below. We only wanted to go down to 17 Hz, which was our design point, so we were in the clear.

In dubbing the picture we wanted to be able to use magnetic media, of course, which is normal, so we had to do extensive modification on one of our three-track recorders, on some of our reproducers and on our mixing console to give us a magnetic channel that would be flat from 17 Hz up to our usual 12,000 Hz upper limit. So we had special heads built for the magnetic recorders and we put in special amplifiers, and I did quite a bit of work in that area, so that we would have the capability of a very wide frequency range magnetic recording in our dubbing room.

On "ROLLERCOASTER" it was decided to try to capture some extra low frequencies and we made tests accordingly. Just at that time a representative from Electro-Voice stopped by to show us some new products. I mentioned to him some of the problems we were having with microphones in trying to get low-frequency sounds for *Sensurround*. He said, "I've got something here that, if we were making it, would

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MIXING "ROLLERCOASTER" SOUND FOR **SENSURROUND**®

A revised technique which, for the first time, makes it possible to mix music, high-pitched screams and low-pitched rumbles on an optical track

By **ROBERT L. HOYT**

Re-recording Supervisor, MCA/Universal

There were some monumental problems in regard to the sound for "ROLLERCOASTER". To begin with, it marked the first time that we put music into *Sensurround* and Lalo Schiffrin had to compose his music so that it would be compatible with the *Sensurround* equipment — which is like writing in a restricted frequency range.

Also, for the first time, we put some high frequencies into the system. It was the first time that there was as much definition to the sound effects.

The company took two sound crews on location — one to record the production dialogue, and the other to record sound effects of rollercoasters and other rides in the various parks. They recorded them flat and also with the *Sensurround* type of curve to them, so that they would have the bottom end that is required to reproduce effects in the *Sensurround* mode.

Then, in the dubbing, there are limitations as to how much volume level you can put on the sound track because of the amplifiers and speaker systems in the theaters. This does become quite delicate, because you can blow those amplifiers and speaker systems out. A very delicate balance was required between the sound effects of the rollercoaster made in *Sensurround* and the music that was recorded for *Sensurround*. By the time you get into a job like that, your head is absolutely spinning because of all the elements involved that you have to try to keep in balance.

Each ride in an amusement park sounds different from the others and there are many problems in trying to put them together to sound real and have individual definition.

In the past — in pictures like "EARTHQUAKE" and "MIDWAY" — the *Sensurround* was more like just a rumble, but in "ROLLERCOASTER" it has music in it, plus the rollercoaster effect, plus the screams of the people — and it's all on a single composite optical track.

"ROLLERCOASTER" is being sent out with two types of sound tracks, each with a different balance. One is

monaural and the other is for *Sensurround*. We make the monaural version first, to be used for drive-ins and all the other theaters that are not equipped with *Sensurround*. Then we take the monaural dub and put up with it for mixing the *Sensurround* units, what we call the "*Sensurround* box" (the device that makes the rumble effect) and, in this particular case, the music tracks. Then we make the *Sensurround* dub. Basically, we dub it in monaural and then update it to *Sensurround*. That's the way we get our *Sensurround* version of it.

We take our monaural and put it on a three-track magnetic. On Channel One we put all the *Sensurround* music, the rumble and the sound effects. On Channel Two we put the entire program. On Channel Three we put the control track — which is what triggers the *Sensurround*.

That was our part of it. Bob Leonard had to cope with the rather complex engineering feat of putting all that onto an optical track. This was the first time that it was ever done that way.

The high-frequency effects in *Sensurround* add a totally new dimension. They come out of both the front and rear *Sensurround* speakers in the theaters so that the effect is more like quadraphonic sound than stereo. The low frequencies are what really shake the chairs, while the high frequencies are for yells, screams and creating dramatic tension. The new method we use of setting up the channels for dubbing makes it possible to raise or lower effects against the *Sensurround*. For example, when a rumble is coming, the music or screams can be raised in with the *Sensurround* to heighten the dramatic effect.

We tried certain *Sensurround* effects that worked very well, but were later cut out of the picture for other reasons. For example, let's take the shooting gallery sequence in Ocean View Park. When George Segal was shown shooting at the ducks, we had the *Sensurround* coming from the front speaker, but when the angle was reversed to show

only the ducks, we brought the *Sensurround* in from the rear speaker. We did have the capability of changing from front to rear speakers, which was really neat and effective — like the quadraphonic sound used in "TOMMY".

But sometimes the question arose as to whether it was more dramatic to have the sound come out of all four horns, rather than jarring the public back and forth between the front and rear speakers. From the artistic standpoint, going from front to back worked very well, but it seemed a bit jolting because it became disconnected for the audience, so we put it on all four horns eventually. However, we did prove the capability of cutting from the front speaker to the back speaker and vice versa. I think it's a super device.

In "ROLLERCOASTER" there were six reels that involved *Sensurround* — probably 13 minutes in all, out of a total running time of two hours, but those six reels took an incredible amount of time to mix. I would say that building the sound effects for those six reels and dubbing them for *Sensurround* took three times longer than it took to do dub them monaurally.

There are some really unique problems involved. For example, an abrupt cutaway from a *Sensurround* to a non-*Sensurround* scene is not just a matter of making a cut. There are many things to think about, because the effect "hangs over" and you've got to anticipate that hangover. Also, the effect of the *Sensurround* as it is perceived in the dubbing studio may be quite different from what it will be like in a theater. Some theaters are larger, which means that the *Sensurround* effect will hang on longer. It becomes an acoustic, rather than an electronic problem — with the sound "swimming" in the room. That's the problem we had with what should have been one simple cut. We were trying to anticipate what it would be like in the theater — and it had to be cut precisely to the frame. That one "simple" cut required two hours to get right. Preparing to dub *Sensurround* takes a
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THE PHOTOGRAPHY OF ROLLERCOASTER

Lighting vast amusement parks for night shooting, and mounting cameras on wildly careening cars of rollercoasters made for a challenging assignment

By **DAVID WALSH**
Director of Photography

When we first started scouting locations for "ROLLERCOASTER", we went down to San Diego to look at an old park on the Bay and make some extensive tests. The problem was that it was a very old park and virtually all the lighting had been replaced with

fluorescents, so that when you looked down that long midway it looked like a dark, old street — nothing more. At either end of the street were some rides that gave it a bit of life, but very little.

At any rate, we went down there mainly to try the rollercoaster, be-

cause we knew we were going to have some formidable problems in attaching cameras to it for the thrilling shots we hoped to get. We took some people with us who were experts at building such mounts and we attached the cameras. Then, to make sure we were



(LEFT) Framed by the 360-degree loop of the spectacular Great American Revolution rollercoaster at Magic Mountain Park in California, the crew sets up for a low-angle shot. (CENTER) Aerial cameraman readies his gear slung underneath a helicopter. (RIGHT) The helicopter soars aloft, with the cameraman lying flat on the horizontal platform beneath it. This unusual configuration was used to follow a rollercoaster car at close range during its run.



(LEFT) A camera is securely mounted to the back of a rollercoaster car. (CENTER) Front-mounted camera is positioned to record expressions of thrill-seekers as they ride the rollercoaster. (RIGHT) Director James Goldstone briefs rollercoaster riders prior to a run. (BELOW LEFT) Camera is set up on rollercoaster tracks at Ocean View Amusement Park to film loading a car. (CENTER) The ultra-modern geometry of the Magic Mountain rollercoaster made for interesting camera angles. (RIGHT) Cameras are mounted on pylon of aerial tramway to film actors in cars.





(LEFT) A night view of the ferris wheel and midway of 76-year-old Ocean View Amusement Park in Norfolk, Virginia. Production Designer Henry Bumstead and his crew completely revamped the park's lighting to make it visually more exciting. They also added lights to the cars of the rollercoaster (renamed "The Rocket") so that they could be seen at night. (RIGHT) In film's opening sequence, derailed rollercoaster car demolishes a balsa wood building. Two stuntmen were seriously injured in the all-too-realistic crash.



(LEFT) A panoramic view of Kings Dominion Amusement Park near Richmond, Virginia. The famous "Rebel Yell" twin-racing rollercoaster can be seen in the background. (ABOVE) Director James Goldstone checks a camera angle during filming at Magic Mountain. (BELOW RIGHT) Director of Photography David Walsh gives instructions to operator of the STEADICAM, Cinema Products' self-stabilizing camera rig, which was used extensively during the filming of "ROLLERCOASTER". It proved especially flexible for following actors through crowds in amusement parks.

safe, we sent the thing around with just the mount on it and a sort of template of a camera attached to it. We wanted to make sure it would clear all the places we had measured and, indeed, it did. So then we attached the real camera and put people in the rollercoaster and set it off. In this particular instance, I happened to be planted halfway up the ride, watching the mount, and I saw the car go down one drop with the camera totally intact. But as it came out of the drop, I noticed that there was no camera. What had happened was that this wobbly old vehicle, which had been built in the early 1900's, had a lot of play in it, which hadn't been taken into consideration. The camera had hit one of the superstructures by maybe 1/8th of an inch and had split the magazine

right off. Luckily, it flew through the air and wound up in the lap of one of the assistant directors — lightly. It was just as if it had been "presented" to him. But that did teach us an important point — namely, that you can't be too careful on a thing like that. You really have to take extreme precautions to make sure there is no sway involved, and one ride won't do it. So from then on, during production, we never had anything like that happen.

On one of our surveys we went to Norfolk, Virginia, where there was an amusement park that had great potential and where we eventually did some filming. It, also, was an old park, built at the turn of the century, as was the rollercoaster. Our marvelous Pro-

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ALONG FOR THE RIDE

By **LESLIE GOLDMAN**

Documentary Director of Photography

"Welcome to Norfolk," the cheery voice sings out from somewhere in the night above me. It is James Goldstone, director of *ROLLERCOASTER*. He and his camera crew are at the topmost curve of the rickety rollercoaster in Ocean View Amusement Park in Norfolk, Virginia. About a hundred feet above ground, they are shooting the detonation of the explosive charge that will break the track and send the train and its riders hurtling off the structure to the amusement park below.

I am there with Universal's Bob Faber to film a documentary of the production which will be run on television to promote the picture. Only a short time before we have arrived on the set, which is one of three amusement parks in which the story unfolds, to size up the location and to plan our coverage.

Faber decides that the scene being shot is essential — it will pay off in the series of crashes we are to get later. I am perched on the steeply pitched roof that covers the area where the riders board and am below the shooting crew. The footing is bad but I manage to frame the crew and the scene they are shooting. I roll as Goldstone calls "Action!" The charge misfires. It flashes down out of his planned shot, but well within my finder. I have the crew outlined against the amusement park lights and rim-lit by the scene lighting.

The director calls for another take and he calls down to me that there's a good angle for me somewhere in the dark behind him. While the charge is being re-set I find my way up the steep track, up a 60-degree cleated incline. Though the shaky structure has been newly reinforced, the footing is worse than before. I am grateful that the Canon Scoopic camera I am using permits one-handed shooting and does not require spring winding. I get close-up details of the charge being placed by special effects, of the orange flash of the blast on the track and a pullback to establish the crew and the midway below. Faber now has a sequence he can cut with overlapping action; hopefully, it will be an audience grabber.

Documenting the shooting of a feature film can be a frustrating and unrewarding chore. Budget and production limitations restrict coverage to what may be superficial at best and downright dull at worst. Usual "promos" will include sequences framing the shooting of a scene with

production crew, equipment, lights, camera, etc., plus an interview with director and/or star. The soundtrack of this interview may also be used as voice-over for intercuts lifted from the feature footage.

You are normally obliged to shoot from well back, so as not to interfere with the filming of the feature. If you fall within the sight-line of the director or an edgy actor, you risk breaking the concentration of either or both of them and will be ordered back by the assistant director. If, in your zeal, you wander into a scene and ruin the take, you will have committed the unpardonable and will probably be invited to leave — permanently.

It is nearly impossible to get exciting action footage under such restrictions and, as a consequence, it is not surprising that many production features are little more than elongated trailers.

Filming the shooting of *ROLLERCOASTER* proves not to be burdened by these unhappy but all-too-usual restrictions. For one thing, we are working for Universal, the same production company that is footing the nine-million-dollar bill for the picture, and are cordially treated. We are members of the production crew, not interlopers. Bob Faber, who directs the documentary filming and will later supervise the completion, is a veteran of many such projects. He has a sharp narrative sense and a diabolical ingenuity for making tough shots that will satisfy it. Since the shooting of this kind of documentary cannot be easily scripted in advance, Faber has worked out a theme and adapts — as we shoot — to the difficulties encountered and the opportunities afforded as we work in and around the sets of a major motion picture.

ROLLERCOASTER's director, James Goldstone (*WINNING, RED SKY AT MORNING, SWASHBUCKLER*) is self-possessed. He is in full command of a complex and demanding production; yet, he also has continuing interest in the progress of the documentary. He readily agrees to wear a wireless mike so that much of our shooting can be lip-sync. We are encouraged to move freely about the set and to shoot almost without limitation. During rehearsals, we are able to get reverse angles from within the scene, withdrawing rapidly and discreetly during takes. Indeed,

For the crew shooting the documentary film, the behind-the-scenes of the making of "*ROLLERCOASTER*" was almost as exciting as the main action

when the director feels it important, we shoot from within the scene during takes! In one instance, where I am in the field of the production cameras, I am "costumed" in a beach hat and, carrying a stuffed bear, appear as one more midway merrymaker while I shoot. In other scenes, during which extras scramble when the rollercoaster crashes among them, Goldstone hides me behind a pillar so that I can get more interesting angles.

When you are shooting to a script, you get a chance for a breather between takes and set-ups. Not so on this kind of job. It's more like a continually breaking news story. When the director calls "Cut!" We have to be ready to move in for coverage of his preparations for the *next* set-up.

When covering Goldstone shooting a scene we must constantly fight against experience and instinct and resist the temptation to frame only for what the *production* cameras see. Any such material that is needed in editing can be pulled from the theatrical footage later. Instead, our shots have to convey a sense of time and place by being framed to include elements of production people and equipment.

Goldstone paints a picture of sudden panic in a crowded amusement park in bold exciting strokes. He moves horrified masses of humanity before his cameras in the stunning spectacular manner of a De Mille (happily absent is the late master's legendary lash!)

Director of Photography David Walsh (*SILVER STREAK, W. C. FIELDS AND ME, MURDER BY DEATH, THE SUNSHINE BOYS*) lights the broad expanses of action with an uncanny eye and unsurpassed technical skill. He maintains space and separation in a way that imparts a feeling of reality. Certain unrepeatable scenes must be shot from as many as four different angles simultaneously; yet, there is no compromise in pictorial quality of any of them. Walsh is able to maintain a consistent look in his work on film that is reminiscent of the best of Edward Hopper on canvas.

Much of our coverage is necessarily done on the fly, often without the chance for a meter reading. This presents no serious problem because of Walsh's consistency and he is always accessible to clue us in on his light levels. He sets a high standard for himself; we try to live up to it. None of

our footage is to be processed until we "wrap," and shooting in this fashion, without seeing rushes, can be unsettling — especially since we are working with rental equipment on which we have had no opportunity to run any film tests. We are using the sixteen-millimeter version of the same Eastman Color Negative stock used in the production cameras and gain some reassurance when we view Walsh's dailies.

Because much of our shooting has to be done off-stage, with light from the practicals and some spill from the scene lights, there is often not a high enough light level to allow shooting without substantial underexposure. I elect, then, to re-rate the film one stop, requesting appropriate forced development. While this treatment is not required for all our photography, we nonetheless push *all* our film, since it would be too easy to mislabel a can and lose a crucial sequence. We gain useful extra depth-of-field, in the full light, as we lose precious exposure latitude. We pay for this in constant attention to lighting ratio and exposure.

With generous assists from Gaffer Norman Harris and Unit Production Manager Wally Worsley, we are able to maintain a uniform pictorial quality in the material we shoot away from the live sets. In this way Faber gets the footage he needs to round out his documentary. For example, Stunt Coordinator John Daheim describes for us in detail the manner in which he plans and choreographs the placement and reactions of his stunt crew. He is in the gazebo office in the center of the park. He is lit "night for night," balanced so that the rides and lights in the background will still read. Daheim explains how they will convey frightening danger and his concern with minimizing the risk of *real* injury to his people. This will tie in with later sequences where we move about with Daheim and the director in the intended impact area on the midway. We see how they stage the scene, picking up their dialog with the mike on Goldstone and witness the realization of the scene, as it evolves in detail, from rehearsal to "print it."

Unlike newsfilm where reasonable focus and exposure are sufficient, Faber properly insists that shots be composed with aesthetics and continuity in mind.

One sequence we do has the director, who wears a bright red parka in defense against the icy ocean wind, staging the shocked panic reaction of the people in the amusement park when the sabotaged rollercoaster crashes in their midst. In order for the

actors to register real shock and surprise, Goldstone uses a massive revolver for cueing the action. We frame him holding the gun foreground and push in for the stunned reaction, getting a shot that effectively tells our expected audience how this director works and conveys some of the excitement of the movie he is making.

A major technical problem in shooting the production history of a feature film on a busy set is the extreme disparity between the actual scene lighting and the lighting of the off-camera action related to it. This brightness range is well beyond what can be registered on the rawstocks presently available. Sometimes you can open up the shadows with a portable fill light. But you can't fill during a take, and it's distracting to a lot of people if you barge in and out of the production with the fill light *between* takes.

The physical size of the location and the working styles of the picture's director and Director of Photography work for us in solving the lighting contrast problem. Ocean View covers some twelve acres of beachfront on the Atlantic near Norfolk and was picked by Goldstone from among fifty such parks he visited, around the country, during preparation for the movie. In the segment shot here, twenty-four people "die" when the old-fashioned rollercoaster they ride is sabotaged. All twelve acres of Ocean View become Goldstone's set, since the sabotaged coaster cars and their occupants fly off in different directions. The park has been refurbished to the way it must

have looked in the Thirties. New construction, required by the story, has been artfully integrated with the old by the scenic crew. Some nine thousand lights that garland the park's rides and attractions have been re-lamped.

Since the action takes place on a summer night, the amusement park has to be peopled with visitors. We include in our coverage a classic sequence in which assistant directors Andy Stone and David Sosna, in alternating relays, work with the background extras. Using a remarkable mixture of stand-up wit, movie lore and outright "con" in their patter, Stone and Sosna amuse, persuade and instruct these people in the way they are to perform on the set.

The two of them convince the extras of their genuine importance to the production and keep their enthusiasm fired up during the boring waits between set-ups. Later we will film the results of the training as the extras are put through their paces during the action.

Thorough preparation is the handle on any undertaking as complex and detailed as making movies. The way the shooting of *ROLLERCOASTER* goes in the difficult and dangerous scenes set in Norfolk demonstrates that "homework" has been done by all concerned with the production. Night exterior shooting and story present notable problems; wind and weather compound them. More often than not, shooting must be rescheduled; yet, the picture moves along as efficiently as if it

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Documentary cameraman lines up to shoot an off-stage scene of "ROLLERCOASTER" star George Segal between set-ups. The documentary crew is always at a disadvantage, because it must work around the shooting of the main unit, shoot from well back, never interfere with the filming of the feature and never, never wander into a scene and ruin the take — an unpardonable sin.



POLAROID INTRODUCES "INSTANT COLOR MOVIES"

By HERB A. LIGHTMAN

NEEDHAM, Massachusetts

The mysterious phone call had come from a public relations representative of the Polaroid Corporation, asking me to attend the company's Annual Meeting of Stockholders and prom-

ising that an announcement "of utmost importance" about a new photographic system would be made. The seductive (female) voice on the other end of the line would provide no further information regarding the nature

of the important announcement, but promised that it would be well worth my while to attend.

It would have to be well worth my while, in editorial terms, for me to travel all the way across the United States,



(LEFT) The genial, witty Dr. Edwin H. Land, Chairman of the Board and Director of Research of Polaroid Corporation, demonstrates Polavision, the company's new instant movies system, to members of the world Press at recent Annual Meeting of Stockholders in Needham, Mass. He holds the cassette in his right hand and the Polavision camera in his left. (RIGHT) Dr. Land inserts the exposed cassette into the Polavision processor/player, where it will automatically show itself 95 seconds later.



(LEFT) The Polavision camera is very lightweight and simple to operate, with two focus settings and automatic exposure control. Both camera and player are manufactured for Polaroid by Eumig. (RIGHT) Dr. Robert Doyle, President of Super8 Sound, beams happily as he tries the new camera. (BELOW LEFT) A mime goes through his act for stockholders at the meeting. (RIGHT) Film of the mime is shown on the player. (NOTE: The image on the screen appears a bit washed out, but this is due solely to slight overexposure of the still photograph. Polavision colors, when viewed on the player, are actually exceptionally rich.)



from Los Angeles to a suburb of Boston, in order to attend a four-hour meeting, but I had a gut feeling as to the nature of the information to be disclosed.

For the past several years it has been rumored that Polaroid has been working on a system for producing "instant color movies" — a seemingly impossible dream, but not all that far-fetched when one considers the miracle of the same company's "instant still color photograph" system. My lumbago tells me that the moment for the announcement of instant movies has arrived, and it is spurred on by that thought that I board the plane in Los Angeles to wing my way diagonally across the American continent.

Arriving at the Technology Square headquarters of Polaroid in Cambridge, I am impressed to find myself in the company of a hundred-or-so members of the elite world Press. Included are representatives of such general-interest news journals as *Time*, all the major news services, and prestigious publications from as far away as Japan and Australia. There are also in attendance several completely equipped remote television crews. The news has to be big, I tell myself, in order to draw these pillars of printed and electronic journalism from the four corners of the earth.

Although no one claims to be absolutely sure about it, several of the more vocal correspondents share my supposition that the announcement to be made will refer to Polaroid's long-rumored instant color movies system.

We are transported to Polaroid's Service Center building in Needham and ushered into the large, well-equipped Press facility which has been set up.

Some objects, tantalizingly covered with a blue cloth, are lying on a table up front, but the mystery is promptly dispelled after Polaroid President William J. McCune, Jr., introduces Dr. Edwin H. Land, Chairman of the Board and Director of Research.



The three components of the new Polavision instant color movies system previewed to the world Press and 3,800 Polaroid shareholders in Needham, Mass. on April 26, 1977. Shown here are the Polavision camera, film cassette and player. This deceptively simple looking hardware is actually evidence of a stunning technological breakthrough — namely, color movies ready for screening a minute-and-a-half after having been exposed.

"I would like to introduce to you a new field in science, art and industry — called Polavision," says the affable and witty Dr. Land, whisking away the blue cloth.

There on the table are three items: a small amateur-type movie camera, what appears to be a film cartridge or cassette and an apparatus that closely resembles a portable television receiver with a 12-inch (diagonal) screen. Dr. Land explains that these are the components of the process for producing "immediately visible living images", which Polaroid has been in the process of perfecting over the past eight years. In other words, *instant color movies!*

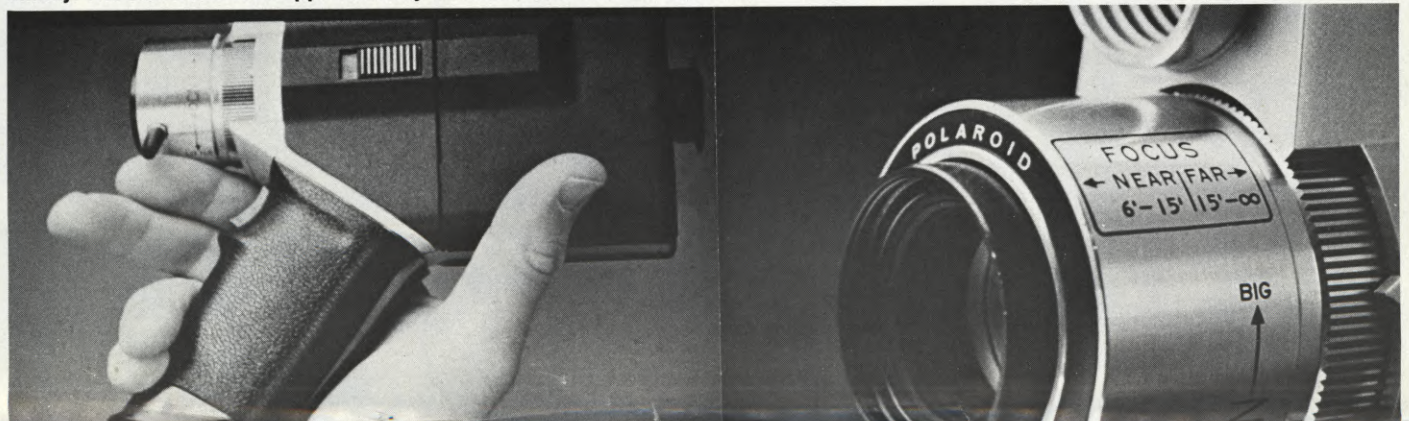
He explains how the system works. You simply slip the cassette into the camera, expose the film, take the cassette out of the camera and pop it into a slot in the top of the TV-like player. After 95 seconds of whirring sound

(during which, we are told, the film is being simultaneously rewound and processed), the player turns on its light and begins to show the finished product — in gorgeous color.

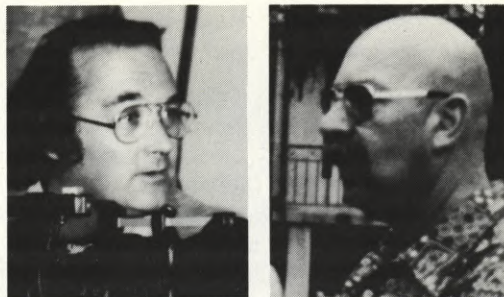
The *blasé* members of the Press are stunned by what is obviously a technological blockbuster — a truly revolutionary scientific breakthrough. Dr. Land explains briefly how the system works. The film itself does everything, he says. Programmed information on the film's edge triggers all the signals within the cassette to control the operation of its components. The cassette is, among other things, a miniature film processing laboratory that releases and precisely controls a small amount of liquid reagent that develops the film. This is done in the space of a minute-and-a-half, and totally within the cassette, which leads one to wonder why all those complicated machines with

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(LEFT) In order to activate the taking mechanism of the Polavision camera, it is necessary to depress two levers, one on either side of the pistol-grip handle. (RIGHT) The camera is equipped with a $f/1.8$ lens having a 2-to-1 zoom ratio. The zoom is operated manually by means of a lever on the mount. Featured also is built-in exposure control and two generalized focus settings — one for 6 to 15 feet, the other for 15 feet to infinity. The camera will run approximately 50 cassettes on four AA batteries.







(Left) Steve Lerner, Director of Photography.
(Right) Lee Heckler, A.S.L.D., Lighting Director.

To light for darkness and despair...

The "hold" set of "Roots," built to recreate exactly the cramped, desperate atmosphere of a slave ship, presented some very tough lighting problems.

Steve Lerner, the Director of Photography, explains how he and his Lighting Director solved some of these problems. "We had skylight coming down through the hatches from above. We also needed the feel of lantern light in the hold. By filtering the lights with Rosco MT2 and ½ MT2 we got just the effect we wanted. As a matter of fact, I used Rosco materials exclusively on 'Roots' and I feel that they really contributed to the good looks."

Lee Heckler, A.S.L.D., Lighting Director on "Roots," goes on to say: "... In front of the 9-lights, I used what

I call the 50/50 Combo—50 Tough Frost and the regular Tough Blue 50—a very effective combination."

We're very proud, at Rosco, that our products were chosen to contribute to the success of an event as significant as "Roots." Our purpose is to offer the cinematographer such a complete line of lighting media that no matter what the problem, Rosco offers the right tool to provide the solution.

If you'd like to get complete information on all the products Rosco offers the cinematographer, just get in touch with us.

Bring us new problems, we'll bring you new products. That's how our entire line was born.

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A scene in the hold of the slaveship.

Steve Lerner, Director of Photography, Lee Heckler, A.S.L.D., Lighting Director.

AN AMERICAN FILM INSTITUTE SEMINAR WITH HASKELL WEXLER, ASC

The winner of this year's golden Oscar for "Best Cinematography" (and one other before that) discusses techniques, film stocks, photographic styles . . . and pantyhose

PART 1

As perhaps the most important aspect of education for the Fellows in training as film-makers, historians and critics at its Center for Advanced Film Studies, located in Beverly Hills, California, the American Film Institute sponsors conferences and seminars with top technicians and talent of the Hollywood film industry. These men and women, outstanding professionals in their respective arts and crafts of the Cinema, donate generously of their time and expertise in order to pass on to the potential cinema professionals of tomorrow the benefits of their vast and valuable experience.

In keeping with this tradition, Cameraman's Local 659 (IATSE) sponsors a continuing series of seminars with ace cinematographers. These men — both contemporary working Directors of Photography and some of the now-retired "greats" of the past — meet informally with the Fellows at *Greystone*, the magnificent estate which is the headquarters of the AFI

(West), to present valuable information on cinematographic techniques and answer questions posed to them. Very efficiently introducing and moderating each of the individual seminars is "Emmy" Award-winning Director of Photography Howard Schwartz, ASC.

Through a special arrangement with The American Film Institute and Local 659, *American Cinematographer* will, from time to time, publish excerpted transcripts from these seminars, so that readers of this publication may also receive the benefits of the information conveyed.

The dialogue which follows (the first segment of a two-part series) has been excerpted from the A.F.I. seminar featuring two-time Academy Award-winning cinematographer Haskell Wexler, ASC. The seminar followed a screening of *AMERICAN GRAFFITI*, on which he was Director of Photography:

QUESTION: I was wondering why you were credited as Visual Consultant and not Director of Photography on

AMERICAN GRAFFITI?

WEXLER: I chose to be credited that way. I sort of helped George Lucas get started in film. I used to race cars, and George was interested in car racing, and I met him there and encouraged him to go to film school. On AMERICAN GRAFFITI they had shot one or two nights, and George felt insecure — unjustifiably — about the direction as much as the filming of it. When he asked me, I told him I would come up and shoot the film for him, but it was to be his film. So I did; I was there except for the first two nights. He had two very competent newsreel guys who were working with him, and I think they could have made the film. Maybe it would not have looked the same way, but they would have done a good job. But he just didn't feel secure. I did help him some with the actors — mostly holding Richard Dreyfuss down from over-acting. You understand that the decision about credits was made before it was a big, successful hit picture. When it was finished we thought we had made another fast "B" picture. So I said, "George, just put me down as Visual Consultant." I didn't want to have anything on the screen that might take away from him, just because of our relationship. He said, "Fine," and then he gave me three-and-a-half percent of the picture — which I did not ask for — and he was very generous with everyone who worked on the film. He gave Verna Fields a new BMW. When the film started to make money he didn't forget the people who had helped him, and he was very generous.

HOWARD SCHWARTZ: That picture was shot in Techniscope, in case you weren't aware of it.

WEXLER: Yes, and everything in the picture was pushed one stop. For the night shooting, of course, it was imperative, but for the dawn sequences and so forth there was some question as to whether we should have, but in order to keep the same granularity, we decided to push that, as well.

QUESTION: Did you use the 5254 negative?

WEXLER: Yes, 5247 wasn't out yet.

Haskell Wexler, ASC, lines up Arriflex 35BL camera for a scene on the location for "BOUND FOR GLORY", the film biography of Woody Guthrie, for which he won this year's Academy Award for "Best Achievement in Cinematography". The Arri belongs to Wexler, since it has long been his preference to own much of his equipment and modify it to suit his individual requirements.



SCHWARTZ: Did you use any diffusion on the day stuff?

WEXLER: No, it was really a simple film technically. I mean, it was very, very simple.

QUESTION: I've heard that you used the Eclair a lot in the shooting of that film...

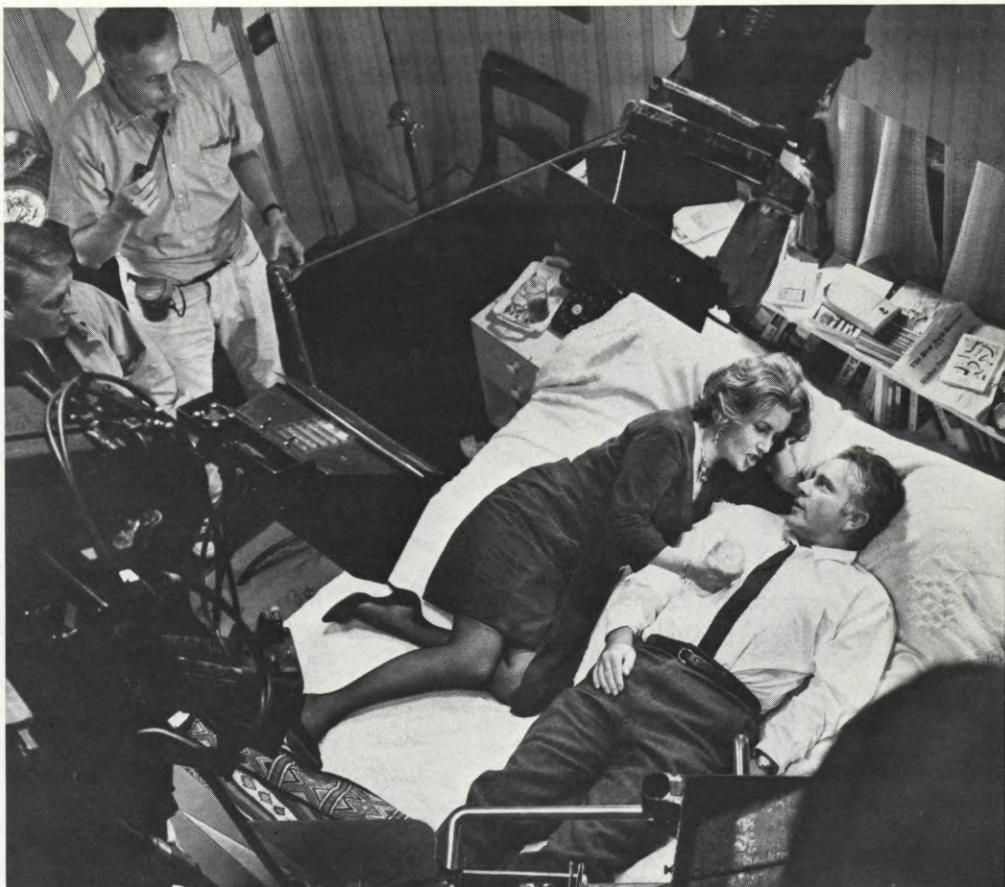
WEXLER: The whole picture was shot with Arriflexes and Eclair CM3s. For the sound sequences we used the Techniscope Arri with the Cine-60 blimp. A very lousy set-up, as you probably know.

SCHWARTZ: That's doing it the hard way.

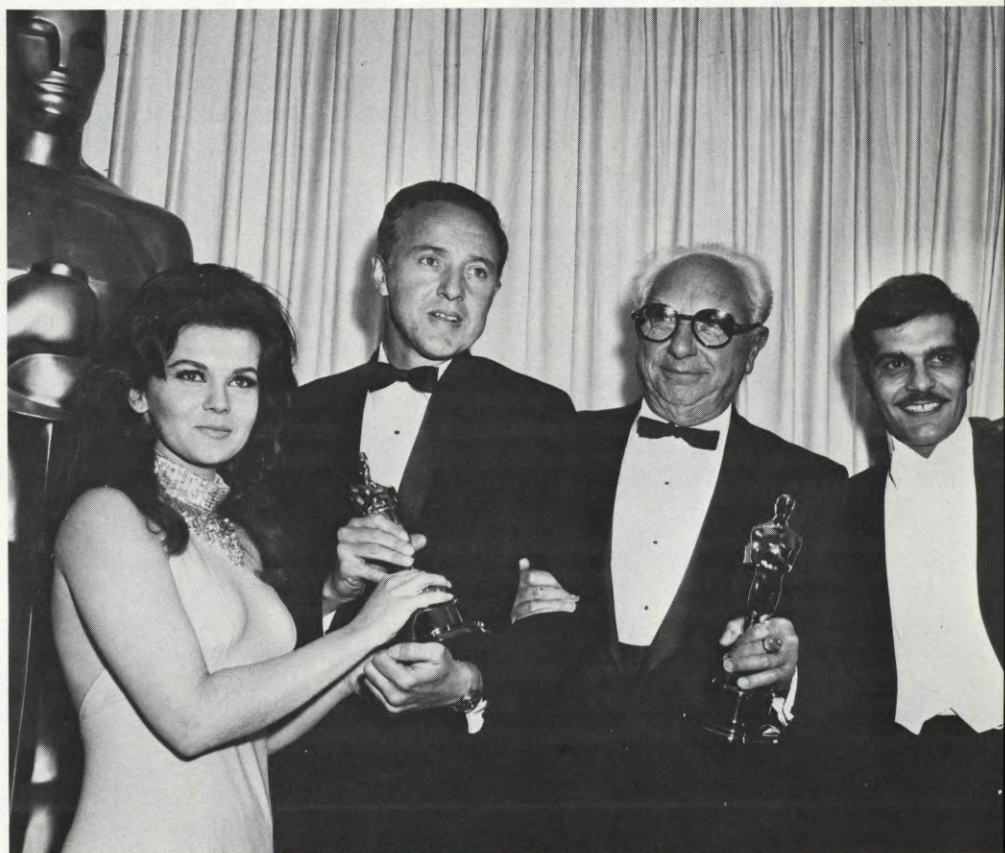
WEXLER: Yes, really tough. And it was a pleasure to use the open camera, the CM3, with which a lot of the car stuff was done. Lines were thrown in later. Like, there's one shot where the Thunderbird is going by and you see her in the back. I just sat in the back seat of the car with the CM3 and panned her over and that was it. And the lenses were Nikon lenses mostly. You notice the flaring of the headlights. I have new Canon aspheric lenses, and when I shot *BOUND FOR GLORY*, in which there was a lot of night stuff, I noticed that with the Canon aspheric lenses there is no flare around the lights, and at first I thought, "God, that's a fantastic lens." But it seems that we've sort of grown to accept and like that sort of blossoming effect that we see around lights. Mitchell high-speed lenses will do that more than other lenses.

QUESTION: What do you like to do when you're starting on a picture with a director — in the way of pre-production planning and getting to know each other?

WEXLER: Well, number one is to have as much time as possible. Number two: as much time with the script as possible. I think it's important to see some of the director's other work and for him to see some of your work, and for you to see some film together — mostly so that you can have a frame of reference, because so much movie talk is in abstractions. I've been with certain directors and they would say, "Well, I want this sort of moody. I want it dark, but not contrasty." The words are very difficult to interpret. Different people have different ideas of how to describe looks. It's like music criticism. I don't know if you've ever read music criticism in the newspapers, but they have



Wexler (upper left) and Director Mike Nichols look on, as Elizabeth Taylor and Richard Burton rehearse a scene for "WHO'S AFRAID OF VIRGINIA WOOLF?" (1966), the Albee drama for which Wexler won the last Academy Award to be granted specifically for black-and-white cinematography. (BELOW) At the Annual Academy Awards Presentation, Wexler accepts his Oscar for "WOOLF". With him are presenters Ann-Margret and Omar Sharif, and the late Hal Mohr, ASC, who accepted the statuette on behalf of Ted Moore, BSC, Color Cinematography winner for "A MAN FOR ALL SEASONS".



this weird language. So it's much better to say, "You know the scene in such-and-such a film where she came down the stairs? Well, I really like that, and I think that would fit this part of the script here. What do you think of that?" Then you both have an immediate frame of reference and you can sort of normalize your language. Also, it's important to work with the art director. On *BOUND FOR GLORY* we had a very good art director, Michael Haller, and we discussed everything. We had wanted to make the film in black-and-white, but that was impossible for economic reasons, because of television, so we wanted to have the film look as black-and-white as possible. What's the easiest way to do that? You can put anything you want in front of the lens. You can flash, you can push, you can fog, you can diffuse, you can net, but if it's out in front of the lens, you're ahead of the game, and that's where the art director comes in handy. So I think it's very important for the art director to be in on discussions with you and the director. Also the wardrobe department, particularly on a period film of the kind that *BOUND FOR GLORY* is. Then a lot depends on the people themselves. I mean, two people have different ways of communicating, and

Wexler pauses to make a decision on location for "MEDIUM COOL", the Paramount release which he wrote, directed and photographed. An original film story about a newsreel cameraman caught up in the chaos of the late Sixties, "MEDIUM COOL" merited considerable critical acclaim. Wexler maintains that he did not find the triple chore "too much to handle", but enjoyed the challenge.

there really is no set system for a director and cameraman to work and talk together.

QUESTION: Do you try to set up some vision of what the whole thing will look like even before you a start to shoot?

WEXLER: On a location film that's harder to do than on a film where there's a lot of stuff that's built in the studio. On a location film you have your concepts in mind and you look for locations that fit those concepts. You're looking for, let's say, a huge parking lot. That's a perfect place. Then you go along and you come to an empty parking lot that has beautiful yellow lines, a beautiful pattern, and you get up on top of Dodger Stadium and look down, and you say, "It would be great to do this thing with no cars, just use the patterns of the lines and have the figures small on the screen." So then you change your concept; you change this particular thing that you're going to photograph. Just to summarize — if the overall intention is correct, then you will be flexible enough to find out how to visualize it, how best to do it.

QUESTION: I saw ONE FLEW OVER THE CUCKOO'S NEST, and it

seemed to me that there was a lot of mixing of tungsten and daylight. Am I correct in that assumption?

WEXLER: There was in the part that Bill Butler shot. I didn't shoot the whole picture. In *CUCKOO'S NEST* the ward was basically lit the way I did it. I had Plexiglass 85s on all the windows and arcs and nine-lights coming in through the windows, and then mostly bounce soft light inside — some with follow-through from a window. We also had tracing paper on the outside. Generally, what I would do is to have follow-through light, because the arc light wouldn't really eat into the room, but by getting lights on the same axis as the window and using tracing paper, we get lights to follow through, so that the effect of the daylight will eat into the room farther. Otherwise, one area would burn up, while in the other we'd have practically zero light. But in answer to your specific question — no, I didn't mix. At least, there was no mixing for the first hour and ten minutes of the film.

QUESTION: And you flashed it?

WEXLER: *CUCKOO'S NEST* was shot in 5247 — one of the early batches of 5247 — and I didn't like it at all. I was just fighting like hell with that film, because I would get green where I shouldn't get green. I would get a sort of brittle look which I didn't like. I wanted it softer. So I used diffusion, I used nets, I used flashing — I did everything I could to break up the brittleness. I also used very soft light. But the dailies would come in and, with absolutely the same lens stop, the same thing would come back in a variety of colors, and Technicolor admitted at the time that they were having trouble with the film. Since then they have made some advances.

QUESTION: Did you do much testing before you used that stock?

WEXLER: No, I didn't do very much testing. 5247 was out, and we were told that 5254 was going to be extinct. In fact, there was some question as to whether one could get any 5254. As it was, I did call up and get some 54 up to shoot it side-by-side because I was struggling with the 47. But at that time they were going to phase out 54 completely.

QUESTION: I'm curious about MEDIUM COOL. Was that shot pretty much from a script the way most productions are shot, or did a lot of that come out of the process of being



where you were at that time?

WEXLER: It came from a script.

QUESTION: You kind of anticipated that there was going to be a riot?

WEXLER: Yes, it was all written and registered with the Writers Guild. In fact, if Mayor Daley had read it, he might have saved himself some trouble. But it was there about four months before.

QUESTION: How did you feel on MEDIUM COOL, directing and photographing it at the same time?

WEXLER: I loved it. I'd like to do it every other week.

QUESTION: It wasn't too much to handle?

WEXLER: Well, it could have been too much to handle; it may have been too much to handle, but I enjoyed it. I mean, sometimes the person who is doing it is the person who is least qualified to answer whether it was too much to handle. I think there are a lot of things to consider when you write it and direct it and shoot it, and sometimes when a scene didn't work I had to think, was it because I didn't write the words correctly? Maybe it was because I didn't know how to get the actors to say the lines correctly or — this was a lesser consideration — maybe if I lighted it a little differently the scene might take on a different meaning. So that problem existed, but mostly because of my insecurities as a writer, rather than as a director or a cameraman.

QUESTION: It was enjoyable?

WEXLER: Oh, yes. I'll tell you, I was looking at GRAFFITI and thinking back over the different films I've worked on, and that's about the most enjoyable film I ever worked on, just the doing of it. The people were terrific. I was like a zombie on that film because I was working down in Los Angeles during most of the days and then flying up at night and working all night and then coming back, and I was flying back and forth. It was difficult because I would often meet people on the plane who wanted to talk to me, and that time was precious to me because I had to sleep on the plane. So I had to say, "I'm working, and I'd just as soon not talk to you now. Thanks a lot." And I'd close my eyes, and people couldn't comprehend that someone only had that time to sleep, plus the time that my kid drove



Wexler cradles his Eclair CM3, a favorite camera for many years, as he prepares to shoot MOS scene of a blonde inside car for "AMERICAN GRAFFITI", a film on which he asked for credit as "Visual Consultant", rather than detract from accomplishments of young director George Lucas or two newsreel cameramen assigned to the picture.

me back from the airport.

QUESTION: When you're working with someone like George Lucas, a younger director who hasn't had so much experience, how do you work without bruising egos?

WEXLER: Well, there's no system. One of the things that I notice about many of

my friends or people who are really "into films," as they say — I don't like that expression — is that films become their life, and I think that's the worst thing for a filmmaker. If you can very consciously be interested in anything else you will find that it will feed your interest in film; it will make you a live person; it will give you contact with
Continued on Page 662

With director Norman Jewison on the set of "THE THOMAS CROWN AFFAIR", a film noted for its dreamy, almost ethereal photography and a highly erotic chess game sequence. Wexler had previously photographed his first color feature ("IN THE HEAT OF THE NIGHT") for the same director. He used black-and-white lighting technique on the picture, which won "Best Film" Academy Award.



TECHNICIANS ATTEND SOUTHERN CALIFORNIA LIGHT CONTROL SEMINAR

Professional cameramen and grips hear about — and watch demonstrations of — basic tools for control, diffusion, reflection and throwing light

An intensive "mini-course", sponsored by Rosco Labs and Matthews Studio Equipment, featuring light control, diffusion, reflection; throwing light and the basic tools to use in doing all of this, was presented to Southern California professional cameramen and grips at the Sportsmen's Lodge in Studio City in February.

The program consisted of conversations and questions and answers with John Alonzo, ASC, presenting the aesthetic uses of the equipment, while Dick Glickman, Consulting Engineer, explained why the effects were achieved with the material and equipment used.

The purpose of this seminar had been to bring the various workers on motion picture sets and locations closer together in understanding why a cinematographer might call for a particular piece of equipment or lighting control material in order to speed the setting up of sets.

John Alonzo, ASC, one of the busiest and most-talented cinematographers in Hollywood, was able to arrange his shooting schedule in order to clear time to participate in the two evening seminars. His credits include "CHINATOWN," "FAREWELL, MY LOVELY," "BAD NEWS BEARS," "BLACK SUNDAY," "THE FORTUNE" and many others. Having been an avid moviegoer in his youth, he studied the techniques of the early cinematographers and has become a master in the art of lighting for films and has innovated a number of techniques in light diffusion.

Dick Glickman is one of the most knowledgeable engineers in the motion picture industry and is a consultant to both Matthews and Rosco, actively participating in new product development and marketing for both companies. Glickman is an excellent speaker and an enthusiastic teacher and has led

workshops in virtually every production center in Europe, South America and the Far East. As an Associate Member of the American Society of Cinematographers and a member of the Society of Motion Picture and Television Engineers, he has written articles for the journals of both societies and edited a number of sections of the ASC Manual.

Although seminars are not a new technique for the dissemination of information in this industry, the sponsors of this seminar are two unrelated companies who happen to manufacture materials for the industry which complement each other. Stan Miller of Rosco, interested in presenting a lighting seminar to feature his materials, called Roy Isaia, President of Matthews Studio Equipment, and asked him to participate in the seminar. Since Matthews has its home base in California and does not sell Rosco products or products which compete with Rosco, they were the logical choice to talk with about co-sponsoring this seminar.

Isaia was delighted to participate because he has had long experience in presenting seminars in the local universities and thought it would be a very good idea to gather together local cameramen, grips and others in the industry to explain the uses of his new and innovative equipment.

Invitations were sent to members of the various unions in Los Angeles and to the schools of cinema inviting anyone interested in the material under discussion to attend the two nights.

Both Rosco and Matthews personnel were elated with the response to the invitation. Rosco President Stan Miller said he had never seen as large a group anywhere on the East Coast when a seminar such as this had been given.

A double room had been rented at

the Sportsmen's Lodge to seat 180 people for each of the seminars. The response was such that the rooms were filled to capacity and overflowed to the balconies outside with standing room only. The audience ranged from students in the cinema schools to grips with years of experience to Academy Award nominees in the field of cinematography. Even a handful of the local salesmen in competing and ancillary products attended to find out what was going on. Grip departments from Paramount, The Burbank Studios and Universal were heavily represented during the Wednesday evening seminar.

Matthews took this golden opportunity to acquaint the attendees of the seminar with its innovations in grip equipment, pointing out the portability, strength, durability, compactness and versatility of its equipment.

Matthews' equipment has been designed with the needs of Hollywood in mind, as Hollywood travels to locations throughout the world to make its films. Portability has become a necessity in the field of lighting today and this lightweight aluminum cast equipment has enabled grips to cut set-up time in half.

On Matthews' Century Stands the legs are collapsible for easy storage, all Matthews' roller stands have individual locks on each of its wheels, and can be used without wheels for rugged terrain applications. Combo stands have a Rocky Mountain Leg for leveling and are also useful as a combination stand for lights and reflectors.

Matthews' also introduced its new Roundee Dolly, which is similar in construction to a wheelchair with an adjustable seat and brackets and clamps to attach arms and poles and mount camera equipment.

Rosco introduced its new Roscomatte, which is an acrylic having

Continued on Page 657

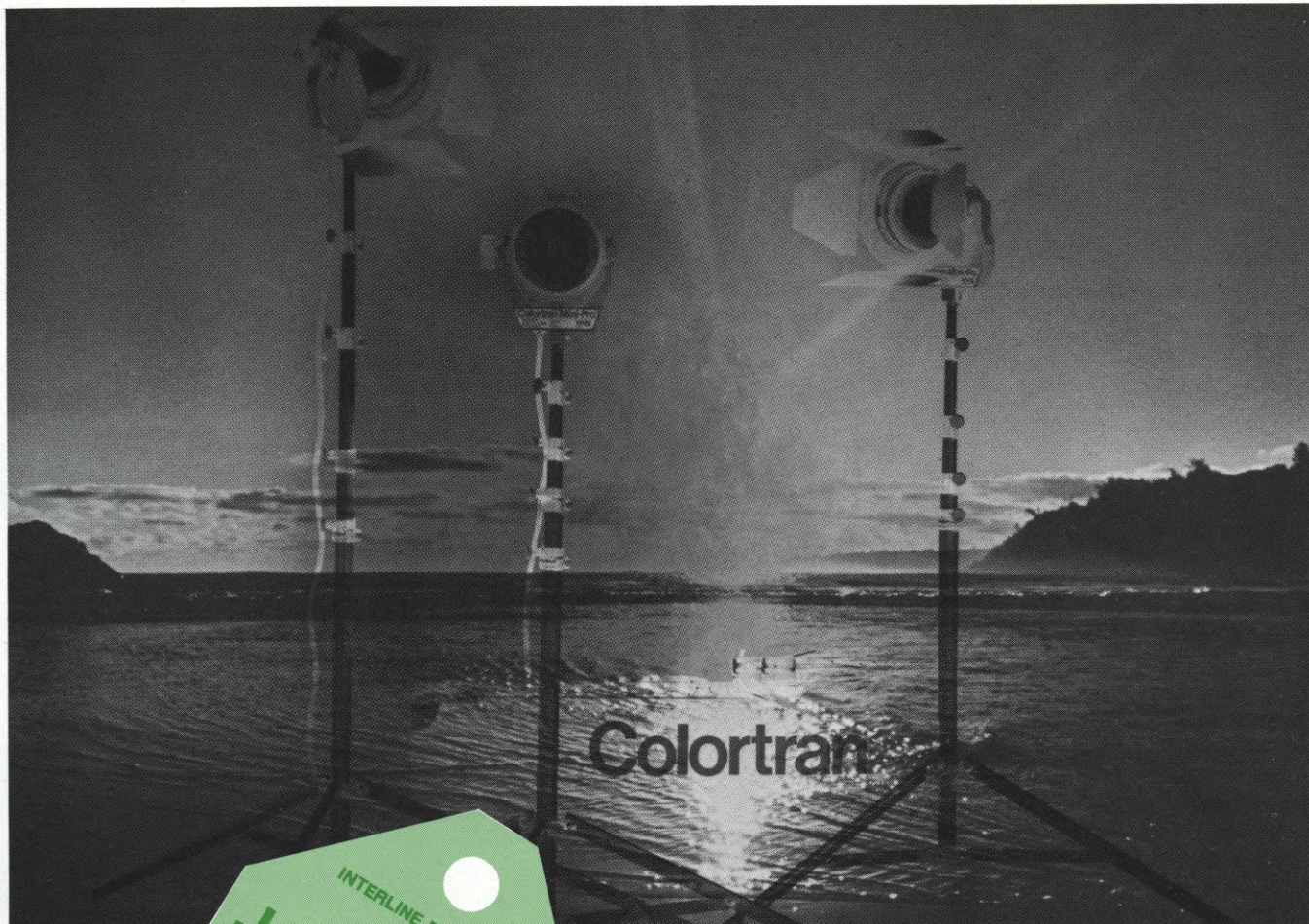
(LEFT) Stan Miller, Rosco President, reiterates point made by consultant Dick Glickman regarding technical characteristics of diffusion material. (RIGHT) Carlos DeMattos (Matthews Studio Equipment) watches while Roy Isaia, President of Matthews, and Dick Glickman hold up Roscoflex material, while John Alonzo, ASC, tells how this was wrapped around the body of a member of the crew to reflect light onto an actor in a tight lighting situation.



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FILMEX '77 IN RETROSPECT

With 296 films representing 30 nations shown, 33 programs sold out, and record-breaking attendance, Los Angeles' big film show is a smash hit

The 1977 Los Angeles International Film Exposition (*Filmex*) attracted record-breaking crowds during its 19-day run (March 9-27). *Filmex* Director Gary Essert stated that 111,000 people attended the event at the ABC Entertainment Center in Century City. Essert said, "Thirty-three programs were sold out and 12 free shows screened to capacity audiences. Two-hundred-ninety-six-films representing 30 nations were presented in total. Three-hundred-twenty-four miles of motion picture film were projected during the 300 hours of *Filmex* '77."

"I am pleased to report," Essert continued, "that ticket revenue (including the opening night benefit) totaled \$215,000. Additional income from *Filmex* Society memberships, grants, and special events amounted to \$335,000, for a 76/77 revenue total of \$550,000.

Filmmakers here for the world premieres of their films included Tony Richardson and Ann-Margret for JOSEPH ANDREWS (opening night), Robert Downey with MOMENT TO MOMENT, Larry Clark for his first feature, PASSING THROUGH, David Lynch with ERASERHEAD, and Charles Joffe, Tony Roberts and Carol Kane with Woody Allen's ANNIE HALL (closing night).

Actors Bud Cort and Samantha Eggar appeared in discussion at the world premiere of WHY SHOOT THE TEACHER? County-western star Willie Nelson and director Yabo Yablonsky participated in the world premiere presentation of WILLIE NELSON'S 4TH

OF JULY PICNIC along with producers Michael J. Jones and Gary Kratochvil.

Thirty-six films had their American premieres at *Filmex*. Claude Chabrol traveled from France for ALICE, OR THE LAST ESCAPE, as did Liliane Dreyfus for her WOMEN IN THE SUN. From Canada came David Brittain, director of VOLCANO: AN INQUIRY INTO THE LIFE AND DEATH OF MALCOLM LOWRY, and writer-director Rex Bromfield along with producers Peter O'Brian and David Pulmutter for LOVE AT FIRST SIGHT. Soviet director Nikita Mikhalkov traveled from Moscow for SLAVE OF LOVE; and from West Germany, Volker Schlöndorff arrived for the presentation of ACT OF MERCY.

At a special reception and audience discussion with Claude Chabrol, Hollywood and European filmmakers turned out to greet the French director, including Jack Nicholson, Roman Polanski, Sally Kellerman, Talia Shire, Rouben Mamoulian, Jerzy Skolimowski, Costa Gavras, Jacqueline Bisset, Dyan Cannon, Susan Blakely, Michael Schultz, Tay Garnett, Bud Cort, Ann-Margret, Roger Smith, Allan Carr, Marisa Berenson, Deborah Raffin and Billy Wilder.

Also attending Exposition presentations were Jean-Louis Jorge (MELODRAME) from France; Jaime Humberto Hermosillo (THE PASSION ACCORDING TO BERENICE) from Mexico; and Dutch director Fons Rademakers (MAX HAVELAAR). Belgian director Chantal Ackerman and French star Delphine Seyrig arrived from

Europe for JEANNE DIELMAN. Andy Warhol, Perry King and Susan Tyrell were present for Andy Warhol's BAD. Franco Nero attended VICTORY MARCH (Italy).

Academy Award-nominated films formed a significant part of the Exposition's programming, including the winner of Best Foreign Language Film, BLACK AND WHITE IN COLOR (Ivory Coast/France), and other nominees: JACOB THE LIAR (Germany) and NIGHTS AND DAYS (Poland). Best Feature Documentary, HARLAN COUNTY, USA, was presented (with director Barbara Kopple in discussion); and Best Short Documentary, NUMBER OUR DAYS, and Best Animated Short Subject, LEISURE. Other Oscar-nominated films at *Filmex* '77 were: THE STREET and VOLCANO (both from the National Film Board of Canada), NIGHTLIFE (Opus Films, Ltd.), and UNIVERSE (Graphic Films).

Music in Film was a major theme at *Filmex* '77: The 50-hour Musical Movie Marathon included 40 well-known musical classics. Ethnic, regional, and contemporary music was featured in a series of musical documentaries by Les Blank. OUR LATIN THING examined Latin "salsa" music, and NEW COUNTRY, like WILLIE NELSON'S 4TH OF JULY PICNIC, explored progressive country music. JIVEASSP and PASSING THROUGH dealt with contemporary jazz.

"Filmusic," a 12-session conference devoted to the role of the composer in motion pictures, was sponsored by RCA Records as an accredited course with UCLA's Extension Program. Lalo Schiffrin, John Green, Marilyn and Alan Bergman, Ernest Gold and Henry Mancini were among the 35 prominent composers and film musicians participating.

Special Tribute programs were presented to silent star Colleen Moore (in person), and the late Peter Finch. The homage to Peter Finch (staged the day before his Best Actor of the Year Oscar was awarded) featured a complete screening of THE MAN WITH THE GREEN CARNATION (THE TRIALS OF OSCAR WILDE), clips from several films, and in-person testimonials by Paddy Chayefsky, William Holden, Ernest Borgnine, Angie Dickinson, Ross Hunter, and George Kennedy. The tribute was coordinated by the staff of the Los Angeles County Museum of Art Film Department.

The ABC Entertainment Center in Century City was alive with colorful banners and international flags for the 1977 Los Angeles International Film Exposition (March 9-27). Aside from the films screened, the highlight this year was "Filmusic", a 12-session conference devoted to the role of the composer in motion pictures.



Two unique "retrospective premieres" featured previously unseen films by Charles Chaplin and Josef von Sternberg: Chaplin's *WOMAN OF PARIS* (1923) received its belated American premiere, and von Sternberg's last film, *ANATAHAN* (1953), was shown for the first time anywhere in a completely restored version.

Other special programs included surveys of student films, trailers, TV commercials, animation, artists' films and videotapes, films made by children, rare "Treasures from the UCLA Film Archives," and tributes to Fritz Lang and Henri Langlois (film archivist).

Exposition audiences this year saw more free programs than ever before: "DoubleVision," a program of 12 movie classics and subsequent remakes, and "The Documentary," 11 films dealing with contemporary society, were offered to the public at no charge. The two series were made possible by grants from Atlantic Richfield Company and the City of Los Angeles. Shelley Winters, Olivia Hussey, Michael York, Pat O'Brien and Elsa Lanchester attended the classic presentations in which they starred.

In addition to the official section and retrospectives at the Exposition, Uni-france (the French film export association) coordinated and presented "The French Film: Current Perspectives," selected by the Société des Réalisateurs de Films. Founded at the Cannes Film Festival in 1973, the program of 10 new features and shorts offered a panorama of current French "cinéma d'auteur." Filmmakers who attended included: Jacques Fansten and star Isabel Huppert of *LE PETIT MARCEL*; Luc Moullet, director of *ANATOMY OF A RELATIONSHIP*; and Rene Gilson who directed *JULIETTE ET L'AIR DU TEMPS*. Bernadette Lafont, star of *NOROIT*, also attended.



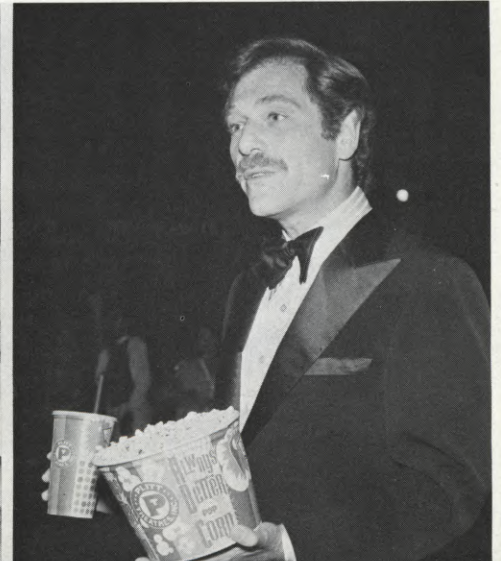
A huge fireworks display depicting the skyline of New York City was part of the closing night festivities at the FILMEX '77 presentation of Woody Allen's new film, "ANNIE HALL". The New York theme was carried through outside the theater by a Salvation Army Band, tap dancers, balloons and newsboys hawking papers — all in all, a gala finale.

Filmex 77 opened March 9 with the world premiere of *JOSEPH ANDREWS*, followed by the Filmex Society Benefit-Ball, which attracted prominent members of the Hollywood film industry and Los Angeles social scenes. Among those attending were Governor Jerry Brown, Ann-Margret and Roger Smith, Jacqueline Bisset, Marisa Berenson and Jim Randall, Berry Berenson and Tony Perkins, Universal Pictures Vice-President Verna Fields and actor-writer Buck Henry (both Filmex Selection Committee members), Helen Reddy and Jeff Wald, and Dustin Hoffman. Other guests included Grace (Mrs. Harold) Robbins, Mickey and Paul Ziffren, Jeanne Moreau and Billy Friedkin, Wendy and Leonard Goldberg, Pat and Walter Mirisch, and Sidney and Lorraine Gary Sheinberg.

Woody Allen's new comedy, *ANNIE HALL*, provided a spectacular finale for the Exposition which included elaborate fireworks at the Manhattan skyline and costumed "New Yorkers" arriving in a cacophonous (but carefully planned) traffic jam of taxicabs. Attending the world premiere presentation of the film were the film's stars, along with Art Garfunkel, Franco Nero, Eileen Brennan, and Rob Reiner and Penny Marshall.

Filmex is a non-profit cultural organization which annually presents the International Film Exposition in association with the City of Los Angeles and with the cooperation of the Academy of Motion Picture Arts and Sciences, the American Film Institute, the Los Angeles County Museum of Art, and the film schools of UCLA, USC, Cal-Arts and Loyola/Marymount. ■

Hollywood stars turned out in force to launch FILMEX '77 in high style. (LEFT) Ann-Margret and husband Roger Smith arrive for the opening night World Premiere Presentation of "JOSEPH ANDREWS", in which she starred with Peter Firth. (CENTER) Cher Bono Allman, dressed for the tropics, stopped traffic on her way in to the auditorium. (RIGHT) Ready for anything, with popcorn and soda in hand, George Segal heads for his seat at the Premiere.





VOYAGE OF THE HOKULE'A

A 1½ hour TV Special, produced by the National Geographic Society and WQED Pittsburgh; Dale Bell, Producer. First broadcast Tuesday, January 18 on PBS

PHOTOGRAPHS BY NICHOLAS DE VORE III, ED GEORGE AND ALASTAIR RIACH.

3,000 miles across the Pacific in a sail canoe. Drenched every day, even sleeping wet. Humidity. Salt. One-man film crew, room for one sync-sound camera: Arriflex.

Cinematographer Norris Brock wore a vest and harness that let him operate the camera, recorder, mike, battery, wireless receiver and mixer, and *still* have both hands free to reload or to prevent himself from falling overboard. The camera wore a wet suit.

Without charts or navigation instruments, could the early Polynesians have sailed deliberately between Tahiti and Hawaii?

Ancestors

That was the question this voyage set out to answer. If successful, it would help to prove that 15,000,000 square miles of the South Pacific were methodically settled by the islanders, centuries before Columbus crossed the Atlantic.

No staging

Hokule'a was a reproduction of an early Polynesian voyage canoe. For 34 days, Norris Brock's job was to shoot on board. Filming was *not* the pur-

pose of the voyage, so he had to keep out of the way. Nothing could be staged.

Cramped

Space was in short supply. Mr. Brock had to sleep and store his equipment in a space 5ft x 3ft x 4½ft. The upper (sleeping) level was soaking wet. The lower (storage) level leaked badly. Both were hot and humid.

Wet

Except for some sunny periods in the doldrums, everyone on board was permanently soaked by spray, waves, and rain. From the first day out, Mr. Brock reloaded the Arriflex's magazines with wet hands, inside a wet changing bag.



Shooting one-handed and keeping out of crew's way. Note custom-made harness.

Negative

"Having used 7247 negative for the pre-voyage sequences, we wanted to use it at sea, too," says Mr. Brock. "Negative meant double-system; and we originally planned on a three-man film crew?"



Crowded and laden canoe meant sync-sound filming had to be done by one man.

One man

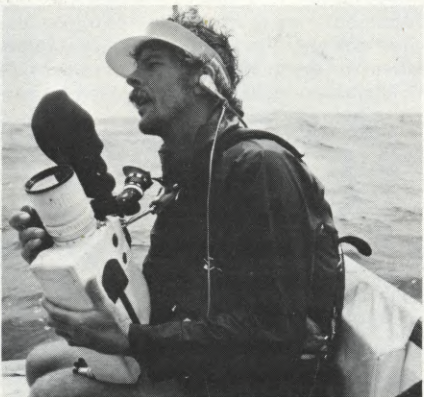
"But after a trial sail, during which we nearly sank, we were told we must lighten the load. *One* man would have to shoot and record the sound, with only one sync camera on board."

Stars only

"There would be a radio-equipped escort boat following us at some distance, to plot with instruments the course our navigator set by the stars. But we had no guarantee of access to it."

No radio

"As it turned out," says Mr. Brock, "*Hokule'a's* walkie-talkies were done in by the physical battering and the salt water, so we sometimes lost contact for several days. I had a 50ft load gun camera in an underwater housing. And I had four Nagra SNs. And *one* Arriflex 16SR."



Norris Brock, wet. Note mike mounted above lens.

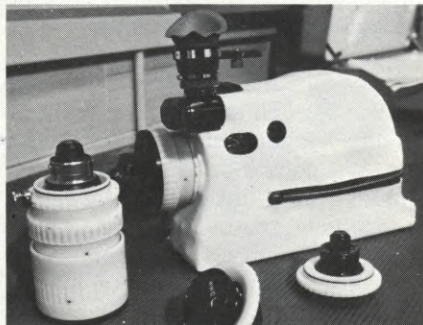
Gamble

"For this job, WQED had looked at every camera on the market. The 16SR was a new and, for us, untried camera. But we figured that the cameras we

did know would not hold up. We decided to bet on Arriflex's reputation for reliability."

Wet suit

"The National Geographic Society made an amazing PVC wet suit for the camera, with a watertight zipper so I could change magazines. The finder and handgrip with its on-off switch we left uncovered."



Arriflex 16SR in custom made PVC wet-suit, lenses in solid nylon housings.

Nylon blocks

"I chose two lenses," says Mr. Brock, "The Zeiss 10-100mm zoom and the Angenieux 5.9mm. National Geographic machined housings for them from solid blocks of nylon, with waterproof O ring seals."



Symmetrical finder let Mr. Brock shoot at any angle on either side of camera.

Harness

"National Geographic also made me a vest with pouches for recorder, camera battery, wireless receiver, audio control unit — and a lifetime supply of lens tissue! And I had a harness made for the camera at a hang-glider shop in California."

Knocks

"Once at sea, I didn't dare put the camera down on deck, so I had to wear it (with the harness) for hours and days on



Wiping off salt spray every few minutes. Throw-away battery in pouch.

end. I fell down countless times. Having both hands free let me save myself and the camera from the worst knocks."

Quick

"The Arri's built-in meter really saved the day, too," says Mr. Brock. "The action was unpredictable. I couldn't walk around taking readings. I'd just start shooting and set the f/stop simultaneously!"

Corrosion

"After two weeks at sea, the rotating finder froze up from salt-water corrosion. I oiled it and coated it with silicon... worked perfectly. Other than that, *no camera problems*."

Delivered

"I shot about 12,000 feet on the voyage," says Mr. Brock. "We had all our eggs in one basket with that camera — and it delivered!"



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ALONG FOR THE RIDE
Continued from Page 601

were being done in the controllable confines of a soundstage!

Our documentary unit is affected by the same variables as the production company: we must adapt, trust to luck and hope we are alert enough to react reasonably.

Earlier in the schedule, when ROLLERCOASTER is shooting at Kings Dominion, a more luxurious amusement park near Richmond, Virginia, I share documentary camera responsibilities with Ted Allan. He has done these documentaries for Universal before and has a clear idea of what is wanted. Some set-ups we work together, getting two or more angles for intercutting. On other set-ups, we work singly.

Kings Dominion is daylight exterior shooting, MOS, so that the technical pressures on Allan and myself are much less than they are to be in Norfolk later on. However, the scenes being made are not as exciting, so that our combined ingenuity is strained to catch good footage for the documentary. Ted Allan carefully pokes his lens through the tracks as not one, but two rollercoaster trains, hurtle down at him and right over the camera. The grips have obligingly built a platform for the shot and director Goldstone has had it camouflaged by the greens-man so that neither Allan nor his equipment will be picked up by the production camera on the front car.

My camera, too, gets a taste of the good fortune that will reassuringly remain with it in Norfolk. The scene being made is that of a "cops and robbers" chase across the park grounds. Allan is positioned near the production crew for wide coverage of their activities. I have already gotten the closeups that we need for continuity intercuts and take off to search for targets of opportunity. From the skyride that traverses the park, I get a flying approach to the set-up and, from directly overhead, a graphic wide-angle shot during a take. The bucket I am riding arrives directly above Goldstone and the crew; its position coincides with the timing of his take by purest chance. I later learn that the production still photographer was stranded aloft in the same spot, for over two hours, the day before, when the skyride was ordered shut down because it interfered with the action then being filmed.

The experience of working in Richmond gives me insight into how the story of ROLLERCOASTER is being

realized, into the working style of the crew and into the temperament of the director. This proves to be the most valuable aspect of the preparation for the Norfolk coverage.

When I am called to rejoin the production after it has shifted to the Ocean View location, Bob Faber tells me that the key action we are to film is that of the flight of a rollercoaster car, which complete with occupants, is derailed by the damaged track, flies over the crowded boardwalk and comes to rest only after it has crashed into and demolished a building on the beach.

Faber tells me that Ted Allan is on another assignment and that I will be working this location as sole cameraman. We decide on a 16 Arri BL for general sync shooting, with a Scoopic for inserts. A 12-to-120 on the Arri and the built-in zoom on the Scoopic allow for variety in angular coverage. A Ronford tripod provides a reliable camera platform and is lightweight, so that the assistant can re-set it quickly. Spare camera batteries and magazines are mandatory, as is a spare drive motor for the Arri. Crystal sync is backed up by a sync cable for sound. A locally procured unipod proves very useful for quickly changing set-ups with the Arri, in order to get fast-breaking action, and makes it almost as maneuverable as the Canon.

Twice delayed by strong winds and once by rain, the shot we are primarily there for is now readied for shooting. While the production crew was busy shooting in Kings Dominion, the construction crew at Ocean View had built, of balsa wood planks, the house which is to be demolished by the crash of the rollercoaster car. Across the concrete boardwalk, atop the funhouse, and hidden from view by its sign, the construction people have also built an inclined chute, down whose well greased rails, the car and its riders, propelled by tightly stretched bungee cords, will break through the sign, fly through the air over the heads of the strollers and crash with its live cargo into the house.

A fourth camera has been added to the three Goldstone has been using. Three cameras are fanned out across the beach between the boardwalk and the ocean, the fourth camera is planted on the boardwalk head-on with the expected impact area. David Walsh instructs each of his camera operators as the lighting is set. Faber finds a suitable spot for the Arri on the beach which gives us a clear view of the action which we proceed to frame between two of the three production cameras in our foreground. I am to hold tight at the

point where the car and its riders break through the funhouse sign, follow the action and widen out just after impact to reveal the entire setting.

Gaffer Harris provides a light to heat the Arri and keep it from slowing down in the icy ocean air. Faber and I, with the Scoopic, pick up some of the myriad details of preparation for the complex, perilous shot.

The concrete near the boardwalk has been covered with pads and the interior and outside of the doomed house have been piled high with empty cartons to cushion the fall of the stunt people. A bulldozer churns up the sand, to soften it on impact, and it is raked smooth by a prop man. We stay with Goldstone and Stunt Coordinator Daheim as they finalize details not only with the five stunt people who ride the car, but with the stunt group in the crash area, as well, who must scatter just before they are hit. In all such stunts, one member of the stunt group will be facing in the direction from which the car will come — as a presumably natural piece of business — so that he can see the car break through and cue the others to break out. The timing must be split-second. Meanwhile, the background extras have been spotted in their positions and instructed in their action by the ADs.

At last all is ready and we return to our place at the Arri on the beach. The Scoopic has been reloaded and is at hand, resting in a carton to keep the sand out of it. The stuntmen and women have shed their outer coats, since the story takes place in mid-summer, they shake hands all around and climb a ladder to take their places

Continued on Page 640

Documentaries of the filming of major features not only have public relations value, especially when shown on TV, but provide an illustrated lecture in film-making for serious cinema students.



POLAVISION COLOR MOVIES

Continued from Page 603

their multiple tanks are needed to do the same thing in a conventional film lab.

Dr. Land informs us that the system has been designed with sound in mind and that, indeed, the film material has been magnetically sound-stripped accordingly. However, he points out that Polavision will not be available in the sound mode for some months to come "because I am not at all happy with any existing home movie sound system." He goes on to explain that because the Polavision picture quality is so good, the company is unwilling to settle for anything less than the best in the way of sound.

Members of the Press want to know whether the film can be edited and whether it can be shown on conventional projectors. Dr. Land replies that all this is theoretically possible, but not advisable. The film *could* conceivably be removed from the cassette for editing, but could not then be reinserted for screening with the Polavision player. The film *could* be shown on a conventional Super-8 projector, he admits, but that would be defeating the purpose. The purpose, as he explains it, is to do away with all the rigamarole of conventional Super-8 filming — having to wait for exposed rolls of film to come back from the developer, setting up a projector and screen, threading film, dimming lights, and then having to put everything away after the screening.

Then comes the question that is in everybody's mind: How much will it cost?

Everyone from Polaroid hedges in giving an answer, explaining that the company wants to coordinate its marketing approach before providing such information. However, we are assured that we will be "pleasantly surprised" at how reasonable the price is. One company official, when pressed for a dollars-and-cents answer, coyly observes that it will be "somewhere between \$100 and \$1,000." Another answers that "the cost will be about the same as that of a good television set." Educated guesses peg the figure at about \$500 — although it could certainly go higher.

Both the camera and player are being manufactured for Polaroid by the very reputable Eumig company of Austria, while the cassettes of Polavision film are being turned out in Polaroid's own factories.

After Dr. Land's introduction of the equipment, we are all directed into a vast area where jugglers, clowns and

dancing girls are performing in front of colorful backdrops with appropriate lighting. We are all given a camera and invited to shoot some film. We do so, after which the film cassettes are popped into the players for 95 seconds of rewind and processing. The proof of this pudding is in the viewing.

First of all, it should be pointed out that to judge the quality of the image according to strict professional standards is both unfair and unnecessary. It can only validly be compared to that of conventional Super-8 movies, as shown on similar rear-projection equipment. According to those criteria, I would give Polavision top marks for color. It is rich and saturated and remarkably faithful to the subject.

When it comes to sharpness, however, I feel that the quality is somewhat less than that of conventional Super-8. This is particularly surprising in view of Dr. Land's obvious pride in the high resolving power of the Polavision film emulsion — "1,500 triplets (4,500 lines) per inch," he points out.

Perhaps the fault lies in the inherent limitations of the player — all that bending of light to rear-project the image onto the screen (rear-projection, *per se*, being not the optimum way to view anything). At any rate, one hopes that this element of the system can be fine-tuned to do justice to what must be considered, by any standards, an extraordinary technical achievement.

Specifications from Polaroid on the Polavision system seem to be non-exis-

tent at this writing. However, I should like to present for the edification of *American Cinematographer* readers my own possibly less than strictly scientific description of the functions of the three major components of Polavision:

POLAVISION CAMERA

The camera is a lightweight, fully automatic unit with built-in exposure control and two focus settings — one for 6 to 15 feet, the other for 15 feet to infinity.

The camera is equipped with a f/1.8 lens having a 2-to-1 zoom ratio. The zoom is manually operated by means of a lever on the mount.

In order to activate the taking mechanism, it is necessary to depress two levers, one on either side of the pistol-grip handle.

For indoor filming, a small floodlight plugs directly into the camera, automatically displacing the daylight filter.

A red blip warning light begins to flash in the viewfinder six seconds before the film runs out.

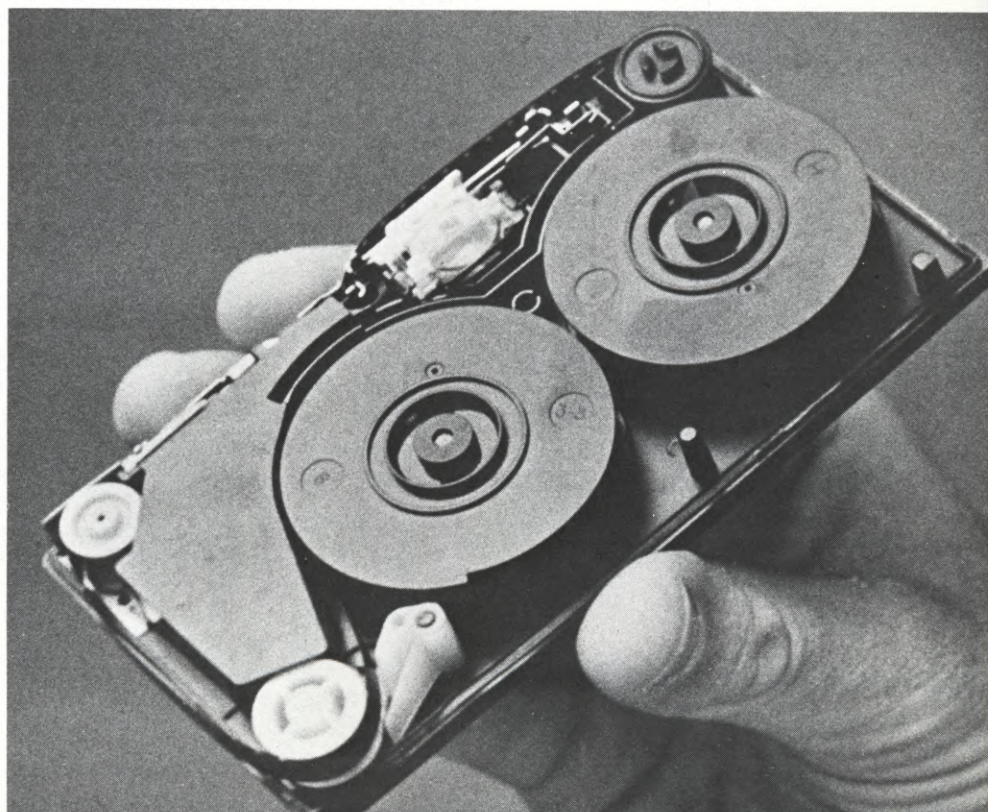
The camera operates on four AA batteries, which will run approximately 50 cassettes of film.

POLAVISION FILM CASSETTE

The cassette measures approximately 5¼ inches by 2¾ inches by a ½ inch in size, and is a completely self-contained, factory-sealed unit, with its own film gate.

It contains 42 feet of special Polavision film.
Continued on Page 641

A marvel of engineering, the Polavision cassette (shown here with top cover removed) serves as part of the camera mechanism, a complete processing laboratory for the development of the film and as a component of the projection chain. No threading is necessary at any stage and the film never leaves the cassette.



PHOTOGRAPHING "ROLLERCOASTER"
Continued from Page 599

duction Designer, Henry Bumstead, completely revamped the park for us in terms of lighting. We renamed the old rollercoaster "The Rocket" and he put a sign on it to that effect, and sparkling lights on the cars. Those lights made it possible to see the cars as they were going around at night, because without them there would have been no way of showing that there were cars running on the tracks. Bumstead went through the entire park diligently and added all kinds of creative lighting to give it some visual excitement.

In considering where to mount cameras on the various rollercoasters that we used, the question was always one of where to mount them in order to get the most interesting and most thrilling shots. It was simply a matter of taking the ride a number of times and thinking where you would want to be in order to get the biggest thrill. Sometimes you really can't answer that question, so it boils down to putting the camera in as many places as you possibly can — and, obviously, on a rollercoaster, there are really only so many places where you can put it. There are certain limitations in terms of space. You can't get very far outside of the cars because of the framework of the structure itself. Low along the tracks is usually an exciting place, and a fairly simple one for attaching, in most cases, a camera so we attempted to do that.

Some of the rides we used were more than 50 years old and that did create a problem, because at certain points the cars actually leave the track. They have bottom runners on them, of course, so that they never leave, in the literal sense of the word, but they fly for a moment. They get airborne, and this will cause certain jitters in the camera. However, those jitters were something that would just add to the excitement of it. At any rate, we had a special crew of people, headed by my key grip, Dick Moran, who went out and measured and designed mounts that would easily adapt to these rollercoasters. It's important that all this be done in advance, because when you get to these parks you don't want to take days to prepare yourself. You can't hold up the production schedule. So, when we got to a park, three or four guys would simply go straight to the rollercoaster and start preparing it, so that when we finished shooting with our principal actors we could then come over and, within an hour, have multiple cameras mounted on a single rollercoaster to take a ride.

Early on, when we went down to San



"ROLLERCOASTER" Director of Photography David Walsh, whose other feature credits include, to name just a few: **"SILVER STREAK"**, **"W.C. FIELDS AND ME"**, **"THE OTHER SIDE OF THE MOUNTAIN"**, **"MURDER BY DEATH"**, **"THE SUNSHINE BOYS"** and **"SLEEPER"**.

Diego to make tests there, we put *Sensurround* with it and made a little teaser film. It was very exciting and a lot of fun.

Lighting an amusement park for night shooting is a major undertaking. The surveys you go on usually take place in the daytime. You look at these places and they are enormous. They seem to go on forever. Then, when you start to consider lighting them at night, you've got big problems, because whatever you see, you've got to light and wherever you light, you've got to run cable there or, in some other way, make generated power available. Sometimes you can operate off the existing power of the park itself, but again, these parks are so old in many cases that, in order to be safe and make sure that you're going to get your picture, you have to bring in your own generating equipment and run cable from it.

It entailed a lot of planning and a lot of thought and, in almost every case where we were in parks at night, we brought in two generators so that we could have one at one end of the park and one at the other end and avoid having to run miles of cable. For the night shooting we did at the park in Norfolk, Virginia, we sent crews in well in advance to set the generators and lay cable. Then, when we arrived, the schedule was laid out so that we could shoot the daytime scenes first, while a certain portion of our crew was preparing for the night work. This meant that when we did get to the night shooting, we were in a fairly advanced state of preparedness, rather than having to start from scratch.

As I've said before, Henry Bumstead and his crew were very, very helpful to us in terms of virtually redesigning the lighting of the amusement park. We would come up with ideas of what we thought might look good and they would help us by putting up signs and visual attractions that we could light from to make the park more interesting.

"ROLLERCOASTER" was one of the first major productions to go totally to the new Eastman Color Negative 5247, Series 600. Prior to that new series, they had been having some problems with 5247. At least, in my mind, they had been having problems (and apparently in their minds also, because they saw fit to change the original emulsion). I was a bit reluctant to go with 5247, because I had not liked the original emulsion, but I made some tests and found the new stock to be very good. I also talked to Skip Nicholson at the Technicolor Lab and he assured me that they had been getting good results with it and that the problems they had been having with the original 5247 were now non-existent.

So we took off with it and found that it is an incredible film. They had done some testing in which the film was pushed one and two stops and it looked marvelous. Some of the shots I saw were lit with maybe four or five footcandles, very low light levels, and it's amazing how the definition held up. "ROLLERCOASTER" was shot in its entirety with the new Series 600 5247, and with no problems at all, under any circumstances. The day and night exteriors, I feel, all have good color and tonal rendition. I find it to be a

wonderful new film.

We did very little pushing of the film, except for one stop in the night shooting, because of the great expense of background and the generally low light level. The fastest lens we had was T/2 or T/2.3. I purposely avoided using any of the new ultra-fast lenses because it was my feeling that the amusement park was another character in the film and I wanted the people in the audience to feel the park around them, to be able to see some of the detail of it in the background. Had we used ultra-fast lenses and shot wide open, that detail would have been fuzzed out and lost. For that reason, I preferred to push one stop with slower lenses and go for the depth of field.

At Magic Mountain the ride which they have in place of an old-time rollercoaster with a wooden structure is a very modernistic, very sleek and very wonderful loop-the-loop with a tubular metal structure. What bothers me about it is that it makes no noise and the structure doesn't shake. I feel that without those two elements, some of the thrill is lost, but Universal has at least added noise (in *Sensurround*) to those sequences to make them more exciting.

The footage shot at Magic Mountain was, from the purely photographic standpoint, more straightforward than that shot in the other two parks. This is because all the action takes place there in the daytime. You always have more problems at night, but during the day you are blessed with some sort of exposure and what you have to do is find interesting ways to present the action — good composition, exciting camera angles, things that will work within the framework of the film in terms of cuts.

"ROLLERCOASTER" was filmed in the anamorphic format with Panavision cameras, which are — without any question in my mind — the finest equipment made today for motion picture use. We had five cameras with us on many occasions and used multiple cameras during the shooting of the entire film. That has always created certain problems. For example, there are many times when you'll find that one camera is shooting another camera, and you have to try to avoid that. Also, when you use multiple cameras, you have to make sure that each will intercut with the others, or there is really no sense in using two, three or four cameras. Their angles all have to cut together well and make some sense in that respect.

Some of the major problems we had on "ROLLERCOASTER" were really those of dealing with people. We used

up to 1,000 extras a day, and that's an enormous number of people to deal with. It's also an enormous expense, so you have to be very well prepared when you arrive in the morning. You have to know where you are going and what you're going to do, so that the Production Department will have those 1,000 people ready when you need them. Preparation is the real answer there.

You also have to hire technical people who understand your problems — the crews for the multiple cameras, for example — so that when you ask them at the end of a shot how it was, you will get a concise, knowledgeable answer. The other operators may be 100 yards away from you and if you have four of them, the communication problem can get serious. You have to have an answer you can understand so that you can communicate to the director whether the shot was good or bad. Fortunately, we had that type of people — really super people who gave us what we wanted.

I had known Jim Goldstone socially for a number of years, but "ROLLERCOASTER" was my first experience in working with him. He is probably one of the most dedicated directors I've ever met and one of the best prepared men I've ever known. He is fastidious in his notes and in his knowledge of a subject. He really dives into a project. I would say that when it comes to rollercoasters, at this point he is an expert. He's probably ridden every one there is to ride in this country, and maybe even Mexico and Canada. He's that type of individual. He goes totally after something and just immerses himself in the subject.

The wonderful thing about working with Jim is that every day, when you go to work, you know exactly what you are going to do. You have the outline and the plan. He'll tell you shot-for-shot what he intends to do. From my point of view, that is very helpful. It means that I can get my crews working without delay. I know what to expect and can be working ahead.

"ROLLERCOASTER" came in on schedule and probably under budget, and I would imagine that was mainly due to the fact that Jim had prepared it so well. We, in turn, had the advantage of that preparation and were able to prepare each specific shot in advance. So, working with Jim, from a cameraman's point of view, was a great pleasure.

Very often, when you go to meet a director for the first time regarding a particular project, he will say that he wants a special look for his film. That's good to hear, because I think that every film should have a special look and feeling all its own. That's a very important thing to have. But I think that unfortunately, in some cases, a director becomes so involved in a project that, from his standpoint, a special look means heavy diffusion of some sort. And that, I feel, is wrong. I think that some pictures look nice when diffused in a certain manner, but others certainly don't look good that way. It all depends upon the subject matter. "ROLLERCOASTER" was a picture about today and the fun of an amusement park — about things that didn't need a heavily diffused look — so we tried to be clear about it. We tried to be sharp about it and, hopefully, that's what it does look like. ■

Walsh takes a trial run on the Magic Mountain rollercoaster to check on how the ride will look to the multiple cameras involved. Shown mounted on the front car here are two cameras (plus light) pointing backwards, and one aimed forward. In an initial test, a camera magazine was knocked off against the superstructure due to swaying of the vehicle. Great pains were taken to make sure this did not happen again.



FILMING "ROLLERCOASTER"
Continued from Page 594

ment. We discussed such things as the sense of motion against motionlessness, people standing against people moving, when to use a long lens to get the effect of the compressed action of hundreds or thousands of people, seemingly. Things of that kind are properly within the purview of the Director, working with the Director of Photography, and there has to be a collaboration. Otherwise there is possible disaster.

QUESTION: I'd like to ask about Sensurround and the different manner in which it is used in "ROLLERCOASTER". What changes were made?

GOLDSTONE: Aside from the purely technical ones of having tremendous numbers of conceptual meetings before the fact and determining to have two sound crews instead of one on location for all the "Sensurroundable" situations, the directorial intent was, for the first time really, to use Sensurround for naturalistic purposes. Obviously, we were not going surrealistic. We simply wanted to involve the audience with realistic effects, such as the rumble of the rollercoaster and other sounds. One of the objectives in a suspense thriller is to keep the audience a little off balance, to keep them guessing as to just what is going to happen next — and so, from the time that the script was being written and, since we knew that we were going to use Sensurround, I was conceiving effective ways to use it. Sensurround became an adjunct, another directorial tool to play with, but I did not want it to be a gimmick; I wanted it to be part of the texture of the film. That's what

I've aimed for. In "ROLLERCOASTER" we have 10 to 12 minutes of Sensurround, which is not that much more or less than they had before in Sensurround pictures, but it is used for naturalistic purposes, in addition to the thrill of the rumble. Conceptionally, it didn't create problems. It gave me another element to work with in terms of how I blocked scenes and how I supervised the editing of scenes. It's interesting to note that I have run the picture without Sensurround and it works without it, as well. I mean, it's still a suspense thriller without Sensurround, but the Sensurround adds an extra dimension and provides surprises and off-balance fits and starts. It also creates a very dynamic feeling of actually being on a rollercoaster.

QUESTION: Aside from the sound of the rollercoaster, how else is Sensurround used in the film?

GOLDSTONE: It is used for other sequences in the parks, involving rides and other things. It is used for psychological, as well as physical, reasons. The audience anticipates certain things and, just as you do with a hard cut or a loud sound, I have the ability to startle the audience with a hard cut and a loud sound that also shakes them. Interestingly enough, I've tried it in a couple of places and, after one or two previews, have taken it out. In my opinion, I had gone one step too far. I had brought the audience up at one point and, as a result, it didn't work quite so well the next time. So I had to make certain directorial choices in regard to where I really wanted to get them.

QUESTION: In other words, you used the effect before you really needed it and thus killed the impact of a later use

where you did need it?

GOLDSTONE: Right. It was justified in being used at the time, but there was a letdown afterwards. There's a temptation, when you have a new tool (or a new toy — if you will) to play with it for its own sake. But I want the audience to be involved in the film, and whenever you do something that is self-conscious, in the technical sense, you run the risk of disinvolved the audience — and that I'm against. I've done 150 or 200 television shows in which I had plenty of opportunity to fool around with various effects. I've tried every trick in the book at one time or another and have come to the conclusion that tricks should not be obtrusive. They should not be noticeable.

QUESTION: In terms of the point of view of the audience — letting the camera function as the eye of the audience — would you say that you've used the camera more subjectively in this film than you would ordinarily?

GOLDSTONE: Not really. There were times when we split the focus in such a way that, if you were really going to be analytical about it, you might say that it is objective and subjective at the same time. The music is used that way too. Sometimes I want to take the audience into the head of one of the characters and music and sound are a marvelous mechanism for that. But if every film depends for its success upon audience identification with characters, then every film has both a subjective and an objective viewpoint, and one shifts from one to the other, hopefully, without the audience noticing that they are going inside or coming back outside. A director has great potential control over how the audience feels and how he alters that subjective or objective view.

(LEFT) Goldstone discusses an intricate follow shot with the operator of the STEADICAM camera stabilizing system which was used extensively during shooting. It was not employed for the rollercoaster shots, because it is not designed for such use, but was valuable for moving through the crowds in the parks. (RIGHT) Assistant follows focus with remote control device, as operator moves about with the STEADICAM.



Personally, I've done it both ways almost simultaneously in many films.

QUESTION: I was speaking mainly of trying to convey the inner excitement of being on a rollercoaster by emphasizing what a rider sees, for example.

GOLDSTONE: No — what I want the audience to do is feel what those particular people are feeling on that particular rollercoaster. It's not a side-show kind of film. I remember seeing "THIS IS CINEMERA" and being in the front seat of a rollercoaster, with a wraparound screen and all that, and it was very effective. But in this film I don't want the audience to have thrills for the sake of thrills. It would have been very easy to do, but I think it would have been very destructive to the film.

QUESTION: Can you tell me about your use of the Steadicam in "ROLLERCOASTER"?

GOLDSTONE: We didn't use the Steadicam on the rollercoasters, because it's not built for that kind of thing, but we did use it effectively for tight movement through crowds. We had it with us on maybe 40 or 50 percent of our days of shooting and we used it a good deal. We could have used it even more, perhaps, had we had the chance to test it beforehand and gotten used to it more. However, I was very happy with its use. I think it's a marvelous machine and there are a number of films I've made on which it would have been even more desirable to use than on this one. It's great for running through streets, for example. We didn't have much of that in this picture, but we did use it in the one chase sequence where there was a lot of moving through the crowds in the park.

QUESTION: Previously, in another context, you mentioned the rollercoaster crash that occurs in an early sequence of the film. Could you discuss the technical and mechanical aspects of staging such a piece of action?

GOLDSTONE: I've done a lot of dangerous things in a number of films in the past and I've certainly learned when and why people can get hurt while doing dangerous stunts. That's why I've become so cautious and by-the-numbers. I say: "Let's rehearse it. Let's talk it through again. Let's walk it through again. Now, let's make sure about this and that." I would rather go through it with 400 rehearsals than risk having confusion, because then every-



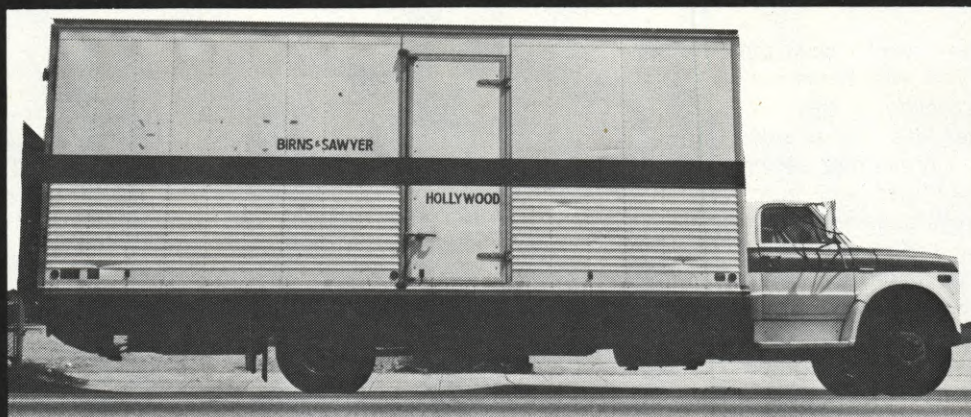
Camera equipped helicopter moves in close to follow action of twin-racing cars of the famed "Rebel Yell" rollercoaster in the Kings Dominion Amusement Park near Richmond, Virginia. No effort was spared to "put the audience in the rollercoaster seat", but director avoided obvious "THIS IS CINERAMA" thrills-for-the-sake-of-thrills effects.

body is at ease and knows what to do. Communication is a very difficult thing to establish and it's what the director is dealing with, both while making the film and showing it to an audience. The rollercoaster crash, which is the major stunt of the film and takes place in the opening sequence, was shot at night — which always magnifies the danger, because of the possibility of looking into lights or having no light to see by or misjudging distance. These are the things that happen at night. It was also very, very cold and everyone knows you're more prone to be injured when you're cold than when you're warm. But we also had wind factors affecting those cars going through the air and, as a result, we put off filming the stunt for three or four nights. Still photographers were streaming down to see us do it and we had five cameras set to roll, but we had to wait until the wind was below a certain velocity in order to do it. The famous "Whenever you're ready, C.B." possibility also existed, but all five cameras did roll during the take. Despite all our meticulous preparation, we did have some injuries and they were unfortunate, but they were the fault of the two individual stunt people. They were overtrained. Had they done what they planned, everything would have been absolutely safe,

but they tensed up so much that one man, instead of jumping to approximately between 25 and 32 feet, where everything was prepared, jumped to about 43 or 44 feet and went right over the pads and the soft sand and, of course, he broke his pelvis. He's alright now, but you never know when an injury is going to occur. Everything was on a very rational and controlled level. That's what I believe in for any kind of shooting, but certainly when you are doing anything that is dangerous. As far as camera technique was concerned, there was nothing particularly remarkable about it. It was covered so that we would have tight, medium and full shots and be prepared to make as much or as little of it as we wished in the final cut. By necessity, it happened very quickly, because that's the way such things happen, but it's all there. I did not intend to stage bloody stunts, and there's precious little blood in this film. The point is not to see the gore afterwards. It is the terror and excitement of the thing happening that are important. In certain cases, I think bloody violence on the screen is, perhaps, justified by the content of the film, but "ROLLERCOASTER" is not intended to be a violent film. As I said before, it is a cat-and-mouse suspense thriller. ■

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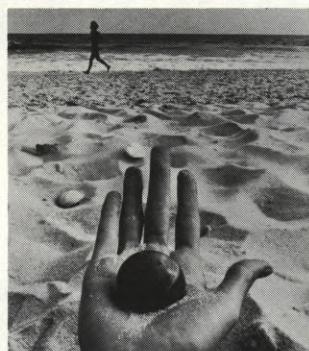
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A LABORATORY TALKS ABOUT 16MM-TO-35MM BLOW-UP PRINTING

By JOHN NEWELL

President, Western Cine Laboratories

Questions asked and answered on the current state of the blow-up art, optimum available film stocks and applicability to theatrical features

Where are we at in the art of blowing up to 35mm from 16mm? Is 16mm really an acceptable, viable alternative to production in 35mm? Does it really save any money? Is it strictly for the documentary approach or can it be used for a dramatic film? Should it be standard 16mm or Super 16mm? Reversal color original or color negative? Should the workprint dailies and sound tracks be in 16mm or 35mm? Any special do's and don'ts?

Certainly all valid key questions, and chances are every one of them will produce very vocal proponents and opponents. Much of the published information has been derived from various producers' experiences and certainly they constitute an informed base for the decision-making process. However, the motion picture laboratory is in a better position to shed some qualitative light on the final judgment. We've been down the path many times and if we can answer these questions, then certainly we should do so, even if a few toes are stepped on in the process. Not all laboratories will agree with positions taken in this article and, at the outset, we state that this is what we have found the situation to be. We are concerned with what kind of image the paying customer sees on the screen, and not with detailed technical descrip-

tions of the sophisticated laboratory apparatus that achieves it. We are equally concerned with the philosophy of film-making now, and probably henceforth.

We are in the midst of a curious situation in the theatrical film today. There are more and more screens being added across the faces of all nations to show less product. The theater owners all agree that more product is needed. With soaring production costs the major studios have had to give primary consideration to potential large-grossing films and almost complete abandonment of the simple program picture. The void, to a limited but increasing extent, has been filled by a new community of independent producers who are able to film, on reduced budgets, for many segments of the theatrical market. It is this community that is frequently concerned with 16mm as a production medium. And it is to this community that we answer these questions:

QUESTION: Is 16mm an acceptable viable alternative to production in 35mm?

WESTERN CINE: Yes it is. No hedging, no particular qualifications. YES. Any production stands on the merits of

its content. If the audience agrees that the content is enjoyable, there will be absolutely no concern as to how that content was achieved. Naturally, we assume skillful execution of the photography, sound and optical effects in either 16mm or 35mm. Too much to assume? We have not found it so. An unequivocal yes.

QUESTION: Does producing in 16mm really save any money?

WESTERN CINE: Many producers have said that by the time you pay for a 35mm blow-up, there is no real saving. We feel there is a saving of something over \$10,000.00 on a 90-minute feature shot at a 10-to-1 ratio.

Let's examine a rather loose comparison, ignoring, for the moment, sound, titles and optical effects.

16mm (7247) 3,240' = 90 minutes	
32,400 stock	\$3,294.00
32,400 developing	2,592.00
21,600 workprint 16mm (2/3 of shoot)	2,052.00
Blow-up to 35mm and 1 print, approx.	10,000.00
Total:	\$17,938.00

35mm (5247) 8100' = 90 minutes	
81,000 (8100 X 10) stock	\$14,280.00
81,000 developing	6,480.00
54,000 35mm workprint (2/3 ratio)	7,020.00
8,100 answer print (from orig.)	4,000.00
Total:	\$31,780.00

Continued on Page 652

Sample strips from features recently blown up from 16mm to 35mm by Western Cine Laboratories. In this case a "hard matte" was printed in to localize composition to the 1:1.85 aspect ratio. Some clients prefer a blow-up to full-frame 35mm, which is easily accomplished, but the client runs the risk of poor framing by careless projectionists. The author maintains that 16mm blow-up is an acceptable alternative to 35mm original production, provided that the 16mm original is sharp and clear.





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THE FILMING OF "CROSSROADS OF CIVILIZATION"

With David Frost as Executive Producer, four separate units undertake the ambitious project of filming eight one-hour documentaries tracing the full sweep of Iranian history from ancient times up to the present

By DR. MEHRDAD AZARMI

Co-producer

While having Sangak bread and sipping on white wine, as he normally did in Iran, David Frost told me about his concept of "CROSSROADS OF CIVILIZATION" in a Teheran restaurant over two-and-a-half years ago for the first time. Our executive producer, first having completed his interviews with historians, authors, political figures and academic experts on the subject, resumed his ceaseless activities in other parts of the world. Since then, my colleague, Tony Mayer, and I have been tackling numerous production problems in Iran for a series of eight one-hour, dramatic docu-

mentaries on the history of this country.

Sarah Mayer (Tony's wife), heading a team of researchers, began her work diligently. Her peculiar exposure to the Iranian culture has always fascinated me. A few years ago, she traveled in Iran in a man's clothing on a motorcycle. For several months she studied with Moslem Mullahs in Qum, the very religious center of the country. Such a school does not usually permit enrollment of women. As a matter of fact, mixing the sexes in such a class is considered quite sacrilegious. Nevertheless she took the risk and completed the course. When bidding farewell to

her colleagues, one Mullah whispered to her ear, "When you go home, don't tell your friends that you have fooled us."

Clive Irving, an author and a broadcaster, headed a team of writers to provide eight documentary scenarios.

The aim was to convey a balanced view based on historical facts for a contemporary television audience.

The history of Iran is full of invasions from the East and the West. Alexander, having conquered ancient Iran, set out for more victories in India. When he reached the Himalayan mountains in Kashmir, he thought he had reached the end of the world. Upon his return to Iran, he was upset to hear that the tomb of Cyrus the Great, founder of the Persian Empire, had been broken into and robbed of its treasures. He first went to Pasargard to repair and seal the tomb. He married a Persian girl, Roxana, and adopted many Persian customs until his death at the age of 32.

Genghis Khan was another invader. He destroyed cities and people alike. Two generations later, his grandson, Oljeitu, adopted the Shi'ith faith, the Iranian religion of the time, and changed his name to Sultan Mohammad Khoda Bandeh, meaning "God's servant". In his capital city of two million, Sultan Mohammad ordered construction of a historical masterpiece of architecture, which he hoped would serve as the mausoleum of Shi'ith Imam, "Ali". Although his wish was never fulfilled, the monument still stands as the symbol of his love for the faith of the land.

The conquest of Islam over Iran had similar results. The country created its

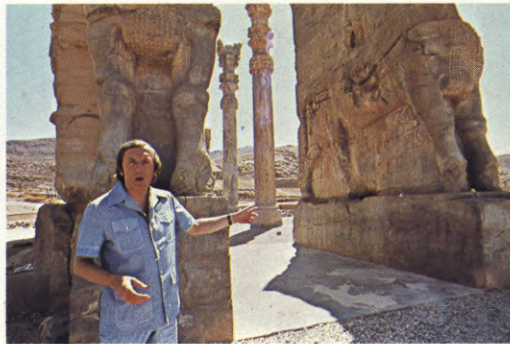


(ABOVE LEFT) The "CROSSROADS OF CIVILIZATION" First Unit films intricate bas relief carvings on a staircase at Persepolis, the magnificent palace complex largely destroyed by Alexander the Great, but still considered one of the world's archaeological treasures. Persepolis was used extensively as a filming location by the First and Second Units. (BELOW) Young paratroopers of the Imperial Iranian Army, wardrobe as ancient Persians and Lydians, square off to re-stage for the cameras the decisive Battle of Sardis fought by their ancestors 2,500 years ago.





(LEFT) An Alouette III helicopter equipped with a Continental camera mount was used for extensive aerial coverage of Iran. (CENTER) First Unit setting up to film comparison of old and new irrigation systems. (RIGHT) Two mountain climbers were hired to hoist the cameraman and his gear to a spot which the director believed could provide the best angle for filming cuneiform inscriptions at Bisotun monuments in Kermanshah. (BELOW LEFT) Executive Producer David Frost interviewing Professor Stronach, an authority on the Achaemenid period, at the tomb of Cyrus the Great. (CENTER) Frost in Persepolis. (RIGHT) Frost filming the prologue to Program VI at the golden dome of the eighth Shi'ith prophet (Reza) in Meshed.



own version of the religion and, after several generations of its defeat, managed to influence the victor by its culture, and leave its perpetual imprint on the Islamic architecture and art.

These examples over the past few thousand years show the country's talent for survival. Therefore, I find Clive Irving's selection of the Theme "Phoenix" most appropriate. The Phoenix is a legendary bird which turns himself to ashes on his funeral day.

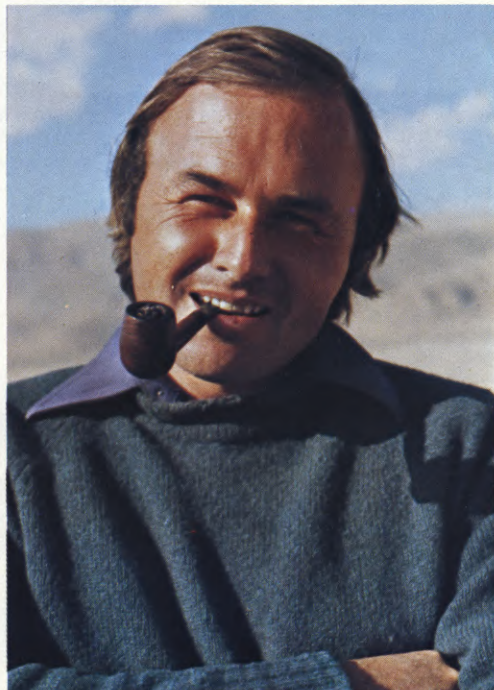
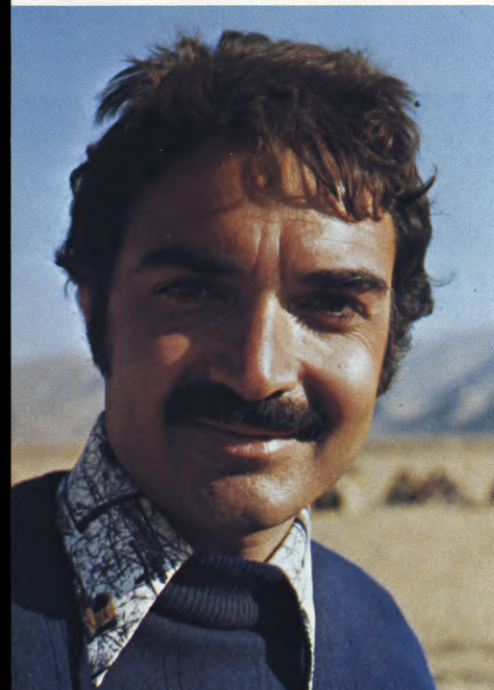
Then from amongst the ashes, rises to live again.

Because of their academic character, it was felt that reconstructing some of the historical events of the past could make the series more palatable to the general taste. Instead of filming one episode at a time, four units were formed, each to record various segments of all eight films. The first unit filmed David Frost's interviews with historians and academics;

the second unit recorded the historical objects in various museums of the world, which were related to the eight stories; the third unit photographed the historical reconstruction sequences; and the fourth unit covered the intricate aerial and ground photography related to the basic skeleton of all eight films.

Before filming each segment we started a reconnaissance of the country. The museum unit was, **Continued on Page 644**

(LEFT) "CROSSROADS OF CIVILIZATION" Co-producer, Dr. Mehrdad Azarmi, is a graduate of the University of Southern California Department of Cinema. Now on the staff of the Ministry of Culture and Arts in his native Iran, he is heavily involved in that agency's many motion picture projects. (CENTER) British film-maker Martin Hall served as Script Coordinator during the pre-production phase of the "CROSSROADS" project and became Reconstruction Unit Producer when filming began. (RIGHT) In store-bought wig, beard and colorful wardrobe, young Iranian paratrooper plays role of an ancient warrior.



FIELD NOTES FROM THE FILMING FRONT

By **TONY MAYER**

Executive Producer/Director

ISFAHAN, Iran

The moment when you are in the midst of a complex film production is the least favorable time to try to analyse it, or even to attempt to record the facts about it. Actually, although we are well over halfway through filming at this writing, it is still a less than ideal time for an overview. However, since *American Cinematographer* is locked into its press date, and I have a break day before shooting in the bazaar tomorrow, I shall attempt to report what has happened thus far.

The production of "CROSSROADS OF CIVILISATION" began in January, 1976. Of course, David Frost and I and our Iranian collaborators — led by Dr. Mehrdad Azarmi of the Ministry of Culture and Arts — had been discussing and preparing the operation for some time before that, but we began serious preparation in January.

I was fortunate in having in my wife, Sarah Hobson, something of an expert on Iran and the history of that part of the world. With her help, as head of our research operation, we located the finest experts on each of the eight one-hour films we had planned, wherever they might be. We commissioned forty-thousand-word essays from, among others, Professor Richard Frye of Harvard, Dr. David Stronach of the British Institute of Persian Studies, Professor Peter Brown of London University, Dr. Robert Hillenbrand of Edinburgh University, Dr. John Gurney and Robin Lane-Fox of Oxford. We enlisted detailed help from Dr. Shapur Shahbazi, the Director of Persepolis, from Professor Seyyed Hussein Nasr, the Iranian authority on Islam, Professor Dr. Walter Hinz of Gottingen,

Professor Jerry Clinton of Princeton, and Professor Oleg Grabar. In due time we turned over these essays, each with a mass of background data and a specialised researcher, to a team of writers of apt academic qualification. With Martin Hall as the script coordinator, Simon Raven, Colin Morris, Robert Wales, Michael Hastings, John Prebble, Don Shaw and Margaret Laing produced scripts of the highest calibre.

To develop the scripts from this stage with the help of historians, a team consisting of Martin Hall, Sarah Hobson and Rob Carter (who was now signed up as Supervising Editor), supported by Clive Irving (our Chief Writer, who had originally prepared the series outline), David Frost and myself, now produced six more drafts leading up to the shooting scripts.

The stories that finally emerged, combined entertainment and honest, probing history. Basically the stories covered first, the Medes and the Persians — and how Cyrus the Great moulded them into one of the first world empires. Second, the story of Alexander the Great, and the Parthians who followed him onto the Iranian plateau. Third the Sassanians — a remarkable Iranian dynasty who developed a style in kingship and rule that much influenced later European patterns. The fourth programme covered Islam and the coming of the Arabs; the fifth, the Mongols — Genghis Kahn and Tamerlane; the sixth, Shah Abbas who built this city called Isfahan and made it "half the world." The seventh covered the story of constitutionalism, of the confrontation between the people and their rulers. It is also the story of the dis-

covery of oil, of its development and exploitation by the colonial powers.

The eighth and last programme is to be an extended interview with his Imperial Majesty, the Shah of Iran. It is rare that such a Head of State — increasingly influencing world affairs — can be viewed within the framework of his national history. To date, His Majesty has responded most frankly to Frost's diligent questions, and with an intriguing honesty. By seeing him in the context of this long history we think the last programme will have unusual depth, and will give some unique perceptions to a western audience.

Kevan Barker, the Production Supervisor, assisted by Roger Connally, prepared schedules and budgets and by June the first crew was ready to start filming David Frost's material and his interviews with our experts throughout the major locations. The shoot lasted more than two months, with its recess, and was carried out during the hottest period of the year. I doubt that David — despite a long experience in television — had ever faced such rigorous locations. In a temperature that often reached the 120's, he climbed mountainous peaks, tunnelled deep underground in *qanats* (the traditional water irrigation system of Iran), explored 200-foot-high tomb towers on shaky scaffolding. We flew scores of hours in helicopters over some of the world's most harshly beautiful terrain, and Frost even carried out an interview with our American Islamic expert, Jerry Clinton, in the inner courtyard of the great Shrine at Mashed, where non-muslims have rarely been, let alone filmed.

As from the beginning of the

The victorious march of the Sassanians is re-created with colorful pageantry in "CROSSROADS OF CIVILIZATION". The most careful attention was paid to authenticity in the reconstruction of various epochs in the history of Iran. More than 2,000 costumes and a mass of props and weaponry were prepared with the help of the Ministry of Culture and Arts, which provided 25 of the costumes used at the 2,500th Anniversary celebrations held at Persepolis in 1971. These costumes served as prototypes for the design of the massive wardrobe required.



operation, the team was admirably supported by our Iranian colleagues. Dr. Merhdad Azarmi, our Co-Producer in Iran, supervised all our logistical needs and we completed one of the smoothest shoots I have known. We had a very strict schedule which never faltered, despite a complex programme of helicopter and road transport through some very rough landscape.

While the Frost unit was at work, with Clive Irving in support, and an experienced camera team led by Nic Knowland, and myself directing, our Museum unit was exploring the world's collection of paintings and artifacts. They were led by Canadian Director/Cameraman Bruce Parsons, who has made a number of acclaimed films about the arts.

Immediately on completion of the Frost shoot, we were into plans, research and location-finding for the next major phase of filming, the reconstruction of historical events and battles. This was to prove the biggest drain on emotional and financial resources. The Imperial Iranian Army had offered some hundreds of infantry, horsemen, horses and transport and they set up a camp on our location in a remote valley near Persepolis in Fars — the heartland of Iran. It was a magnificent location, with a variety of landscape suitable for about 15 major set-ups, a reasonably equable climate, and a first-class hotel about thirty miles away. The army provided a Chinook helicopter (seating more than forty) and a fleet of 25 vehicles to ferry our crew and support staff to the location. It was to be a massive exercise — certainly in terms of television production. We ourselves bought twenty horses for falling, and the army provided another forty, all of which were installed in a special camp in the valley, where they also organised a permanent staff of about five hundred troops. In addition to the basic crew of about sixty, who were mostly from Britain, there was also a large number of Iranian personnel, most of whom played a crucial role in the reconstruction production.

Supervised by Martin Hall, who now took over as Producer of the Reconstruction unit, Tiny Nicholls, the Wardrobe Master, and Fred Harrison, the Property Master, prepared 2,000 costumes and a mass of props and weaponry, with the help of the Ministry of Culture and Arts who provided 25 of the costumes used at the 2500th anniversary celebrations at Persepolis in 1971. These costumes were to serve as prototypes.

Dennis Postle, Martin Hall and Mike



In the historic battle between the Romans and the Parthians, the Romans adopted the unique defensive tactic of forming a miniature "castle" made of their shields, in order to protect themselves from the arrows of the enemy. The point of view of the Romans was filmed from a bunker around which the Parthians charged on horseback, attacking with bows and arrows.

Davis have talked or written elsewhere of the tribulations and achievements of the Reconstruction unit, which recently completed its filming. Let me note simply that it was a triumph of collaboration on several levels. Imagine the impact on a remote region of southern Iran of not only a crew of around a hundred, but also an army camp built to house the extras, a parade ground where soldiers appeared carrying shields and wearing Roman skirts for rehearsals supervised by British and American dons, a corral containing scores of horses, a herd of camels trained and controlled by a 12-year-old boy, a large transport contingent and giant helicopters, and you get some idea why this production is singular.

Imagine further the communication problems between people of very different cultures, language and nationality, and the problems of communication between main-line feature technicians and documentary television technicians with their separate disciplines. What we wanted Dennis Postle and his team to achieve was excep-

tionally difficult, and it is a measure of his ability and personal charm that he appears to have achieved it.

What we didn't want — for that would have been right outside the documentary idiom of the series — was simply a series of perfectly executed dramatic actions. Of course, the hits and falls had to look genuine, but we were also groping for documentary truth . . . apparently observing the facts about, say, an army on the move 2,000 years ago, as though the camera were shooting newsreel.

An example: the team filmed, documentarily, the life of a village just before an attack by a group of thirty of Genghis Kahn's Mongols on horseback. The incident would have taken place during the 13th century. The villagers were real villagers, going about their work the way they largely have during many centuries. The Mongols were a group of Turkmen, part of a gentle community who had moved down to the region from northern Iran a few years ago. They quali-

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PHOTOGRAPHING 2,500 YEARS OF IRANIAN HISTORY

By **MICHAEL DAVIS**

Director of Photography, Reconstruction Unit

I want to make it clear that on the "CROSSROADS" series as a whole I am Director of Photography of only one section. That is the Reconstruction unit, which basically is concerned with the reconstruction of events which occurred in the history of Iran.

I suppose the best approach to discussing the problems we had and how we tackled them is to first describe my background as a cinematographer, because it is strictly relevant. I started out a long time ago in documentaries, all sorts of documentaries, but mainly for television. Later I began doing commercials (quite a few of those) and photography on four or five small features, low-budget things. I also did second unit photography on some bigger features.

This particular project has a feature structure in that we've got hundreds of extras, with the attendant problems of wardrobe, props, makeup and hair. We are also shooting very ambitious sequences involving horses and wranglers. But the amount of time we have in which to do it, and the style and

flavor we wish to inject into it, have demanded a documentary approach. However, I don't think a pure documentary set-up would be sufficient to handle it. What we've got, actually is a combination of a feature style and a documentary style. That's a sometimes uneasy combination, but at other times it's absolutely magic, because you can set up a structure as you would in a feature — with planned movement and action for a specific sequence — and then, within that framework, you can let it hang a little loose, because you are working with people who are not trained actors — like the Iranian Army people we are using as extras. They are not going to react very well to direction, because they don't understand. They are not trained for that. So, within such a structure, a lot of interesting and sort of impromptu things are going to happen. Some of those things are rubbish, but some of them are magic.

On this project we are working with many non-professionals who are kept in line by a handful of very highly skilled

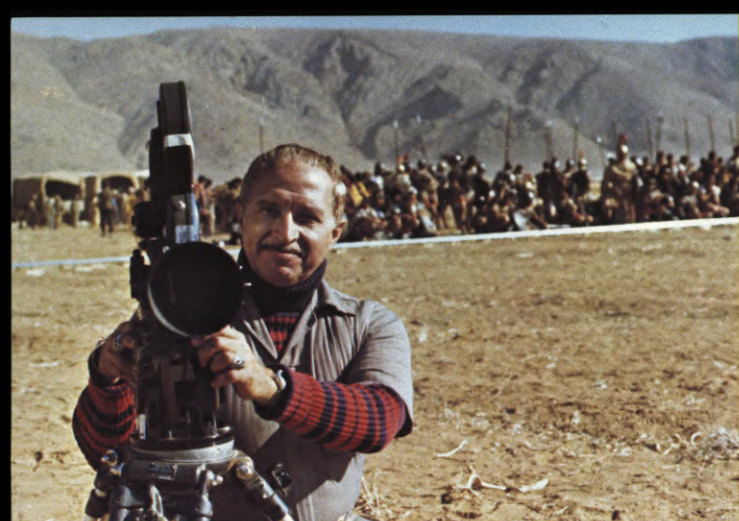
professionals. For example, you might show 50 soldiers who are beating hell out of each other, but within that group there are six trained stuntmen in the same costumes who are doing it right. As you move in toward the 50 soldiers who are beating hell out of each other — but who are not very convincing — you narrow down to the trained guys who know how to work on a fight and present it to the camera. I find that stuntmen are amazing. They have this incredible air of not particularly caring about cameras, these big tough guys, but if you put a camera in a remotely controlled position (without a cameraman, because it's too dangerous), the stuntmen will play right to it. They will come off their horses and go *bang!* and roll over the camera. They will practically put their horses right on top of it.

Here we have a few professionals who are working among people who are not professionals, but who are simply having a bit of fun beating hell out of their friends. The professionals keep it just a bit tight, so that it doesn't go to complete chaos.



(ABOVE) The duel between Ardashir and Ardavan (two monarchs) signified the handing over of power from one dynasty to the next without a war. The battle between the two lonely combatants was staged on a desolate plain near Persepolis and filmed from a helicopter. (BELOW) Opposing armies of ancient Persians and Lydians are arranged in position for an historically accurate (except for the number of troops involved) restaging of this decisive clash. Extensive dolly tracks permitted the camera to move into battle alongside them.





(LEFT) Backed up by hundreds of ancient warriors (and a few modern location trucks), *American Cinematographer* Editor Herb Lightman prepares to film the reconstructed Battle of Sardis in Tang Bolaghi. Having had the camera shoved into his hands almost before getting off the airplane, he was delighted to work again with Director of Photography Mike Davis, a fellow veteran of four Olympic Games shoots, and flattered to be assigned the key camera for several scenes. **(RIGHT)** Young Iranian cavalymen play horsemen of a far distant era.

Because we are working with untrained people who cannot repeat an action precisely, we usually have to shoot with multiple cameras. We brought along six cameras, but one got destroyed. It was one of Michael Samuelson's "indestructible" GSAP cameras, but somehow six of the Iranian Cavalry, dressed as Mongols, managed to stamp it into the ground. However, the report we got back from London said that the shot is amazing, so maybe it was worth it. We've got five cameras left, which means that on every set-up that is sort of unrepeatable there are at least two cameras and

sometimes four.

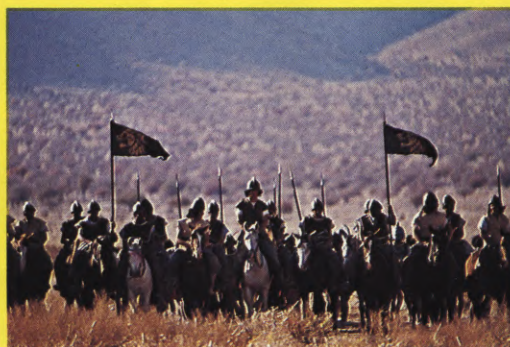
We work with a camera crew of five. Besides myself, there is an operator, two assistants and a grip. Obviously that's not enough crew to run four cameras, so when anyone who has had this kind of experience happens to be around, he gets roped in to help out. For example, when Herb Lightman was visiting the set for a few days during filming of the battle sequences, almost before he got off the airplane we shoved a camera in his hand and away he went. Aside from seeing an old friend, it was a great privilege to have someone of his skill and experience

working with us.

If I had to describe the photographic style of this project it would be very difficult to do. As a cinematographer, I feel that your style is something that other people tell you about. Most often you do something in a certain way because you feel it should be done that way — but as for putting a name to the style . . . I tend to leave that to other people. I'm very conscious of the use of light and composition, but then, so is every cameraman. In this particular instance, where we are trying to conceal the fact that the action sometimes isn't all it could be (because we are using



(ABOVE) Filming the furious action of the reconstructed Battle of Sardis. In ancient times, the King of Lydia initiated an attack on Persia and was forced to retreat to Sardis, his capital city. It was in the outskirts of the city that, much to his amazement, he found his army being pursued and ultimately defeated by Cyrus, the founder of the Achaemenid dynasty. **(BELOW)** In classic battle formations, Parthian archers and Roman cavalry clash in another carefully reconstructed conflict.





(LEFT) Closing his eyes against the blowing dust, Reconstruction Unit Director of Photography Mike Davis turns away momentarily from the massed troops he is about to photograph. Ironically, the dust proved to be his photographic ally, since great back-lit golden clouds of it helped conceal the sparsity of troops and lent an archaic aura to the battle sequences. **(RIGHT)** The camera, on a tiny Elemack dolly, tracks the troops right into the thick of the fray.

untrained people and don't have time to repeat things), there is a tendency to make use of the dust that is everywhere here. I always have it back-lit, because that gives it a special flavor. It looks dramatic with clouds of back-lit dust rising up. Also, when you're supposed to have 10,000 people in the scene and, in fact, you have only 300, you can get a lot of people in front of the camera and then let them gradually disappear into a cloud of golden dust. It's very, very lucky for us that we can do that.

In one particular sequence that we did there was supposedly a group of Roman soldiers being surrounded by Parthian horsemen and having arrows shot into them. Now, the problem was that we had our square of about 50 Roman soldiers, but there was no way you could surround them with only 50 Parthian riders, because they wouldn't go all the way around the circle. Without the dust you would have had a little group of riders going around a little group of men. But by shooting it at the right time of day — with a strong, low

sun back-lighting the whole subject — in the very wide shot I was making, it was very hard to distinguish the actual riders. What you could see was a great rising cloud of back-lit golden dust gradually circling around these people like an enormous caterpillar. It rose higher and higher until the Romans were obliterated — not by the arrows, but *cinematically* obliterated by a great cloud of dust, as if they were in the center of a tornado.

In some ways this assignment has been quite easy because, in addition to the people and the marvelous scenery, there is the fact that each sequence is a separate entity in itself — and none of them lasts more than ten minutes. I hate to admit it (because I'd like to feel that I'm doing a big movie), but what we are really shooting is a series of long commercials. In other words, we try to get things to look as marvelous as possible, but we don't have to worry about matching the reverse angle of something we shot two weeks before. I would say, then, that this project relates less to feature production than it does to a

combination of documentary and commercial shooting. The most difficult part of photographing a feature is having to retain a consistency of style throughout an hour-and-a-half subject. I remember that when I was a humble focus-puller, a cameraman said to me, "Basically, it's not all that difficult to light a big picture — to light each individual scene. The difficult thing is retaining a consistency of style and feeling over that long a period."

We are shooting this series in 16mm, which means that we can afford to be a bit careless with stock. I would like to shoot in 35mm, because so much of what we shoot — those wide vistas with composed action moving through and down and around — would look so lovely on a big screen in Panavision or something like that. But 35mm would limit us so severely in terms of cost that we wouldn't be able to afford to run the number of cameras we've been running or shoot the amount of stock we've been using. Ordinarily, 16mm also means greater mobility, but in a situation like this where you have to

(LEFT) A jarring anachronism in the carefully reconstructed world of the ancients is this giant Chinook helicopter about to land at the remote filming location near Persepolis. Capable of carrying forty people at a time, the huge aircraft saved many hours of travel over almost non-existent roads by ferrying the cast and crew in and out of the location daily. **(RIGHT)** Another anachronism — hundreds of feet of dolly tracks, to provide fluid coverage of the advance of ancient warriors.



wait three hours for props, hair-dressing or until everyone gets their particular thing together, the budget factor of mobility is cancelled out. Basically, it's the cost of the stock that's important and we can afford to shoot a lot more in 16mm.

We have been using the Aaton as one of our cameras on this shoot and I have a few comments on that. Basically, we've seen a whole generation of 16mm cameras that started off with the Arriflex 16BL and Eclair NPR. Later came the Eclair ACL and the CP16. They are of a generation that was designed to meet the requirements of a particular section of the film industry of 15 years ago. They have worked — and still do work — extremely well, but I think that as the industry has gained experience and made new demands on that sort of equipment, there has arisen the requirement for a new generation of cameras to match the new demands of the industry. So far there's only two cameras — the Arriflex 16SR and the Aaton — that meet those demands, and it seems to me that the Aaton fits the bill especially well.

This particular Aaton camera that I've had was one of the first off the production line, and we've had it out here now for two months, using it under the most rigorous conditions — dust and dirt everywhere all the time — and it has performed superbly. It hasn't given us any trouble at all.

We have fitted our Aaton camera with the prototype of a new 16mm, f/2.2 Varitol zoom lens that goes from 9mm to 50mm. The quality of this lens is superb. In fact, one of the problems I have is that the quality is noticeably better than that of the older generation of zooms on the other cameras and I've had to knock down the definition of my Varitol with a light fog filter in order to equalize the difference. The effect of a light fog, I know, is not the same as having a lens which does not have such good definition, but it moves it in that direction and brings the two a bit closer together. Also, I'm being very careful to use the lenses on the other cameras to get content that is different from that being shot with the Varitol, even though the basic action is the same. The result is that even though the respective definitions of the lenses may be different, the ways in which the subject matter is rendered makes comparison of the lens definitions rather difficult.

There are a lot of features of the Aaton that I like very much. It has a mount which is basically a Mitchell-type mount, but which is superior to other Mitchell mounts; you don't have to twist the lens around to get it in and out. The viewfinder system, which is quite



Master still photographer for the "CROSSROADS" series, Peter Carapetian, shown on location at Soltanieh Monument near Zanjan. In connection with the release of the series, a book is scheduled for publication which will feature text by Chief Writer Clive Irving and photographic illustrations by Carapetian.

sophisticated, you can twist around all sorts of ways and fiddle with it and it always ends up right. I like the fact that the battery clips onto the camera body itself, so that you don't have any leads or batteries hanging over your shoulder. But mostly I like the fact that the Aaton *feels* right. It feels *righter* than other cameras, because the weight is in the right place and it fits onto the shoulder really well.

It has been a continuing challenge throughout this assignment to film the various ancient battles distinctively, avoiding a sameness of approach. I've already described our symbolic approach to the battle between the Romans and the Parthians in which there were hundreds of men involved. But for another sequence, repre-

senting the clash between the armies of two kings, we dressed two people up as kings and put them in the middle of a vast empty plain ringed by mountains and we shot the entire action of the two men fighting from a helicopter circling above.

We represented the death of Genghis Khan by placing a horse and Khan's banner of yak tails on a hill that was very strongly back-lit, in such a way that the horse's hair and tail and the yak tails on the banner all glowed with back and rim-light against a completely shadowed wall, so that you got this image in front of black. Lovely stuff, but relatively easy compared to the battle we are doing now. In this one, a massed clash between ancient Per-

Continued on Page 646

The ordinarily good-natured young paratroopers of the Imperial Iranian Army fell to with a vengeance, when given the command of "Action!" for the filming of ancient battle sequences, often leaving the battlefield strewn with real (though usually minor) casualties. There were, however, several fractured arms and legs, mostly due to falls from horses.



OF CAMERAS, CAMELS AND MODERN-DAY MONGOLS

By DENIS POSTLE

Director, Reconstruction Unit

The series to be known as "CROSSROADS OF CIVILIZATION" consists of eight one-hour films, with the filming being done by four separate units. The unit of which I am the Director, the Reconstruction unit, will be responsible for 60 to 80 minutes of the total footage and is devoted to the cinematic reconstruction of various ancient events which would otherwise be impossible to deal with.

I have seen several films of this type

that have been made in England and they have always lacked the enlivening possibility of showing the battles that happened in various historical spots. For example, they'll be taking you around Greece or Italy and a narrator will say: "Now, in this valley 2,000 years ago, 80,000 troops came in from the left and 100,000 came in from the right, and just down there where you see the buildings they fought each other." All this is visualized with a sort of tradition

of smoking cannon mouths, people waving flags and running toward each other, and that sort of stuff.

I've never had any interest in that approach; it's been the kind of thing to avoid. Fortunately, the decision was made to avoid it, so there isn't a foot of that stuff in "CROSSROADS". The action is explicit to the point that it needs to be explicit. If you need a king, you have a king. If you need a battle, you really have a battle, and so on.



(LEFT) Those in the chow line at the Tang Bolaghi location were treated to a *smorgasbord* of exotic delicacies brought in from a restaurant in the nearest town — which was a considerable distance away. (CENTER) Lunchtime included a *siesta*, during which the young soldiers usually engaged in spirited songs and dances. (RIGHT) How an ancient battlefield looks when the warriors are out to lunch. (BELOW) Camera and sound crews surged right into the thick of the fray during filming of the knock-down-drag-out Battle of Sardis.



(LEFT) A seasoned stunt coordinator from London teaches a young Iranian paratrooper how to fight hand-to-hand convincingly, as his ancestors did 2,500 years before. Highly experienced and skilled professional stuntmen were mixed in with the green troops during the battle sequences and the cameras centered on their action. (RIGHT) A bit of horseplay relieves the pressure on a tedious location. Reconstruction Unit Director Denis Postle (left) shares a laugh with his Director of Photography, Mike Davis.

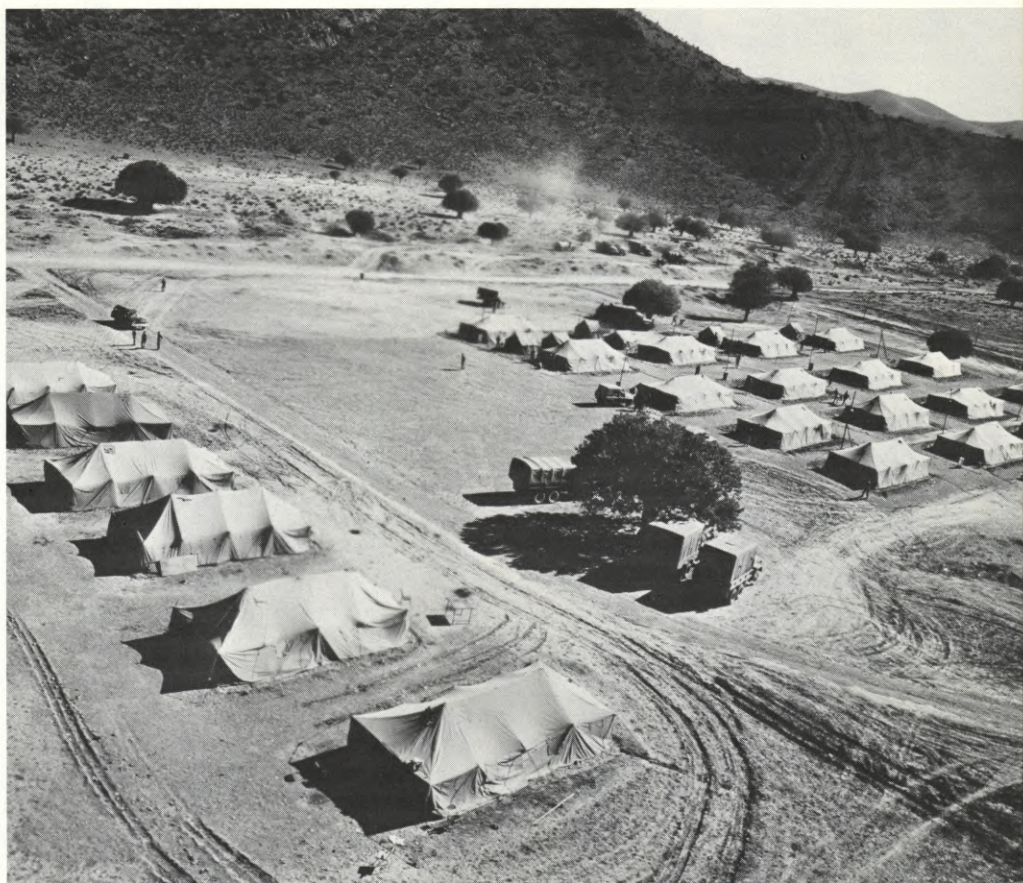


There have been unavoidable limitations in certain cases, such as the sequence in which the Romans fight a battle with the Parthians. The Parthians were the only people who ever successfully beat the Romans. They did it several times and, in the battle that we were trying to suggest, the chief of the Parthians had 10,000 camels on his side and 80,000 cavalry. The Romans had 65,000 cavalry and 20,000 foot soldiers. Obviously, nobody is going to film on that sort of scale, so what we've really done, in fact, is step aside. We've done it as a diagram of the strategy, so that it is explicit but only about certain things. We've limited ourselves in certain ways in order to do something sensible.

It's been quite a performance to keep everybody's mind on that, because there have been scenes written which suggest that Alexander's army came out of a cleft in the mountains and spread across a vast plain. No one has to look at that and say, "Can you do that? How many people do you need to do that?" The view was taken that even 5,000 people wouldn't be enough to do that. So you don't do that at all, in my view. I think it's a matter of directing your resources toward where they can work best, and I think that's a truism that can be applied to any sort of filming.

I've coined a phrase for what we are doing here. It has involved a lot of "judicious concealment", which is to say that, on this kind of thing, there are never enough people. Nor could you ever have enough well-made props — properly sharpened swords, for example. Of course you can't have real props. If you give them real props, people will kill each other — so there has to be a point of balance. But the crew has been under a lot of pressure to achieve this "judicious concealment", so that the attention is drawn to what one wishes the audience to see, rather than what is actually there. It's a way of making more out of what you have. It's not a matter of concealing what is bad so much as having something good, but introducing a certain amount of ambiguity so that you can't quite see everything about it.

In working with the Iranian Army we have been delighted to find that the discipline is very firm — except when the Major goes off for a day's holiday; then things tend to slip a bit. But when he's been here — which is most of the time — it's been very good. Given that, we found that we had to work things up a level at a time. You don't just ask people to do 11 separate things — particularly if they involve running, stopping, changing direction, shouting



A camp was established by the Imperial Army of Iran to accommodate the large number of troops participating in re-enactment of various segments of Iranian history. Despite the fact that military discipline remained as rigid as ever, the young soldiers enjoyed the assignment and threw themselves into the battle sequences with almost too much vigor.

and then hitting. First you have them move forward to get them used to that. Then you get them to carry themselves in the way you want them to — like aggressively, for example. Then you introduce something for them to do when they stop. You do it a bit at a time. You don't ever tell them five or ten things at once. The few times we've tried that have ended in instant confusion — I mean *complete!*

Then, of course, there is the language thing. By now I've almost forgotten what it's like to work without interpreters. Getting past that barrier also depends upon having really good assistants. We have had with us at various times two Iranian assistants who are from American film schools and who have been there for years and years and years. This is their first sizable assignment since returning to Iran and they have been most helpful.

There are certain advantages to working with an army. One of the more extraordinary circumstances is that you can ask people to lie on the ground and play dead and stay there for an hour-and-a-half or two hours, if it is really required.

In the village that we chose to be the site of the Mongol massacre the sit-

uation was quite different. Here we needed to have non-actors (the villagers) playing themselves, mainly because it was their village and one can't just introduce strangers willy-nilly. Secondly, it was quite obvious that the people who lived there were, in many respects, very like their forebears and that their life-style hadn't changed very much over the centuries.

Now, it's one thing to work with the Army, because you can give orders and those orders will be obeyed. For example, during shooting of the very large army-on-the-march sequence that we did, in which the Sassanian army was being portrayed as returning from a battle against the Romans, with a lot of Roman prisoners, it was a rather cool and cloudy day. With an army you can tell them to do what you need them to do, so we marched them in a circular route through the river ten times, I think, in an afternoon. And while the soldiers weren't too pleased about it, they did it.

However, it becomes more interesting in a situation where one works with people over whom one doesn't have that kind of control. The villagers we proposed to have in our film were

Continued on Page 658

THE MAKING OF AN ODYSSEY

By CLIVE IRVING

Chief Writer

British television has a distinguished record of series which cover great historical themes — "CIVILISATION", "AMERICA", "THE WORLD AT WAR", "THE ASCENT OF MAN". All these were models of their kind, using television to widen the experience and knowledge of the audience without in any way being dull and didactic.

What makes *Crossroads of Civilisation* an important stage in the evolution of films of this kind is that it steps firmly outside the western orbit and into a new perspective of world history. There is an invisible, and to some extent flexible, line on the world map which divides east from west. This has always been there, a division of experience, outlook and cultures. But today the west is suddenly more aware of and concerned by this divide than before because its own welfare is directly influenced by it — as the 1973 oil crisis so pointedly showed.

So here is an intriguing alliance — a western creative tradition adapting itself to an essentially eastern subject, the story of what has concerned one of the most influential periods in the long history of man. The series is, in a real sense, an odyssey, a journey made through 3,000 years of history and across some of the most spectacular landscapes in the world.

When we first considered the scope of this story there seemed an obvious danger. How could any one person be "The Expert" on such a broad canvas? What Lord Clark did for 'Civilisation', a personal *tour de force* of narrating

Massed archers, actually young paratroopers of the very modern Imperial Iranian Army, fall under the spell of the distant past in the very areas where their country's colorfully dramatic history unfolded. Few nations boast a background with such lush built-in cinematic potentialities as does the ancient Persian empire of Iran. The "CROSSROADS" crew took full advantage of these elements.

a cultural history, simply wasn't credible in this case.

We came to two solutions. The first was that although one person was desirable as the focus of the series, it should be somebody without any pretensions as an expert. Instead, it should be somebody operating in the idiom of the television reporter, the intermediary between subject and audience who pursues the story on behalf of that audience.

Who better to fit such a role than David Frost, that man of infinitely wide curiosity in the pursuit of information with a gift for making the most complex issues accessible to the majority?

The second solution flowed naturally from the first: that Frost, using his natural gifts as interviewer, should take historians to the places where their own speciality lay, and there interview them *in situ*. If it worked, this technique promised a marvellous combination of expertise and the drama of locale.

With this technique developed, the scripts were planned first as a series of themes, the strands of which would run through eight 50-minute programmes as the binding agents to a very diverse and rich tapestry. Frost would work these themes through his interviews and clarify them in statements punctuating the narrative.

Three principal themes sprang from the story. The first was the way in which the ancient east and the Iranian plateau have been a catalyst of civilisation between the worlds of east and west. The second was the extraordinary resilience and gift for survival of a part of

the world which, because of its position, had to endure some of the most devastating invasions in history. And the third, a rather salutary theme for all of us making the films, is the way in which the traditional western view of history has neglected and distorted the impact on all our lives of events in this epic arena.

With the themes emerging, we had then to consider the techniques available for telling the story. The core of the programmes was clearly Frost's material, but this needed careful expansion and visual endorsement. We decided on three additional strands of filming. Two of them, what we called "the Main Unit" filming landscapes, buildings and the diverse life of the people, and "the Museum Unit" which filmed archive and artifact material, were obvious requirements. The third, what came to be called "Reconstruction", was perhaps the most creatively adventurous.

This was a case of discipline and imagination, not always happy bedfellows. The discipline was a measure of constraint on our part. Given the resources to recreate major battles and events in the narrative, we chose to avoid characterisation and dialogue. Instead, we envisaged a metier not dissimilar from that of the television newscast, as though our camera was a witness to events without intruding into dialogue.

What we wanted was authentic detail: the tactics of a battle, the temperament and motivation — religious or political — of the combatants, the costumes, weapons and equipment of the time and, above all, a sense of the unstudied *reality* rather than a theatrical veneer. In this way we wanted the "Reconstruction" sequences to give our audience an intimate participation in the most exciting episodes of the narrative without the distraction of acting.

Ironically, to be able to meet this objective we needed to use technicians and stunt men who normally work in the feature film medium, and to whom our self-imposed constraint of avoiding the thespian seemed at times to be peculiar. We needed their skills, but we denied them the familiar resolution of Ben Hur or James Bond.

Intriguingly, the blending of all these strands — Frost's personable interrogations on location, vivid photog-

Continued on Page 642



FROM THE FILMING FRONT
Continued from Page 629

fied because they could ride horses and because they were distantly related to Genghis Kahn's Mongol hordes. But ask them to act like some of the worst villains in history, and ask the villagers to act convincingly dead, when speared or shot by arrows, and you have another problem. So we mixed in a superb team of nine stuntmen from London, led by Eddie Stacey, and Alan Whibley produced some devastating special effects, and it will look fantastic . . . what Grierson called "the creative interpretation of reality." But it caused a lot of heart-searching, for in a series like this, the truth of a situation, the documentary reality, must be your anchor.

In any event, that part of the project is over now, and most of the crew have returned home. The next phase is already well under way. My own crew — what we call the Main Unit, which is filming the bulk of the eight programmes throughout thirty-odd locations — left Persepolis just as the Reconstruction unit was wrapping-up. We began the first two weeks of our shoot in the same area, where there was much general material to be shot.

It's bound to be a fascinating journey through extremes of landscape and climate. On Monday we travel to Kermanshah to film the Kurdish people, and some of the more remote archeological sites. Today's news was that the temperature there was an unbelievable 25 degrees below, yet within three weeks we will be in Bandar Abbas, where it will probably be above 100. We'll be filming in old bazaars, on

the tops of mountains, we'll be filming the nomads, and we'll be in ancient religious centres.

Cameraman Mustafa Hammuri has also to cope with a considerable amount of aerial work, using Helicopter Air Service Alouette Three's. When considering the schedule, Hammuri recognised the need for extremely light equipment that would be totally reliable. He also required a high-speed zoom lens to minimise lighting problems for electrician Larry Prinz. He settled on the new Aaton camera, which Nic Knowland had used so successfully during the Frost shoot . . . and the Varitol lens. During a long experience of aerial photography, Hammuri has used most of the available mounts. He decided on the Continental, which has so far proved to be a brilliant choice — tracking us through the heaviest turbulence over two-thousand-foot precipices with the steadiness of an oil tanker.

The team is equipped with thermal gear for the snow regions, ropes and zip tower to climb to inaccessible rock carvings, and a travelling office of research data, managed by Karla Erlich. Her job is particularly strenuous, since she has to keep track of material that covers eight hours of cut film.

Back in London, Supervising Editor Rob Carter and Research Head Sarah Hobson are already collating the first massive segment of processed 16mm film that will finally amount to more than 180,000 feet. The main editing operation, using about six editors, will start when the Main Unit filming is complete, and Clive Irving — who is travelling with the crew — will be under heavy pressure to write in his commen-

tary. David Frost, too, will be standing by to complete his studio presentation in London, and to patch in the factors we may have missed on location.

It's a fascinating exercise, both from the point of view of technical challenge, and creatively. It's rare in our industry that one can have such freedom to explore another part of the world, another people and another history, in such depth and with the advantage of such resources. I take my hat off to our Iranian colleagues, who have so doggedly come to terms with the abrasive and frequently disruptive nature of western television production technique. I am grateful to His Excellency, Mr. Mehرداد Pahlbod, the Ministry of Culture and Arts, and to his colleagues, Mr. Kheradmand and Mr. Honarvar, for the facilities they have offered.

I salute my Co-Producer, Merhdad Azarmi. And above all, I salute the 180 film technicians and historians who have worked and are continuing to work as a team towards a common and worthwhile goal.

Perhaps there's an interesting symbolism in the Main Unit, which is a microcosm of the whole. We have twelve unit members — if you include helicopter pilot Pierre Carbonne and Peter Carapetian, the stillsman. They come from Iran, Jordan, America, Britain, India, Germany, France, and Armenia. ■

(ABOUT THE AUTHOR: Executive Producer and Director of the Series, Tony Mayer, has produced, written and directed a number of documentary films for television and the cinema. He has worked mostly in what are called the "developing" areas of the world.)

Ancient and modern civilizations come together during the filming of "CROSSROADS". (LEFT) The tents of nomadic tribesmen, appearing much the same as they must have thousands of years ago, stand in the valley of Fars near Persepolis, the heartland of Iran and site of 15 major locations used in the filming. (RIGHT) In the same valley, a huge Chinook helicopter, seating more than 40 people and provided by the Imperial Iranian Army, stands ready to ferry cast and crew after a hard day's shooting. This ferrying operation eliminated four hours of driving daily over almost non-existent roads.



BOOK REVIEW

MOTION PICTURE CAMERA & LIGHTING EQUIPMENT — Choice & Technique, By David W. Samuelson, A Media Manual, Published by Focal Press Limited, London and New York

In these days of mushrooming film schools and a wildly proliferating interest in the techniques of film production, the market continues to be flooded with how-to-do-it books on the subject. Yet, in the practical sense, very few are worth the varying quantities of blood, sweat and ink which have been expended in bringing them to publication.

A happy exception is this gem of a soft-cover manual by David W. Samuelson. The first of an in-the-works series of four texts covering every aspect of the art and science of cinematography, *Motion Picture Camera & Lighting Equipment — Choice of Technique* deals with the cameraman's working tools, and does so in exhaustive (but not *exhausting*) detail. Indeed, one of the joys of this handbook is its down-to-brass-tacks economy of language. It wastes not a word in giving the reader absolutely practical information. Every syllable counts . . . literally.

Fortuitous, too, is the book's format, a standard of the Focal Press Media Manuals. There are, in this instance, 220 pages, divided half-and-half between text and illustration. Each left-hand page discusses, in text, a separate phase of the subject — while the facing righthand page is devoted to exquisitely articulated line drawings that very clearly illustrate that particular subject matter. The reader has the instant opportunity of seeing exactly what everything looks like that is under discussion.

The range of subject matter covered in this relatively small, handbook-size manual boggles the mind. It starts off with the all-important subject of Choosing a Camera. Then, rather than making specific recommendations, it breaks the basic motion picture camera down into its various components, discussing each separately, so that the reader will know which features to consider in making a choice. The author deals with such elements as: The Camera Movement, Registration, The Shutter, Viewfinder Systems (Reflex and non-Reflex), Aperture Plate, etc. He then moves into a very in-depth discussion of lenses, dealing with every possible item which

must be considered in the selection, care and feeding of such.

Moving right along, Mr. Samuelson deals with Camera Accessories (Magazines, Motors, Batteries, Heads, Tripods, etc.) He then breaks all of the currently-in-use professional 16mm and 35mm motion picture cameras down into groups and lists them according to major characteristics.

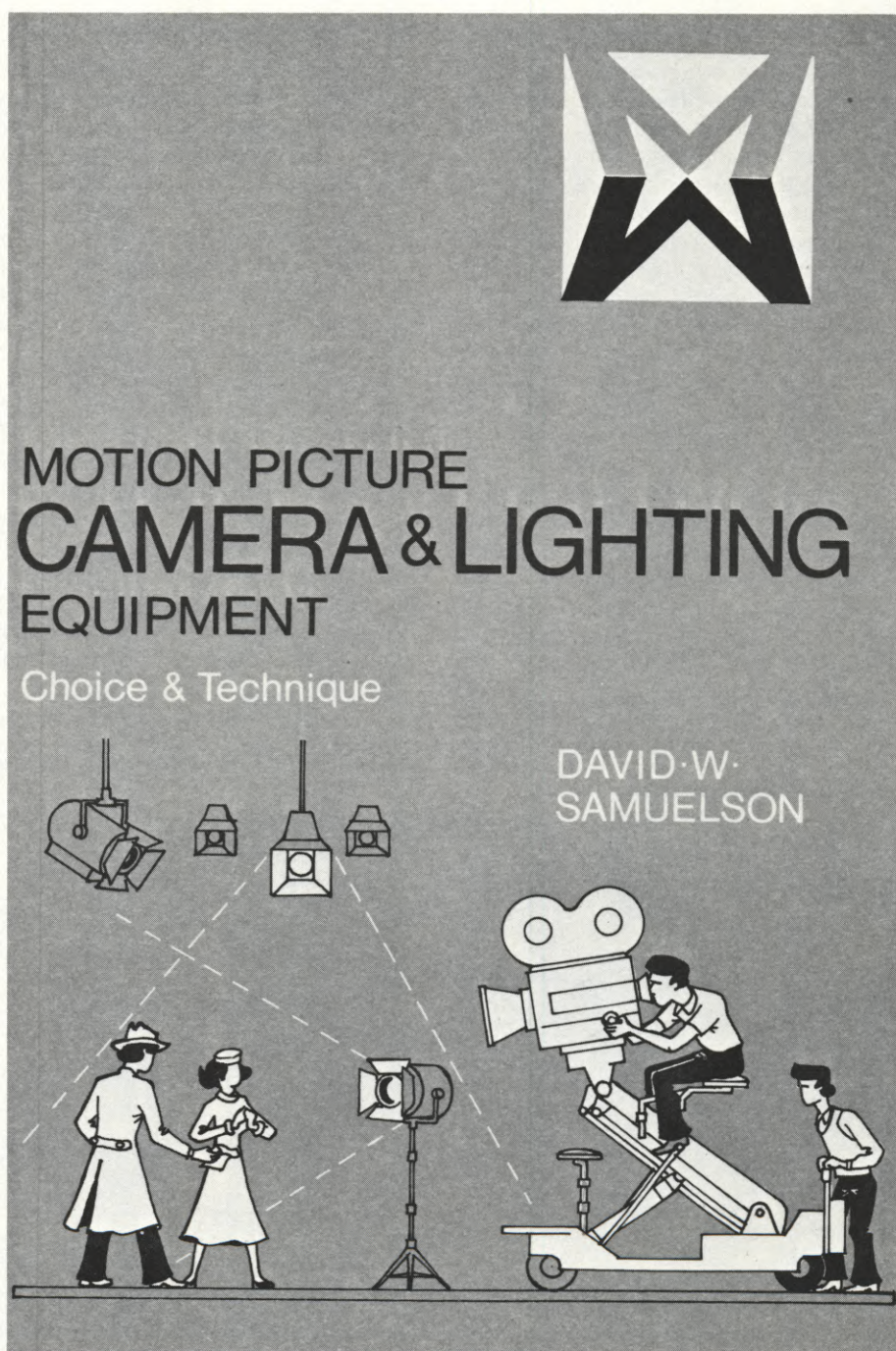
He next gets into dollies, cranes and tracking vehicles, and continues on to discuss Meters (for both Exposure and Color Temperature) and Filters in every conceivable professional application.

The entire final third of the book is devoted to lighting equipment — and "devoted" is exactly the right word. Every type of lighting applicable to

professional cinematography is thoroughly discussed, with special attention being given to the relatively new HMI (Metal Halide) equipment.

Motion Picture Camera & Lighting Equipment — Choice & Technique is that rarity among publications, a book which the working professional (or serious cinema student) can take in hand and actually use in his day-to-day activity. It has the tremendous advantage of having been written by a man who has been a working cameraman during most of his professional career — and who still keeps his hand in, when other duties permit.

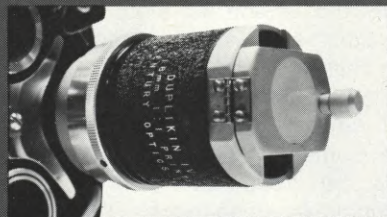
The writing of this book — and the sharing of his considerable expertise — was a labor of love. And it shows. ■



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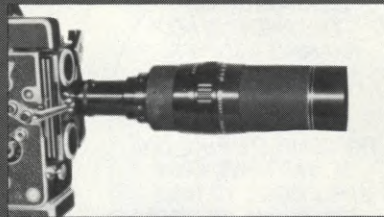
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The ultra-compact Angenieux 17.5-70mm T2.5 zoom lens is shown mounted on a CP-16R reflex camera. The matching retro-zoom attachment screws into the front of the lens, converting it to a wide-angle 12.5-50mm T2.5 zoom lens.

in the car for the fateful ride.

The director calls for the cameras to roll, the scene is slated, and on "Action!" a release is tripped causing the car to go hurtling down the chute. I follow as the car careens through the sign and the riders spring out in mid-air. Something has gone wrong. As I hear the director call "Cut!", I have the Scoopic, resetting focus as I run in.

Two of the stunt people have been badly hurt. I film instinctively as they are carefully placed on stretchers and gently carried to an ambulance that has appeared so quickly that, for a time, I believe it to be part of the action called for in the script. Daheim explains that the intense cold and nerve-wracking postponements have adversely affected muscle coordination. One stuntman, concerned with the concrete, has over-compensated and sprung too far, landing on the hard-packed sand. Daheim is visibly shaken, as is Goldstone.

When he has satisfied himself that the injured people are being cared for, the director returns to his closeups and reaction shots and we continue to film them.

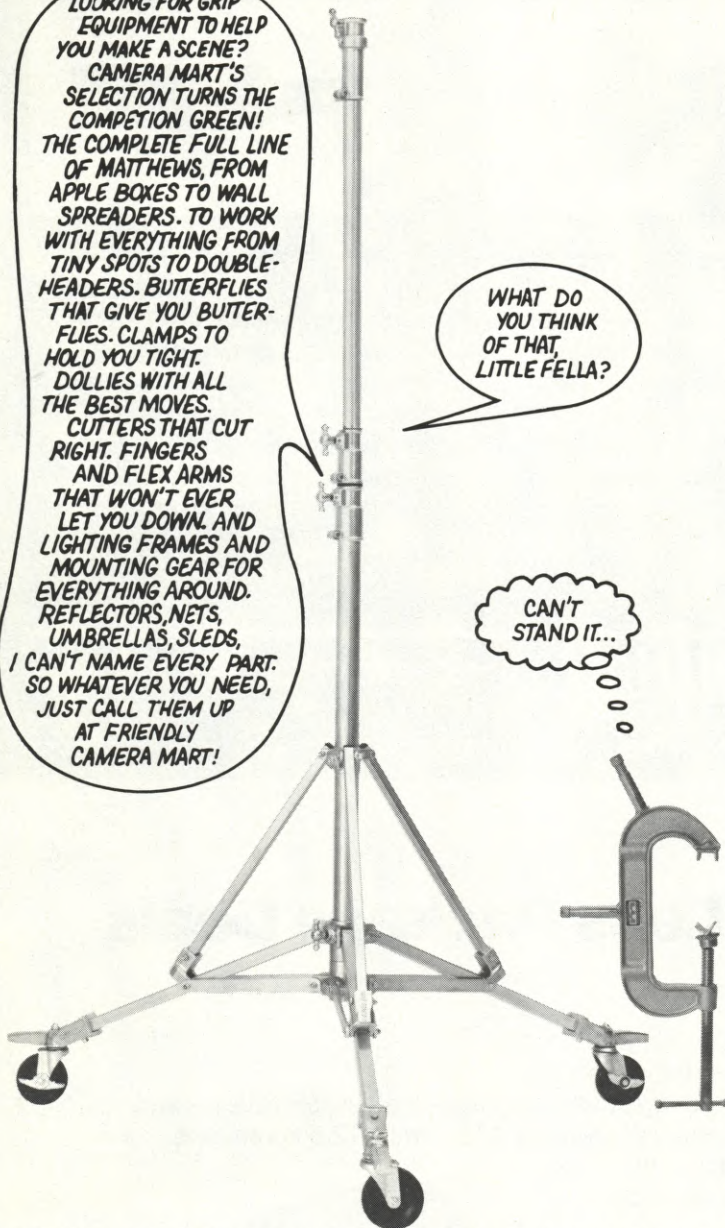
In making this documentary on the production of *ROLLERCOASTER*, we seem to have gotten coverage that does justice to the picture, although included are some "thrills" we could have well done without. As has been said, thorough preparation has allowed us to take advantage of unexpected shots as they presented themselves. The preparation was not so thorough, from this cameraman's standpoint, that I did not sorely wish, when shooting one sequence, for correction filters and gels to wipe out the green cast of fluorescent practicals that had to be overpowered with tungsten.

In addition, shooting lip-sync on the fly as we did, really places a heavy burden on the editors, since we had no way of slating takes consistently. In the future, for a project like this one, I could urgently recommend the use of magnetic striped raw stock in a single-system camera to back-up the double-system. Recommended also is an additional wireless mike for slating, and some convenient means of simultaneous sound monitoring for the documentary director and cameraman. Much of what we hope is our success in filming the making of *ROLLERCOASTER* comes from the added dimension and presence that live sound can give to a picture which is already exciting to begin with. ■

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POLAVISION COLOR MOVIES

Continued from Page 617

roid film in the Super-8 format, with a speed of ASA 40.

There are almost three minutes of film in each cassette and a visible leader reads EXPOSED, UNEXPOSED or RERUN, depending upon the current state of the film.

A small opening in the side of the cassette leads to a prism which deflects the light through the film during projection.

The cassette is a miniature processing laboratory, containing all of the chemistry necessary to develop the film into a transparent, stable color image almost instantly.

The film never leaves the cassette, during processing or projection.

POLAVISION PLAYER

The player somewhat resembles a portable television receiver with a 12-inch (diagonal) screen.

After almost three minutes of film have been exposed, the cassette is simply dropped into a slot in the top of the player and pressed down, "just as one would pop a slice of bread into a toaster." There is no threading or winding of film, nor are there any buttons to push.

All of the operations of the player are completely automatic. It immediately begins to rewind, and simultaneously process, the film inside the cassette.

A small quantity of liquid — "about 20 drops of Honey-like reagent," according to Dr. Land — is squeezed onto the film through a precision slot in an extremely thin, even layer (about 1/200th of a drop per frame) as the film is rewound.

The reagent penetrates the various layers of the multi-layer film, triggering the particular chemistry stored in each layer. When this penetration has been

completed, the residue of unexposed silver, now in "negative" form, is stripped off the film and deposited into a tiny receptacle within the cassette.

By the time the film is rewound, the first part of it is ready to be seen, while the last part requires some additional seconds.

The player switches automatically to the projection mode after the 95 seconds required for rewind and processing.

The beam from a 150-watt lamp with

a fresnel lens is focused onto the prism in the side of the cassette and deflected down through what is now the positive transparency film.

The light path is interrupted by a shutter, then continues through a lens and onto a mirror, which bounces the focused image onto the rear of the player's screen for viewing.

After showing, the cassette pops up in the slot and can be removed, or it can be re-run by pressing it into the slot again and waiting eight seconds. ■

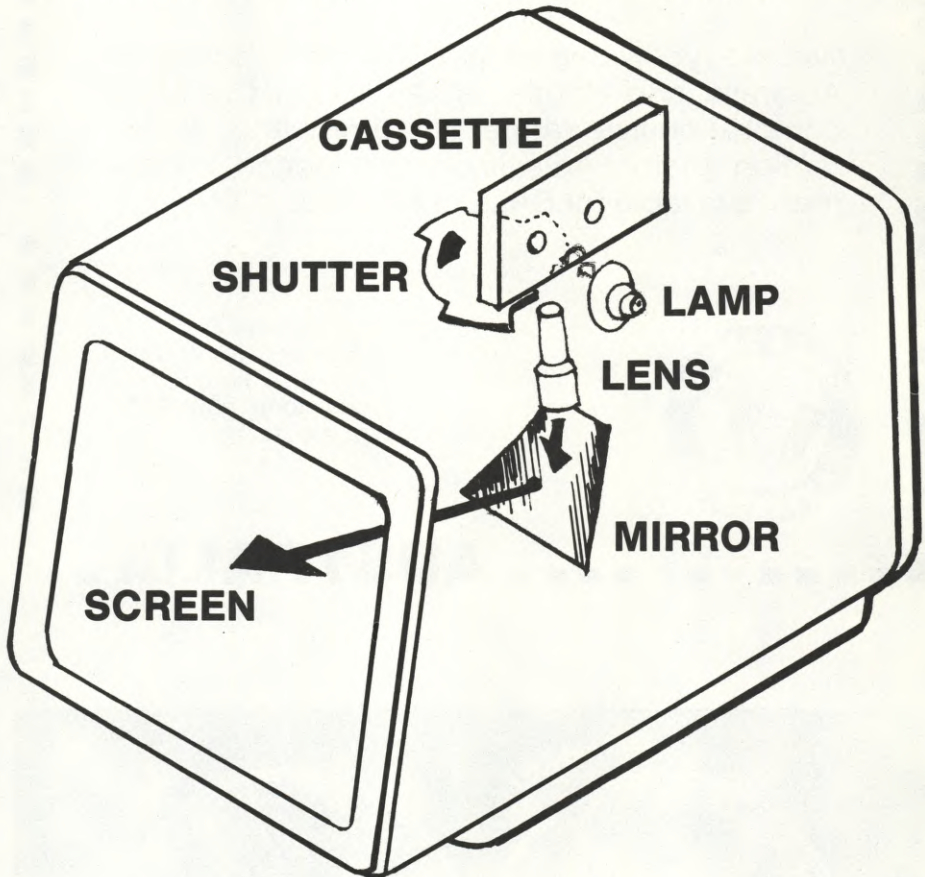
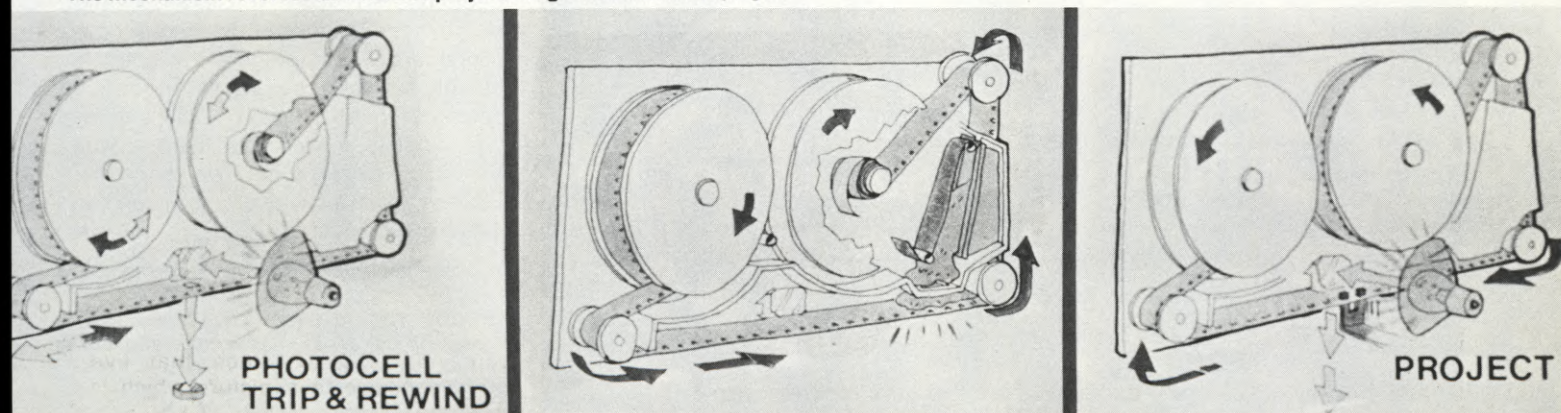


Diagram portraying the method in which Polavision film is projected in the player. Having been inserted in the top slot, the film is processed as it is rewound. Then a 150-watt fresnel lens lamp shines through a prism on the side of the cassette. The deflected light beam shines through the film and down a lens, and is reflected off a mirror onto the screen.

Diagrams detailing what goes on inside the cassette after it has been inserted in the player for the first time. (LEFT) The film is rewound and simultaneously processed, as liquid reagent is squeezed in a light coating onto surface of the emulsion. (CENTER) When the reagent has penetrated the film, the residue layer of unexposed silver (or "negative") is stripped off the film and discarded in receptacle at right. (RIGHT) The mechanism reverses direction to project image onto screen of player.



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AUSTRALIA



MAKING OF AN ODYSSEY Continued from Page 636

raphy of our arena, immaculate work in the museums and painstaking spectacle from the reconstruction — has resulted, we think, in both an unusual harmony of storytelling and perhaps something new in deploying the diverse virtuosity of film. That, at any rate, is what we will stand to be judged by and that, for certain, is the challenge of the scripts.

The colour and richness of our tapestry is beyond doubt. We begin with the world in flux, an unstable period when old empires — Egypt, Assyria, Babylonia — are declining and breaking up, and before a new order and an astonishing burst of creativity were apparent. While Europe was still groping its way from primeval darkness, the power vacuum of the ancient east was astutely filled by Cyrus, the creator of the first Persian empire and (and it was a *world* empire in the literal sense) without doubt one of the most underrated forces in history.

From there the story is tumultuous: the impact of Alexander the Great (Great or Destroyer?); the contest with the Roman empire; the astonishing arrival and spread of Islam; the great fusion of art and architecture that followed; the ruthless carnage of the invasions of Genghis Khan and Tamerlane; the magnificent Persian renaissance culminating in the glory of Isfahan; the sudden isolation and decline of the plateau; the intervention of western powers to exploit the resources, first of tobacco and ultimately of oil; and the gradual reassertion of independence and confidence which shapes world events today.

It is quite a telling thought that the cost of productions as ambitious as "CROSSROADS OF CIVILISATION" is now such that few, if any, broadcasting organisations can on their own embark upon them. We will, instead, have to find sympathetic partnerships to advance the state of the art.

Having been given editorial independence to make these films, and numerous resources from our co-producers, we hope that the spirit is established for exploring the other rich seams of history which — as the archaeologists show in our films — wait to tell us more of how we made the journey from primitive man than we even now suspect. ■

(ABOUT THE AUTHOR: Clive Irving, Head Writer of the series, has written and produced many documentaries for British television, and works frequently with David Frost on his topical interview series.)

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Monique Champagne



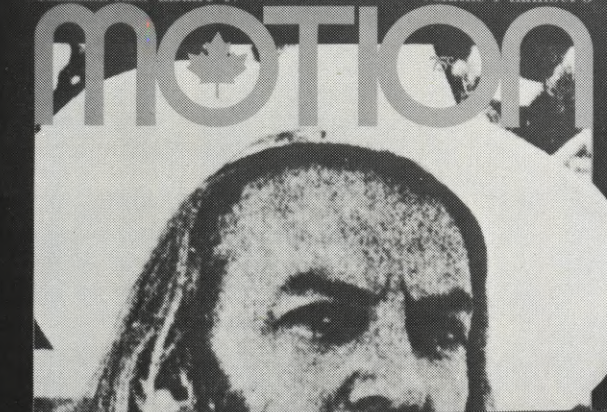
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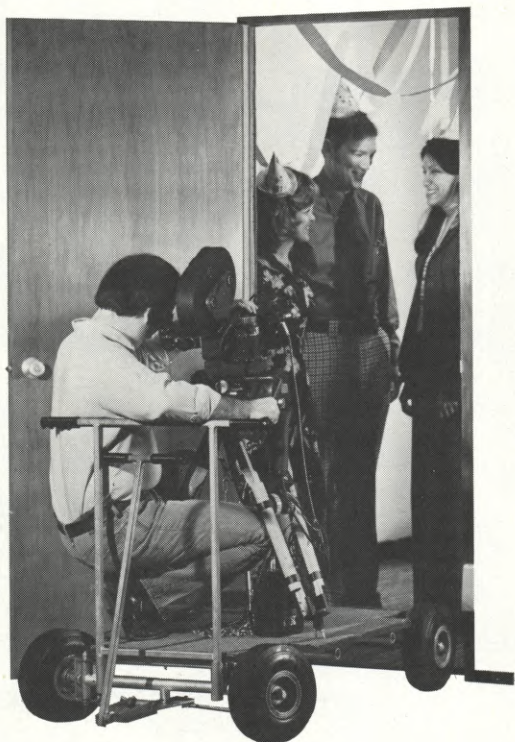
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"CROSSROADS OF CIVILIZATION" Continued from Page 627

course, exempted, since our research team had located the exact locations of the historical objects related to the eight scenarios. We had no problem finding the locations for the Main unit and David Frost's unit, since we were dealing with an historic, colorful country for the most part.

But finding the right locations for historical reconstruction was indeed a difficult task. We searched for the combination of five different sites in one location: a green valley for the Buide Camp; a village for the Mongol attack; a hilly background for the Sasanian March; a flat landscape for the battle of Sardis and another for the war between the Romans and the Parthians. The battlegrounds had to be covered with soft earth to allow for the charging of the horses. In addition to the geographical requirements, we needed a hotel to accommodate a crew of 75 and we had to establish a camp for several hundred infantry and cavalry and to provide stables for horses, tents and mobile units for wardrobe, props, make-up, hairstyle and special effects.

With some compromise for living accommodation at first, we located a site in Azarbaijan between Ardebul and Sarab. Although it would have been quite adequate for our purpose, we soon disregarded the location because of the early arrival of cold weather and possible rain and snow.

Another site was the Demarvand area near Teheran, the city which could provide most of the facilities. But the existence of telephone poles and tin roofs could have limited the scope of our filming to a considerable extent.

It was evident from the start that the budget of 2½ million dollars would not be adequate to cover the cost of eight hours of film with such an ambitious reconstruction concept. To secure some assistance, we approached the Imperial Army of Iran. Obtaining the cooperation of the army was not easy. We had to convince them of the necessity of such cooperation, the authenticity of our concept and sincerity of our views.

Once this was done, we received their indispensable assistance. A camp was established in Tange Bolaghi, the original site of some ancient battles, and a large helicopter was provided to transport the crew from a hotel in Persepolis over 40 miles of very difficult terrain. This meant a saving of three to four hours of driving time each day. The temperature varied in Tange Bolaghi. Nights were clear and crisp on the verge of freezing and daytime was a

nice 75-80°. Because of the elevation and the excess of ultraviolet rays, sun bathing while working soon became popular among the crew. During the breaks, the crew had discovered an even more interesting amusement. They scattered over the hills and picked up broken pieces of pottery, broken stone arrow heads and spear heads. According to Professor Stronach of Oxford University, some of the broken items dated back to the 6th Millennium, BC. Besides the sun and the pebbles, there was no other amusement on this location for seven weeks.

During the battle scenes we had a few broken arms and legs. We also had several days of rain and hail, and even a storm which blew away the tents, wardrobe and props. But the camp was restored, the wounds healed and we finished the reconstruction of historical scenes on schedule.

There was a strong temptation on the part of some of our Iranian colleagues to film the series in 35mm. This would have meant a difference of more than \$400,000 in time, equipment, film and lab costs — an added expenditure which could not be seen on the television screen. Consequently, the entire project was shot in Eastman 16mm negative 7247.

I believe we can easily derive a two-hour version from the sequence, for theatrical distribution. This version obviously needs to be blown up to 35mm. ECN2, being a fine-grain stock, can easily lend itself to high quality C.R.I. blow-up through the wet-gate process and diffused light source printing. Furthermore, we have taken all necessary precautions to avoid dirt and camera scratches during filming. The lenses used had been carefully collimated prior to filming and, in most instances, a Varitol zoom lens was used to ensure maximum sharpness and image fidelity on 16mm negative. The T/1.5 speed of this zoom lens was indeed a great asset to us, since it enabled us to film interiors of mosques and bazaars, as well as exterior night scenes where lighting could have been a great problem.

"CROSSROADS OF CIVILIZATION" will be ready for distribution in the late summer of '77. The project has been made in collaboration with the Ministry of Culture and Arts of Iran and is sponsored by Bank Meli up to 2½ million dollars. ■

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Continued from Page 633

sians and Lydians, there were historically about 8,000 people on each side, but we have to reconstruct it with only 300 people and 60 horses. So, in addition to thinking about the usual things, such as light, composition, movement and all the technical elements, you've also got to make it look like 16,000 people instead of 300. It's difficult and frustrating, but the only chance is to never let your camera see outside the edges of your 300 people. You must always keep within the boundaries of your armies. The real frustration comes from never being able to get that big, wide, expansive shot; you've got to keep in tight and close all the time. Now, this will probably work quite well on television — which is what the series is primarily intended for — but now, of course, people are talking about blowing it up to 35mm for cinema distribution in certain areas and all that sort of thing. It will look fine on TV — we'll get away with it — but as soon as it's blown up onto a big screen I'm afraid you'll be able to tell that we were being careful because we didn't have many men.

The only dissatisfaction we on the crew have is not being able to get the shots that just sort of make people gasp — the kind of thing where you start in on the fighting, with people hacking at each other, and then you pull back to show thousands of men beating the hell out of each other, with mass movement and lines of battle and the vast panorama of the scenery. We've got the most marvelous scenery around here, stunning stuff, and this is the first sequence I've had to do since I've come here in which I'm completely unable to use the scenery. In every other sequence I've been able to use it — and it's beautiful to use.

On the Reconstruction filming, none of the individual usages of cameras and lenses have been outside the realm of normal technique, but I think that some of the combinations which we've managed to achieve are perhaps unusual. For example, on one particular battle sequence we had four cameras running. There was one hand-held camera in amongst the fighting — really in close. I know, because I was shooting it and my assistant got beaten over the head a couple of times with swords. (That's what comes of being an assistant, I guess. Lucky it wasn't me!)

There was another camera placed well back, but with a 240mm lens. A third camera on a straight zoom was playing it very straight, but getting very

valuable stuff. The fourth camera was a GSAP on the ground with a 10mm lens — just sitting there, being trodden upon and kicked and stepped over. I think this combination of camera deployments is rather unusual. There could be, of course, enormous problems in cutting that sort of thing together, but there are certain continuities in the way in which I've placed the cameras to catch the light and the action. You have so much action which is almost a melee of people crashing around that the sort of mixture of photographic techniques, as you cut from one to the other, creates a feeling of added aggression. It certainly isn't a technique I'd use on many other sorts of subjects. I simply feel that, in a case like this, using each camera in a completely different way on the same piece of action does, in fact, contribute to the action. If someone used the same technique on something more gentle I think I'd be horrified.

Except for what I've just described, we are playing it very, very straight from the technical standpoint. It's got to be straight. It's got to be reliable, because there's no time or money for reshooting. You've got to know that every time you shoot it's there on the film. We are not seeing rushes; we get reports on rushes about a week later from the editor in London by Telex. We've got to know that all those cameras are getting good usable material — but we don't want them getting exactly the same good usable material. We are trying to provide as much variety as possible, presenting as many possibilities as we can to the editor, and I think the action we've been shooting does, in fact, lend itself to that sort of technique.

Aside from the inevitable problems to be encountered in this sort of shoot, it's a lot of fun. We all have enjoyed it enormously. That's one thing about filming . . . there are many facets to it. It's intellectual and artistically stimulating and there are technical challenges to it — but most times you can make it fun, as well — and that's terrific. ■

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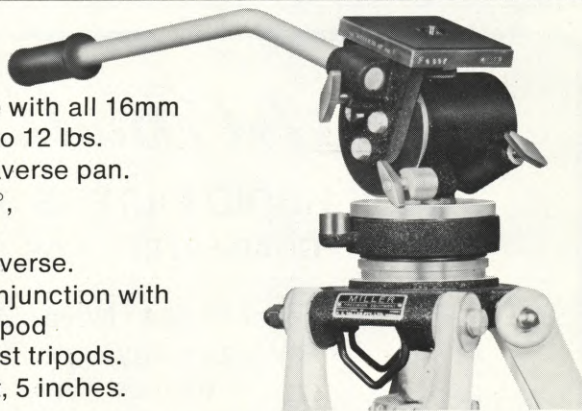
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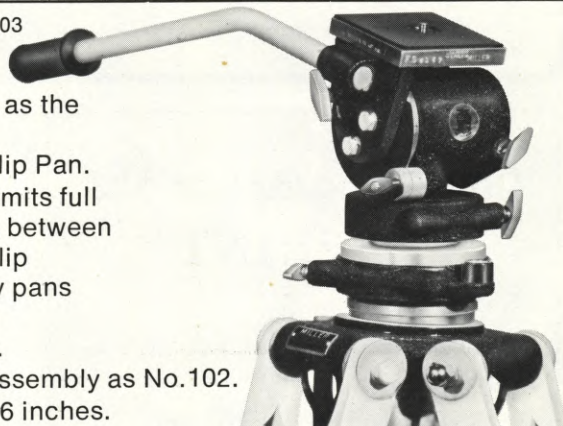
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RECORDING IN SENSURROUND
Continued from Page 596

really do what you want." He pulled out an inch-long piece of brass stock with some screen over one end — obviously a one-of-a-kind prototype — and screwed it onto one of their normal condenser-type microphones. We did some testing and, indeed, it turned out to be a very good microphone for the purpose we had in mind. So, with some fast talking, we managed to borrow it from him for about two weeks. Well, that two weeks ran into two months and I kept getting calls from Michigan wondering where their microphone was, because it was the only one they had.

It was basically an electret-type condenser microphone, which does not require a lot of external power supplies, and it was very good in the respect that it was not receptive to wind-gusting and popping (which a lot of condenser microphones are), plus the fact that its frequency response went down to 15 Hz, which was exactly what we had in mind. It was, in essence, a very highly calibrated microphone of the type used for making sound measurements — but more rugged and capable of being used on a production. It worked out very well and we did a lot of the recording with it.

To record the sound effects for "ROLLERCOASTER", I modified a Nagra S Stereo recorder (which has an excellent low-frequency response) so that one channel was always flat, with no low-frequency roll-off, and so that on the other channel one could apply the normal roll-offs that are available on the machine. By combining the signal from the microphone source, or even using two microphones, we could have a normal roll-off version, as well as a flat version of everything that was recorded, so we wound up with a lot of choice.

One of the things we did when we went through our "MIDWAY" modification (or what we call our "Mod II" Sensurround) was to provide an entire system for theater sound, with the exception of the main fader and power amplifier systems. In other words, we put in pre-amplifiers, all of the equalization necessary, and a little button that said NORMAL and SENSURROUND on the control unit. That was simply because we ran into so many problems in the theaters, trying to get a signal from their pre-amplifiers. Maybe they didn't have any low-end frequency response or the equipment was in poor repair or was old and wouldn't perform as we required it to — so we provided that whole package in our Sensur-

round unit. We now have approximately 800 *Sensurround* systems throughout the world — about half in the United States and the other half foreign.

Since "MIDWAY", we've made some improvements at the studio in our techniques of dubbing for *Sensurround* and also in our optical transfer. One of the big problems we have is that whenever the *Sensurround* is running, there is so much energy in the low frequencies, that it is hard to get across any of the high-frequency components of the sound. Of course, it's the high and mid-frequencies that give you definition and allow you to understand what something is. For instance, the gun blasts that we created electronically for "MIDWAY" could well have served as thunderclaps or anything else in the low-frequency range, because it all turns out to have about the same basic sound. You have to have the high and mid-frequencies in order to identify the sound. We have tried to increase our capability of maintaining the clarity of that area of the spectrum, so that we can define differences between the various *Sensurround* effects and not have them all end up as one irritating rumble.

Universal has a tremendous library of sound effects. In fact, it's possible to go over there and completely build the sound track of a picture from their library effects. That being the case, "ROLLERCOASTER" is really unusual in that its track incorporated very few library effects. This was because a completely separate sound crew went along on all the locations to do nothing but record sound effects. As a result, we had available a tremendous number of sound effects that were actual live recordings from the production. Of course, such a wealth of effects created its own problems. We had a lot of transferring to do and the effects editors had quite a sorting job. Then, of course, any *Sensurround* effect had to be transferred onto the special magnetic recorders that had the wide frequency response.

The big problem in recording effects for *Sensurround* is that you can't really monitor the sound. There are no headphones that will give you that kind of low frequency response. The result is that you really don't know what you've got until you get back to the big room with the large *Sensurround* horns, where you are able to monitor what you have. So, as the dailies for "ROLLERCOASTER" came in, we would listen and then call back to wherever the location was and try to give them some advice.



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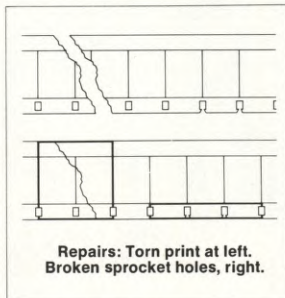
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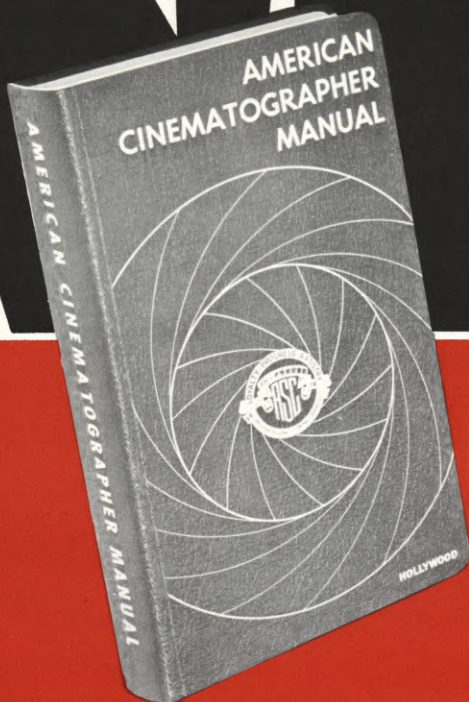
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DUBBING IN SENSURROUND

Continued from Page 597

tremendous amount of the engineers' time. It is quite an effort.

On "ROLLERCOASTER", because this was the first time music and effects had been used in *Sensurround* in this way, it was like a school to all of us. We were groping. We knew what result we wanted, but didn't know how to get it, because we'd never done it before.

We tried this and that and there were tremendous problems when the effects started to phase against each other and lose articulation. You have to be very careful to make each wheel click definite and precise, so that you don't end up with a muddy type of sound.

I've worked on a lot of films, including "JAWS", "PSYCHO", "THE BIRDS", DeMille's "TEN COMMANDMENTS", "SLAP SHOT", "TWO-MINUTE WARNING" ... but to be honest, "ROLLERCOASTER" is probably the most difficult picture I've ever worked on. And yet, it was really great to do, because it gave me a chance to really learn something, instead of just doing more of the same thing.

Most exciting for me was the fact that I was able to change the *Sensurround* technique from the way it had been used up until now. ■

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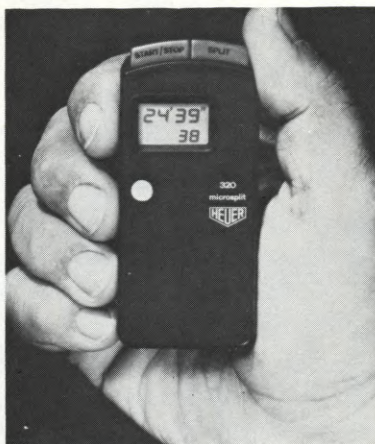
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16mm-TO-35mm BLOW-UP Continued from Page 624

All right, we ignored the necessity of a 16mm answer print, and 35mm CRI (Color Reversal Intermediate) from the 35mm shoot. Add in what you want, and there is a direct saving in shooting 16mm over 35mm. Given a \$500,000 budget, a saving of \$10,000 is 2% of total budget. Not too significant. Given a \$100,000, budget the saving becomes 10%. Quite significant. But the real reason for consideration of 16mm is not the direct film cost, but the much more significant potential production savings.

When you consider 35mm you must consider the necessity of larger crews, less mobility, higher license fees in many areas and somewhat less intimate control of the whole package. Of course, we know of lightweight 35mm productions cameras, but if we are shooting alpine sequences from the end of a rope, the difference between 6 pounds and 16 pounds becomes a prohibitive difference.

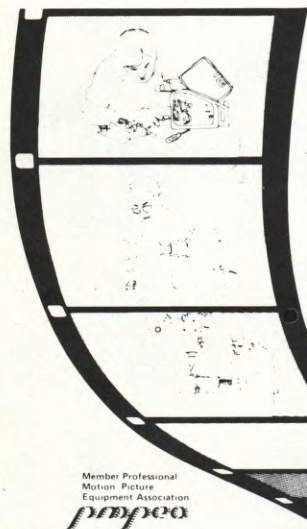
The very consideration of 16mm begins with ease of use, mobility, tight intimate control. Yes, it is a philosophy and we have found that the philosophies of the 16mm and 35mm film-makers differ. They really are two different disciplines, with their own strengths, weaknesses, attitudes and even markets. It is a rare director, producer or technician who is equally facile in both film widths. You have only to look around you to check the accuracy of those observations.

Can you really save money in producing in 16mm? Yes, of course you can, particularly if you are well-versed in 16mm production techniques.

QUESTION: Is 16mm strictly for the documentary, or can it be used for a typical dramatic film?

WESTERN CINE: If there is a style of cinema today, it can best be described as free-form. In the framework of the laboratory, we see no significant difference in results obtained in 35mm blow-up from the simplest outdoor shot to the dramatically lit interior. Correct exposure and the use of lenses of good quality that have been checked and tested provide very acceptable viewer-quality on the theater screen, regardless of scene content.

An out-of-focus scene in 16mm or 35mm will print as an out-of-focus scene. In blow-up printing we are dealing less with resolution than with acuity. Does the damned thing look sharp to the audience? The answer is yes, it can, and does.




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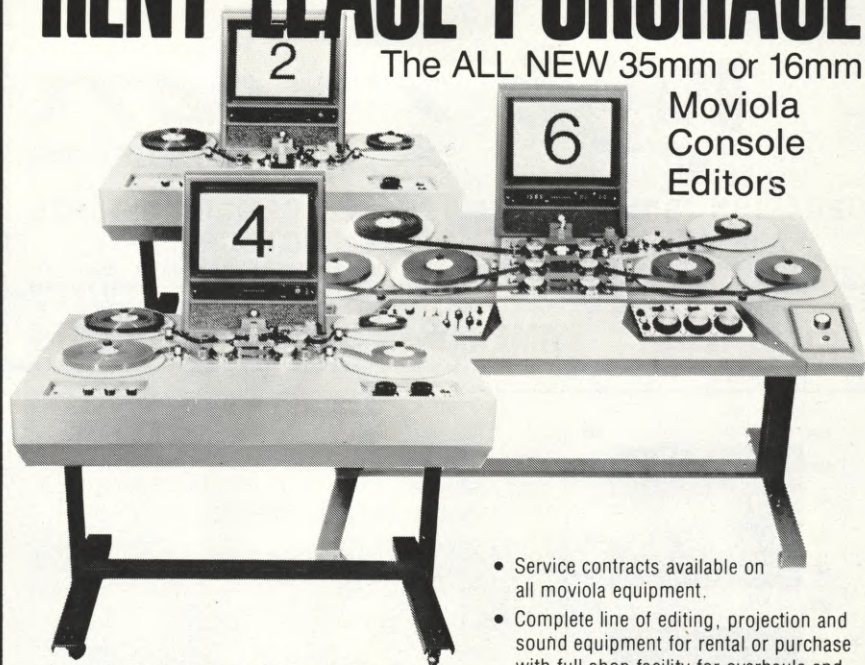
How about the "grain like gravel" commonly thought to be associated with blow-up printing? Years ago it was a problem—partly because films were not as fine-grained as they are now and partly because blow-up printers and lenses were not as good as they are now. Even now there are noticeable differences in both grain and definition between laboratories. You are best advised to ask several laboratories to make a short blow-up test of your footage that is indicative of the type of thing you want to do. More than likely, they will not charge for such a test, and you will find the results most revealing. Most, if not all, laboratories equipped for blow-up printing utilize various types of liquid gate movements. Some utilize full-immersion wet systems which are a more recent innovation. Some use diffusion filters. In any case, these systems are designed to eliminate or minimize scratches on the original. As a by-product, they also veil the grain pattern of the blow-up image. Here again, we are dealing with acuity, or that which is apparently seen by people, and it is worth repeating that our interest is in what people see and not in a scientific discourse on line resolution and field fall-off.

So we answer the question of what type of production is most suitable with this statement: If you can perceive it, film it.

QUESTION: Should it be standard 16mm or super 16mm as a production medium?

WESTERN CINE: If super 16mm systems involving cameras, lenses, editing devices, complete lines of support gear were as readily available as standard 16mm technology, I'm not sure that it would be worth the modest gain in overall quality. The fact of the matter is that super 16mm is not a flowering technology. I would further say that the difference in quality would not be reflected in higher grosses at the box office. There is also a problem associated with ultimate television sale in the 1:85-to-1 format. And a problem for 16mm remote area release. Substantial optical printing charges, and sub-mastering would be required to take advantage of these important markets. My advice is to stay with standard 16mm. A competent 16mm cinematographer should use a 1:85-to-1 mask in his finder system. Preferably one that permits viewing of the full 1:33-to-1 field as well. Vital screen action must occur in the 1:85-to-1 field, but microphones and lights, etc., should also be kept out of the 1:33-to-1 field. Then you have the best of both

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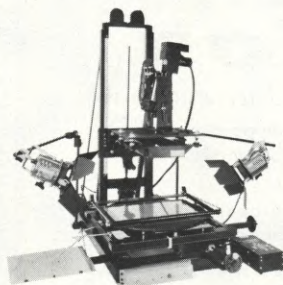
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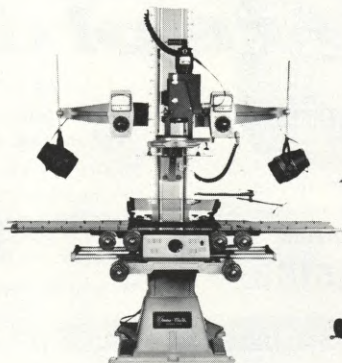
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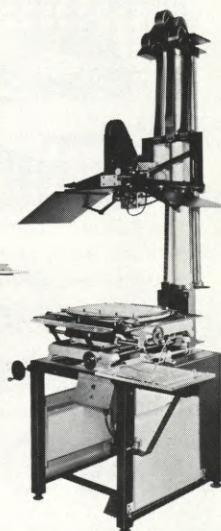
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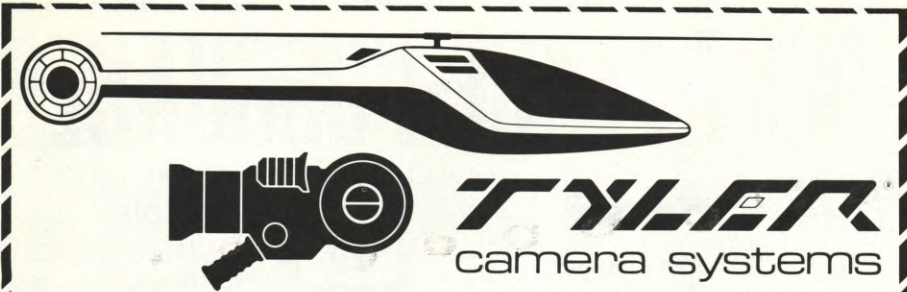


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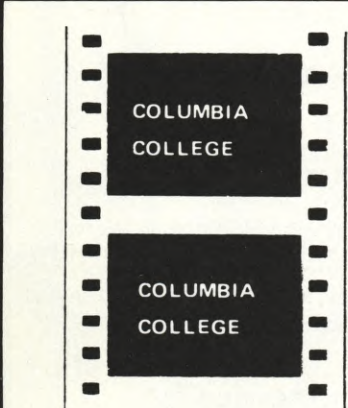
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worlds. Once blown up to 35mm, the 16mm originals can be utilized to make 16mm internegatives and prints at modest costs.

A cautionary note here. Don't go for the hybrid production in which certain sequences are done on 35mm to be intercut with the balance of the 16mm blow-up negative. It calls attention to itself on the screen, and you generate the need for further optical charges to reduce those elements to 16mm for TV and other market requirements. Some folks will tell you that titles must be accomplished in 35mm. Not true. If you are going to select 16mm as a production format, use it all the way. The same is true of optical effects, such as freeze-frames and splits. Have them done in 16mm and cut the resultant masters into your 16mm A & B rolls. So the quality might be a bit better in 35mm. So what — people and box office grosses — remember? I am not suggesting that the general public is so indifferent to quality that you can get away with poor work. I am saying that if your production is done well, the audience will be unaware of any compromise. This same philosophy applies whether you select standard 16mm or super 16mm. Again, the fastest track favors standard 16mm.



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QUESTION: For optimum blow-up quality, should one use Ektachrome Commercial (7252) or Color Negative (7247)?

WESTERN CINE: Let me preface these remarks by saying that if 7252 and 7247 had identical ASA ratings, it would be no contest. 7252 every time. But the film speeds differ and therein lies the dilemma. 7252 is a remarkable product. It is stable and quite forgiving in respect to varying storage conditions and delays in processing. It is easy to visually check exposure results. It has very little variation between emulsion batches. Its contrast level is well suited to any form of contact or blow-up printing. It is forgiving of minor cinch marks on base or emulsion. All in all, it is an ideal film. On identical subject material, the two films will provide very similar results in blow-up printing. We have found that 7247 is slightly more contrasty and that 7252 appears to have the edge in shadow detail. Both films have a fine-grain appearance, with 7247 having a slight edge. Both provide 35mm blow-ups of very acceptable quality. 7247 is more difficult to handle in that any defects on the low gamma negative become high-contrast defects on the print, and that is the main problem.

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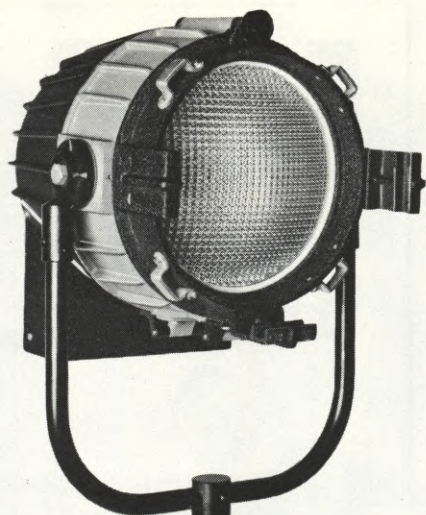
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negative original to your workprint, then by all means let them do it. The requirements for clean room editing and matching of negative are stringent and demanding. There are a number of post-production houses that are also well qualified to handle this film.

Recommendation here: If at all possible to utilize 7252 Commercial Ektachrome throughout your production, then it is the film of choice. 7242 High Speed Ektachrome can be used for very low-level light situations and intercut successfully with your ECO original. Particularly if post-flashing techniques are used prior to processing the 7242. The key here becomes one of avoiding intercutting the two emulsions in the same visual situation.

If the majority of the production is geared to low level light situations then 7247 becomes the original of choice. Its wider latitude and finer grain yields superior blow-up results when compared to 7242.

Recently we undertook to blow up a 2 1/2-hour feature, "THE FATHER KINO STORY", a Ken Kennedy Production, which takes place in the desert country around Tucson, Arizona. The feature is 85% daylight exteriors and involves typical harsh desert sunlight conditions. Considering the black-robed 15th-Century priests against the brilliant desert background, 7252 Commercial Ektachrome clearly tested as the film of choice. Remarkable texture and detail was maintained even in the shadow side of dark costumes. Most of the people attending the premiere of this film were unaware that it was a 16mm blow-up. The only photographic comments issuing from this audience noted how beautiful it was. Our Southwest representative was called in for pre-production conferences and the producer agrees that his counseling resulted in production savings amounting to over \$50,000.

Reviewers at the premiere of Arthur Annacherico's production of "RUN FOR BLUE" in San Diego, California (June 1976), went out of their way to comment on the outstanding photographic quality of the feature. Here, again, 7252 was the original of choice with a few interiors in 7242.

The Arizona feature is an intensely dramatic film utilizing sync dialogue throughout, while "RUN FOR BLUE", the story of girls competing in rodeos and show horse events, was a more documentary approach. 16mm worked equally well for both of these features.

There are a number of producers who insist that there is totally different color appearance on the screen between identical scenes photographed on 7252 and 7247, when both

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are blown up to 35mm. Our position, in the laboratory, is that when both scenes are matched in the printing process, the differences are so modest as to frequently cause confusion as to which is which.

QUESTION: Should workprint dailies be in 16mm or 35mm? How about sound?

WESTERN CINE: Stick with 16mm. Cost saving alone is the main justification. If the scenes look good to you in 16mm, they will look equally good when you make the blow-up. In our opinion, you should follow 16mm production procedures throughout the production of the film, including 16mm sound editing and mixing. A quality 16mm magnetic mix survives beautifully to 35mm optical printing track. Recognize that the response characteristics of 16mm magnetic exceed the typical response characteristics of 35mm optical sound in the theater. You might achieve a slight improvement in response by dealing exclusively with 35mm magnetic recordings, but you are not going to increase the grosses because of it.

An oft-quoted statistic, that probably has some truth in it, is that only \$1.00 in every \$5.00 taken in at the box office, drifts back to the producer. It makes good economic sense not to spend three or four or more thousand dollars for modest improvements in sound that even engineers can't really hear except in a comparative situation. Self-satisfaction is fine, but you may have to take in \$15,000 or more at the box office to pay for it. That figure represents an excellent grossing week in a theater in a large city.

QUESTION: Any special do's and don'ts?

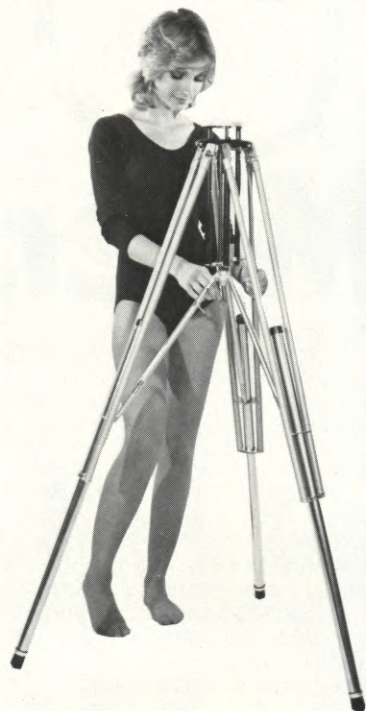
WESTERN CINE: I've seen and discussed at great length so many rules and so many concepts about picture-making that I take serious exception to anyone who professes to be able to tell you how to do anything.

The laboratory likes original that is well exposed and sharp. We can maintain those qualities in the blow-up operation. The producer may occasionally want soft focus and a high-key overexposure look. We can maintain those qualities also. In a creative sense, the laboratory is delighted to help you come up with effects that really go beyond the scope of the camera. A good time to confer with the laboratory is prior to the start of production.

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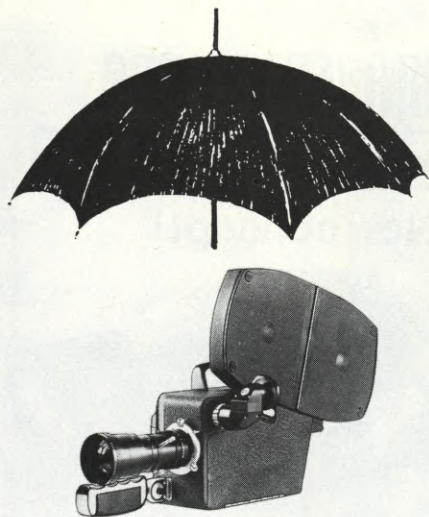
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more than adequate to govern your methods. I really would encourage you to do only one thing; it's very important to us at the laboratory and we can give you a better print or a better blow up if you will regard it as gospel: PLEASE ASK WHOEVER CONFORMS YOUR FILM TO USE A FOOT-PEDAL SPLICER IN PRECISE ADJUSTMENT. That's our main problem. Poor splices, out of line splices, improper overlaps, cause us, and you, much grief.

So now you have it, one laboratory's views on 16mm-to-35mm blow-up printing. It works. It really works. No limitations. Indoor screen, drive-in screen, Cinerama screen. It still works. Control your quality — control your cost. People will judge your content. That's where it's at. I would hope that the independent producer has found these remarks to be, at once, illuminating and provocative. They were meant to be. Good concept is much more important than high budget. There are countless stories that lend themselves to 16mm and modest production costs. The fact of the matter is that there is no other way to tell them — not with the scarcity of those hard-to-get dollars. I envy you your opportunity. ■

LIGHT CONTROL SEMINAR

Continued from Page 610

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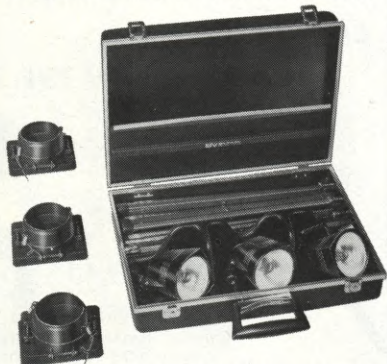
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OF CAMELS AND MONGOLS Continued from Page 635

both non-professional and non-Army, and here we had two weeks during which a very, very strange and really rather beautiful balance was struck.

We found a village by accident, as one often does, that had walls around it and about a dozen houses inside which had recently been deserted by almost everybody. The people had left this enclave to go live nearby in houses outside the walls, and the whole thing was a complete, standing, ready-made set. There was no way you could have built anything better. The people of the community that lived outside the walls were quite happy, after we talked to them, to have our forty horses housed inside the walls. I mean, it gradually crept up on them. First we arrived with a helicopter, and everything was amazing. We were like Martians. Then we arrived with lorryloads of horses and sort of built stables inside the walls. Then we started training the horses. Gradually we rounded the people in, a few at a time — first as workmen building the stables. Then, out of curiosity, lots of other people started coming around until, after 10 or 12 days, we eventually found that we could draw the whole village into this thing.

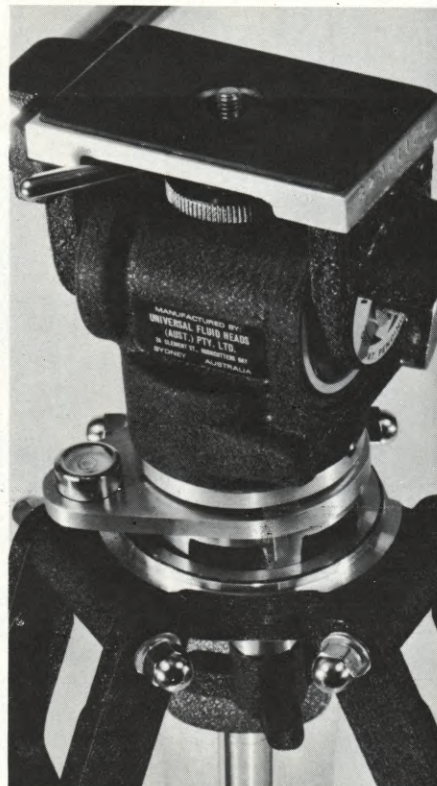
By the time we were ready to film the sequence in which a detachment of Mongols attacks the village, we had the entire village involved — old people, children, women, everybody. Of course, such people can't act, and you can't expect them to act — so one has to, again, resort to "judicious concealment". In that respect, a lot of dust is very important.

We did get some impressive things, though. For example, the headman was more than happy to be impaled with a spear to his own front door, with blood running down. That scene was really amazing! Afterward he was the professional, experienced actor in the village who had to tell everybody else how to do it.

Early on I could see that we would have to have everybody in the village involved in the filming. Also, they would have to enjoy the experience, even though it was going to be uncomfortable being chased by the bloody Mongols — and eventually they would all have to be massacred. We sort of slipped into thinking how everybody could be persuaded to enjoy this.

I had the idea of sending the two Iranian assistant directors into the village quietly, while other things were going on. They were to talk to this man and that and find out what it was that the village needed — and what the

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villagers would be prepared to work for. After three days of talking with people, they found out what they wanted. It was a bathhouse. So the idea of a bathhouse was born. Over the period of that few days it became clear that they really needed a bathhouse, and we could afford it, so the deal was struck. The idea of the bathhouse was devised in just this way as a means of unifying everybody's intention.

The point was that eventually our movie Mongols would have to "kill" everybody in the village — because that's what the real Mongols did. They swept into northern Iran and went from town to town, village to village. They rounded up everybody in the place and very coolly, calmly gathered them in a knot outside the walls. Then they went in with knives and axes and killed them — absolutely every single person, except useful craftsmen and sometimes a few young men whom they sent in to bear the brunt of the attack in the next village. So we knew that, in order to be historically accurate in our filming, we would have to aim everybody toward eventually being killed. We had this vision that at some point we would have everybody lying on the ground covered with blood, including the old people.

The bathhouse was the device that made this possible, because you couldn't pay everybody individually properly. You couldn't figure out who'd done what — and it was not a kind of cash situation anyway. So the idea of the bathhouse was born and it worked perfectly. They knew they were doing it for their bathhouse. So, on the last day but one, we did, indeed, have every single person in the village — women, children, everyone — lying in their village "dead" and covered with blood. I've never thought of doing that anywhere else.

Finding our "Mongols" was an adventure in itself. We had resigned ourselves to the idea that transforming ordinary people into credible Mongols would be most difficult and would require elaborate makeup, but seeing no alternative, we had brought along all the stuff to make people up as Mongols as best we could.

However, it turned out that in Shiraz, Martin Hall, Producer of the Reconstruction Section, happened to notice one or two Mongolian faces just in the street. He got the idea that there might be several more, so he asked them. It turned out that there was in Shiraz a small community of Turkomen, who were actual descendants of the original Mongols. I was told that if we were to be present in a certain street at six in the morning we would see them there. I

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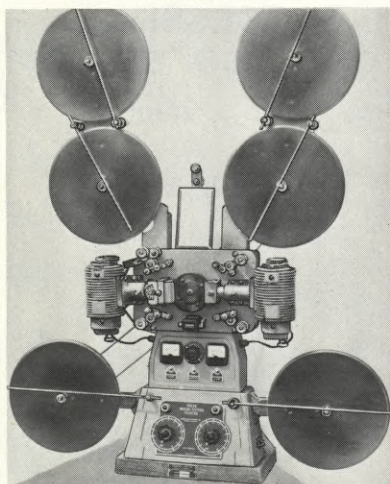
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didn't really believe this, but I did as suggested. I went there with a bus and we stood on the street at a quarter-to-six in the morning and, sure enough, out of what might have been 8,000 people filling the street — there's a kind of street labor market there — within 45 minutes we pulled 17 or 18 absolute descendants of the Mongols, *real* Mongols, off the street — building laborers, people who would do anything at all. We pulled them by twos into the bus and said, "Would you like to do this film? It will mean a week's work. All you have to do is be a Mongol and know how to ride. Alright — everybody who's a Mongol and knows how to ride — into the bus."

I'm still not sure that they knew what they were getting into, but we took them with us and brought them out to the location and they became our Mongols for a week. They were great. In some cases they were a little too gentle; a few of them couldn't quite find the vigor, or hate, that we needed, but they looked so *right*, so *convincing*. Particularly on the horses, they looked very strong. Some of them weren't too swift with the bows and arrows, and it turned out that a few of them could only ride donkeys really, but there were several very good horsemen. After three or four days of practice, some of them were really excellent. They were riding through streams and up hill-sides and into all sorts of places. So much for the Mongols.

Making this kind of film has its own special difficulties. It's not a matter of matching footage — which is entirely documentary — nor is it a question of style either. It's a question of what I look for — *veracity*. Except for the people wearing costumes, you really don't know that what you're seeing is reconstructed. That's particularly true in a sequence we shot of one of the Islamic saints, Ishmael, emerging from the hills. There are pieces of that I fancy because certain things happened very well. We had a lot of dust and huge herds of goats were organized, and things like that. There's a sort of feeling of veracity about it. Nothing seems fictional. It's right on that sort of knife-edge of what is real. Getting something like that is 80% arranged and 20% accidental.

For example, let's say that you've organized a situation with some soldiers in costume and on horseback. You give them a very straightforward thing to do — which is to march down this road. However, when they do march down this road, they turn and go right through a deep river — which you didn't expect — and then over to the other side around a rather steep hill —

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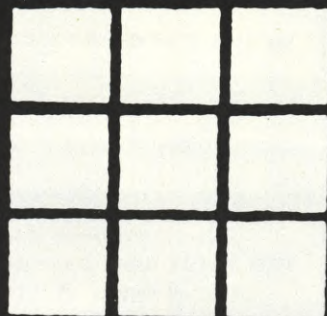
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which you didn't expect. Some of the best scenes evolve this way. I suppose if one has a principle in devising this kind of footage it is to get people to do something they can do anyway and then organize a series of obstructions. For example, when they come to a river, the water is four feet deep and it's up around the donkeys' stomachs. The carts find it very rough going and the men get wet and cranky because it's really uncomfortable. A cart with three or four ladies on it gets stuck in the water and everybody has to help.

You get a kind of thing that you wouldn't really be able to get in a more organized circumstance, because you wouldn't dare do it; you wouldn't have the time really. Of course, it involves finding things that aren't in anybody's mind to begin with. One of our best little scenes on a particular march has to do with a couple of carts going up a hill. They couldn't get up, because it was really beyond the capacity of the horses. The people got into terrible trouble. All of the contents of the carts was rolling off the back. The horses were freaking. People were trying to help, but really couldn't do much. *It was the way it must have been.* That seems to me to be very much the kind of thing that one wants to do.

All of us have had to make certain adjustments to do this sort of film. The stuntmen, for example, have done the James Bond films and things like that. As a result, the stunt arranger guy has a view of how certain things can be done because he's done them that way so many times before. But my interest lies less in doing things as they've been done before than in doing them as they've *not* been done before. However, both of us need each other and I think he's been more than amused by the way things have turned out. We've been getting him to do things he doesn't like doing or didn't think he could do. That's always very good.

I've made probably 30 or 40 documentaries and eight or nine various non-documentaries (fiction or drama or what-have-you), but this project has proved to be a very interesting fusion of the two types of production. It involves feature-type resources and is being serviced as a straight-forward feature operation. On the other hand, in its intellectual aspect, its ideas, it's entirely a TV documentary type of thing.

There's been a certain amount of tension here and there between the dramatic and documentary elements but, funnily enough, the result has been quite good. It's actually a quite lively hybrid. I like hybrids. They're always very interesting. This is the biggest hybrid I've ever had my hands on, I guess. ■

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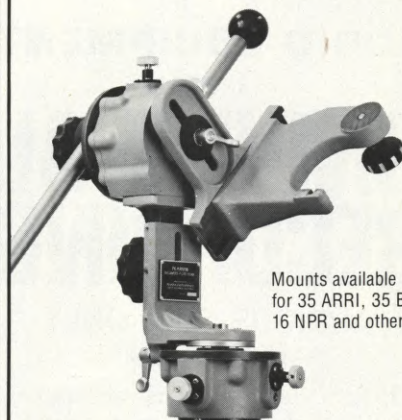
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A.F.I. SEMINAR Continued from Page 609

what's going on; it will give you
inspiration. If you sort of chase your tail
and you go to films and you make films
and you look at television and you talk
to filmmakers you will lose, you will
really lose. You lose as a person, not
just as a filmmaker. You lose as a
person. I think it's very important.

**QUESTION: What is your philosophy in
terms of pushing or flashing film?**

*WEXLER: Well, I generally like to do as
little to the film as possible. In BOUND
FOR GLORY I flashed everything, and I
only pushed some night scenes. The
flashing was mostly because I wanted it
to look old and I wanted it desaturated,
and I worked out a filter combination
and a flashing combination which
helped desaturate the film. But the
latitude of the film was good; the film
was very responsive, and the main
thing is that to get the most out of the
film you have to learn to get the most
out of your light. On exteriors you have
to be able to look where the sun is and
where the light falls, and if you can get
the director to do the shot basically
shooting in a certain direction, then it's
going to look better. So, in general, my
philosophy is to do as little as possible.*

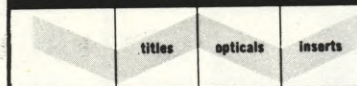
**QUESTION: You mentioned the style
and the color treatment of BOUND
FOR GLORY, trying to make it look
black-and-white, and also that the art
director had a lot to do with that. Can
you tell me a little about what kinds of
things the art director did to get that
effect?**

*WEXLER: Well, starting with the
wardrobe department, there were no
bright colors; all earth colors: browns,
blacks, grays, all subdued earth colors.
In fact, they had the whole crew trained;
if there was anything bright anywhere,
anybody, an electrician, a grip, would
come out and cut it out of their ground.
Even the back of a spotlight, that kind
of thing, so we just fought to keep any-
thing of any bright color value out of the
scene.*

**QUESTION: And you as a photog-
rapher, how did you get your feeling for
it?**

*WEXLER: Photographically? Well, see,
this is a period film, which is another
thing. You're at an advantage, because
in a period film everything you photo-
graph is there. I mean, you just don't go
out and grab stuff on the street and get
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goes by, because they didn't have Thunderbirds in 1934. It's a funny thing — I have a certain reticence about telling everything that I did. I used frost filters, Mitchell diffusion. I used pantyhose a lot. I went into a store in Stockton, and I said, "I'd like to see some pantyhose." The lady said, "Yes, what size?" I said, "Well, I don't care what size. I just want to sort of look through them." So she told me the price, \$2.80. She thought that would probably stop me. (I'm dressed up now; usually I look pretty crummy.) So she thought the price would stop me, but I said, "No." So then she started to show me different kinds of pantyhose, and I would hold them up to the light, and I guess she felt that I had them too close to my nose or something. So, anyway, I found a nice brown pair of pantyhose, and I shot quite a bit through that.

QUESTION: Which of the films you have worked on appealed to you the most in a photographic sense?

WEXLER: I did a film called AMERICA, AMERICA which I haven't seen in a long time but I sort of think that photographically I like that film the best. It was a black-and-white film.

QUESTION: Do you like working in black-and-white?

WEXLER: No, I like color. The first color film I shot was IN THE HEAT OF THE NIGHT, and the good part about that was that I decided I was just going to light it like black-and-white, and it worked out pretty well. I just said to myself, "Forget that you're shooting color; shoot black-and-white." That was before 5254. Color film, as you know, is easier to shoot. You get away with murder with color film, and you couldn't with black-and-white. I mean, with black-and-white you have to depend on separation and gray tones and so forth, which you have to create with lighting. But with color you can almost do anything.

SCHWARTZ: It creates its own separation.

WEXLER: Right.

QUESTION: I was going to ask you to get a little more specific about what you meant when you said, "Light it like black-and-white, as opposed to color."


SCHWARTZ: In effect, you have to make more breaks, and that sort of thing, in black-and-white because it doesn't separate by itself.

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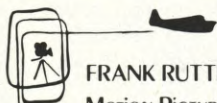
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CINEMA WORKSHOP Continued from Page 568

slightly different amount, which accounts for the color spread or rainbow effect of a prism.

Unfortunately, this same phenomenon occurs in a lens. As a lens forms an image, it affects the various wavelengths by different amounts resulting in two types of aberrations. FIGURE 1 exemplifies "longitudinal chromatic aberration". It is quite evident that the white ray entering the lens is split into color components, as the blue ray is bent to a greater degree than the red. As a result, the blue and red components of the image will be focused on *different image planes*. As a matter of fact, every color will have its own image plane. (See FIGURE 2a) Obviously, the film can only be in one plane at a time and, thus, only one specific color can be in sharp focus, while all the others must be *out of focus* to varying degrees. On color film this is noticeable as color fringing, while on black and white stocks the result is a generally soft or uncrisp image.

Here is where the complexity and cost of the lens begins its ascension. The lens designer can create a combination of positive and negative lens elements employing glasses of various refractive qualities that will yield a common plane of focus for two specific wavelengths (colors). Such a lens is said to be *achromatic* and is represented in FIGURE 2b. Notice that all wavelengths other than the two chosen still focus outside of the film plane. However, the net result is that the maximum deviation from the actual film plane has been reduced from the uncorrected lens of FIGURE 2a.

A third type of lens is the *apochromat*, which corrects for three specific colors, as in FIGURE 2c. Wavelengths other than the chosen three are still focused outside the film plane; yet, the maximum deviation is even less than that of FIGURE 2b. While it appears that the apochromat would be the preferred design, Paul informs me that the latest computer-generated achromatic designs are yielding apochromatic quality and correction. This is reflected in FIGURE 2d. The lens is still fully corrected at only two specific colors. However, the curve is much flatter. Those colors that do not fall precisely on the film plane tend to stay closer to the actual plane of focus and the maximum deviation is no more than that of the apochromat (FIGURE 2c).

Longitudinal chromatic aberration is just one problem. Next we will look at some of the other aberrations and how the designer deals with them. ■

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PROFILE

Continued from Page 576

the front yard, and carefully guarded by a gauze screen.

The Frakers also have somewhat of a menagerie. In order, they have: a yellow-headed Amazon parrot named Eddie; a cockateel; six finches; four cats; and two Russian Borzoi dogs named Nicholas and Alexandra, one black and one white.

"Eddie isn't scared by the cats," he comments. "If anything, they're scared of him. He can be pretty mean, when he wants to be."

A two-car family, Denise drives a Mercedes while Bill much prefers his Volkswagen. It's not the familiar Bug — it's The Thing. More like a Jeep, with a VW engine.

"It goes anywhere, and I love it," he says enthusiastically.

A man who takes a consuming interest in his work, Fraker spends many off-the-set hours at home in his office, where he displays artifacts from many of his movies and TV shows.

He keeps up with all the new trends and equipment in film-making, and is especially conscious of the advances made with the use of video tape.

He feels that tape will not replace film in movie-making, however, "until we bypass the tape engineers."

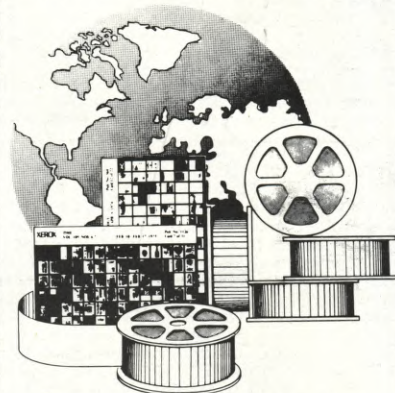
"Creatively, we're too restricted as cameramen by their demands," he maintains. "They always want a 2-to-1 ratio. You can't make light and dark, and never any shadows. When creators are given more freedom, then you'll find that tape will begin to move strongly in motion pictures."

One secret of Fraker's success as a director of photography has been his ability to get maximum effort from his camera crews.

"Film-making is a tremendous team effort," he concludes. "People in most jobs give only 50 percent of their capability. With our crews, we give at least 90 percent. And that's the name of the game."

With that, he drove off in The Thing, back to the hillside home he loves so much.

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