

American Cinematographer

International Journal of Motion Picture Photography and Production Techniques

AUGUST 1972
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Bell & Howell Eyemo Compact w/lens. used	350.00
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Spectra Professional w/pointer lock complete.....new	109.50
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Minolta Spot Attachment for Professional.....new	19.95
Minolta Spot Meter and Pouch.....new	240.00
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Akeley Hi Hats.....used	20.00
Akeley Boots.....used	set 10.00
Akeley Standard Legs.....used	99.50
Akeley Baby Legs.....used	89.50
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Pro Jr. Baby Legs.....new	89.50
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60-240 Berthiot w/finder, Wall mount.....used	295.00
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Maier Hancock 16/35 Hot Splicer.....used	275.00
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Akeley Variable or Constant Speed Motor.....used	15.00
Eyemo Motor "U".....used	45.00
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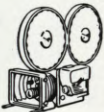
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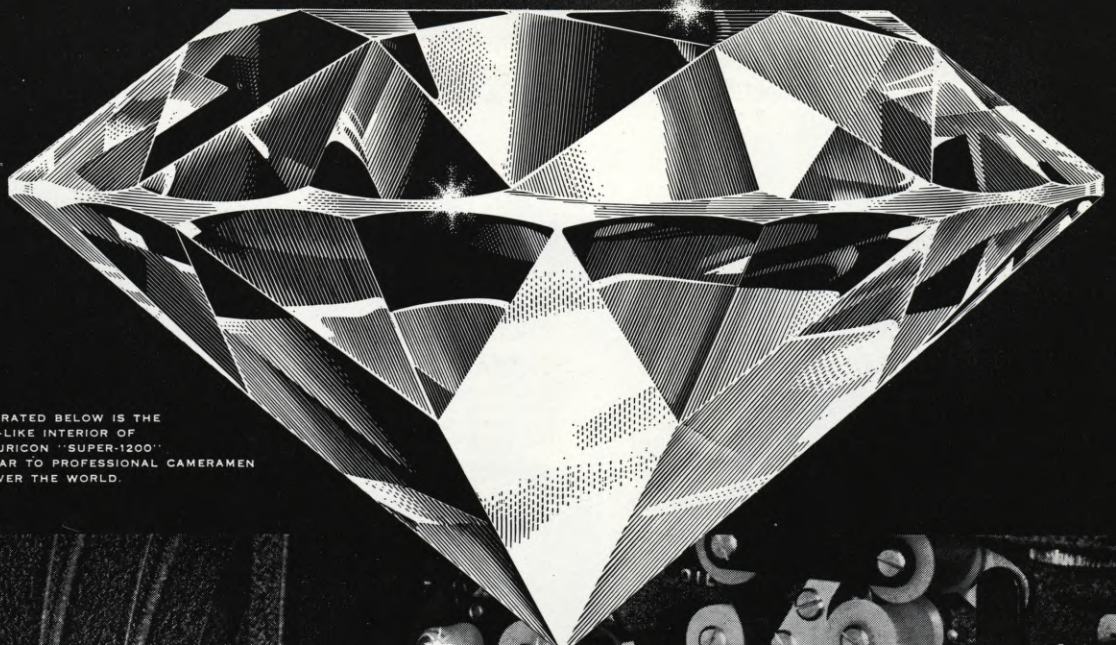
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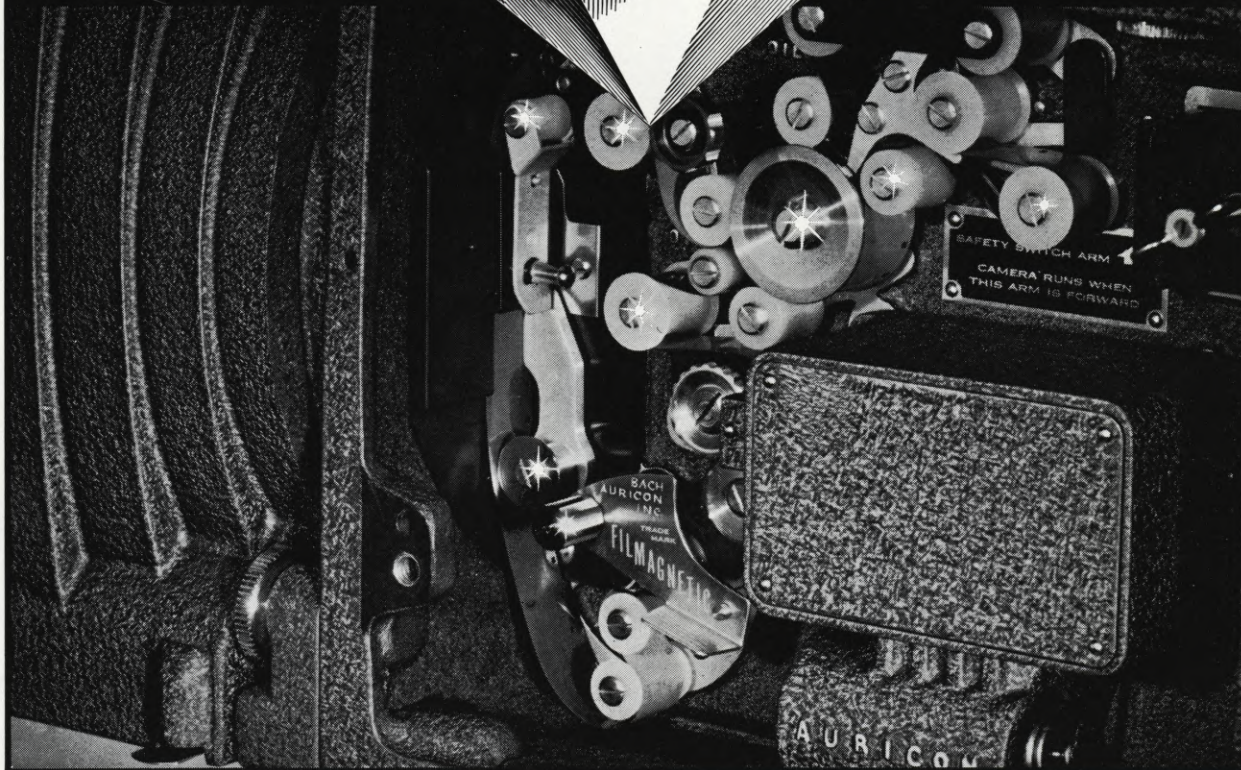
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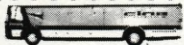
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25

**Cine
mobiles**

FILMING-JUN/JUL '72



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AUSTRIA

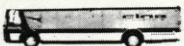
MGM PRODUCTION
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PETRUS SCHLOMP — CINEMATOGRAPHER



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NEW YORK

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TOM SAWYER

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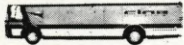
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TENNESSEE

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NO PLACE TO RUN

LOS ANGELES

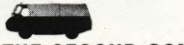
SPELLING/GOLDBERG PRODUCTION
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DELBERT MANN — DIRECTOR
RALPH WOOLSEY — CINEMATOGRAPHER



THE BOUNTY MAN

LOS ANGELES

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SPELLING GOLDBERG — PRODUCER
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IVAN DIXON — DIRECTOR
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VICTORIA, B.C.

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BRUCE GELLER — DIRECTOR
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LOS ANGELES

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RICHARD KLEIN — CINEMATOGRAPHER



TIME KILLER

SEATTLE

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DAN CURTIS — PRODUCER/DIRECTOR
BOB HAUSER — CINEMATOGRAPHER



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FRED KOENEKAMP — CINEMATOGRAPHER



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LOS ANGELES

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ARKANSAS

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WHERE THE LILIES BLOOM

NORTH CAROLINA

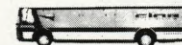
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WASHINGTON D.C.

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LOS ANGELES

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American Cinematographer

International Journal of Motion Picture Photography and Production Techniques

AUGUST, 1972

VOL. 53, NO. 8

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• FEATURE ARTICLES

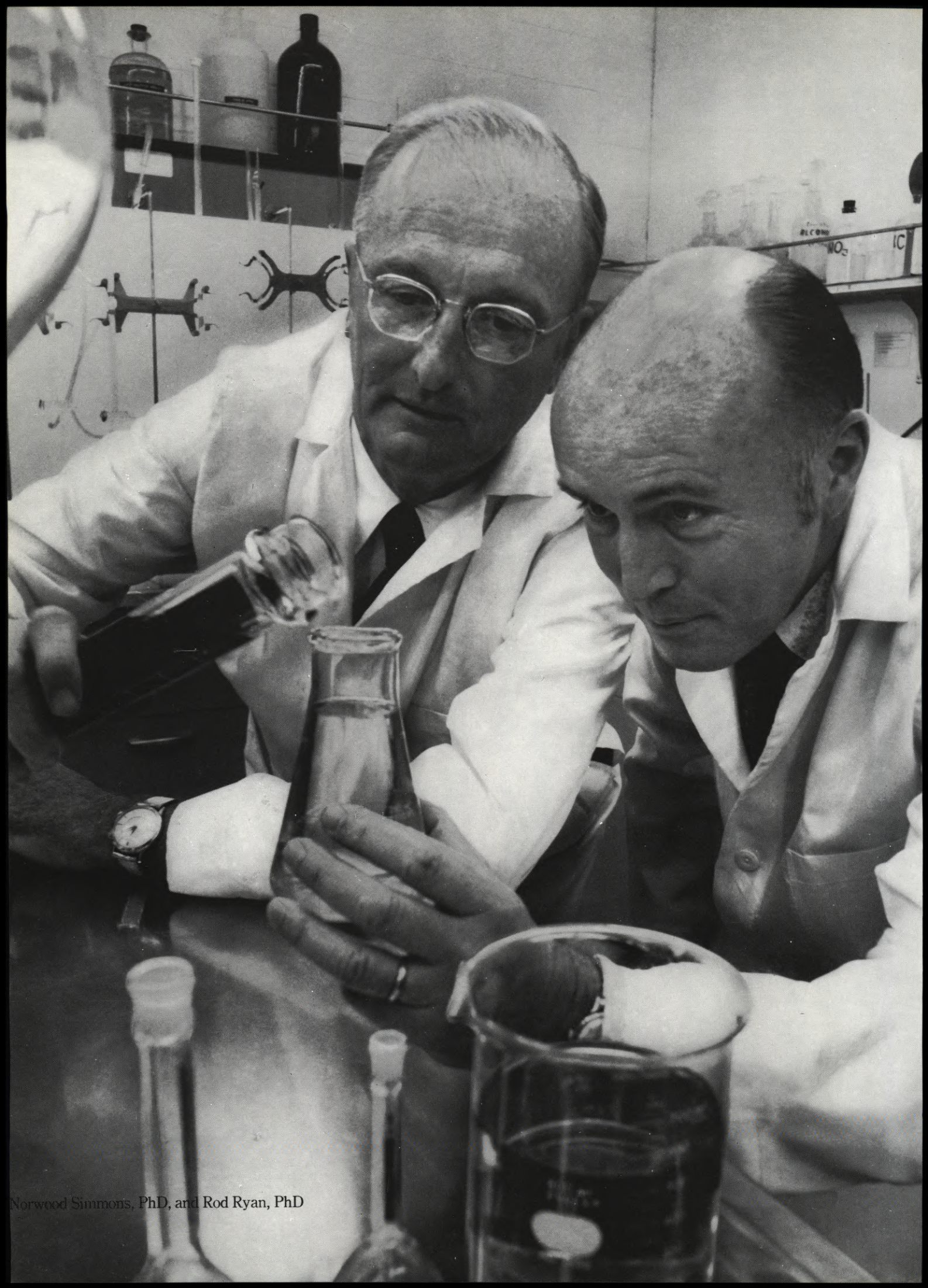
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ON THE COVER: Ulf Bäckstrom reads Nagra recorder, while Bert Van Bork takes meter reading in preparation for filming Dr. Thomas D. Brock atop magnificent Minerva Terrace in the Mammoth Hot Springs area of Yellowstone National Park. Scene is for a scientific film on microbiology of hot springs, produced by Encyclopaedia Britannica Educational Corp. Photograph by Herb A. Lightman.

AMERICAN CINEMATOGRAPHER, established 1920, in 53rd year of publication, is published monthly in Hollywood by ASC Holding Corp., 1782 North Orange Drive, Hollywood, California 90028, U.S.A. **SUBSCRIPTIONS:** U.S. \$7.00; Canada, foreign, including Pan-American Union, \$8.00 a year (remit International Money Order or other exchange payable in U.S.) **ADVERTISING:** rate card on request to Hollywood or New York office. **CHANGE OF ADDRESS:** notify Hollywood office promptly. Copyright 1972 ASC Holding Corp. Second-class postage paid at Los Angeles, California.



Norwood Simmons, PhD, and Rod Ryan, PhD

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OXBERRY® *breaks* *the* **35_{MM}** **LIQUID** **GATE** *barrier....*

For the first time OXBERRY has engineered and is marketing a 35mm fixed pin registration Liquid Gate. It eliminates the effect of scratches on the base, prolongs the life of soft emulsion films like CRI and reduces the effect of dust and dirt on the film.

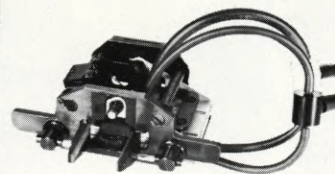
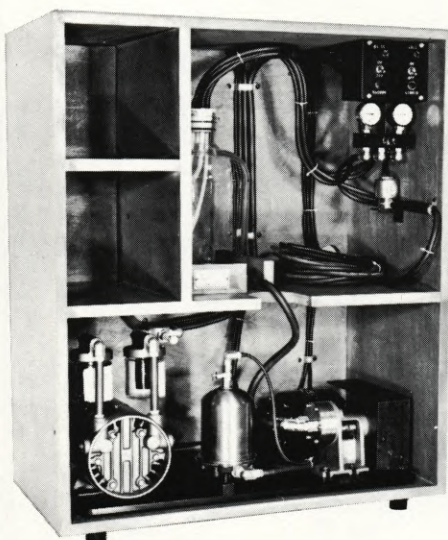
After meticulous testing, OXBERRY is offering its 35mm Liquid Gate System. This is a compact precision engineered system. It is completely interchangeable with the standard dry gates in Optical Printers and is a self contained, normal loading, unit that's ready to go in minutes. It virtually eliminates scratches and passes splices easily without causing liquid spillage, streaks or turbulence, at freeze frame, normal speed, forward and reverse. All this with fixed pin registration! The entire system is easily transportable, is operated and threaded in the same manner as the OXBERRY dry gates, it requires almost no attention from the operator.

The Support System maintains a constant and precisely controlled flow of filtered liquid in the gate area. A regulated pressure pump supplies the proper liquid environment and bypasses all excess liquid back to the reservoir while a vacuum pump removes the liquid from the emerging film and the gate area. In the gate the film is positioned by the precision fixed pin registration system and is held completely immersed in turbulence and dirt free liquid. Two thick optically flat glass windows are used in the aperture to minimize the effects of dust and dirt on their outer surfaces. These windows are specially coated to maximize light passage. The position of the film plane is meticulously corrected to maintain normal focal plane and to preserve the ability for precision automatic focus.

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AC 30-70	ACME 35mm
AC 30-73	ACME Combination Super 16mm & Standard 16mm
AC 30-75	ACME Standard 8mm
AC 30-74	ACME Super 8mm
5030-75	OXBERRY Standard 8mm
5030-74	OXBERRY Super 8mm

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The new Nizo cameras embody the latest in technological advances — most of these capabilities were developed by Nizo and most remain Nizo exclusives. And when you've had an opportunity to examine the other features of the new Nizo S-560 and S-800, you'll see we haven't stinted anywhere else. To mention only a few: incomparable Schneider Variogon zoom optics with as much as an 11.4 to 1 zoom ratio; automatic metering that works all the way up to ASA 160; built-in sound synch pulse generator; and instant slow motion. The suggested retail price is \$595 for the S-560 and \$695 for the S-800. See your dealer for a complete demonstration. He'll have some statements of his own to make concerning the amazing new Nizo movie cameras.



BRAUN Nizo

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* If within two years from date of purchase a Nizo S-560 or S-800 movie camera fails to function because of defects in materials or workmanship and the unit is returned to an authorized service center, Braun North America will, at its option, repair or replace the unit without additional charge. Batteries, misuse or tampering excluded.

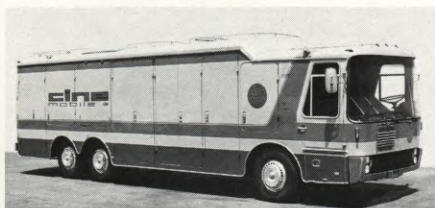
For information write: Braun North America, A Division of The Gillette Company, Dept. 56, 55 Cambridge Parkway, Cambridge, Mass. 02142.

In Canada: Braun Electric Canada, Ltd., Mississauga, Ontario.

Price is subject to change without notice.

WHAT'S NEW

IN PRODUCTS, SERVICES AND LITERATURE



CINEMOBILE MARK VII

NEW ULTRA-SOPHISTICATED MARK VII AND MARK VIII CINEMOBILES

First six-wheel drive and eight-wheel drive Cinemobiles, the Mark VII and Mark VIII models of the famed "studios on wheels", arrived by freighter at San Pedro from the factory to join the fleet of Cinemobiles based in Hollywood, it was announced by president Fouad Said. The newest and latest Cinemobiles are specially designed for the rough terrain of the Western states and for use anywhere off regular highways.

The six-wheel-drive Mark VII is 35 feet in length, while the eight-wheel-drive Mark VIII is 40 feet long. Both models, in addition to the multiple-wheel drive, feature a deck and a half, front-mounted diesel engines with ten-speed transmissions and two-speed front wheel drive as other innovations.

Extra storage space for props and lumber is provided by the unique extra half deck of the vehicles. Like previous Cinemobiles, both new models have the exclusive aircraft-type 1500-ampere generators built in.

Other Cinemobiles in the Hollywood fleet are the Mark II, Mark III, Mark IV, the double-deck Mark V and the Mark VI.

"MASCELLI'S CINE WORKBOOK" ANNOUNCED FOR FALL PUBLICATION

Cine/Grafic announces that Joseph V. Mascelli, ASC, is preparing "Mascelli's Cine Workbook" for fall publication. The "Workbook" is an entirely new concept in cine books for the working cinematographer. It is not a textbook, data book or manual, but a "cine accessory" that helps the cameraman choose and use the films, filters, lenses he needs for the particular set-up at hand, and also permits testing, checking and evaluating cameras, filters, films, meters.

The book will contain no advertising. In lieu of ads several select motion picture firms are contributing various accessories, such as calculators, viewing filter, filter sample booklet, lens tissue, neutral card, gray scale, color control patches, slate and marking pencil, orangewood stick, film time clocks and numerous other items to aid the cameraman. The book will be 5½" x 8½", wire-lock type binding, packed in a heavy duty mylar bag (which together with the back cover becomes an erasable slate). The price will be \$15.00.

Firms serving the cinematographer are invited to inquire about contributing useful accessories. Write Cine/Grafic Publications, P.O. Box 430, Hollywood, CA 90028.



HERVIC ANNOUNCES IMMEDIATE AVAILABILITY OF NEW TRIPOD

Hervic Corporation/Cinema Beaulieu is proud to announce the immediate availability of its new Hervic Tripod.

The Hervic Tripod is a very compact and lightweight unit (only 11 pounds), making it an ideally portable tripod unit for the exacting requirements of the 16mm field cinematographer. The Hervic Tripod has a built-in bubble-level indicator which permits precise leveling of the unit even when positioning it on the roughest terrain.

The Hervic Tripod features durable all-aluminum body construction (fully anodized) with stainless steel cam-lock devices on each leg to firmly lock the leg into position.

Other features on the new Hervic

Tripod include:

- ★ Integral ball head
- ★ 360° pan head with drag lock
- ★ Sliding chain tension device for maximum rigidity of the tripod legs
- ★ Operator adjusting handle with lock
- ★ Large, professional-size knobs and levers
- ★ Miniature foot pedal units on each leg (for use in bringing tripod legs into extended position)

The Hervic Tripod measures 6" x 38" when closed... and extends to 64". The price of the new Hervic Tripod is \$199.95.

For further information, write Hervic Corporation/Cinema Beaulieu, 14225 Ventura Boulevard, Sherman Oaks, California 91403.



LOWEL-LIGHT INTRODUCES NEW VERSION OF VARI-FLECTOR

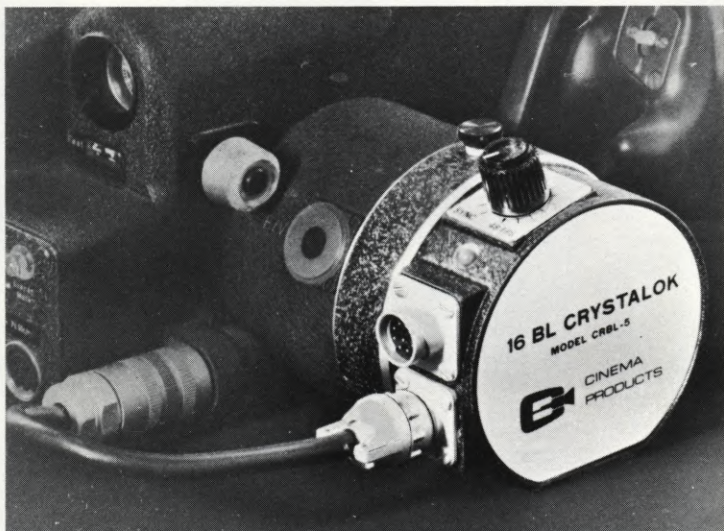
Lowel-Light, manufacturers of portable location lighting equipment, recently introduced the Vari-flector II, an improved version of their well-known reflector, incorporating several new design features.

A new side-channel mechanism had been added so that the reflector sheet can be inserted more easily. With the turn of two screws, these adjustable side-channels grip the sheet with vise-like action, while the entire reflector assembly is held fast by a new cross bar locking lever. This increases structural integrity, withstanding even high winds.

Like its predecessor, Vari-flector II has a variable brightness control, which

Continued on Page 916

"Talk about Crystal Control!"



No connecting cables necessary

Everyone's talking about the new 16BL Crystallok, which makes crystal sync recording with your Arriflex 16BL a reality at a price you can afford. Designed and developed by the Academy Award-winning Cinema Products and available from AGE Inc., 16BL Crystallok requires no modification of your BL camera or battery. The small, compact 16BL Crystallok slips over the end of the Arri motor housing and is held in place by three thumb screws. Ready to operate in seconds. A switch on the 16BL Crystallok allows you to shoot 24 fps in crystal sync or variable speeds from 14 to 48 fps. The 16BL Crystallok offers the ultimate in quality and reliable operation, incorporating high efficiency, solid state integrated circuitry and high accuracy.

Price: \$775.00

16BL Crystallok unit,
complete with power cable and connector

FEATURES:

- Frame rate 24 fps forward only in crystal mode, ± 15 parts per million over temperature range of 0° to 140°F. (The 16BL Crystallok will drive cameras geared for 25 fps at 25 fps sync.)
- Frame rate in variable speed mode is 14 to 48 fps. Accuracy factor $\pm .05\%$.
- Power supply: standard Arriflex 12V battery. No changes required in camera or battery.
- Works compatibly with any Universal motor (i.e., type without forward/reverse switch.)
- Comes ready to operate with pigtail connector.
- Extremely compact. Projects only 1 1/2" beyond motor housing when installed.
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As our Color Timer looks at the picture, he adjusts it for proper color balance and density by using three color dials. They provide a practically infinite range of adjustment. Much more accurate than *wedging*, which is making several trial exposures with different color and exposure values and then interpolating for the one that is most nearly right.

Wedging is costly, it takes too much time, and it's hit and miss. CFI's Title & Optical Department does your job fast—and *right the first time around*—by using the sophisticated capabilities of the Eastman Video Color Analyzer. You save time (service in most cases in 24 hours or less) and you save money. And, most important of all, you get superior quality.

CFI's Title & Optical Department is the industry's first to utilize the advanced technical capabilities of the Eastman Video Color Analyzer for your benefit. At CFI we always keep an eye on the technology of tomorrow, because we've found it helps us do your job better today.



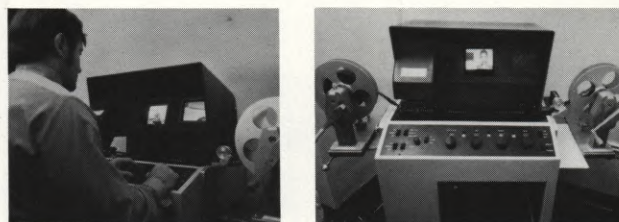
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Complete 35MM and 16MM Film Services

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Complete 35MM and 16MM Film Services



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Based on what we had done, they selected Cinema Research to restore over 300,000 feet of World War II footage.

This priceless historical documentation of World War II is the

only full color combat footage being reconstituted by the Armed Forces.

We are pleased to be a part of the effort to restore these films to their original condition.

The point?

Just this. Every foot of film, regardless of the amount, gets the same careful attention when it's placed in our care. Whether we're doing 35mm optical printing, blow-ups, reductions, special effects, titles or restorations. Call it our professional attitude, the best equipment, or 25 years of optical experience.

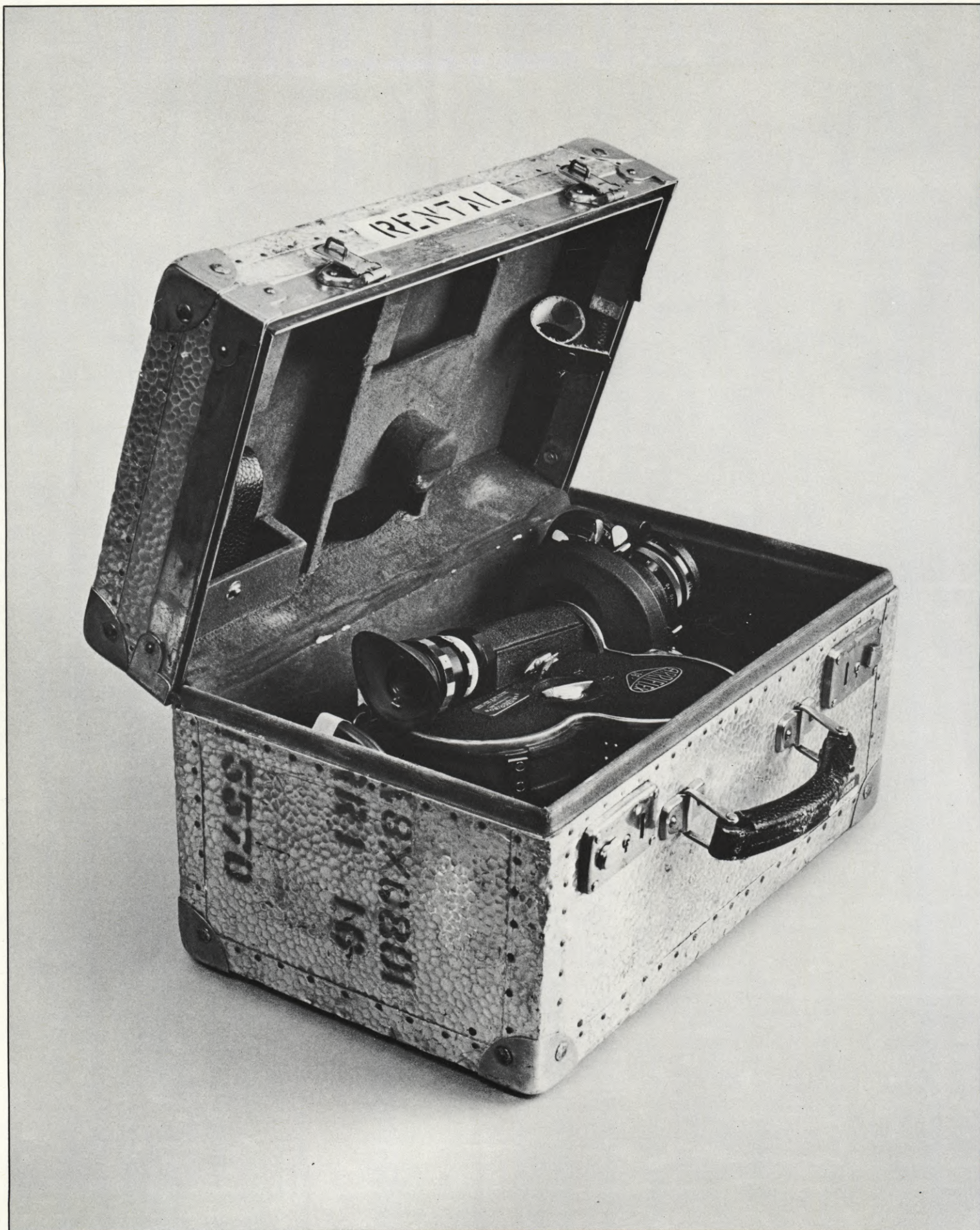
The Marines have a word for it. They call it pride.

We'd like to start something with you. Contact us at **(213) 461-3235**. Just ask for Hal Scheib or Jack Glass.

Or simply write or wire Cinema Research Corporation, 6860 Lexington Avenue, Hollywood, California 90038.

- Complete in-plant art department (direct aerial image blow-up titles)
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Cinema Research



Seven out of ten rental cameras are Arriflexes. Why?

Every rental agency has a reputation to protect. Camera breakdowns would ruin it, of course. And they'd rather have their gear out on rental than in the repair shop or on the shelf. That's no secret.

Dependability?

So it's their business to know which equipment is the most dependable. Arthur Florman, President of F&B CECCO, says: "As the backbone of our rental departments for many years, Arriflex cameras have proved themselves reliable, trouble-free and simple to maintain."

Familiarity?

Director of Photography Fouad Said uses seventy-two Arriflexes in his Academy-Award winning Cinemobiles. Says Mr. Said: "Everyone knows how to use an Arri. You can hand one to a production crew anywhere in the world, and they'll be ready to go."

Service?

Film maker Gerry Feil's Arri 16S was swept away by a torrential river in the uncharted jungles of New Guinea. His short-wave radio request for a replacement was relayed to the factory by cable. A new camera with the correct motor, cables and lenses, plus proper customs documents, arrived at Port Moresby in New Guinea *three days later*. Service like that impresses rental agencies concerned with "down time."

Versatility?

The more *uses* a camera has, the more people are likely to rent it. For example, people

have used the Arri 16S for hand-held footage, animation, time lapse, microscopic study, shooting titles, kinescope recording, and on a sound stage, (blimped), shooting lip sync. *Not bad*, for a camera whose basic body weighs only six pounds and lists for \$2680.00.

Accessories?

Whichever Arriflex model you're using, there are more accessories available to you than with any other brand of camera on the market. And you have a choice of more than *ninety* Arri mounted lenses. Dealers and rental agencies around the world stock most of their lenses with Arriflex mounts.

Toughness?

You've probably heard it said that such-and-such is "not a rental camera." This means, simply, that it can't stand up to the treatment it gets from rental users, day after day. Well, obviously, the Arriflex can.

You can baby your own camera, of course; but sooner or later, if it's fragile, it'll break. Possibly on location, a long way from home. With Arriflex, that's just not likely to happen. *It's worth thinking about.*

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CINEMA WORKSHOP



By ANTON WILSON

FILM LATITUDE

Motion picture film consists of two parts: the base and the emulsion. The base is essentially the "mechanical" part of the film. It accounts for over 90% of the thickness of the stock, it is virtually clear, and its function is solely to carry the emulsion. The emulsion is a very thin layer on one side of the base and is the medium which actually forms the recorded image. The density of the emulsion can vary over a wide range and it is this property that actually forms the image.

Ideally there should be a direct and linear relationship between the density of the emulsion and the magnitude of exposure. Areas of the film receiving a greater amount of light should have proportionately greater density and vice versa. Most photographic media will exhibit this linear relationship. However, there always exists one serious limitation. The range over which this relationship exists is usually very narrow. For a particular film stock, the emulsion will only record images within a small range of exposure; that is, above a certain level the film becomes fully

exposed (maximum density for a negative) and higher values of exposure cannot possibly be recorded; the film is overexposed or saturated. Likewise, values of exposure lower than a certain value will not even begin to register on the emulsion. The emulsion remains as if unexposed (minimum density on a negative). The emulsion can thus only record images when the light energy is within this particular "range."

FIGURE 1 shows the plot of the "sensitometric curve" of a typical negative material. This curve provides a clear graphic representation of this phenomenon. The horizontal axis is the magnitude of exposure. The vertical axis represents the density of the emulsion. Note that the curve is linear between prints B and C. Exposure levels within this region will produce an accurate image, as the density will vary proportionately with the exposure. As exposure increases, the curve enters the "shoulder" (C-D) region. The curve begins to level off, and increases in exposure will not produce a proportional increase in density. As the exposure increases above the 0.00 level, the curve virtually flattens; maximum density has been reached and no further detail can be recorded regardless of how high the exposure may go.

Exposure levels below B in the example, will be in the portion of the curve called "Toe" (A-B). Like the "shoulder", the curve levels off in this region and the density is no longer linearly related to the exposure level. The density approaches the actual density of the clear base material. In other words, values of exposure much below the 2.00 level will not even register on the emulsion, and the developed film in these areas will be virtually "clear" or unexposed. Thus for exposure levels below the 2.00 level, no detail can be recorded.

For a well-exposed and detailed image on the emulsion depicted in FIGURE 1, exposure levels from the various areas of the scene should be between 0.25 and 1.75 (B to C on curve). Each step of the Log Exposure Scale is approximately 3-1/3 stops. This is usually expressed by saying that the film has a latitude of five stops, (or a

latitude of plus and minus 2½ stops). The emulsion will still record some detail just above and just below the linear region. In the example of FIGURE 1, the emulsion will continue to record limited detail for an additional ½ to 1 stop on both sides of the linear region. (Partially into the 'Toe' and 'Shoulder'.)

It is imperative that the cinematographer be cognizant of the latitude of the raw stock he is using. Using the film depicted in FIGURE 1, the cinematographer must keep all important elements of the scene within a spread of five stops. For example, a scene may consist of areas that are in direct sunlight and areas in the shade. If an incident reading indicates a five-stop difference between the two areas, you can be sure that most details will be lost for light objects in the sunlight area as well as dark objects in the shade. When using films with particularly narrow latitudes, fill light must usually be employed to provide even lighting. As a rule, negative materials have a wider latitude than reversal stocks. Likewise, black and white stocks exhibit wider latitudes than most color stocks.

The curves in FIGURE 1 are all for the same film stock. Each curve represents a different "gamma" (γ). The gamma indicates the extent of development and a particular emulsion can be developed to a wide range of "gamma". Notice that the gamma is the "slope" of the characteristic curve. That is, for a larger value of gamma there will be a greater change in density for a given change in exposure. The gamma is one

Continued on Page 929

FIGURE 1

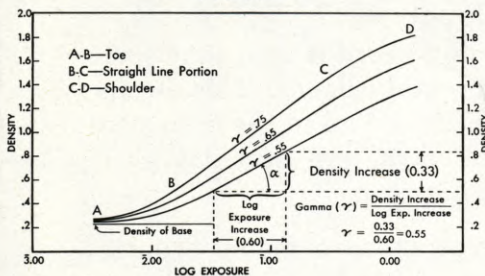


FIGURE 2

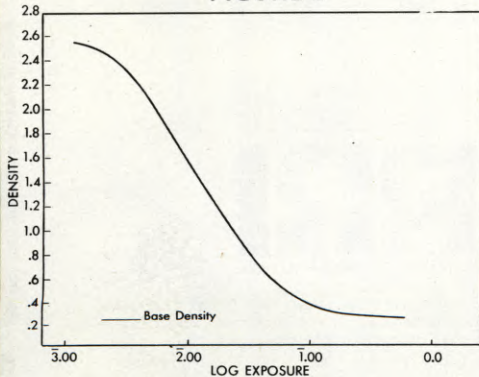
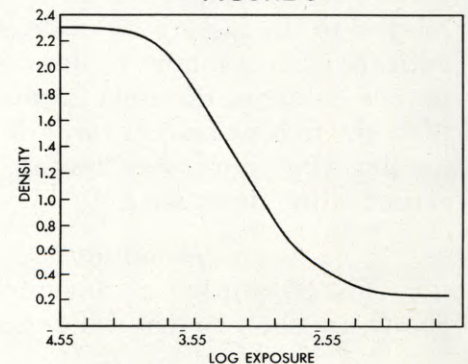


FIGURE 3



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TO T.V. PRODUCERS

DON'T LET YOUR SHOW BECOME
OBSOLETE

LOREN L. RYDER

Dear T.V. Producer:

When color T.V. was in the early experimental stages, I advised producers to shoot color and release black & white. Some did and sold their reissue in color for more money than the original release returned. Some producers continued to shoot black & white and could not sell their reissue for love or money.

Stereo sound is in the early experimental stage, and my advice to all T.V. producers is to record all music, sound effects and off stage dialogue in stereo, with all on stage dialogue in monaural. Then release monaural and be prepared for a stereo reissue.

A few extra dollars in rental, or a few hundred dollars in investment and no appreciable increase in production cost is all that is required. The cost for a T.V. station conversion to stereo sound is only a few thousand dollars. The viewer's cost will be between \$100 and \$200. At these prices I expect this change to take place in the next year or two.

Stereo sound has already completely replaced monaural sound on disc, tape and FM reproduction in the home. It will do the same thing for T.V.

Please protect your product.

Sincerely,



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NEW YORK, N.Y. -- SEPT. 12-15, 1972

The Moody Institute of Science

uses the new Photo-Sonics 1PD camera extensively in Hawaii photographing volcanic activity 'round-the-clock, rain or shine!

On a recent field trip Robert L. Miller, Director of Production at MIS, picked up footage for several films currently in production. Photo courtesy of Moody Institute of Science.



This new camera, Model 1PD, designed to meet the more sophisticated requirements of documentation and sports, is a direct by-product of Photo-Sonics' 36-year record of meeting and exceeding the most rigid specifications for cine and high-speed motion picture photography.

Outstanding features include . . .

- Rugged construction
- Movement: 2 pulldown, 2 register pins.
- Speeds, 16 to 200 fps, to 500 fps optional.
- Continuous reflex viewing; image always correct. 360° rotation perpendicular to film plane, 360° rotation around viewer centerline.
- Interchangeable ground glasses.
- Clear gate; no spring loading of pressure plate against film.
- 200', 400' and 1200' daylight load magazines

change in five seconds.

- Designed for use with Arri bayonet mount zoom lens.

Optional features:

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QUESTIONS & ANSWERS

Conducted by CHARLES G. CLARKE, ASC.
and WALTER STRENGE, ASC.



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

Q We are considering doing a theatrical feature film in 16mm or Super 16mm and blowing it up to 35mm release prints. Can older cameras (Auricon and Cine Specials) be converted to Super 16? Where do we go for information?

A Comprehensive answers to your questions are given in depth in articles which have appeared in this magazine for June, 1970, (Volume 51, #6), November, 1970, (Volume 51, #11) and April, 1972 (Volume 53, #4). A good many professionals believe that the advantages of Super 16mm over regular 16mm are not sufficient to compensate for the trouble and expense of converting cameras and changing lenses unless the film is solely intended for 1.85-to-1 theater exhibition. The Super 16mm format is not acceptable without expensive conversion for 16mm prints with sound or for the 1.33-to-1 aspect ratio of television.

Q I have just acquired a Beaulieu 4008 ZM II and may want to add sound to my films in the future. Should I shoot my films at 18 fps? 24 fps seems to slow up the action. I also expect to use a filter such as the Skylight 1A or a U.V. Filter over my lens at all times. Which would be better?

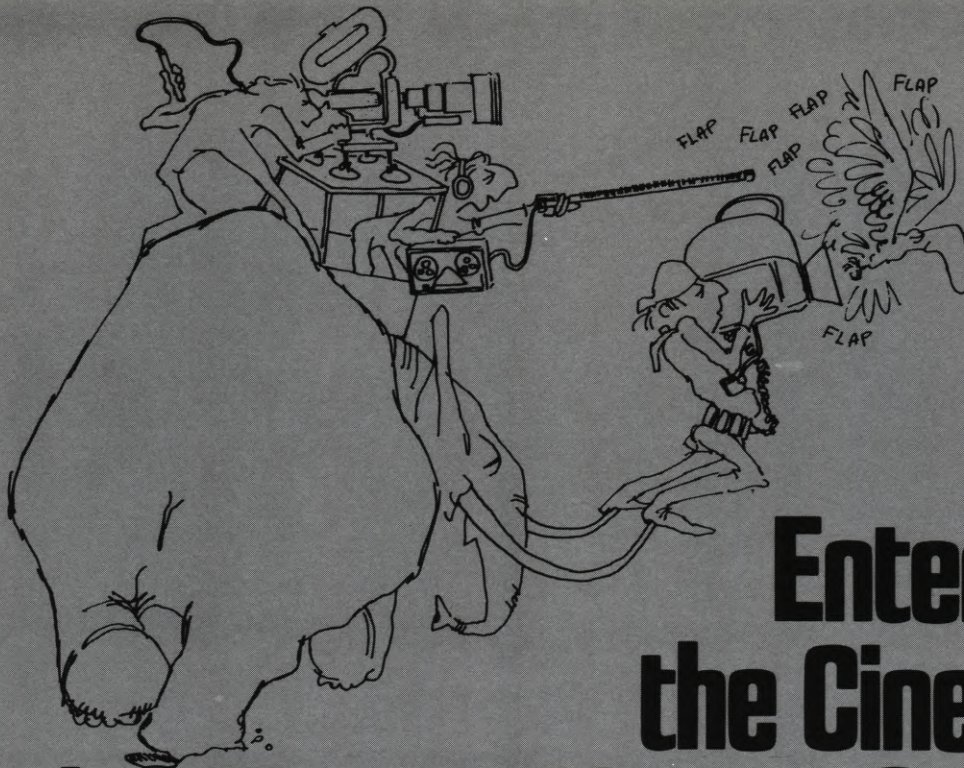
A The standard rate for projecting sound films is 24 frames per second. Any deviations from this norm in your taking or recording speed will produce distorted action and sound pitch. You had better stay with 24 fps for any sound films you intend to make. We cannot understand your thinking for using any form of ultra-violet filter at all times. These filters are useful for absorbing excess blue light which occurs in overcast days, aerial shots, seascapes, etc—otherwise, forget it.

Q I recently photographed a scene of a subject against a brightly lighted window. My meter indicated a light reading of F/8 for the long shot and F/5.6 when I zoomed in for a close-up. In both cases the subject was a silhouette, but I expected to see detail in the face. What went wrong?

A In such cases of extreme light contrast you should use daylight filtered lamps or reflectors on the subject to reduce the light contrast. Then take a meter reading for the wide shot which includes the window. Next take a reading very close to the face, excluding all of the lighted window. This would undoubtedly indicate a lens stop much larger than F/5.6. Rather than zoom in, in this case, it would be better technique to cut to a close-up, preferably from an angle that excludes the window. But if you must zoom, you should frame on as large a close-up as possible to avoid the flare and halo which will result from the optics of the zoom lens, and the gross overexposure from the window as you open the lens.

Q I have two questions. First, when using a polarization screen with its factor of 2.5, do I open the lens two-and-a-half stops when the polarscreen is set at its darkest position and one-and-a-half stops for its lightest position? Secondly, when trying to penetrate haze in aerial photography, using 5254 color-negative and a #85 filter, will that filter be sufficient to absorb the haze by itself, or should I add a haze filter—or a polarscreen? Which would be the best?

A First, you should use a factor of 2.5 for the polarscreen regardless of its rotation before the lens. There is not much advantage in using this screen unless full advantage is taken of its darkening of the sky effect, or for the removal of unwanted reflections in glass or water surfaces. Secondly, nothing is gained by adding a haze filter to the #85 filter for that absorption is built into the 85 filter itself. In a rare case, a polarscreen might be used for aerial photography, if the flight course was in a straight line with no banks or turns. In that case the polarscreen could be set to its proper position in relation to the direction of the sunlight. This is seldom possible in usual aerial work. You could use a more deeply saturated filter of the 85 series for maximum haze absorption, but the laboratory can make a color-corrected print by using yellow filters in the printer which will produce satisfactory results. ■



Enter the Cine 60 Motion Picture Picture Contest.

**Whether you win or not,
you win!**

Every day, it seems, more motion picture people discover Cine 60 products. Often, because of a word from fellow-professionals. *But sometimes, because our equipment is the only practical way to do the job.*

Take our Power Belt, for instance. Available in voltages up to 35 and ampere-hour ratings up to 7½, it's been responsible for making many impossible shots possible. From sky divers in action to skiers schussing down the slopes to motorcycle racing.

The same goes for our Arri-35 Blimp. Our Vacu-Platform. Our Snap-lok. Zoom motors. In fact, just about

every item in the Cine 60 line fills a unique need.

What does all this have to do with a contest? Simple. Because people are so busy *doing things* with Cine 60 products, they don't have time to take pictures of how our equipment does the job. So we have few photos to help show others what they're missing.

Result: our contest

Any cinema professional or student is eligible. All you need is a photo you've taken of our products *in action on location*, along with a brief note describing the situation and production (name, location and name of people in the picture). For other rules, see below.

While you're at it, why not ask the people using our products what they think of Cine 60 equipment? You'll discover why many have become industry "standards"—for reasons like comfort and lack of restriction; compatibility with all types of cameras; unusual flexibility; and day-in, day-out reliability. In fact, you may even want to try some Cine 60 equipment yourself. (We'd like that!)

Now that we've made it more interesting than ever to find out how Cine 60 can help you make the most of your talent, we'd like to hear from you. At the very least, you'll discover why so many people think of Cine 60 when they think of camera accessories. Which will make you a winner by itself.

CONTEST RULES

1. Any cinema professional or cine student is eligible.
2. All contestants must submit an 8 x 10" glossy photograph, which they have taken showing the Cine 60 Power Belt in action, on location, during an actual production.
3. All photographs must be accompanied by a signed letter from the photographer, describing the situation, production (name and description), and names of all people recognizable in the photo.
4. All photos and letters entered become the property of Cine 60 Incorporated, and will not be returned.
5. Photographs will be judged on the basis of artistic and technical merit, uniqueness, and illustration of the Power Belt in action.
6. Prizes will be as follows:
First Prize: a Cine 60 Sun Gun Power Belt and Sylvania Sun Gun (value: \$418.50)
Second Prize: a Cine 60 Power Belt for Arriflex, Eclair, or other equivalent camera (value: \$269.00)
Third Prize: a Cine 60 electric zoom drive of the winner's choice, or comparably valued Cine 60 accessory (value: \$365.00)
7. In all cases, the decision of the judges is final.
8. Prizewinners' photographs may be used in Cine 60 advertising. In such a case, receipt of the prize will be considered compensation.
9. If other (non-winning) entries are used in advertising, suitable compensation will be arranged by mutual agreement between Cine 60 and the entrant.
10. Employees of Cine 60 Incorporated and its advertising agency are ineligible.
11. All entries must be postmarked no later than Sept. 30, 1972.

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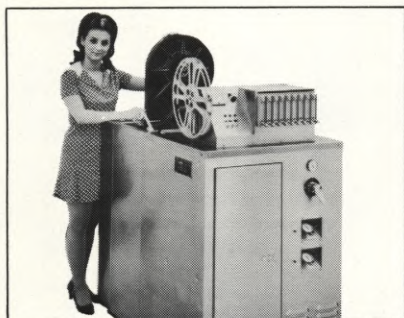


We build from basics to give you more features, more versatility, more field-proven dependability and more economy than any other processor.

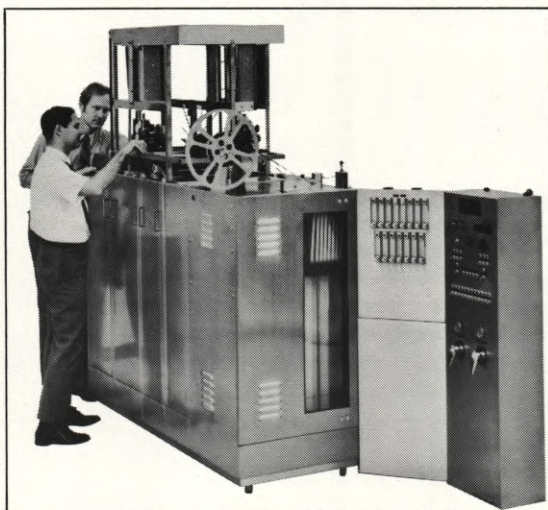
Jamieson Color Film Processors.

Basic features of all Jamieson color film processors that give you the ultimate in reliability, simplicity, and high quality output.

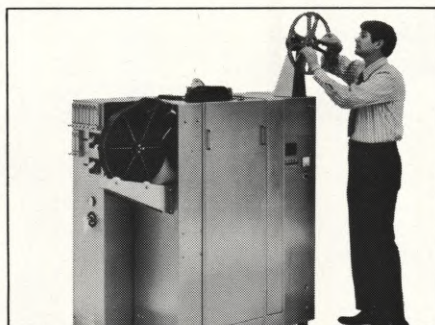
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- Small sizes that save space
- Modular construction
- Stainless steel cabinets
- Color coded plumbing and wiring



Jamieson Compac 16/8. Conducts standard ME-4 at 20 f.p.m. Runs 16mm and 8mm interchangeably. Also available for 35mm/16mm. Other Compac models for B & W reversal and negative/positive.

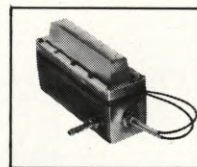


There's a Jamieson color film processor in the size you want, for the process you want to conduct. For complete technical data and specifications on the Mark IX series, Mark IV series, and Compac models, write for our catalog on Jamieson Color Film Processors.

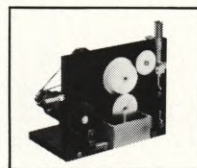


Jamieson Mark IV, Model A. Processes 16mm and 8mm Ektachrome at 30 f.p.m. Model B for ECO-3 and ME-4 with silver track. Other models for 35mm processes, including CRI.

Jamieson Mark IX, Model B. Conducts ECO-3 and ME-4 for all 16mm, 8mm Ektachrome camera and print films at 65 to 75 f.p.m. Other models in the Mark IX series for Eastman Color and other processes in 16mm and 35mm.



Jamieson Ultra-High Velocity Pre-Dryer. Utilizes capillary accelerators to produce high air velocity for surface moisture removal. Small size, easy mounting, small air volume, minimum heat input and low power consumption.



Jamieson's Vacuum Augmented Track Applicator*. Provides absolute film positioning, highest reliability through vacuum assisted contact at back-up roller. Gives maximum power for uniform film drive. Precision machined, micrometer adjustments, right- or left-hand operation.
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The only reflector that rolls up into a compact case for storage and travel is *also* the only reflector on the market with a flood control: the Lowel Vari-flector. And now, we've improved it!

New ease of assembly

If you're familiar with the Vari-flector, you already know it unrolls like a roll-top desk, becoming rigid by attaching two side channels and a cross bar. But now, the side channels open wide, making the reflector a cinch to insert.



New ruggedness

The Vari-flector's channels now clamp shut like a vise. Which, with the added protection of a new cross bar locking lever, increases structural integrity... even in high winds.

As compact as ever

The large Vari-flector II (model 404) and stand fit into a 42 x 7" case. And the smaller unit without stand (model 202) fits into a case only 24 x 4½". Both units are compact enough to take to the most remote locations.

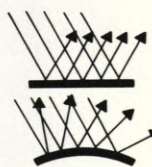
Superior stand-mounting

Rugged, lightweight Vari-flector stand (model VS) assures positive tilting, panning and height adjustment, providing horizontal, vertical and diagonal reflection and flooding. Center spike can be forced into soft ground for added wind stability. Extendable leg levels stand on uneven ground. (Incidentally, many gaffers have taken to using our VS stand for large lights, cutters, etc.)



Exclusive flood control

Vari-flector's brilliant, extremely even light pattern can be instantly softened and spread out (as much as 3:1) with its finger-operated cam lever.



You can continuously adjust the degree of flood to prevent "washing out" subjects as they approach the camera.

Works indoors, too

Vari-flector is an excellent studio or location "source", reflecting artificial or window light. And it's especially useful where space and/or power restrictions exist.

Cleans with soap and water

The aluminized surface resists stains and scratches; eliminates frequent, expensive resurfacing.

Choose from two sizes

Model 404, measuring 42 x 27" opened, and model 202, 24 x 18".

For more information

... visit your Lowel dealer, and try the Vari-flector II for yourself. For his name, or further information, contact us.



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U.S. Patent No. 3,254,207

THE BOOKSHELF

By GEORGE L. GEORGE

Two Arno Press reprints in their *Literature of Cinema* series are of particular interest for historic information on the beginnings and early days of cinematography. HISTORY OF THE KINEMATOGRAPH, KINETOSCOPE AND KINETO-PHONOGRAPH (\$4.) by W. K. L. and Antonia Dickson, published in 1895, was intended to describe their collaboration on Edison's experiments in the development of silent and talking motion pictures. The well illustrated text deals with the filming of productions starring Buffalo Bill, strongman Sandow, bears, cats and monkeys. The Dicksons' early grasp of the kinoscope's "no limitations" potential is indicated in their statement that from no "conceivable phase of the future can it be debarred."

* * *

Published in 1927, E. G. Lutz's THE MOTION-PICTURE CAMERAMAN (\$13.) is an invaluable document dealing with equipment, processing, studio and location work, trick photography and animation. It will surprise many to learn what sophisticated techniques were used almost half a century ago, and to what extent current viewing of films from that period fails to do them justice.

* * *

The revised edition of Raymond Fielding's TECHNIQUE OF SPECIAL EFFECT CINEMATOGRAPHY (Hastings House \$18.50) updates its encyclopedic contents in both innovations and improvement of familiar procedures. Front-projection, for instance, has been updated as to the Scotchlite sheeting, the beam-splitter, and the front- vs. rear-projection comparison, with many illustrations added. In virtually all chapters, this authoritative and reliable work reflects the continued advance of widely-used processes.

* * *

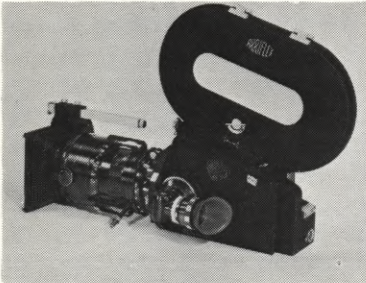
In JAMES BOND IN THE CINEMA (Barnes \$5.95), the significance of camerawork is stressed by John Brosnan's survey of a celebrated film series. Photographers Ted Moore, with five Bond films to his credit, Freddie Young and Michael Reed with one each, outdid themselves in devising spectacular action and trick effects that marked these unusual movies.

* * *

What it really means to work in the film industry—the texture of experience—is the theme of MOVIE PEOPLE

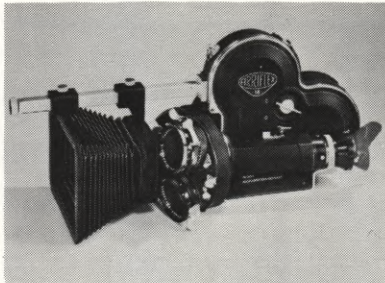
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Rugged, reliable, versatile, self-blinded sound camera. The professional camera for quality location sync sound filming. Compact, lightweight. Tachometer, frame/footage counter. Simplified film path, gear-driven sprocketed magazine system. Camera built around famed mirror-shutter reflex system and registration pin movement. Also available with single system magnetic sound.



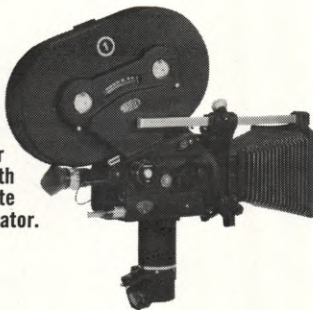
ARRIFLEX 16mm STANDARD

Model S Camera. Use with 100' spools or 400' magazines. Simplified film path lets you change magazines in seconds. Rock-steady registration pin movement. Mirror-shutter reflex system, also available with built-in slate and sync generator.

ARRIFLEX 35mm CAMERA

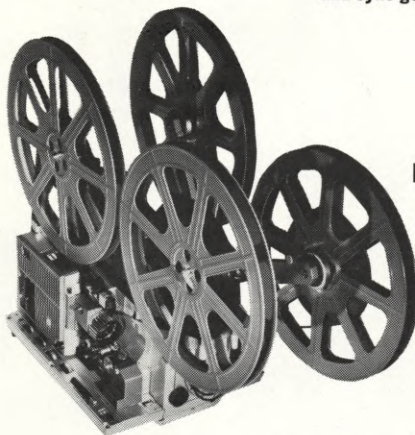
Model 11-C incorporates the latest improvements in 35mm reflex cameras.

Quick change magazines, mirror reflex shutter. Also available with variable shutter, built-in electric slate and sync generator.



SONOREX INTERLOCK PROJECTOR

The Sonorex is a single system optical/magnetic sound projector — with a built-in 16mm interlock magnetic deck, that is ideal for double system sync previews, original recordings, sound transfers, and many other practical and creative sound film jobs. Sonorex is outstanding for its mechanical, optical and audio quality, and is the answer to a wide variety of daily production problems.



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(Douglas \$2.95), in which Fred Baker, with Ross Firestone, has recorded talks with some top professionals. Directors Sidney Lumet and Francis Ford Coppola discuss *The Pawnbroker* and *You're A Big Boy Now*. Screenwriters Terry Southern and James Salter, editor Aram Avakian, and actor Rod Steiger are among the perceptive and articulate contributors to this stimulating book. While, regrettably, no cameramen participated, their essential role is explicitly acknowledged.

* * *

Compiled and edited by educational experts Ronald Gottesman and Harry M. Geduld, *GUIDEBOOK TO FILM* (Holt \$6.95) is a comprehensive and compact world-wide reference work. Beside an excellent bibliography, it lists museums and archives useful for research, publishers and bookstores, film schools, sources of audio-visual equipment, distributors, organizations and services, festivals and awards, and a glossary.

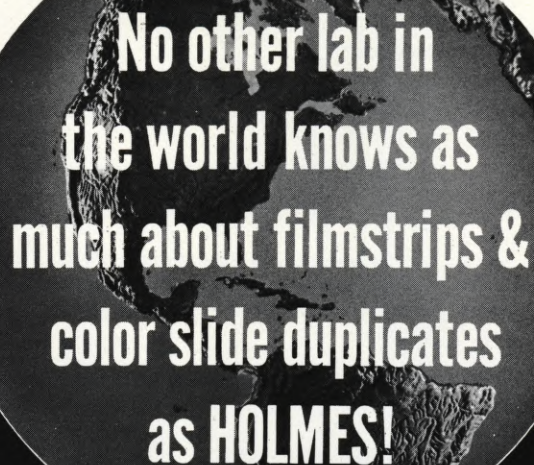
* * *

Attempting to cash in on *Woodstock's* phenomenal success, Warner Bros. undertook *Medicine Ball Caravan* with Oscar-winning French director François Reichenbach and an all-French camera crew. Studio publicist John Grisim's *WE HAVE COME FOR YOUR DAUGHTERS* (Morrow (\$6.95) tells of this calamity-ridden production, a hilarious and pathetic cross-country trek by a group of freaked-out rock musicians where everything imaginable went wrong.

* * *

Viking Press has initiated the "MGM Library of Filmscripts" with three volumes, Hitchcock's *NORTH BY NORTHWEST*, Lubitsch's *NINOTCHKA* and Cukor's *ADAM'S RIB*. (\$5.95/2.25 ea.) Photographed respectively by Robert Burks, William Daniels and George J. Folsey, these screenplays are not only outstanding examples of cinematic writing in the comedy and suspense genres, but also enjoyable reading for their literary quality. The scripts are fully annotated in a way that accurately describes the action. The illustrations (although production stills rather than frame blowups) clearly suggest the professional skill and artistry of their photographers.

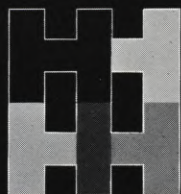
Beside its obvious film buff appeal, *THOSE GREAT MOVIE ADS* (Arlington \$14.95) is a well-documented survey of Hollywood publicity techniques, with some 1,000 reproductions of outstanding ads and a lively text by experts Joe Morella, Ed Epstein and Eleanor Clark. ■



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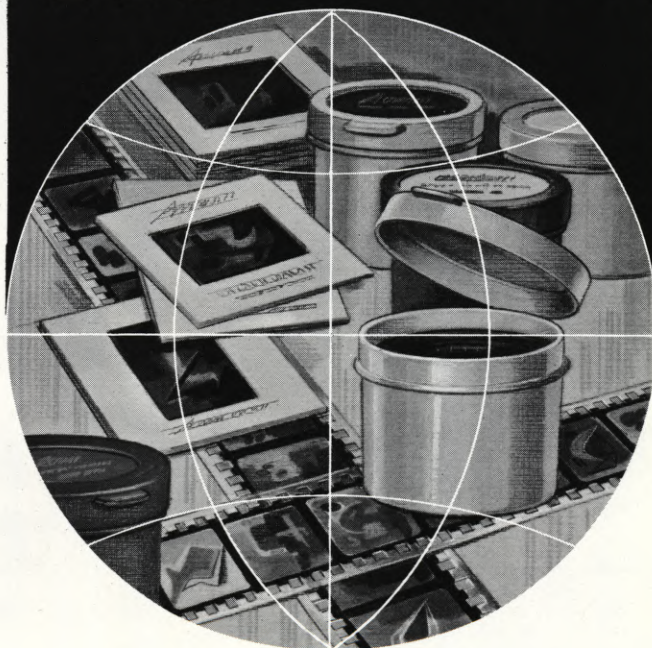
Since 1948 we've specialized in processing filmstrips and color slide duplicates. They're not a "side line" with us. They're our only business. During these 24 years, we've created our own unique equipment and developed many unusual techniques. Most important of all, we've instilled in every department an outstanding enthusiasm for perfection. That's why we say: "No matter what your material is, we can do more with it — and get more out of it — than anyone else." It's a promise... from the only lab that knows and cares enough.



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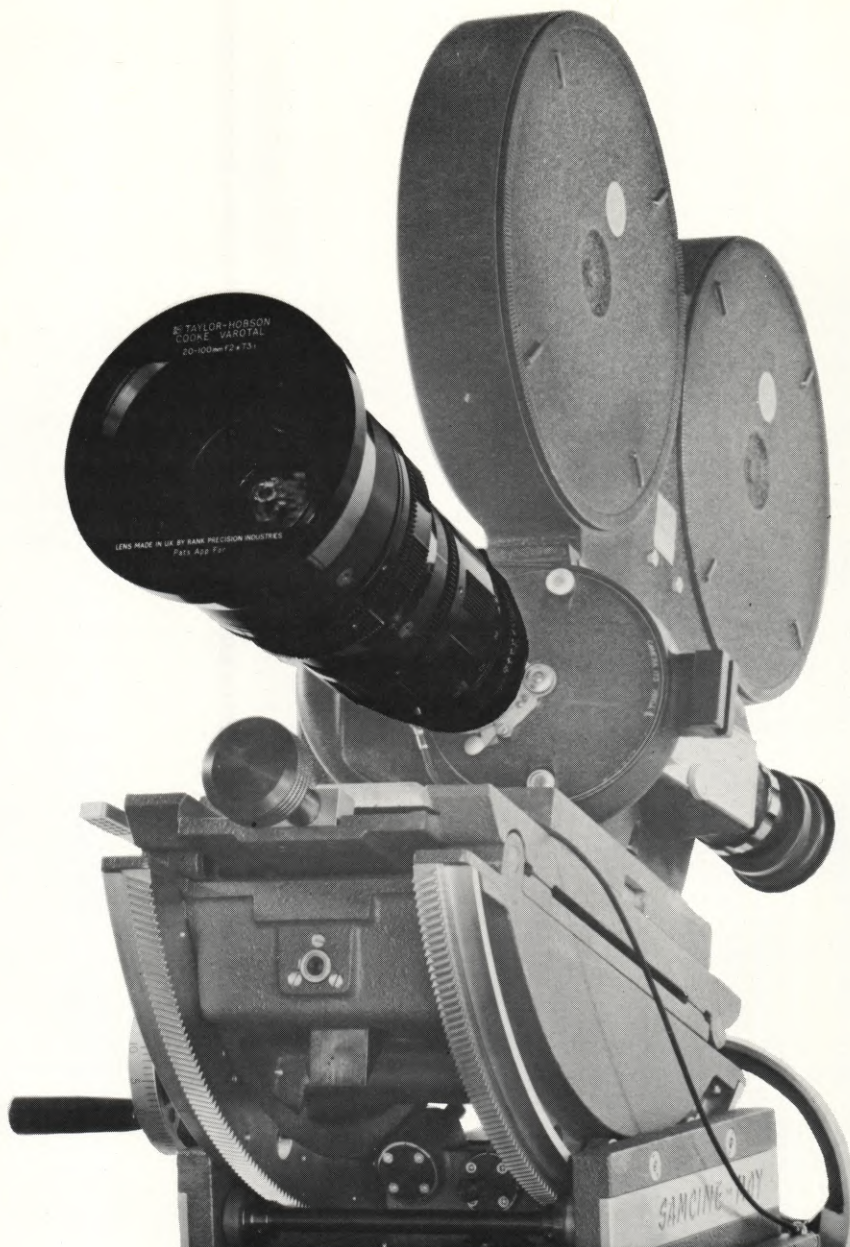


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INTRODUCING THE BEAULIEU "NEWS 16" PROFESSIONAL SINGLE/DOUBLE SYSTEM 16MM SOUND CAMERA



The Beaulieu "NEWS 16" is an *absolutely* new and unique 16mm camera system specifically designed to meet the demanding filming requirements of documentary motion picture and television newfilm cameramen.

The Beaulieu "NEWS 16" is a remarkably *silent* running camera. The cameraman has available six different and interchangeable synchronous sound options: single system (magnetic) module...to be used with the light weight and compact Beaulieu miniaturized amplifier; a 24 or 25 f.p.s. crystal-sync module; and three different synchro-pilot generator modules (50 cps, 60 cps, and 100 cps).

The Beaulieu "NEWS 16" camera is designed to be operated with one hand — leaving the other hand free to ward off crowds, or rioters, or to protect the cameraman himself in some other way. (Of course, the cameraman's free hand can also be used to follow focus while power zooming.) The low camera profile permits the cameraman to see directly across the entire camera body — again, providing an additional protection to the cameraman in difficult filming situations.



The "NEWS 16" camera weighs approximately 16 lbs. (together with interchangeable Angenieux "Auto" 12-120mm zoom lens and interchangeable crystal-sync module). The weight is distributed so that this compact camera is balanced comfortably on the cameraman's shoulder. The co-axial film chamber accepts 100' and 200' daylight-load film spools, with fully automatic (and extremely fast) *self-threading*.

The mirrored shutter always stops in the viewing position. The thru-the-lens viewfinder swivels 180° for front, rear and top viewing, with 22X magnification, etched TV frame, and choice of left or right eye viewfinders. A signal light inside the viewfinder warns the cameraman that only 15 feet of film is left. At the same time, the external camera on-light switches off automatically.

Some additional technical features include: built-in variable power zoom (3 to 25 seconds) and fully automatic exposure system (both with manual override); interchangeable variable speed motor (12-40 f.p.s.), and lens interchangeability (C-mount). Also available is an Angenieux "Auto" 9.5-57mm, f1.6 zoom lens.

Hundreds of thousands of feet of sound film were used to test the Beaulieu "NEWS 16" in all parts of the world — from the heated riot scenes in Belfast — to extensive and diversified filming situations across the continent of Europe — and even to Peking for test filming coverage during the recent Nixon visit.

Production model Beaulieu "NEWS 16" cameras have now been formally introduced at the SMPTE Show (May 1972) in New York City. This exciting new single/double system professional 16mm sound camera has already been demonstrated to many hundreds of professional cameramen. Before you decide to purchase any other camera system, write us today to arrange for your own personal demonstration of the Beaulieu "NEWS 16" camera.

Amplifier Measurements:
5" High x 3" Wide
x 8" Long.

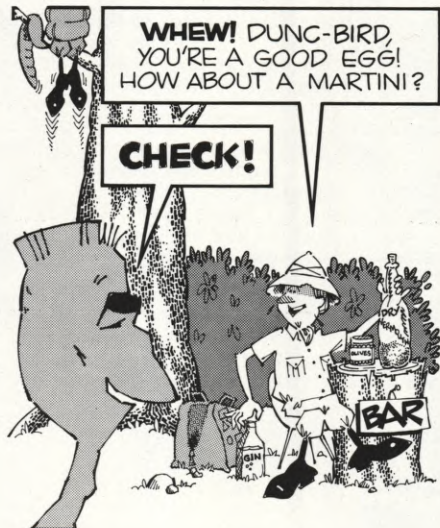
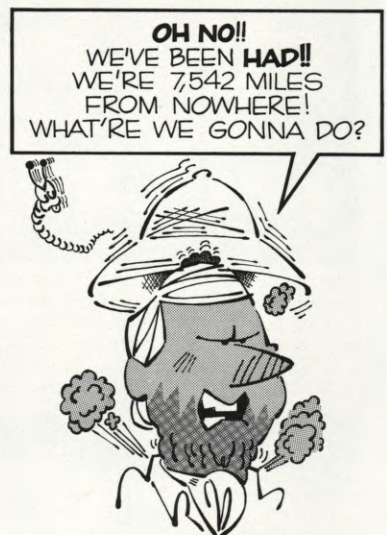
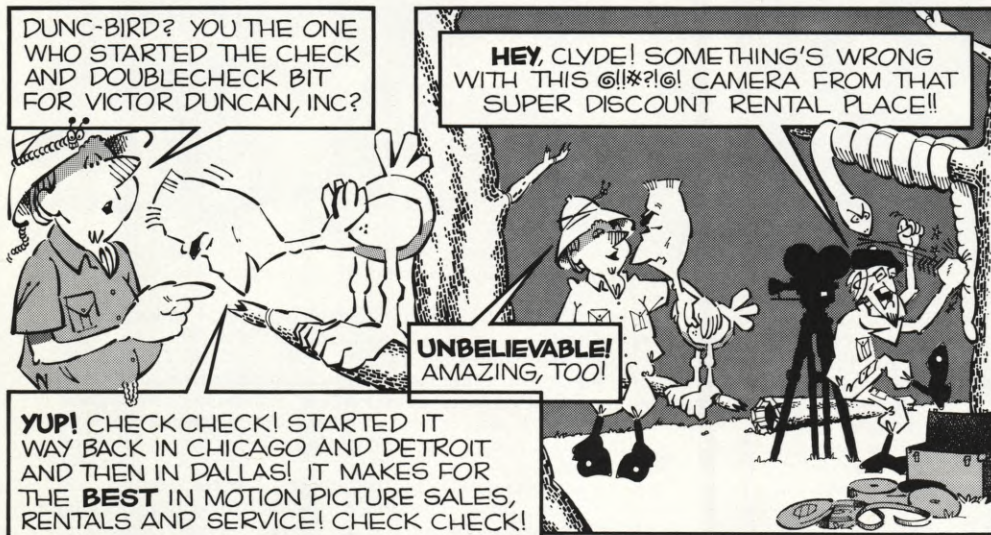
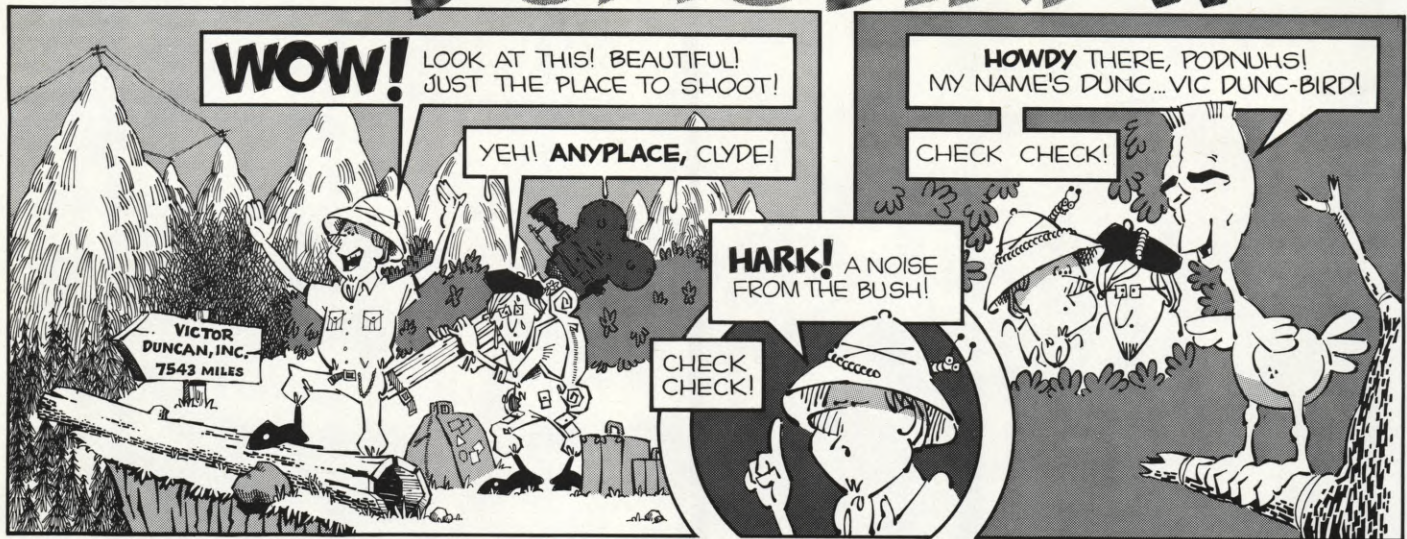


Camera Measurements (Body ONLY):
8½" High x 8½" Wide x 19¾" Long

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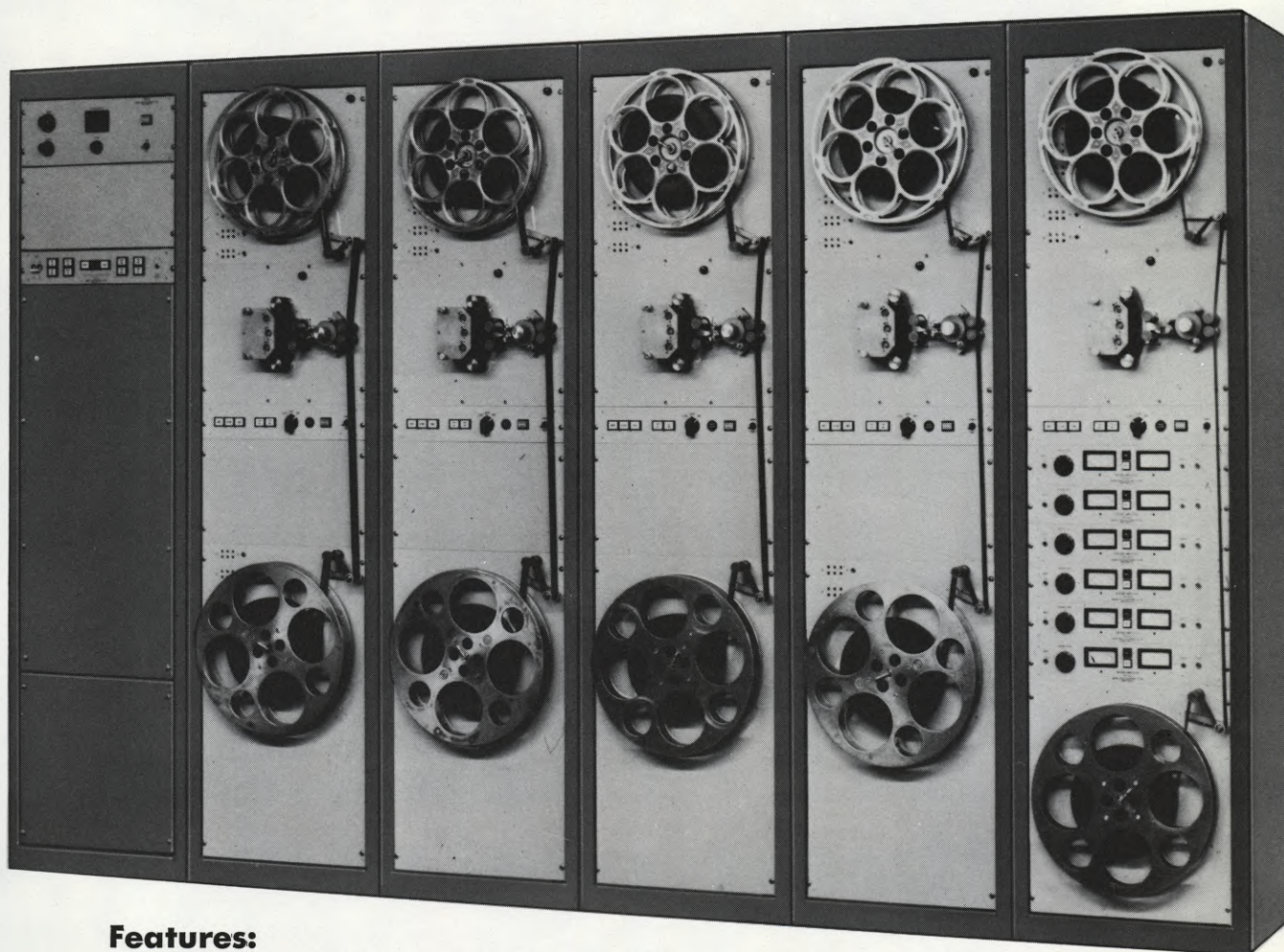
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FILMING IN THE YELLOWSTONE WONDERLAND





Go-anywhere Editor accompanies two intrepid film-makers through the steaming, exploding wilds of one of the greatest natural wonders on earth



By HERB A. LIGHTMAN

Yellowstone National Park

I look out the window of the plane and am stunned by what I see. We are flying over the Teton Range, a chain of majestic jagged mountains that leap abruptly from the Wyoming flatlands to form a peak-studded fantasy world 40 miles long and 15 miles wide. Though it is late summer, snow still lies on the highest slopes and blue lakes nestle in

Continued overleaf





Producer/cinematographer for Encyclopaedia Britannica Educational Corporation, Bert Van Bork has enormous patience and persistence for "getting it on film."

the valleys below. This is one of Nature's proudest displays—but only a preview of the wonders to come. Minutes later we touch down at the small neat airport outside West Yellowstone, Montana—"Gateway to Yellowstone National Park". The waiting and welcoming crowd is small, so I have no difficulty picking out the two friendly, smiling faces I have been searching for. There they are—Bert Van Bork and Ulf Bäckstrom, the two fearless film-makers who traipsed into the hell of an erupting volcano to film the award-winning short, "FIRE MOUNTAIN" (see *American Cinematographer*, June 1971). They are here to shoot two film subjects on Yellowstone National Park for Encyclopaedia Britannica Educational Corporation and they have asked me to come along and share the adventure.

Though they both hail from Chicago (most recently, that is), they look quite Western in their cowboy hats. And they've brought one along for me—a black mean-looking hat, so that I can look like one of the "bad guys" (a long-cherished ambition).

I'm really happy to meet up with them again, because these two dudes are my kind of people—totally turned on by film and willing to go anyplace and do anything to get that certain scene in the can. Bert, slightly larger than life, houses the soul of an artist in the body of a lumberjack. He has great natural style. Ulf (which means "wolf" in the

Scandinavian languages) is about as noisy as a turtle, but with a delightfully dry sense of humor. Built like a bull and imperturbable, he's a cool hand to have along, no matter what the crisis.

Together they constitute a formidable two-man film-making team. Van Bork is producer/cinematographer, while Bäckstrom functions as soundman/editor. They have a string of beautiful films behind them to prove how well the combination works.

Why They Are Here

After I've been registered in at West Yellowstone's pride, the Dude Motel (wouldn't you know it?), I ask to hear more about the projects at hand.

"Well, first of all, we're shooting a scientific film here on the ecology of the hot springs," Bert explains. "Also, we're filming another picture that will be similar to 'FIRE MOUNTAIN'. It's not a scientific film—but more of a mood piece that deals just with the beauty and natural phenomena of Yellowstone Park."

They had, I knew, made a previous trip here during the winter—rambling around in a big snowcat to shoot scenes, mainly of the animal population—the bears, deer, moose, elk, Bighorn Sheep, buffalo (American Bison) and coyotes that are resident in the Park. In the winter these critters come down out of the deep snow to feed near the thermal areas, which never freeze over. It's a great time to photograph them—if you can keep the film from snapping in the sub-zero temperatures.

As for the beauty and natural phenomena of the Park—there is such a mind-boggling profusion of both, that

the whole place is a photographic *smörgåsbord*—a veritable cameraman's paradise.

"That's actually something of a problem—as far as we're concerned," Bert explains. "You see, when you come to Yellowstone there are blue skies filled with fleecy white clouds and all of the formations are very colorful. It would be quite easy to shoot scenes that look like picture postcards. Also, the main geysers and hot springs have boardwalks all around them for the tourists. Of course, these boardwalks are necessary for safety because, in a lot of places, there is a real danger of falling through the crust into boiling water. But photographically speaking, the boardwalks are very hard to shoot around."

"Also, I have decided upon a different visual style for the films. I don't want the scenes to look like picture postcards—the pretty images of Yellowstone that are so familiar—because this is a very gutsy place, a very moody place, and a tremendous challenge for a cinematographer. You really have to study it first, get to know it, in order to come up with the true picture, a different picture."

"Yeah, but—what about the boardwalks and tourists?" I ask.

"A serious problem," admits Bert. "Everything here is broken down into little pieces, like a mosaic. Each geyser has a name sign and a boardwalk alongside it. We'll just have to break it all up somehow and pull it together again. I remember reading in your magazine about similar problems they had in shooting 'TORA! TORA! TORA!'—how they had to use smoke bombs and such at Pearl Harbor to block out the modern

Van Bork and soundman/editor Ulf Bäckstrom set up to shoot near Yellowstone's Beehive Geyser. They prefer to work as a two-man team and have a string of beautiful films behind them to prove that the combination works. They form a gung-ho crew that will go anywhere and do anything to get exciting scenes on film. Example: the spectacular award-winning short, "FIRE MOUNTAIN".





(LEFT) Van Bork takes a light reading preparatory to shooting an over-the-shoulder shot of Dr. Thomas D. Brock at work with his microscope. Dr. Brock, Professor of Microbiology at the University of Wisconsin, is the "star" of the scientific film devoted to micro-organisms that live in the Yellowstone hot springs. (RIGHT) A few small quartz lights are used to shoot scenes inside the laboratory, which is actually three mobile home units combined.

buildings. We'll have to do something like that—using geysers and whatever else to block out the boardwalks and tourists and buildings. What I'm after are images like the ones the first explorers saw when they came here and the place was completely untouched."

A neat trick, I tell myself, but lots of luck!

A Bit About Yellowstone

The place where we are is unique on earth. It was the first—and is still the largest—national park in the world. It is also America's largest wildlife preserve.

There is evidence that nomadic tribes tracked the now-extinct mastodon in this area 8,500 years ago and, much later, hunting parties from several Indian tribes trekked through here in quest of game—although only one tribe (the "Sheepstealer" Shoshone) actually dared the rigors of living in the Park area.

During 1804-06 the famous Lewis and Clark Expedition came within 40 miles of what is now the Park, but missed it completely. However, one of the Expedition's hunters, John Colter, left the group to become a fur trapper and ended up as the first white man to explore the area when he stumbled upon vast Yellowstone Lake during the winter of 1807-08. When he returned to civilization years later, no one would believe the wild stories he told about spouting geysers, boiling hot springs and bubbling mud pots. Though many trappers worked the area during the 1830's and 40's, it wasn't until 1871 that there was an official government expedition by the United States Geological Survey. A year later, on March 1, 1872, the Congress had the magnificent foresight and good sense to establish Yellowstone

National Park "for the benefit and enjoyment of the people." This year Yellowstone celebrated its Centennial Anniversary—may there be many more.

To try to describe the spectacles of this wild wonderland in terms of mere words is like asking a blind man to paint a masterpiece. The most extreme superlatives are simply not adequate. Within this Park lies the largest hydrothermal area in the world. There are others in Iceland and New Zealand—but there is only one Yellowstone.

Everywhere one looks there are weird and wonderful forms—each more original in design than the last. A vast natural art museum! It is as though Nature had run riot in an orgy of creativity, placing every variety of far-out natural beauty in this one place.

Nor does it just lie there and be beautiful, like an ordinary landscape. This place is *alive!* It pulses and stirs with an inner, fiery restlessness. It steams and spouts and smokes and bubbles and boils and hisses and roars. Cataclysmic forces roil about just below its thin skin. It is elemental—primeval—a total turn-on!

The Star of the Show

As Bert has told me, one of the two films to be shot here is a scientific documentary about the peculiar micro-organisms—bacteria and algae—that live in the boiling waters of the hot springs. The scientific authority who will serve as "collaborator" and provide the narration for the film is Dr. Thomas D. Brock, Professor of Microbiology at the University of Wisconsin.

For the past several summers, Dr. Brock has been engaged in research here for a number of sponsoring organiza-

tions, including the Atomic Energy Commission. He maintains a full-scale laboratory housed in three huge mobile home units which have been joined together. It is staffed by an eager group of his graduate students, who spend summers here with their wives and/or husbands, dogs and cats.

Dr. Brock, when I meet him, turns out to be an amiable, bearded giant who looks more like a frontiersman than the *cliché* image of a college professor. He is the "star" of this film—being, actually, the only human who will appear in it. He will portray Man—not *against* the wilderness—but working with it to preserve its ecology, while revealing its secrets.

We start off with him of a morning to film a normal "day in the life", which will actually take many days to shoot and will show him making various tests in the thermal areas.

After a lengthy drive from the West entrance to the Upper Geyser Basin, we pull off the road and strike out on foot, toting cameras and tripods and—in my case—about 30 pounds of still photographic equipment to take the pictures that will appear with my article. We wind our way for a mile or so through a dense forest which ends abruptly at the edge of a vast meadow. In the distance can be seen three huge, almost hemispherical mounds. It is an eerily beautiful scene, like a landscape on some far-off planet, and there is not the slightest sign of civilization anywhere.

We head for the central mound and climb up on top, where I am amazed to find a perfectly circular pool about 12 feet in diameter. It is of the deepest azure blue. Every few seconds a plume

Continued on Page 902

PHOTOGRAPHING "SHADOWS OF THE SEA"

A new integral underwater camera gets its baptism in an exciting cinematic search for killer sharks

By JOSEPH KEYERLEBER

Scope Productions, Tampa, Florida

Sharks!

Just thinking about them sent cold chills up and down my spine. In all my previous underwater filming, I had made a determined effort to give sharks a wide berth. Now my partner, Jack Cosgrove, was telling me that we were going to have to go looking for them. He had just convinced the Jos. Schlitz Brewing Company that a documentary about sharks would make an exciting addition to their public relations film library.

Ever since Jack had designed and built the SeaScope, a new integral underwater camera, he had been working overtime trying to find somebody to sponsor a filming expedition that would enable us to thoroughly test the new camera prior to marketing it. Schlitz and sharks proved to be the right combination, along with some help from the Stamas Boat Company, Johnson Motors, and the W. J. Voit Corporation. The waters of the Florida peninsula and the Florida Keys would provide

ideal testing locations, as well as plenty of sharks.

Almost two years later "SHADOWS OF THE SEA", the fifth in a series of adventure films SCOPE Productions has made for Schlitz, is finished and in distribution.

Jack designed the SeaScope to eliminate difficulties we had found in other underwater filming systems. First, we wanted a 200-foot film capacity. With the standard 100-foot load, we would frequently run out of film at critical moments. This meant surfacing, climbing into the boat, doffing dive gear, and getting dry. Then we would have to dry the housing, open it, remove the camera, change the film, and put it all back together. By the time we got back into our wetsuits, tanks, weight belts, masks, and flippers, we were exhausted, not to mention having lost valuable production time. Some of this hassle could be avoided by having several loaded cameras on standby with a "go-fer" to fetch and carry, but on our tight budgets, we



Using Arriflex 16S, his first choice for the cramped confines of a boat, Jack Cosgrove films gaffing of 7-foot shark caught by Al Ristori.



(LEFT) Joe Keyerleber sets the diaphragm by rotating the clear plexiglas "snoot" on the SeaScope camera. (CENTER) A head-on shot of Keyerleber shooting with the SeaScope. New camera is compact and easily maneuvered underwater. (RIGHT) Jack Cosgrove films hammerhead shark with Scope's original underwater camera, a Bolex H-16 in transparent plexiglas housing. After six years of service, it imploded on a shark-filming dive in 60 feet of water.

(LEFT) Cosgrove films topside scenes of Les Rayen's operation. (CENTER) One of the three sharks filmed during production of "SHADOWS OF THE SEA". (RIGHT) Filming sharks in the Mote Marine Laboratory tank. This way, the cameraman risks only the camera and his hands. The purpose of "SHADOWS", a documentary for the Jos. Schlitz Brewing Company public relations film library, was to make a serious study of the shark as a natural phenomenon.



have never been in a position to afford such luxury. So, the SeaScope solves this problem by providing double the amount of film. The film is carried on standard 200-foot daylight loading spools pre-loaded in old Auricon Pro-200 magazines. The magazines prevent edge-fogging even while changing film under bright sunlight on the water.

The camera had to be electrically driven. We used a six-volt Globe motor powered by rechargeable nickel-cadmium batteries. The lens diaphragm can be set underwater by rotating the clear plexiglas "snoot", which also allows the settings to be clearly seen. For most underwater filming we pre-set the focus at just under six feet, providing an effective depth of field of 2½ feet to almost infinity at F/2.8 on our 10mm Schneider Cinegon lens. This eliminates the need for focusing underwater.

The mechanism is from a Bolex H-16. Jack discarded the case and all the spring-drive, wind, counters, take-up and supply components, leaving us essentially with only the film transport, governor and gate. The film take-up and supply is re-mounted on an aluminum plate big enough to accommodate the two 200-foot magazines. A Veeder-Root footage counter can be checked through a window in the back of the camera.

The entire camera is "O"-ring sealed and has been tested down to 150 feet. We feel that its design will enable it to withstand the pressure of even greater depths. The prototype is fabricated from opaque black plexiglas, ½-inch thick, except for the door which is built up to a full inch. The door opens with four heavy-duty quick-release snaps for rapid film changing. The SeaScope weighs 27 pounds in air, less than two pounds underwater. It is two pounds lighter than a Bolex H-16 in the Bolex housing.

Perhaps most important of all for successful underwater filming are the handling characteristics and maneuverability of the unit. The SeaScope has two large handles, one on each side, for ease in holding the camera steady. The right index finger operates a comfortable spring-loaded on-off trigger. Tucking the camera between the right cheek and shoulder provides additional support and brings a large Mer-Optics viewfinder into contact with the face mask. The camera is ballasted to maintain a normal filming attitude in the water.

In cooperation with Electromagnetic Industries, Inc., of Clearwater, Florida, SCOPE is producing a more sophisticated version of the SeaScope. The production model is injection-molded of polyester material. It is smaller, lighter, tougher, and totally corrosion-free. The

new SeaScope will withstand pressure encountered at any practical diving depth.

The SeaScope was one of three underwater cameras we used in our search for sharks. We also used a Bell & Howell equipped with a 12mm Elgeet lens in a Sampson-Hall underwater housing, and our old Bolex H-16 with a 10mm Schneider Cinegon lens in a transparent plexiglas housing. This old standby, after six years of dry and faithful service, imploded one day last year in the Florida Keys in 60 feet of water. Jack had been swimming around with it, hoping to encounter a shark, when he heard what sounded like a shot.

"I thought Joe must have fired his powerhead, and I started looking around to see what had happened. It took me several seconds to realize that my right arm was suddenly heavy, and that I was being dragged to the bottom by my flooded camera."

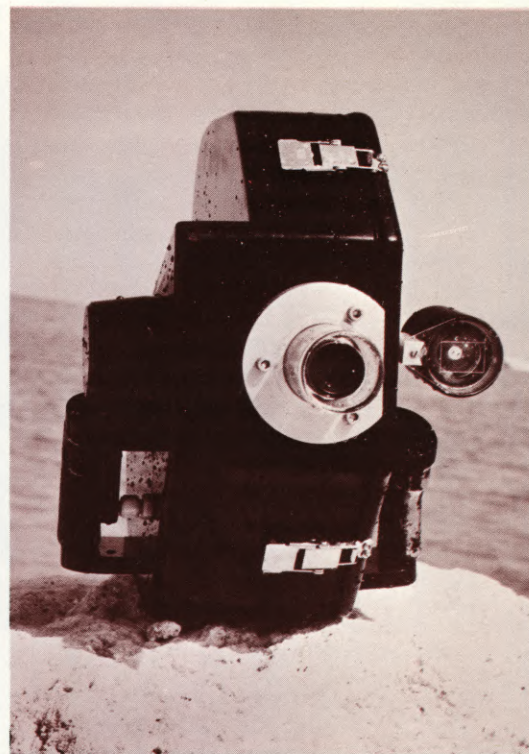
Jack finally struggled to the top with the watery mess. We were able to salvage the camera, but the housing and lens were a total loss.

For topside filming during this production we used a hand-held Arriflex S with 10, 16, and 25mm Schneider lenses. This is Jack's first choice for filming on boats because of its small size and flexibility. For sync-sound sequences we used the Eclair NPR with a 12mm-to-120mm Angenieux zoom lens and a Nagra III with a Sennheiser MKH 804 "shotgun" mike. And we had a Bolex H-16 with 17mm-to-85mm Pan-Cinor zoom lens for backup.

Our purpose was to make a serious study of the shark as a natural phenomenon. We soon began to develop a sense of awe and admiration for this monarch of the sea. Sharks are one of the oldest life forms on this planet. Fossil remains of creatures remarkably similar to today's sharks have been found dating back 320 million years. Mankind, by comparison, has been around for less than a million years. Somehow the shark has achieved a near-perfect adaptation to his environment. Scientific efforts to find out why this is so are the subject of a major sequence in the film.

Florida, to the dismay of the Chambers of Commerce, is an ideal location to study sharks. The Mote Marine Laboratory in Sarasota has the largest collection of sharks in captivity in the world. Dr. Perry Gilbert, executive director of Mote, allowed us to film his sharks and the experiments that are being conducted there. We were able to film closeups of sharks swimming within inches of the camera lens.

To accomplish this Jack donned SCUBA gear and entered a channel of



The SeaScope, integral underwater camera designed and built by Jack Cosgrove, is battery-driven and features a 200-foot film capacity.

water separated from the main shark tank by a slatted gate. He put his hands through the slats and I lowered the camera to him. My job was to stand at the edge of the tank with a prod to make sure the restless sharks endangered neither the camera nor Jack's unprotected hands. However, I wanted to make sure we got good closeups, so I tried to do as little prodding away as necessary. Jack came out of there a little pale-looking, with trembling but intact hands, and spectacular shark closeups.

Still at Mote, we filmed a sync-sound sequence with Dr. Gilbert demonstrating the shark bite meter, a device that has shown sharks to have a biting force as high as 18 tons per square inch. Jack filmed this underwater through the gate, this time on his own because I was filming topside with the Eclair. This provided us with a match-action sequence of a huge brown shark biting the meter, which had been wrapped in tempting filets of bonito. The shark bit hard, but let go in a hurry when his teeth hit the aluminum core underneath.

We did something in the shark film that we have never done before: we included ourselves and our cameras in the story. I felt that the viewer would be interested in seeing how sharks are filmed as well as the sharks themselves. This also provided us with a good excuse to film a sequence about the



(LEFT) Jack Cosgrove films the capture of a giant hammerhead shark by Capt. Emil Hanson of the Miami Seaquarium. (RIGHT) Using the new SeaScope camera, which he designed, Cosgrove photographs a dusky shark on the sea bottom. He and partner, Joe Keyerleber, were often in danger of shark attack during filming of "SHADOWS OF THE SEA", especially since sharks are cannibalistic and attract other sharks when they are wounded or caught on a hook.

SeaScope, which we did in the Florida Keys, off Islamorada.

Early in this project we became convinced of the impracticality of cages for filming sharks. For one thing, the cameraman is immobilized. If the sharks swim out of range he can't get any film. For another, if the seas are even a little rough, the cage is hazardous, uncomfortable, and difficult to get in and out of the water. Our search for sharks in the Keys would be in open water, without a cage.

Dick Stevenson, a Keys expert, took us out to a favorite spot of his where he said a big hammerhead lived. We stood on the bottom in 60 feet of water, cameras ready, as Dick chummed the water profusely with dozens of cut-up fish. As I stood there in the cool water, now murky with chum, thinking about how far it was to the boat, I experienced strange conflicting emotions. Of course, I wanted the shark to appear so that we could proceed with the filming. But in reality I wished that it were all over. I wished I were back in the boat drinking a cold Schlitz. I was afraid, and I kept making nervous circles in the water. What if the shark came at me from the front while I was looking behind me? To make it all worse, Dick had announced before we went over the side that the hammerhead is one of the most vicious of sharks. In truth, I hoped no shark would appear.

But the shark did appear, a big old ugly hammerhead. I figured that his ugliness and the rejection he has undoubtedly encountered from other more sleek and attractive sharks are what had turned him mean.

I was the "star" in this sequence, along with the SeaScope. Jack filmed me filming the hammerhead, while Dick Stevenson watched over us with an armful of powerheads in case the shark decided to deviate from the script. We completed the sequence without incident and got back to the boat safely. That cold Schlitz was the best I've ever tasted!

Jack and I felt well-protected that day, but on another occasion we weren't sure what was going to happen next. We were filming the commercial shark-fishing operation of Les Rayen in Fort Pierce, Florida. Rayen catches an average of 40 sharks a day on baited lines he sets out overnight. He sells the hides to Ocean Leather Corporation of Newark, New Jersey, a company with a secret process for making elegant and almost indestructible shark leather for fine cowboy boots, expensive shoes, and golf bags for movie stars. Jack and I were both underwater. He was filming the hooked sharks as Les Rayen was bringing them aboard his "Shark Boat". I was shooting production stills with the Nikons.

According to our custom, we had hired a diver to "ride shotgun" for us. Most of the sharks were still alive, and could conceivably struggle off the hooks, causing a serious problem. Since sharks are cannibalistic, we feared that more of them might swim into the scene to attack their dying brothers or us. To add to the danger, the water was murky and riled, with visibility only about 15 feet. We had instructed our "shotgun" diver to do nothing but make slow circles in the water, keeping near us but

out of camera range, so that all we would have to think about was taking pictures. To my astonishment he unhooked a large, seemingly dead, shark and began riding it like a horse, maneuvering it in front of the cameras. He seemed to interpret our frantic gestures that he should stop clowning around as signs of encouragement. Somehow we got the shots we needed. There were no shark attacks, and the shark our diver was riding stayed dead. Back on board the boat we had a long discussion with our underwater cowboy.

Other important sequences in "SHADOWS OF THE SEA" were filmed at the Miami Seaquarium and in the waters off Sarasota, where Al Ristori, director of field testing for the Garcia Corporation, was on a shark fishing expedition. He caught four sharks of the "requiem" family for our cameras.

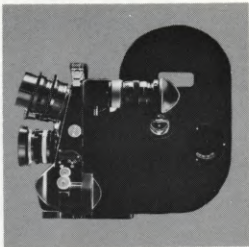
The editing of this film was straightforward. We felt that, due to the inherent interest of the footage we had compiled, our best approach in telling the story was a simple narrative style. Our narrator was Will Sinclair.

The music track was produced on the MOOG Synthesizer by Media Artists, Inc.

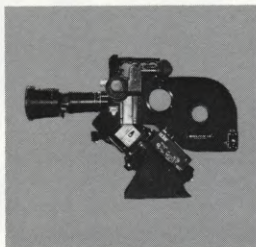
"SHADOWS OF THE SEA", 27:30 minutes in length, is being distributed by Schlitz and by Association-Sterling Films.

Jack Cosgrove and I learned a lot about sharks on this project. One thing I've learned is to always dive with a buddy if there might be sharks around. That way, if the sharks get hungry, there's at least a 50-50 chance they'll eat your buddy! ■

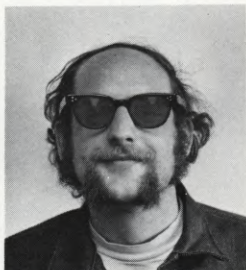
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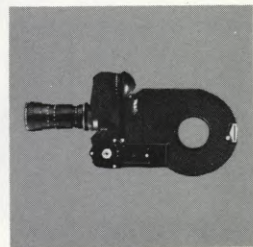
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THE MITCHELL MARK III CAMERA

A new 35mm hand-held camera, bearing a famous name, makes its appearance to join the ranks of portable, light-weight modern filming equipment

During recent years, an increased trend toward *cinema verité* filming techniques, both in the studio and on location, has brought forth ever-increasing demands for more mobile equipment. The development of the mobile studio has provided the justification for many manufacturers to develop light-weight, compact and more efficient designs in almost every type of equipment required for filming feature motion pictures.

The Mitchell MK III 35mm Camera is the most recent product to be developed for the Professional to use in this new era of cinematography.

The MK III is a completely new design, with the exception of the intermittent film transport. The intermittent transport in the world-famous Mitchell MK II has been used as the starting point in the MK III. During twelve years of production, the MK II transport has been used under the most demanding conditions by cinematographers the world over and by agencies of the United States Government, operating at speeds from animation to 120 frames per second with astounding reliability.

Since the MK III is designed to be a quiet camera (mid 30 dbs.) for docu-

mentary use, primarily at 24 frames per second, the maintenance on the film transport will be limited to cleaning and lubrication for many years.

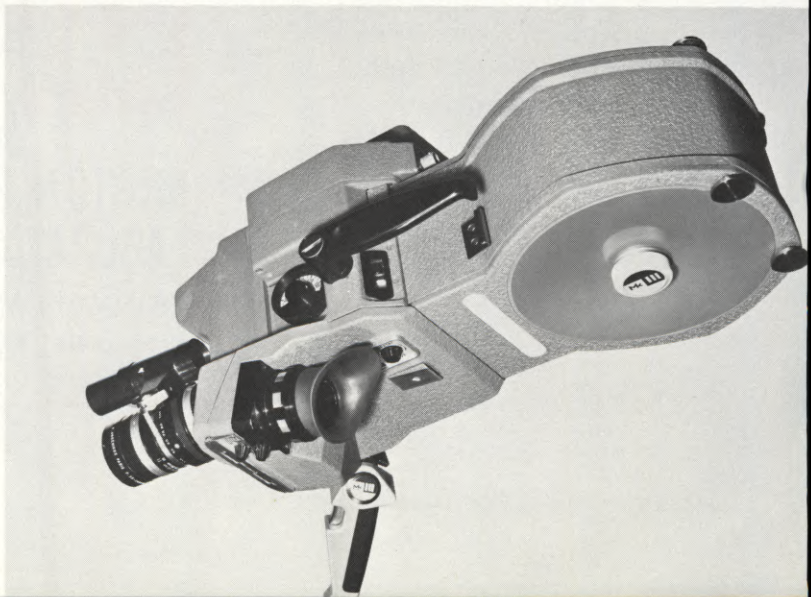
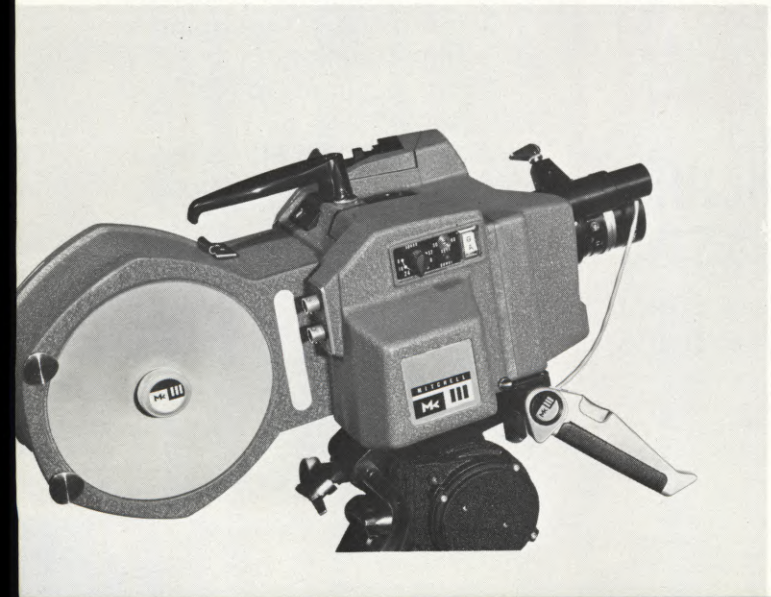
Other points of the Specification for the MK III, beyond the usual Mitchell product quality, required that the MK III be a lightweight unit; well-balanced when placed on the shoulder; have a quick-detaching coaxial magazine, with no metering sprocket in the camera box to expedite film loading; have a brilliant rotary-mirror reflex-viewing system, with a large-diameter viewing eyepiece; and, by all means, a variable speed crystal-regulated motor that will operate from conventional DC battery packs and belts. All of these design goals have been attained in the MK III, with a few extra goodies thrown in.

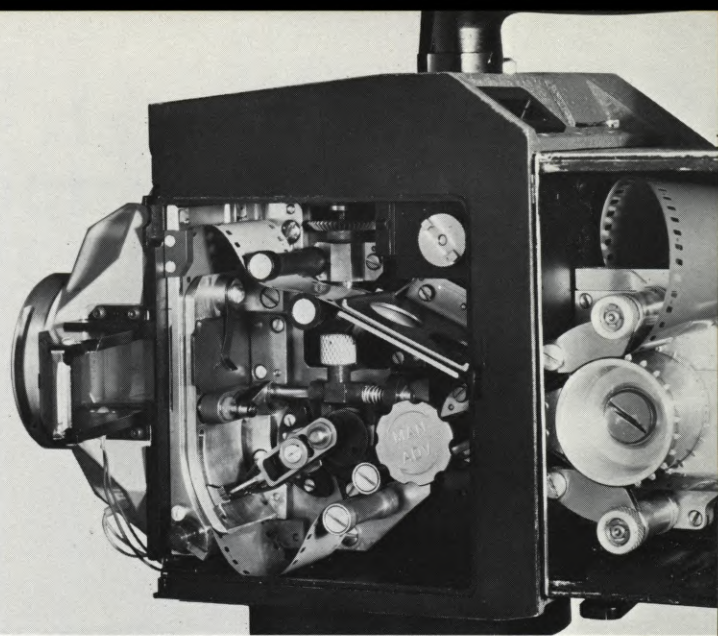
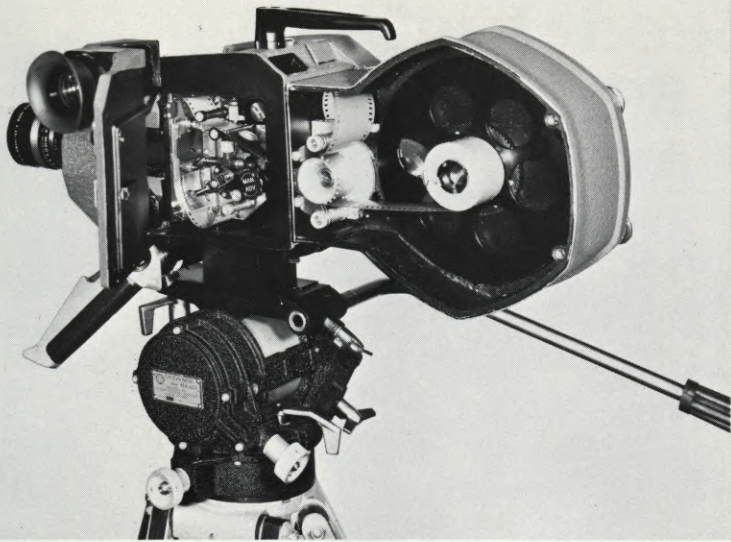
To achieve the completely insulated configuration, the Mitchell engineers started with a "T"-shaped mechanism plate which carries the film transport, shutter and rotary mirror drive mechanisms, the lens mount, the camera drive train and film footage counter. This allows the outer shell of the camera to be completely isolated from all of the mechanisms that contribute to the noise level of a camera. The mechanism plate



Claude Chevereau, President of CHEVEREAU "au Service du Cinema", Paris tries the new Mitchell Mark III on for size during recent formal presentation at Sheraton-Universal Hotel, Hollywood.

(LEFT) Right side of camera, showing 30-volt DC, variable-speed, crystal-regulated motor and various controls, such as power input, sync-pulse output connectors, frame-speed selector, 50/60 Hz sync-pulse selector and auxiliary run switch. Right hand-grip contains camera run switch. (RIGHT) Top view, showing variable shutter adjustment dial and digital footage-counter, with carrying handle. Highly-corrected viewing optics are folded to keep eyepiece as high and forward as possible. Eyepiece has generous 9mm exit pupil and large, comfortable rubber eyecup.





(LEFT) Camera with door open and magazine cover off shows clean, uncluttered interior. Camera door was changed to swing open further after this photograph was taken. (RIGHT) Camera with front cover and door containing viewing optics removed. Note perforation index pin at top of aperture plate which aligns perforation for easy insertion of register pins. Manual advance knob for positioning pull-down claw in threading position. View shows crossover film loop, film path in camera and metering sprocket on take-up side of magazine.

View with cameraman shows well-distributed weight and natural, comfortable positioning attainable by adjustable hand-grips and shoulder-pad.



concept allows maximum access to the internal parts of the camera for service, since removal of the outer case is quick and easy.

State-of-the-art materials have been used to provide silent gearing that is self-lubricating. The rotary mirror has an enhanced silver coating that provides 96% reflectivity. A silicon monoxide hard coating protects the highly-reflective surface from scratching and discoloration. A digital footage counter provides an accurate film measurement. It is located in the camera box and has

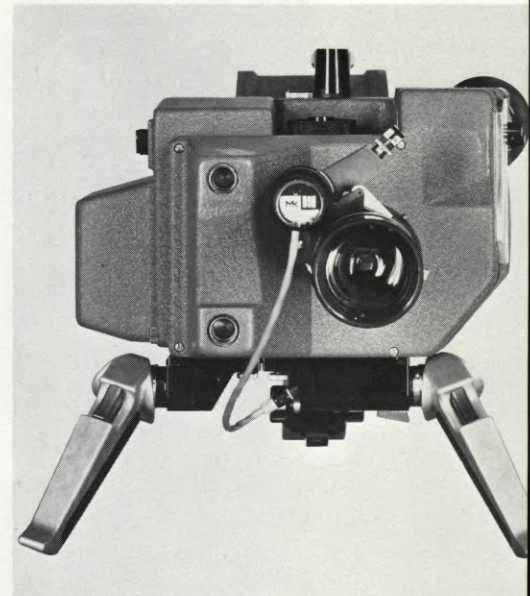
lighted dials for easy reading. The coaxial 400-foot magazine utilizes lab pack film on plastic cores. It is well light-trapped without being difficult to load. A crossover film loop controlled by sprockets transfers the film from the feed side to the movement and take-up side. Film metering to and from the movement is controlled by the sprocket in the magazine. A preset film loop that is set when loading the magazine simplifies threading of the film into the film gate. A perforation index pin is located at the top of the aperture plate to align film perforations for easy entrance of the register pins. The aperture plate is quickly released and removed by turning a single bayonet lock. The aperture plate has a full-format opening. A matte slot is provided to allow use of any format desired.

Full mobility is achieved by use of the 28-volt DC crystal-regulated, variable-speed motor. Filming speeds of 8, 16, 24, 25, 28 and 32 frames per second allow for most special effects other than high-speed. A 50/60-cycle sync-signal output is included in the motor circuitry. A scene-marker lamp in the gate automatically flashes when the camera reaches speed. An out-of-sync light in the viewing system automatically lights up when even the camera speed is under or over tolerance.

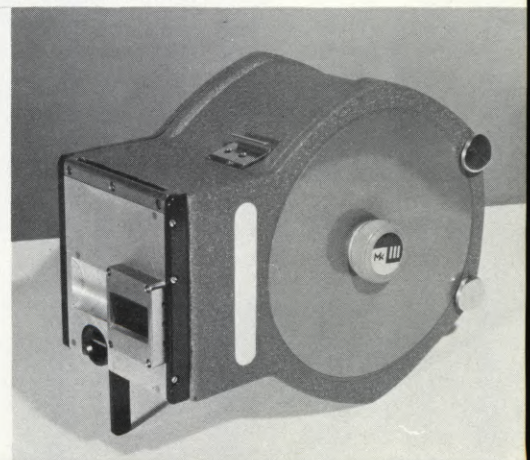
Adjustable hand-grips and shoulder-pad are quickly attached to dovetail accessory mounts on the base of the camera body. Electrical contacts are automatically made when the handles are installed. The right hand-grip contains the camera run switch; the left hand-grip contains the zoom control functions.

Continued on Page 926

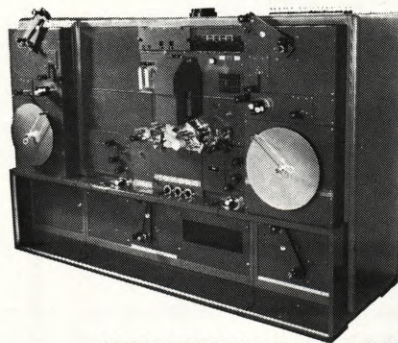
Front view, showing adjustable hand-grips and shoulder-pad—all quickly detachable by loosening one screw. Electrical contact is automatically made when handles are attached.



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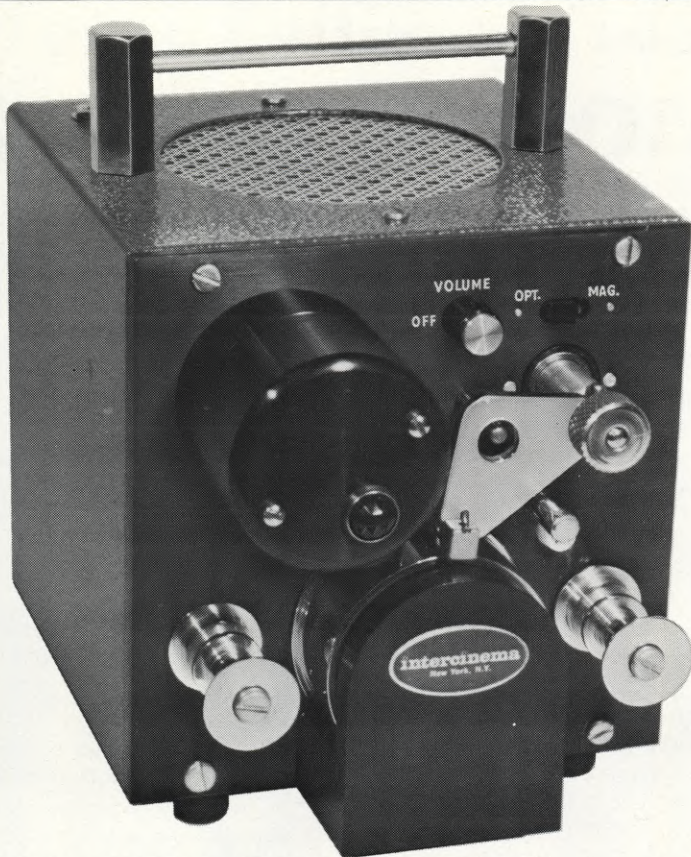
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ARRIFLEX 35BL MAKES PRODUCTION DEBUT IN "ACROSS 110th STREET"

Long-awaited hand-held silent camera passes professional "acid test" with flying colors during filming of Harlem-based action feature

By CHARLES LORING

There were several unusual aspects about the filming of "ACROSS 110th STREET", a Film Guarantors, Inc. production for United Artists release, recently completed in New York.

For one thing, it was filmed almost in its entirety in Harlem—about 95 percent—and is probably the first feature motion picture to focus so directly on that area.

Then there was the fact that the picture was shot exclusively in actual locations—interiors, exteriors, everything. While this has now become an almost standard technique for the filming of certain "raw-gut realism" subjects, the special problems of shooting in the teeming ghetto of Harlem made it especially challenging.

However, what should prove most interesting to cameramen and technicians of the film industry is the fact that "ACROSS 110th STREET" marked the production debut of the long-awaited new Arriflex 35BL portable silent reflex camera.

According to Director of Photography Jack Priestley, the new Arri 35BL passed its initial acid test with flying colors. "It's a real winner," says Priestley, with unconcealed enthusiasm. "It's as quiet as a churchmouse and it has great flexibility, especially since it weighs only 21 pounds. I don't know

what I would have done in a lot of spots without it—especially in those small rooms where we often had to shoot. We could have shot with a regular Arriflex in a blimp, but that probably would have meant a big 'looping' session to post-dub much of the dialogue. As a hand-held camera, this new Arri 35BL is just fantastic. You put it on your shoulder and walk around, bend down, sit down, hold it in your lap—everything. I think it's going to help the film industry tremendously."

Priestley, New York Local 644 cinematographer, who won an "Emmy" Award for "NAKED CITY" and Emmy nominations for "EAST SIDE, WEST SIDE" and "FOR THE PEOPLE", was confronted with a dramatic challenge in photographing "ACROSS 110th STREET"—namely, how to convey the special atmosphere of Harlem (what he describes as the "down" mood of the ghetto) and relate it to the film's story of a power struggle between the black and Italian Mafia gangs involved in the policy numbers racket.

"We knew going in that the people of Harlem might not like having us film there—although the picture is certainly not anti-black. It just happens to take place in Harlem," relates Priestley. "Even so, there is probably no way we could have shot the picture up there

without protection. We hired some people that we used as extras and they sort of looked after us. There were only a few incidents—and these were amongst themselves; we were never involved in any of them. As for the visual style of the film—every cameraman is always trying to get a 'new look' for the picture he's shooting. At the same time, you try to stay away from 'THE GODFATHER' look or 'THE FRENCH CONNECTION' look. I knew there were going to be many locations in this picture and a lot of night shooting, so I used a combination of fog filters and diffusion—because at night, with the practical lights, you get a strange look with the fog filters. Even in the daytime, with hot sky, you put this combination of filters on and you get that 'flarey' look, which I think is a good look to have for this kind of picture. I had used the same fog filter/diffusion combination several years ago in shooting a picture called 'NO WAY TO TREAT A LADY' and it worked very well."

When director Barry Shear announced to friends in Hollywood that he planned to shoot a film on location in Harlem, the reaction was loudly negative. He was warned that New York was the worst place to make a movie because of labor costs and lack of co-operation. As for Harlem, probably the

(LEFT) Camera operator with shoulder-supported Arriflex 35BL stands behind Director of Photography Jack Priestley during lull in shooting of "ACROSS 110th STREET", while Director Barry Shear (right) looks on happily. (RIGHT) In close quarters of location interior, boom operator fishpoles microphone barely three feet from the new quiet-running Arriflex camera. Knock-down-drag-out action feature, filmed almost entirely in Harlem, is a Film Guarantors, Inc. production for United Artists release, co-produced by Fouad Said.





(LEFT) Fast-action sequence is filmed with Arriflex 35BL. Jack Priestley was highly impressed with the new camera's flexibility and easy portability that made possible sync-sound shooting in very close quarters. (RIGHT) One of the many low-key interior sequences filmed in actual interiors. Cinematographer often used extremely low light levels, ranging between 5 and 25 foot-candles, with film pushed one to two stops in development. A combination of fog filters and diffusion was used throughout, even for the interior sequences.

worst ghetto in the country, Shear was told to forget it.

Shear refused to be intimidated, and, as he said in New York a few days before the shooting there was completed, his Hollywood friends "couldn't have been more wrong."

As far as the production costs in New York were concerned, they were cut way down, thanks to the co-operation of the city government in establishing a one-stop permit system. The production did not have to be stalled by making applications first to one and then to another city agency to get the use of streets and parks and to work with the Police and Fire Departments.

Anthony Quinn, who starred in "ACROSS 110th STREET" along with Anthony Franciosa and Yaphet Kotto, asked how he liked working in New York, commented: "This is the smoothest film I ever worked on."

Surprisingly, even the residents of Harlem enjoyed the filming. Hundreds of people turned out every day for



(ABOVE RIGHT) Again the Arriflex 35BL is operated very close to the microphone. Quiet operation of the camera precluded necessity for post-dubbing or "looping" of dialogue, usually required under such conditions. (BELOW LEFT) On the sidewalks of New York—Harlem, to be precise—crew sets up for multiple-camera filming of sequence. The Cinemobile Mark VI was used throughout the production and saved considerable time during the many location moves. (LEFT) The company takes to the rooftops for shooting of climactic sequence.





(LEFT) Three portable cameras used for rooftop sequence filmed in Little Italy district of New York made it possible to shoot complex scenes without having to repeat action over and over. Camera Operator Sol Negrin comments: "The concluding segment of the picture—72 scenes—was shot in a day-and-a-half. Without the three cameras shooting at the same time, it would have taken three or four days." **(RIGHT)** Director of Photography Priestley (center) mans a standard 35mm Arriflex during shooting of rooftop sequence.



hours to watch the shooting, which is a novelty in that area. The crowds were orderly and in a festive mood. They enjoyed the excitement of the gangster film, and frequently showed their appreciation by lustily applauding the actors after their scenes, especially the scenes involving action. People hung out of windows; many sat on front steps; kids were on rooftops—all apparently enjoying the filming. Local people were employed for crowd control.

For the crew, the picture was an energetic workout—involving more than 60 different locations, split about equally between exteriors and interiors. Many of the interior scenes were filmed inside condemned buildings, and of these Jack Priestley says: "We shot in police stations and tenement houses and bars and apartments and what I guess you'd call 'houses of ill repute.' The areas were small, dingy and dirty, with rats running around and junkies sleeping in the hall-

Continued on Page 913

(ABOVE LEFT) People of Harlem crowd the streets to observe night filming of action sequence. Crowds, controlled by local people, were festive, but orderly. **(BELOW LEFT)** A furious chase takes place up and down the fire escapes of sleazy tenements, many of which were condemned buildings. Multiple cameras made possible filming of such sequences without having to repeat action many times. **(RIGHT)** Anthony Quinn, playing the role of an Italian Mafia leader, makes a dash for his life during climactic rooftop sequence of "ACROSS 110th STREET".

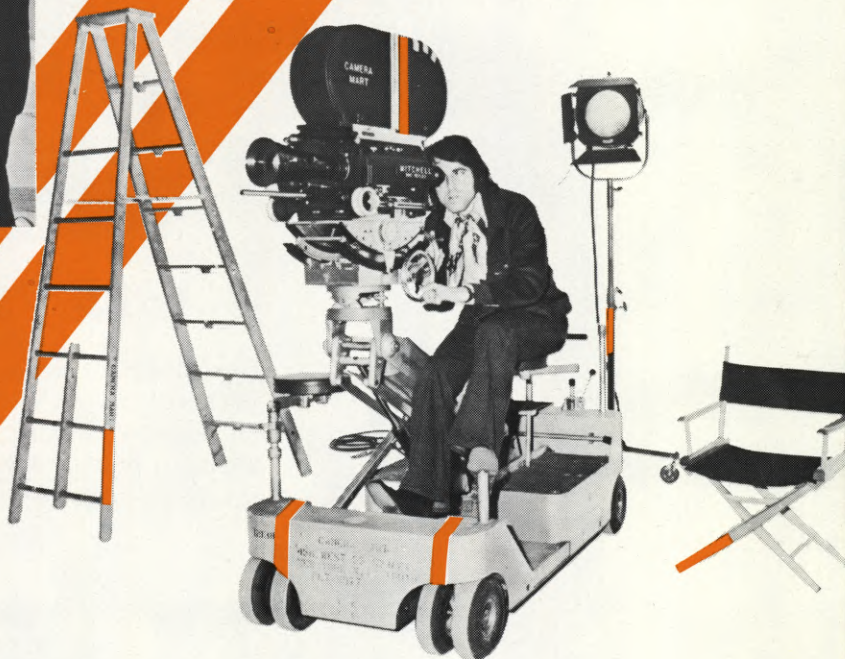


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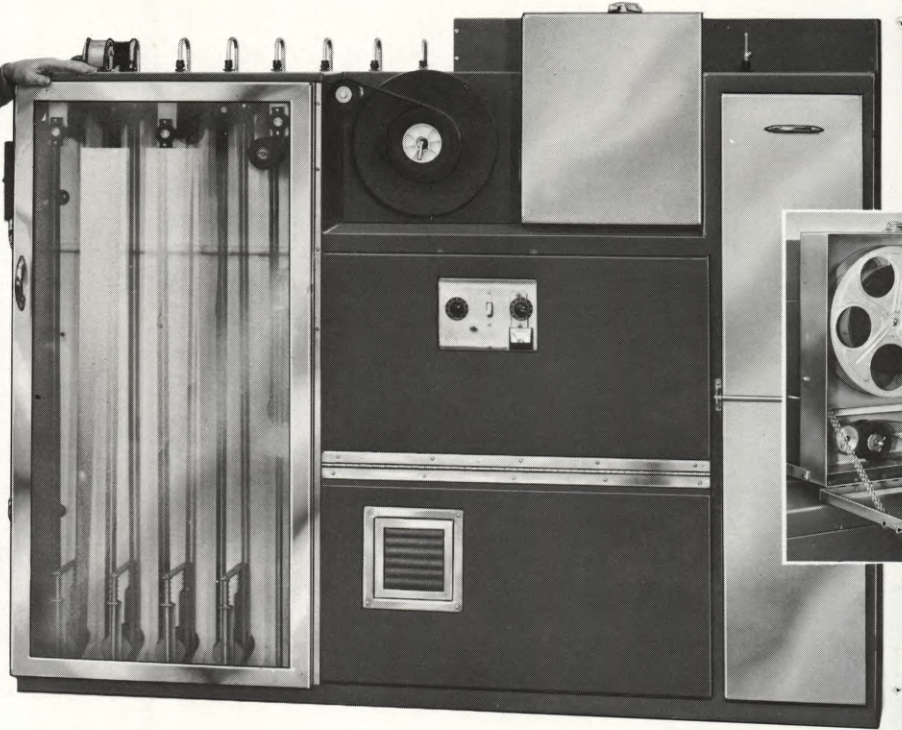


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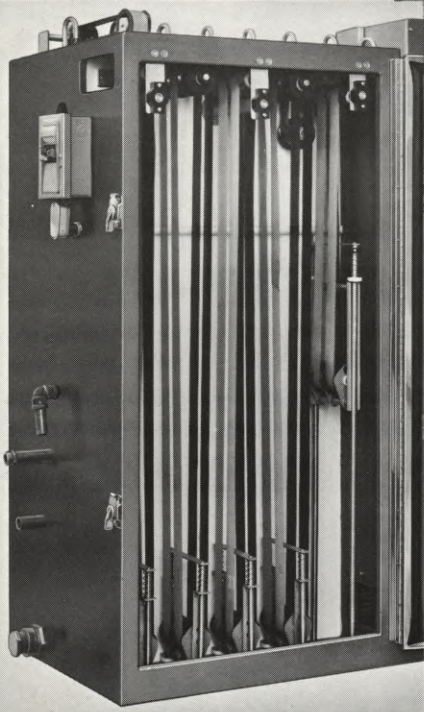
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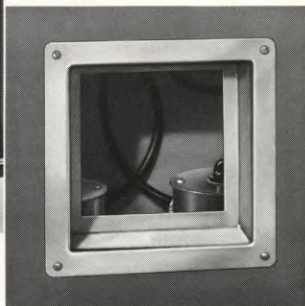


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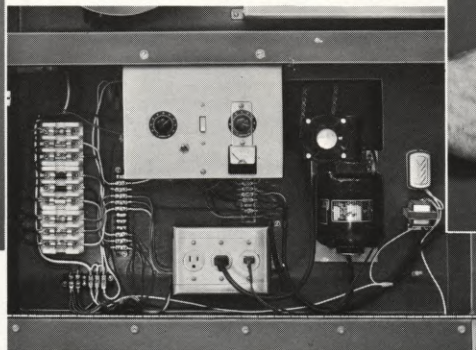


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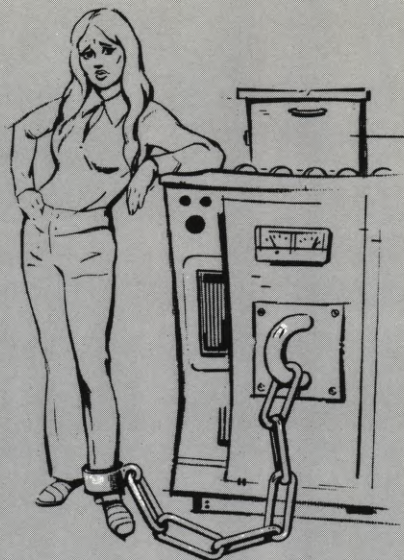


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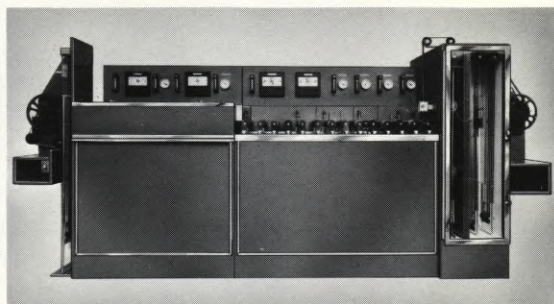
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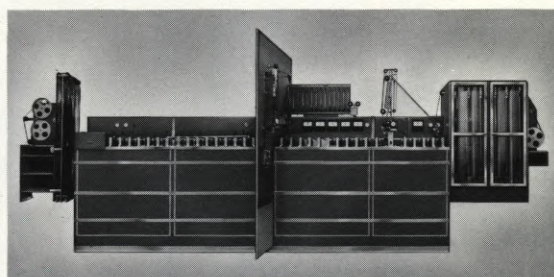
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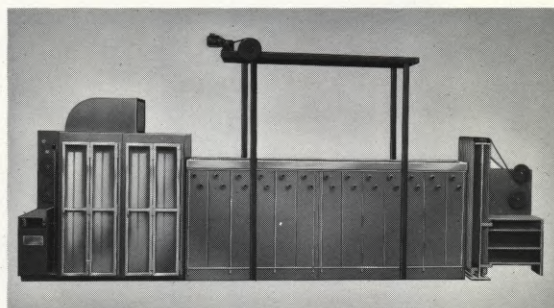
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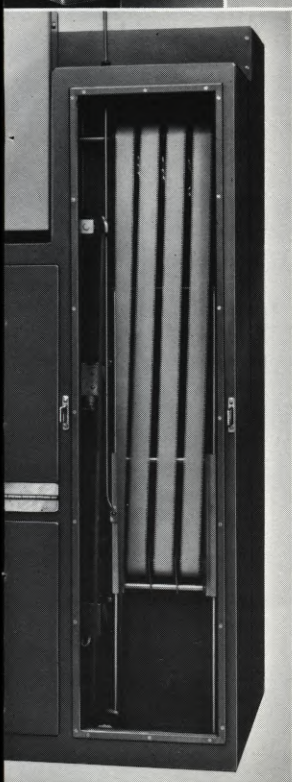
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BEHIND THE SCENES OF

THE SPECIAL LONDON BRIDGE SPECIAL



From Londontown to the shores of Lake Havasu an energetic crew works to film a very special show for TV

By STEPHEN BURUM, *Director of Photography*

"THE SPECIAL LONDON BRIDGE SPECIAL" produced by Winters/Rosen, stars Tom Jones, Jennifer O'Neill, Hermione Gingold, The Carpenters, Rudolf Nureyev, Merle Parke, Jonathan Winters, Engelbert Humperdinck, Chief Dan George, Lorne Greene, Elliot Gould, Kirk Douglas, and Terry-Thomas. It is a musical, romantic fantasy centered around the movement of the old London Bridge to Lake Havasu, Arizona. The story is woven together by musical numbers which interpret the feelings and moods of the characters in song and dance.

The show starts in London, then moves to Lake Havasu, then back to London. Photographing this special in two such diverse locations and widely different circumstances was an interesting challenge.

To capture the separate mood of each location and to tell the story photographically takes careful planning and thought. I always try to give a

distinctive style and look to each production I undertake. I believe every subject has its own style which is inherent in the material. In conjunction with the director, I try to discover that look, and bring it convincingly to the screen. In talking over the script with David Winters, the director, a rich, romantic feeling was indicated. The London segment would have a desaturated, muted effect to contrast with the bright colors and sunshine of Arizona. To retain a general softness in color presentation throughout the entire show, a careful selection of wardrobe and background was the key.

I've tried in this article to explain how I went about conceiving and executing the photography of this special.

EQUIPMENT

When choosing camera equipment for an assignment, I always try to take the minimum amount needed to do the maximum job. I have found that this

On location for filming of "THE SPECIAL LONDON BRIDGE SPECIAL" at Lake Havasu, Arizona, a Winters/Rosen production. Set up on the reconstructed London bridge, camera crew prepares to shoot musical number with star Tom Jones (left). Director of Photography Stephen Burum holds up his hand to check arc light, while Director David Winters looks through viewfinder of the camera.



The author takes a light reading for the "London is London" number.

benefits both myself and the production company.

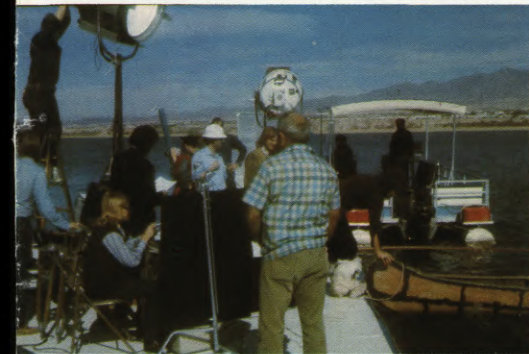
For the "SPECIAL LONDON BRIDGE SPECIAL", I took along the following basic items: Two Eclair NPR's with TV groundglass markings, BEALA motors, and two extra motor cables. Six 400' magazines, one 12-120mm motorized zoom with lens shade, one 12-240mm motorized zoom with lens shade, one 10mm lens, one 5.9mm lens, four battery belts, two changing bags, three series #9 85 filters, two 4½" round 85 filters, one O'Connor 100 fluid head, one Mitchell standard tripod, sawed-off tripod, baby tripod, and hi-hat, one triangle, one Worrall head.

Continued overleaf





(LEFT) Director of Photography Burum taking a light reading on Tom Jones for the "London is London" number; (CENTER) Tom Jones roams around London's Trafalgar Square during filming of the number. (RIGHT) A Western set for the "Style" number in which Kirk Douglas sings, was built on the backlot at Pinewood Studios near London.



(LEFT) The crew sets up to shoot a sequence at Lake Havasu, Arizona, new home of the historic London Bridge. (CENTER) An "Odd Couple" if ever there was one. Hermione Gingold and Chief Dan George enjoy a romantic interlude in a canoe. (RIGHT) Chief Dan George, Academy Award nominee for his sensitive role in "LITTLE BIG MAN" lends a touch of dignity to "THE SPECIAL LONDON BRIDGE SPECIAL", despite the show's wacky shenanigans.

(LEFT) One of the set-ups for filming numbers by The Carpenters in the amphitheater at Lake Havasu. (CENTER) Crew members on Chapman boom during filming at Lake Havasu. (Left to right:) Ralph Guthrie, key grip; Tim Griffith, gaffer; Stephen Burum, Directory of Photography; Paul Hennessey, assistant cameraman. (RIGHT) Burum and Hennessey ride the boom above the English Village at Lake Havasu.



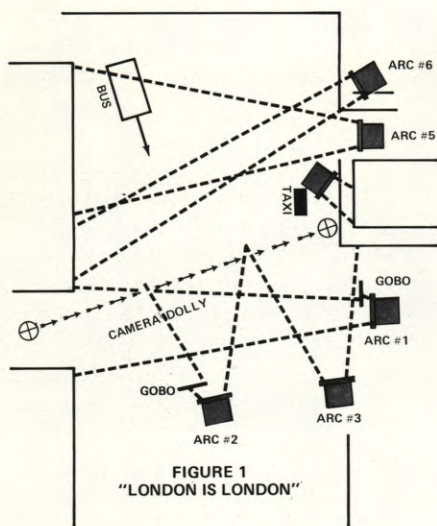


FIGURE 1
"LONDON IS LONDON"

We had both dialog and playback to handle, so I chose the Eclair, inasmuch as it can do both jobs without any special conversions. In addition, the BEALA motors allowed us to run at wild speeds for the silent movie-type sequence we had to shoot. Occasionally, if we were rushed, or on a stunt, or special sequence, we would shoot two-camera coverage. However, I usually take the second camera along simply for back-up insurance.

I have found that you usually shoot five to six loads per day on these shows, and since we didn't have a loader, it was much more efficient to load the night before and unload after the day's shooting rather than during shooting time. I, therefore, take a minimum of six magazines along.

CAMERAS/LONDON

The camera list for London was basically the same except that here I chose the Arri-'S' because most of the shooting was done to playback. There was no reason to spend the extra money on Eclairs. This price difference becomes particularly important in the magazine department where Eclairs cost \$10 per day and Arris only \$2... a pretty big saving. Sync was resolved by adding a 60 cps generator to the cameras. Samuelson Film Services had converted two of their Arris to 60cps at 24fps for us when we shot "RAQUEL" in Europe before, so I used the same cameras that had previously served me so well.

We shot some high-speed material for the "London is London" number and the Nureyev dance sequences. On these I used a 16mm Mitchell and a 12-120mm zoom with an external finder.

LENSES

Though prime lenses are sharper, the

added burden of time and manpower with our limited crew was not outweighed by the added quality. However, if we had been planning on blowing up to 35mm for theatrical presentation, I would have insisted on them. The nature of the show and the style of the director dictated the almost constant use of the zoom lens. The 10mm and 5.9mm were the exceptions, of course, because they extended the range of the camera beyond that of the zooms we carried.

TRIPODS AND HEADS

The choice of a head for good camera operation is really a matter of personal taste and what feels best to you. I prefer to use a Worrall head whenever I can. It gives more control and allows you to make finer adjustments. Camera operation is smoother because a sudden jump in the crane or dolly which bumps your body is not transferred so much to the camera with the Worrall. There are many times, however, when a geared head is impossible to use to make certain shots, particularly when your assistant has to zoom, leaving the focusing up to you. In the end, each situation has its best solution, and each person has his preferences.

FILTERS

I always take a filter for each lens, even though, in some cases, one filter fits several lenses. Having a filter already on the lens not only speeds the operation, but also protects the front element of the lens. In cases where one filter fits two lenses, I take one back-up filter between them. In case of breakage, I carry a back-up filter for each of the other lenses. If I were shooting color negative or EF, I would, of course, take along not only 85's, but 85n3's and 85n6's.

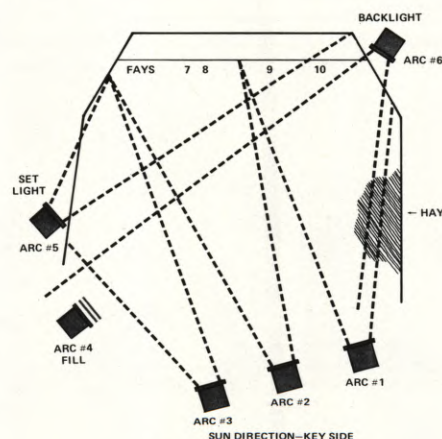


FIGURE 2 - "STYLE"
PINWOOD STUDIOS, ENGLAND

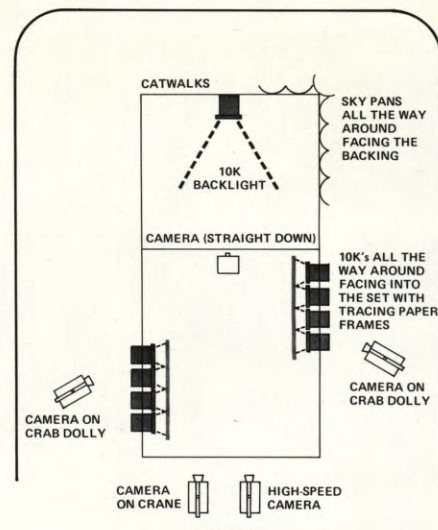


FIGURE 3
"ROMEO AND JULIET"
EMI-MGM STUDIOS, ENGLAND

FILM

Choosing the right film stock in 16mm is always a bear. You have to weigh so many factors. It's sad that we couldn't shoot in 35mm. The ease, quality, versatility, and precision equipment available make it a pleasure to work with. The economic pressure of the added cost of the film stock and processing never seems to outweigh the technical, artistic, and operational advantages of 35mm in this type of production. But if you must shoot 16mm, what can you do?

For color rendition, you can't beat 7254 color negative... beautiful pastel colors with all the latitude of 35mm. Great! But when processed and printed in the US, it is too grainy and the labs tend to scratch the negative, often rendering it unusable. Somehow the European countries have mastered 16mm color negative, but not us. So color negative is out because of the lab problem.

Next we look at the 16mm reversal stocks 7252, 7242, and 7241. Because London in January was dark to darker and we were shooting outside for the entire opening number, it seemed sensible to use one of the faster stocks like 7242 (ASA 80 with an 85 filter) or 7241 (ASA 160). It must be remembered that these two stocks were designed as "shoot and show" films for TV news and not to be used in an original/print situation but, in recent years, the labs have done a beautiful job of making prints off these stocks with their pre-fogging system. In the end, the factor which made me decide against them was that many opticals including supers, freeze-frames, split-screen, and reverse action were planned. These opti-

Continued on Page 935

INDUSTRY ACTIVITIES

SMPTE SETS FALL LOS ANGELES MEETING, CHAIRMEN NAMED

The 112th Technical Conference and Equipment Exhibit of the Society of Motion Picture and Television Engineers has been set for Oct. 22-27 at the Century Plaza Hotel in Los Angeles.

The meeting will feature five days of sessions on the technical aspects of motion pictures and television, and a show of professional film and television equipment.

SMPTE Conference Vice-President Harry Teitelbaum, Hollywood Film Co., announced the appointments of Anthony Bruno, Eastman Kodak Co., as Conference Arrangements Chairman, and Warren Strang, Hollywood Film Co., Exhibit Chairman.

The appointment of Dr. Frank P. Brackett, Jr., Association of Motion Picture and Television Producers, Inc., as Program Chairman was announced by SMPTE Editorial Vice-President Richard E. Putman, General Electric. He also named Frank P. Clark of the Association of Motion Picture and Television Producers, Inc., as Chairman of the two-day symposium on Communications Satellites and CATV.

For information regarding the SMPTE Conference technical sessions or the Equipment Exhibit, write to SMPTE Conf., 9 East 41st St., New York, NY 10017.

THE 15th INTERNATIONAL FILM & TV FESTIVAL

"The 1972 INTERNATIONAL FILM & TV FESTIVAL OF NEW YORK will be an especially outstanding event in view of its 15th anniversary celebration this year," announced Mr. Herbert Rosen, chairman and festival director. This anniversary of the first and oldest film festival in New York will enhance the importance and significance of the immensely important annual event, scheduled for October 17-20, 1972 at the Americana Hotel.

From its modest beginning fifteen



Winners for Cinematography in the recent "EMMY" Awards Presentation, shown with their statuettes: (LEFT) Lloyd Ahern, ASC, For a series or a Single Program: "BLUEPRINT FOR MURDER", "COLUMBO" series, NBC. (RIGHT) Joseph Biroc, ASC, For a Special or Feature-length Program: "BRIAN'S SONG", ABC.

years ago, the festival has continuously grown to its present status and achieved recognition as one of the leading international film festivals of the world. Its growth parallels that of the film medium itself, now of the greatest importance among means of communication and art forms in the last decade.

The Festival encompasses all aspects of production in the professional film and TV industry from Filmstrips, Industrial and Educational Films, Television and Cinema Commercials to filmed Introductions and Titles, Public Service Television Programs, Newsfilms, Promotional Films and Multi-Media Presentations. It provides a unique opportunity for filmmakers to meet and exchange views on the exciting developments in film today and, at the same time, to vie for its coveted awards.

Invitations to participate have already been mailed to all leading film producers, advertising agencies, industrial organizations and television stations throughout the world. Full details and

application blanks can be obtained from the Film Festival office at 251 West 57th Street, New York, N.Y. 10019.

NEW TELEVISION COMPETITION MEETS WITH TREMENDOUS FAVORABLE REACTION

The Atlanta International Film Festival's new major Silver Phoenix Award competition, Television, has had heavy initial interest, with networks, major studios and top producers entering their outstanding television productions. Just accepted into competition are television specials by Truman Capote and Patricia Neal. The new TV competition was specially created to answer a special need for a dignified and well-managed television award competition. The areas of competition were established in consultation with the festival Advisors and a special television panel, including major network and broadcasting executives. The new categories, carefully selected to provide competition, recognition and creative excellence are: 1. Features made for television; 2. News film clips; 3. News programs; 4. Public affairs—program; 5. Public affairs—Continued on Page 944

THE AMERICAN SOCIETY OF CINEMATOGRAPHERS ANNOUNCES WITH PROFOUND SORROW
THE DEATH OF ITS BELOVED HONORARY MEMBER

Dr. Robert Richter

COLOR BALANCE WITHOUT GUESSWORK

Academy Award-winning Spectra 3-Color Meter predicts accurate color temperature in unusual light situations

By BRUCE HILL

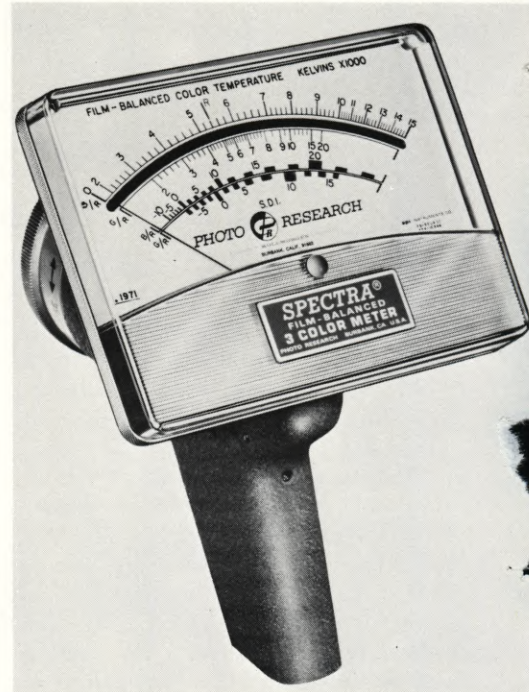
For many years color temperature meters have been relied upon to measure light sources in degrees Kelvin and the analysis produced by these instruments is generally quite accurate when the output source is a "black body radiator" such as a tungsten lamp. Unfortunately, if a color temperature meter is used to measure sources which are not "black body radiators" (such as xenons, fluorescents, mercury vapor, dichroic-coated PAR-type incandescents and others), the results are usually not acceptable. This is because most color meters will only measure the blue/red content of the light and ignore the green/red value in the ratio of light-energy distribution.

The Motion Picture and Television Research Center had long recognized the ever-growing need for an instrument that responds to light in the same way as typical motion picture film, such as Eastman Color Negative type 5254, as modified by the spectral transmittance of a typical cine lens. In other words, an instrument that is able to "read" the full range differences in the green/magenta balance and capable of "seeing"

the light exactly as the film does in the camera. After a careful study in 1970, the Research Center established the design objectives for a new Color Meter and, shortly thereafter, Photo Research Corporation undertook the task of developing such an instrument. This instrument is now in full production at the Photo Research facilities in Burbank, California under the product identification of the "Spectra Film/Lens Balanced, 3-Color Meter".

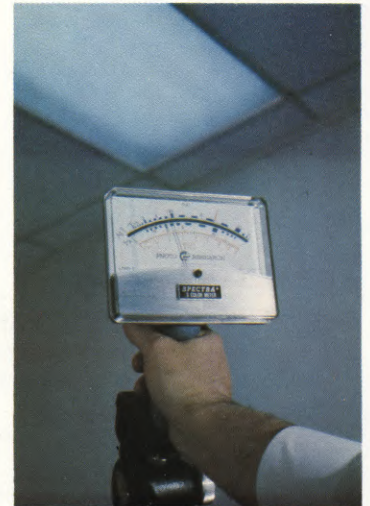
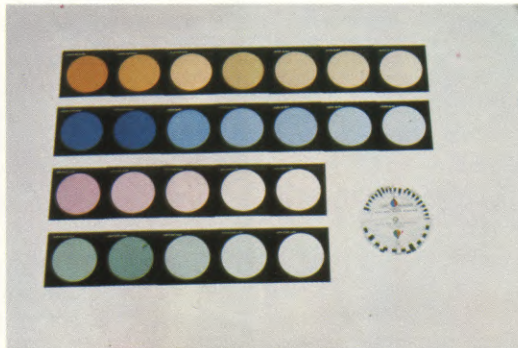
In a Research Center evaluation report on the new Spectra 3-Color Meter that was published in the February 1971 SMPTE Journal, Mr. Petro Vlahos reported that split-screen photographic tests were conducted to determine the correlation between readings by the 3-Color Meter and the response of color film. Several different illuminants were employed in the tests and various lamp filters were used, including dichroics.

In his report Mr. Vlahos stated, "In every case, excellent correlation was obtained between the color balance indicated (by the Spectra 3-Color Meter) and the color balance obtained on color film." Based on the results of



Model D Spectra 3-Color Meter features an easy-to-read 5½" meter which is engraved in double-scale blue/red and green/red film balanced color temperatures.

(LEFT) Complete Spectra Filter and Computer kit available from Photo Research Corp. includes Spectra 3-Color Meter, 16 light-balancing filters and 8 color-correction filters, 3" x 3" in size. (CENTER) Display of filters indicates extreme degrees of correction possible with the meter. (RIGHT) Model D Spectra 3-Color Meter used to read fluorescent light. Such lights exist in a wide range of color temperatures, all of which can be accurately read with the meter.



(LEFT) Reverse side of meter showing light-gathering disc. Here three-way filter trigger is being actuated. (CENTER) Turning rim of disc varies iris for green/red reading. (RIGHT) A spectrasphere fitted over the disc of the meter will integrate different light sources for balance when mixed light is used. The Spectra 3-Color Meter received a Class III Scientific/Technical Award during the recent 44th Annual Academy Awards Presentation.



these tests, a well-known manufacturer of dichroic daylight conversion filters is now using this 3-Color Meter exclusively as its quality-control evaluation instrument.

Many professional Cinematographers and Gaffers now using the Spectra 3-Color Meter are often amazed at the instrument's ability to point out subtle color balance differences that would escape the most highly trained eye at the time of shooting.

Haskell Wexler, ASC, a leading cameraman who films extensively in practical locations, states as follows: "The Spectra 3-Color Meter is an extremely valuable instrument when fluorescent lamps are involved in the lighting of a scene. In one particular circumstance, the 3-Color Meter predicted a 25 Magenta filter which was used on the camera lens. This filter correction completely eliminated the objectionable green content that is common to fluorescent influence. It is also interesting to note that fluorescents do vary extensively in color output from lamp to lamp and that they differ with environments. Therefore, rule-of-thumb or previous experience cannot be generally used to balance this type of light. I have found that warming and cooling the scene by introducing light-balancing filters that were predicted by the 3-Color Meter produces excellent results. The 3-Color Meter has also been very helpful in matching the duplication of an exterior location set in a studio."

Wade Bingham, well-known documentary news Cameraman for CBS, uses the Spectra 3-Color Meter on every job and says: "The 3-Color Meter is an absolute must where I cannot light the scene and must use ambient light supplemented with some fill. Filter predictions given by the 3-Color Meter are used on both camera and lighting to balance illumination with color film. Balancing outside and inside illumination to ambient light can only be done with an objective measuring device. Budgets, time, space and prevailing circumstances many times limit the quality of lighting that can be provided. Therefore, I must correct the lighting situation to the best possible balance to make ambient illumination, fill and color film compatible."

Ken Palus, Director of Photography "E", uses the Spectra 3-Color Meter exclusively in both television and cine lighting and is quoted as follows: "The Meter is very useful in checking the Kelvin output of discontinuous-spectrum lamps. On coverage of sports events in stadiums and arenas, the 3-Color Meter is 'worth its weight in gold'

because of the many variations in light sources that are encountered."

(AUTHOR'S NOTE: My organization specializes in multiple-camera filming activities that often present special lighting demands. The 3-Color Meter has proved to be essential in assuring consistent color balance between cameras that are simultaneously filming scenes that are lit with mixed illuminants.)

The desired response and critical accuracy of the instrument is accomplished through the careful selection of the 3-color separation filters and photo detector combination. By means of a special built-in solid-state amplifier, the sensitivity of the meter provides a capability of taking accurate readings in ambient light levels that are as low as five foot-candles.

The color separation filters are positioned by simply actuating a three-way trigger system with one hand. Readings can be obtained simply and quickly from a large, easy-to-read dial that is graduated in both Kelvin and Spectral distribution index values.

A spectrasphere can be fitted over the front of the 3-Color Meter which will integrate different light sources when using mixed lighting.

The instrument is available in two different models. The Model C has a 3" meter and is most popular with cinematographers because of its compactness. The Model D features an easy-to-read 5½" meter which is engraved in large double-scale blue/red and green/red film balanced color temperatures.

A Spectra filter computer is provided with the instrument to determine proper correction filter selection. Sixteen (16) light-balancing filters and eight (8) color-correction filters 3" x 3" in size are available from Photo Research in either gelatin or glass. Equivalent filters are also available from Eastman Kodak, Rochester, N.Y.; Tiffen Optical, Roslyn Heights, N.Y.; Ednalite Corp., Peekskill, N.Y., or any commercial photo dealer.

The 3-Color Meter can solve many of the serious color-balance problems that face the cinematographer who is filming with "uncontrolled" light sources. This instrument can also reduce subjective decision-making that can often lead to color imbalances which cannot be fully corrected by the printing laboratory.

It is an established fact that the ultimate in color fidelity can be obtained by film-testing the scene prior to shooting, but the procedure is often impractical because of time and budget limitations. It is my opinion that the best alternate to a film test is the diligent use of the Spectra 3-Color Meter. ■



Wade Bingham, well-known documentary news cameraman for CBS shown using the Spectra 3-Color meter during shooting of television special.

The Model C Spectra 3-Color Meter has a 3" circular meter and is most popular with cinematographers because of its compact size.



The unshot New York Skyline...



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No, they haven't moved New York. And we're not moving Texas. This is just a friendly Texas reminder that we've got a metropolis or two, too. Film makers and cinematographers need to know that there *is* a fresh approach to shooting "the city." There's Dallas, the Southwest's largest banking center, leader in wholesale business, among the leaders in "million dollar" companies, and one of the nation's top three fashion markets. There's Houston, the nation's sixth largest city, boasting a \$100 million entertainment complex, a

156 acre medical center, and headquarters for the man-in-space NASA effort. There's San Antonio, where a 622 foot tower stands guard over the site of the 1968 Texas World's Fair and a 16th century Spanish town. Maybe the new, fresh, unique, and exciting you've been looking for is here . . . in Texas. Just call us. We've got the answers . . . and the photos to prove it.

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We mourn the loss of a great man and a dear friend.

Dr. Robert Richter

17 May 1899 — 18 June 1972

Managing partner of Arnold & Richter, K. G.
Munich, West Germany

His memory and work will be our inspiration.

Arriflex Company of America
Paul Klingenstein, Pres.

MATERIALS FOR LIGHT CONTROL

Diffusion, Color Media and Reflectors . . .
Some New Ideas and Some Familiar Ones

By RICHARD F. GLICKMAN

The control of light and shadow is the primary skill of the creative cinematographer. At first this may seem a simplistic view, but it is the essence of the art form, and is anything but simple to accomplish. This work requires not only an artistic sense, but also a thorough understanding of the tools available for accomplishing the lighting functions.

In recent times the trend has increased toward the production of film on location. A great proportion of film is produced for TV. Locations, with the use of real structures, do not permit the application of many of the implements, and therefore the lighting techniques, which are practical in the studio. The pressure to produce film on short production schedules, especially for TV, has forced the re-examination of the traditional lighting tools and the related practices used in the production process. An example of this is that the use of multiple PAR lamp fixtures has increased sharply due to the compactness and the high efficiency of these units. They produce a great deal of light for a modest power input. The quality of the light and the controllability tend to leave much to be desired. The search for new diffusion materials has been spurred by this and related needs.

Cinematography in natural interiors has become a commonplace, and this has increased the pressure for new means to deal with the problem of balancing daylight coming through windows. New materials had to be brought forward to make these shots practical within today's time and budget limitations.

As is the case with any activity which

(ABOUT THE AUTHOR: Dick Glickman, for 12 years, was variously Chief Engineer, Director of Engineering and Manager of Research and Development for Colortran. He has been in private consulting practice for just over a year, doing product design and development, marketing and systems work in the fields of theater, television and film. In addition to his engineering activities, he is active in the Theater, Television and Film Lighting Committee of the Illuminating Engineering Society, having just been named as Western Vice-Chairman. Dick's last published effort in American Cinematographer was in January 1972, with Si Wexler and Karen Siegert, entitled "A New Tool for Composite Photography". He is an Associate Member of ASC.)

is not isolated from the flow of change that surrounds it, so the pressures of change have brought new materials to the fore in order to meet the requirements of these new situations. Most of those working in these areas are aware of the innovations in lighting and in production which have emerged during this period. It is the purpose of this article to summarize the present state of the art in a specialized field that is not often thought of in an organized way. This area encompasses the materials which are used for the control of light. These are not the standard and well-known lighting accessories for the various luminaires, such as barndoors, snoots, etc. Instead, an attempt will be made to organize the materials which are used to change the intensity and character of the light after it has emerged from the luminaire opening. These are the "light control" materials.

These materials may all be considered light "modifiers". They may be either transparent, translucent or reflective and they may be further divided into broad groupings, based on whether or not they change the spectral energy balance of the light passing through them or reflecting from their surfaces. In effect, one class can be thought of as being neutral-density light-modifying materials, and the other as being light modifiers with color-filtering properties. A group of reflector materials is also described. The very latest materials to make their appearance combine several of the functions (i.e. diffusion and color filtering). It is obvious that the term "neutral density" as used above, is utilized in the very broad sense that the material being described does not change the color of the light passing through it.

In order to place all the new materials in proper perspective, we will also deal with the established items in proper order. A brief reference to the outline shown on the adjacent page will be helpful in understanding the organization of the material as a whole.

SCRIM

Scrims have traditionally been mesh materials with varying percentages of open area. The scrim offers a means for reducing the light level without affect-

ing the color temperature, and without refocusing the luminaire. The net effect is that of a mechanical dimmer. Certain types of light sources will cause the pattern of the scrim to be projected. This is usually not noticeable, due to the textures present in most natural situations.

In order to provide some flexibility, scrims are available usually in at least two percentages of transmission, the familiar single and double scrims. In addition, scrim is also supplied so that only one half of the illuminated field is affected. These are the familiar "half-scrims", which permit the reduction of intensity to be effective on only one half of the field. A typical use of the half-scrim would be to dim the lower half of the light beam which is lighting nearer objects. This would tend to balance the lighting on the entire field.

These devices have been supplied by the various manufacturers for many years as simple metal screens bound in metal frames. The scrims as supplied for the open reflector "quartz" luminaires have required the use of stainless steel screen material.

Scrim is also available as black cotton net material. In this form it is used on a gobo frame usually some distance from the luminaire. Its function is the same as that of the metal scrim, except that it can affect a discrete area within a lighted set.

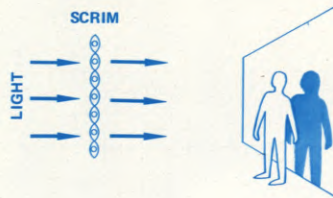
DIFFUSION

Diffusion materials have the effect of making the luminaire on which they are applied appear to have a larger light-source size than is actually the case. For many years, the standard material for application directly to lighting fixtures has been a fibreglas mat made up of chopped glass fibers in a resin binder. The material is a very good light diffuser. Its disadvantages relate to the fact that the binder causes the material to turn brown when applied to high intensity luminaires or open reflector fixtures. This will cause the color temperature to shift toward the warm side (lower apparent Kelvin temperature). In addition, the material is fragile and easily broken or pierced. One consideration, which is of increasing importance, Continued overleaf

TYPES AND FUNCTIONS OF LIGHT SOURCE CONTROL AND FILTER MATERIALS

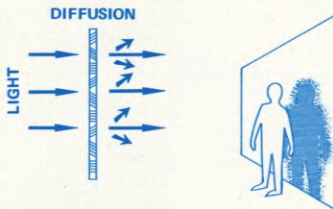
- 1.) Light Source Control Materials—These materials may be reflective, transparent or translucent. They permit changes in the intensity, direction or "shadow casting" properties of the energy from a light source without affecting the color balance of the transmitted light.

A.) Scrim—useful primarily to change the light level.



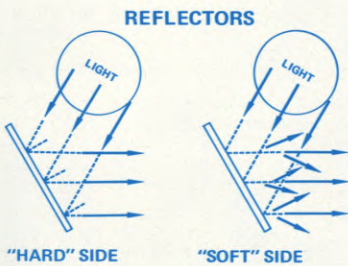
A scrim reduces the amount of light, without affecting its color. It also has little or no effect upon the "character" or shadow-casting properties of the light.

B.) Diffusion—Used to "soften" the light. These materials tend to increase the apparent size of the light source, and therefore produce softer, less distinct shadows.



Diffusion material reduces the amount of light, without affecting its color. However, it tends to soften the "character" of the light, producing less distinct, soft-edged shadows. The effect of the diffusion is to make the apparent source size seem larger.

C.) Reflectors—Used to redirect energy from either a natural or artificial light source. Available as either "hard" or "soft" types. These either reflect the original source with essentially the same (hard) or more diffuse (soft) shadow characteristics.



The "hard" side of a reflector is strongly directional. It tends to retain the character of the light coming from the source, producing hard shadows. The "soft" side is less directional. The diffused surface produces softer shadows.

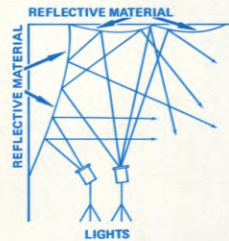


Diagram shows the use of soft, light-weight reflector sheet when used with high-efficiency lighting units. Illustration demonstrates bounce lighting where the entire room, in effect, becomes the source.

- 2.) Light Source Filter Materials—These materials are usually transparent. They are used to change the color balance of the transmitted light.

A.) Filters for Mood or Effect—No particular concern for precise color correction. Application is governed by artistic judgment.

B.) Color Correction Filters—In these applications, the materials are used to change the color balance of the light from various sources in order to permit the final color balance to be appropriate to match the emulsion requirements of color film.

(1) Artificial Sources

(a) Carbon Arcs—Various color filters used to adjust the color balance of the light from this source. Filter selection usually depends on the need to match other sources (natural and artificial).

(b) Incandescent Sources—Various filters used to adjust the color balance, usually to be a match for "daylight". These may be in the form of absorption types (gelatine, acetate, polyester or glass), or interference types (dichroic).

(2) Natural Light Sources—These are materials, applied at windows usually, which change the color balance of the incident daylight in order to match the requirements of color film.

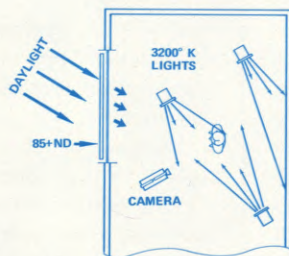


Diagram illustrates interior filming with daylight coming through windows. Film is tungsten type or, if daylight type, camera lens is filtered. Daylight entering the room through the windows is being filtered with 85+ND correction. Interior lighting utilizes 3200° Kelvin light. Use of appropriate amount of ND with 85 allows cameraman to establish lighting balance, without being dominated by the incident light.

- 3.) Combined Materials—These combine effects, such as diffusion and color correction. This is an entirely new class of materials.

is based on the unpleasant effects of the fibreglas fragments which cause itching and skin irritation in many people. The pressure to replace the material has been steadily increasing because of this problem.

Other materials for diffusion have been pressed into service by innovative cameramen and gaffers at various times. These have ranged through a gamut from cheesecloth to drawing vellum. As the use of the multiple lamp fixtures increased in recent years, so the search for better, more consistent diffusion materials has intensified. Recently, several new materials, designed to meet the particular needs of the cinematographer, have made their appearance. Five of these are noteworthy.

One of the most interesting of the new materials was specifically designed to replace the spun glass described above. It is a non-woven polyester mat. It will not turn brown under high heat, and totally avoids the handling problems. Those who have used the material state that it gives the same diffusion quality as spun glass. While spun glass, in the most commonly used thickness, represents about a one-stop light loss, this material as received from the manufacturer has about a one-and-a-third-stop loss. One of the most interesting properties of this diffusion is that by stretching it out in both directions the light loss can be reduced to one stop. The stretching operation is easily performed in the hands, and is very non-critical. The material seems to self-limit the amount of stretching it will permit.

Another new diffusion material has been rapidly accepted by a number of cameramen in Hollywood. It offers a diffusion effect which is comparable to silk. The material is a relatively stiff, clear polyester sheet, which appears to have scratches in it running in one direction. The diffusion properties of the sheet have a directional character. The light is spread somewhat more in the direction perpendicular to the scratches. This material has a deceptive appearance, and, at first examination, would not seem to offer much promise for diffusion. The experience of those who have used it belies its appearance. A number of companies in Hollywood have converted completely to this material as their basic diffusion. It has good resistance to heat, and can be used in the color frame in most luminaires.

Yet another new diffusion material has made its debut for another type of application. This is intended where the need is for the highest possible degree of diffusion. At first look, this material appears to be drawing vellum, but it is not paper. It is a plastic sheet, with

SUMMARY CHART OF LIGHT-CONTROL MATERIALS

Classification	Manufacturer	Trade Name	Comments and Available Size/Designation
SCRIM MATERIALS			
Wire Screen	Various	Scrim	Available from the various fixture manufacturers for their fixtures. Also available (single and double) in 36" x 100 foot rolls.
Scrim (cloth)	Various	Scrim	Black cotton net material. Sold by the yard (72" width).
DIFFUSION MATERIALS			
"Frost" Materials			
Gelatine	Brigham Rosco Labs	Brigham Roscogel	#1; SS-1 #201; SS-1
Acetate	British Celanese Mole-Richardson Rosco Labs	Cinemoid Molocolor Roscolene	#29 Heavy, #31 Light; SS-1 MR #1; SS-1 and RS-4 Cine Frost; RS-4
Polyester	Colortran Lee Filters Rosco Labs Ryu Den Sha	Gelatron Lee Filters Roscolar Ryuchrome	#99; SS-2, RS-1 and RS-5 #129; SS-3 and RS-5 Tough Frost; RS-6 F-1, F-2; SS-2
Other Diffusion Materials			
Fibreglas Mat	Various	Spun glass	(.010 and .015) 36" x 100 yard rolls
Silk	Various	Silk	36" wide (sold by the yard)
Glass Textiles	Colortran	Super Silk	48" x 10, 35 or 100 yard rolls
	Rosco Labs	Silkglass	48" x 25 yards
Vinyl	Leonetti Rosco Labs	Velvateen Softfrost	RS-8 RS-8
Plastic-based materials with "vellum" appearance.	Lee Filters Rosco Labs	Diffusion White Rolux	48" x 33 foot rolls (very dense); RS-6
Polyester sheet	Rosco Labs	Tough Silk	(scratched appearance); RS-6
Polyester mat (non-woven)	Rosco Labs	Tough Spun	RS-6
REFLECTORS			
Reflector Board Covers	Rosco Labs	Roscoflex-H Roscoflex-S Roscoflex-SB Roscoflex-SG	Hard side reflector Soft side reflector Soft side reflector (blue tinted) Soft side reflector (gold tinted) (all Roscoflex materials above are supplied in 48" x 30 foot rolls)
Soft Reflector	Rosco Labs	Roscoflex-F	Extremely lightweight (225 square feet weighs one pound); RS-8
COLOR FILTERS FOR MOOD OR EFFECT LIGHTING			
Gelatine	Brigham Rosco Labs	Brigham Roscogel	Approximately 75 colors; SS-1 Approximately 74 colors; SS-1
Acetate	British Celanese Rosco Labs Ryu Den Sha	Cinemoid Roscolene Ryuchrome	Approximately 60 colors; SS-1 Approximately 52 colors; SS-1 Approximately 60 colors; SS-2
Polyester	Colortran	Gelatron	Approximately 20 colors; SS-2, RS-1 and RS-5
	Lee Filters	Lee Filters	Approximately 20 colors; SS-3, RS-5

sufficient body for easy handling, which has the ability to soften the effect of even the most concentrated and intense "point source" types of light sources. It can be applied to the multiple PAR-lamp holders (Mini and Maxi-Brutes, etc.) at a distance such as that provided by the extension of the barndoors on these units. At this distance, the material is durable and stable, and can produce an almost "soft-light" effect from these types of fixtures. The material does not turn brown or get brittle due to exposure to the high light and heat levels.

Several woven fibreglas textile materials have recently made their appearance. These are intended for the replacement of silk diffusion and for general application. They are supposed to avoid the handling problems of the fibreglas mat material due to the fact that they are woven of yarn made up of very small-diameter fibers.

Two vinyl diffusion materials also have recently appeared. These have poor heat resistance and must be used some distance from the lights. They represent low-cost replacements for "Marlex" sheets.

Classification	Manufacturer	Trade Name	Comments and Available Size/Designation
	Rosco Labs	Roscolar	Approximately 52 colors; SS-1, RS-6
COLOR CORRECTION FILTERS—CARBON ARCS			
Gelatine	Mole-Richardson	Molocolor	SS-1
Acetate	Mole-Richardson Rosco Labs	Molocolor Roscolene	SS-1 and RS-4 MT-2 and MT-2½; RS-6
Polyester	Colortran Lee Filters Rosco Labs	Gelatron Lee Filters Roscolar	RS-2 RS-5 RS-3
COLOR CORRECTION FILTERS—3200° KELVIN TO "DAYLIGHT"			
Glass	Absorption-type filters. Contact the various fixture manufacturers for information relative to filters for their lights.		
Dichroic (on glass)	Interference type filters. Contact the various fixture manufacturers for information relative to filters for their lights.		
Acetate	Mole-Richardson Rosco Labs	Molocolor Roscolene	TD-25 and ½ TD-25; RS-5 Cine TD-25; RS-6
Polyester	Colortran Lee Filters Rosco Labs	Gelatron Lee Filters Roscolar	#72; SS-2, RS-1 and RS-5 CT Blue; RS-6 Tough Blue 50; RS-7
COLOR CORRECTION FILTERS—BOOSTER COLORS			
Acetate	Rosco Labs	Roscolene	Cine Booster Blue (+800° K); RS-6
	Rosco Labs	Roscolene	Cine ½ Booster Blue (+300° K); RS-6
	Rosco Labs	Roscolene	Cine 26 Blue (+600° K, with warm skin tones); RS-6
	Rosco Labs	Roscolene	Cine ½ 26 Blue (+300° K with warm skin tones); RS-6
Polyester	Lee Filters Lee Filters Rosco Labs	Lee Filters Lee Filters Roscolar	½ CT Blue (+1100° K); RS-5 ¼ CT Blue (+400° K); RS-5 Tough ½ Booster Blue (+800° K); RS-6
	Rosco Labs	Roscolar	Tough ¼ Booster Blue (+400° K); RS-6
COLOR-CORRECTION FILTERS—DAYLIGHT TO 3200° KELVIN (WINDOW FILTERS) INCLUDING NEUTRAL-DENSITY TYPES			
Gelatine	Mole-Richardson	Molocolor	MT-2 and 5 ND values; SS-1
Acetate	Mole-Richardson Rosco Labs Ryu Den Sha	Molocolor Roscolene Ryuchrome	85 and 4 ND values; SS-1 and RS-4 85 and 3 ND values; RS-5 85N3; SS-2
Vinyl (self-adhering)	Colortran Lee Filters Rosco Labs	Self Stick Lee Filters Roscovin	85 and 1 ND value; RS-6 3 ND values; SS-4 85, 3 ND values, and 85N3, 85N6 and 85N9; RS-8
Polyester	Lee Filters	Lee Filters	CTO+0.3ND and CTO+0.6ND; RS-5
Acrylic (rigid panels)	Rosco Labs Samuelson	Roscolex Samcine	85, N6, N9, 85N6 and 85N9; 48" x 96" 85, N3, N6, and N9; 60" x 84"
COMBINATION DIFFUSION AND COLOR CORRECTION FILTER MATERIALS			
Diffusion with Color Adjustment	Rosco Labs	Rolux Plus	Correction overcomes tendency of diffusion itself to be "warm"; RS-6
Diffusion with Conversion (3200° K to "daylight")	Rosco Labs	Tough Frost Blue	Full daylight from 3200° K, on a diffusion base material; RS-6

REFLECTORS

This group of materials has been included because of the original concept that those materials would be described that offered some means for light control. It is interesting to note that this is a completely new class of materials relative to film production applications.

The reflector board has existed for many years, but it was never possible to speak of the reflector separately from the board. The use of the extremely fragile foil which had to be applied in 5"x5" squares, and the attendant skill required to resurface a board, are the

traditional hallmarks of this system. In addition, the surfaces were extremely fragile, and subject to attack by salt air and humid atmospheres. With all these drawbacks, the reflector board has continued to be used by many cinematographers because of the convenience and speed with which it can be handled, and also, of course, because it requires no power.

The means are now at hand for realizing all the advantages of the reflector board, with almost none of the classical problems. As noted earlier, these new materials make this tradition-

al tool more useful. The new coverings are metallized plastic laminates with pressure-sensitive adhesive backings. The re-covering of a board is simply a matter of cutting the correct size sheet from the roll, peeling the protective cover from the adhesive back and smoothing it into place on the board.

The new board coverings are available in two finishes that precisely match the performance of the "hard" and "soft" sides respectively of the traditional board. The stability, mechanical strength and corrosion resistance of these materials were well demonstrated on "HAWAII FIVE-O", which used the same set of boards (and covers) for an entire season's shooting.

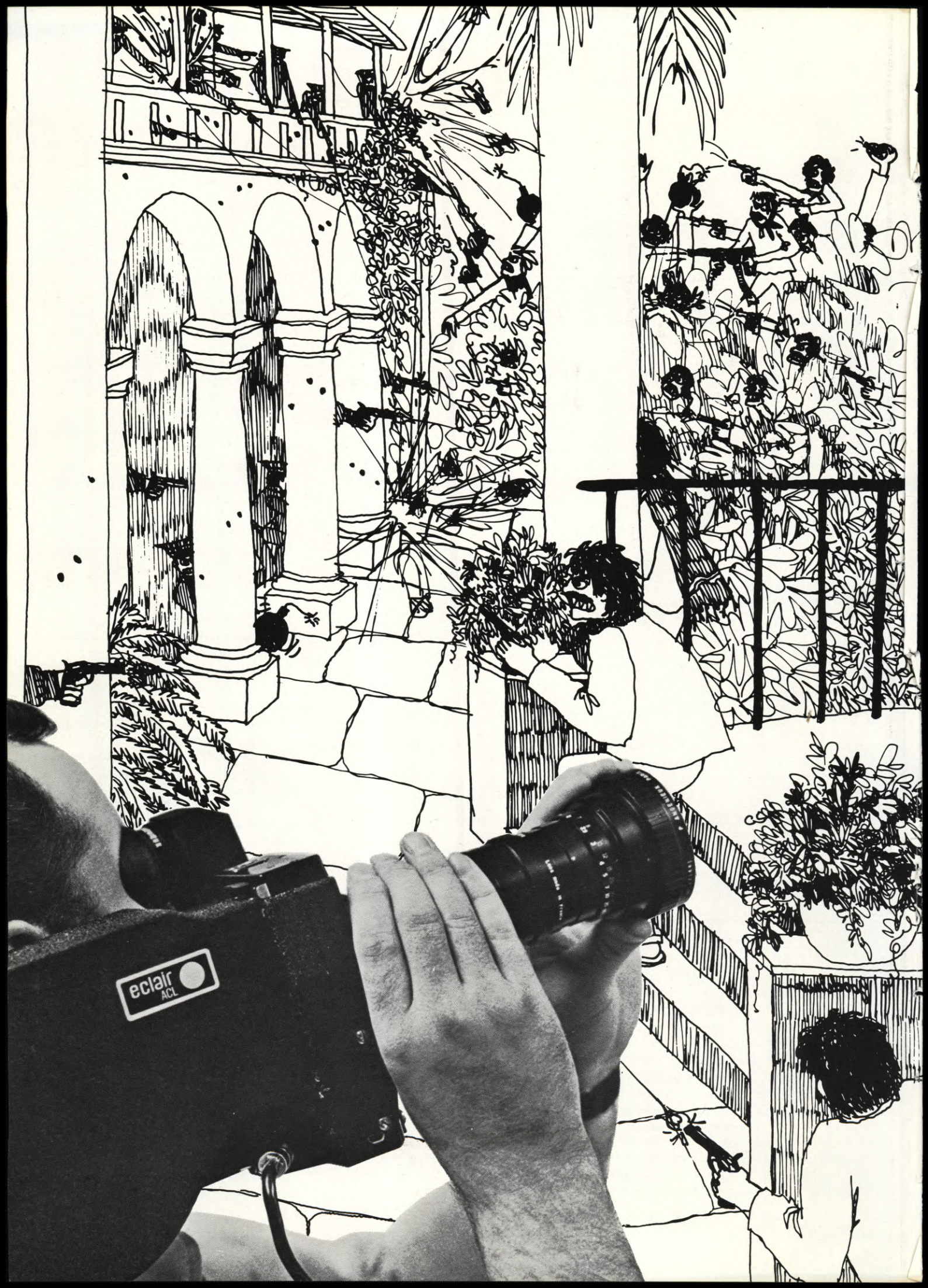
The demands of location photography are such that the highest level of ingenuity must be exercised by the cinematographers and gaffers who function in these settings. One of the materials which was being utilized in these situations was the so-called "Space Blanket". This small, aluminized, lightweight polyester-based item (intended for an entirely different function) was being used as a convenient way of placing a reflector surface in almost any location. The reflector could be held in place with tape, and served as a bounce surface for difficult locations. The reflectance of the surface was poor, but the overall functioning of the material filled a unique requirement.

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FILTER MATERIALS

These comprise the general class of materials which are used to modify the spectral energy distribution of the light from any source. Sometimes the purpose of the filtering can be for mood or effect only. More commonly, the application of color-modifying filters to light sources is to accomplish the modification of the light so that it is suitable to properly render colors on a particular emulsion.

Continued on Page 918



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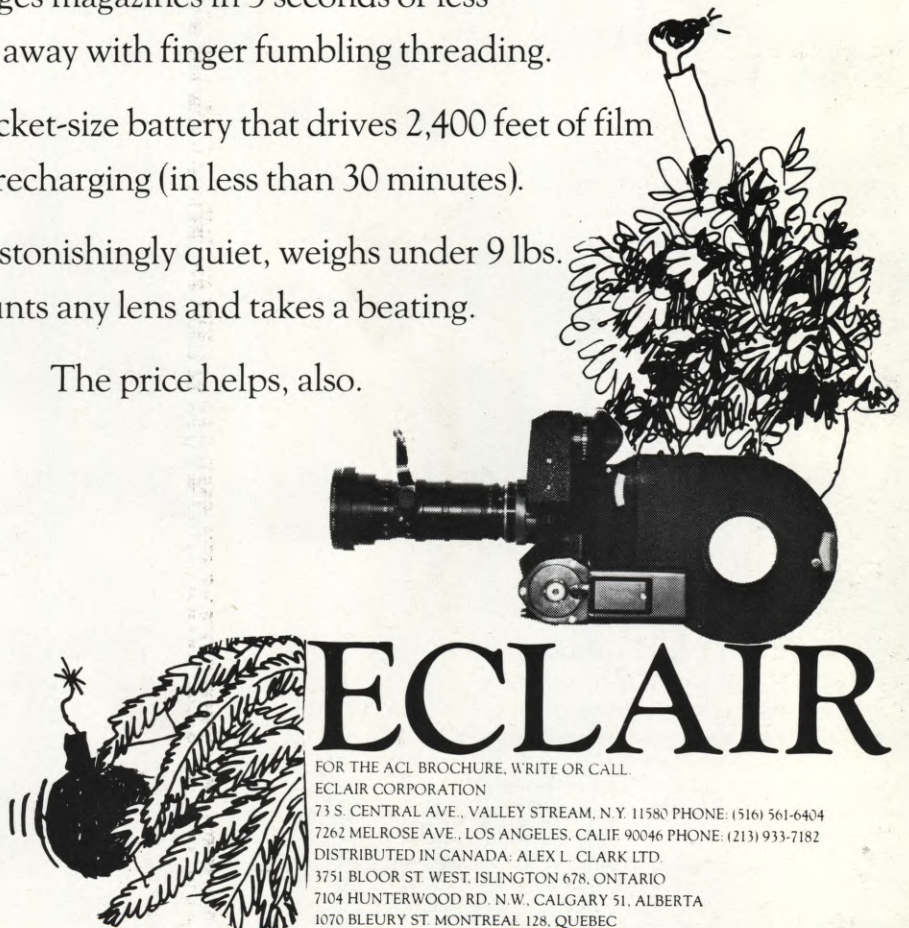
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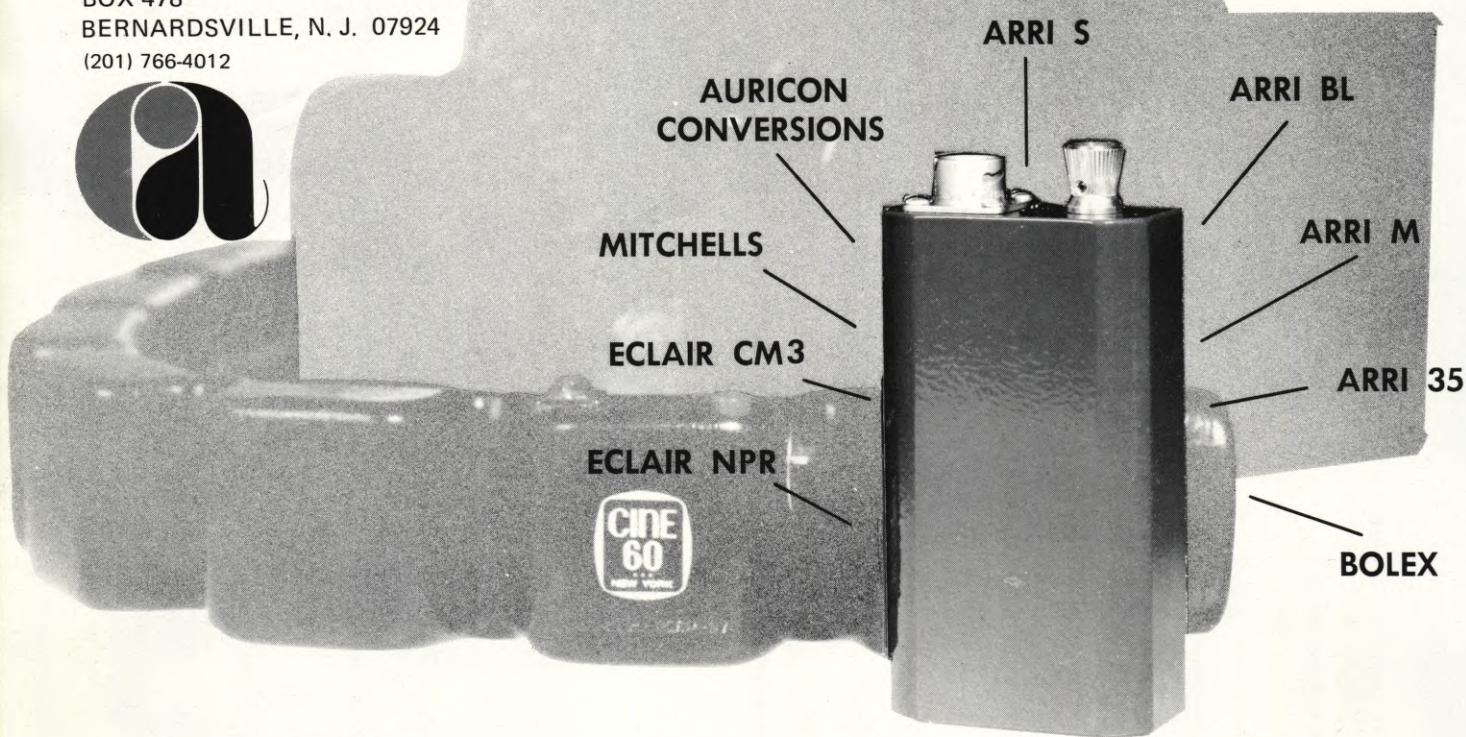
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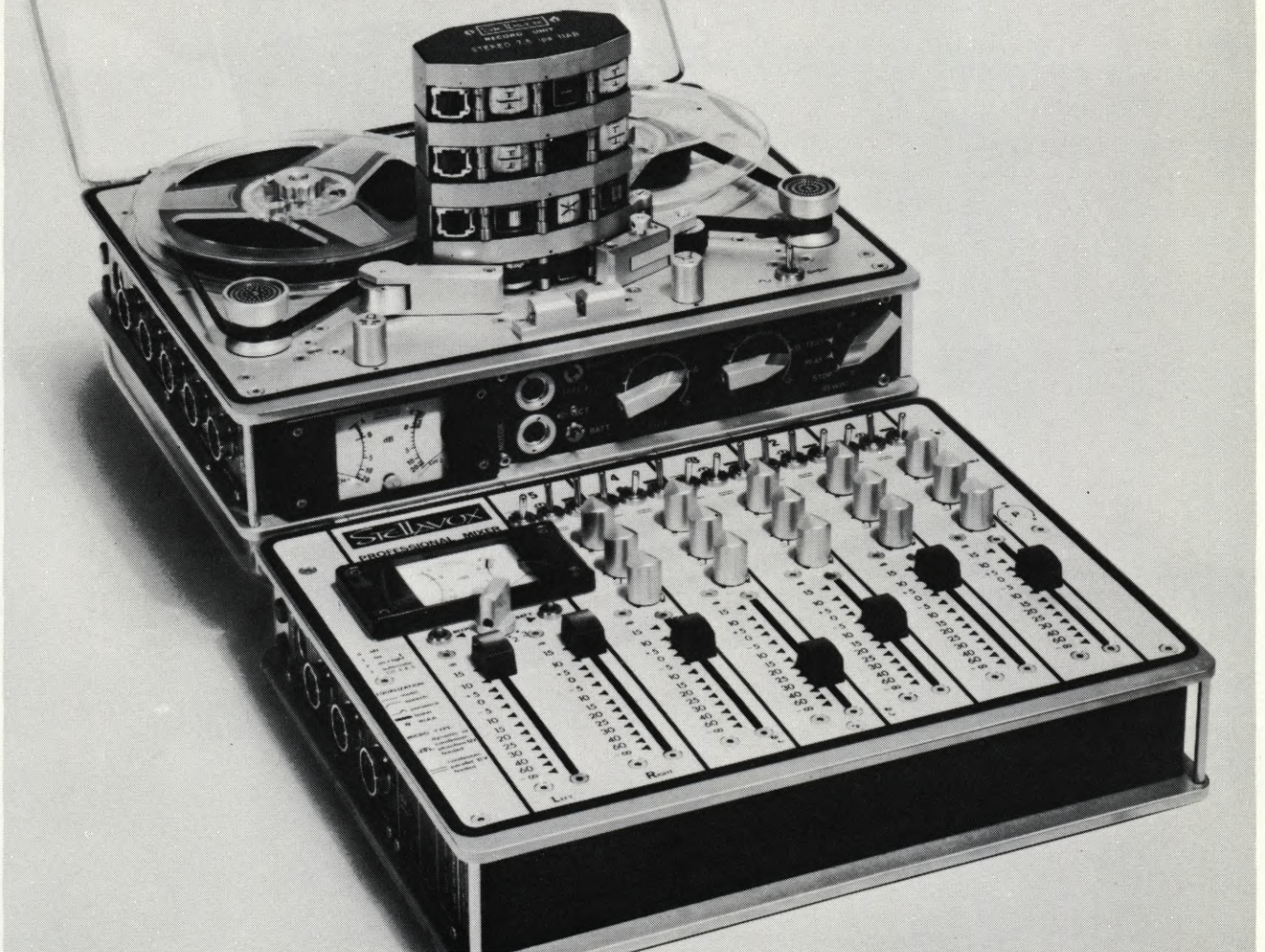
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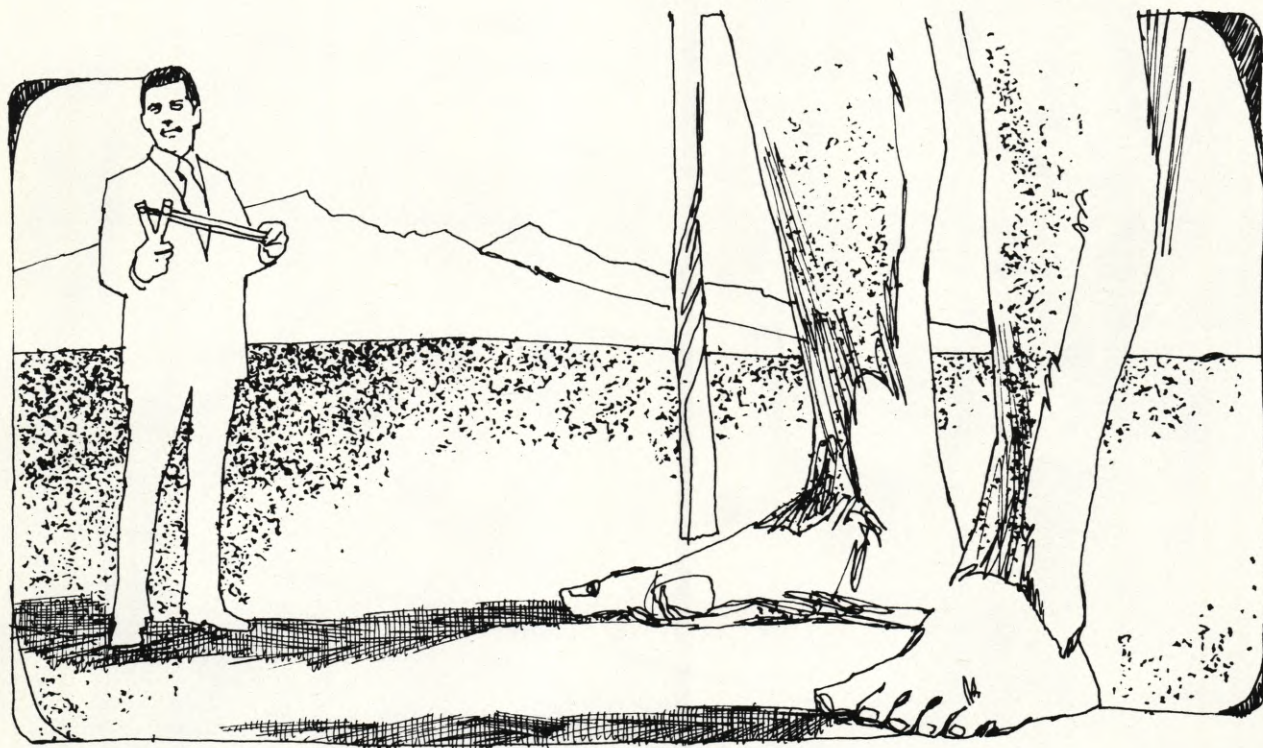
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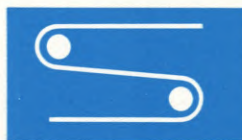
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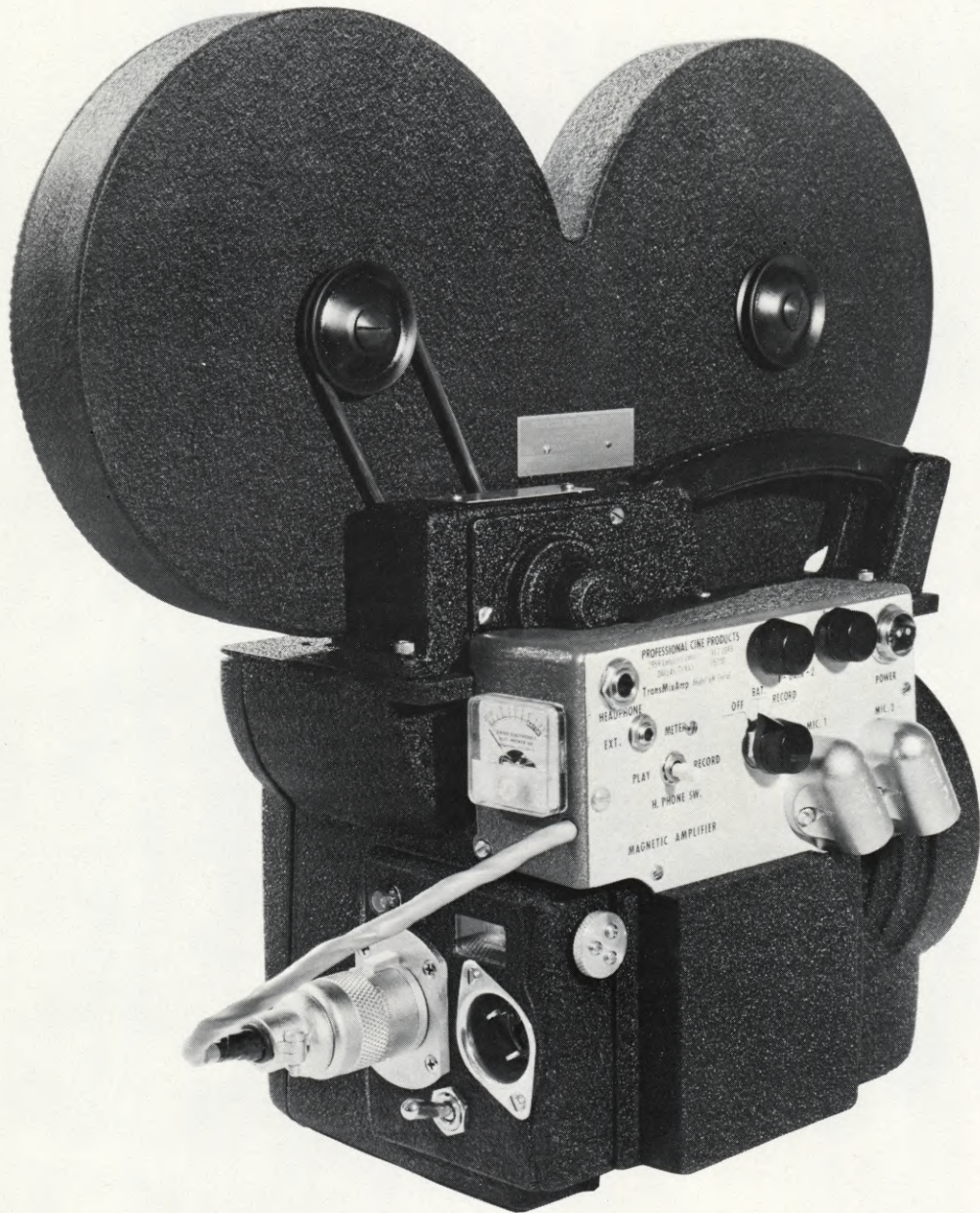
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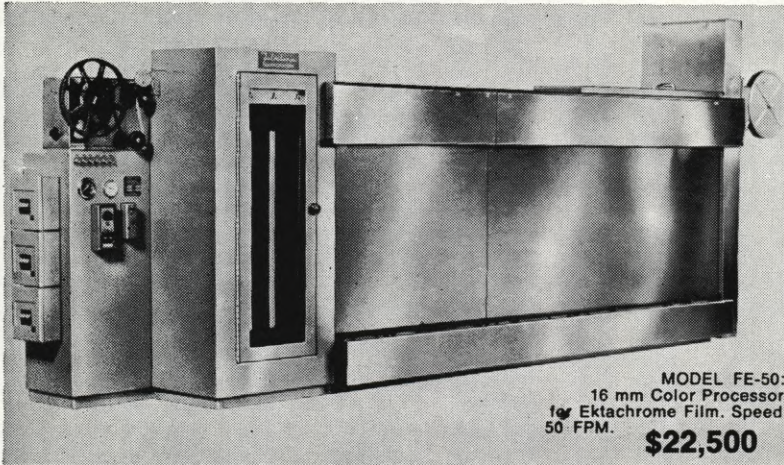
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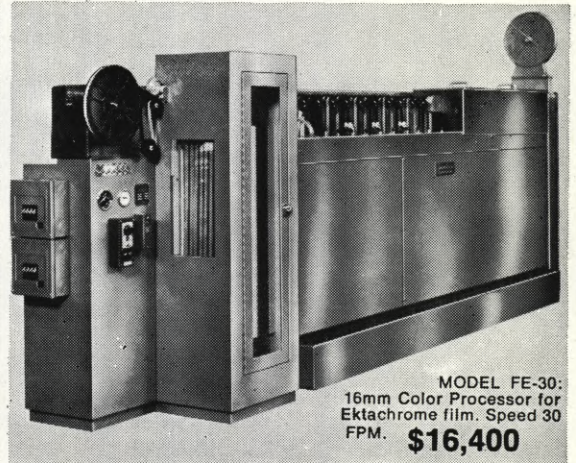
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YELLOWSTONE WONDERLAND

Continued from Page 865

of white boiling water gushes up from its center. On the map this gem-like phenomenon is called Crested Pool.

The crew breaks out the cameras and films Dr. Brock taking temperature measurements at the pool, while I run amuck in my own orgy of picture-taking. On the way out we pause to drink from a crystal-clear stream that meanders through the meadow.

Our next stop is Roaring Mountain—and it is unlike anything I have imagined in my wildest fantasies. Picture a vast peak that appears to have smoke belching forth from its entire slope. Of course, it is not smoke at all, but super-heated steam and gaseous vapor surging up through hundreds of vents (called *fumaroles*) that perforate its surface. All of this is accompanied by a low roaring sound, which gives the mountain its name. The total effect is that of a landscape in Hell.

The crew sets up at the bottom of the mountain to film a scene of Dr. Brock picking his way upward through the boulders, as jets of steam and sulphur-laden gases belch out of the vents at him—a kind of “Orpheus ascending” effect. Then the director says he wants a shot of his star making it along the ridge of the peak. Dr. Brock, obviously in tip-top form, goes loping

Dr. Brock reads the temperature of the water in an azure circular pool that bubbles and spumes atop a mound in a beautiful meadow.



The crew waits patiently for the optimum moment to shoot scenes of Riverside Geyser, which steams furiously in promise of things to come. In full eruption, the unique geyser sends an almost horizontal arc of water spouting into the adjacent Firehole River. Like most phenomena in the Park, its eruption cycle has been quite accurately calculated.

up the trail like some sort of hooved species, while I, sagging under the weight of my camera gear, struggle to keep up with him. When we are almost to the top, my Nikon 200mm lens (luckily in its leather case) jars itself loose from my gadget bag and goes bouncing down the slope. I go clambering down after it, falling tail-over-teakettle on the way.

The lens comes to rest squarely in the mouth of a *fumarole*. Had it landed at a slightly different angle, it would have continued all the way through to the bowels of the earth. Even so, I have the devil's own time extricating it from the belching fissure without having all the skin on my hand removed by live steam.

Later, back at the bottom of Roaring Mountain, the lads film a scene of Dr. Brock taking specimens of the vivid blue-green algae which live in a narrow stream of boiling water that winds its way down the fuming slope.

The Pause That Refreshes

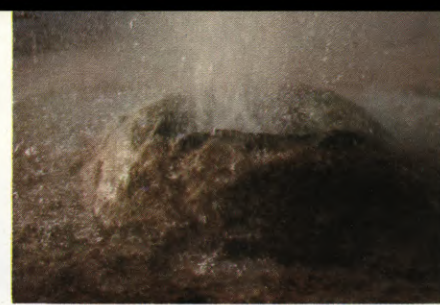
It becomes a ritual that, after a long day over a hot camera, we repair to a West Yellowstone beer and pizza palace called *The Gusher*—there to pull ourselves together and quaff a few brews. It's an ordinary enough place, but somehow suggests the *ambiance* of a frontier saloon and serves as an unofficial social center for the town. The denizens of *The Gusher* form a mixed-bag of humanity, ranging from shaggy hip types to super-square-looking pillars of the Establishment. However, it's a lively,

colorful spot and I like it.

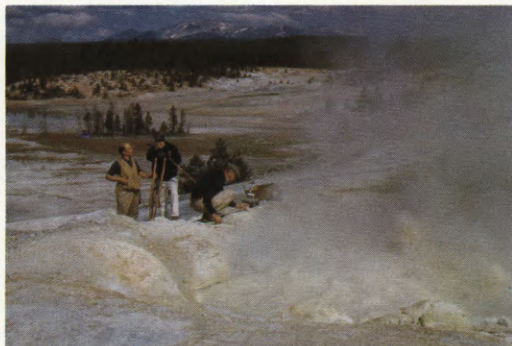
So do Bert and Ulf—but for a different reason. Having originated in Europe, they are both turned on to beer in gargantuan amounts. They regard *The Gusher* as a kind of “pit stop” for refueling. Each of them orders a huge pitcher of brew for himself and settles down to enjoy it. Since I have neither the taste nor the bladder for that quantity of beer, I play it more conservatively, but watch in awe as they swill down the entire pitcher and ask for more. I can't help wondering how many miles they get to the gallon.

In *The Gusher*, while engaging in our nightly chug-a-lug, the conversation invariably gets around to film-making, and Van Bork discusses some of the special problems they have in regard to the two pictures they're shooting here.

“When it comes to the picture that is strictly about Yellowstone, I can take a lot of license with light and exposure in order to capture certain mood effects,” he tells me, “but the scientific film about the micro-organisms in the hot springs is a completely different challenge. Here we are working with a scientist collaborator, Dr. Brock, to whom it is critically important that things show up on film with precise color fidelity. For example, if I should underexpose—especially on the deep blues and greens—the colors would go too dark and could not be made to look really authentic, even with lab correction. On the other hand, should I overexpose, the yellows, oranges and reds would be washed out and it would



(LEFT) Setting up to shoot scenes of the eruption of the Pink Cone Geyser. Van Bork lies on the rock with his camera set for a low angle. Misgauging the time interval, he lay there for two hours until the obstinate geyser decided to do its thing. (CENTER) The recalcitrant geyser finally goes off in a spectacular performance that lasts about 45 minutes, allowing ample time to change angles. (RIGHT) Close shot of the Pink Cone Geyser. Its narrow funnel sends a condensed column of super-heated steam and boiling water high into the air.

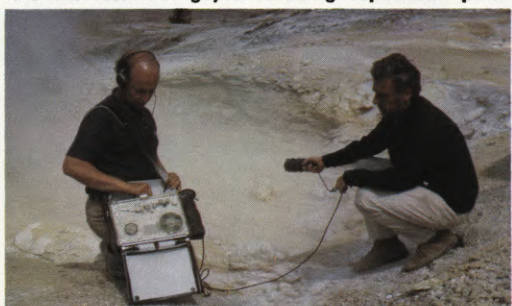
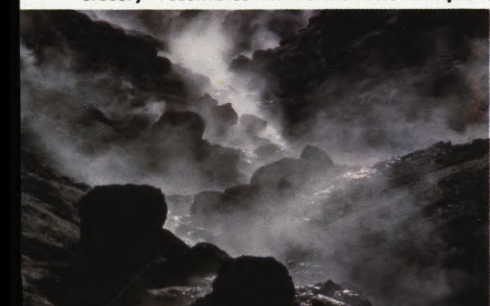


(LEFT) The crew prepares to film a scene of microbiologist Dr. Thomas D. Brock as he takes temperature measurements at one of the many hot springs that flow through Yellowstone National Park. (CENTER) Moving in for an over-the-shoulder shot of the same action. (RIGHT) The breath-taking natural sculpture of Minerva Terrace at Mammoth Hot Springs in Yellowstone. The spectacular terraces are composed of travertine (limestone or calcium carbonate) that has been dissolved in hot carbonic acid and ejected from below ground. On the surface, as the acid becomes both weaker and cooler, it precipitates the travertine to form these beautiful formations.

(LEFT) The camera crew films interior shots inside Dr. Brock's permanent Yellowstone laboratory, which is composed of three huge mobile home units. Dr. Brock returns to research sessions in this lab each summer, between teaching sessions at the University of Wisconsin. (CENTER) A meter reading is taken prior to filming an over-the-shoulder shot of Dr. Brock at work. (RIGHT) Bert Van Bork sets up the Arriflex camera on a microscope mount of his own design.



(LEFT) A smoking pathway up Roaring Mountain, a steaming mountain of mystery. (CENTER) The film-makers use the Nagra recorder to capture the sounds of a growling hot springs. The multitude of hydro-thermal phenomena in the Park emit a vast variety of sounds, all of which are duly recorded for the film's sound track. (RIGHT) The natural sculpture of Grotto Geyser is as awe-inspiring as any of the work of Henry Moore, which it closely resembles in form. The unique shapes are the result of geyserrite being deposited upon trees which once grew around the geyser.





One of two films deals with Man—not against the wilderness—but working in harmony with it to preserve its ecology, while revealing its secrets.

be impossible to put the richness of the colors back in. Since the bacteria and algae vary greatly in color depending upon the temperature of the water, it is scientifically important that these colors be rendered with realistic precision. It takes a lot of careful calculation to get the exposure just right."

Speaking of exposure, I have noticed, during our forays into the wilderness, that he usually uses the Spectra incident meter when photographing vast, front-lighted vistas—but, when he moves into closeups or has a back-lighted subject to contend with, he whips out his Pentax spot meter and uses that instead.

"That's right," he nods. "The scientist wears clothing of very neutral colors and if he goes into silhouette it's alright. I don't have to glamorize him, so I don't use any reflectors. But the things he's working with are something else again. If I move in for a closeup of the bacteria or algae, I use the spot meter on them to make sure I get the correct color rendition. Then, too, steam and gushing water are more dramatic when filmed in back-light and I find that, under those conditions, the spot meter gives me a more accurate exposure."

I've noticed that he uses a wide array of prime lenses with the Arriflex, but no zoom lens, and I ask him about this.

"We carry a full complement of

Cooke lenses—16mm, 25mm, 50mm, 90mm, 150mm and 300mm," he tells me. "I don't use a zoom lens because I don't think it would fit the mood of the pictures we're making here. The idea of zooming in and out of hot springs doesn't grab me too much. But there are practical considerations, too. A zoom is a long lens, a big piece of glass that is unprotected. Considering the amount of climbing and hiking for miles that we have to do, it would be too fragile a piece of equipment to use under these conditions. Also, I've rarely found a zoom lens that is as sharp as good prime lenses."

The Inside Story

We move into the mobile home units to shoot scenes of Dr. Brock at work in his beautifully-equipped laboratory. The boys light the whole place up with a few small quartz lamps and I notice that they now take special pains in lighting Dr. Brock.

"There is a contrast of approach in here," Bert tells me. "Up until now we've seen the scientist out in the wide open spaces, where he's relatively unimportant, compared to the surroundings. But now we go with him into his main habitat, the laboratory, and it's the first chance we have to see him at work in his specialty. Here I'm very interested in bringing out the character of the man, in contrast to the rugged outdoor scenes we shot before, so I'm very careful about lighting him."

They shoot scenes of Dr. Brock preparing samples of algae and bacteria, looking at them under his microscope and doing the other basic operations that take place in his lab. Then it's time to zero in on photomicrographic shots of what he sees under the microscope.

Van Bork unpacks an assortment of complicated plumbing and fits the pieces together like an Erector Set. It ends up looking like a Rube Goldberg special, but it's actually an ingenious microscope mount for the Arriflex.

"This equipment is all my own design," he tells me, "and it consists of parts of two microscopes which I've put together. It's made to my specifications and it's important that it can be broken down into small parts because we take it with us frequently on location and it has to be portable. It's very large when it's set up, but it breaks down into little bits and pieces. You have to know exactly how to put it together again because, in the places where we go, there's nobody to help you figure it out. Lining it up for shooting is a very critical procedure."

He goes through a complicated routine that involves focusing the filaments

of the special quartz lamp he is using onto a piece of lens tissue placed under the microscope. Then he racks the condenser up and down to arrive at the precisely correct distance.

"Now I close down the aperture diaphragm until the halo of the light just disappears around the edges of the field," he explains, doing it. "This is to insure good contrast. If the aperture is left open too far, you have good resolution and poor contrast. If it is closed down too far, you lose resolution, but you have excellent contrast. Now I open up the diaphragm just until it fills the field. I don't open it all the way, because this could lead to possible internal reflections."

I can see what he means by a "critical procedure." Meanwhile, Ulf has been loading Ektachrome EF into the magazines.

"In shooting highly-magnified algae and bacteria you need an enormous amount of light just to get an exposure," says Bert. "So we use the high-speed film with a rating of ASA 125 and this bright quartz light that has been specially designed for cinematography through the microscope."

Dr. Brock prepares slides of various specimens and they're photographed under the microscope, with Bert's complicated rig working perfectly. Then the shooting is over and it's time for *The Gusher* again!

The Homemade Matte Shot

"Today," says Our Leader, with a Marquis de Sade leer lighting his rugged features, "we are really going to give you a workout."

I wonder what he thinks I've been getting up until now, and I shudder to imagine what new torment he may have in store.

It turns out that we are going to climb straight up a mountain to get to a vantage point where they can make a down-shot of Grand Prismatic Spring, Yellowstone's largest hot spring.

I'm game. I've always said that if I'm going to drop dead, it had better be while doing something I find exciting. And the climb up this particular mountain would be exciting enough even for a mountain goat. There is an almost non-existent trail that leads over boulders and fallen trees on an almost perpendicular grade.

Bert blazes the trail like Stanley surging out to meet Livingstone. Ulf the Wolf is right behind him, laden down like a pack-burro with the Arriflex and all its accessories, the Nagra recorder, a sturdy Mitchell Pro tripod, plus extra film and magazines. Guess who's taking up the rear.

I'm in pretty fair shape, for a battered warrior, but these guys are really incredible. They lope up the mountain like a couple of goats. I think they must extract some sort of jet-propulsion from all that beer they drink. Anyway, we make it to the top—and I'm the only one who's huffing and puffing.

The view from the summit is something else. Directly below lies the magnificence of Grand Prismatic Spring, a huge circular pool of incredibly blue water, surrounded by concentric rings of vari-colored algae. It has been worth the climb!

"My God, a cast of thousands!" exclaims Bert. He is referring to the throngs of tourists crowding the unsightly boardwalks that surround the Spring.

"Whattaya gonna do?" I ask, convinced that he has finally met his Waterloo.

"I guess I'll have to do a homemade matte shot," says he.

"A what?"

"I'll just have to mask them out some way. Can't have them cluttering up the composition," he says, briskly cutting some pine boughs.

I watch in wonder as he tapes up an arrangement of boughs in the foreground of the shot. When he's through, I look through the lens. There isn't a sign of a tourist—or even a boardwalk. The precisely placed pine boughs, slightly out of focus, have completely masked them out. Grand Prismatic Spring sparkles below in magnificent solitude!

I get another demonstration of this cinematic legerdemain when, later on, we sally forth to shoot scenes of Old

Faithful Geyser, probably the best-known phenomenon in the Park. It is also the most cluttered with trappings of so-called civilization. It stands hard by a venerable old log hostelry and is surrounded by bleachers on which the "cast of thousands" is waiting to see the latest eruption. There seems to be no way—but *no* way—to comb Old Faithful out of all this claptrap.

But Van Bork finds a way.

We go traipsing out over what seems like miles of boardwalk until we come to the smoldering cone of Beehive Geyser. Behind it, in the distance, is the Old Faithful area.

The camera is set up at a very low angle, and a 90mm lens is mounted onto it. This relatively long lens compresses the planes, while still holding an acceptable depth of field, and Old Faithful is brought much closer. When its cone spouts a proud plume of water into the sky minutes later, the steam cloud from Beehive Geyser in the foreground blots out the hotel and the low camera angle, gets rid of the tourists and bleachers. *Magic!*

To Him Who Waits

We are tooling along Firehole Lake Drive when we come to Pink Cone Geyser, so-named because its cone is pink—which figures.

"Stop the car," says Bert.

He listens. "This one's just about to go off," he says. "I can tell by the sound of it. Let's get the camera set up."

The camera is set right on the ground and Bert lies down on the flat rock

beside it, hand on trigger. "It's going any minute," says he.

Two and a half hours later Pink Cone Geyser finally blows. It goes off with a woosh and a roar, its narrow funnel throwing a graceful fountain of water high into the air. We have fun shooting the setting sun through the column of water.

During the long wait, Ulf had been running around with the Nagra, recording wild sound from the various bubbling, growling things nearby. He would dangle the microphone down the spout of some geyser, only to get chased away when the hot water came roaring out—but he was getting some crazy sounds on tape.

"The sound effects around here are fantastic and the variety is enormous," comments Bert later. "These sounds are tremendously important to our films and we're taking advantage of them. We record all of the dominant effects from several different perspectives, so that when it comes to laying in our sound tracks, we'll have a wide choice of effects. The sounds out here are like music, especially the hissing and puffing you hear in the morning. It's a feeling like, maybe, the beginning of the Earth, or something like that—an eerie feeling that goes well with the gutsy style of photography we're getting into this picture?"

I ask about any sound problems he may have encountered.

"Again, you have tourists," he says. "You have the sounds of cars and people clattering along the boardwalks. Sometimes we have to record at night after most of them have left. You have

(LEFT) Van Bork moves in for a closeup of the scientific instrument which Dr. Brock uses to measure temperature of the water in various hot springs. These temperatures are of critical importance in the evaluation of his research. (RIGHT) A second film, concentrating on the moody magnificence of the Park, is aimed toward showing it as it might have appeared to primitive man who lived there more than 8,500 years ago. By skillful shooting, the crew manages to avoid tourists, boardwalks and any other evidence of encroaching civilization.





(LEFT) The main street of West Yellowstone, Montana, "Gateway to Yellowstone National Park". Despite its ultra-modern gas stations, the tiny town still has much of the feeling of the raw Western frontier. (CENTER) Bäckstrom and Van Bork converge on "The Gusher", the town's beer and pizza palace, which is their favorite refueling stop for the foaming brew. (RIGHT) Riverside Geyser is most unusual in that its vent discharges a jet of steam and boiling water almost horizontally into the adjoining river.



(LEFT) At the edge of the Firehole River, the crew films a closeup of Dr. Brock, as his wife (who is also a scientist) visits the location. (CENTER) In the center of a vast verdant meadow is a high mound on top of which an azure pool boils and bubbles. It accounts for one of the most spectacular sequences in the film. (RIGHT) Dr. Brock stands atop Minerva Terrace at Mammoth Hot Springs. The beautiful terraces have been built up by eons of action by the hot waters that precipitate the multi-colored travertine. Occasionally part of the formation collapses, but Nature begins immediately to build it even higher.

(LEFT) The magnificent Grand Canyon of the Yellowstone River, with the Lower Falls in the background. The Lower Falls is 308 feet high, twice the height of Niagara Falls. (CENTER) Dr. Brock gathers specimens of the vivid blue-green algae which grows in the hot springs. The micro-organisms in these springs vary in color through the entire spectrum, depending mainly upon the temperature of the water. (RIGHT) The indefatigable film-makers lug heavy filming equipment up a steep mountain to shoot the grand Prismatic Spring (in background).



(LEFT) Roaring Mountain is a wide peak completely perforated by fumaroles, small openings in the surface which reach to the bowels of the earth and continually spout smoke, steam and gases. It is especially spectacular in the chill of early morning when the steam condenses into high columns. (CENTER) Dr. Brock stands at the foot of Roaring Mountain in terrain that resembles a landscape in Hell. (RIGHT) The game-for-anything scientist climbs to the top of Roaring Mountain so the film-makers can get a shot of him on the ridge.



to contend with sound pollution, as well as boardwalk pollution!"

Off to Buffalo

One day we round a curve in the road and there stands a magnificent bull buffalo scarfing up the green goodies from the valley floor. He looks as big as a boxcar and must weigh about 2,000 pounds. I have this thing about photographing buffalo, so I go charging out of the car, camera in hand, ready to snap his picture.

"Don't get too close to that beast," bellows a Park Ranger, through his bullhorn. "He killed a man last week!"

And so he had. The full story was that this buffalo had been placidly browsing in a meadow when some kids decided to make his life a living hell by pulling his tail and throwing rocks at him. The tormented beast finally worked up a head of steam, and the next human he saw—which happened to be a man approaching—he trampled to death. Somehow, my sympathies are with the buffalo.

We see many other animals in the park—moose and elk and the whimsical black bears that panhandle snacks from the tourists.

The days that follow are devoted to filming other phenomena in the Park—each more beautiful than the other.

Often we hike into areas that have been left completely undisturbed—virgin oases of beauty with no tourists and no boardwalks. We feel like explorers discovering a total environment.

We photograph pots of bubbling, multi-colored mud; hot springs gushing out of the sides of sheer cliffs; the unique Riverside Geyser, spouting its graceful arc of water almost horizontally into the Firehole River, and the awesome Grand Canyon of the Yellowstone River, with its Lower Falls—twice the height of Niagara.

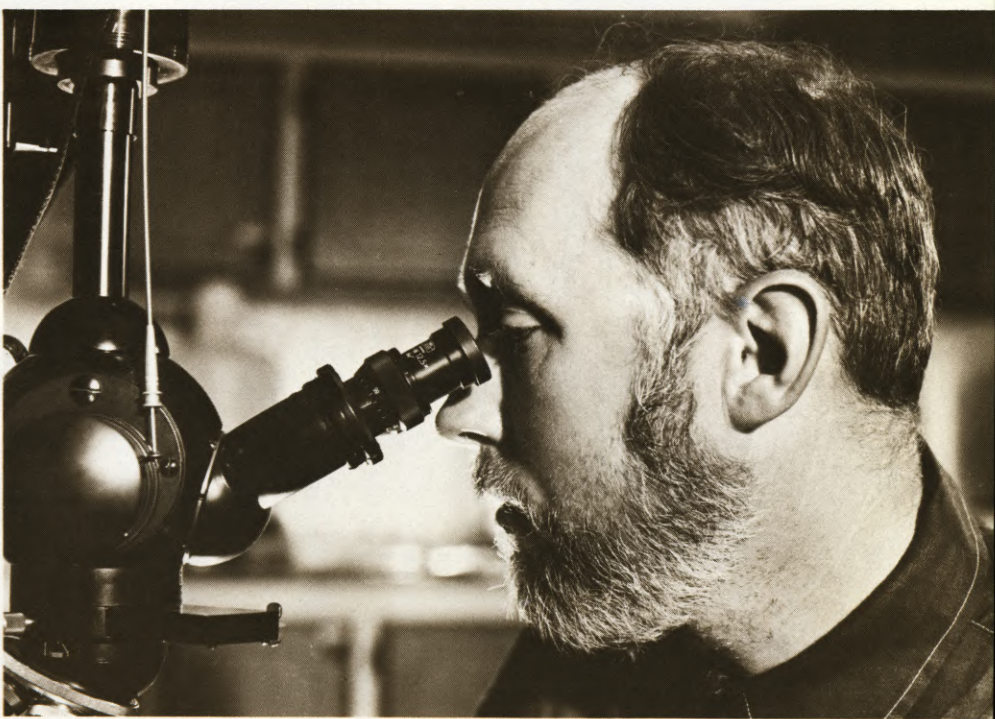
Most spectacular of all, perhaps, is magnificent Minerva Terrace, with its lovely cascades of vari-colored travertine. The intrepid camera crew sets up to shoot a scene of Dr. Brock on top of the Terrace. I snap a picture of them for the cover of *American Cinematographer*. It's a high-contrast scene and I have no fill-in flash to lighten the faces. The hell with it—the scenery is more important!

Then, inevitably, it is time for me to leave, since deadlines and printers wait for no man.

I say silent *au revoir* to the Yellowstone Wonderland, vowing to come back very soon. Then, with much hand-shaking and back-slapping, I bid fond farewell to my rollicking buddies, Bert and Ulf—until our next adventure . . .



(ABOVE) A map of Yellowstone National Park, showing its location in the northwest corner of Wyoming. Several of the Park's main entrances are located in narrow strips of Montana on the North and West. (BELOW) Dr. Brock makes a microscopic study of hot spring bacteria and algae. Their colors vary greatly, depending upon the temperature of water in which they live.



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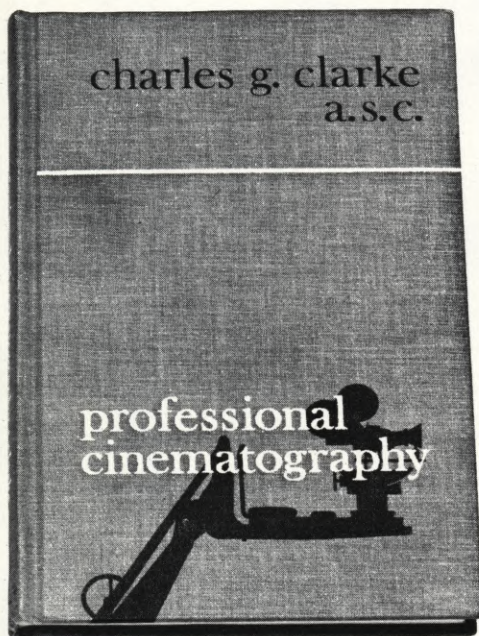
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ABOUT THE AUTHOR: Charles G. Clarke, ASC, a top Director of Photography at 20th Century-Fox for many years, and an ASC member, taught Advanced Cinematography at the University of California at Los Angeles, where he recognized a need for practical professional guidance for students striving to be the industry's future Directors of Photography. It is this need which has given rise to his publication of a book on the subject and subsequently the latest revised edition of Professional Cinematography. The first edition of this valuable book has become required reading at many universities and schools offering courses in cinematography.

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FILMING "STREET SCENE"

U.S.C. Cinema students overcome multiple problems to film a drama of urban life in black-and-white

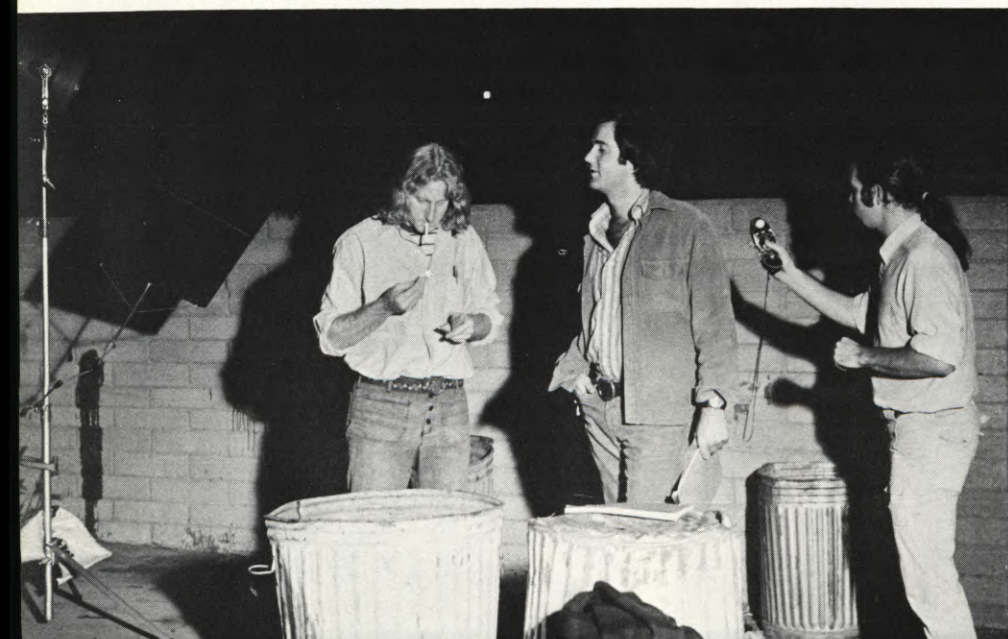
By DAVID C. ENGELBACH

Writer/Director



Helper Rick Shaw, Director David Engelbach and Production Manager Milt Hubatka talk over an upcoming sequence on location for "STREET SCENE", a social drama filmed in Los Angeles and surrounding communities.

Engelbach and Hubatka stand by while Shaw takes a light reading. "STREET SCENE" was the author's graduate level production workshop project in the Cinema Department at the University of Southern California. It was made on an extremely low "student" budget, utilizing an all-student crew that pitched in wholeheartedly to turn out a film with professional finish.



As anyone who has ever attempted to produce a sophisticated film on virtually no budget knows, it can be a terrifying experience. Particularly with an inexperienced student crew, and a script that must be shot almost entirely at night on real locations with a largely black cast. This was the problem my crew and I faced in the making of *STREET SCENE*. The film was produced for the graduate level production workshop in the Cinema Department at the University of Southern California. The only requirement from the school was that it be a sync-sound film employing a five-man crew: Director, Cameraman, Soundman, Editor, and Production Manager.

The usual procedure is for the writer, who is generally the director, to convince his fellow students that the project in question is worth the time and energy necessary to complete it. I found the process of putting together a student crew to be excellent experience when I made the transition from student to professional. I was initially fortunate in having a superb still photographer, Nathan Fierman, as my cameraman. Even before I had assembled the rest of the crew, Nathan and I began breaking down the half-hour script into its visual components. Though my crew

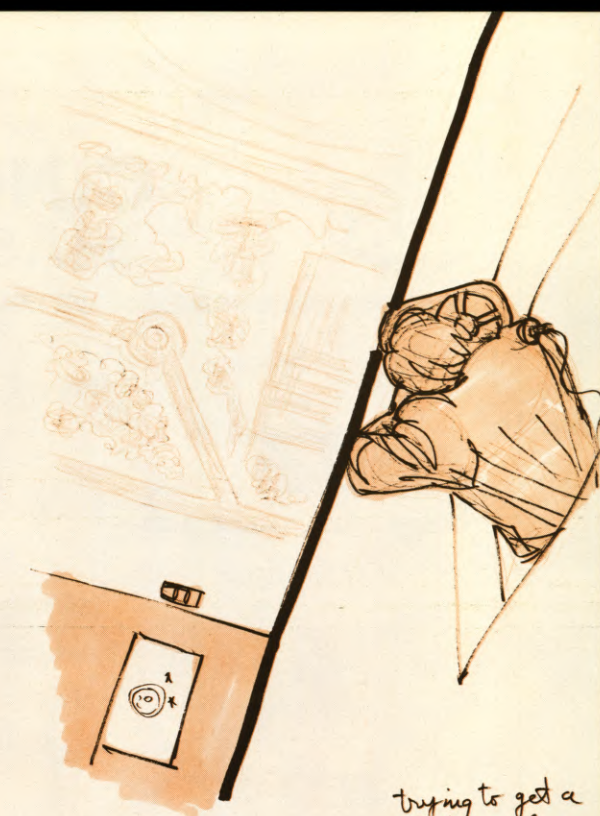
and I had never before attempted as long or as complex a script, we all felt confident that we would be able to pull it off, in spite of forebodings from some of the faculty. What we lacked in experience we more than compensated for in energy and talent. Especially energy. We believed that if we prepared sufficiently in advance we could complete the film in time for the semester screening.

The story itself dictated many problems we would have to face, as well as the style we wanted to give it. It concerns itself with the paranoia of a sheltered, affluent white college coed who finds herself stranded in a black urban ghetto late at night. Refusing help from two well-intentioned black men she sets out alone to find assistance in the empty frightening streets of the city. Her liberal views, never challenged in the safe fortress of academia, begin to crumble against the fears of her own prejudice. The other side of the film, told in parallel action, is about a hard-working, non-political black man who is just trying to take care of his family and himself. The two finally meet in the end, violent victims of a society not yet ready to throw away its hypocrisy.

I wanted the visual look of the film to seem real, almost documentary-like. Because we were using the school's equipment, and had a severely limited budget, we knew that elaborate lighting set-ups were out of the question. While casting began, we ran tests to determine the most suitable raw stock. For both aesthetic and fiscal reasons I had ruled out shooting in color. It would ruin the hard-nosed look of the film and there wasn't a fast enough color film in 16mm to meet our requirements. We purchased a 100-foot roll of Eastman 4X Reversal and one of 4X Negative. We lit an exterior scene and had both a white actress and black actor in it to see if their relative reflectance would present any problems. The results of the tests were quite surprising. Eastman rates 4X Reversal at ASA 320, and Negative at 400. The rating for Negative seemed accurate, but the Reversal stock was over-exposed. Checking the notes we



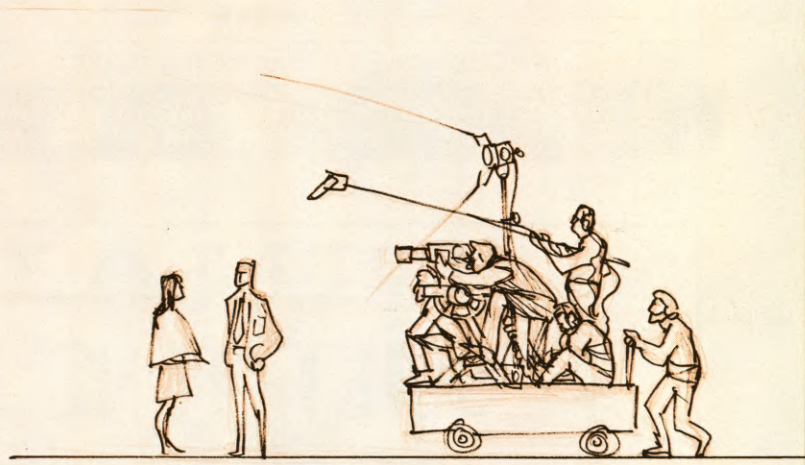
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The Juggernaut,
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On-the-spot location sketches made by Art Director/Editor Dan O'Bannon document a typical late-night (early morning) shooting session, photographing of a high-angle shot, a run-in with the police due to lack of a shooting permit and the trundling trauma of filming a complex dolly shot.

made during the test we found that we had made no error. It seems that Eastman simply underrates their 4X Reversal. My cameraman and I decided to go with the 4X Reversal, a decision I would not regret. Its grain structure and contrast seemed much superior to the Negative stock. The primary difference for us was that our F/stop settings would have to be more accurate, as we didn't have the latitude inherent in Negative. When we began principal shooting we rated the Reversal stock at ASA 400 and had

no problems with over-exposure. As a matter of fact, after viewing the first night's rushes we realized that the film's sensitivity allowed us to reduce significantly the number of lights that we needed for any set-up. In many instances we were keying at only 13 foot candles, and the results were superb.

I wanted to avoid the extremely high-key lighting one sees in night sequences, so reminiscent of old-style studio lighting. That meant we had to blend the light into the location as

much as possible. In keeping with the film's concept we had to motivate all of our lighting. Just throwing globs of light onto a scene and then shooting would have been faster, but the results would have been disastrous. Instead, we had to carefully think out the sources of lighting that one would expect to see on a city street late at night. Additionally, I wanted a sense of background and depth to the locations. High-keyed lighting would have created impossible con-

Continued on Page 930

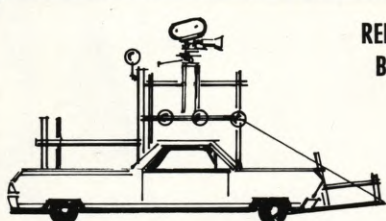
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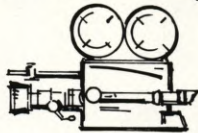
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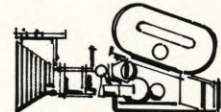


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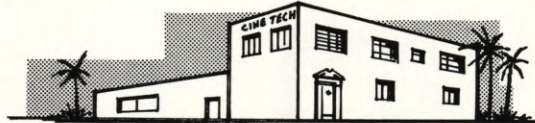
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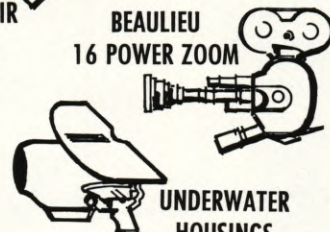


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"ACROSS 110th STREET"

Continued from Page 878

ways. The smell was worse than that of a Himalayan yak. *Terrible!*"

The "sets" were all practical rooms with four walls and measuring, on the average, about 8 x 10 feet. "I used available light during an awful lot of the shooting—and very little of that," says Priestley. "I shot in a range of 5 to 25 foot-candles for most of the interiors—very low-key. The director, Barry Shear, wanted a new look as much as I did, and I think it worked for him. I think we've got a very exciting-looking picture. They say I drove the assistants crazy, shooting wide-open during the whole picture. We used the Panavision high-speed F/1.1, F/1.5 and F/1.9 lenses—which helped a lot—and, of course, we pushed the film in development. We pushed it one stop most of the time and, occasionally, two stops. I don't think you can go any more than that. I've heard of cameramen pushing it three and four stops, but the Kodak people say that's nonsense."

As far as lighting equipment was concerned, Priestley used very small units, mainly "inkies" and 150-watt lamps for the interiors. "I don't think we used anything higher than a 750-watt lamp inside during the whole picture," he recalls. "For night exteriors we used the six-light Maxi-Brutes a lot. We'd put them high up on a roof and rake the street with them and get a very nice effect. We didn't use any arcs because there was no reason to use them. We kept the equipment simple and this meant that we were able to work with a very small crew. We had three grips, three electricians and three propmen—plus the camera crew. If you use a lot of equipment, you need a large crew. If you keep it down, you can move pretty fast with a small group."

The feature debut of the new Arriflex 35BL came about when the first production model arrived in New York and the film's co-producer, Fouad Said, persuaded Volker Bahnmann, Vice President of Arriflex Company of America, to let his crew try it out for a week on "ACROSS 110th STREET".

"As I said before, I don't know what we would have done without it," observes Priestley. "We were supposed to have it for only a week, but Volker was nice enough to let us finish the picture with it—so we ended up by using it for four weeks. He did me a wonderful favor."

Says Operator Sol Negrin of the new Arriflex: "It was used in major sound sequences shot in confined quarters

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where it was impossible to use a large camera, but where we needed portability and quietness. We also used it on the rooftops of buildings in Little Italy—buildings that had no elevators. The low noise level of the Arri-35BL permits shooting sound sequences in confined quarters, thus eliminating the post-dubbing of dialogue that is usually necessary under such conditions."

Because of the intricate character of the action, multiple cameras were used in many of the sequences. "Out of the 40 shooting days in the schedule, I'd say there were perhaps 15 on which we used two cameras and sometimes three," recalls Priestley. "The problem was where to put three cameras in an 8 x 10 room. But the director didn't want to duplicate the action, so we hand-held cameras with 75mm lenses to get our close-ups. It drove the assistant crazy on guessing focus, because nobody ends up where they're supposed to in a fight. However, we had a First Assistant named Fred Schuler who is really excellent at following focus and he kept it all pretty sharp. An even bigger problem arises when you're shooting inside at F/2.3 and a guy falls out the window and breaks the glass and the 85ND filter sheet with it. Suddenly it's F/2.3 inside and F/22 outside—but with the fog filters, it's a hell of an effect. You can get away with it; it works."

Commenting on the use of multiple cameras, Negrin observes: "Three cameras were really necessary for the rooftop sequences, where we were trying to cover as many shots as possible without having to repeat the action over and over for a single camera. It was also easier on the actors. The concluding segment of the picture—72 scenes—was shot in a day-and-a-half. Without the three cameras shooting at the same time, it would have taken three or four days."

One of the "hairiest" sequences for both cast and crew was filmed at night high up on the new Federal Building under construction at 125th Street and Lenox Avenue. "That was kind of strange," recalls Priestley. "The building wasn't completed and we were up on the 20th floor, actually about 300 feet above the ground. On the first night we were up there, everybody was pussy-footing around, holding onto things and looking for traps. But on the second night, everybody just forgot about it and went prancing around, running all over the place. I was afraid somebody was going to fall off the damned thing. We had one scene where Tony Franciosa beats up this black guy and hangs him over the side by his heels. Tony got emotionally involved in the scene and

actually hung him over the side of the building by his heels, 300 feet up. Then he forgot his next line and kept repeating the last one until he remembered it. Meanwhile, the guy who was hanging head downward kept screaming, 'No! Stop! Cut! Let me out!' He was really scared."


Asked about the problem of shooting black actors against a black sky at night, Priestley answered: "All I do is tell them to keep smiling and keep those baby-blues open. Seriously, it really is a problem—especially since they're always wearing black suits and driving black cars. Everybody recommends using a lot of kickers, but I didn't do that on this picture. If they're standing still, you can help them by hitting them with a PAR-64 or something like that, but if they're moving around, you're in trouble—especially if a white guy moves into the position where a black guy was. There really isn't anything you can do if they're moving around a lot. I don't care what anybody says—they'd have to show me if there's a way to do it. If there is, I don't know it."

There are many chases in "ACROSS 110th STREET"—several at night—and they required considerable rigging, with cameras front-mounted, side-mounted and rear-mounted onto cars and ambulances. Inside the cars at night a 150-watt lamp was usually concealed to light the actors just enough to be able to see them, providing a light of about 15 foot-candles. However, that was usually enough and the scenes turned out very well.

Asked if there was any particular sequence in the film that sort of got to him, Priestley replied, "There was one night sequence where a car is lifted out of the water. They wanted to start down low, right on the water and, as the car came out of the water, they wanted to boom up and swing with the car, bring it onto the pier where a thousand cops and police cars and ambulances were standing by. There was this construction crane standing nearby and when the director saw it, he said: 'That's going to be our crane!'

"So the grip I had, Jack Kennedy, rigged a platform off the top of the crane, so that when the arm was all the way down on the water, I was lying on my stomach hand-holding the Arri. Then, as the car came out of the water, the crane swooped up. By the time it was upright, I was standing straight up on the platform, holding the Arriflex and shooting down 70 feet into the black water. I didn't mind the first couple of takes, but fun is fun, and after that I figured I'd had enough of that nonsense!"

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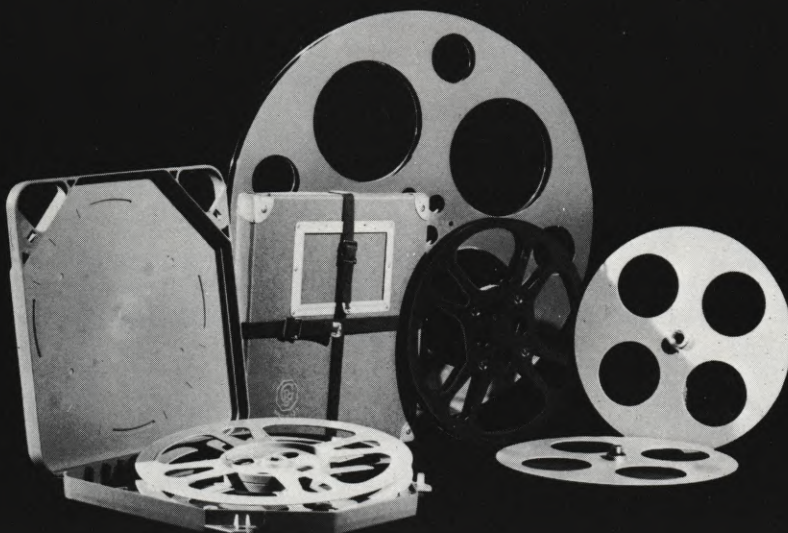
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WHAT'S NEW

Continued from Page 842

can be continuously adjusted to "flood out" up to 3:1.

Both the reflector and its stand are easily collapsed for transportation and storage. The large Vari-flector II and its stand fit into a 42 x 7" cylindrical case. The smaller unit (without the stand) fits into a 24 x 4½" case.

Designed for easy maintenance, the Vari-flector II resists stains and scratches. The aluminized surface washes clean with soap and water.

Model 404 measures 42 x 27"; Model 202, 24 x 18".

NEW UNDER-\$275 RICOH 800Z SUPER-8 FROM BRAUN NORTH AMERICA CARRIES MANY PRO FEATURES

Remote control and fade-in/out capabilities are just two of the professional features of the brand new Ricoh 800Z Super-8 movie camera just introduced by Braun North America. Available for immediate delivery, the camera carries a suggested retail of \$274.95, including lenshood and handstrap. Additional features which will be appreciated by the sophisticated Super-8 cinematographer are the three filming speeds of 18, 24 and 32 fps, plus single-frame; and the fine two-speed power zoom Rikenon F/1.7 7.5mm-60mm (8X) lens with manual override.

The exposure metering system is automatic CdS through-the-lens with manual override, and automatically adjusts to film speeds from ASA 25-400. The camera will accept the new Kodak high-speed Ektachrome E160 film. A micro split-image viewfinder includes these automatic viewfinder signals: f-stop numbers, under/over-exposure warnings, film advance and end-of-film indicators. A back-light control of +1EV is another significant pro feature.

Power source for film transport and zoom lens is four AA penlight cells stored in the folding pistol-grip handle; a single 2.6V mercury cell in the camera body powers the automatic exposure control system. Battery checks are located at the back of the camera conveniently facing the operator: one checker for the motordrive batteries, a second for the exposure meter battery. A tripod socket is located in the base of the camera. Remote control cable and deluxe carry case optionally available, at \$6.95 and \$19.95 respectively.

Ricoh Photo Products are marketed in the U.S. exclusively by Braun North

America, division of The Gillette Company, 55 Cambridge Parkway, Cambridge, Mass. 02142.

MEDIATECH MAKES TAPE-TO-FILM TRANSFERS VIA TELEDYNE

A new machine for making film from video tape has been acquired by Mediatech, a Park Ridge, Ill., company which specializes in film transfers.

The machine, the Teledyne model CTR-2 Color Recorder, can produce broadcast-quality 16mm film from video tape and other video sources.

The system is similar to the old "kinescope" process, which also used a lens to expose the image displayed on a television picture tube. But, according to Mediatech President Neal McLain, the Teledyne machine employs greatly improved signal-processing and exposure-control circuitry to insure excellent picture detail and color rendition with consistent results.

Film in the Teledyne system is exposed by a Milliken DBM-64B camera, which uses compressed air to achieve film pull-down during television vertical interval.

Mediatech also has acquired an Ampex model VR-1200C video tape recorder and helical VTR's in the more common formats to help in the production of high quality video tape to film transfers.

Mediatech provides film transfer services for advertising agencies, broadcasting stations, tape production houses and industrial, retail, government and educational institutions.

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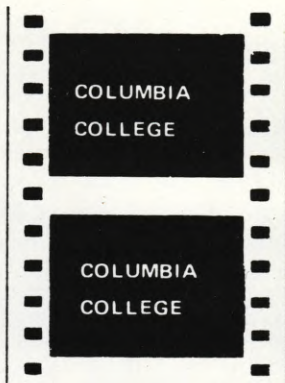
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Continued on Page 946



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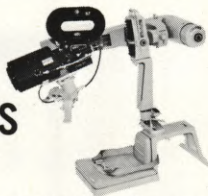
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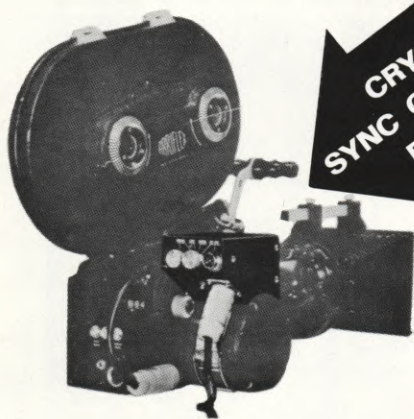
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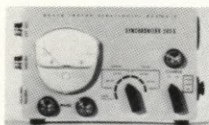
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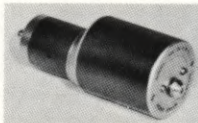


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LIGHT CONTROL MATERIALS

Continued from Page 893

COLOR FILTERS FOR MOOD OR EFFECT

Color media are often applied to various types of lighting fixtures to achieve a mood, or for effect. In those cases, the judgement and experience of the cinematographer will determine the choice of color and the degree to which it is to be used. These are not situations requiring the relatively precise filtering associated with color correction for proper spectral energy distribution to match film sensitivity. The range of materials to accomplish these effects is broad. It includes gelatines, acetates and polyester sheet materials in a veritable rainbow of theatrical colors.

The basic material, and the longest established, is gelatine. This is the most widely known of the color media, and has its roots in the theater. It is still readily available; it is inexpensive and offers the widest selection of colors (over 70). Gelatine is the least durable of the color media, and presents certain problems if it must be used for any length of time in front of hot lights.

The next most durable, and somewhat more expensive, material is the acetate sheet. This is probably the most widely used color medium in use today. It is applied in theater, television and film work. The color range offered is not quite so broad as it is in the gelatines—only 50 to 60 colors—but the material is more durable when exposed to heat and is mechanically strong.

The most durable, heat-stable and expensive of the color media are the polyester based materials. The color range is approximately the same as it is for the acetates. This material will tolerate relatively high levels of light intensity and heat for long periods with good stability of most colors.

All of the above materials represent relatively established capabilities and the choice of type (gelatine, acetate or polyester) must be made on the basis of various tradeoffs such as cost, durability and the degree of heat resistance necessary. Other factors may also be operative in a given situation.

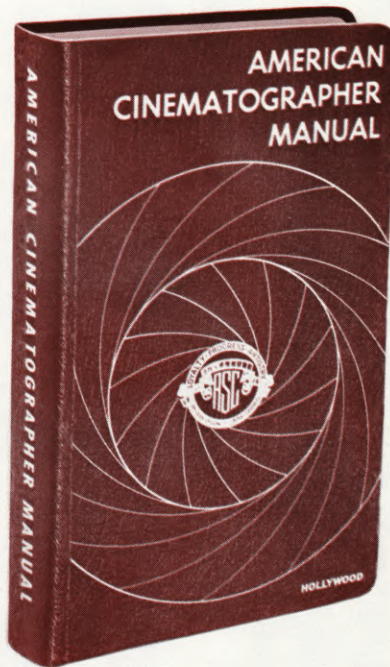
COLOR CORRECTION FILTERS—CARBON ARC LIGHTS

The use of color filters to improve the color of the light from carbon arcs is a long-established practice. The various carbons used require that corrections be made in order to modify the spectral energy distribution of the arc to better match either "daylight" (i.e. white flame carbons + Y1 filter for daylight), or the incandescent lighting with which the arc may be used. In different situa-

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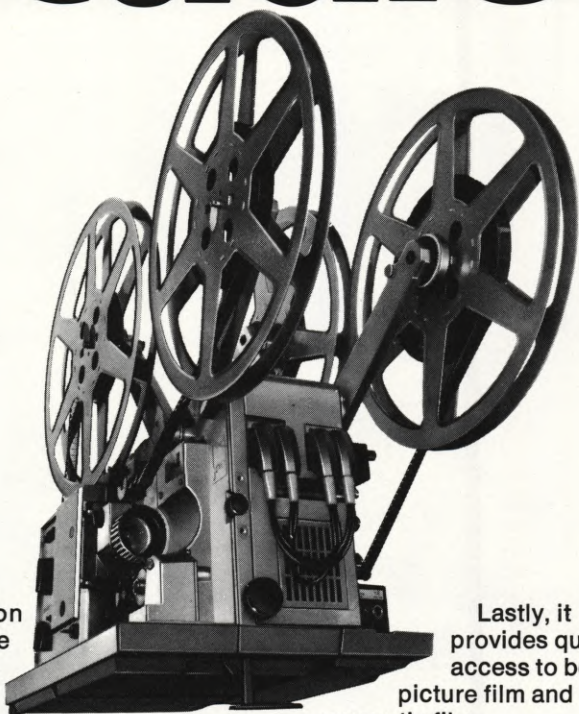
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tions, including various times of the day, it may be desirable to "warm" the light from the arc in order to provide a more pleasing match to the other sources being used. Some of this is done on the basis of the experience of the cameraman, and is not solely concerned with precise color balancing.

The original material for accomplishing these corrections was gelatine. For many years, it was available only in 20" x 24" sheets and it was necessary that the sheets be cut and taped to make up the 30" diameter required for the "Brute" arc color frame. All the limitations of gelatine were experienced, including particularly the fact that it does not stand up well to the heat. Further, it tends to become brittle and is mechanically fragile.

At present, acetate filters are available in several different width rolls, ranging from 30" to 48" wide, for application to the Brutes. There are also filter materials in the traditional colors available in the form of a polyester sheet supplied 30" wide. The relative properties of these two materials are as described in the section on theatrical color media. It is necessary that the same study of tradeoffs be done, and the most cost-effective of the materials be chosen for the particular situation. Some of the criteria might be the length of time that the arcs will be used (day, week or months?), the cutting losses in preparing the filters to fit in the color frames, or the amount of handling expected.

There are no standard designations for the basic arc filters, but the best known are the Y-1, YF-101 and the MT-2. There are several others which are primarily variations in density, but the above are the basic types. Some of the manufacturers have chosen not to use the exact designations shown above. Functionally, the Y-1 (approximately a 10% light loss) is used with white-flame carbons to match "daylight". The YF-101 is used with yellow-flame carbons to provide the correct color balance for 3200° Kelvin negative film (light loss 15%). The MT-2 (light loss 35%) is used with a Y-1, where white flame carbons are being used, in order to provide light which is of the correct color balance for 3200° Kelvin negative color film (combination light loss 40%).

COLOR CORRECTION FILTERS— 3200° KELVIN TO DAYLIGHT (DAYLIGHT CONVERSION)

These are the only types of color correcting filters usually applied to incandescent sources. The purpose is usually booster light, which must be a reasonable approximation of "day-



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light". The advent in recent years of the small, very efficient "quartz" fixtures, together with the availability of the dichroic type of conversion filter, combined with the need for compactness on location, brought an increase in the use of incandescent light for daylight fill applications. The dichroic was the first significant improvement offered in reducing the light loss of the older blue glass absorption type filters which transmitted only about 35% of the light (i.e. Macbeth "Whiterlite"). The dichroics transmit about 50%, which is a significant improvement to those forced to work on location. This was particularly so prior to the appearance of Eastman 5254 color negative. The dichroic filters, after overcoming the early problems of instability, non-uniformity and coating breakdowns, have become a relatively stable, reliable product—albeit somewhat expensive.

The use of the glass absorption types is still practiced, but is somewhat limited by their lower transmission. They do have a lower first cost, and they do not change with time and continued exposure to heating and, for these reasons, should continue to occupy a place in the spectrum of correction filters.

Conversion filter materials are also available in the form of acetate, and the new polyester-based materials. Some of these materials have sufficient durability to withstand the effects of the multiple PAR-lamp arrays mentioned earlier. This has permitted the use of the 3200° Kelvin bulbs, with their longer life and lower first cost, instead of the dichroic-coated lamp types. By using the color-correcting acetate or polyester, there is no need to change lamps when going from a "daylight" to a 3200° Kelvin situation. The most important point is that the concern for the possible breakdown of the dichroic coating is eliminated. The choice of materials should be made on the basis of the cost-effectiveness in the particular situation being considered.

Although they are treated separately later on, a brief mention must be made here of the appearance of a range of "booster" colors on a range of base materials. These are available in "½-booster" (Kelvin temperature increase of approximately 300-400°) and "booster" (Kelvin temperature increase of approximately 800°). These increases are based on the use of a 3200° Kelvin light source.

The boosters allow the cinematographer the latitude of varying the degree of "daylight" conversion desired, or to more nearly match the early-morning or late-afternoon daylight with filtered incandescent light. These have also been

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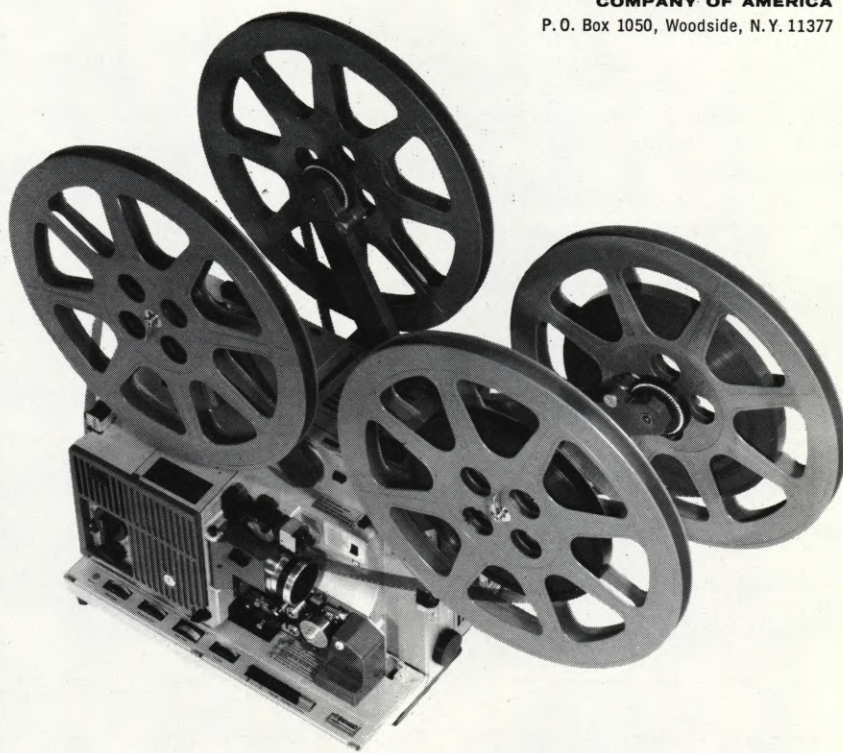
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used to allow compensation for the gradually failing dichroic coatings on certain bulbs. This approach has permitted the use of these bulbs for time periods approximating their rated lives. Another related product (treated in detail later) is the combined diffusion-and-correction or booster colors.

COLOR CORRECTION FILTERS— DAYLIGHT TO 3200° KELVIN

The need to be able to modify the spectral-energy balance of the light from natural sources such as the sun and sky, has existed for as long as there has been color photography on location. The trend in recent years toward more and more location production has intensified this requirement. In order to properly render the colors in a scene, it is necessary that all the objects being filmed be illuminated with light of the same approximate color temperature.

The cinematographer has two options. First, he can use "daylight" balanced fill lights with the naturally occurring daylight. Any necessary conversion is then done with a filter at the camera lens. The second option is of interest in this section. It is often taken to permit the convenience of incandescent lighting at its maximum efficiency (unfiltered) for the interior lighting. This requires that the equivalent of an 85 filter correction be applied to the incoming daylight. For many years this was done with either 20" x 24" sheets of gelatine laboriously cut and taped to the windows, or a little later with acetate in 42" rolls which usually required framing in order to be handled.

The incident natural light is typically from 2 to 20 times as intense as the typical levels of set lighting. Because of this, neutral density must be used in conjunction with the 85 type filter in order to reduce the level of the filtered daylight. This combination permits the cinematographer to accomplish his desired lighting effect without being dominated by the level of the filtered daylight.

Recently, the materials to accomplish this job have proliferated so that a choice of types is available. The acetate materials are now available in rolls 48" wide by 50 feet long in 85 as well as a variety of neutral density values. These materials are clear, and when properly mounted sharp focus can be held through them.

The lowest-cost material in this family of filters is the vinyl films which self-adhere to windows. These are available in 85, and 1, 2, and 3-stop neutral density. In addition, three combination colors are available (85N3, 85N6 and 85N9). The use of these combination

materials is rapidly increasing due to the fact noted above, that neutral density is nearly always needed in these situations. The material is available in rolls up to 54" wide.

Application of the vinyl films is accomplished by washing the windows and leaving them wet. The vinyl film is then applied and smoothed down with a window-washer's squeegee. The vinyl film is easily trimmed to precise size with a razor blade after being placed against the glass. The film adheres tenaciously, and will stay up for weeks if necessary. It is easily removed by simply picking up a corner and peeling it off the glass. This material, as supplied in the large rolls, is not optically clear and should not be used where it is necessary that sharp focus be carried through the windows coated with it. Small sheets of polished vinyl are available, as ND only, which are clearer than the roll materials.

Coming increasingly into use are clear, rigid acrylic panels of 85 and neutral density for window correction filters. These rigid panels are preferred in situations where the company is moving rapidly. The panels can be virtually leaned against the windows in many situations, and their rigidity becomes an enormous asset in handling. They can obviously be taken down and stored quickly as well. The most recent additions to this product series, are 85 combined with two different values of neutral density. This class of material is optically clear and permits the carrying of sharp focus through the windows.

COMBINATION MATERIALS

It has been found for a variety of reasons, that it may be desirable to combine the effects of a color filter and a diffusion, or a color filter with a reflector. Also, in the course of the development work on some of the new materials, it was observed that many of the materials which had been in use for a long time actually changed the color temperature of the light as well as diffusing it. The shift was usually small, and usually downward (toward the warm side).

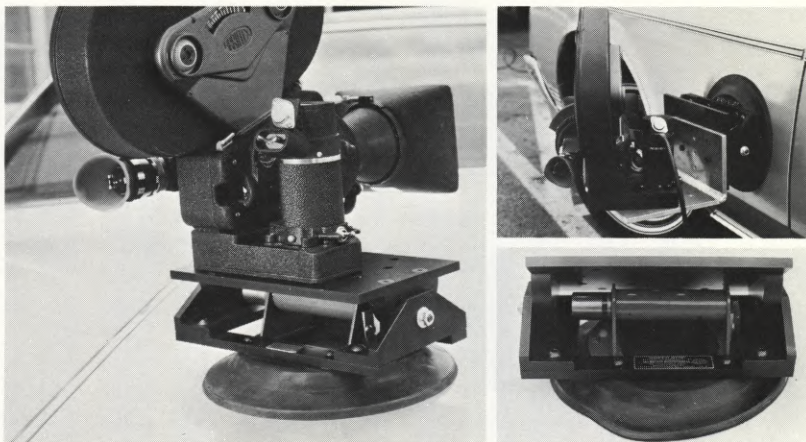
As a result of these observations, some materials were produced which had light-correction filters built in to assure that the diffused light coming out of the "light modifier" was of the same effective color temperature as the source. A tinted version of the vellum-like material mentioned in the diffusion section accomplishes this function.

The increasing use of the multiple-PAR lamp fixtures, as noted earlier, has brought about a group of combination materials to meet the simultaneous requirements of conversion to "daylight"

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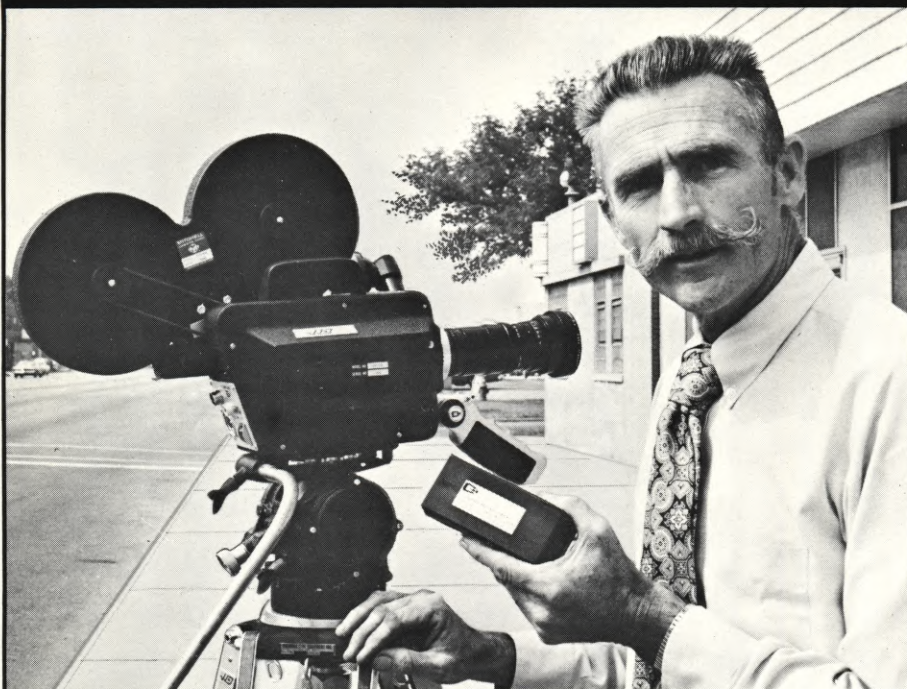
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and diffusion. Some cameramen use these with dichroic-coated lamps, starting out with new lamps and the ½-booster. As the coatings change (tending to raise the Kelvin temperature), the change is made to the booster color, and the job may finish with the full-conversion blue, in order to permit the use of the bulbs to full-rated life.

The problems associated with dichroic coated lamps for daylight fill (high first cost, and the tendency to change with life . . . toward the warm side), has placed increasing importance on the combination of diffusion and conversion color. This material permits the use of these fixtures with the lower-cost, longer-life 3200° Kelvin lamp types. The need to change bulbs is also eliminated for the situation where the fixture is used in 3200° Kelvin shooting situations. The combination materials make the lighting quality of these fixtures suitable for the highest-quality photography.

Another combination material has resulted from an understanding of a problem long observed with the use of reflector boards. Those familiar with the use of the boards have been aware that the daylight reflected from the board is warmer than directly incident daylight. This is explained by the fact that the daylight is made up of light from the very blue, diffuse and relatively low-brightness sky, plus the sun. The light reflected from the board is predominantly the parallel rays of the sun, with very little of the sky (due to its non-directional character). Where it is desired to have the reflected light more nearly match the directly incident daylight, a blue-tinted (soft side) reflector board covering is now available. In addition, where an even warmer effect is desired from the reflected light, a gold-tinted (soft side) covering is also available.

CONCLUSION

The recent period has witnessed a proliferation in the types of new materials being made available for use as diffusion, color correction, reflection and other light-modifying functions. Many of these have arisen to meet the needs of the cinematographer in utilizing some of the new lighting fixtures, and the special demands of location cinematography. It is to be hoped that the suppliers of these materials will continue to be as responsive to the needs of the industry as they have been in recent times.

The accompanying chart attempts to provide an easy reference relative to the source for the various types of materials described in the text of the article.

Every effort has been made to make this presentation complete, and apologies are offered in advance to any who may have been omitted.

Key to available sizes of sheets and rolls of the materials described in the accompanying chart:

Designation	Sheet or Roll Size
SS-1	20" x 24" Sheet
SS-2	24" x 24" Sheet
SS-3	21" x 48" Sheet
SS-4	36" x 60" Sheet
RS-1	24" x 50-foot Roll
RS-2	30" x 26-foot Roll
RS-3	30" x 50-foot Roll
RS-4	41" or 42" x 50-foot Roll*
RS-5	48" x 25-foot Roll
RS-6	48" x 50-foot Roll
RS-7	52" x 50-foot Roll
RS-8	54" x 50-foot Roll

*These are actually the same practical width in acetate. The manufacturers of the extruded material call the sheet 41", but it actually comes out close to 42". Some suppliers refer to it as 41" and some as 42". It is really the same in acetate. ■

FILM LECTURE AND SCREENING SERIES AT BUFFALO

A wide-ranging series of fourteen lectures by film scholars and filmmakers on various aspects of film will be held at the State University of New York at Buffalo from June 22 through August 21 as part of the Summer Institute on the History, Interpretation and Teaching of Film.

Support for the Institute, which includes eight graduate seminars as well as the screening of over two hundred films, comes from a grant made by the National Endowment of the Arts and the Office of Summer Sessions.

The documentary film will be explored in a panel discussion on "The Aesthetic Dimension of the Documentary Film" with guest filmmakers Willard Van Dyke, director of the Museum of Modern Art's Film Department, and Frederick Wiseman. The documentary theme will be discussed further in a group of lectures given by U/B professors.

Film and politics will be discussed by several lecturers, as will the problems of teaching film and film's relation to other arts.

Documentary filmmaker Ralph Arlyck and experimentalist Tom Dewitt will screen and discuss their films.

The lecture series has been organized by Gerald O'Grady, assistant professor in the Department of English. The lectures are free and open to the public.

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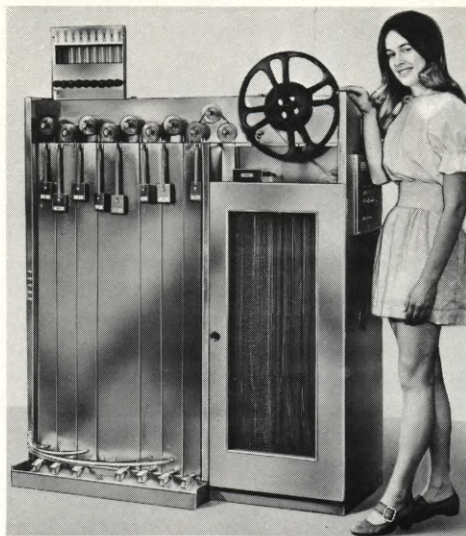
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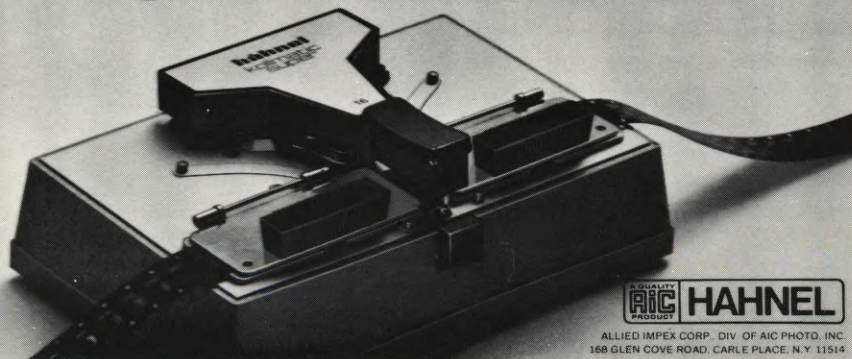


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MITCHELL MARK III

Continued from Page 873

When the camera is used on a fluid-head or a gear-head, a quick-release dovetail plate has been designed to allow quick removal or installation of the camera onto the desired pan head. The base-plate also contains support rods for use with the larger zoom lenses. The complete camera and zoom lens assembly can be removed as a unit from the pan head by actuating the quick-release mount.

A unique, lightweight, vacuum-formed plastic sunshade and matte box containing two filter stages and a rotating polarizing filter holder have been provided. The filter stages accept 4½-inch-diameter filters as used with the 10 X 25mm zoom lens. The sunshade will handle wide-angle lenses to 15mm focal length. Quick-release locks allow instant removal of the matte box from the camera.

Every effort has been made to make the MK III camera easy to use; flexibility and mobility have been the design goals. The manufacturer feels that the MK III is another history-making camera that will have wide acceptance in this new era of film-making. ■

TECHNICAL CHARACTERISTICS OF THE MITCHELL MARK III 35mm PORTABLE CAMERA

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"T"-shaped mechanism plate carries film transport, mirror/shutter systems and drive train.

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in viewing system.

Automatic slate system fogs film in gate and sends signal to tape recorder.

SHUTTER

Adjustable 20° to 170° Rotary focal-plane-type shutter with external adjustment.

FOOTAGE COUNTER

Gear-driven footage and frame-counter in camera body has internal lighting for easy reading.

External reset knob.

MAGAZINE

Co-axial, 400-foot capacity.

Dual metering sprocket provides transfer loop control.

Preset loop, when magazine is loaded, simplifies loading film in gate.

Quick-release bayonet lock secures magazine to the camera.

Helical gears and precision clutch assure uniform tension for film take-up.

Lightweight magnesium casting and unique design provide necessary counter-balance to camera for easy handling.

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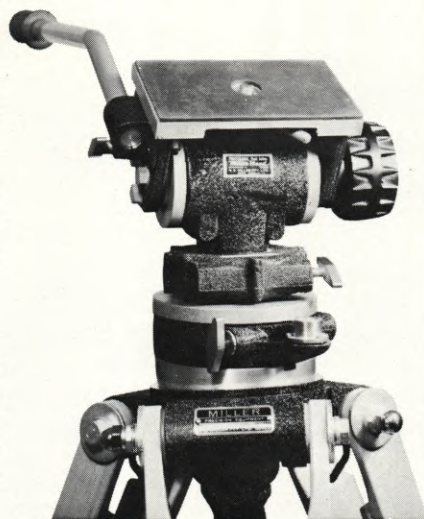
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PROMINENT DANISH FILM-MAKER NAMED VISITING PROFESSOR

Bent Christensen, dean of the Danish Film School and one of Europe's leading filmmakers, has been named visiting professor of communications at the Temple University School of Communications and Theater, Dr. Kenneth Harwood, dean of the School, has announced.

Dr. Harwood said Christensen will teach advanced film production courses and possibly a special course for advanced graduate students on current trends and history of the Scandinavian film during the 1972-73 school year starting in September.

Christensen replaces Ernest Rose, who was recently awarded a one-year Fulbright Hays lectureship to the Akademie fur Musik und Darstellende Kunst in Vienna, Austria.

Christensen was producer and director of some 17 feature films and six stage plays and has received nominations for an Oscar by the Academy of Motion Picture Arts and Sciences and the Golden Globe Awards of the Hollywood Foreign Press Association. His films have received numerous Bodil Awards (Oscars of the Danish film industry) and have represented the country at all of the major American and European film festivals.

He studied drama at the Copenhagen Academy of Theater Arts and is a 1953 graduate of the Danish State Television Producer School. He was with Danish State Television from 1953 to 1959 as a writer, director and producer of serial, dramatic and variety programs. He served as production manager at the Palladium Film Studio in Copenhagen, associate producer to Preben Philipsen at Rialto Films in Hamburg, Germany, and for three years owned his own film production and distribution firm. He was managing director of the Cinerama theater in Copenhagen before being named dean of the Danish Film School in 1969.

CINEMA WORKSHOP

Continued from Page 848

of the many factors that contribute to the overall contrast of the resulting image. Higher values of gamma will produce greater changes in density over a given latitude, and will thus provide greater contrast in most cases. Every manufacturer usually recommends a specific gamma that will give best overall results (fine grain, best resolution, etc.). This is particularly true of reversal stock. The film data sheets for reversal stocks will usually display only one sensitometric curve rather than a family of curves for different gammas. This one curve represents the specific gamma that the manufacturer recommends, and one can be certain that almost all film labs will follow this recommendation strictly.

FIGURES 2 and 3 are, respectively, actual curves for TRI-X and 4-X black and white reversal film. Note first that these curves slope in the opposite direction from that in FIGURE 1. These films are reversal stocks and, therefore, density decreases as exposure increases. The sensitometric curve also indicates film "speed". This can be clearly demonstrated by comparing FIGURES 2 and 3. The linear region for Tri-X (FIGURE 2) corresponds to an exposure from 1.40 to 2.5. The linear portion of the 4-X curve corresponds to an exposure from 2.85 to 3.75. Thus, 4-X can record images with a lower exposure and is, therefore, a faster film. ■

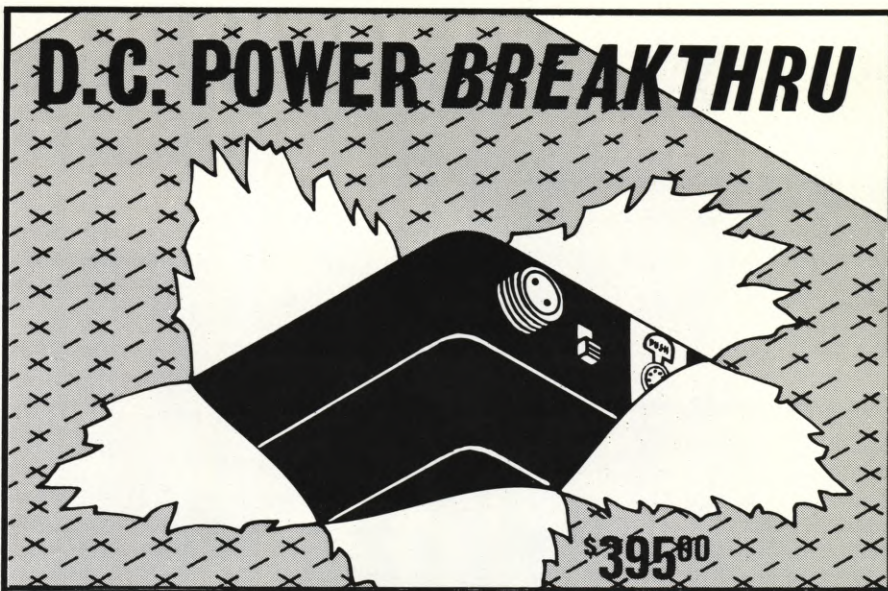
UNIV. OF SOUTH FLORIDA FILM FESTIVAL

The WUSF-TV FILM FESTIVAL 1972 will award \$1800 in prize money in the third annual competition sponsored by GTE Information Systems. Entries will be accepted through September 1, 1972. Winners will be notified on October 2, 1972. Judging this year's competition is TV Guide critic Cleveland Amory, who will pick three place winners in two categories, Documentary and All Films.

The competition is limited to 16mm films... no video tapes... and sound films must be single-system. Commercial film houses may not submit entries, but professionals may enter as individuals.

The winning films will be broadcast on WUSF-TV's Film Festival programming, so all films submitted must meet broadcast standards as outlined by the FCC.

Brochures containing Festival rules and an entry form are available from WUSF-TV, University of South Florida, Tampa 33620.



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"STREET SCENE"

Continued from Page 911

trast ratios. Our principal lights were 1000-watt quartz lamps. Generally we only had four, with an occasional 650 for a kicker. Because a lot of the action took place around the girl's car we had to avoid sharp glare spots that would ruin its authenticity. For the most part that problem was solved by double folding fibreglass and clipping it onto the barndoors with wooden clothespins. However, my choice of a white-colored car, usually against a dark background, didn't help our lighting problems any. But the dramatic effect was worth it.

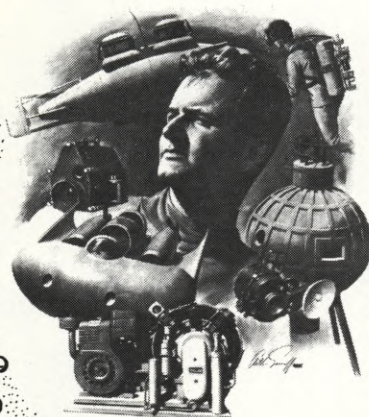
On very rare occasions, we rented additional lights to supplement our own. Again we used quartz lights, for both their ease and versatility. Besides the time it takes to set lights there is another problem we always had to face. Power. There was simply no money available for generator rentals. Besides which, they are noisy and cumbersome. That was one of my considerations in selecting locations. Was there a terminal box that we could tie into? And if there was, could it supply the required amperage? Unfortunately, in many situations, there just wasn't enough electricity available.

One site we had selected in San Pedro was due to be torn down as part of a redevelopment project. The only power for a two-square-block area was an old hotel. After telling the owner of our situation and what we were doing, she said no. But we tied-in anyway, and to this day I'm sure she doesn't know. I don't recommend larceny as a production technique, but when you don't have the financial resources of a commercial company, then anything goes. But in most situations people would extend us the favor and permit my cameraman to pull power from their breaker boxes. Incidentally, the tie-in cables we used contained their own fuses to minimize the chance of blowing out somebody's circuit. As I mentioned earlier, we had to motivate the lighting consistently. The lightweight quartz units permitted us to strap lights onto telephone and electrical poles and thus create realistic lighting that worked well for both long shots and closeup work.

Milt Hubatka, the production manager, was frequently responsible for finding sources of electricity before getting a permit for the location. We carried with us a set of screw-in AC adapters to pull power from conventional light sockets. In one situation we even climbed atop a building to get to the light sockets for a billboard display. I'm sure we must have presented quite a

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sight to the inhabitants of this area in Venice—five grown men scampering over rooftops in the middle of the night.

Another cliché I wanted to avoid was wetting down the streets to increase the reflectance. It would have made the task easier, but again it would have been wrong for this movie. I was not hiding the fact that it was Los Angeles, and anyone who lives there knows how infrequently it rains. I didn't think it necessary to resort to such well-worn techniques to tell the story.

Though most of the film was exterior we did have some interior shooting. Again we had to light. The interiors were all supposed to be at night. So we covered up the windows and shot. For the interiors we selected Plus-X Reversal. Its contrast and grain would match well with the 4X, and still give the mid-tone scale we desired. Aside from the claustrophobia common to shooting practical interiors, we had to contend with some rather noisy Eclair NPRs. Equipment in film schools tends to take a rather severe beating, and some cameras don't hold up as well as others under those conditions. Whenever possible, I would choose the Arriflex BL. I have found that for tripod shooting indoors it's much quieter. The problem with the particular BL we had was that we had to use the zoom lens affixed to the camera. Some of the shots called for a wide-angle that the 12-120 couldn't handle. It was my understanding that the "C" mount on the NPR wouldn't work with the Switar "C" mount supplied on Bolexes. Again, our budget was so tight that we could not afford to rent a wide-angle lens. But the Switar 10mm lens we used presented no problems when mounted on the Eclair. As a matter of fact, we used it rather extensively for some hand-held driving shots inside a car.

One of the luxuries that we had to forego was the opportunity to replace any equipment that failed while on production. For example, one night after getting only about five set-ups shot, our NPR went out on us. That meant a scrub. That also meant we had to reschedule the entire sequence—actors, props, cars, crew—all had to be reshuffled and squeezed into an already impossible schedule. I sometimes wonder how we ever did manage to complete the shooting. The crew worked from sunset to sunrise. Because we had only five men, and an occasional sixth, the cameraman had to do his own gaffing. This meant a loss of time that would drag out the shooting to the point where everyone's nerves were worn thin. To make matters worse, some crew members had 8 A.M. classes

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the next morning. It was necessary to schedule our shooting around classes, exams, term-papers—a concern not usually faced by professionals. But we managed consistently to average three full nights of shooting a week. That, in itself, was an encouragement to keep going.

Some set-backs can be anticipated; others, though, are too absurd to even consider. Like getting busted by the LAPD. We had unknowingly been sold some out-of-date stock by a camera shop in Hollywood that should have known better. Anyway, we turned the footage into CFI and waited to pick up our rushes only to find that 400 feet was totally unusable. It looked like an old kinescope broadcast in a snow storm. The contrast was shot, the grain danced across the screen. With CFI's assistance we were able to determine the cause of the NG footage. Though the store was willing to reimburse us for the cost of stock and processing, we had to bear the rest of the problem.

It was difficult enough trying to stay on schedule without having to reshoot a scene with some fairly heavy production value. After some pretty intricate juggling we managed to schedule a reshoot on a day's notice. All our talent would be available, and Universal Studios said we could use the same van and police car mock-up that they had permitted us to use earlier. Dan O'Bannon, the editor and art director, made up a new set of decals for the police car and we were ready to reshoot. Unfortunately, in all the last minute furor, we had overlooked securing a shooting permit. Permits can be obtained from the police for free if you're doing a student production. Having never encountered any previous problems with the police, we set about lighting and restaging the sequence. This particular evening, though, the police had nothing better to do than check to see if we had a permit. When they found that we did not have a permit for that date they ordered us to break set and leave. Even though we explained our predicament and established that we were, in fact, a student production they still demanded that we leave. Surrounded by police, including one who took photographs to be used as evidence against us, we packed up reluctantly and left. We did eventually finish the sequence, but it almost doomed the production.

STREET SCENE would not have been finished if it weren't for the help we received from members of the general community and from the industry itself. For one principal interior location we needed a restaurant kitchen. The script established that Ron Recassner,

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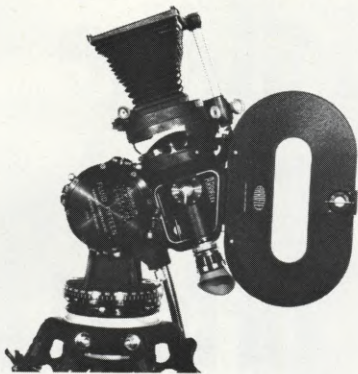
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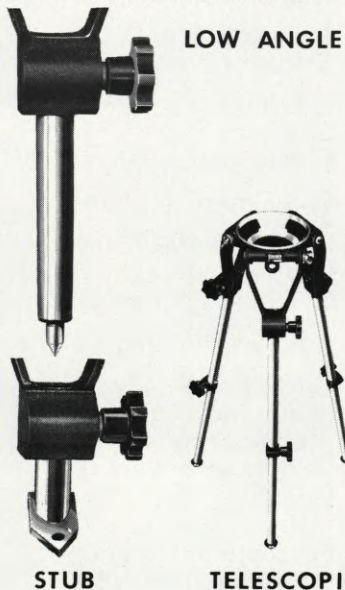
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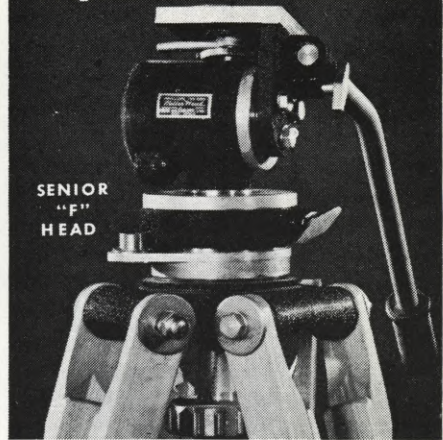
the black male lead, worked for a chicken delivery company. Bill King, the owner of a Kentucky Fried Chicken franchise, offered us his entire establishment. We told him that it would be necessary for us to spend an entire night in his restaurant and that we had no money to reimburse him for his troubles. He told us that he would be glad to help. He even went so far as to prepare a batch of fresh chicken at 2:30 in the morning. It sure beat coffee and stale donuts.

From the beginning of the production I was worried about securing our final exterior location. The script dictated that we be able to control an entire city block, since we would be using firearms. The only logical choice was to use a studio backlot. We had to find one that looked right and that we could use. Most studios we contacted were helpful but for one reason or the other their facilities were unavailable. However, Bob Hagel, then facilities manager for Columbia studios, appreciated our endeavor and said he would help. He secured a waiver from the unions and cleared the red tape involved and gave us the Columbia Ranch for two nights. Not only the ranch, but a police car mock-up and a dolly and track. He even had the studio electricians rig electrical lines so that all we had to do was plug in our lights and shoot. Unfortunately, we were using 220 twist lock and the electricians had laid 110 cable. Luckily, Columbia was doing a lot of construction and so there were 220 to 110 adapters about. We only had to find them.

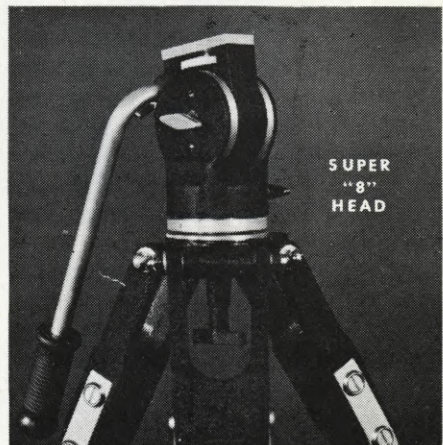
At 1 A.M. we were ready to shoot. The final sequence involved lighting the entire block, no small job. Again we were using quartz lights. This time we had a couple of 2Ks and our standard battery of four 1Ks. There was a standing street lamp on the set which we used, but it served primarily as a way to motivate our other lights. I was amazed at how much light we could get from so few units.

After we shot our masters, we did some minor relighting for inserts and dialogue scenes. The problem was that we had to strike at dawn and then relight identically the following evening. But since we had to rely upon the equipment available through the school, there was no guarantee that we would have the same number of lights. And we didn't. It was impossible for us to match the previous night's lighting set-up. After consulting with Nathan, I changed the coverage we had planned previously. Incidentally, both the cameraman and the editor were involved in decisions regarding the specific angles we used throughout the movie. Even with less

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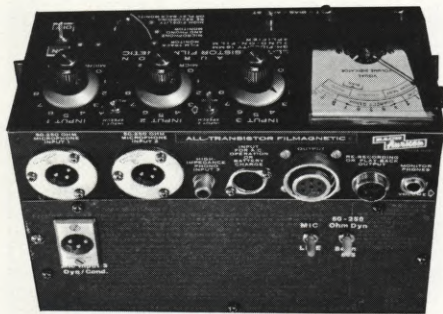
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lights we did it. When the sequence was cut together nobody could tell the difference. It seems that what we lacked in individual knowledge we made up for collectively. Perhaps it is this collective effort that was responsible for the quality of the finished film.

Practically every dime I had went into the making of STREET SCENE. I believe this to be the rule rather than the exception among student film makers. It seems that the less money available, the more resourceful students have to be. And if it's your own money then it becomes even more important how it is spent. Most of our production money went into stock and processing. Some money was spent on costumes, but we generally made our own whenever possible. For the most part, the actors and actresses supplied their own wardrobe.

When the semester screening rolled around, we had a rough cut to show. In spite of the problems, our lack of money, and the trepidation of some faculty members, we had, in fact, completed it on time. Of course, Dan O'Bannon, the editor, and I still had lots more to do before STREET SCENE would be finished, but the shooting was over. What had been a gamble, based on my belief that a student crew could, in fact, shoot a successful dramatic film of some length, paid off. We did it. ■

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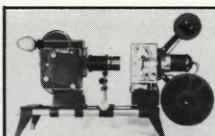
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Continued from Page 884

cals meant that a dupe had to be made and inserted into the A and B rolls for printing. While you can print EF one generation down and it is acceptable, two generations away it is not; it blocks up, becomes grainy, harsh, and contrasty, and creates incorrect color balance.

By the process of elimination, this, of course, leaves only ECO 7252. Its advantages are that it is intended as an original/print film, has the finest grain, and can be duped successfully for the necessary opticals. Its primary disadvantage is its slow speed (ASA 16 with an 85 filter and 25 tungsten). It can be pushed a stop in an emergency, but I didn't want to do this because of the increase in grain and contrast. For the Lake Havasu sections of the show, 7252 was fine, and the slow speed an advantage in the bright sunlight of the desert. I don't like putting ND filters on the lens to bring the film into exposable range. The less in front or behind the lens the better I like it. In 16mm for TV, you are fighting for as much resolution as you can get and, since most of the commercials contained within the show were in 35mm, we had to be very careful to make the 16mm show look good and sharp.

EXPOSURE

To get a properly exposed piece of film is not simply a case of reading your meter and transferring that reading to your lens. You always have to temper your raw readings with judgment and experience. If it is possible, I always shoot a test and send it to the lab which will be handling all the processing and printing. While every lab will tell you it is processing at Kodak standards, this statement should always be taken with a grain of salt. What the labs should say is that their processing is an "interpretation" of Kodak standards. I have found this so-called standard to vary up as much as a stop and a third. This is what labs will tell you is within "acceptable tolerances". If you don't know what their acceptable tolerances are, you can be in deep trouble. For the quality to be as good as the film can reproduce, make a test and find out where the lab is processing. You can then adjust your exposures to get the optimum out of the film processed by the lab you choose. It is impossible to try to change a lab's procedure. You must go along with them. They are now locked into an automated and mechanized system that cannot be changed without great expense.

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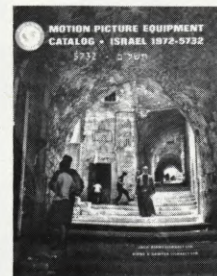
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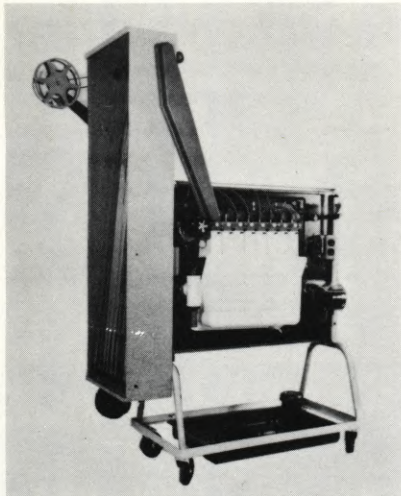
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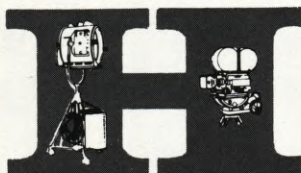
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tion, lights are a must. I use them for any and all of the following reasons: 1) modeling of actors, 2) color quality control, 3) contrast control, 4) extending the shooting day, and 5) matching the days.

When you are dealing with stars who already have an established public image, it is doubly important that they are lit properly. If this is not done and the audience is not pleased by what they see, the producer has every reason to complain.

When working outdoors and in natural locations, this job is a difficult one. Most real streets are not built with optimum lighting in mind. You can always move your performers to get the best light on them, but much of the time this means you are shooting away from the backgrounds you travelled thousands of miles to get. So you either have to wait for the "right time of day", which may or may not come, or make it look as good as possible under the circumstances. I prefer the "right time of day" method myself.

Many times in real cities, as on this project, getting permission to shoot anytime is almost impossible. The *right* time was always in the middle of rush hour, or we were told, "No one can shoot here". It was only by the persistent efforts of our associate producer, Jean Gardener, and production manager Drummond Challis that we got the permission but there would be provisos like: "Only between 1 and 2 on Thursday the 7th". That was it... *shoot* it, rain, shine, or snow. On the tight schedules we all have to work under these days, you learn to do the best you can under the circumstances. The lighting units you carry often give you the extra boosts which make the difference between being able to get the shot or not.

When shooting in color, your actors' faces are subject to much stray reflected light, giving them a color cast. On a bright spring day under a mass of green leaves you get a green cast. This can be corrected in the lab, but then you lose the color impact of the green around them. The best way I've found is to put in some light of the proper color temperature to erase the green cast. In this manner, you keep the surrounding green tone true and full, but the faces retain a pleasant flesh tone and don't look sickly and dead. This principle is also very important on overcast days, as we had in London, where the color temperature from the sky was very high and the faces tended to have a blue cast to them. The lights cleaned up the flesh tones so everyone looked normal. The trick here is to provide enough light for

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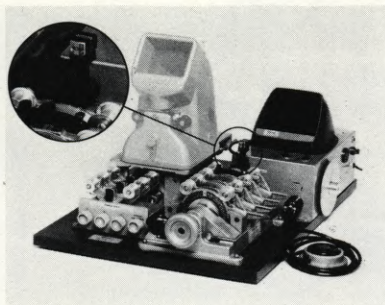
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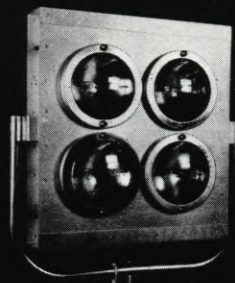
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exposure without interfering with the overcast quality. In using booster lights you can't put in more than two stops of additional light over the base exposure of the scene or it will look artificial. I try to keep it down around one to one-and-one-half stops above. You should try not to cast any hard shadows from the booster lights. This straight-in lighting doesn't flatter men; you need a light that defines their features. Both of these requirements can be taken care of by putting the light high over the lens of the camera. In this way the light is still fairly flat, yet gives highlights to the cheek bones and a shadow under the chin, defining the strong jawline.

In contrast to the heavy flat overcast of England, Lake Havasu presented other problems. The two major ones were matching the skies and controlling the extreme contrast levels. Since film does not correct for contrast as the eye does, on sunny days we must do it artificially. In photographing actors, there are several ways of doing this. We may turn the actor so there is full sun on his face and expose for that, or we may turn the actor into full shadow and expose for that. But, it is usually impossible, in terms of cutting continuity, to reposition him.

Another method of "contrast control" is to subtract light from the bright side through the use of butterflies and scrims. This often necessitates the scrimming over of an entire street or field in the background or it will appear overexposed. With a production such as ours this also is an expensive and almost impossible task. But this highlight softening system is good in small areas where you have no vast backgrounds.

In the end, the best way of making the film see what the eye does is to add light to the shadows and bring them into the contrast range of the film. The cheapest and fastest way is to use silver-covered reflectors that bounce the sun where you want it. This method has several drawbacks: 1) they need sunlight to work, 2) as the color temperature of the sun changes at the end of the day, so does the reflected light, 3) as the sun moves, the angle of the light from the reflectors moves too, so they must constantly be readjusted, 4) slight wind makes them jiggle and a stronger one knocks them over, and 5) actors find them very hard to look into.

Lighting units having a color temperature matching daylight are the best way of supplying light in the shadows. These lighting units fall into a number of groups. One of these is the tungsten or quartz type, using TD 25 blue gel filters, blue Macbeth glass filters, or dichroic filters.

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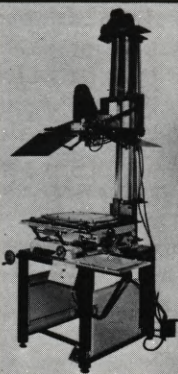
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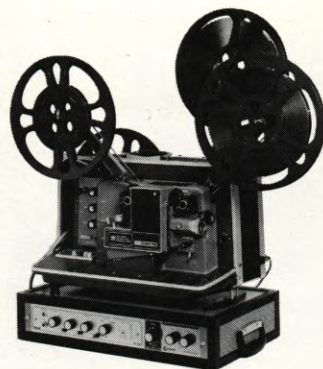
Another group is the FAY-type lights utilizing dichroic-coated bulbs. They are available in either Mini-Brute or Maxi-Brute sizes, but are expensive to rent and maintain. The dichroic coating on the bulbs tends to burn off in a short time and a piece of blue filter must then be introduced to maintain the color balance. You must constantly check the color temperature to make sure they are O.K. This unit in use is the one with nine bulbs... three high and three across. Since there are nine sources, this gives you nine shadows, but this can be smoothed out somewhat by placing spun glass in a frame in front of the unit. This cuts down on the amount of light, which means that on bright days, unless the unit is five to ten feet away, it is doing no good at all. On overcast days they don't have the punch and throw to handle large areas with an even light. If you don't have anything else, they certainly are better than nothing.

A further unit is the xenon "Sun-Brute". It utilizes a xenon bulb burning at the proper color temperature of daylight. It has a powerful one-source light and runs off a 30-volt D.C. battery source. This has the advantage of cutting down the length of your cable run because you don't have to hide your generator around the corner to get rid of the noise. While not having the punch of a Brute arc, it is fairly close. Its two primary drawbacks are the lens system, which needs to be redesigned to permit better control of the light, and the battery power supply, which should be refined to produce a longer running time.

The last unit is the Brute Arc. This unit is still unsurpassed in performance. It costs less to rent than any of the others, the color quality of the light is perfect. You have full control of the light. You can gobo it without fringing shadows, and you can vary the intensity and size of the beam without moving the unit. There are good holders for gels and diffusion and it is not so hot that it burns them up. However, the arcs have their disadvantages too. They are large and heavy, they require a generator, large cable, and a man to operate and watch the unit.

As you can see, each type of unit has its own advantages and disadvantages. In my particular situation in London with no sun—reflectors were, of course, out. The next choice was either FAY lights, xenon SunBrutes, or arcs. I didn't think FAY lights could do the job because of the color-quality problem and the lack of control. They need a generator and cable just like the arcs. In order to cover the areas necessary, I would have needed many more FAY units than xenons

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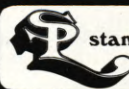
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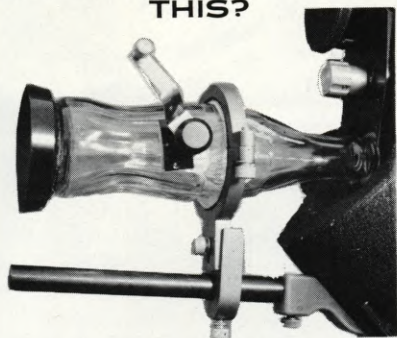


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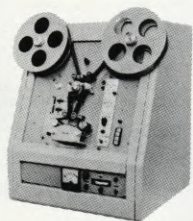
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or arcs. The problem of lacing the lights together to keep the proper balance is difficult and time-consuming. We had to move fast, and with that many FAY units there would have been a jungle of cable taking a good deal of time to wrap.

An arc-type unit was the logical choice. With only two, I could handle the area it would have taken as many as 8 to 10 nine-FAYs to cover. The mass of cable was simplified and the generator remained the same. However, their bulk and cumbersome handling still bothered me. They require a larger truck for transport and in old cities like London, parking and narrow streets would have been a problem.

I felt the xenon SunBrute was the answer to my situation. It has nearly the control and power of the arcs, yet doesn't have their bulk. The cable run is cut way down and a battery unit is substituted for the generator. I had used a Laser Battery Cart and four 4-K xenon SunBrutes on the Paul Newman Special, "ONCE UPON A WHEEL" and they had worked out well. On "London is London", I would need only two of the units for the bulk of the work and on one day I needed four. To the joy of our Production Manager, this was the least expensive way of going. Unfortunately there were only two xenon lights in England. Their battery system, which did not constantly recharge like the Laser system, would only run the lights for an hour, then take 7 to 8 hours to recharge. I asked about shipping to England the set-up I had previously used, but was told it would cost too much. As it turned out, Xenotech had apparently gone out of business with the result that their battery cart and lights were no longer available anyway!

In England, I ended up using two Brutes and four 2-K Mighty Moles with dichroic filters. For the large areas I used the arcs and for the quick close-ups and the interior of a London bus, the Mighty Moles. On one occasion I used the xenon lights on the Thames for a barge shot where I could get no power and needed a long throw. On two other occasions I used six Brutes.

For the Lake Havasu sequences I used two Brutes, six reflectors, two 2-K Mighty Moles and two 1-K Mole Pars. It's always hard to explain to a production company why you need light when the sun is blazing down on the desert, but, in fact, the more sun you have the more booster lights you need to balance it! Fortunately, Winters/Rosen has come to understand this concept. One of the most important things they've learned is that lights are insurance. They can extend the shooting day by helping

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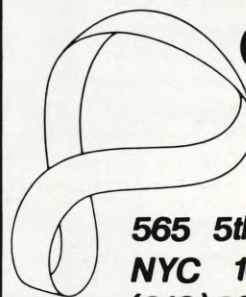
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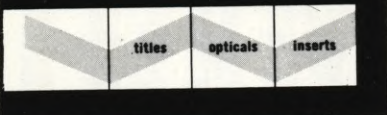
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you get those last shots to finish the sequence after the sun has gone down, provided that you can limit your shooting area. Lights can also help match shots taken on a sunny day with those taken on overcast days.

The lights paid for themselves many times over in days and location costs saved. The less time you have to shoot and the less money you have, the more you need the extra edge lights give you.

APPLICATIONS

Toward the end of the "London is London" sequence we come out of a freeze frame as Tom Jones is opening a large iron gate. He is singing as he walks across the street, the camera dollying with him. A double-decker bus pulls up, and he gets on. This shot was done on a street surrounded by dark high buildings. And, of course, it was an overcast day! I lit this sequence as diagrammed in Figure 1. Brutes 1, 2, 3, were Jones' key lights. #1 was goboed off the background wall and the middle part of the shot. Brute #2 picked him up in the middle position. #2 was goboed off the wall and carefully laced with #1 to keep a constant light level. #3 was a continuation of #2. Brutes #4, 5, and 6 gave relief from the dark buildings so Tom's hair didn't mesh into the background. #4 was on a low stand, hidden behind a Taxi parked at the curb. We were careful to make sure the extras did not walk in front of the lamp. #5 and 6 were masked behind a building and were hitting the bus and the building across the street. They also added a shine to the wet pavement, giving extra definition to the scene.

Figure #2 illustrates the basic set-up for the "Style" number in which Kirk Douglas taught Tom Jones how to be a gunfighter. While this was supposed to be set in Arizona, availabilities of the stars forced us to shoot at Pinewood Studios where we re-dressed a leftover set from "FIDDLER ON THE ROOF". We tarped over the set because of bad weather... it rained throughout most of the shooting. I used six Brutes and four single FAYs. Arcs 1, 2, and 3 were the keys, simulating the sun coming from one direction. They were carefully laced together to avoid the double-shadow problem. Number 4, the fill, had spun glass on it to soften the pattern of the lamp. Number 5 was a "set" light to pick out the top part of the set over the small roof. Number 6 was a soft backlight to add sparkle to the scene. Single FAYs 7, 8, 9, and 10 filled the dark shadow cast by the sun (arcs 1, 2, and 3), but they were not so strong that they washed it out.

Figure #3 is a plan for the "Romeo

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and *Juliet Ballet* sequence in which we presented an abstract interpretation of our boy and girl falling in love. We were fortunate enough to have the services of Rudolf Nureyev and Merle Parke. We had only one day in which to film the entire 5½-minute sequence! This limitation allowed us no time to re-block the dance for cameras, so we had to shoot it as if it were a stage performance.

Our director, David Winters, wanted a soft, romantic-limbo look to the scene—yet the dancers could not look like cardboard cut-outs. They had to have a feeling of roundness. In addition, we had to shoot with five cameras at once, one of which was to roll at 128fps. In order to shoot 7252 at 128fps, the minimum light level for F/2.8 would have had to have been 2400 footcandles . . . a total impossibility. If pushed one stop it would still have required 1200 footcandles and that, too, was out of the question, not only because of the heat, but the immensity of the lighting job. The cyc was 215 feet around and 25 feet high. There was no way I could talk anyone into shooting in 35mm, even though we were going to have massive opticals and the lighting requirements were so complex. I finally solved some of my problems by shooting 7242 in the high speed camera and the 7252 in the other cameras. While I don't like to mix stocks, economics once more pushed out artistic considerations. I ended up working with a minimum light level of 580 footcandles, giving me a stop of F/2.8 for the high speed camera and F/3.5 for the others.

For the lighting I used forty 10K's, seventy-five 5-K sky pans, and sixteen clusters of six 1500-watt lights, surrounded by silk. With that many units, the chances of a pinwheel effect, shadows all over the floor, was almost assured. To eliminate this problem and to give the soft effect David wanted, I had large ten-by-ten-foot frames covered with tracing paper and hung in front of the 10K's. The sky pans lighting the cyc didn't create a shadow problem because the dancers were always far enough away so that their bodies didn't cast shadows. The 10K's were placed to create a pool of light in the center of the dance floor softening out toward the edge where the cameras were placed. Thus, as the dancers came closer to the cameras, they got darker. I kept the cyc about 1½ to 2 stops under the key area in the pool and the edges of the pool were about one stop under the center.

If we had been able to shoot with one camera and had been allowed several days to do the sequence, I would have used a true north light look with the key just from one side. But if I had

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done this with the multiple-camera set-up, one camera half-light, one camera silhouette, and so on. This obviously would not have worked, such a severe lighting change from camera to camera could never have been intercut.

However, I worked out a double-cross soft light so all camera positions looked pretty much the same and the cross-light showed the roundness I was looking for. I had one 10-K placed high behind the dancers as a backlight to give a little more relief and put just one hard shadow on the floor.

We got three complete run-throughs of the dance and each time we changed the camera positions and the types of coverage each camera was assigned to get. The use of zoom lenses on all the cameras was dictated by the circumstances. If I had chosen fixed lenses, it would have created a problem for the operators who were assigned the close-ups. Shooting against a blue limbo backing, if they had lost the dancers out of the frame it would have been very difficult, if not impossible, to find them again. With zooms they could widen out to the shortest focal length, find the dancers; adjust back into the closeup and hold them as long as they could once more. The zoom was imperative on the Mitchell high-speed camera for, without it, the camera would not have been reflex while shooting, causing no end of parallax and focusing problems.

For ease of operation, I used Worrall heads on the three standard-speed cameras on the floor. For the overhead camera I had an O'Connor 100 fluid head because of the weight problem. The high-speed camera on the floor also utilized an O'Connor head. For some of the faster moving closeups we used a fluid head on the floor cameras because we couldn't move the Worralls fast enough.

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In London I used a small Western dolly with pneumatic tires which could run either on the ground or on aluminum track. I prefer a crab dolly, but it was just too big to load and unload all the time. I wish I'd had an American Western dolly with airplane tires as I had at Lake Havasu. These tires are big and soft, making track-laying rare and dolly moves simple and very fast. The only drawback with this type of dolly is that if you are working in tight quarters there is no real maneuverability as with the crab.

We had a Chapman Titan Crane with us most of the time in Lake Havasu. We did many shots off it, not only boom moves, but dolly moves in dialog scenes

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At Lake Havasu, there were times when we had to block the sunlight and then relight to get the proper effect. I had a scene in which The Carpenters and Jennifer O'Neill were sitting across the front seat of a convertible. The shadow from the top of the windshield was cast across their faces. It was not possible to move the car in relation to the sun because the position was important to the storytelling-geography of the film. I could not shoot the scene with this black shadow across their faces. Even if I had filled it in with booster light, the shadow would still have been distracting. I took it out by blocking the sun with a 12'x12' butterfly then re-lit them with two arcs laced together and matched to the light level of the background. I made sure the arcs did not cast the same shadow as before. I also removed the tinted windshield to eliminate the green-tinted faces.

In general, I tried to arrange the camera angles so that the performers were in backlight. This gave a pleasant bright sparkle to the film and was in keeping with the fantasy elements of the story. This meant that the faces had to be brought into balance with the backgrounds so I used the arcs. The overall exposure was about F/11 and the backlit faces were about F/6.3. I would fill until I got a F/9 on the faces and in this way the film would see what the eye would see and not look as if I were using lights.

Whether it be a commercial, feature, or television special, I always approach each assignment with the aim of producing the highest quality photographic image, both technically and artistically. I feel both go hand in hand. ■

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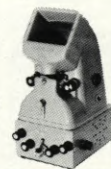
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Continued from Page 885

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WHAT'S NEW

Continued from Page 917

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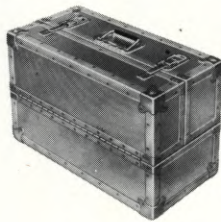
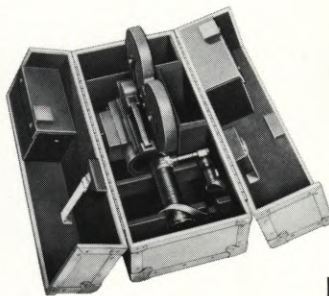
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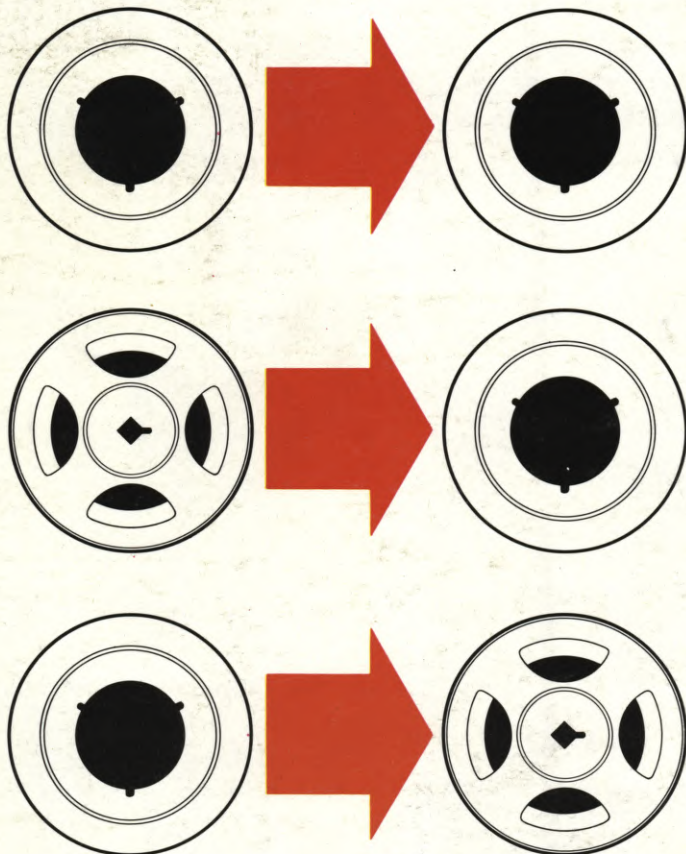
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


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