

# American Cinematographer

International Journal of Motion Picture Photography and Production Techniques

OCTOBER 1975 / ONE DOLLAR

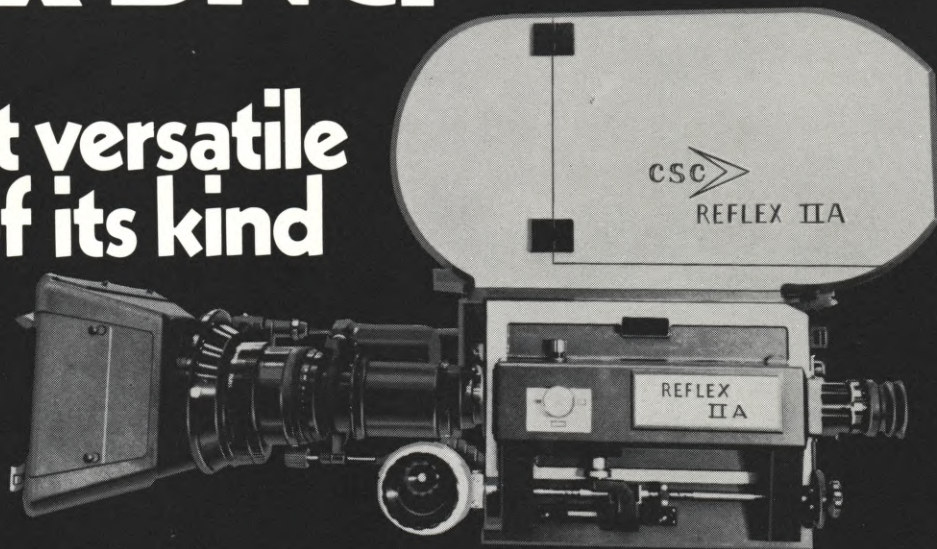


THE FILMING OF "PROBES IN SPACE"



# Now! The ultimate reflex BNC.

The most versatile camera of its kind available today.



## Light weight:

The new CSC Reflex IIA is a precision scale-down of our world famous Reflex II. Weight, complete, 89 lbs.

## Cooke lenses:

Now you have a choice. The IIA is the only reflex BNC engineered to accept Cookes. You'll see the big difference when you screen your dailies.

## Ultra wide angle:

Do you use a second camera for your dramatic wide angle shots? No need to now. The Reflex IIA will accept lenses as short as 9.8mm—Yes—9.8mm! Look at the exclusive creative edge you get with the Reflex IIA —

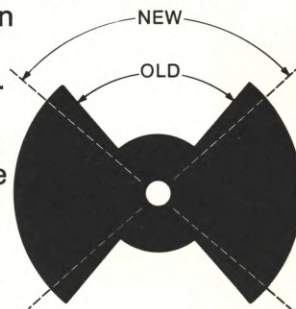
Now you have a choice.											
9.8	14.5	15	18	20	25	32	35	40	50	75	100 & up
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm

## Super speed Zeiss lenses:

Another exclusive—you can specify aspheric ground floating element Zeiss Distagons. Scalpel-sharp images at a true T:1.4! 25mm/35mm/50mm/85mm focal lengths are available.

## New shutter:

To further boost lens performance, we've made an ingenious design change that permits the use of a new 200° shutter. The big advantage, of course, is the raised light transmission factor. More light means smaller apertures for increased overall sharpness, depth of field and brilliance.



Our new BNC Reflex IIAs are immediately available. Call or write for details—today.



ASSOCIATE MEMBER



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**16MM. CAMERAS**

Eclair NPR 16mm., 400' magazine, crystal motor, motor cable, TV ground glass, & carrying case	Used	\$ 5975.00
Eclair NPR Super 16, 400' magazine, 12V constant speed motor, motor cable, & hi-hat adapter	Used	6250.00
Eclair NPR Super 16, 400' magazine, crystal motor, & motor cable	Used	6900.00
Eclair ACL 16mm., 24 fps crystal motor, motor cable, 2-200' magazines, & carrying case	Used	5250.00
Eclair ACL 16mm., 24 fps crystal motor, motor cable, 2-400' magazines, & carrying case	Used	5995.00
Arriflex 16mm. BL, 400' magazine, 12V constant speed motor, motor cable, TV ground glass, 12 x 120 Angenieux zoom lens, matte box, & carrying case	Used	8500.00
Arriflex 16S, variable speed motor, motor cable, 1-400' magazine and torque motor, & carrying case	Used	3225.00
Arriflex 16S sync generator, variable speed motor, motor cable, 1-400' magazine and torque motor, & carrying case	Used	3300.00
Auricon Super 1200 magnetic, 12 x 120 Angenieux zoom lens w/10 1/2" viewfinder, 2-1200' magazines, & carrying cases	Used	3500.00
Auricon SSII conversion (magnetic), 2-400' Mitchell magazines, 12 x 120 Angenieux zoom lens w/7 1/2" viewfinder, & carrying case	Used	2000.00
Auricon SSII conversion (magnetic), 2-400' Mitchell magazines, & carrying case	Used	1100.00
General Camera SSIII (magnesium), 2-400' Mitchell magazines, 12 x 120 Angenieux zoom lens w/mini-finder, & carrying case	Used	2500.00
General Camera SSIII (magnesium), 2-400' Mitchell magazines, & carrying case	Used	1500.00
New \$2495.00		
Milliken DBM 5A 16mm. High Speed camera, 24 fps variable speed (AC/DC), 12 x 120 Angenieux zoom lens w/7 1/2" viewfinder, & carrying case	Used	3500.00
Locam 164-5DC 16mm. High Speed camera, 16-500 fps variable speed, 12 x 120 Angenieux zoom lens w/7 1/2" viewfinder, & carrying case	Used	3650.00
Canon Scopio 16mm., 13-76mm. zoom lens fl. 6, 2-rechargeable batteries, battery charger, & carrying case	Used	625.00
B & H Filmo 70DR camera body, filter slot, gel holder, & carrying case	Used	295.00

**16MM. LENSES**

12 x 120mm. Angenieux zoom Eclair mount	Used	\$ 835.00
12 x 120mm. Angenieux zoom "C" mount	Used	785.00
New 1425.00		
12 x 120mm. Angenieux zoom Arri mount	Used	825.00
12 x 120mm. Angenieux w/7 1/2" viewfinder	Used	895.00
New 1395.00		
12 x 120mm. Angenieux w/3" "mini" or "uni" viewfinder	Used	935.00
12 x 120mm. Angenieux w/AV-30 viewfinder	New	1495.00
9.5 x 57mm. Angenieux Eclair mount	Used	1300.00
New 1990.00		
9.5 x 57mm. Angenieux "C" mount	New	1795.00
9.5 x 57mm. Angenieux w/AV-30 viewfinder	New	2295.00
9.5 x 95mm. Angenieux Arri mount	Used	1600.00
9.5 x 95mm. Angenieux Eclair mount	Used	1620.00
9.5 x 95mm. Angenieux w/7 1/2" viewfinder	Used	2150.00
9.5 x 95mm. Angenieux w/3" "mini" or "uni" viewfinder	Used	2200.00
12 x 240mm. Angenieux Eclair mount	Used	2500.00
12 x 240mm. Angenieux Arri mount	Used	2500.00
15 x 150mm. Canon Super 16 format "C" mount	Used	750.00
17 x 68mm. Angenieux zoom w/viewfinder	New	575.00
12.5 x 50mm. Angenieux zoom w/viewfinder	New	675.00
5.7mm. fl.8 Tegea Arri mount	Used	650.00
10mm. fl.6 Switar "C" mount	Used	125.00
10mm. fl.8 Angenieux "C" mount	Used	215.00
10mm. fl.8 Cinegon Arri mount	Used	325.00
16mm. f2 Cine-Xenon Arri mount	Used	195.00
25mm. fl.9 Cine-Ektar "C" mount	Used	75.00
25mm. fl.4 Cine-Xenon Arri mount	Used	275.00
50mm. fl.9 Cine-Ektar "C" mount	Used	75.00
75mm. fl.9 Switar "C" mount	Used	215.00
102mm. f2.7 Cine-Ektar "C" mount	Used	85.00
152mm. f4 Cine-Ektar "C" mount	Used	85.00

**35MM. CAMERAS**

Arriflex 35mm. 2C w/sync generator, 400' magazine, matte box, variable speed motor, motor cable, & carrying case	Used	\$ 3950.00
Arriflex 35mm. 2C w/sync generator, 28, 50, 75mm. Cine-Xenon prime lenses, 400' magazine, matte box, variable speed motor, motor cable, & carrying case	Used	4600.00
Arriflex 35mm. 2B w/variable speed motor, motor cable, 3-lenses, 2-400' magazines, matte box, & carrying case	Used	2000.00
Bell & Howell single lens eyemo w/1-lens & carrying case	Used	325.00
Bell & Howell Reflex eyemo (MKII) w/carrying case	Used	525.00
Bell & Howell single frame reflex eyemo w/90mm. Macro lens, & carrying case	Used	615.00
Mitchell 35mm. Standard with AC/DC wild motor, 3-lenses, 2-1000' magazines, & all carrying cases	Used	2200.00
Mitchell 35mm. NC w/25, 35, 40, 50mm. Baltar lenses, 2-1000' magazines, 12V DC motor, motor cable, matte box, & all cases	Used	3800.00

Mitchell 35mm. BNC w/25, 35, 40, 50, 75, 100mm. Cooke lenses, 2-1000' magazines and magazine housing, 110V or 220V motor, motor cable, side finder, & all cases	Used	\$ 16,500.00
<b>35MM. LENSES</b>		
25 x 250mm. Angenieux zoom, Arri or MKII mount, w/sunshade, zoom rods, & carrying case	Used	\$ 3650.00
35 x 140mm. Angenieux zoom, Arri mount	Used	1200.00
38 x 154mm. Berthiot anamorphic zoom, Arri mount, w/case	Used	1595.00
24 x 240mm. Angenieux zoom, BNC mount, w/finder & case	Used	950.00
9.8mm. fl.8 Tegea, Arri mount	Used	725.00
New \$950.00		
14.5mm. f3.5 Angenieux, Arri mount	Used	395.00
18mm. fl.7 Cooke Speed Panchro, BNC mount	Used	260.00
18.5mm. f2.2 Angenieux, Arri mount	Used	250.00
24mm. f2.2 Angenieux, Arri mount	Used	260.00
25mm. f2.5 Baltar, BNC mount	Used	245.00
28mm. f2 Cine-Xenon, Arri mount	Used	195.00
28mm. f2 Cooke Speed Panchro, BNC mount	Used	240.00
30mm. f2.5 Baltar, BNC mount	Used	235.00
32mm. f2 Astro-Berlin, Arri mount	Used	180.00
35mm. fl.2.3 Baltar, Arri mount	Used	200.00
35mm. f2 Cooke Speed Panchro, BNC mount	Used	235.00
35mm. f2.5 Baltar, BNC mount	Used	230.00
40mm. f2.3 Baltar, BNC mount	Used	230.00
40mm. f2 Cooke Speed Panchro, BNC mount	Used	235.00
40mm. fl.8 Angenieux, Arri mount	Used	250.00
40mm. f2.3 Baltar, Arri mount	Used	200.00
40mm. Macro-Kilar, Arri mount	Used	85.00
50mm. f2 Cooke Speed Panchro, BNC mount	Used	230.00
50mm. f2.3 Baltar, BNC mount	Used	225.00
50mm. f2 Cine-Xenon, Arri mount	Used	225.00
50mm. fl.3 Kinoptik, Arri mount	Used	475.00
75mm. f2 Cine-Xenon, Arri mount	Used	235.00
75mm. f2.3 Baltar, BNC mount	Used	220.00
75mm. f2 Cooke Speed Panchro, BNC mount	Used	230.00
90mm. Macro-Kilar, Arri mount	Used	139.00
100mm. f2.5 Cooke Speed Panchro, BNC mount	Used	230.00

**MAGAZINES**

400' x 16mm. Mitchell magnesium magazine	Used	\$ 75.00
New \$125.00		
400' x 16mm. Mitchell-type magnesium magazine	Used	60.00
1200' x 16mm. Mitchell mag	New 425.00	Used 220.00
400' x 16mm. Arriflex 16S magazine	Used	250.00
400' x 16mm. Arriflex 16M magazine	Used	285.00
400' x 16mm. Arriflex 16 BL magazine	Used	475.00
200' x 16mm. Arriflex 16M magazine	Used	225.00
400' x 16mm. ACL magazine	Used	1400.00
400' x 16mm. NPR magazine	Used	1350.00
200' x 16mm. ACL magazine	Used	1050.00
1000' x 35mm. Mitchell standard magazine	Used	165.00
1000' x 35mm. Mitchell NC magazine	Used	315.00
400' x 35mm. Eyemo magazine	Used	25.00
400' x 35mm. Mitchell Standard magazine	Used	95.00

**HEADS, TRIPODS, & MOUNTING EQUIPMENT**

Akely Gyro Head w/Standard Legs	Used	\$ 95.00
Akely Hi-Hat	Used	15.00
Arriflex Gyro Head w/Standard Legs	Used	175.00
Arriflex Friction Head w/Standard Legs	Used	150.00
Arriflex Baby Legs	Used	30.00
Cartoni Gyro Head w/Standard Legs	Used	150.00
Cartoni Metal Baby Legs	New	75.00
Cartoni Wood Baby Legs	New	75.00
Cartoni Wood Standard Legs	New	85.00
Pro-Jr. Friction Head w/Standard Legs	Used	125.00
New 175.00		
Pro-Jr. Hi-Hat	New 35.00	Used 15.00
Pro-Jr. Baby Legs	New 95.00	Used 65.00
NCE Fluid Head w/Standard Legs	Used	325.00
NCE Baby Legs	Used	75.00
NCE Hi-Hat	Used	20.00
Cinekad Body Brace	New 65.00	Used 20.00
SSIII Rotating Shoulder Pod	New 75.00	Used 30.00
3-Wheel Triangle Dolly w/Case	Used	40.00
Cine 60 Quick Release Plate	New	85.00
Eclair NPR Camera Barney	New	90.00

**SOUND**

Nagra 4L Recorder loaded, ATN unit, leather carrying case, Beyer headset, & heavy duty carrying case	Used	\$ 2495.00
Nagra 3 Recorder, ATN unit, leather carrying case, Beyer headset, & heavy duty carrying case	Used	1500.00
Electrovoice 666 Mike	Used	40.00
Electrovoice 655 Mike	Used	35.00
Electrovoice 655C Mike	New	55.00
Electrovoice 642 Shotgun Mike, windscreen, shock mount, & cable	New 315.00	Used 175.00
Electrovoice 635 Mike	Used	30.00
Electrovoice 635A Mike	New	45.00
Electrovoice 649B Lavalier	New 55.00	Used 35.00
Electrovoice RE-15 Mike	New 115.00	Used 65.00
Sony ECM-16 Lavalier	New	15.95
Sony ECM-22P Mike	New	75.00
Sony ECM-51 Mike	New	119.60
RCA BK6B Lavalier Mike	Used	30.00
Uher Report L Recorder w/carrying case	Used	75.00
Uher 4000 Report L Recorder	New	400.00
Shure M67 Professional Mixer	Used	115.00
Nagra ATN Power Supplies for 3 or 4	Used	60.00
Sennheiser 804 Shotgun Mike, battery adapter, cable, windscreen, shock mount, & carrying case	Used	425.00
Sennheiser 404 Condenser Mike, battery adapter, cable, windscreen, & carrying case	Used	325.00
Sennheiser R1010 Receiver/SK1007 Transmitter Wireless Mike w/cables & antennas	Used	450.00
Back-Auricon MA-11 Magnetic Amplifier, charger, rechargeable battery, E-7 Mike & cable, desk stand, headset, & carrying case	Used	750.00
MA-11 Carrying Case	Used	50.00
General Camera GCA Magnetic Amplifier, carrying strap, belt clip, charger, rechargeable battery, & carrying case	New	450.00
General Camera Auto-Slate Box	New	95.00
EMB Blue Ribbon Magnetic Recording Head	New	425.00
Sony TC-110A Cassette Recorders	New	98.00
Sony TC-55 Cassette Recorders	New	119.00
Sony TC-142 Cassette Recorders	New	161.00
Back-Auricon Magnetic Recording Head	New	500.00

**EDITING EQUIPMENT**

Moviola 35mm. UD20CS w/separate magnetic head	Used	\$ 2150.00
Moviola 50-R 16mm. Viewer	Used	165.00
New \$225.00		
Moviola SZA Synchronizer w/counter	New	88.00
Maier Hancock # 1635 Hot Splicer	Used	225.00
New 275.00		
Maier Hancock #816 Super 8 Hot Splicer	Used	225.00
Maier Hancock #816 Hot Splicer	New	195.00
Moviola URS Amplifier	New	65.00
Moviscope 16mm. Viewer	New 199.50	Used 115.00
Neumade Edit Table w/lamp well & film rack	Used	149.00
Editing Bin w/rack	Used	50.00
Grissold 16mm. Splicer	Used	25.00

... and there's more, much more, call or write: General Camera Corp., 471 Eleventh Ave., New York, N.Y. 10018 • (212) 594-8700  
 Tel.: 14-7136



# SALE

**GENERAL CAMERA CORPORATION**  
 471 Eleventh Ave., N.Y., N.Y. 10018 (212) 594-8700  
 Telex: 14-7136

Gentlemen: I am interested in \_\_\_\_\_

Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Prices F.O.B. 471 Eleventh Ave., N.Y.C. All equipment offered add sales tax prior sale. Prices subject to change without notice. Offer valid where applicable.

# SALE

100mm. f2.2 Angenieux, MKII mount	Used	\$ 395.00
100mm. f2.2 Angenieux, Arri mount	Used	450.00
100mm. f2 Kinoptik, Arri mount	Used	425.00
100mm. f2 Astro-Berlin, Arri mount	Used	350.00
100mm. f2.3 Baltar, BNC mount	Used	220.00
150mm. f3.5 Kilar, Arri mount	Used	125.00
300mm. f5.6 Tele-Kilar, Arri mount	Used	200.00
500mm. f5.6 Anastigmat, Arri mount	Used	375.00
500mm. Tele-Analyt, Arri mount	Used	325.00

**CAMERA BLIMPS**

Arriflex 35mm. 120S steel blimp w/zoom port, DC constant speed motor, motor cable, matte box, & case	Used	\$ 2495.00
Arriflex 35mm. 120S steel blimp w/120V AC motor, motor cable, matte box, & case	Used	1950.00
Arriflex 35mm. 400 steel blimp w/120V AC motor, motor cable, matte box, & case	Used	1500.00
Arriflex 16mm. steel blimp w/120V AC motor, motor cable, & case	Used	1500.00
Cine 60 35mm. plastic blimp w/2-power cables, matte box, & carrying case	Used	1100.00
Cine 60 35mm. plastic motorized zoom port for 25 x 250mm. w/zoom motor, control, follow focus device, & case	Used	875.00

**MOTORS**

Eclair NPR Beala crystal motor	Used	\$ 1450.00
New \$2495.00		
Eclair NPR Perfectone crystal motor	Used	1425.00
Arriflex 16S 8V constant speed motor	Used	295.00
Arriflex 16BL AC sync motor, w/transformer & cable	Used	250.00
Arriflex 16S AC sync motor w/power supply & frame counter	Used	350.00
Arriflex 35 constant speed motor	Used	365.00
Arriflex 35 variable speed motor	Used	220.00
Eclair NPR 115V Perfectone AC motor w/motor cable	Used	495.00
Arriflex 35 2C High Speed motor w/rheostat & cables	Used	495.00
Vicon Servo zoom motor (25 x 250mm.) w/control & cables	Used	175.00
Arriflex 16S torque motor	Used	215.00
Eurotechnical flat motor base (Arriflex 35)	Used	149.00
New 225.00		





I'm Sy Cane and for those of you who might not have noticed, I am upside down. This causes the blood to rush to my head, giving me an excuse to act irrationally. I'll sell motion picture equipment while on my head at prices that would make me sick if I was upright. And I'm talking about CP-16s and Nagra's. Angenieux lenses and Sennheiser mikes. We carry the leading names in professional equipment. And we back up our sales with professional servicing. Call me right now for a price quote. But hurry. Only a maniac would stay this way forever.



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# American Cinematographer

International Journal of Motion Picture Photography and Production Techniques

*The American Society of Cinematographers is not a labor union nor a guild, but is an educational, cultural and professional organization. Membership is by invitation to those who are actively engaged as Directors of Photography and have demonstrated outstanding ability. Not all cinematographers can place the initial A.S.C. after their names. A.S.C. membership has become one of the highest honors that can be bestowed upon a professional cinematographer, a mark of prestige and distinction.*

OCTOBER, 1975

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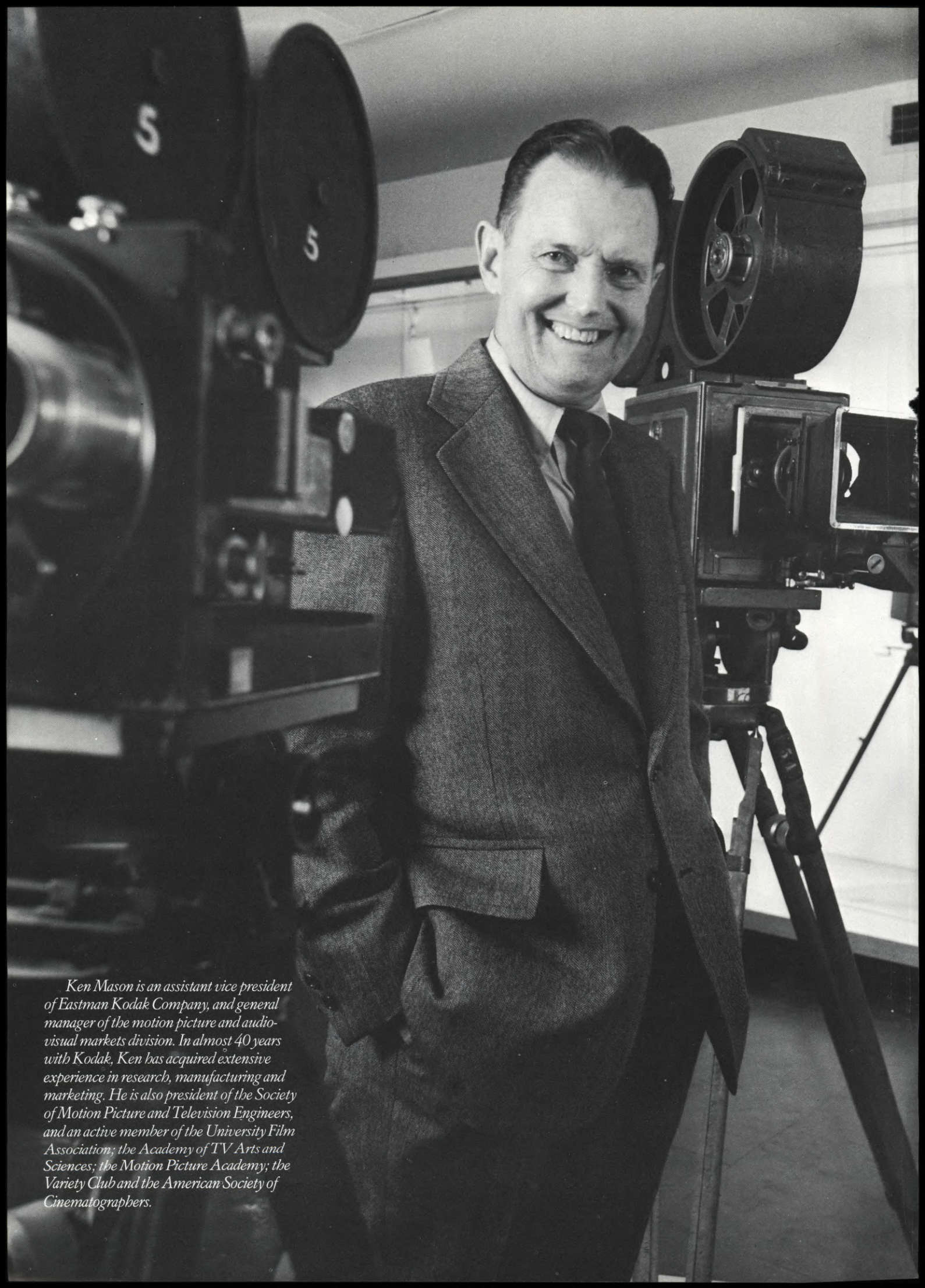
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1128 **Profile: A.S.C.**

ON THE COVER: The concave dish of a giant radio telescope silhouetted against the sunset sky probes the Universe in a scene from "PROBES IN SPACE", spectacular science-documentary film produced by Graphic Films to fill the giant tilted dome screen of the unique Reuben H. Fleet Space Theatre in San Diego, California.

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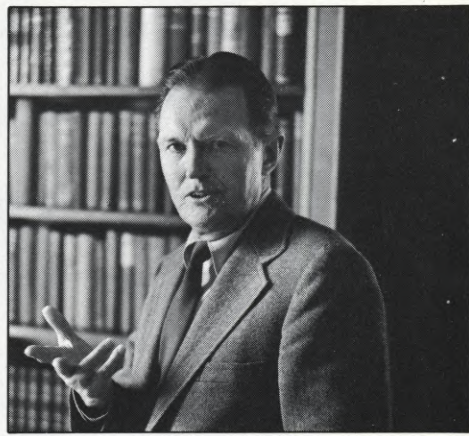




*Ken Mason is an assistant vice president of Eastman Kodak Company, and general manager of the motion picture and audio-visual markets division. In almost 40 years with Kodak, Ken has acquired extensive experience in research, manufacturing and marketing. He is also president of the Society of Motion Picture and Television Engineers, and an active member of the University Film Association; the Academy of TV Arts and Sciences; the Motion Picture Academy; the Variety Club and the American Society of Cinematographers.*



# KEN MASON



"Technology and service. I think these are primarily Eastman Kodak Company's claim to fame. Our major contribution to the art of film, without question, is the high quality of our product, and the people who stand behind that product.

"Imagine the responsibility on a director's shoulders when making a picture. The things that must be settled before the first frame of film is ever exposed—script, casting, costumes, location, weather.

"Then comes acting, cinematography, cutting, editing, scoring, promotion. I mean, the task is almost beyond the endurance of the ordinary human. The last thing a director needs to worry about is the quality of the image on that screen. But believe me, nobody is more intensely concerned about the quality of that image than we are.

"Eastman color negative and print films are very, very good. I don't say that selfishly; it's true. And improvements in these two films are going to be small. The intermediate films can be improved, and we're working on that right now.

"However, I do visualize the day when color negative films are going to be considerably faster than they are today, with quality levels equal to what we now have. This will be a boon, because every time you increase the speed, the lights on the sets can be lowered. And lowering these lights not only cools tempers, but it helps in turn to reduce the overall costs of production.

"For example, we introduced Eastman color negative II film 5247 because it was a reachable evolutionary step of quality. It has provided a tool that motion-picture producers can use to provide a high-quality product.

"When the industry buys our film, they expect a lot more than just a can of film; I think it's this constant involvement and responsiveness that enable us to offer products increasingly suited to changing techniques.

"At the heart of all this are people—during the time a picture is shot, our people regularly visit the sets. True, not every set everyday, but they visit sets everyday and make contact with the camera crews, and then talk with the director or producer who may be on the set.

"Our contacts are mostly with the cinematographers and lab personnel; and they tend to look to Kodak for a lot of things. I'm proud of the caliber of people we have, too. You know, many have 20-30 years of experience in the field. It is their relationship with the industry which is so important—getting calls at night, or over weekends, is quite routine.

"I think we are very, very fortunate in having people like this staffing our regional offices both here and abroad. They are experts, and intensely concerned about every step in the cycle—from original photography to the quality of the final image on the screen.

"These regional offices are much more than convenient distribution points. They have come to be regarded rather as

a hot line for service, particularly for technical service and counsel.

"It is this constant contact, and involvement in the day-to-day activities of the industry, that helps us to develop the products that are needed.

"Because motion pictures and television have become truly global, we also devote constant effort to supplying product which is consistently uniform, whether it is manufactured here or abroad. Believe me, we do all we can to have that product readily available and backed with the very best service we can provide. And when you realize that all film testing is "destructive testing," we are very proud whenever a producer tells us that he has operated for years and never lost a scene.

"This, to me, strikes right at the heart of the concept of quality and value. There is so much more to the bottom line than price."

*For a revealing look at people and ideas in the moving visuals industry, Kodak has combined this and other interviews into a fascinating and informative booklet. For a free copy write: Eastman Kodak Company, Dept. 640-G, Rochester, New York 14650.*

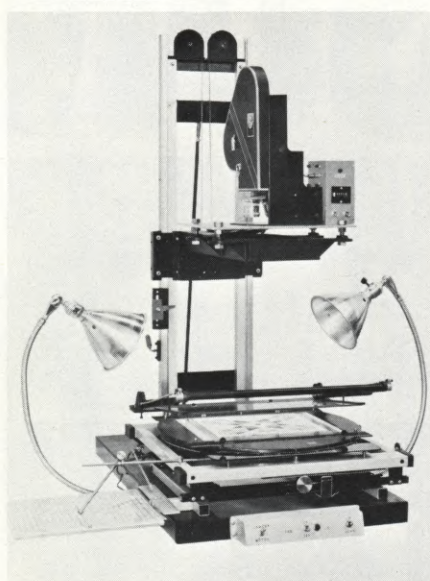


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# WHAT'S NEW

IN PRODUCTS, SERVICES AND LITERATURE



## FAX 'JR.' ANIMATION CAMERA STAND

Fax Company, longtime maker and marketer of animation equipment and supplies, has introduced a Fax 'Jr.' Animation Stand. The senior ThriftFax Stand has been used for some years in small production companies, colleges and universities, and television stations for completion of animation and titling. Some TV stations have made permanent camera installations on the stand for constant monitoring of titles and backgrounds.

The new Fax 'Jr.' stand is comparable in most ways, but is a table-top model without its own base. Special construction methods have provided economies for purchasers without affecting accuracy or reducing durability.

A cast aluminum supporting bracket, traveling vertically on 40" gibs, assures precise alignment. A pointer records pre-determined positioning, coil springs assist in manual adjustment, and a lock secures the desired gib positions.

A combination 12/16-field disc and platen with top and bottom sliding bars is attached to the welded steel bottom frame. Either Acme or Oxberry pegs are available. The 2"-wide top and bottom bars with scales in 20ths allow rapid positioning with the patented Magnabar® method which utilizes magnetic strips to secure selected movements east or west of center. For straight animation work with a background in the upper bar, moving east

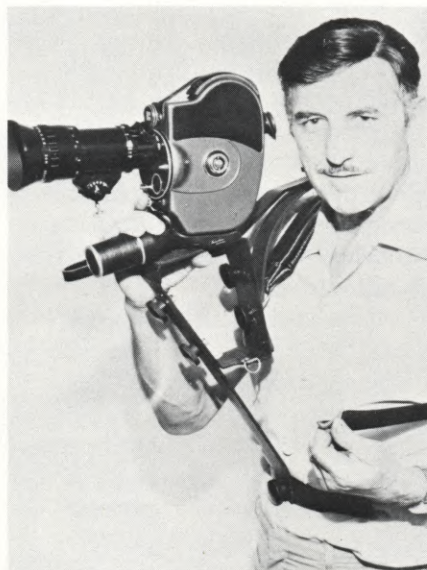
or west, the standard animation can remain stationary or move east or west on the lower bar.

The large plexiglass window permits back-lighting. Wired lamps and shades are supplied, as well as a front-mounted control panel for switch or stop-motion motors. Fax Company makes separate 12- and 16-field discs for artists' use, as well as the disc combining both fields.

A N-S-E-W compound also is available with scales and pantograph pointers. Disc and platen rotate a full 360° for spin shots and other effects.

Camera shown on the 'Jr.' Stand is a 16mm Cine-Kodak with Fax stop-motion motor.

More information may be obtained from Fax Company, 374 South Fair Oaks Ave., Pasadena, Calif. 91105.



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First-hand exposure to some of the most talked-about new technical developments in the U. S. film and television industries will be featured at the third annual Midwest Seminar on Videotape and Film, to be held in Chicago, October 17-18.

Seminar participants will get hands-on demonstrations of sophisticated film and tape editing equipment, from a multi-plate flat-bed film editing unit to the newest in videocassette editing hardware.

A demonstration of electronic news gathering techniques by John D. Callaway of WTTW/Channel 11, Chicago, will illustrate how the portable production equipment and modern editing techniques of broadcast journalism apply to industrial and educational situations.

"SynthaVision," a radically new computer-based system for generating complex film animation from flat artwork, will be demonstrated by its developer, Dr. Phillip S. Mittelman of Mathematical Applications Group, Inc. (MAGI), New York.

Joining Callaway and Mittelman as Seminar speakers will be an array of leaders in the A-V industry.

The Seminar is devoted to stimulating the use of film and videotape as interrelated media in business, education, medicine, and other fields. A non-profit event, it is sponsored jointly by the Chicago Film Council, the Chicago Television Guild, and Chicago chapters of the Information Film Producers of America (IFPA) and the Society of Motion Picture and Television Engineers (SMPTE).

Reservations for the Seminar, and further information, can be obtained by writing to Midwest Seminar on Videotape and Film, P. O. Box 11376, Chicago, Ill. 60611. Reservations are \$45 if made before Oct. 1, and include a party on Oct. 17 and lunch on Oct. 18. The Seminar will be held at the Holiday Inn near Chicago's O'Hare Airport.

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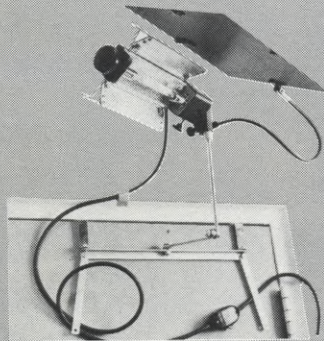
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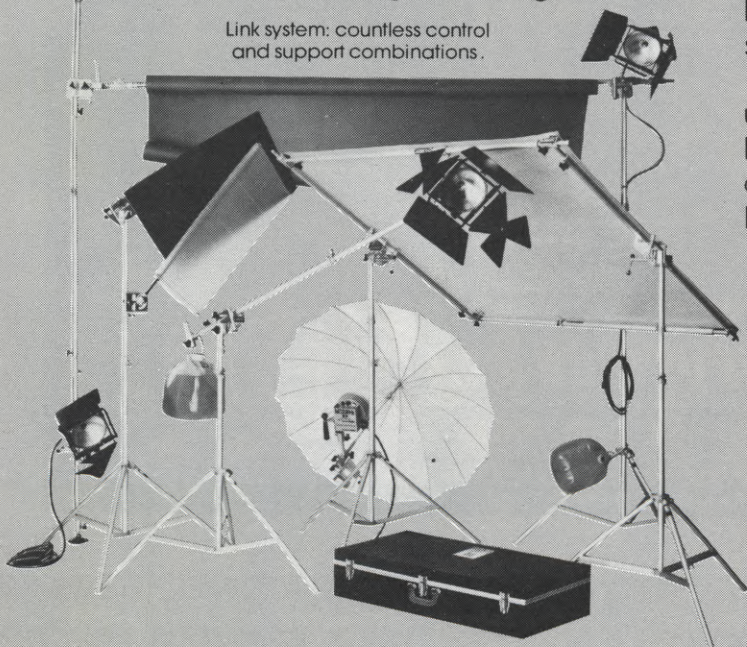
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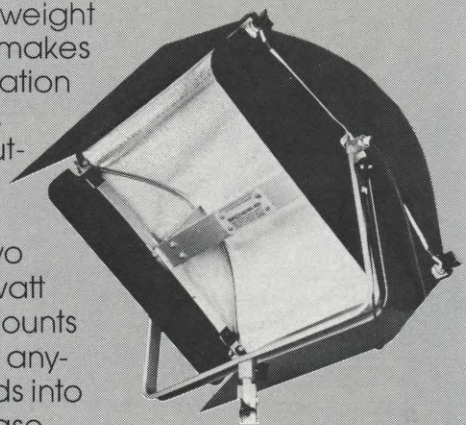
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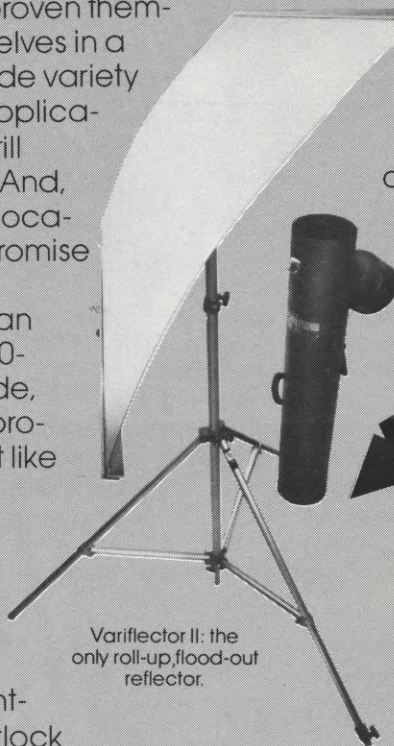


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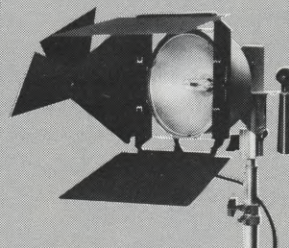
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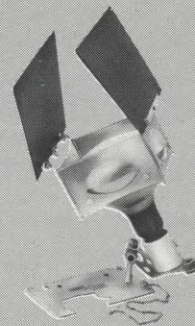


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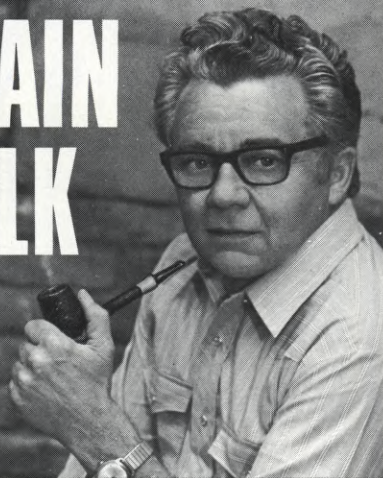
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# PLAIN TALK



by *J. Carl Treise*

**Why am I writing this column? If you don't know by now, I'll tell you.**

In many ways I'm an old-fashioned square. And I probably shoot off my mouth too often. But very few will deny that I'm a "square shooter".

I've been in this business a helluva long time and I damn well know what makes it tick (— and what doesn't).

I feel you should know what's going on. Both the good and the bad. After all, the more you know, the better you'll be able to buy.

You should know the limitations of a processor as well as its capabilities.

You should know that money stretches only so far. If a firm is offering you more than you have a right to expect at the price, the chances are likely that you're getting screwed.

I find it amazing that a buyer will accept a lousy unit just because it has a shiny exterior. Or that he will let himself be sold something that isn't right for him.

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# QUESTIONS & ANSWERS

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

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



**Q** I am often confronted with the problem of using a telephoto lens to capture closeups of wildlife, then following these closeups with shots at closer range, using the same lens. This I am unable to do, however, because the lens focusing mount will not extend the distance required. I don't want to use a larger tele lens because such lenses are usually too slow for color photography. Lens extension tubes also diminish the effective aperture. Would a portra lens solve my problem?

**A** A portra lens might be the right answer. You may find, however, that an achromatized auxiliary lens may be necessary. I have used this technique with very satisfactory results.

**Q** As a camera lens, even at its widest aperture has a certain amount of depth of field, why is it that a projector lens — even one of the same focal length — must be critically focused to obtain a sharp image on the screen? The only reason I can think of is that the projector lens and screen, in effect, comprise a huge camera having a negative comparable in size to the screen. Am I right or wrong?

**A** In a camera, the film is held stationary in the aperture during the interval the shutter is open. With a projector, this is not the case. Curl of the image during projection, therefore, determines the best *average* setting of the lens for focus.

For this reason, it is impractical to calibrate projection lenses. The best setting of the projection lens will vary for color, black-and-white, lamp adjustment, number of times the film has been projected, humidity, etc. The optics of the two systems can be compared only as a first approximation, based on the false assumption that the image lies in a flat plane during projection.

**Q** Using a Filmo 70-DA camera having single-frame exposure release what f/stop should I use for

single-frame exposures with this camera, where same subject was shot at f/8 at 24 fps in the same light?

**A** According to Bell & Howell Company the exposure would be the same for single-frames as for 24 fps — f/8.

**Q** When projecting a scene on a ground glass screen for rear-projection photography, a "hot-spot" often occurs. How can this be eliminated?

**A** Use a neutral density filter cut to size required and place in front of projector lens. Use of a lens too short in focal length is often a contributing factor where a "hot-spot" occurs. Try moving back with the projector and use a longer lens to project image.

**Q** What are the respective merits of glass-mounted filters and unmounted gelatine filters? Would you advise me to have a filter slot cut in my camera so I can use gelatine filters?

**A** Probably the chief advantage of using a glass or glass-mounted filter in front of the lens is that it is a bit more convenient, and of course the glass mount gives the gelatine filter material some physical protection.

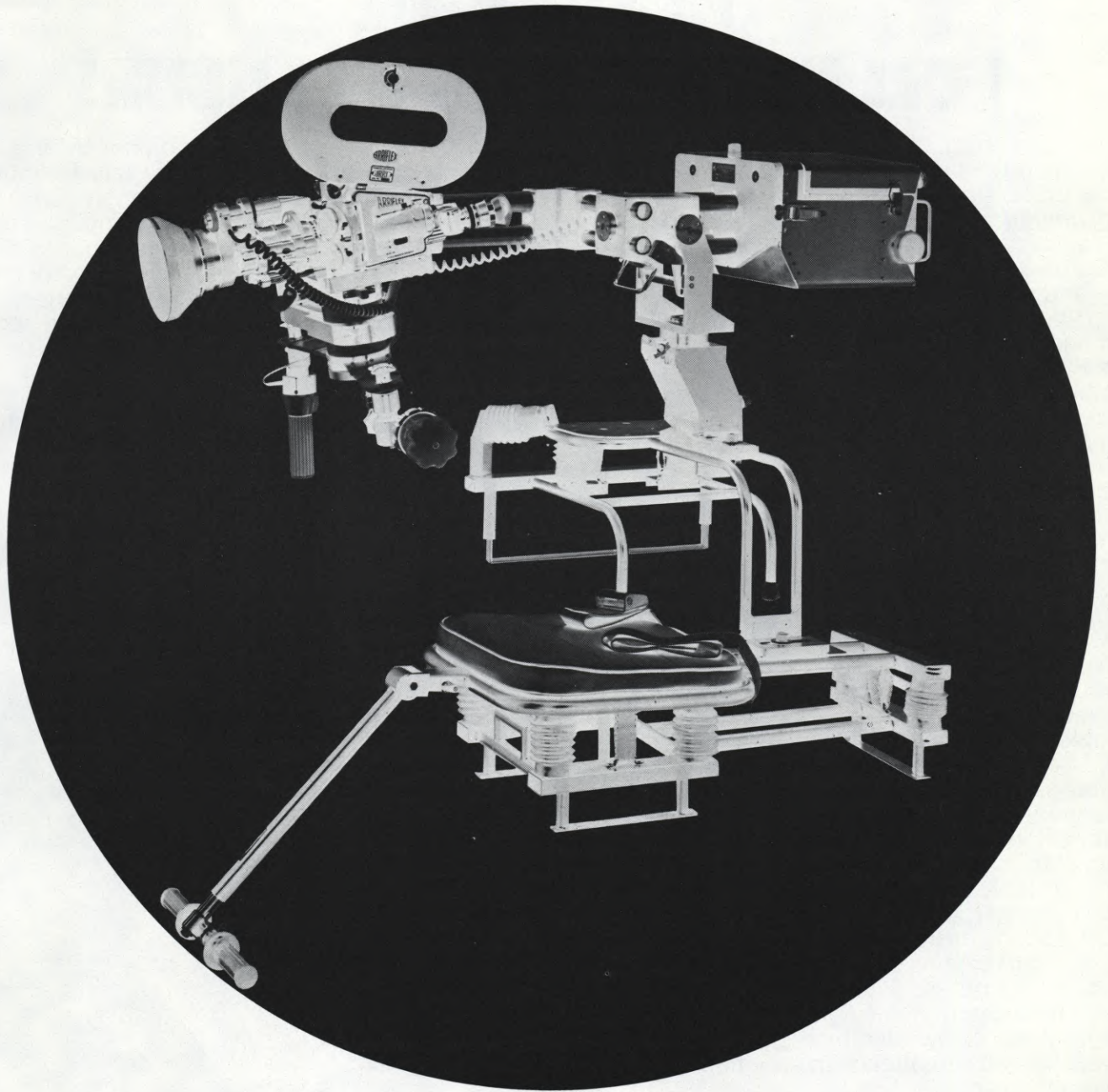
On the other hand, glass filters are more expensive. And if you are doing completely professional photography where optical quality and definition must be high, it is not particularly desirable to have to shoot through any more pieces of glass than absolutely necessary.

Many major studio photographers prefer to use gelatine filters for these reasons: 1) the two air-surfaces of the glass filter are eliminated; and 2) a gelatine filter in a filter slot directly in front of the film permits using a much smaller filter, reducing filter replacement cost. ■



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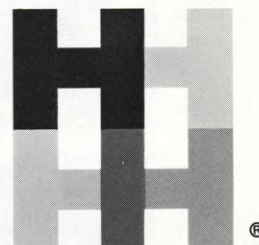
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# CINEMA WORKSHOP



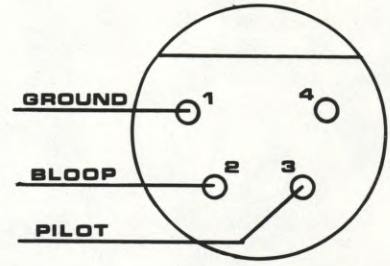
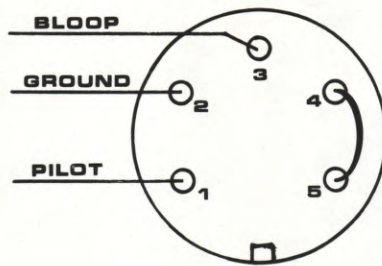
By ANTON WILSON

## Pilotone Connectors

Several months ago we took a look at battery connectors and power cables. Since that time I have received many requests for a similar treatment on sync connectors. Although crystal motors are rapidly making sync cables a thing of the past, there are still many cameramen using the conventional pilotone sync method. The following diagrams and comments should prove beneficial in constructing, repairing, or just understanding a pilotone sync system.

The pilotone signal is just a simple 60 Hz sine wave of about 1 volt AC when the camera is at 24 fps (50 Hz @ 25 fps in Europe). Like any other circuit, only two conductors are needed to transmit the pilotone signal from the camera to the recorder. Most sync cables in the U.S., however, have three conductors. The third wire transmits the automatic slate, or bloop. Basically, for simple pilotone, including the European in-audible slating technique, only a two-conductor cable is necessary. The cable must have three conductors for the use of the audible bloop system.

Connectors at the recorder end of the sync cable must match the specific recorder being used. FIGURE 1 and 2 illustrate the two most popular conventions. The connector in FIGURE 1 is found on the NAGRA III, Tandberg 1-11-P, and the ARRIVOX Tandberg. It is a 6-pin male DIN type and requires a similar 6-pin female connector on the cable. The two pilotone conductors go



(LEFT) FIGURE 3 — 5-pin female DIN Pilot connector found on most Arriflex cameras. Note the jumper between pins 4 and 5 to activate slating lamps. (RIGHT) FIGURE 4 — 4-pin Cannon XLR power connector found on Eclair NPR cameras. Pilot and bloop are usually transferred to a 3-pin XLR (See March 1975 *Cinema Workshop*.)

to pins #1 and #2. The two pilotone conductors are not identical in most cases. One is usually grounded at the camera and is actually considered to be a ground connection, particularly when the three-wire bloop system is employed. (See FIGURES 3 and 4) Referring to FIGURE 1, pilot goes to pin #1, ground to #2, and bloop to #6.

FIGURE 2 represents the pilotone input on the newer NAGRA IV, 4.2, and SL series. In this case the pilotone goes to pins #4 and #1, pin #1 being the ground connection. Bloop should go to pin #4. Note that this connector is a 4-pin female DIN and requires the mating cable to have a 4-pin male DIN.

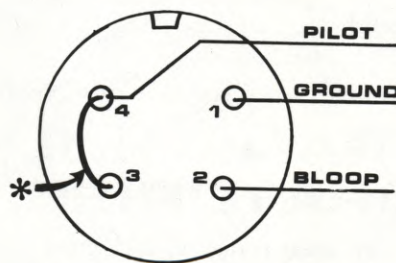
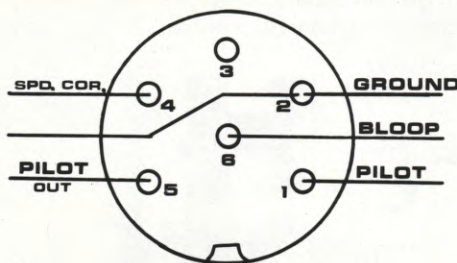
The connector in FIGURE 1 is also used to retrieve the pilotone signal during transfer and to control the recorder for self-resolving. Pilotone output is pin #5, and the correction pulse is injected

on pin #4. Pin #2 is still ground for these playback operations. The NAGRA IV series uses a separate connector ("Power Pack") for pilot playback and resolving and, therefore, no provision for these functions appears in the 4-pin connector of FIGURE 2.

If a NAGRA IV series is fitted with an internal crystal, the 60 Hz (50 Hz.) crystal signal will appear on pin #3 of FIGURE 2. For crystal operation of such a machine, a blank DIN connector *must* be inserted in the pilot plug to jump pin #3 to pin #4. If an external check of the Nagra crystal is desired, this signal can be tapped from pin #3 (and ground pin #1).

At the camera end, most ARRIFLEX cameras use a five-pin female DIN connector requiring a five-pin *Male* DIN on the cable. The pin connections are shown in FIGURE 3. Note that pins #4 and #5 must be jumped to activate the bloop lamps. Figure 4 illustrates the 4-pin Cannon XLR power connection of the ECLAIR NPR camera. Some power supplies will use a double 4-pin XLR to transfer the pilot/bloop signal to the sync cable (as shown). Other designs have used a 3-pin XLR connector for interface with the sync cable. For this latter arrangement, refer to the *Cinema Workshop* on battery connectors in the March 1975 *American Cinematographer*.

(LEFT) FIGURE 1 — 6-pin male DIN Pilot connector found on Nagra III, Tandberg I-II-P and Arrivox Tandberg recorders. (RIGHT) FIGURE 2 — 4-pin female DIN Pilot connector found on Nagra IV, 4.2 and SL recorders.



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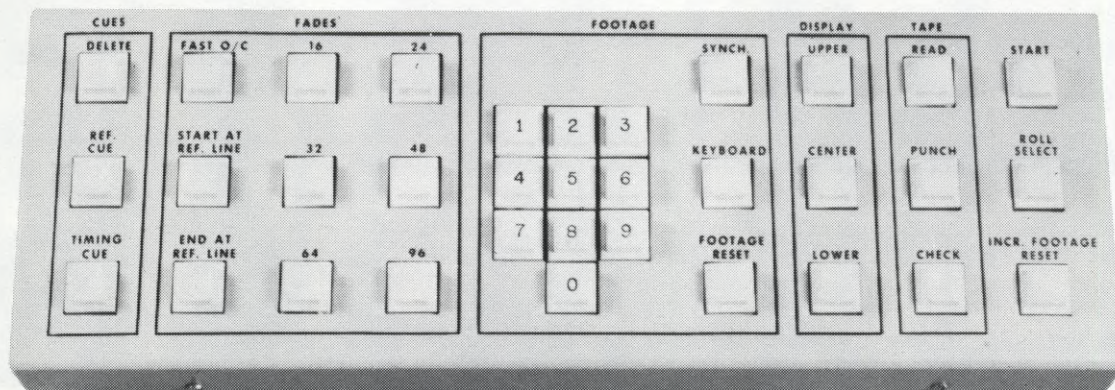
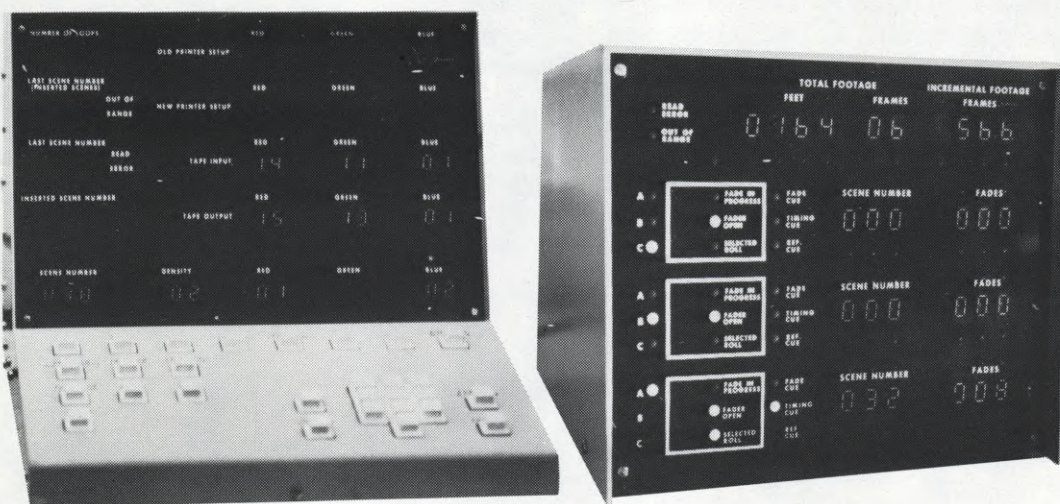
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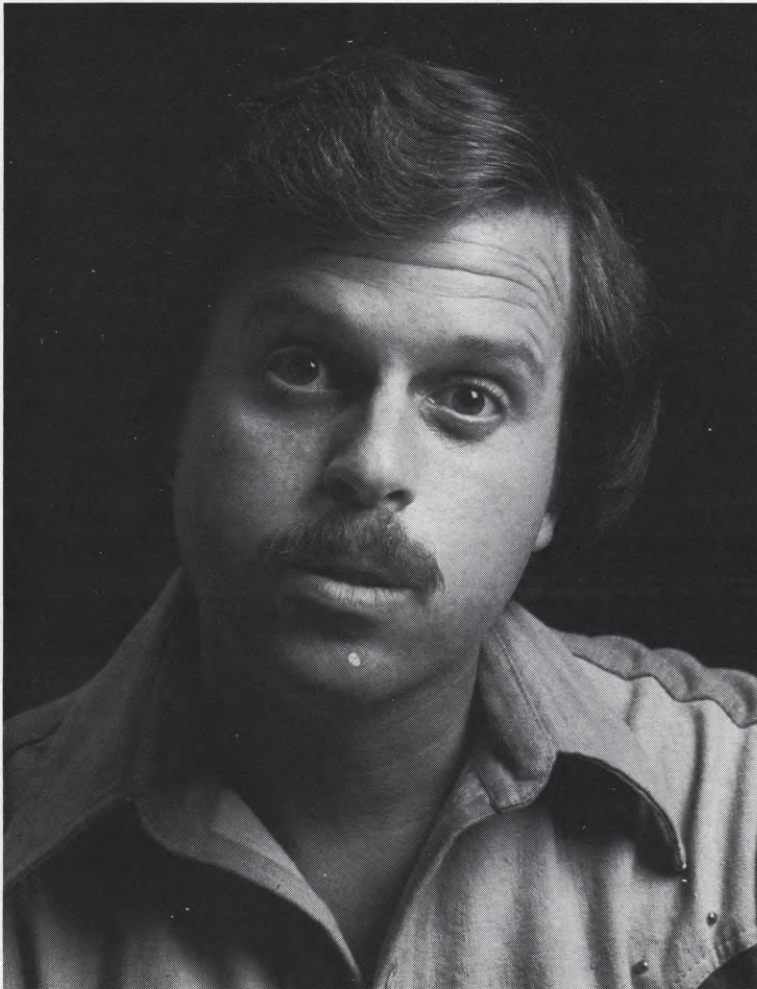
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# THE BOOKSHELF

By GEORGE L. GEORGE

## FILMING THE IMAGINARY

Almost as spectacular as its subject, *THE MAKING OF KING KONG* by Orville Goldner and George E. Turner tells the exciting story of the filming and of the men who made *King Kong*. It stresses the meticulous planning by photographers Eddie Linden, Vernon L. Walker and J. O. Taylor, the special effects supervision by Dunning and Williams and the stunning impact on audiences. (Barnes \$17.50)

Edward Edelson, in *VISIONS OF TOMORROW*, takes young film buffs on a fascinating tour of the great sci-fi epics, via Méliès *Trip to the Moon* (1902), *Metropolis* (1926), *The Shape of Things to Come* (1944), *2001: A Space Odyssey* (1968) to the current crop of visionary film and TV galactic adventures. (Doubleday \$4.95)

With his extensive history of animation, *CREATORS OF LIFE*, Donald Heraldson offers a broad survey of the innovative artists who created the genre and the techniques they developed over the years. Illustrations are plentiful, but the writing style is often uninspired. (Drake \$14.95)

In *GROKING THE FUTURE* ("grok" is sci-fi for "grasp fully"), Bernard C. Hollister and Deanne C. Thompson persuasively argue that films of anticipation can help students gain new insights into contemporary social issues, while assisting teachers in providing appropriate materials. (Pflaum/Standard \$4.50)

Designed to keep the kiddies interested, juveniles off the streets and grown-ups out of trouble, *MONSTER MOVIE GAME* is a clever film quiz book that combines an essentially educational approach (memory, observation, knowledge) with the normal interests of cinema buffs. (Troubadour Press, 126 Folsom St. San Francisco, CA 94105 \$2.)

\* \* \*

## CINEMA IN PERSPECTIVE

The progress of movies as an art and an industry is not assessed in books alone. Periodicals are the means of following events as they happen and keep readers abreast of topical



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subjects. In a collection of notable reprints, Arno Press has made available magazines of the past that afford an invaluable perspective on the developments of cinema as recorded by contemporaries.

The most significant of these reprints is *CLOSE UP*. Published in Europe between 1927 and 1933, it was the first magazine with a broad approach to the history, theory, esthetics and criticism of film. It contains articles dealing with censorship and film morals, interviews with directors and cameramen, and reviews of then current movies. (10 vols. \$245.)

An advocate of cinematic progress, *EXPERIMENTAL CINEMA*, issued from 1930 to 1934, was militantly leftist in its outlook during the depression years. Articles by Eisenstein, Pudovkin, Dovzhenko, U.S. critics Harry Alan Potemkin, Seymour Stern and Lewis Jacobs, and theoretical comments on montage, sound and camera work give it particular value. (1 vol. \$20.)

A quarterly devoted to discussion and analysis, *FILMS* ran in 1939 and 1940, reaching into every corner of international cinema in its relation with other art forms and its impact on society. Contributors included James Agee, John Grierson, Alberto Cavalcanti, Joris Ivens, Jay Leyda, Budd Schulberg. (1 vol. \$25.)

Described in Dr. George Amberg's preface as "a permanent record of a venture of historic significance," *THE FILM SOCIETY PROGRAMMES* reprints notices on some 900 movies screened between 1925 and 1939 by the London Film Society, an expert appraisal of the most important movies of their times. (1 vol. \$25.)

Sponsored by the National Board of Review of Motion Pictures, *FILMS IN REVIEW* (covering 1950 through 1953) emphasizes the preservation of factual information about the early history of cinema. Reviews of movies and of books dealing with film formed an important section of each issue, followed by articles about and interviews with leading filmmakers. (4 vols. \$125.)

A predecessor to *Films In Review*, the *NATIONAL BOARD OF REVIEW MAGAZINE* was published from 1926 to 1948. A comprehensive index to its content has been compiled by Nancy Warfield, a well organized and carefully cross-referenced guide for scholars and students. (Cinemabilia, 10 W. 13 St., NYC 10011 \$8.95)

\* \* \*

## ON AND OFF THE PEDESTAL

The status of women in films is the subject of many current books dealing with sex symbols, past and present. British film historian and scholar Roger Manvell leads off with a thoughtful survey of the star system, *LOVE GODDESSES OF THE MOVIES*, a large format volume of informative text and tasteful illustrations. (Crown \$5.98)

Gerold Frank's monumental *JUDY* (Harper & Row \$12.50) surprisingly depicts Garland as a victimizer of her entourage, rather than the victim of the exploiters of her talent and beauty. In Donald Zec's intimate biography, *SOPHIA* (McKay \$8.95), Loren's indomitable spirit, earthy optimism and motherly instincts are credited for her audience impact. In *MY LIFE* (Warner \$1.95), "adult film" star Marilyn Chambers describes candidly the means and motivations of her popularity.

Women and their role as "love goddesses" are naturally the prime subjects of books like Thomas R. Atkins' *SEXUALITY IN THE MOVIES*. This serious and literate study presents assessments by some 15 film scholars of the wide variety of trends in sex films, discussing specific movies as well as their reflection of today's socio-cultural trends. (Indiana U. Press \$12.50)

In *A PICTORIAL HISTORY OF SEX IN THE MOVIES*, Jeremy Pascall and Clyde Jeavons present a factual, illustrated film cavalcade from Edison's *The May Irwin-John C. Rice Kiss*, a "scandalous" 1896 short, to Dusan Makavejev's 1974 explicit *Sweet Movie*. (Hamlyn \$17.95)

A good-natured guided tour narrated by Marv Strick and Robert I. Lethe, *THE SEXY CINEMA* is an entertaining survey of today's permissive screen. (Sherbourne \$4.95)

Censorship is the natural twin of permissiveness. In a timely reprint, *FREEDOM OF THE MOVIES* by Ruth A. Inglis, first published in 1947, vividly recalls the historic period of self-regulation by the motion picture industry through the Hays and, later, the Johnson office. (DaCapo \$11.)

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# PROFILE: A.S.C.

## RICHARD KELLEY, A.S.C.

Most people pay large sums of money to travel around the world. Richard (Dick) Kelley has circled the globe many times — and always “on the house.”

The likeable, easy-going Kelley (an old friend of this writer from Disney studio days) was director of photography on Shell's *Wonderful World of Golf* for eight consecutive seasons, 1961-1969. During that time, he spent each February, March and April jetting from one country to another, filming the TV series on the world's leading golf courses.

In 1973, he lensed the Monsanto travelog, “Magic Carpet 'Round the World”, in a hectic 60-day assignment which took him to 25 countries. The film is now on view at Walt Disney World in Orlando, Fla.

“I never really get tired of traveling, though,” says Kelley. “I like to meet people and see new places. And I just happen to have the kind of job that takes me just about everywhere I want to go.”

Right now, Dick is working in Tucson, Ariz., as director of photography for the Paramount TV series, “Petrocelli”. It's a six-months assignment, covering 22 one-hour shows. Some people might hesitate about working in that 110-degree-plus Arizona sun during the late summer, but not Kelley.

“When you like what you're doing, it doesn't really matter where you do it,” he maintains (and you know he means it). “The weather — hot or cold — doesn't bother me, either.”

Perhaps that's the key to Dick Kelley's career — and his lifestyle. He's



always enjoyed himself.

Originally from Aberdeen, Wash., Dick and family arrived in Los Angeles when he was a six-year-old. A graduate of famed Hollywood High, he later enlisted in the Coast Guard in 1942, not long after America entered World War Two.

Starting out as an ensign, he found himself attached to the Marine Corps, in charge of a landing barge unit. “I made the first invasion in the Pacific — at Makin Island,” he says proudly. “And before the war was over, I took in the Marines on 14 invasions.” On discharge in 1945, he was a lieutenant, senior grade.

Back home, he went to work in the camera department at Technicolor, learning the basics of a new trade. He was there seven years.

“I figured it was time to move on, then,” says Dick, with a grin. “I got a job as an assistant cameraman at Paramount in 1952, and that got me going in the feature film business.”

He worked on numerous Paramount features (including the memorable “Shane”), before checking in at the Disney lot in Burbank in 1956.

During nine years with the Disney organization, Kelley worked on most of the major motion pictures and television series produced there.

“It was a real pleasure working there, as you know,” he reminisces. “Walt was such a meticulous man — he wanted everything real. And his research department always spelled out every detail.”

But in 1964, Dick Kelley moved on, to several other Hollywood studios. He had already embarked on the Shell golf series, however, while still spending most of his time at Disney. In 1964, he won the assignment as director of photography on the half-hour TV series, “Felony Squad”, which starred Howard Duff.

Subsequently, he was cinematographer on “The Ghost and Mrs. Muir”, (“Hope Lange is one of my favorite people”); “Name of the Game”, 90-minute shows produced at Universal; and more recently, “Love, American Style” and “Happy Days” at Paramount.

His feature credits as cinematographer include “The Biscuit Eater” and “Justin Morgan Had A Horse”, both Disney productions, “Top of the Heap”

and “Maharlika.”

Prior to the current Tucson assignment, Kelley also photographed the pilot TV show of “Robin Hood,” the Mel Brooks series which debuts this fall.

One of his chief career ambitions came in 1968, when he was admitted as a member of the American Society of Cinematographers. “I always told myself that, if the A.S.C. would accept me as a member, then I really had arrived in Hollywood,” he comments.

Another highlight came two years ago, when he re-visited his home town of Aberdeen, Wash., while filming a John Wayne movie near Seattle.

“Our film company was in the area for seven weeks, so I got plenty of opportunity to meet up with family friends. We even filmed a part of the picture in and around Aberdeen.”

Twice married, but now single, Dick lives in a San Fernando Valley home built by the late John Garfield. His 22-year-old son, Steven, lives next door, along with Dick's father.

“My boy has a talent for landscaping,” he notes, “but for now, I want him to go back to school. So he'll enter Pierce College this fall.”

As might be imagined, Dick Kelley is a man of many interests. In addition to travel, he likes to play golf and swim. He's a member of the Universal golf club, but doesn't get to join in their tournaments very often because he's usually working.

At home, he dabbles in carpentry and spends a good part of his spare time shooting and processing his own still photography.

He'd also like to be a good skier, but decided discretion was the better part of valor after he broke a leg on his second skiing attempt on Mount Waterman, near Mount Wilson, Calif.

Right now, though, Dick Kelley is thinking “Petrocelli.” That's his current assignment — and that's always the job Dick likes to talk about the most.

“I photographed eight shows on ‘Petrocelli’ last season, also in Tucson, and I liked working with this production crew,” he enthuses. “The producer (Leonard Katzman) asked me if I wanted to do the whole shebang this season, so I said ‘fine.’ They're a good group.”

The Paramount crew of about 50 is billeted mostly at the Hilton Inn in Tucson, and Dick gets the opportunity (if he wants it) to fly back to Los Angeles every so often.

Chances are, though, that he'll spend almost all of his spare time close to the “action.” He's a professional — and professionals stay on the job until it's done.



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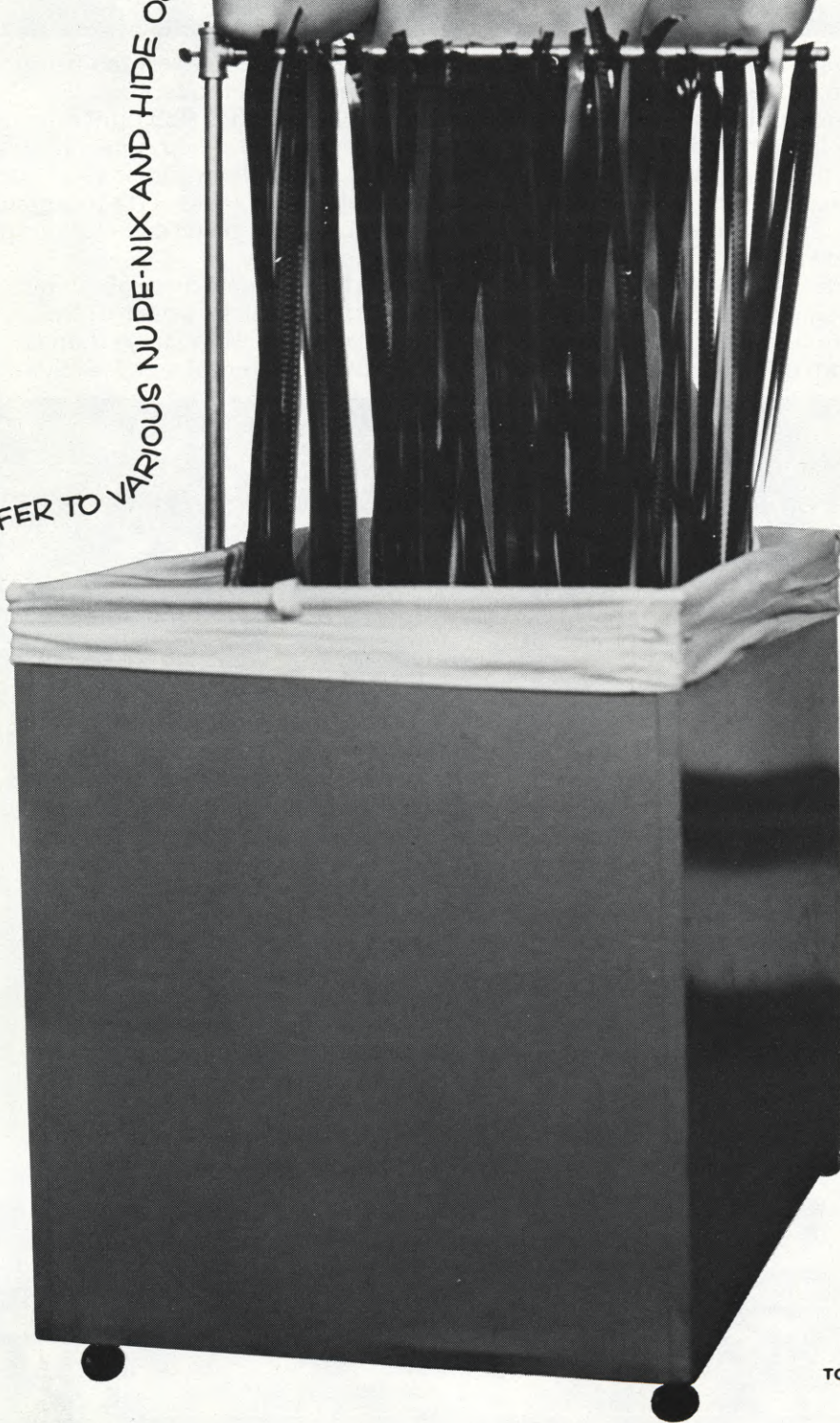


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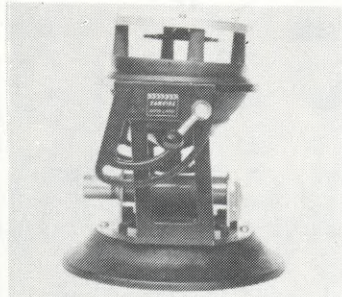
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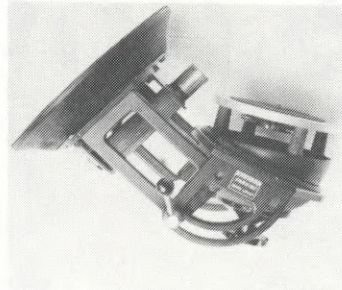
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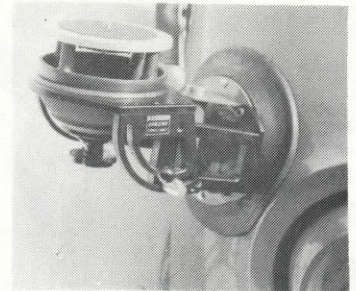
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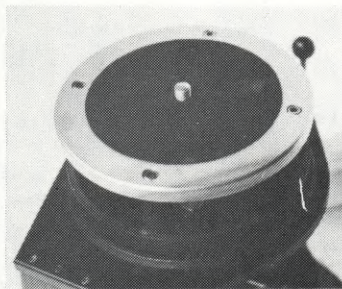
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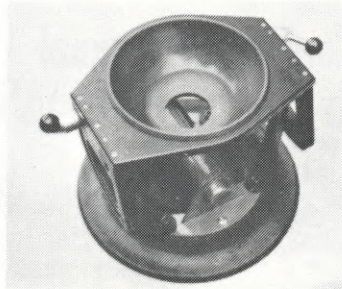
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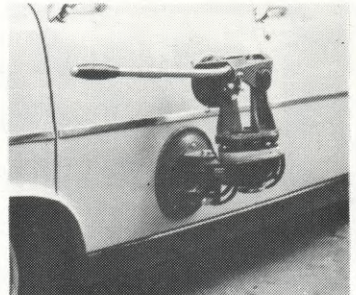
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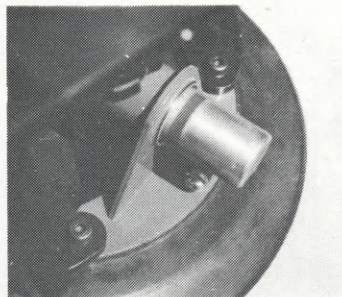
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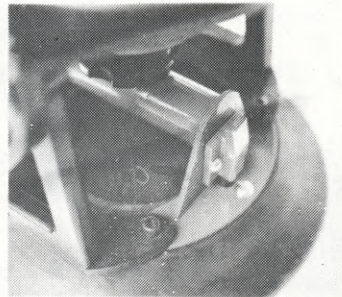
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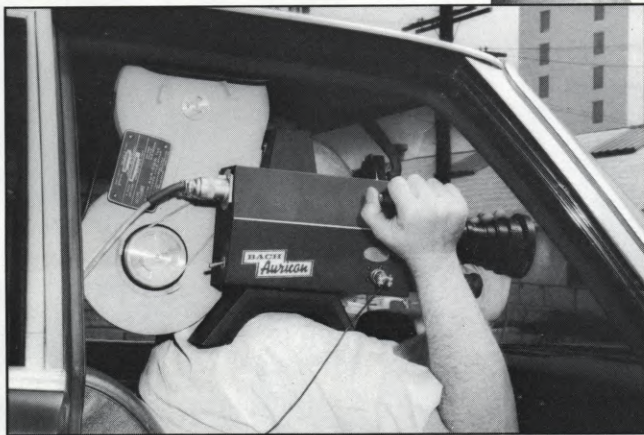


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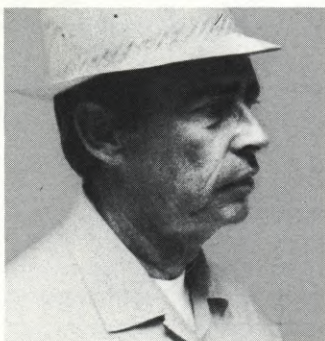
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# Film speed enhancement at CFI

Comments by cameramen on CFI's AL200 and AL400 system with EK 5247 negative:

**“W**e wanted to create a documentary look for *Streets of San Francisco*,” says Director of Photography Jacques Marquette A.S.C., in the August *American Cinematographer*.



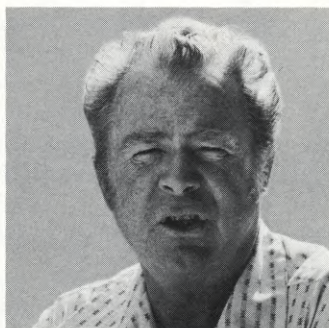
Jacques Marquette A.S.C.

## 200 or 400 ASA

“Our tests with CFI showed that 5247 could be rated at 200 or 400 ASA, using their AL200 and AL400 process. So we went with that for some location interiors and night scenes.”

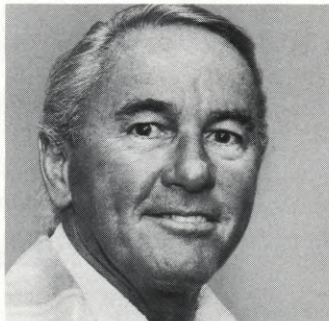
## 5 foot candles!

“On some problem locations, we were able to light as low as *five foot candles*,” says Mr. Marquette. “In general, minimal lighting gave us the realistic look, and it let us make faster setups.”



Jack Swain A.S.C.

Jack Swain A.S.C. says: “Using AL200 saves time and energy. Shooting *Cannon*, I use it all the time for ‘live’ interiors. It looks as good as footage shot at ASA 100.”



Robert Hauser A.S.C.

“On one feature that I shot, I had some 5247 forced at another lab — and there was grain running all over the place,” says Robert Hauser A.S.C.

## Choose the lab

“The producers had a deal with that lab. But after I protested, they told me to send the footage for forcing wherever I chose.”

## Night at 3 PM

“On another show,” says Mr. Hauser, “We suddenly got a hailstorm at 3 PM. The sky had to be in the background — and it was literally like *night*.”

## Off the meter

“I had *one* light, pulled way back to balance the actor's face against this black sky. I decided to go to AL400 — and even then... the reading was *f/1.2*.”

## ASA 400 day ext

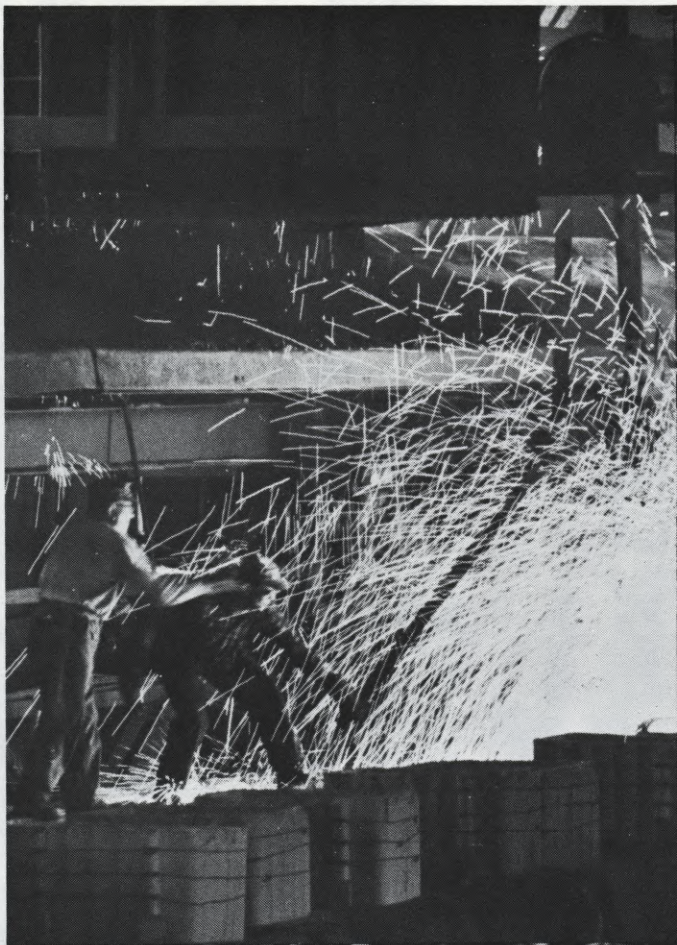
“So once again, I told the producers: If you want this shot, it has to go to CFI. It looked fine.”

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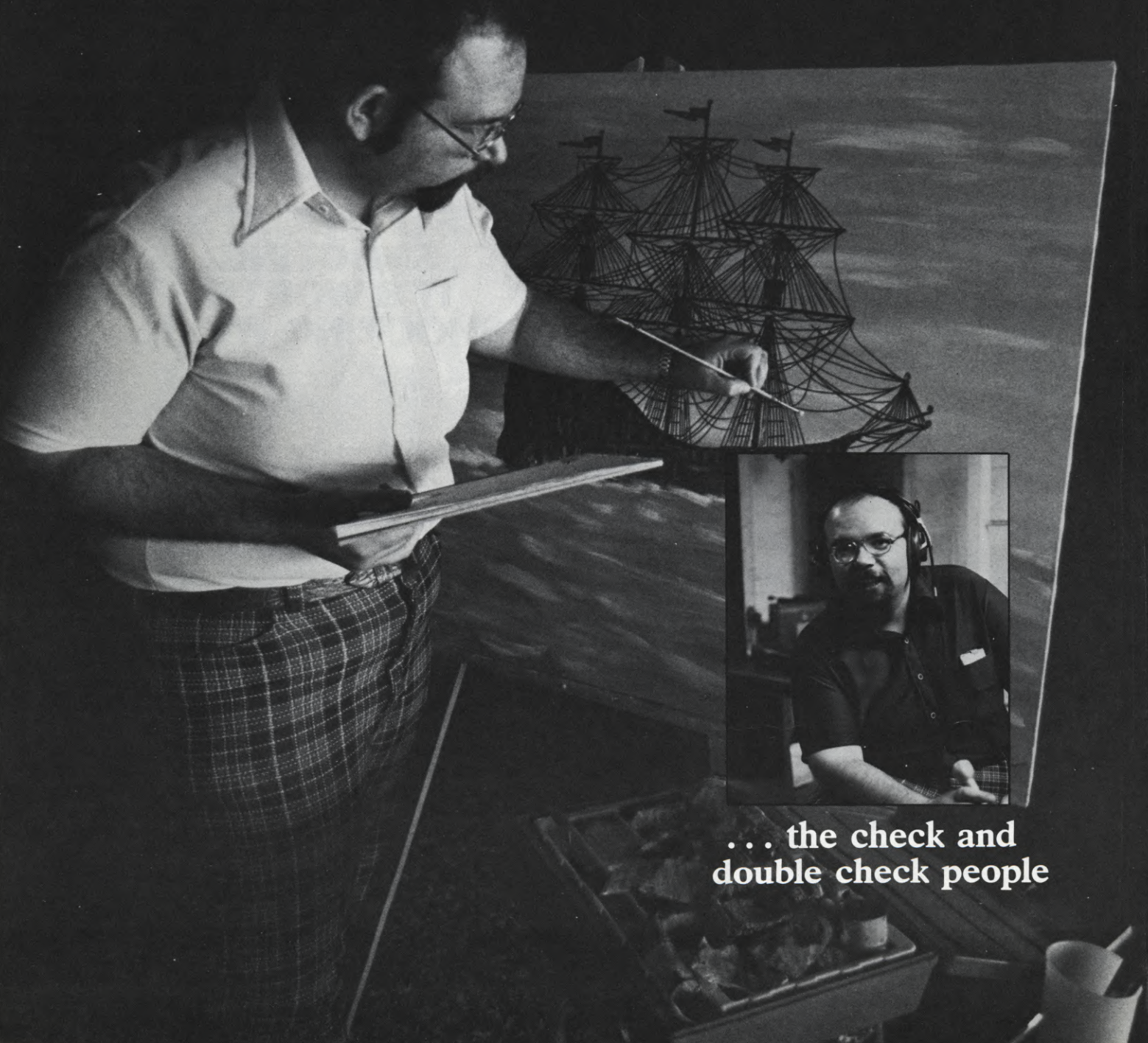


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... the check and double check people



# CONRAD HALL, ASC CONDUCTS MAINE PHOTOGRAPHIC WORKSHOPS SEMINAR

A picturesque Maine fishing village provides an inspiring locale for an in-depth, one-week cinematography workshop conducted by one of Hollywood's most talented and respected Directors of Photography

By ANTON WILSON

The Maine Photographic Workshops offered a six-day seminar this past July 20-26 with Conrad Hall, ASC. It happened to be in Northern New England that week and, being a fan of Conrad Hall, I made a slight detour of 250 miles to spend the day with the seminar group in Rockport, Maine. You could not imagine a more picturesque location for a film seminar. Rockport is a real old-fashioned New England fish-

ing village and port. The atmosphere is very relaxed and down-home.

The enrollment for the seminar was held to about 15 participants to ensure individual attention. There was indeed a close personal rapport between Mr. Hall and the students as well as among the students themselves.

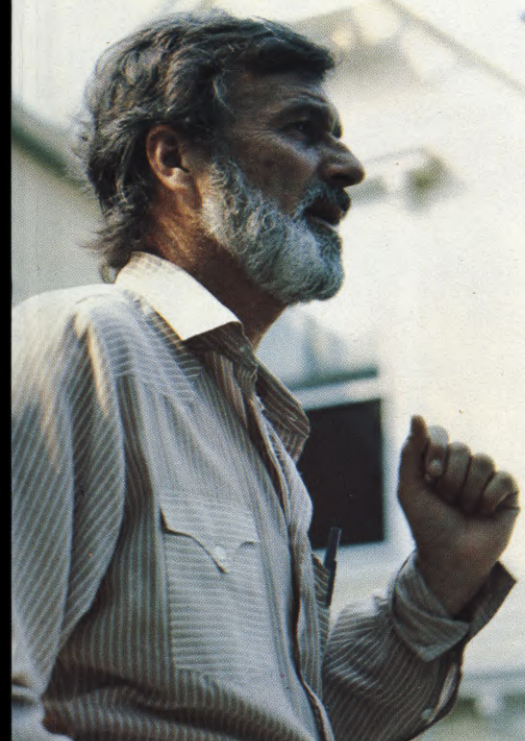
The seminars consisted mostly of screenings, both in the afternoon and evening. Students' films would be shown, followed by a group discussion and critical comments by Mr. Hall. Each evening a film of Conrad Hall was shown. Among those screened were: "BUTCH CASSIDY AND THE SUN-

DANCE KID", "IN COLD BLOOD", "FAT CITY", "THE PROFESSIONALS", "ELECTRA GLIDE IN BLUE", "COOL HAND LUKE", and "THE SABOTEUR OF MORITURI". Mr. Hall conducted a discussion after each film and answered questions.

This screening and open discussion method is an excellent way of analyzing and improving one's filming technique. You not only get comments on your own films, but you get to see a very diversified sample of work by other cinematographers. The participants were very pleased with the

Continued on Page 1223

(LEFT) Academy Award-winning ("BUTCH CASSIDY AND THE SUNDANCE KID") cinematographer Conrad Hall, ASC conducted the cinematography seminar, which was limited to 15 participants in order to insure individual attention. (RIGHT) The quiet harbor at Rockport, Maine, scene of the seminar. Rockport, a real old-fashioned New England fishing village, provided a very relaxed and "down-home" atmosphere.



(LEFT) The seminars consisted mainly of screenings, both in the afternoons and evenings, with student films being shown, followed by group discussions and critical comments by Hall, who also screened seven of his own features as Director of Photography. (RIGHT) The instructor demonstrates a point using a hand-held Arriflex camera. The seminar was described as "a complete success, as well as an enjoyable change of pace." (Photographs by WILLIAM O. MITCHELL.)





# THE FILMING OF "PROBES IN SPACE"

By **GEORGE V. CASEY**

*Writer/Director/Producer*

*Vice President, Graphic Films Corp.*

Familiar locations, these: the rust-colored deserts of Mars; the hellish landscapes of Venus, the scorched and cratered surface of Mercury; Jupiter's turbulent cloudscape.

I had recently "toured" these inhospitable worlds while writing, directing, and producing a short theater film, "PLANET-OCEAN", which was honored with an Oscar nomination last year.

And now I was going back, this time at the request of one of our favorite clients, The Reuben H. Fleet Space Theater in San Diego. For their Summer/'75 program, they commissioned our company, Graphic Films Corporation, to produce a 23-minute, 70mm motion picture about Man's most recent discoveries about these planets, derived from data returned by the unmanned NASA and Russian space probes.

The resulting production, "PROBES IN SPACE", faced some challenging limitations. The budget dictated that the film be in standard, 5-perf. 70mm rather than in the Omnimax format (15-perf. 70mm) which the unique San Diego Space Theater is also capable of exhibiting — and in which format the companion feature would be produced. This meant we would be filling approximately half of the theater's tilted dome screen. The luxury of completely enveloping the audience's field of view — which we had enjoyed in the production of "VOYAGE TO THE OUTER PLANETS" (*American Cinematographer*, August 1973) — was no longer

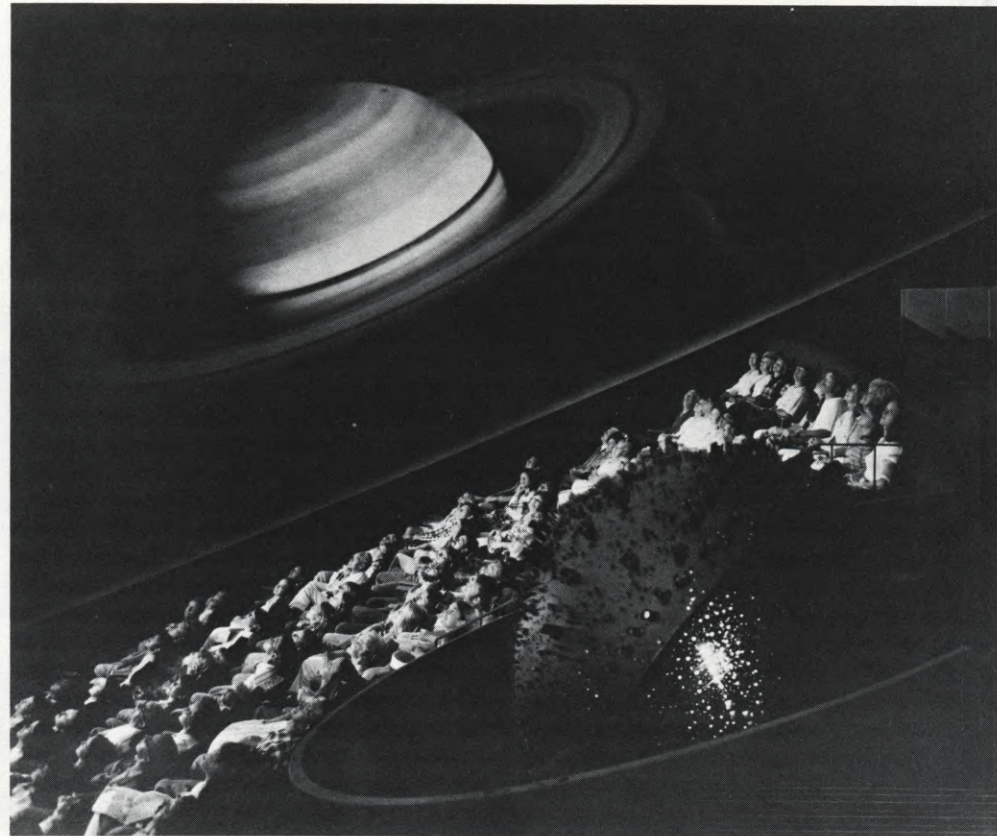
**Today the Solar System, Tomorrow the Universe—all in the day's work for this company of artists and artisans who, with motion picture cameras, explore worlds as yet unvisited by Man**

ours. More-than-usual care in the composition of each scene would be required, as would convincingly realistic three-dimensional models of planets and spacecraft which would stand up under the large screen magnification and the proximity of the theater audience.

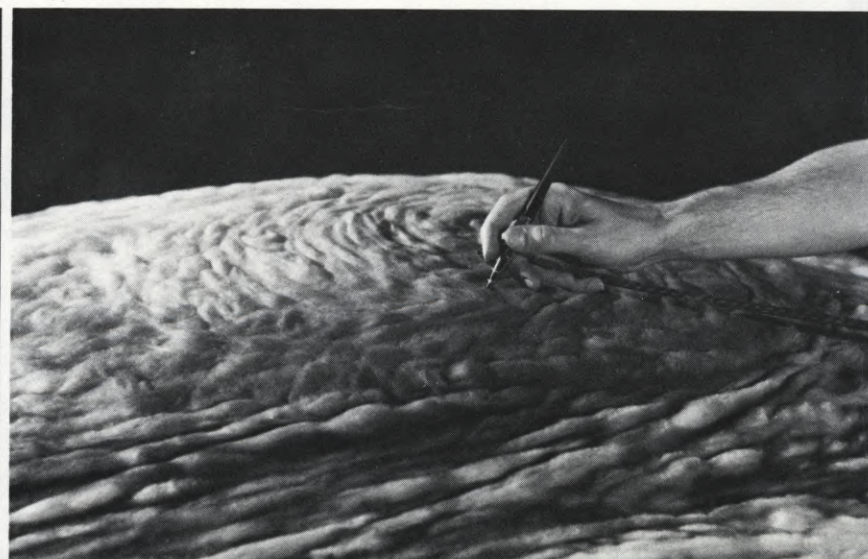
Since we couldn't fill the screen, that

portion we could fill had to be interesting and believable enough to cause the audience to forget the cinematically uncultivated acres of screen surrounding it.

We had some advantages, however: absorbing subject matter; our studio's considerable inventory of excellent three-dimensional models of planets



(ABOVE RIGHT) An audience lies in comfortable "reclining" chairs, as ringed Saturn soars above on the unique tilted dome screen of San Diego's Reuben H. Fleet Space Theatre. (BELOW LEFT) Artist Don Moore airbrushes model of Great Red Spot used in Jupiter sequence of "PROBES IN SPACE", the featured summer attraction shown in the Fleet Space Theatre. (RIGHT) The surface of the model was formed of cotton and polyester fibre, shown here sculptured upon a shallow section of the sphere.







**Airbrush artist Moore completes retouch of a composite of photographs representing distortion of the surface of the planet Venus, caused by refraction of its strange atmosphere. Because of budget limitations, the film was shot in standard 5-perforation 70mm, rather than in the huge Omnimax format (15-perforation 70mm) which the spectacular Space Theatre is also capable of exhibiting. This meant that the picture would be filling approximately half of the theatre's vast screen.**

and planetary surfaces and features; and full access to appropriate spacecraft models from NASA, Jet Propulsion Laboratory and TRW Corporation.

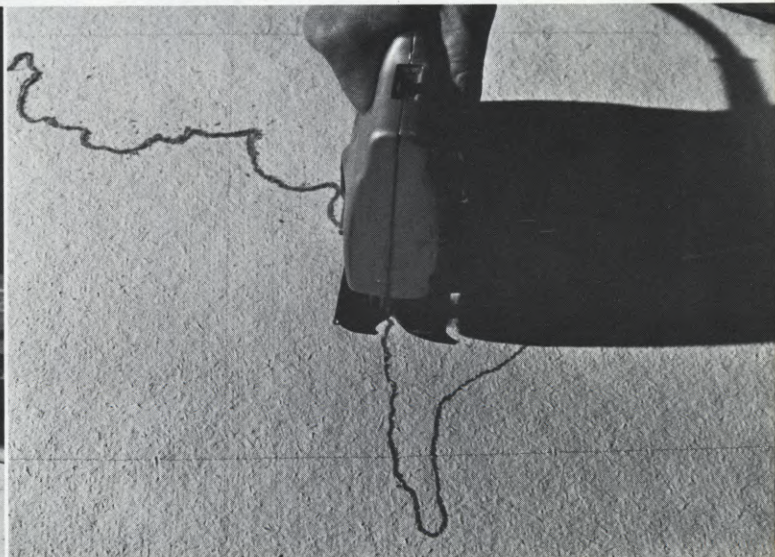
We also had the accumulated equipment and techniques from a long genealogy of space films which Graphic Films has produced over recent years, including "MARS, THE SEARCH BEGINS", "COSMOS",

For "PLANET-OCEAN", I had relied almost exclusively upon three-dimensional models for the surface features of the planets. Some, such as the models of the Martian features (canyons, craters, caldera, river beds) had been faithfully translated from "SPACE IN THE SEVENTIES", "TO THE MOON AND BEYOND", and several dozen more.

Mariner 9 photographs into models of exceptional detail and accuracy. A talented corps of artists — Colin Cantwell, Don Moore, Dietrich Friesen, and Marion Connor — utilized fibreboard, plaster, modelling plastic, powdered pigments and delicate air brushing to achieve miniature Mars-scapes of striking verisimilitude.

(These same models were originally

**Colin Cantwell, an accomplished model maker, as well as director/ animator/ writer of previous Graphic Films space pictures, saws a layer of fibreboard which will form a layer in a topographical build-up for a three-dimensional model of a Martian canyon system. The production company has an "inventory" of excellent three-dimensional models of planets and planetary surfaces and features, and full access to appropriate spacecraft models from NASA, Jet Propulsion Laboratories and the TRW Corporation.**







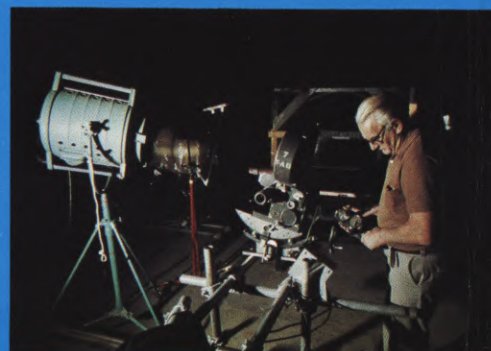
Completed Mars river channel exemplifies heightened detail and degree of believability achieved with models used in Mars sequence of the film.

(OPPOSITE PAGE, TOP) Windswept sand dunes, filmed in desert near Yuma, Arizona, represented Martian sandstorm where winds can exceed 300 miles an hour. Color timing of print in lab matched colors to best estimates of those existing on Mars. (CENTER) Turbulent cloud bands encircling the giant planet Jupiter were sculptured from polyester fibre and later airbrushed to match actual colors detected by Pioneer space probes which recently flew by the planet. (BOTTOM) Terrifying distortion which exists on surface of Venus because of the refraction of the extremely dense atmosphere is represented in this scene from the film. Dozens of still photographs shot with "fish eye" lenses were collaged together to create the required art work.

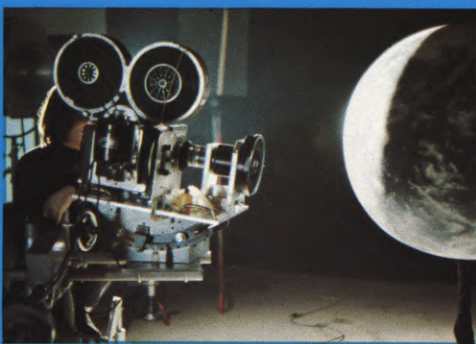
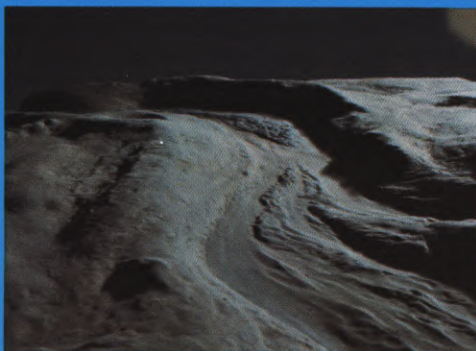
employed in "MARS, THE SEARCH BEGINS", a film directed by Lester Novros, President of Graphic Films, and a production which has won innumerable awards. For that film, the models were photographed with the Kenworthy Snorkel Camera System, giving the illusion of "flying" over, and through the terrain of the models. Unfortunately, the 65mm format in which

"PROBES" was shot prohibited the use of the snorkel.)

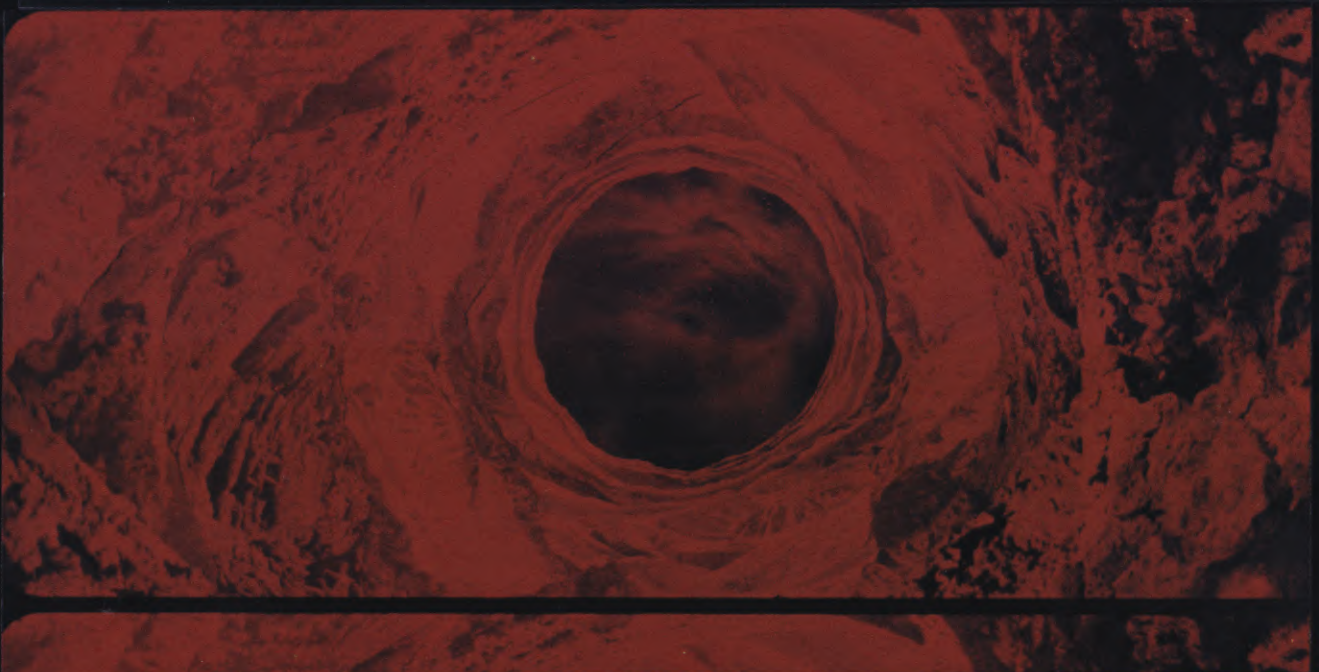
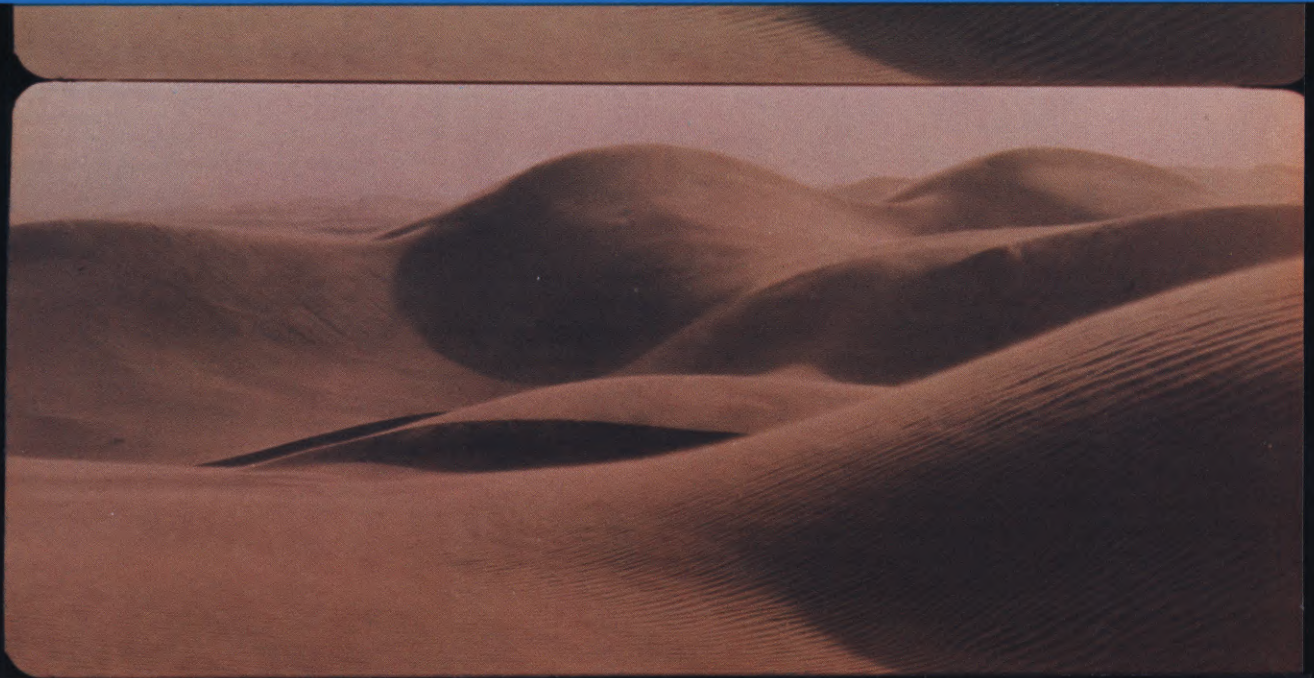
Other models allowed for some artistic license. A featured asteroid came not from a local planetarium or museum nor the half-dozen rock and landscaping yards I scoured, but from my wife's backyard rock garden. And the surface of Mercury I created in **Continued overleaf**



The Almighty, it is said, created the entire Universe in just six days (ask any Monkey Trial juror), but at Graphic Films Corp. the recreation of our relatively tiny Solar System for the cameras took considerably longer than that, with authenticity, based on accumulated scientific data, being very important. The company has collected equipment and techniques from a long genealogy of space films produced in recent years. Utmost care is taken in lighting and photography in order to create an illusion of reality.









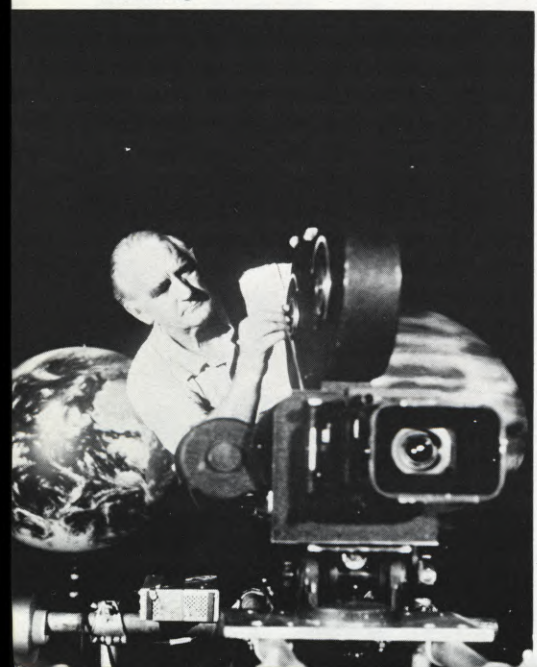


**George Casey, writer-director of "PROBES" assembles three-dimensional model representing surface of planet Mercury. Model was collaged from dozens of slag spillings selected from Fontana plant of Kaiser Steel.**

collage from dozens of slag spillings collected at Kaiser's Fontana steel plant.

For "PROBES", however, I hoped to invest the Mars and Mercury sequences with an even stronger you-are-there believability. An extensive search for geological formations approximating Martian features drew us to Death Valley, California, where the stark, unvegetated landscapes provided me and my Director of Photography, James Connor, with a wide variety of analogous features: volcanic formations, canyons, sand dunes, and starkly sculptured forms representing the wind and fluid erosion which have also shaped the surface of Mars.

**James Connor, cinematographer of "PROBES IN SPACE", mounts magazine on 65mm Todd-AO camera used in shooting.**



In the timing of the projection print, we would later alter the basic colors of the landscapes to match the true colors of Mars and of our three-dimensional models of that planet.

An ancient lava field in the Mojave Desert served for the volcanic flocs of Mercury. And a severe sandstorm in the Yuma, Arizona sand dunes stood in very convincingly for its Martian counterparts. I and my brother, Harry, who together photographed the sandstorm, can attest (after removing sand from ears, nose, throat, and teeth for days afterwards) that Mars may be an interesting place to visit, but hardly an enticing site for homesteading.

Aerial photography of storm clouds and extensive stop-motion filming of clouds from the ground, using selected color filters, were utilized in portraying the cloud systems of Jupiter and the perpetual cloud cover of Venus. Large, three-dimensional cloud models, sculpted from cotton and polyester fiber and painted with airbrush techniques, were used to represent Jovian clouds in larger scale.

Filming was not without its setbacks. More than a thousand feet of our best footage was lost in a lab processing accident, necessitating a week of reshooting at Death Valley. Three different sandstorms were filmed before we achieved the quality we wanted. Camera malfunctions were to ruin a number of unduplicable shots.

More than once, Mother Earth seemed to object to being cast as other planets. While filming the storm cloud footage for the Jupiter sequence, our camera aircraft was blown far off course, and severe headwinds prevented us from returning to Los Angeles. The plane, a Beech A-11 specially converted to aerial cinematography, remained grounded on a small airfield in the Mojave desert for two days before we could take to the air again to complete the shooting. Later, in the final stages of production, Mauna Loa, the great volcanic mountain in Hawaii, began erupting, providing the exciting prospect of a beautiful segment on the volcanic history of Mars or Mercury. Yet twenty hours later — even before we could catch a plane — all volcanic activity ceased.

Thus embattled, necessity again mothered invention. Footage of "Martian" canyons, shot in high winds with a 600mm telephoto lens, we discovered afterwards, had a noticeable, trembling unsteadiness when viewed in large-screen magnification. Layering the soundtrack through this sequence of the film with an ominous quake rumble (yes, Mars and Southern California share that habit, too) turned that

defect into a nice — and, it can be admitted here, totally serendipitous — visual enhancement.

Later, the camera returned the favor to the soundtrack. A minor light leak in our 65mm camera had conferred fascinating flash-frame patterns to the head and tail lengths of some of our color-gelled aerial shots of Jupiter's clouds. Several of the best of these — later synchronized to the monumental crash of thunder on the sound track — enabled us to represent the massive lightning bolts which occur within Jupiter's immense and violent cloud layers.

By contrast, most of the shooting was quite premeditated and controlled. Several techniques we devised will



**Sculptress Marion Connor develops models of Martian volcanic mountains. Foreground model shows topographic build-up made with fibreboard sections.**

illustrate. Since travelling mattes were unaffordable within the budget (and my strong preference is to incorporate all the elements from the multiple passes which would comprise the shot within the single original negative), we constructed a very versatile and useful "self-matting" star-field process.

This required the construction of a large, upright backdrop of plexiglass sheeting, backlit by a battery of fifteen 500-watt photofloods. The front was



(TOP RIGHT) Modelling plaster is used to form contours of model of huge volcanic mountain discovered on Mars by mission of Mariner 9 space probe. Photograph returned by telemetry (lower right) is used as a constant reference. (CENTER) Model of massive caldera of Mars volcano acquires near-final form. Cheesecloth saturated with modelling plaster is shaped around fibre-board topography to represent tortured lava flows. (BOTTOM) Model-maker Dietrich Friesen surveys partially completed model of ancient Martian river channel.

given an opaque thickness of flat black paint. Thousands of "stars" were then pecked into the paint, representing whatever number, magnitude, or constellations of stars each shot might require. The order of the heavens could be easily rearranged by any amount of repainting and repecking. Fashioning the cosmos in this manner, incidentally, can give one an intoxicating feeling of power, if not disturbing new theories about the creation of the Universe.

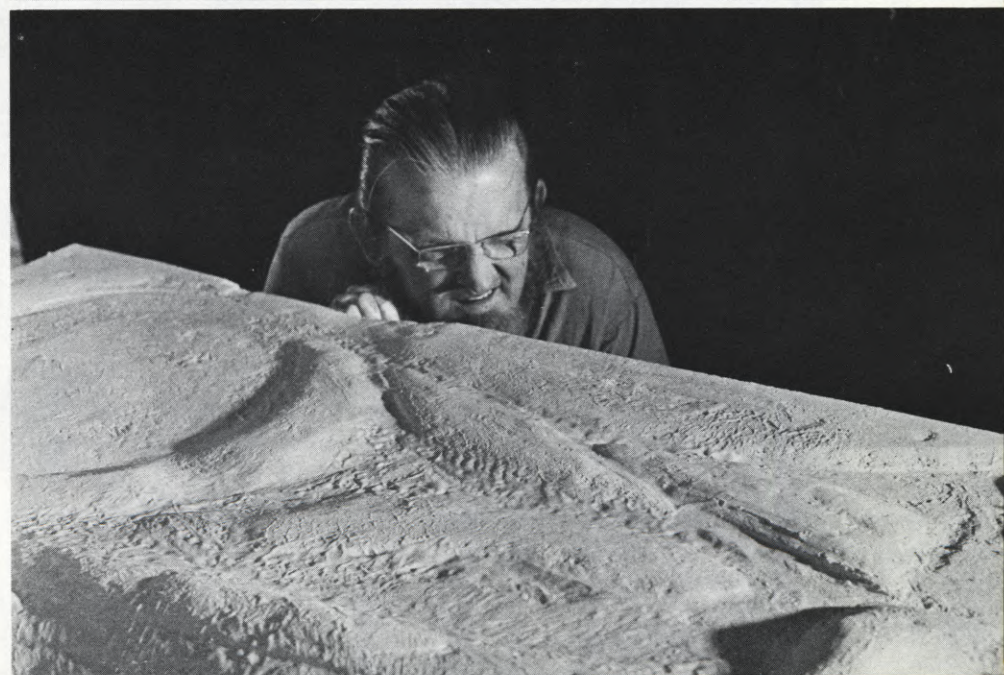
Selected areas of the star field could, of course, be opaqued to allow for inclusion of an element such as a planet or a spacecraft on a later pass; or the same could be achieved by appropriate masking on the matte box before adding the star pass.

For more critical matting, we often used the model to create its own travelling matte. For example, if we wanted to film a spacecraft moving across a star field, our first pass would photograph the model, moving alone, fully illuminated. Then, having backed up the film to the same start frame and the model to the same start point, we would backlight the star field and reshoot the scene with the unilluminated model moving in matting silhouette across the starfield. Since changes in focus from models to star field involved some change in magnification of the model image, a considerable amount of care and practice is required to master this technique. Interlock of camera and track, of course, is also desirable.

One other important consideration dictated the use and placement of live action photography in "PROBES". That was my strong desire to heighten, wherever possible, the credibility of the models. To certify the reality of the space craft models, for example, I used a series of matching dissolve zoom shots from models to full scale prototypes of actual and identical spacecraft which we filmed at Jet Propulsion Laboratory in Pasadena.

To make the Mars surface models more believable, I dissolved to an

**Continued on Page 1222**





# A NEW BAJA CALIFORNIA LOCATION FACILITY TO SERVICE HOLLYWOOD

Just South of the Border lies a new movie town, Cine Pueblo, built with backing from the government of Baja California to provide a complete and varied location filming facility

By DON KADER

Most U.S.-Mexican border towns conjure up one impression: sidewalk hawkers, runny-nosed kids selling chewing gum (or what-have-you), and a plethora of squalor.

However, crossing the border at Tecate — 30 miles east of Tijuana — belies that picture. After winding across the picturesque back country of San Diego and passing through such wide spots in the road with equally picturesque names — Jamul, Dulzura — you approach a neat, mission-styled building housing both U.S. and Mexican customs and immigration offices. As you are courteously waved through by the Mexican officials, you enter a paved, clean, wide street bordered with small businesses that leads you to the town plaza. Here, amid manicured

lawns and shade trees, the local populace meet to exchange gossip and let the children enjoy the oasis-like quality of the place.

For years, Tecate's main source of income has been the Carta Blanca brewery and the affluent Beverly Hills ladies who come to La Puerta — variously referred to as "The Golden Door" or "The Fat Farm" — to expensively rid themselves of excess suet.

Now, however, Tecate has changed from the traditional "mañana" attitude to a vibrant, "now" atmosphere. The cause of the excitement is the creation of a new industry for both the city and the State of Baja California — motion pictures.

Spearheaded by Baja Films, S.A., and its dynamic president Octavio



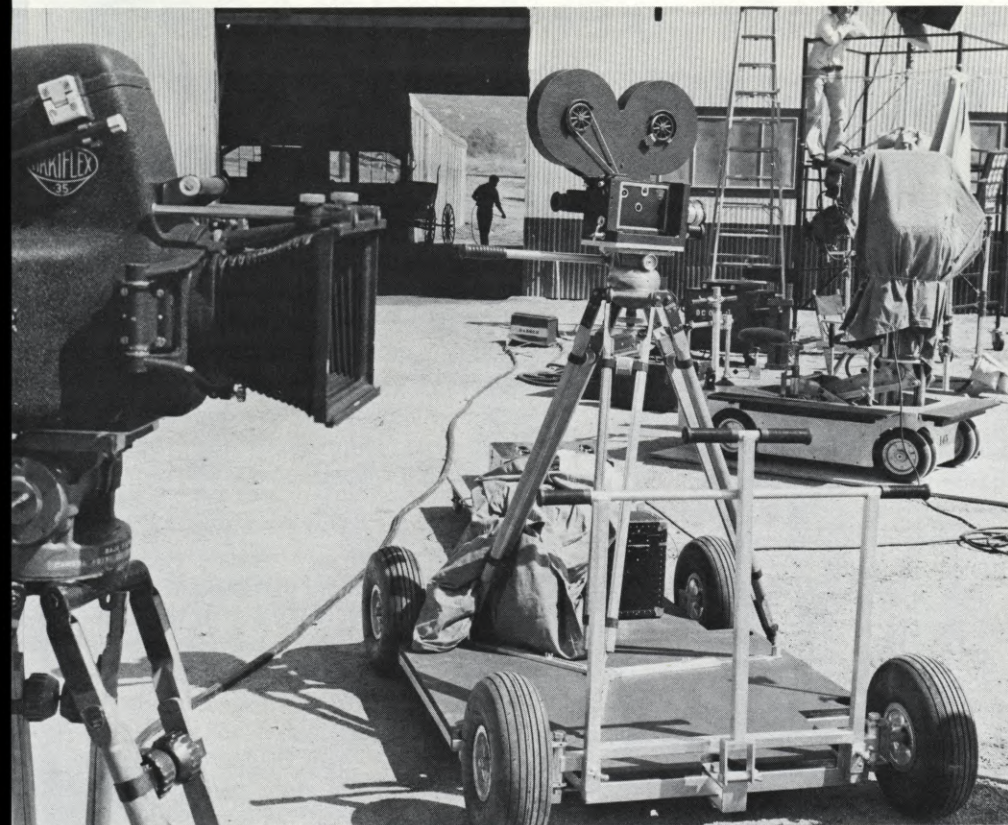
(ABOVE RIGHT) Roy Isaia, President, Matthews Studio Equipment, Inc.; Francisco Santana, Lt. Governor, Baja California; Milton Castellanos, Governor, Baja California; Octavio Elias, President, Baja Films. (BELOW LEFT) The main street of "Rumorosa", 19th Century Western town set at Cine Pueblo. (CENTER) "Wild Horse Saloon" in the movie town of "Rumorosa". (RIGHT) The Mexican Village" portion of Cine Pueblo. This building doubles as housing for film crews and contains all modern conveniences.



(LEFT) Grip truck designed for Baja Films by Matthews Studio Equipment, Inc. (CENTER) Lighting truck designed for Baja Films by Matthews Studio Equipment, Inc. (RIGHT) A covered wagon heads down the main street of "Rumorosa". In addition to the Western town and Mexican village sets, there is presently in the design stage an Indian village replete with teepees, ceremonial firepits and totem poles, which will be located on the shore of an artificial lake.







Some of the equipment available at the Baja Films compound in Tecate, B.C. Roy Isaia, formerly a key grip at Paramount Studios, served as a consultant to Baja Films President, Octavio Elias, in determining the optimum equipment list for the company. It is quite impressive and is being added to daily.

Elias, in consort with Alfonso Sanchez Tello of Mexicali Films, S.A., and with backing from the government of Baja California, a complete motion picture location facility is emerging.

On June 14 last, more than 100 invited guests (and nearly half again as many uninvited) toured the facilities of Baja Films (located in a compound on the outskirts of Tecate) and roamed the streets of Cine Pueblo — Movie Town.

Cine Pueblo is a uniquely designed cluster of outdoor sets depicting from one angle a complete American mid-19th-century western town, and from another, a typical Mexican village. Presently in the design stage is an Indian village replete with teepees, ceremonial firepits and totem poles which will be located on the shore of an artificial lake.

Nestled in the center of historic Rancho Las Juntas, some 18 miles southeast of Tecate, Cine Pueblo offers movie-makers an almost infinite variety of terrain to choose from. As we toured the 5,000 acres devoted to Cine Pueblo in this beautiful mountain valley, we could easily envision not only western locales, but sites for war films (the steep hills were reminiscent of parts of both Italy and Korea), and sci-fi epics (some rock formations looked almost moonscapish). And within easy reach of the ranch lie both the arid desertland

around Mexicali and the awe-inspiring beaches and coastal cliffs between Tijuana and Ensenada.

But what about equipment, shooting facilities and accommodations? Baja Films seems to have the total answer to those questions. Elias has equipped his company with just about every item needed for location shooting.

The wealthy Sonora cattle rancher and Mexican film backer went to Roy Isaia, president of Matthews Studio Equipment, Inc., in Burbank, to have his fleet of camera, grip, electrical and projection trucks designed and built. Isaia, formerly a key grip for Paramount, acted as a consultant to Elias in determining the optimum equipment list for Baja films. The list is quite impressive, and is being added to daily.

Okay, so much for the facility and capability. But what's the real reason for Baja Films and Cine Pueblo, and how does this venture propose to compete with Durango or Tucson or New Mexico?

According to Elias, the consortium was formed for four primary reasons: (1) to create jobs for Mexican citizens along the California-Mexican border; (2) to provide a low-cost location site and production facility for Hollywood producers; (3) to establish a new

**Continued on Page 1215**

Roy Isaia and Octavio Elias check out the 35mm Mitchell camera and dolly at Baja Films headquarters in Tecate. The company now has a fleet of camera, grip, electrical and projection trucks, designed and built to Hollywood standards. Cine Pueblo is a matter of minutes by air from Hollywood and there are Mexican and American Customs facilities at Tecate to expedite bringing in equipment.





# COMPARING CARBON ARC, XENON, SELECTED INCANDESCENT AND METAL-HALOGEN LAMPS

To clear up possible confusion, an in-depth comparison of various lighting modes available to the cameraman, including the various trade-offs pertinent to each

The Osram Metallogen® HMI lamp is a high-intensity discharge (HID) light source offering two vital attributes that only carbon-arc and xenon lamps presently afford: namely, full daylight spectrum, and a highly compact source.

To some extent, incandescent lamps provide near-daylight output too, but often require filters to compensate for blue-end-of-the-spectrum deficiency. Use of filters further degrades already-poor lumens/watt efficiency. The alternative of running incandescent lamps at higher temperatures to improve the color spectrum, in turn, drastically shortens lamp life. A further disadvantage of incandescent lamps is that in higher-powered designs, the filament is relatively bulky; therefore such lamps no longer resemble a good point source light.

## NEED FOR FULL COLOR

Many applications in the theater, in motion picture photography and projection, in television and in commercial and industrial photography require a light source that simulates daylight. Too, there are industrial applications involving the matching of fabrics, paints, and dyes. Motion and still photograph reproduction, color reprographics and color xerography and the graphic arts field, also demand full spectrum light sources.

## NEED FOR COMPACT SOURCE

An ideal light source, from the viewpoint of optical control, is a point source, since it permits use of accurate lenses, mirrors and other optical apparatus to put the light exactly where it is needed. Exact projection of light, and control of its intensity and color content, is of great importance in the live theater, in motion picture and television photography, in motion picture projection, and in public events for the selected highlighting of sport scenes, political figures, etc. The near point source nature of a Metallogen® lamp's arc discharge allows daylight quality light to be projected accurately over considerable distances to illuminate, for example, a political speaker, a theater scene or the unusual features of an architecturally or socially significant building.

## FEATURES OF FOUR LAMP TYPES

### CARBON ARC

Although it is mankind's oldest electrically-powered light source, the carbon arc suffers from basic and quite serious drawbacks that are making it obsolescent in today's cost and safety conscious world.

For a start, the carbon arc lamp continuously consumes (i.e., literally burns away) its carbon electrodes, requiring an operator or technician to fit new carbons whenever the old ones burn out. In fact, because the carbon tips are continuously eroding during lamp operation, a method of readjusting arc length is required in order to sustain correct arc current and light output.

Besides burning up carbons, which today are an exorbitant operating cost, the consumption of the electrodes creates fumes and ash, which invariably require costly and elaborate ventilation ducts for their removal. The arc lamps' internal mirrors, lenses, and other optical surfaces also require frequent polishing to remove ash and dust. Further, the sputtering of white-hot carbon particles requires the optical surfaces to be placed well out of reach of the pitting effect of hot carbon particles, which in turn may further compromise overall optical design.

The carbon arc operates from DC power and therefore requires costly electrical support equipment. Presently, a group of 180-ampere, 100-volt carbon-arc spot followers installed in New York's Radio City Music Hall are being retrofitted with 1200 Watt HMI Metallogen® lamps. This step eliminates purchase and frequent replacement of carbon rods, permits removal of the bulky ventilation and ash removal ducts, reduces lamp power requirements from 18 kilowatts to 1.3 kilowatts per spot follower, cuts air conditioning loads and eliminates the need for bulky motor generators. Besides eliminating more than a quarter megawatt of DC generating capacity, the retrofit program will enable management to put the newly liberated motor-generator room to fresh use.

### XENON LAMPS

Few light sources can match the precision attainable in projecting light from xenon lamps. For example, a 75-Watt xenon lamp can be designed into a spotlight whose beam is still only six inches in diameter at a mile distant. Like carbon arc lamps, xenon sources run on DC power, require electrical support equipment that produces high current in the 30-volts region. Multiple-lamp installations, therefore, require heavy cables to handle the unusually high current levels. One advantage of the xenon lamp that is not shared by other high intensity discharge sources is its ability to run at variable power, yet preserve the color temperature of full power operation.

Aside from complexity and cost of electrical support equipment, the xenon lamp's most serious drawback is the danger of lamp explosion because of their gas pressure. Starting cold at some 10-12 atmospheres, the internal gas pressure rises to a working level of as much as 40 atmospheres ( $40 \times 14.7 = 588$  pounds/square inch).

In effect, the xenon lamp is a small bomb that could play lethal havoc with the careless or unwary. Increasingly, safety authorities are placing restrictions upon equipment and personnel involved with xenon lamp use. Xenon lamps are used extensively in motion picture projectors; some states are now beginning to require operators to wear masks and explosion-proof clothing while working with xenon lamps.

### INCANDESCENT LAMPS

The tungsten filament lamp, or its modern incarnation, the tungsten-halogen lamp, offers one major advantage over the three other lamp types capable of radiating a daylight spectrum. The incandescent lamp requires neither the DC supply of carbon arc or xenon lamps nor the ignition circuit and ballast of the Metallogen® lamp. It can be dimmed or brightened at will, using simple rheostats or more sophisticated SCR controls and can be designed for a wide range of operating voltages.

Continued on Page 1184





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# THE CAMERAMAN AND SPECIAL PHOTOGRAPHIC EFFECTS

By L.B. ABBOTT, ASC

The Special Effects cameraman is unique in that, plus being a photographer, he must be well versed in the various techniques used to produce the effects; i.e., miniatures, composite photography (such as rear projection, blue screen, sodium screen, glass shots, hanging miniatures, matte shots, combining live action and paintings), and optical effects. A description of these techniques follows.

## MINIATURES

The success of miniature photography may be attributed to the fact that cameras may be cranked at speeds higher than normal. This facility allows us to expand time. For example, normal speed is 24 frames per second for camera and projector which produces a 1-1 time ratio. When a camera is cranked four times normal and the film is projected at normal the original action time will be four times longer on the screen than the actual time of the action. From our life experience we associate speed with object size. For example, a 2-inch wave traveling at its normal speed and photographed at four times normal will appear to be approximately four times larger.

There is an empirical rule governing the camera speed used for various scale miniatures. The rule is that the camera speed be the square root of the scale; i.e., a ¼-inch-to-one-foot scale miniature is 1/16 full size and will require a four times normal camera speed; i.e., the square root of 16.

Miniatures are used extensively to display various types of disasters. A few examples would be ships exploding and sinking, trains falling from trestles, airplanes exploding and crashing, cars crashing, burning cities and buildings, dams breaking and floods.

The Effects-cameraman must be in on the planning of the miniatures so that he may elect a proper scale to be used that will produce an acceptable effect. His judgment is made from his knowledge of how various elements will appear in a miniature scale. In the main, it is less costly to build small miniatures than large ones. However, it is a fact that larger scales produce the best results, so the economic factors dictate how small a scale may be used and be practical. Example: Water will not homogenize and a drop remains drop-size. It has been determined that 1/16 full size is the smallest practical scale.

Automobiles and trains involve a relationship of weight to size; i.e., a large car, say 18 feet in length, will weigh at least 3200 pounds. Scaling this down to 1/16 normal size will give a required weight of the miniature to be 200 pounds and a length of 13½ inches. It is obvious that there is no material fashioned in the shape of a car 13½ inches long that will weigh 200 pounds. Therefore, to honor the laws of physics a larger scale must be used. In practice, a ¼ full size scale is practical. The reason for the laws of physics being important is that if the car is too light when it crashes into a wall it will bounce back in a very unreal manner. The ¼ full size miniature will still have a big discrepancy in the weight-to-size ratio, but the fact that the camera will be overcranking will erase enough of the fault to make the action believable.

## REAR PROJECTION

Rear projection is a system requiring the use of a translucent screen placed behind the foreground action, a projector behind the screen projecting a scene on the

An "often retiring" and much-honored wizard of motion picture magic details the various technical methods of creating illusions, spectacles and disasters on the screen

screen and the camera viewing the foreground and the projected picture from the front. The Effects-cameraman's responsibility is to see that the perspective of both parts matches and that the lighting of the foreground is compatible with the background scene. Since the camera and projector shutters are synchronized, the exposure of the background is one-half that of real time. Therefore, when the cameraman views the composite he must elect a foreground light-level that to the naked eye appears to be too dark. This balance is a neat trick and the cameraman must have considerable experience to be proficient.

## FRONT PROJECTION

Front projection is a process producing the same type of composite as rear projection, but in an entirely different way and allowing the use of a background screen area far greater than rear projection. It is the newest of these composite systems and is still in the development stage, but will no doubt become a much used tool in composite photography. The process is made possible by the use of a beaded screen material manufactured by the 3M Company. The base of the material is similar to that used for Scotch Lite tape. The surface is covered with very small glass beads approximately 1/128-inch in diameter. When a light is projected onto this surface from a small point source, approximately 95% of the intensity is reflected back to the source.

This reflection differs from that of a mirror in that, since the beads are spherical, the angle of incidence equals the angle of reflection. The camera and the projector are mounted on the same table at a 90-degree angle to each other. A sputtered mirror is mounted at a 45-degree angle midway between the camera and the projector lenses. A sputtered mirror is sometimes called a Jail House mirror.

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(ABOUT THE AUTHOR: L.B. "BILL" ABBOTT, ASC, was born June 13, 1908 in Pasadena, California, and graduated from Hollywood High School in February, 1926. He started as an assistant cameraman in June, 1926 with the William Fox Studios and continued with that firm (which later became 20th Century-Fox Films) until December, 1970, when he retired. However, since his retirement he has been called back to work on "THE POSEIDON ADVENTURE" and "THE TOWERING INFERNO". He is currently at work at MGM on the science-fiction spectacle, "LOGAN'S RUN".

Abbott was made a first cameraman in 1943 and operated the 20th-Fox Special Effects camera department, under Fred Sersen, until 1957, when he became head of the entire department.

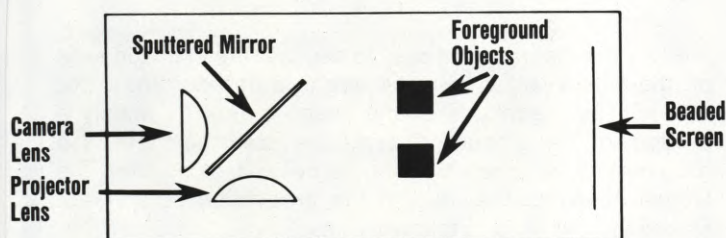
He received an Academy Award nomination in 1959 for the feature "JOURNEY TO THE CENTER OF THE EARTH" and was subsequently awarded three "Oscars" — for "DOCTOR DO-LITTLE" (1967), "TORA, TORA, TORA!" (1970) and "THE POSEIDON ADVENTURE" (1972).

In addition, he has received four "EMMY's" — two for the "VOYAGE TO THE BOTTOM OF THE SEA" series (1964-65 and 1965-66), the "TIME TUNNEL" series (1966-67) and "CITY BENEATH THE SEA", a two-hour special (1970-71). He received an additional "EMMY" nomination for the "LOST IN SPACE" series (1965-66).

As head of the department at 20th Century-Fox, Abbott was given Special Effects credits on all of that studio's productions from 1957 through 1970. To name all of them would be impractical, but the list includes: "THE ENEMY BELOW", "CLEOPATRA", "THE AGONY AND THE ECSTASY", "FANTASTIC VOYAGE", "THE BOSTON STRANGLER" and "BUTCH CASSIDY AND THE SUNDANCE KID".)



These mirrors may be made to transmit and reflect various percentages of light. In front projection a 50 percent transmission and 50 percent reflection mirror is generally used. The success of the process depends on having the axis of both camera and projector lenses the same. The fact that although the background is projected onto the foreground as well as onto the screen, the foreground objects will reflect such a small percentage of the light compared to that reflected by the screen that the projected image on the foreground will not photograph. The shadows of the foreground which are cast upon the screen by the projector pose a problem in that they must be kept sharp or a black line will appear around the foreground images. A good rule of thumb is that the foreground objects shall be no closer than half the distance from the camera to the screen. Using this process, background screen areas of one hundred feet in width are well within the scope of the light levels attainable.



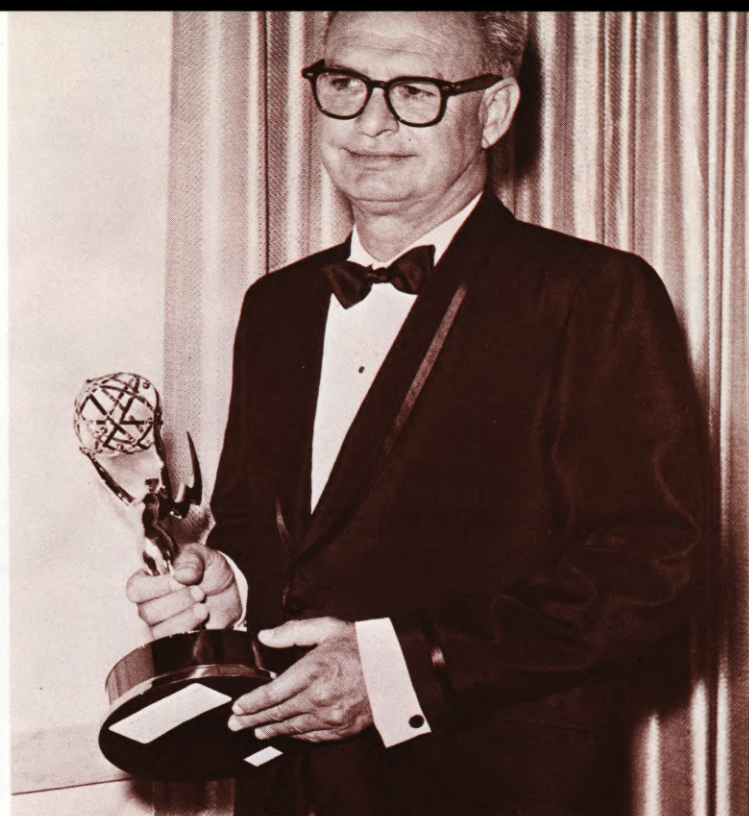
It should be noted that the beaded screen has a very minimal depth and presents a hard image as against the diffuse image presented by the rear projection translucent screen.

#### BLUE AND SODIUM SCREEN PROCESSES

The Blue and Sodium screen processes which produce the same type composites as rear projection and front projection came into use when the industry went into color pictures. The need for the processes stemmed from the fact that the light levels needed for color photography limited the picture size of the rear projection process to approximately eighteen feet. Also, the translucent screen, by nature, does not present a tack-sharp picture and the definition in the background is less than that desired. The Blue and Sodium screen processes are called traveling matte processes and require an optical step to produce the marriage. Perhaps this is a good place to define the term Matte. Most composite photography requires the facility of being able to print a selected area of the frame at one time and the remaining area at another time. In order to be able to do this a pair of Mattes are made. One Matte will have a clear area with a black surround and the other the opposite being a clear area where the first was black and black where the first was clear. The methods used in producing the Mattes are quite varied and some of the variations will be discussed later.

#### REGISTRATION

Good film registration is a must where multiple scenes are to be composited. The term "registration" refers to the fit of the camera's register pin to a perforation hole in the film. That is, the image juxtaposition must be the same from frame to frame in reference to the register perforations. Since the film is perforated four holes at a time and the perforation pins vary in size from use, it is possible that only one or perhaps none will be the exact size of the camera's register pin. One method of predetermining the proper perforation to use is to mount a camera register pin on a rod, load the film in a magazine and then place a section of the



Famed Special Photographic Effects expert L.B. "Bill" Abbott, ASC, shown with "EMMY" statuette he was awarded in 1965 for his work on "VOYAGE TO THE BOTTOM OF THE SEA" — the first of three he received. He has also been awarded three Academy "OSCARs" for "DOCTOR DOLITTLE", "TORA! TORA! TORA!" and "THE POSEIDON ADVENTURE". Abbott has tried to stay retired since 1970, but keeps getting called back to lend his unique expertise to such spectacles as "THE POSEIDON ADVENTURE" and "THE TOWERING INFERNO". He is currently at work on "LOGAN'S RUN" at MGM.

raw stock, which is now attainable, between two flat steel plates with the perforation extending just beyond the edge of the plates. Insert the pin on the rod into the holes until a hole is found that fits the pin snugly. Then scribe a frame line on the film so that when it is used the camera register pin will use the selected perforation. If the registration is promiscuous the parts of a composite will appear to jiggle against each other, producing an unacceptable scene.

#### BLUE SCREEN PROCESS

The Blue Screen process is accomplished by placing a deep blue screen behind the foreground action. Ideally this screen is lighted with blue light, such as white carbon arcs plus T.D. 25 filters. The foreground is lighted in the normal manner. It is necessary to avoid any blue colors in the foreground. That is to say, that should a person wear a blue coat the coat area would join the Matte and the background would print in that area. It is also necessary to avoid semi-transparent objects such as smoke or a glass full of water, as these will pick up the blue and form a bad Matte. The Matte is produced by a combination of positive and negative exposures. Probably the best way to explain this procedure is to use some diagrams.

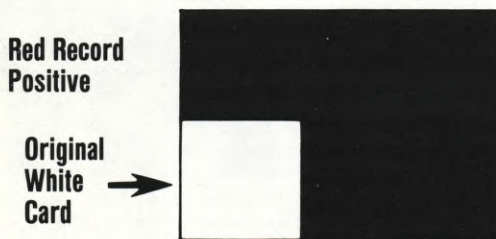




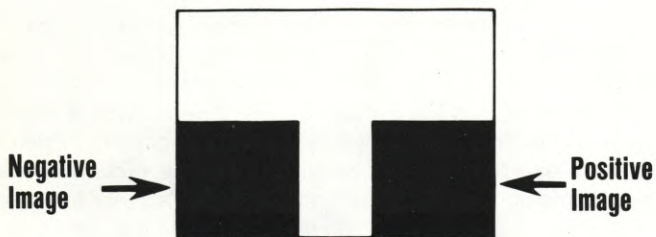
When a print is made from the color negative of the foreground onto a blue sensitive or orthochromatic film using a Blue filter, the blacks of the foreground are separated from the background.



A print from the foreground negative made using a red filter and panchromatic film will produce a positive in which the highlights are separated from the background.



By making a blue record positive and, before developing it, adding an exposure from the Red record positive, a Matte which has density in both the white and black cards surrounded by a clear field will be produced.



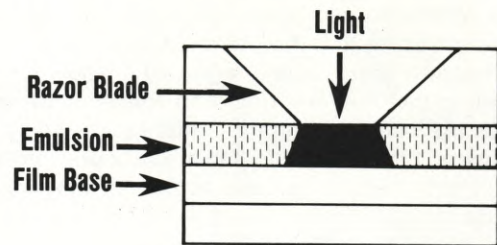
A print from the Positive Negative image Matte will produce the reverse.



The assembly of the composite is done on an optical printer. Placing the background positive in the projector head and the Matte of the dense cards bipacked with a duplicate negative stock in the camera, the dupe negatives will record only the background area. Rewind the dupe. Place the foreground positive in the projector head and bipack the clear cards Matte in the camera with the dupe, the black surround of the clear card Matte will protect the already exposed area of the background and only the fore-

ground area will be exposed. This completes the composite.

The manufacture of these opposite film Mattes is influenced by a phenomenon known as image spread, which is a product of the fact that the emulsion is diffuse. The emulsion is composed of a gelatin thickness impregnated with silver haloidal molecules. If a pair of razor blades are placed in contact with the surface of the emulsion and an exposure is made using collimated light the result will be as diagrammed:



From the diagram it is easy to see that the exposed area on the film is larger than the aperture between the razor blades. The magnitude of the image spread is mainly a product of the amount of exposure used, so there is a choice as to the amount of spread desired. In practice, the choice of exposures used in the production of opposite Mattes that will fit, is as follows:

Say the first Matte is a male with a black area density of 2.00 Log E in a clear surround. 2.00 is a usable Matte density.

Two of these Mattes are made — one to the usable Matte density and the second to a Log E density of 3.00 in which the black area will be larger than the 2.00 density. Printing the 3.00 density Matte back to a 2.00 density female Matte will produce a Matte matching the size of the 2.00 density male Matte. It is a true statement that if opposite Mattes are made at the same density they will overlap and there will be a black line around the matted subject. The Blue Screen process is popular because it may be used with any of the registration type cameras presently used for the various aspect ratios that are displayed; i.e., 65mm, 1max, anamorphic, 1.85-to-1 and 1-to-1.33, etc. This process also allows the facility of, let's say, walking people on a blue screen and in the final screen they will appear to be walking down the road of a miniature set.

The Effects cameraman's responsibility in the use of the Blue Screen is to be aware of the proper perspective and to balance the light level of the foreground with that of the Blue Screen. A common practice is for him to view a white card through a Wratten 47B blue filter. The card is illuminated with the foreground key light and the card should visually match the density of the Blue Screen.

A variation of this process is used extensively in Television and is called Chroma-Key. Often you will see, let us say, Vince Scully advertising a product. He seems to be sitting in a Baseball stadium. Actually he is in a studio backed up by a Blue Screen and the stadium has been photographed at another time. This is accomplished by the ability to adjust one TV scanner to ignore any of the Blue spectrum energies and another to ignore the rest of the spectrum energy bands.

When two channels are run simultaneously the Chroma-Key acts as a switch, so that as the spot scanner traces the roster, the channel containing the background subject is presented to the viewing tube only in the area occupied by the Chroma-Key and the foreground subject is presented to the tube by the other channel only in the areas not occupied by the Chroma-Key. It is interesting to note that in this electronic traveling Matte process there may be a wide



variety of colors used. As long as the color is reasonably monochromatic any area of the spectrum may be used, i.e., should blue be an integral part of a product being advertised a yellow Chroma-Key may be used.

The Sodium Screen process produces the same type composite as the Blue Screen but uses different tools. I believe the system was first introduced by the Rank Organization of England and has ensuingly migrated to the U.S., where it is presently used mainly by the Walt Disney Studios. This system is predicated on the availability of Sodium lamps. These lamps emit a vary narrow energy band — about 484 to 485.5 millimicrons. These wave lengths are very close to the middle of our visual sensitivity peak. Because of this, sodium lamps have been used for street illumination throughout the world. The application of this unique narrow band emission is used to produce a traveling matte system as follows:

A white screen is placed behind the foreground and illuminated by Sodium lamps. Between the lens and the two movements is a block prism with a sputtered mirror in its center at a 45 degree angle to the lens axis. The mirror surface facing the lens is coated with a Dichroic or interference Didymium filter which allows the mirror to reflect only sodium light to the matte film. The exit surface of the Block which is directly in front of the foreground color negative film has a transmittance type Didymium filter attached to the surface. This filter helps the Dichroic filter to insure that no sodium light will reach the foreground

negative. The foreground objects in the negative stage are exposed areas against a virtually clear background and these same objects in the matte film are clear areas in an opaque surround. The fact that the foreground objects, in a positive form, appear to be against a black background makes it possible to use a very low density cover matte which aids in making the mattes fit. Both male and female mattes are easily generated from the original panchromatic negative matte. The sodium energy band being squarely in the middle of the visual spectrum allows the lens to form both foreground and matte negative in identical planes, so the sizes automatically match. Since the matte is the product of a single exposure, as opposed to a positive-negative combination, in the Blue Screen method, it is possible to use semi-transparent objects, such as smoke, cascading water, a glass full of liquid etc., in the foreground. Unfortunately the optics of the camera do not lend themselves to anamorphic lenses, limiting the use of the process to spherical formats.

In the past there have been systems employing the same type camera using infra-red and ultra-violet background screens. Since these energy bands are beyond the visual spectrum there were problems involving the focus and size of the matte film and at present these systems are rarely used.

### GLASS SHOTS

Glass shots afford a means of combining live action and a painting, and the facility of panning and tilting on the composite. A glass or glasses are placed approximately ten feet in front of the camera. In the case of multiple glasses, an object such as a tree trunk is placed in front of the glass to mask the frames of the glasses. The artist, with the help of an assistant viewing through the camera, draws in the dividing line between the live action and the painted area and then paints in whatever subject matter is desired. Due to the problem of the live action shadows matching those in the painting the time of day for shooting must be pre-determined. The leeway is usually about one hour. The camera is mounted on what is known as a nodal point head. This pan and tilt head puts the node of the lens on the axis of the pan and tilt movement so that the matte line will remain constant between the live action and the painting at any angle.

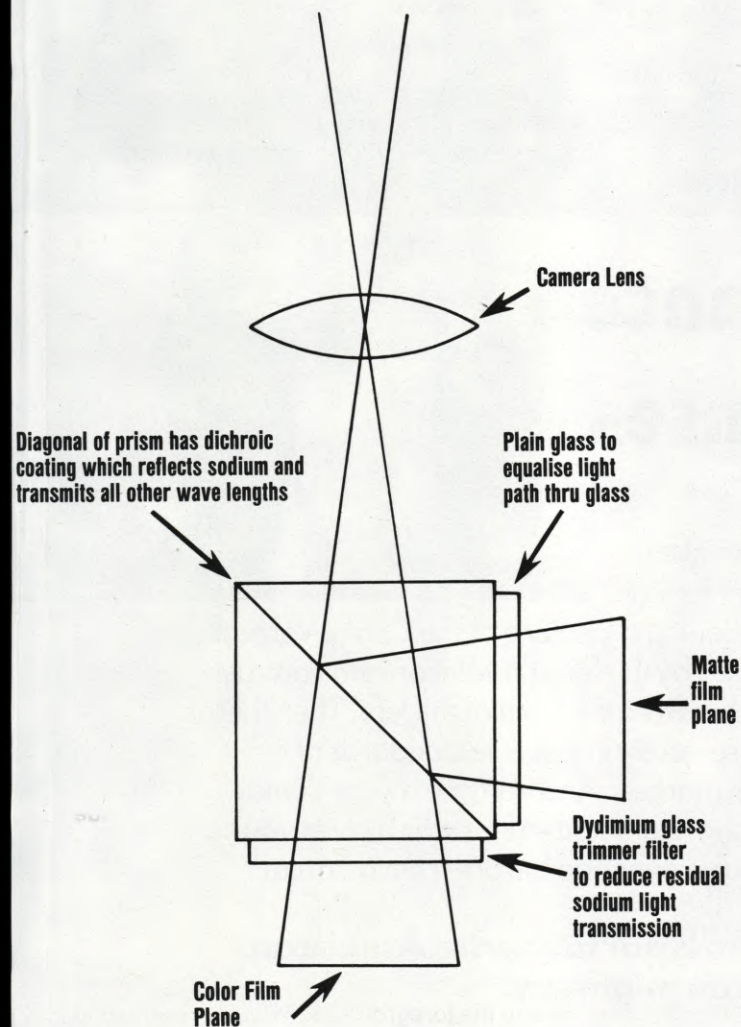
### HANGING MINIATURES

Hanging miniatures are a variation of the glass shots. The camera is mounted on the same nodal point head and a suspended miniature is substituted for the glass. This system allows some action to occur in the added portion of the composite, such as bells tolling in a church steeple.

### MATTE SHOTS

The term Matte shot, in the vernacular of the industry, implies the combination of live action and a painting in a stationary mode, the scene being put together in an effects department. The department camera is a combination of camera, printer and projector. It is mounted on a firm base and focused on an easel. This procedure makes it possible to project the action scene onto a board in the easel and establish the matte line. One method often used is to glue a piece of enlarging paper on a tempered masonite board using Wilhold Glue, which will survive the developing process. Using the camera as a projector, make an enlargement of the action scene. This enlargement will give the artist the information he needs regarding perspective and matte line location. When the painting is completed the matte line is described and the area to be occupied by the

Continued on Page 1176



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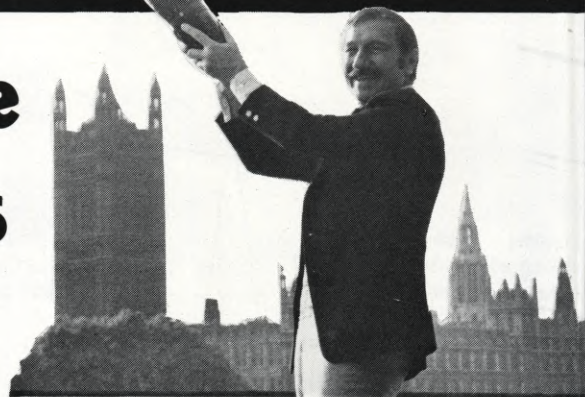


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# BEHIND THE SCENES ON "THE ADVENTURE OF SHERLOCK HOLMES' SMARTER BROTHER"

Zany American film comedian curls British stiff upper lips while making splashy directorial debut in London

By CHARLES LORING

On a sound stage within the heretofore sedate precincts of Shepperton Studios outside London a source of innocent merriment frequently erupts into bedlam as filming proceeds on the 20th Century-Fox production of "THE ADVENTURE OF SHERLOCK HOLMES' SMARTER BROTHER".

Starring in the film, as well as directing it, is Gene Wilder of "THE PRODUCERS", "BLAZING SADDLES" and "YOUNG FRANKENSTEIN" fame. Aiding and abetting him in the current project are his two kooky cohorts from "YOUNG FRANKENSTEIN", Madeline Kahn and Marty Feldman (he of the pop-eyes and shifting humped back).

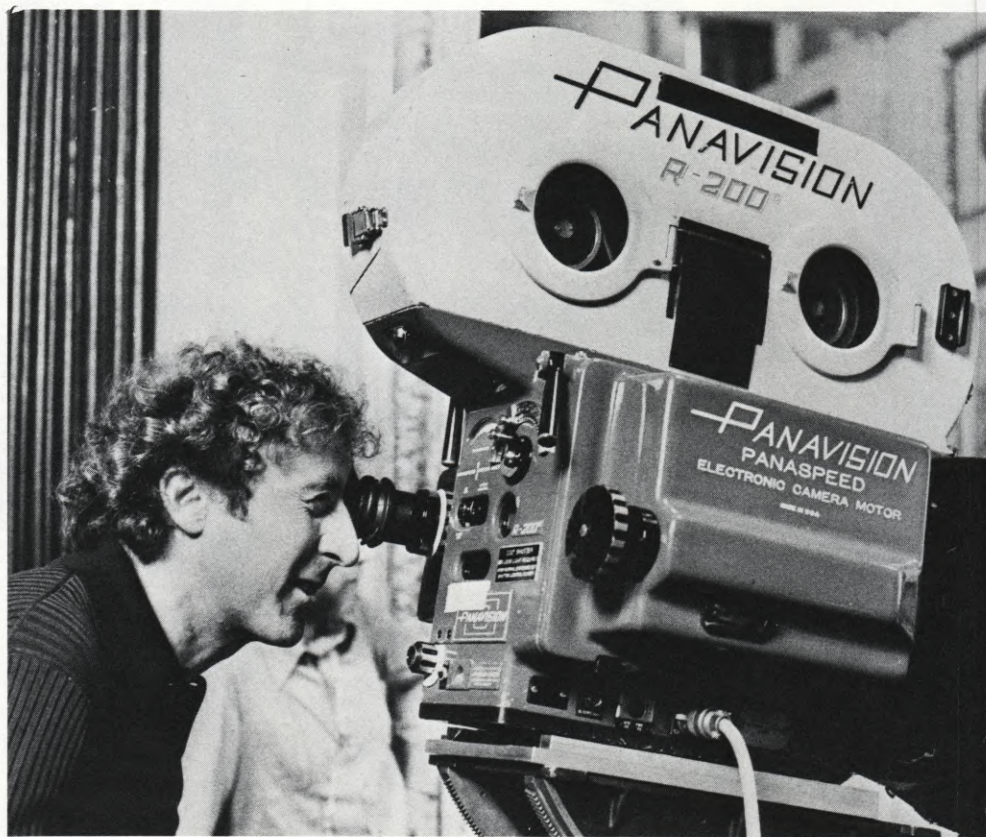
The juxtaposition of these three zany Americans with a relatively reserved and proper British crew would, on the face of it, seem to be a prescription for culture shock, but oddly enough, they appear to be getting on swimmingly and have even developed a very genuine mutual respect and affection for one another.

Up until now a kind of professional appendage of Mel Brooks, Wilder, with this picture, is making his directorial debut and, in that respect, he is fortunate to have the use of the video viewfinder-playback system from Samuelson Film Service Ltd. known as Samcinevision, the whole-hearted support of a most professional crew and the sympathetic expertise of Director of Photography (Lighting Cameraman) Gerry Fisher, BSC. On the set of "THE ADVENTURE OF SHERLOCK HOLMES' SMARTER

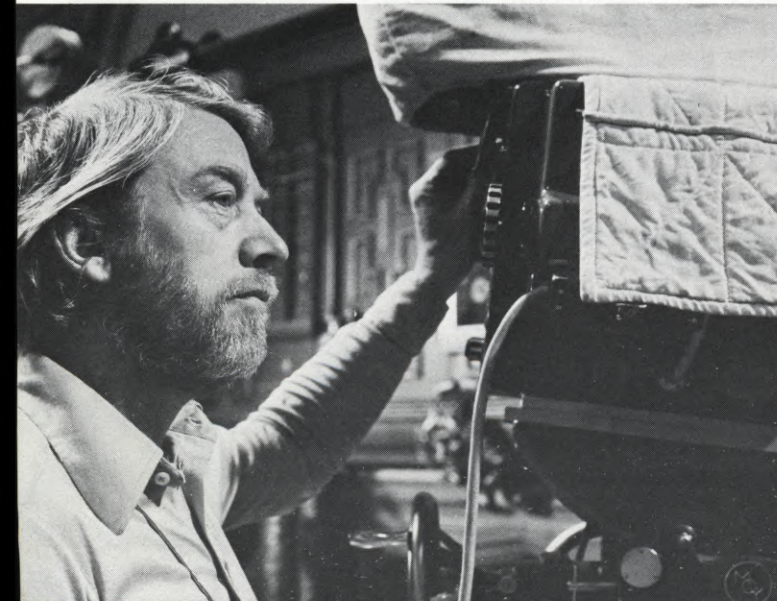
BROTHER" recently, Fisher engaged in the following interview for *American Cinematographer*:

**QUESTION: Can you tell me a bit about the photographic style you've adopted in shooting "THE ADVENTURE OF SHERLOCK HOLMES' SMARTER BROTHER"?**

*FISHER: Photographing this picture is something of a departure for me, because I'm usually a sort of location type cameraman really. That's mainly the kind of pictures that are being made these days. But this one is a full studio operation, like the kind I used to do when I was an Operator. I was with Jack Hildyard for a long time and,*



(UPPER RIGHT) Turned on by the film-making process, now that he is making his directorial debut on "THE ADVENTURE OF SHERLOCK HOLMES' SMARTER BROTHER", American film comedian Gene Wilder is described as "itching to get at the camera and do the set-ups." Here, on the set at London's Shepperton Studios, he is seen sneaking a peek through the viewfinder. (BELOW LEFT) "Resignation" might well describe the look on the face of Lighting Cameraman Gerry Fisher, BSC, but (RIGHT) he's actually getting on very well with Wilder, describing the collaboration as "quite a useful exercise for both of us, really."





during that time, we used to do many of the major studio "set" pictures. This has become that sort of project, mainly because the story takes place in the Victorian period.

**QUESTION:** Visually speaking, that period is usually thought of as dark and somber, so colorless as to be almost monotone — the "DR. JEKYLL AND MR. HYDE" or "GAS-LIGHT" sort of thing. Yet this picture, as I understand it, is a far-out, zany comedy of the kind that fairly screams for high-key. Wouldn't these two diametrically opposed types of mood lead to a rather "schizophrenic" photographic style?

**FISHER:** They certainly present something of a challenge. When I read the original script it was obvious that it was way out. Yet it had to have some serious overtones and a kind of romantic quality, too. So I tried to give it beauty where it wouldn't be harmful and not be inhibited by logic where it would be detrimental to the comedy. Along with that, I've tried to give the photography a kind of clarity, a visibility for the sight gags — and I think that it's worked.

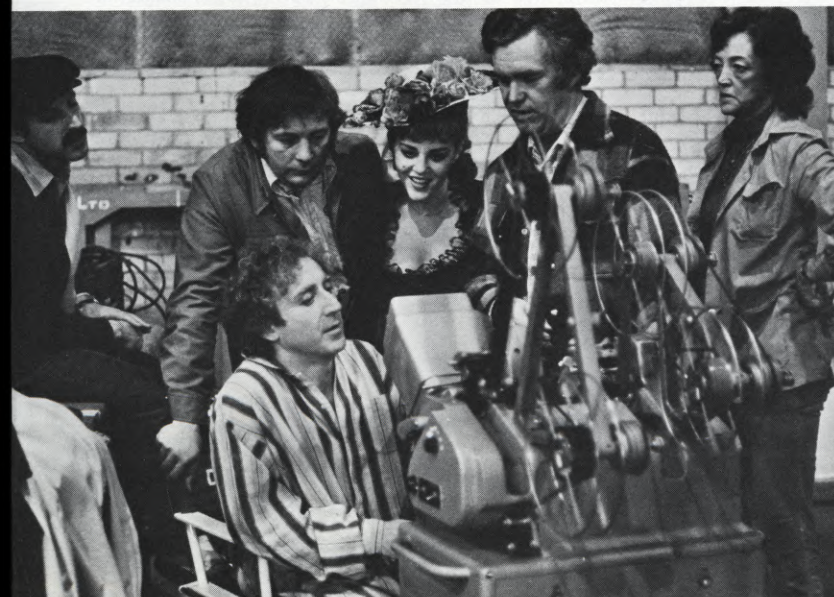
**QUESTION:** Since this is Gene Wilder's first directorial effort, what effect has that had on your work?

**FISHER:** It's given us a lot of preparation time. I was on the picture earlier than usual, as was Terence Marsh, the Production Designer. A great deal of the action had to be story-boarded because it was so complex. For example, the script called for a highly complicated chase down a street, which had to be built because there wasn't a real period street available. Continued on Page 1172



"THE ADVENTURE OF SHERLOCK HOLMES' SMARTER BROTHER" is a wacky comedy, but it is also a period piece, set in Victorian times. Hence, the lighting is not uniformly the high-key usually associated with high comedy. The most complex sequence in the film is a chase down the street in hansom cabs at night and, since no suitable period street could be found in London, the set shown here had to be built. Production Designer Terence Marsh was able to do it economically, because all the action was story-boarded in advance, and the set built accordingly.

(LEFT) A family portrait around the old Moviola. On this, his first time out as a director, Wilder has shown a keen interest in learning the technical processes involved in film-making, something he never really needed to know as an actor. A painstaking man, he spent the first few weeks asking technicians why everything was being done — but he learned fast. (RIGHT) From behind the camera, Wilder (right) directs his pop-eyed buddy from "YOUNG FRANKENSTEIN", Marty Feldman, as that droll character mounts an old-time bicycle. The two comics seem to fuel each others' sense of the ridiculous when working together.





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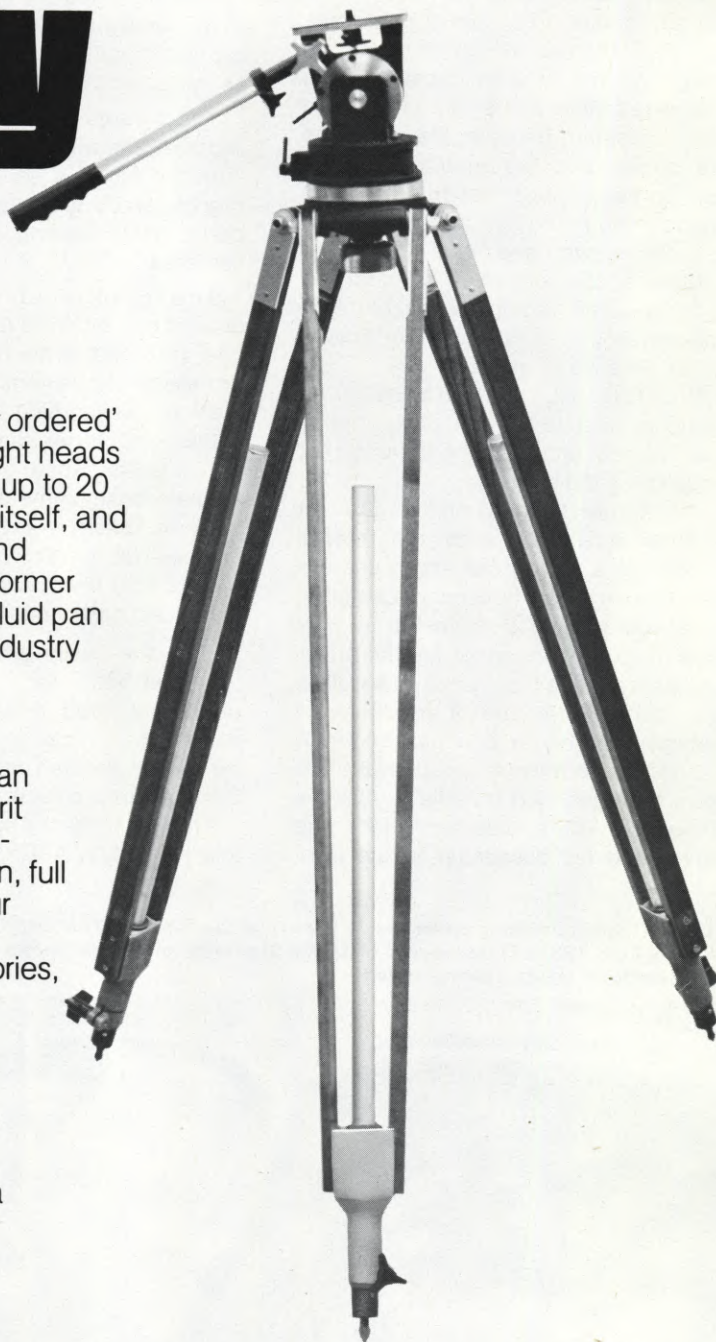


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# A CAMERA MOUNT THAT REALLY PUTS YOU IN THE DRIVER'S SEAT

To show the world what it's really like behind the wheel, racing champion Jackie Stewart makes an exciting film with the aid of a unique car that accommodates four cine cameras in unusual mounts

By KENN RAND

Racing driver Jackie Stewart calls it "THE EXPERIENTIAL TREATMENT" — a look at auto racing that has never before been seen.

Stewart, who was a world's champion auto racing driver before he retired, is vice president of marketing for ELF-United Kingdom, an oil company, and in both capacities has always felt there was a lack of in-depth communication between his sport and the public and the media. It is his opinion that the best way to bridge that gap is through the film medium, by letting the viewer see what the driver actually encounters when he is tooling a finely-tuned racing car at extreme speeds around a race course. This is what Stewart means by "THE EXPERIENTIAL TREATMENT" — being as close to the actual experience itself without sitting in the driver's seat and driving the auto.

To capture his ideas on film, Stewart needed a unique auto that would double as a racing car and a camera car. The car would house four cameras. One would shoot from inside the car past the driver's head, giving the driver and passenger's point of view as well as providing sync sound of any dialogue between the driver and passenger. A second camera would shoot at the car from the hood and be able to film the driver, or, with a wide angle lens, the driver and his passenger in the front

seat. A third camera would be mounted in the nose of the car and shoot straight ahead at the road from the grill area. The fourth camera would shoot at the right front wheel.

Stewart selected a Ford Capri on which to mount his cameras and the car was modified to run on a race track as well as on public streets.

The mounts were built in France by Jacques Deranger and Alain Bonnard and consist of a series of struts and braces which are attached to the car body, each holding a head for the cameras.

The choice of cameras was determined by three important criteria: one, the cameras had to produce professional-quality film; two, they had to be quick-handling and provide sync sound; and, three, the cameras had to be able to absorb a tremendous amount of punishment without failing to perform. Stewart and his consultants decided on Eclair NPRs with crystal motors, and the results proved them to be correct on all counts.

With the design phase behind him, the next step for Stewart was the proverbial road test for his unique camera-racing car. In this case it would be a multi-faceted test for car, driver, cameras, sound recording and mounts.

The scene of the tests was Monaco this past May. ABC Television, under

the aegis of Emmy-award-winning producer-director Doug Wilson, was going to cover the Grand Prix for Wide World of Sports and had 15 cameras scheduled to film the race. Wilson was intrigued by the exciting footage promised by Stewart's car. Where better to not only check out the system, but to put it to actual use?

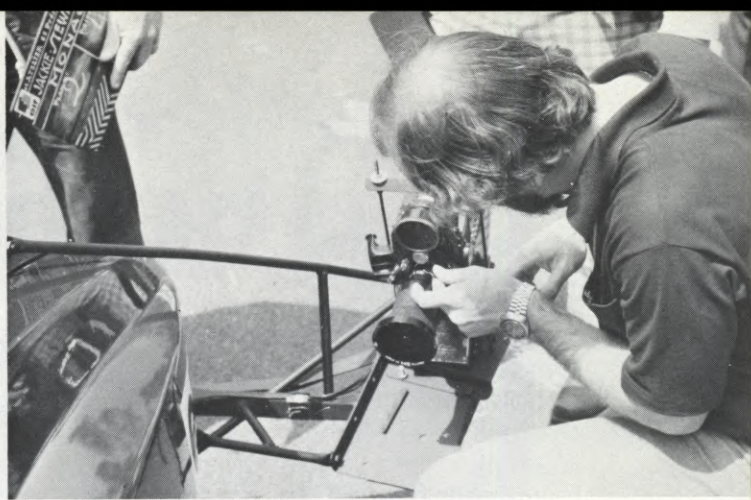
Putting his Capri through the paces in Monaco before the Grand Prix, Stewart knew he had a winner as far as getting the footage both he and Wilson had hoped for. True, there were some close calls during the tests, because one of the cameras was out of Stewart's line of sight, but after a few laps and an adjustment of his driving technique to compensate for the camera, this problem was rectified and it was clear sailing (or driving!) — that is, until the day of the Grand Prix itself.

Wilson, with his 15 cameras (mostly Eclairs with a couple of Arris) strategically lined up at 15 vantage points along the torturous Grand Prix course that winds its way 3,278 meters through the heart of Monaco, was counting on footage from the camera car to intercut into his Wide World of Sports show. In addition to the unusual filming angles offered by the camera car, Wilson had scheduled commentator Jim McKay to ride with Stewart at racing speed around the course for a live interview. Never before had a

(LEFT) Champion racing driver Jackie Stewart at the controls of his Capri camera car, with Eclair NPR camera in background mounted to film driver's POV. (RIGHT) Dashboard of Jackie Stewart's camera car shows on-off control panel for cameras and sound at left. Miniature Nagra SN recorder is under steering wheel.







(LEFT) Cameraman Don Shoemaker films interview between driver Mario Andretti (left) and ABC commentator Jim McKay during a quieter moment of the Grand Prix in Monaco. (RIGHT) Don Shoemaker of Dana Point, California, adjusts Eclair NPR mounted near the fender of Jackie Stewart's Capri for filming the Monaco Grand Prix.

commentator been able to sit next to a driver to discuss the course as the driver was actually driving it and the audience was actually viewing it.

Clear, beautiful weather preceded the day of the race and the ABC crew, Stewart, McKay and Wilson eagerly looked forward to filming under ideal conditions. Then it happened. An unexpected deluge hit Monaco the day of the race and it was apparent that weather conditions for the race were going to be anything but ideal. But the race went on and so did Stewart and his camera car. The outside cameras were hastily wrapped in plastic and Stewart and McKay did their interview in the pouring rain only two hours before the starter waved his flag to get the Grand Prix underway.

"Those cameras survived speed, rain, water and took a tremendous pounding," Wilson recalls, "but they did

not fail once and, in fact, gave us so much great footage it was difficult to edit anything out."

Wilson says one of the most breathtaking shots in the program was McKay and Stewart talking about the extreme wetness of the track as they entered the dreaded waterfront tunnel which follows the portier turn. A cut to the nose camera which is being hit by water as the car comes out of the blackness of the tunnel and heads for the chicane with McKay reminding Stewart that "you have my life in your hands!" added to the drama of a very dramatic sporting event.

Don Shoemaker, a cameraman and film editor who has been working with ABC Sports since 1967 and who was selected by Wilson as one of the lead cameramen for the Grand Prix, calls Stewart's camera car "fantastic."

Continued on Page 1214



(ABOVE RIGHT) View of Stewart's Capri camera car showing unique mounting system for three external Eclair NPR's. A fourth NPR was mounted inside. (BELOW LEFT) A front end view of the car, showing the three externally mounted cameras. (RIGHT) Assistant cameraman Jim Williams adjusts camera mounted to film the right front wheel.





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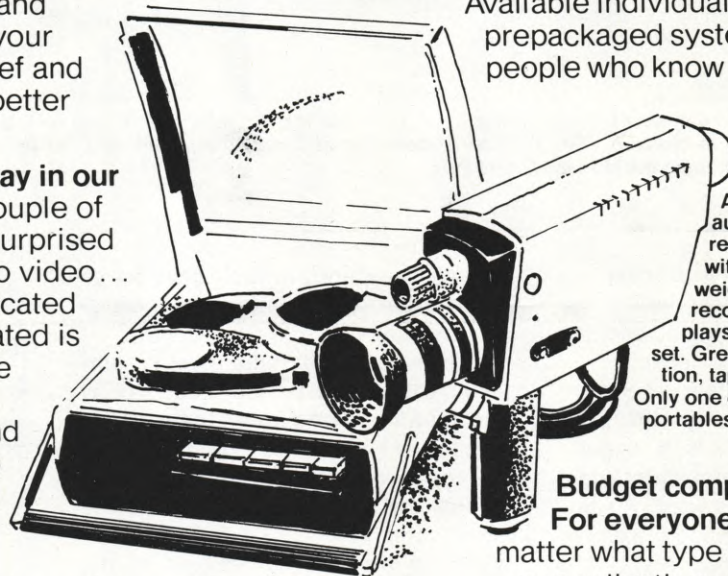
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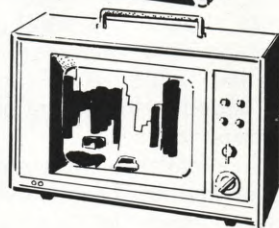
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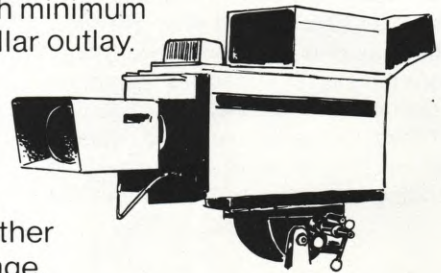
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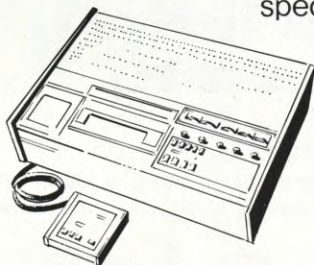
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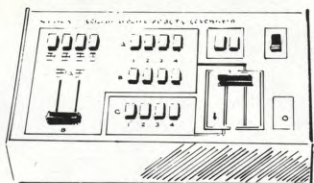
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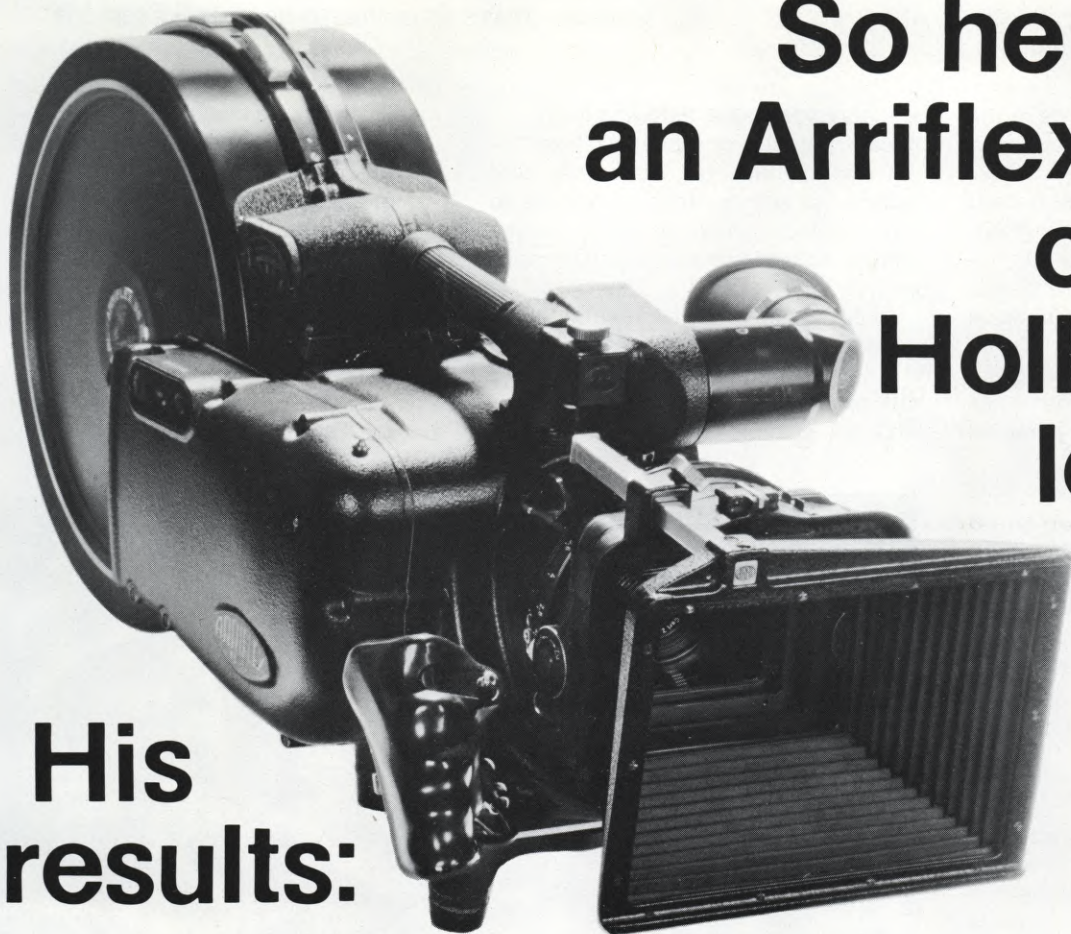


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# SAFETY IN FILM PRODUCTION

By **WALTER J. KLEIN**

President, Walter J. Klein Company, Ltd.

When I was polling production people for examples of hazards in the motion picture production industry, there was no hesitation.

One nominated the greatest hazard as the enchilada dinners aboard Eastern Airlines jets.

Another said it involved dogs who wanted to mark their territorial limits on camera cases lying outdoors.

And one suggested that mixing gin and rye at Chicago awards banquets was possibly the greatest personal safety problem.

Granted these may be memorable situations. But there are genuine safety concerns in the film production business that should be known and acted upon by all personnel at all levels.

We elect to divide the safety areas into:

1. Crew and talent physical safety
2. Public physical safety
3. Equipment, studio and public property safety

Clearly it behooves producers to accept responsibility in all three areas. Safety discipline is not just seeing that a cargo handler doesn't drop a camera case. It is also sealing floor cables in a department store with gaffer tape and stationing a person at the site to help the public safely over them.

Electrical and lighting trouble probably threatens more film professionals than any other type of hazard. We work with a lot of power and a lot of heat, often in alien surroundings. Our crews go into buildings with ancient wiring and tie into the mains. They hang deuces near flammable materials. They work fast, trying to get as much on film in one day as possible.

Some valuable pointers on a subject which many film-makers neglect giving sufficient thought to . . . until it's too late

They get repaid in burns, shocks, lost equipment, lost time and lost business. What rules should they follow?

Gaffers must be issued — and ordered to wear — asbestos gloves so they can more safely tilt lights, change lamps, adjust barndoors and remove gels.

Light stands must be weighted with attached water, sand or metal weights.

Cables should not be draped so as to pull down a light or obstruct people.

Only qualified electricians should

perform serious work like opening panels and going into the mains.

Overhead lights should be secured with safety lines.

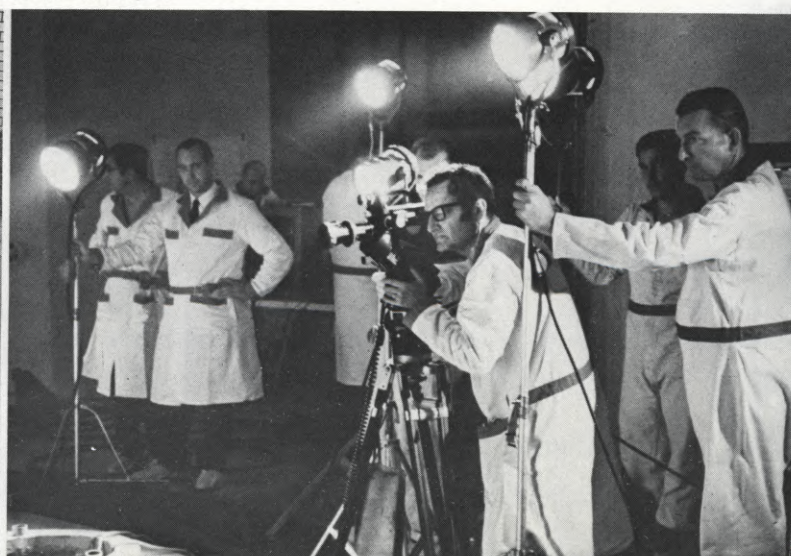
Lights should never be positioned so close to talent that an exploding lamp would injure them.

Lights, stands and tripods should be handled gingerly to avoid serious pinches and cuts.

Lights, flags, dots, and cookies should never be positioned near any surface, and certainly *distant* from any



(ABOVE RIGHT) Ladders should be held or otherwise secured in position when crewmen climb up or down. (BELOW LEFT) Back-up alarms are required on mobile units to warn off people behind a suddenly moving or stopping vehicle. (RIGHT) Filming the fueling operation at a nuclear power plant exposes the camera crew to a variety of unusual safety challenges.







**(LEFT)** The average motorist is not often exposed to the hazards of an encounter with a rampaging elephant — nor is the average camera crew, but the “Cowboy Instinct” leads some film-makers to take dangerous chances, such as might be encountered during African animal or auto safaris. **(RIGHT)** Clients will occasionally send crews into danger areas without advance notice of conditions.

*flammable* material. (Photography lights can start many a “safe” material smoking.)

Worn cables and electrical equipment should be replaced, remade or rebuilt at once. It is irresponsible to send such faulty, dangerous equipment back to the studio or rental agency without immediate warning — or to continue to use it.

Special watertight electrical fittings should be used in any damp or wet location.

Warning signs should be made to cover up any electrical panel you open.

People working on a lighting grid

must wear safety harnesses clamped to the grid, no matter how inconvenient it may seem to them.

Our industry considers it standard procedure to scout locations before shooting so that there will be no unpleasant surprises involving ceiling heights, power sources, dolly surface, ambient sound and so on. But how many producers *scout safety hazards as well?* The person who scouts locations should be reminded to check for hazards and report them without delay.

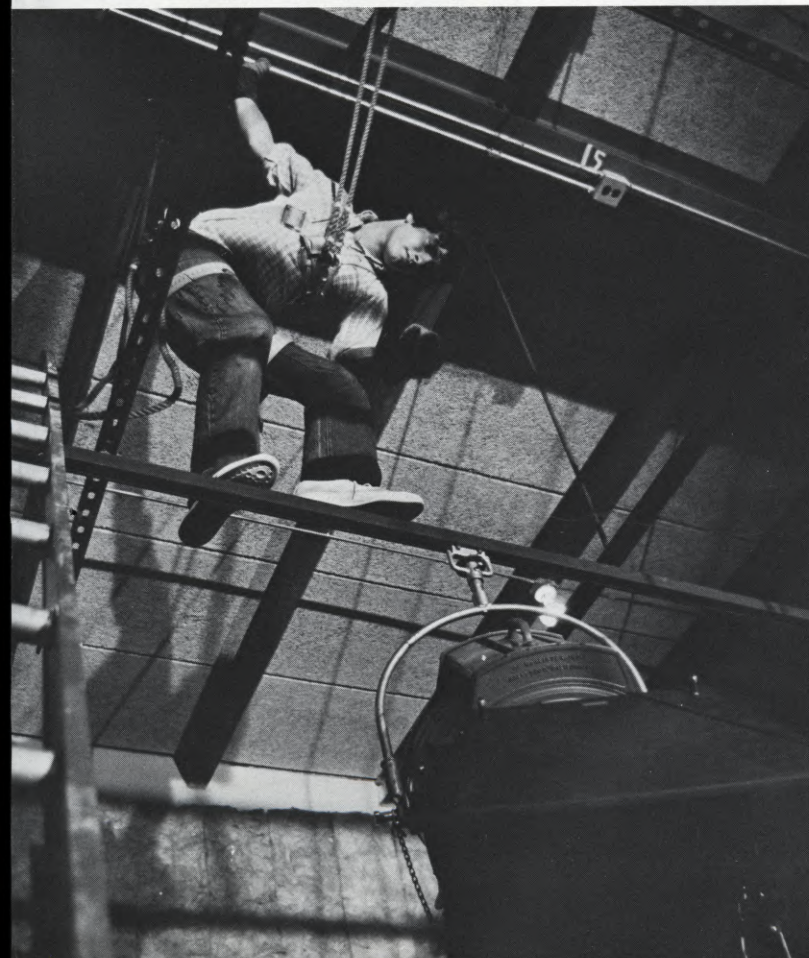
Speaking of hazardous locations, that is one massive safety problem for

film producers. Some industries are not above concealing the fact that a shooting location is hazardous, for fear of alarming employees or the federal government. More than once I have greeted our crews on their return from location to learn that they had been shooting inside a grain elevator, or filming mining operations where spontaneous explosion was a genuine threat, or working where they were not told in advance that they were subject to possible nuclear contamination.

If filmmakers are to be required to perform in unsafe situations, it is im-

**Continued on Page 1212**

**(LEFT)** Safety harnesses should be doubly connected to the grid when gaffers adjust lights, and hands should be gloved. **(RIGHT)** Abused electrical cables are highly dangerous and should be replaced at once. The film industry considers it standard procedure to scout locations before shooting, so that there will be no unpleasant production surprises, but how many producers scout safety hazards, as well?





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H288	152MM Baltar BNC mount*	\$99.50
H290	40MM Baltar BNC mount	\$99.50
H291	32MM C.S.P. BNC mount	\$99.50
H292	50MM Angenieux 0.95 BNC mount	\$350.00
H293	35MM Kinoptic Eclair mount	\$105.00
H295	18.5 Angenieux NC mount*	\$145.00
H297	28MM Angenieux NC mount	\$90.00

H14	12-240 Angenieux zoom Arri mt.	\$3000.00
H112	13MM Elgeet 1.5 C mt.	\$70.00
H117	9MM Cooke Kinetal 1.9 Arri mt.	\$590.00
H298	102MM Ektar W/C mt adapter	\$89.00
H299	150MM Century lens 2.8 C mt.	\$75.00

### 35MM MOTORS

H7	ARRI 35 constant speed motor	\$250.00
H8	ARRI 35 variable speed motor	\$250.00
H31	Eyemo 6 volt D.C. St. George v.s. motor	\$30.00
H32	Mitchell R 35 variable speed motor	\$500.00
H33	Ceco 115 V AC-DC V.S. Mitchell type motor*	\$125.00
H69	Mitchell R 35 3 phase 60 cycle 96V-DC-230V-AC multi duty motor	\$390.00
H70	Mitchell R-35 110 V 3 phase sync motor	\$400.00
H71	Mitchell R-35 3 phase 230 V interlock	\$395.00
H72	Mitchell NC 96-220 multi duty motor	\$250.00
H73	Mitchell NC-BNC 3 phase 220 sync motor	\$350.00
H74	Mitchell NC 96-220 AC multi duty motor	\$450.00
H80	Mitchell R-35 Blimp with zoom snoot, front optical door, cables	\$2750.00
H81	Arri 35-120 S blimp complete w/25-250 zoom snoot and case	\$3975.00
H84	Mitchell Hi speed motor with variac (Tachometer missing)	\$390.00
H100	Mitchell 35 hi speed motor with variac and Tachometer	\$490.00
H131	Mitchell BNC 220 3 phase sync motor*	\$350.00
H134	Mitchell 35 V.S. 110 V AC-DC motor*	\$125.00
H398	CECO B&H V.S. DC-AC motor	\$125.00

### 16MM MOTORS

H9	Arri 16 BL sync motor, 60 cy	\$290.00
H11	NPR sync motor	\$395.00
H12	NPR perfectone variable sp motor	\$395.00
H13	NPR constant speed motor	\$695.00
H35	B&H filmo 110 volt v.s. motor	\$30.00
H36	Ceco cine special stop motion motor with counter (no control box)	\$95.00
H37	Mitchell 16-4pin 110 V v.s. motor	\$95.00
H38	Mitchell 16-3pin 110 V v.s. motor	\$95.00
H40	Arri 16 sync motor w/weeder root counter and reverter box*	\$145.00
H42	Mitchell 16-3pin v.s. motor	\$95.00
H75	B&H filmo v.s. motor 110V	\$35.00
H77	16MM Nova hi-speed camera w/motor (as is condition)	\$500.00

### 16MM & 35MM ACCESSORIES

H3	ACL battery & charger	\$150.00
H30	NPR motor cradle	\$99.50
H65	Ceco Arri 35 swing away matte box	\$80.00
H66	Mitchell NC matte box	\$95.00
H68	Mitchell Kinovox slating device	\$45.00
H76	Ceco type-Mitchell reverter	\$65.00
H78	Carter converter 12V to 110 w/cy meter	\$125.00
H79	Constant voltage transformer 6.4 amp.	\$65.00
H85	Ceco Mitchell type geared wedge	\$190.00
H86	Flat top pro jr. airplane bracket	\$65.00
H87	Platform riser for Mitchell	\$30.00
H88	Platform with 4 rubber feet	\$7.50
H92	Moy wedge	\$50.00
H145	Case for 400 ft. x 35mm Mitchell mags*	\$15.00
H147	Sampson underwater housing with meter	\$250.00
H148	Mitchell 35 Access. case*	\$15.00
H149	Mitchell 35mm finder*	\$175.00
H150	Mitchell reg. NC matte box & double arm bracket*	\$99.00
H151	Mitchell reg. NC matte box only	\$49.50
H156	Mitchell reg. matte box w/double arm bracket	\$99.00
H157	Mitchell W.A. matte box only*	\$49.00
H159	Mitchell 35 hi hat adapter	\$25.00
H394	Eclair CM 3 finder only	\$125.00
H442	F&B/Ceco adjustable wedge	\$65.00
H443	Filmo camera & magazine case only	\$15.00
H444	Case only for Auricon 1200 pro mags*	\$15.00
H161	4-5x5 Harrison filters 85-85N3-6-9	\$89.50
H162	5-5x5 Harrison diffusion filters	\$89.50
H163	3-5x5 Harrison N.D. filter 3, 6, 9	\$89.50

### 35MM MAGAZINES

H50	400 Ft. x 35MM Mitchell R35 inverted mag*	\$95.00
H51	200 Ft. x 35MM Eyemo metal mag.*	\$15.00
H96	1000 Ft. x 35MM Mitchell N.C. mag.*	\$145.00
H137	1000 Ft. x 35MM Mitchell STD mag.*	\$99.50
H139	400 Ft. x 35MM Mitchell STD mag.*	\$95.00
H436	400 Ft. x 35MM Arri mag. (new type)*	\$390.00

### 16MM MAGAZINES

H43	400 Ft. x 16MM Filmo mag.*	\$65.00
H44	400 Ft. x 16MM Filmo mag.*	\$50.00
H45	400 Ft. x 16MM Auricon Pro 1200 mag.	\$45.00

H46	1200 Ft. x 16MM Auricon Pro mag.*	\$99.50
H48	1200 Ft. x 16MM Mitchell mag.*	\$350.00
H422	400 Ft. x 16MM Mitchell mag.*	\$89.50
H434	400 Ft. x 16MM Arri 16M mag.*	\$200.00
H438	400 Ft. x 16MM NPR mag (new type pressure plate)*	\$1200.00

### EDITING & SOUND

H399	16MM diagonal Rivas type splicer*	\$75.00
H403	Moviola URS amplifier*	\$55.00
H406	16MM ST. cut Guillotine splicer*	\$95.00
H408	Zeiss 16MM Moviscop viewer*	\$135.00
H410	Zeiss Super 8 Moviscop viewer	\$49.50
H411	3 gang Takita synchronizer, 16MM	\$95.00
H440	Mezzy 35MM film footage counter	\$40.00
H412	3' x 5' Filmtronics 4 channel mixer	\$79.50
H413	Knitron lamphouse w/standby switch w/solid state rectifier, model R-2180*	\$675.00
H415	Knitron lamphouse only	\$550.00
H416	16-16 Moviola with arms	\$1975.00
H417	16-16 Composite Moviola w/arms	\$2400.00
H64	Panasonic Video Tape recorder Model MV 8100	\$125.00
H82	Cinevoice Optical amplifier & case	\$75.00
H83	Auricon NR 25 amplifier	\$100.00

### SOUND

H21	Nagra 4L, 3 speed, 2 pre-amps resolver, ALC crystal, case, ATN	\$2850.00
H57	Nagra BMII	\$90.00
H67	EV 642 shockmount only	\$4.00
H102	Senn MZA 6-2*	\$7.50
H60	Beyer D48 Headset*	\$45.00
H354	12 FT. Kadish mike boom, stand counter weight	\$175.00
H361	Automatic degausser on wheels	\$375.00

### TRIPODS

H90	Arri 35 S&W legs only	\$125.00
H91	Miller Pro head w/pro. jr. legs	\$385.00
H93	O'Connor C head with pro. jr. legs	\$349.00
H94	Pro Jr. friction head & handle only	\$65.00
H95	NCE baby legs	\$65.00
H441	Arri 35 friction ball head & handle only	\$125.00
H58	NCE Arri tripod adaptor (offset)	\$15.00
H63	Mitchell 35mm tripod top plate only	\$15.00

### LIGHTING & GRIP

H164	Director chair*	\$13.50
H170	Colortran Mini Brute 6 w/bulbs*	\$175.00
H172	M/R 750 Cone Light*	\$98.85
H175	M/R 2KW Cone Light*	\$138.00
H178	Med Century Stand w/Riser (non fold)	\$10.00
H181	Med. Century Stand	\$10.00
H188	M/R 5KW Skypan*	\$127.50
H199	American Sputnik*	\$695.00
H201	B&M 10KW Skypan*	\$75.00
H207	Lifalite (crank) stands (folding)	\$100.00
H208	Lifalite stand*	\$100.00
H220	M/R T.V. Scoop	\$61.80
H221	Lowell 404 Reflector stand & case	\$65.00
H222	B & M double broad	\$85.00
H223	Thomas Molevators*	\$900.00
H225	Lifalite Molevator*	\$600.00
H228	B&M 2Kw zip lite*	\$100.00
H234	B&M Sklmine*	\$67.50
H239	B&M 3 Bar Splicing Box*	\$20.00
H254	B&M 4 Bar Splicing Box*	\$25.00
H289	M-R Baby solar spot*	\$90.00
H265	M-R Junior Stand*	\$59.00
H275	M-R Senior Stand*	\$79.00
H304	B&M 5KW Skypan*	\$45.00
H310	Kobold 30 V Battery operated Quartz Light*	\$225.00
H313	M-R 10KW Spot*	\$475.00
H317	5KW Skypan-Spec.*	\$35.00
H319	M-R 5KW (KEG) Spot*	\$270.00
H329	M-R Crank Stand	\$175.00
H334	Morgan 4KW Softlite*	\$99.50
H338	Hele Reflector	\$125.00
H339	Colortran CYC-Strip 3 light*	\$165.00
H341	Colortran CYC-Strip 10 light	\$375.00
H345	M-R SR Stand	\$35.00
H346	M-R Reflector stand w/GOBO	\$30.00
H347	Colortran Multi 10*	\$75.00
H353	Colortran Vari 10	\$89.00
H355	1000 W. Colortran Broad*	\$85.00
H362	1000 W. Colortran set lights*	\$40.00
H368	Colortran 30 V Focusing Head*	\$35.00
H374	Colortran 30 V Head*	\$25.00
H380	40" Century stand 2 risers folding*	\$60.00
H386	40" Folding Century stand*	\$47.50
H392	B&M Clip strip set & case complete	\$385.00

\* More than one available.

All Used Equipment.

All Items F.O.B. Shipping Point.

All Items Subject to Prior Sale.



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You'll never buy at these prices again.

## NEW YORK

The following items are only available from our New York City store.

### LENSES

N01	Tegea 9.8MM F1.8 Arri mount	\$625.00
N02	Zeiss 25MM F1.5 Arri mount	\$135.00
N03	Zeiss 35MM F2 Arri mount	\$175.00
N04	Rodenstock 25MM F1.5 Arri mount	\$115.00
N05	Tele-Votar 25MM F5.5 Arri mount	\$75.00
N06	Baltar 40MM F2.3 Arri mount	\$115.00
N07	Baltar 50MM F2.3 Arri mount	\$150.00
N08	Baltar 100MM F2.3 Arri mount	\$195.00
N09	Zeiss 35MM F2. Arri mount	\$175.00
N10	Schneider 25MM F1.5 Arri mount	\$135.00
N11	Schneider 50MM Cine Xenon F2. Arri mount	\$190.00
N12	Angenieux 18.5 F2.2 Arri mount*	\$275.00
N13	Schneider 50MM Cine Xenon Arri mount	\$175.00
N15	Zeiss Sonnar 85MM F2. Arri mount	\$235.00
N16	Schneider 16MM F1.9 Arri mount	\$125.00
N17	Cooke Kinetel 25MM F1.8 Arri mount	\$295.00
N18	C.S.P. 75MM F2. Arri mount	\$425.00
N19	Angenieux 14.5MM 3.5 Arri mount	\$395.00
N20	Kinoptic 75MM F2. Arri mount	\$295.00
N21	Baltar 75MM F2.3 Arri mount	\$185.00
N22	Cooke SP Series III 18MM F2.2 Arri mount	\$540.00
N23	Cinegon 10MM F1.8 Arri mount	\$395.00
N24	Cinegon 10MM F1.8 Arri mount	\$350.00
N25	Angenieux zoom 12-120 F2.2 Arri mount	\$895.00
N26	Angenieux zoom 12-120 F2.2 Eclair mount	\$840.00
N27	Pan Cinor 25-100 F3.4 Arri mount	\$125.00
N28	Angenieux 17.5-70MM Arri mount	\$450.00
N29	Pan Cinor 38-154 F3.8 Arri mount	\$650.00
N30	Angenieux 25-250 zoom F3.2 Arri mount	\$3200.00
N31	Baltar 17.5MM C mount*	\$50.00
N34	Baltar 25MM C mount	\$65.00
N36	Cosmicar 25MM F1.4 C mount	\$60.00
N37	Cine Nikkor 25MM F1.4 C mount	\$65.00
N38	Switar 25MM F1.4 C mount*	\$75.00
N40	Cine Xenon 25MM F2. C mount	\$90.00
N41	Angenieux 75MM F2.5 C mount	\$140.00
N42	Angenieux 25MM F0.95 C mount	\$350.00
N43	Angenieux 10MM F1.8 C mount	\$210.00
N44	Baltar 100MM F2.3 C mount*	\$95.00
N46	15MM Ektar 2.5 S mount*	\$90.00
N48	25MM Ektar 1.4 S mount*	\$150.00
N51	25-15 Ektar converter*	\$25.00
N54	40MM Ektar F1.6 S mount	\$175.00
N55	63MM Ektar F2. S mount*	\$85.00
N57	102MM Ektar F2.7 S mount	\$150.00
N58	102MM Anastigmat F2.7 S mount	\$130.00
N59	102MM Anastigmat F2.7 S mount	\$100.00
N60	152MM Ektanon F4.5 S mount	\$150.00
N61	"Dynalens" complete w/case	\$6500.00
N62	New S to C adaptor with purchase of each S mount lens	\$20.00 ea.

### 35MM CAMERAS

N63	Arri 35MM 2B camera, 30 Baltar, 50, 75MM Xenon, wild motor, cable, 2-400 Ft. Mag, tripod adaptor, case	\$2000.00
N64	Arri 35 2CB/G, Pilotone Gen. & Auto Clapstick, 32, 50, 75 Cooke Lenses, wild motor, 2-400 ft. mags., case, tripod adaptor, 14 VO 4 Battery	\$5150.00
N65	B&H Compact Eyemo, Filter slot, 32, 50, 75MM lens 3 pos. viewfinders	\$450.00
N66	B&H Spider Eyemo model A-B, 25, 50, 75 Baltar lenses, 3 pos. viewfinder	\$375.00
N67	B&H Spider Eyemo Q, 24, 50, 100 Cooke Lenses, 2 pos. viewfinder	\$395.00
N68	B&H Spider Eyemo Q, 25, 50, 100 lenses, 3 pos. viewfinder	\$350.00
N69	B&H Spider Eyemo Q, 25, 50, 100 lenses Barrel Type finder door	\$350.00
N70	B&H Spider Eyemo Q, 25, 50, 100 lenses 3 pos. viewfinder	\$350.00
N71	Eyemo Single Frame reflex conversion w/90MM Makro with viewfinder	\$1300.00
N72	Mitchell 35MM STD. camera, 4 lenses, wild motor, matte box, 4-400 ft. mags, case	\$1500.00
N73	Mitchell 35MM STD Camera, 4 Baltars, 2-1000 ft. mags, wild motor, viewfinder, matte box, case	\$2300.00
N74	Mitchell 35MM STD. Hi speed, 4 Cooke lenses, 2-1000 Ft. mags, wild motor, viewfinder, matte box, cases	\$2800.00

### 16MM CAMERAS

N75	F&B/Cine-Sync Auricon conversion, 110V AC & Crystal w/handle & flat door, opt galv. accepts mag. head, 12 volt 7 AH Battery & charger, 1-400 ft. mag, aluminum, case (needs some work)	\$1795.00
N76	F&B/Cine voice conversion w/front handle, & flat zoom door (AC only)	\$1200.00
N77	Canon Scoopic "M" camera complete w/12.5-75MM zoom	\$1050.00
N78	Auricon 1200 Pro camera w/opt Galvo (as is)	\$500.00
N79	Mitchell 16-235" shutter w/4 Baltars, finder, 110 sync motor (or wild) 2-400 ft. mags., 2 cases	\$2495.00
N80	Arri S w/3 Schneider lenses, matte box, sync gen. constant speed motor cable, camera case, 1-400 ft. mag. torque motor, 12-120 Ang. zoom, Bauer battery & carrier	\$3825.00
N81	Arri 16 S/G, bloom light, sync gen., 3 Cooke Kinetel lenses, matte box, constant speed motor, wild motor, pistol grip, camera case 2-400 ft. mags & case, Torque motor, 14 VO 4 battery, sync cable	\$4500.00
N82	Arri 16 BL camera w/12-120 Ang. zoom, matte box, universal motor & cable, 2-400 ft. mags, Aluminum case, 12 volt belt battery	\$7000.00
N83	Cine spec I camera w/p adaptor, 100 ft. magazine	\$215.00
N84	Eclair NPR camera w/12-120 Ang. zoom, constant speed motor, cradle, 1-400 ft. new type mag., case, 12 volt battery	\$5500.00
N85	B&H 70 DR w/filter slot, 13, 25, 50 lenses, 3 pos. viewfinder	\$375.00
N86	B&H 70 DL, 15, 25, 50 lenses, 3 pos. viewfinder	\$275.00
N87	Bolex 100 Ft. Reflex w/25MM Switar lens, Unimotor & AC transformer	\$375.00

### 35MM CAMERA ACCESSORIES

N88	Arri 35 x 400 Ft. Mags. (Flat)*	\$235.00
N91	Arri 35 x 200 Ft. Mags*	\$125.00
N93	Mitchell 35MM x 1000 Ft. STD Mags*	\$99.50
N95	Mitchell 35MM R 35 x 400 Ft. inverted mags.*	\$95.00
N97	Eyemo 35 x 400 Ft. Metal Mags.*	\$20.00
N99	Eyemo 35 x 200 Ft. Metal Mags.*	\$15.00
N100	Arri 35MM Sync Motor & Cable	\$250.00
N101	Arri 35MM Metal Blimp	\$1500.00
N102	Arri 35 Constant speed motor	\$275.00
N103	Arri 35 V.S. Motor	\$250.00
N104	Arri 35 Underwater Blimp for 2 C Camera	\$2000.00
N105	Cine 60 offset motor base for Arri	\$290.00
N106	Arri 35 Bellows matte box	\$225.00
N107	Mitchell STD or NC follow focus units	\$100.00

### 16MM CAMERA ACCESSORIES

N108	Arri 16 x 400 ft. Mags*	\$195.00
N111	Mitchell 400 Ft. x 16MM Mags*	\$89.50
N112	Auricon Pro 400 Ft. Mags*	\$95.00
N114	Mitchell 1200 Ft. x 16MM Mags*	\$350.00
N116	Auricon Conversion 200 Ft. Daylite Mags*	\$99.50
N118	16 Arri Torque Motor*	\$215.00
N120	Arri 16 Sync Motor & Power Supply	\$175.00
N121	Cine Spec. Sync Motor	\$65.00
N122	Maurer 110 Volt Sync Motor	\$125.00
N123	Cine Spec. 12 Volt V-S Motor w/tach	\$125.00
N124	Cine Spec. 110 Volt V-S Motor w/Tach	\$150.00
N125	Cine Spec. Matte boxes*	\$15.00
N126	Mitchell 16 Blimp	\$175.00
N127	Maurer metal Blimp (needs front glass)	\$275.00
N128	Cine Spec. metal blimp	\$125.00
N129	Arri 16 Metal blimp	\$850.00
N130	Kodak Reflex Blimp ((needs work)	\$695.00

### EDITING

N131	Moviola 5 gang 16MM sync w/MS-16 mag head	\$195.00
N132	Moviola 2 gang 35MM sync	\$75.00
N133	Takita 4 gang 16MM sync w/MS-16 mag head	\$150.00
N134	8/16 B&H Hot splicer*	\$150.00
N136	8/16 Maier Hancock hot splicer	\$185.00
N137	16/35 Maier Hancock hot splicer	\$245.00
N138	URS amplifier (Moviola)	\$55.00
N140	Amplifier (URS type)	\$40.00
N141	800 Precision Opt-mag sound reader	\$175.00
N142	16/35 Japanese Opt-mag sound reader	\$125.00
N143	Moviola 35MM SRO Opt-sound reader	\$90.00
N144	Moviola 35MM SRM Mag sound reader	\$40.00
N145	16MM Muray viewer	\$99.50
N146	35MM Muray viewer	\$299.50
N147	FED 19 16MM viewer (F&B/Ceco)	\$190.00
N148	16MM Edioray viewer	\$190.00
N149	35MM Acme tape splicer	\$50.00
N150	16MM Precision Jr. viewer	\$115.00
N151	16MM St Cut Guillotine Splicer	\$95.00

N152	16MM Comb Guillotine Splicer	\$135.00
N153	35MM St. cut Guillotine Splicer	\$135.00
N154	16MM St. cut Rivas type Splicer	\$95.00
N155	16MM Diag. Rivas type Splicer	\$85.00
N156	16-16 Composite Moviola	\$2350.00
N157	35MM Moviola magnetic searching arm	\$300.00
N158	1-Auricon NR 40 4 input amplifier	\$300.00

### TRIPODS & ACCESSORIES

N159	NCE fluid head on pro jr. legs*	\$450.00
N161	Ceco fluid head on reg. legs	\$325.00
N162	F&B/Ceco magnesium fluid ball head w/reg legs*	\$475.00
N164	H.D. Miller fluid head on reg Mitchell legs	\$600.00
N165	Mitchell type reg legs	\$90.00
N166	Akeley Gyro reg leg only	\$40.00
N167	F&B/Ceco H.D. metal tripod legs	\$150.00
N168	H.D. Mitchell (35) type friction head	\$125.00
N169	Rank Tripod stabilizer	\$200.00
N170	F&B/Ceco 3 wheel SR dolly	\$125.00
N171	Moviola crab dolly, w/seats & side boards	\$4400.00
N172	Triangle	\$25.00
N173	Triangles with clamps	\$40.00

### PROJECTORS

N174	B&H Auto sound projector model #1552	\$400.00
N176	Bolex #421 Opt-mag. sound projector	\$1350.00
N177	B&H Opt-mag model 302 sound projector	\$400.00
N178	STM 3 16MM continuous projector	\$395.00
N179	Graflex sound projector	\$350.00

### LIGHTING

N180	Colortran LQK-10-DY dual yoke	\$25.00
N181	Colortran LQF-10-Focus	\$50.00
N182	Colortran Super beam	\$40.00
N183	Colortran 2KW soft lite	\$120.00
N184	Colortran cine king	\$20.00
N185	Colortran old type cine queen	\$15.00
N187	Colortran R 60 heads*	\$10.00
N188	Colortran R 80 heads*	\$15.00
N189	Colortran Sr. converter	\$15.00
N190	Colortran 40 amp converter	\$25.00
N191	Colortran LQK-6-DY heads w/yoke	\$17.50
N192	Colortran LQF 30 heads	\$15.00
N193	F&B/Ceco 5KW cone heads	\$25.00
N194	F&B/Ceco 2KW cone heads	\$20.00
N195	F&B/Ceco 2KW cone head	\$20.00
N196	M/R-B/M single broad heads	\$7.50
N198	F&B/Ceco Quad heads*	\$7.50
N199	B/M Double broad head	\$15.00
N200	M/R 750 spot heads	\$42.50
N201	M/R 2KW spot heads	\$85.00
N202	M/R 5KW spot heads	\$185.00
N203	M/R 170 ARC lamps w/grids	\$850.00
N204	M/R 90 ARC lamp w/grid	\$350.00
N205	F&B/Ceco Hydraulic Molevator	\$400.00
N206	Thomas Hydraulic Molevator	\$650.00
N207	M/R-5KW Single riser stands	\$20.00
N208	M/R Wood 48" x 48" reflector boards	\$7.50
N209	M/R Wood 30" x 36" reflector boards	\$5.00
N210	M/R Wood 48" x 48" reflector storage box	\$5.00
N211	Hollywood scene dock 48" x 48" yokes	\$7.50
N212	M/R reflector ground rods	\$5.00
N213	M/R sound boom	\$500.00
N214	M/R sound boom parambulator	\$150.00
N215	Ceco Lite century Stands	\$7.50
N216	Ceco Med. Century Stands	\$10.00
N217	Ceco 750 Trombones	\$10.00
N218	Ceco 750 Adjustable claws	\$10.00
N219	Ceco 750 Double hanging claws	\$7.50
N220	B/M 2KW Spot heads	\$65.00
N221	B/M 750 Spot heads	\$35.00
N222	B/M 5KW Spot heads	\$125.00



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# THE NEW BELL & HOWELL/MAMIYA SUPER-8 SOUND CAMERA

Details of the new "Filmosonic" Super-8 sound camera, which features one-stop plus or minus contrast control, pushbutton fade-in/fade-out and a red cue light for alerting the subject

A new low-light Super-8 sound camera with more advanced capabilities has been introduced by Bell & Howell/Mamiya Company.

"The new Bell & Howell Model 1235 Filmosonic™ XL Super-8 magnetic-sound motion picture camera has advanced capabilities which make possible the shooting of higher quality and more creative sound movies," state George R. Simkowski, president of Bell & Howell/Mamiya Company.

Major features of the new sound camera include: contrast control of plus or minus approximately one f/stop for front and backlighting situations;

pushbutton fade-in and fade-out control; and a red cue light which alerts subjects when the camera is in operation. Other new features are an earphone sound monitor and full-time pushbutton power zoom.

The contrast control helps provide better picture quality by giving movie-makers the flexibility to vary exposures by about one f/stop in either direction to compensate for extreme front and backlighting conditions.

Movie-making creativity is enhanced through the use of special effects made possible by the camera's fade-out and fade-in capabilities. Fade-

outs and fade-ins are smoothly accomplished from full illumination to blackness and back again to a properly exposed new scene in about five seconds, thereby providing smoother transitions from scene to scene and easier editing if required.

The full-time power zoom push-buttons, fade-out and fade-in button, and contrast control switch are all conveniently clustered at the top front of the camera body where they can be easily reached and operated by the fingers of either hand.

Positioned below the lens, the red cue light provides subjects with a visual signal that the camera is operating, eliminating need for verbal communications which otherwise would be recorded.

The earphone and sound monitor provide more positive assurance of good sound quality because it enables movie-makers to listen to actual sound levels and make an adjustment in the microphone position or sound level switch both before and during filming.

The full-time pushbutton power zoom provides a smooth transition between wide-angle and telephoto lens position at any time.

The new Bell & Howell 1235 Filmosonic XL sound camera also includes all of the operational features of ease and simplicity and accepts all of the accessories provided with the company's previously introduced Model 1230 Filmosonic XL sound camera.

Weighing less than 3 lbs., the compact, sleekly designed Model 1235 camera is 25 to 50 per cent lighter than most other sound movie cameras. Economically operating on only six AA alkaline batteries, the camera has Bell & Howell's exclusive Focus-Matic® pushbutton distance-measuring system; visual viewfinder signals for indicating correct sound level, light level and filter positions prior to picture-taking; reflex thru-the-lens viewfinder; professional pistol grip; low-light f/1.3 zoom lens (8.5mm wide-angle to 24mm telephoto); wide-ranging external-sensing electric-eye system; and two-position automatic level control (ALC).

The camera's built-in Type A filter is automatically removed by a Type G film cartridge or movie light mounting

**The new Bell & Howell 1235 Filmosonic XL Low-light, magnetic sound-on-film Super-8 camera was designed to make possible higher quality and more creative sound films, and thus incorporates many professional features. Weighing only 3 lbs., the sleek new camera is 25 to 50% lighter than most other Super-8 sound cameras. It operates economically on six AA alkaline batteries.**







The full-time power zoom pushbuttons, fade-out and fade-in button and contrast control switch are all conveniently clustered at the top front of the camera body where they can be easily reached and operated by the fingers of either hand. Positioned below the lens, the red cue light provides subjects with a visual signal when the camera is operating.

bracket, as well as being controlled manually by an external switch.

Other camera features include an omnidirectional dynamic microphone with a long 20-ft cord; combined viewfinder film transport, "last five feet" and end-of-film indicator; pushbutton battery test scale; automatic resetting film-footage counter; lock/run button; and tripod and cable release sockets.

The camera accepts 50-ft. sound and silent Super 8-film cartridges (ASA 40/25, ASA 160/100 and Type G — ASA 160). Sound and silent film cartridges both run at 18 fps, providing 10 percent more screen time for silent film, which runs at 20 fps in most other sound cameras.

The new camera is the latest addition

to Bell & Howell/Mamiya Company's complete Super-8 magnetic-sound movie system which also includes the Filmosonic Model 1230 XL camera and Filmosonic™ Models 1744Z, 1742 and 1733 Super-8 magnetic sound projectors.

**FEATURES: Bell & Howell Filmosonic™ XL Low-Light Super 8 Sound Motion Picture Camera — Model 1235**

★ Super-8 magnetic sound-on-film low-light movie camera.

**New Camera Features**

★ Earphone sound monitor (used both in test position and during filming)

- ★ Contrast control (± approximately 1 f/stop)
- ★ Fade-out and fade-in pushbutton control
- ★ Red cue light
- ★ Full-time pushbutton power zoom (zoom can also be operated manually)

**Other Features**

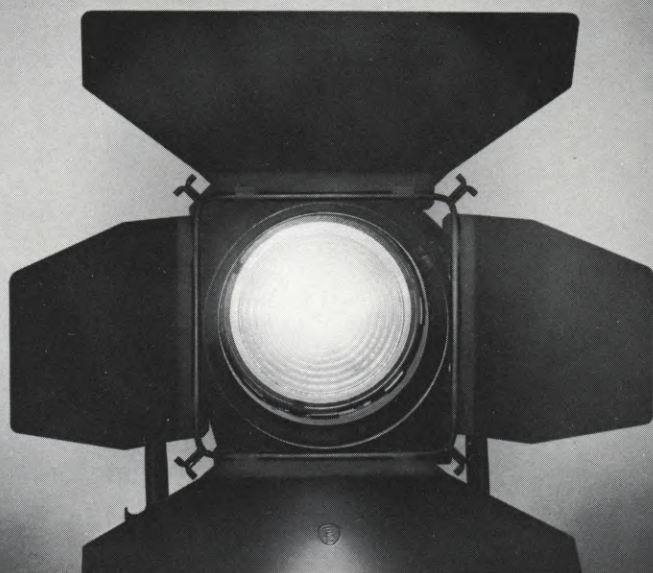
- ★ 2.8-to-1 ratio f/1.3 zoom lens (8.5mm wide-angle to 24mm telephoto).
- ★ Focus-Matic® pushbutton distance-measuring device.
- ★ Aperture range of f/1.3 to f/45 (with automatic ND filter).
- ★ CdS external-sensing, high-torque electric-eye system with double vane iris.
- ★ Built-in Type A filter (controlled by external switch, movie light mounting bracket, or Type G film cartridge).
- ★ Super 8 film cartridge loading (sound and silent).
- ★ Thru-the-lens reflex viewfinder.
- ★ 18 frames per second with sound or silent film.
- ★ Automatic level control (ALC) with normal and low settings controlled by external switch.
- ★ Omnidirectional, dynamic microphone with 20-ft cord.
- ★ Full viewfinder read-out (illuminated Type A filter reminder, green signal light sound level indicator, red signal light under-exposure warning signal, film transport indicator, and red "last five feet" signal).
- ★ Automatic resetting film-footage counter.
- ★ Battery test scale to show battery strength.
- ★ Contoured pistol grip with trigger-activated film and sound control.
- ★ Test for sound and light level by pressing trigger part-way in.
- ★ Lock/run button.
- ★ On/off power switch.
- ★ Tripod and cable release sockets.
- ★ Power: Six (6) AA alkaline batteries (external 9-volt power supplies are also available).
- ★ Size: 9x8x2¾" (including pistol grip).
- ★ Weight: about 3 lbs with batteries.
- ★ Suggested List Price: \$389.95
- ★ Available accessories include: AC Adapter; Car Adapter; Battery Pack with belt clip; 15 ft. Microphone Extension Cord; Unidirectional Microphone; Camera Carrying Case. ■

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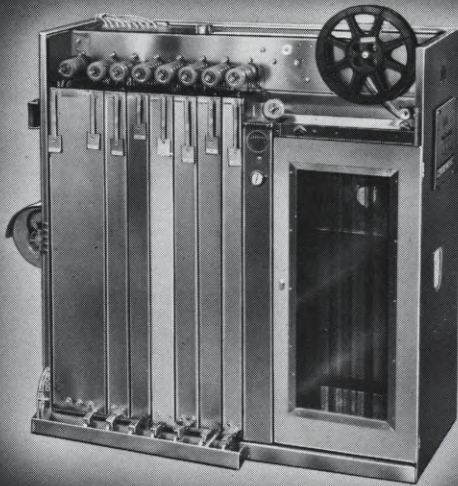


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## SHERLOCK HOLMES

Continued from Page 1157

able that you could actually work in. This sequence was very carefully storyboarded, with the result that, while it was a very big set, it was very economical, because Terry built only what was needed. It was a matter of knowing exactly what camera angles would be needed and what type of lighting. It was a fog sequence and we had to put in a lot of lampposts and things like that to give us a reason for the light sources.

**QUESTION:** Judging from the rushes I saw of the opera sequence, I would say that the photography in that particular case had almost a "comic strip" quality. Isn't that so?

**FISHER:** Exactly so, in that sequence. It had to be very high comedy, and since it was a stage situation anyway, there was no realism involved. It was entirely theatrical in its content, so it could go beyond reality, taking on a kind of "comic strip" character, as you pointed out. By way of contrast, there have been other, more dramatic sequences involving very obvious villains and they had to be lit in a very obviously "villainous" manner.

**QUESTION:** You mentioned having to inject a romantic quality into some of the sequences. Could you elaborate on that a bit?

**FISHER:** Yes. There are scenes between Gene Wilder and Madeline Kahn which had to have a kind of romantic quality. They were sort of tenderly done and the camerawork was much more soft and persuasive. When I first read the script, Gene came out to Nice, where I was working, and we

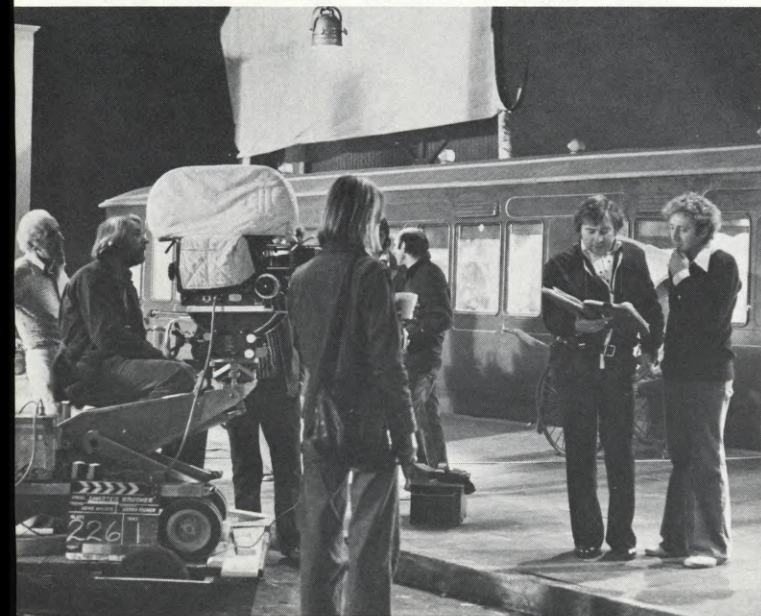


The crew sets up on the waterfront for one of the few location sequences in the film. Unlike most pictures made today, which are mainly or entirely shot on location, this one is being filmed almost entirely within the studio on specially constructed sets, an interesting change of pace for Fisher, who describes himself as "basically a location-type cameraman."

talked about my doing the film. The one thing in the script which he said he wasn't sure about — as far as how to do it was concerned — was the final shot. They meet in the park and it's the kind of an end shot on which you would normally say: "Okay, up and away!" But, of course, we didn't want to do just that. An idea suddenly occurred to me,

and I said: "Maybe this isn't right, but the way I feel about it is that we 'up and away', but we do it with the people going along with the camera. They take off, too, you see." So we did it that way. We put Madeline and Gene on a little platform on the end of a crane. There is music (which arrives conveniently because two of the characters appear

(LEFT) Rehearsing a sequence on a train platform built inside the sound stage. (RIGHT) Getting ready to make a take for the hansom cab chase sequence, which includes fights taking place atop the coaches. Lampposts were included in the sequence to motivate light sources. Instead of rear-projection process for the chase, a device harking back to the silent movie days was resurrected, that of playing the chase action against a 35-foot revolving drum background.





with a harp and a violin) and they dance. Then, in fact, as they dance, you're suddenly aware that they have taken off; they are actually floating, and we continue up and up and up through the trees and end up with just letting them drift out of the picture and finish in the sky — to sort of sum up the romantic element of the thing. Gene loved the idea and we did it that way.

**QUESTION:** The sequence I saw in the rushes took place at the opera, in a backstage room filled with the most outlandish props. The "comic strip" quality I spoke of resulted not only from a higher key of light, but from the fact that light seemed to be coming from some rather crazy angles. Can you tell me a bit more about that?

*FISHER:* In that sequence I purposely used multiple sources of light, instead of the more conventional single source lighting. The sequence takes place in a large room full of a lot of figures. Obviously, these throw lots of shadows but, on the other hand, if the actors are continuously moving you don't want them to disappear into large areas of vacancy. To solve that problem without duplicating shadows (I don't like duplication of shadows), I kind of began the sequence by introducing unexplained angles of light. You don't know where they come from, but I could manipulate them according to the set-up. You are always able to see the actors, always able to see the action, although, in principle, there are no lights on in the room. Logically, in such a case, you would keep the set dark, but that obviously wouldn't work. Since one has to be able to see so much more, the light comes in through the open doorway, from the windows opening onto the street, and from other sources that are simply unmotivated. Any cameraman looking closely would see that the lighting is achieved from a multiplicity of angles, but I don't think one need worry about that, because it is essential in order to capture the action. As you said, it's done in a comic strip style.

**QUESTION:** Which I think is absolutely correct for this kind of subject. Do you feel that there is another approach that could have been any better?

*FISHER:* Not really. One could flat light it, of course, using a sort of overall soft light that would permit you to see everything everywhere. But that would have no emphasis at all and you would lose the comic element. There's an



(TOP) For the final scene of the film, the camera soars "up, up and away", taking Wilder and Madeline Kahn along with it. They are standing on a platform at the end of the camera crane. (RIGHT) As they dance romantically, they rise with the camera through the treetops, eventually ending up against the sky.

awful lot of things in that set which sort of make a comment — like the gorilla with a Faye Wray in its arms. There are so many stuffed animals, so many textures, so many little details. Shooting that sequence was a lot of fun.

**QUESTION:** I'm sure it must have been. If you had to reduce all this to theory (as they're always trying to do in the film schools), what would

you say are the main differences in lighting approach between a drama and a high comedy like this?

*FISHER:* Well, I think a drama often dictates its own style, in a sense, because it's clearly written into the script. A certain atmosphere definitely prevails. Whereas, in a comedy, it's not so much atmosphere as situation that

Continued on Page 1180





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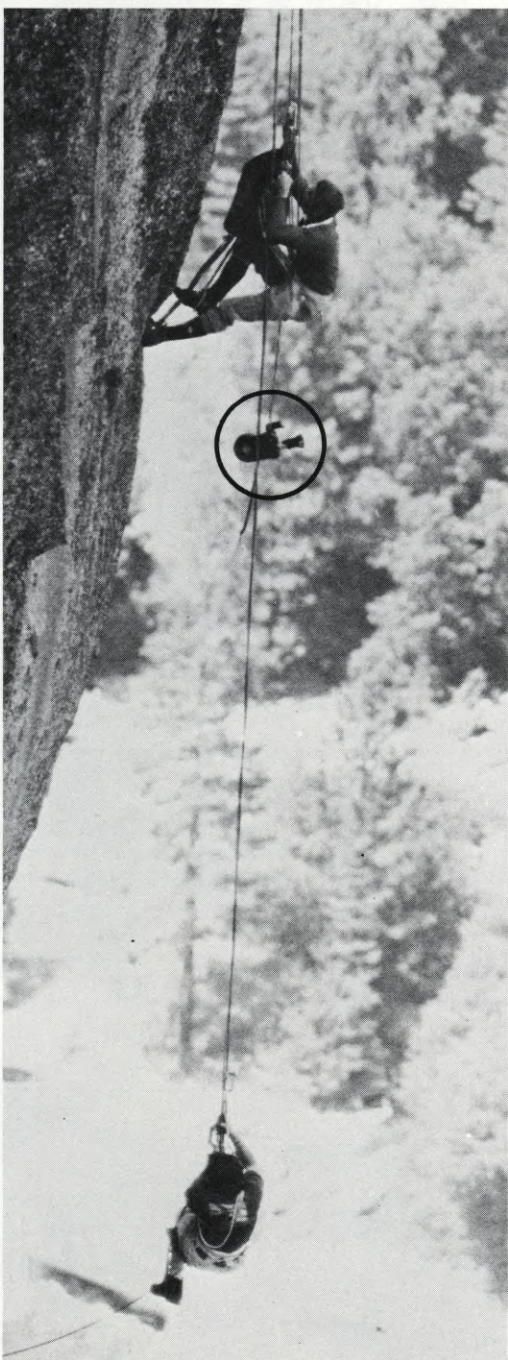
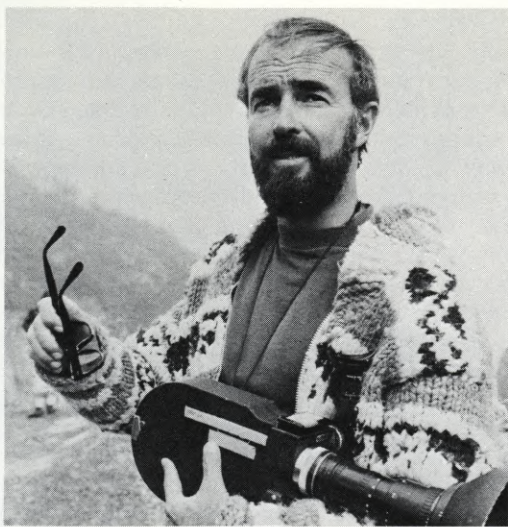
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Producer-director-cinematographer Roger C. Brown, president of Summit Films Inc., has been using Eclairs since 1968, so when he began shooting his feature film, "The Edge," his first choice for a camera was the ACL.

*"The original reason I had for wanting an ACL was its weight, or lack of it, I should say. Every extra ounce really hurts when you're climbing mountains or hiking down canyons. The ACL, with a 200 ft. magazine, is the lightest professional sync sound camera unit available. On top of this, it's compact. I can put the whole thing plus extra rolls of film, an extra magazine, batteries, a light bag, and cables in one backpack and I still have a reasonable load."*

Brown's film, "The Edge," is no ordinary feature. It took him and his ACL on some of the most rugged film-making assignments ever faced by a cameraman and his equipment. In Yosemite Valley the camera went up and down vertical rock faces. In Aspen, Colorado, the ACL filmed all day at 20°F below zero with winds pushing the chill factor down another 10 to 20 degrees. Socorro, an island in the middle of the Pacific, is a birthplace of cyclones, and salt water and sand, blown by the high winds, penetrated the ACL but did not prevent it from running. The camera went up to 16,000 ft. on Mt. Kenya in Africa, facing everything from snow to hot equatorial sun. And a trip down the Grand Canyon produced more wind, sand, water and intense heat. Brown says he filmed several thousand feet at 75 fps in addition to the usual 24 fps, all with no problems.

If ruggedness isn't enough, Brown adds that the lightweight ACL was so comfortable to hold that he would seldom put it down, even during rehearsals. "My arms never felt shaky even after holding the camera for an hour or more."

Seventy thousand feet of film is a lot of film to put through a camera even under ideal conditions. For "The Edge," the ACL was given the supreme test. As Brown comments, "I suppose the ACL isn't perfect, but, as much as I have thought about it, I can't suggest any improvements."



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action scene is painted black. The board is then placed on a tracing table and the matte line is transferred to a white board. The area to be occupied by the painting is then painted black on this board. This procedure requires that camera, easel and the tracing table have the same means of registration. Using the camera as a printer with a positive of the action scene bipacked with a dupe negative film and the board which is white in the desired area, a dupe of the action is made. This dupe negative is rewound and the painting is substituted for the printing matte and is exposed on the dupe negative, completing the composite. If the scene is in color, three narrow band separations are used to make the action dupe. The negative stock used is the current taking stock, such as EK5247. The painting is photographed with the narrow band filters, one record at a time, which provides a fine vernier of exposures for balance purposes. This camera easel setup lends itself to what is known as composite shots. An example would be a long shot of a theatre audience. It is economically unsound to hire 1000 extras at \$50 each, so 200 are hired and moved from section to section of the seating area and composited using printing mattes.

**OPTICAL EFFECTS**

The optical printer is a tool used extensively in the manufacture of effects. Basically, an optical printer is a machine composed of a camera and a lens that is focused on the aperture of a projector. Today there are available several augmentations of this relatively simple concept, for example, a second projector and its optical system are added behind the first projector. Then, by placing a block prism in front of the aperture of the first projector, a third projector and its optical system may be added at right angles to the first two projectors. With the ability to bipack two films in each of the projectors and the camera the resultant dupe negative may be the result of the modulations of seven films. Henceforth the optical printer will be discussed on the basis of a simple camera projector machine. It is true, however, that most of the functions described are applicable to the multihead printers. Moving the camera and the lens via a cam system makes it possible to enlarge or reduce the image in a stationary or zoom mode. Powering the projector and camera with separate motors activated by a power supply similar to that of a distributor in a car the frame rate may be readily changed; i.e., print one, drop one, print three, etc. Print each frame twice or three times, etc. The projector may be run in reverse so that the scene will appear tails to head. Obviously

Continued on Page 1184



FIGURE 1A

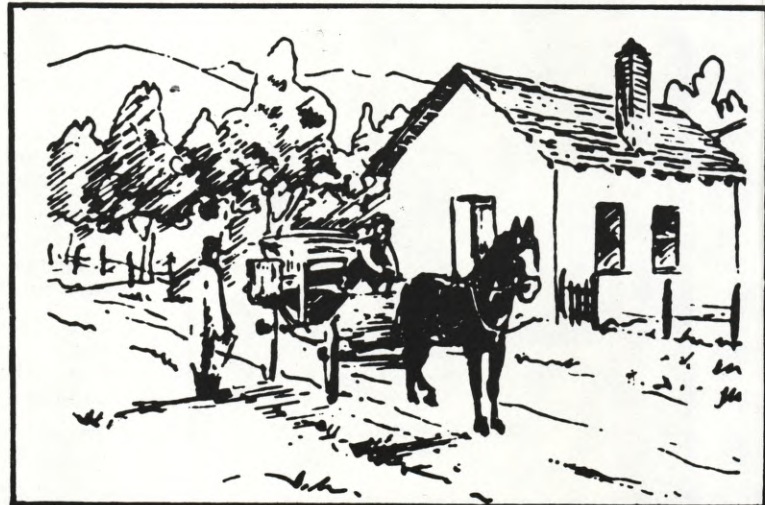


FIGURE 1B

Elements of a stationary matte shot. (LEFT) FIGURE 1A is a sketch of a scene as originally photographed. It has a nondescript building, sparse foliage and an incongruous and distracting background. (RIGHT) FIGURE 1B is a sketch of the same scene, as altered by a matte painting. A more attractive roof has been added to the building, the foliage has been extended and the inappropriate background has been replaced by mountains and clear sky.

The method of altering the scene above (FIGURES 1A and 1B) is illustrated here. (LEFT) The area to be occupied by the matte is painted black and the combination camera-printer-projector, bi-packed with raw stock and a master positive of the original scene, photographs a dupe negative. (RIGHT) The matte painting to be added by superimposition is photographed onto the rewound, but undeveloped dupe negative.

FIGURE 2

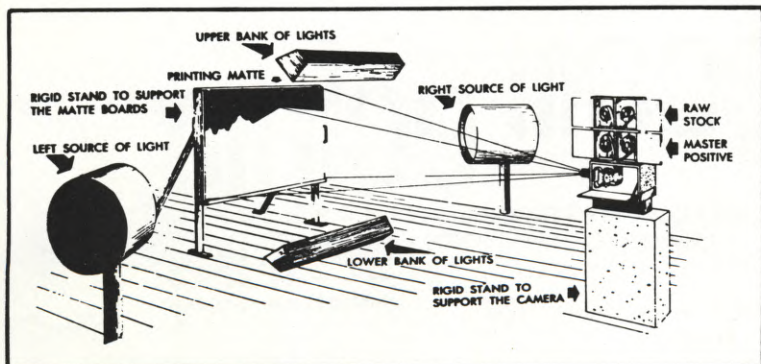
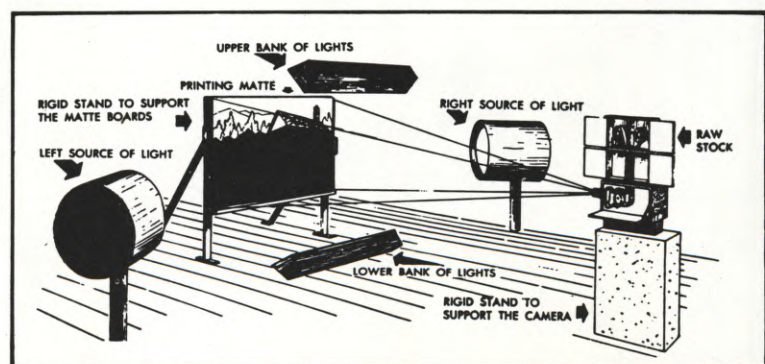


FIGURE 3





(RIGHT) FIGURE 4A is a profile sketch of the method used for planning and shooting a glass shot. By this method, the upper portion of the scene is painted in miniature on a panel of glass erected before the camera, and the painting and part of the actual set are photographed in one shot.

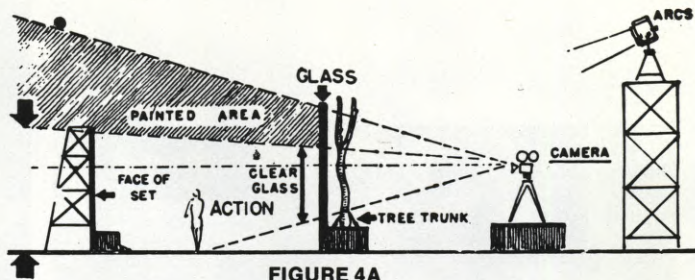


FIGURE 4A

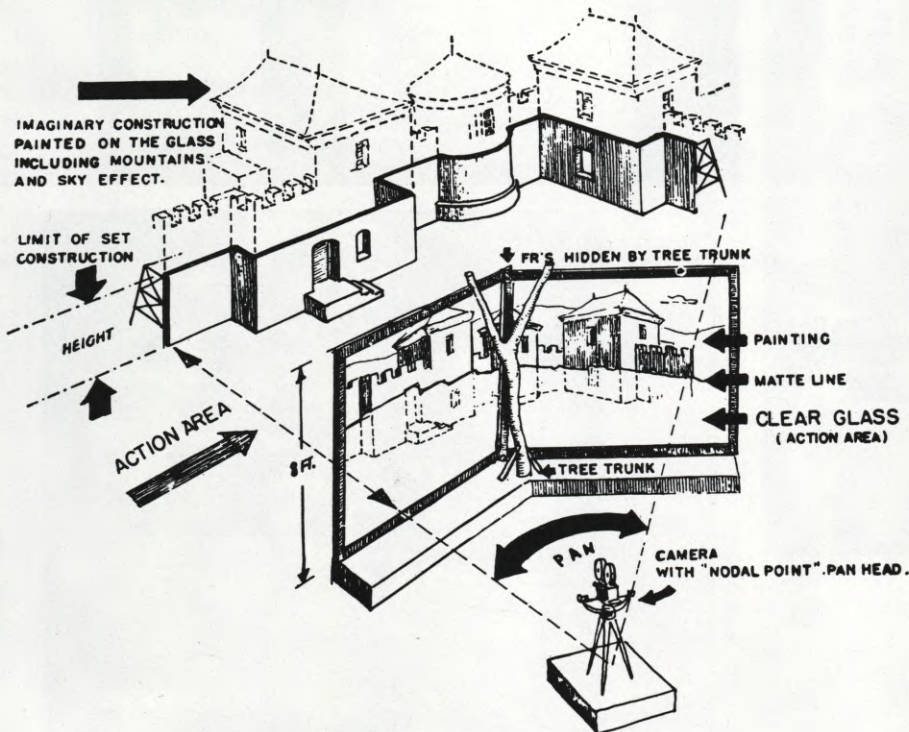


FIGURE 4B

(LEFT) FIGURE 4B shows the glass shot set-up in much greater detail. Only the lower portion of a very elaborate set need actually be constructed. The upper portion, which may be as ambitious as the imagination of the production designer allows, is painted on one or more glass panels. In the case illustrated, two panels are butted together to allow for panning, the point at which the panels are joined being hidden by a prop tree trunk.

(RIGHT) FIGURE 4C presents a "bird's eye view" sketch of the glass shot set-up. The glass paintings are front-lighted to balance with the lighting of the live action area and this balance is critical to the success of the shot. Since the glass painting also serves as a mask to blot out the upper portion of the actual set, all live action must obviously be confined to the area below the painting.

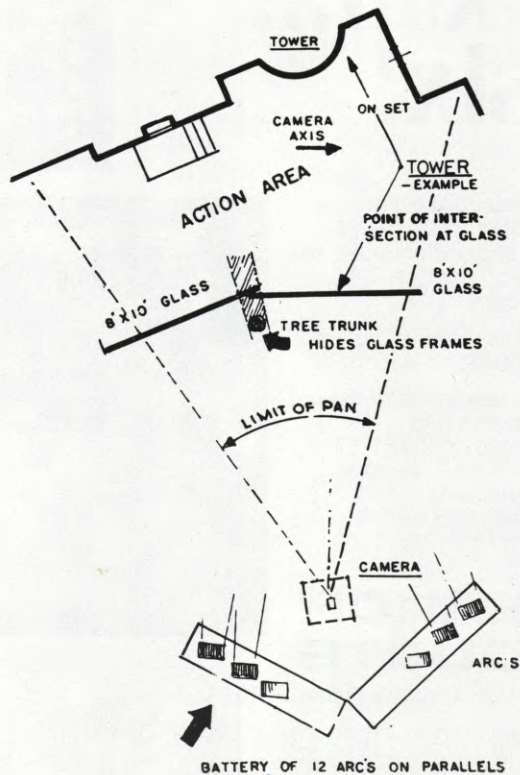


FIGURE 4C

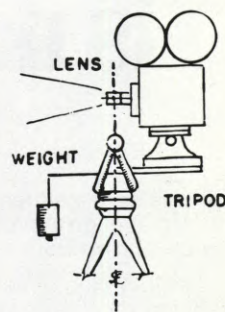
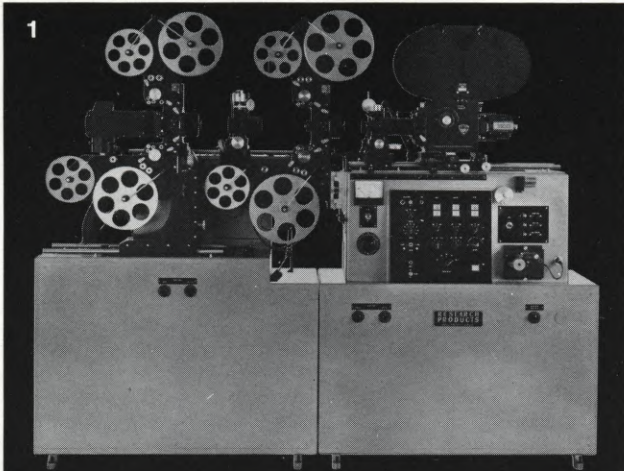


FIGURE 4D

(ABOVE) FIGURE 4D is a sketch of the special camera set-up needed to film a glass shot in which panning is involved. It involves a special pan-head which locates the tripod pivot-point exactly on the nodal point of the lens. Without such a head there would probably be an undesirable shift between the perspective of the painting and the live background scene onto which it is superimposed.



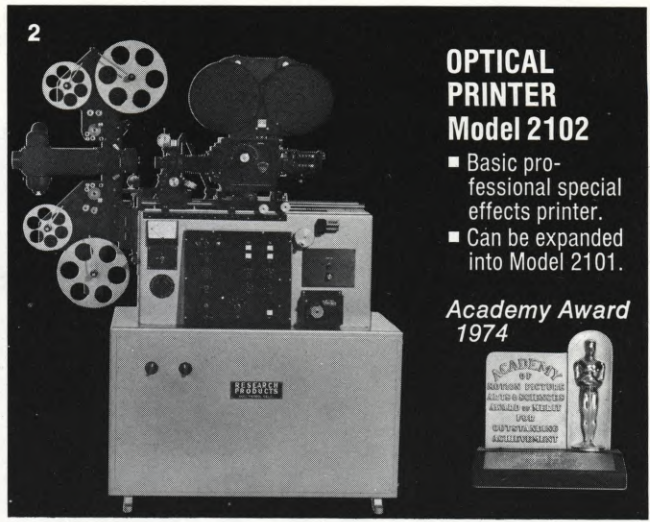
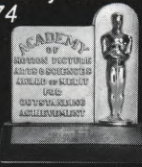


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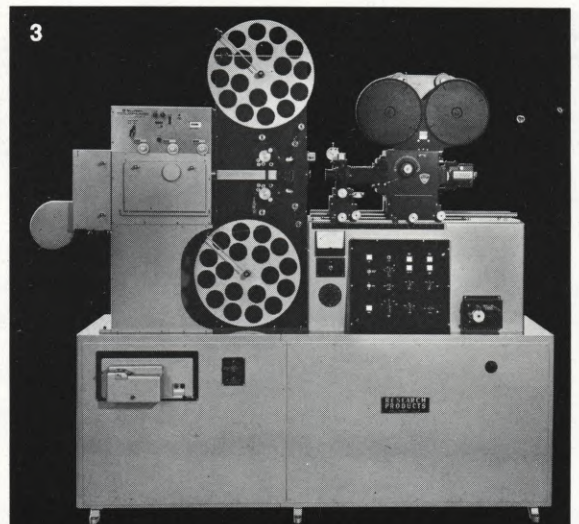
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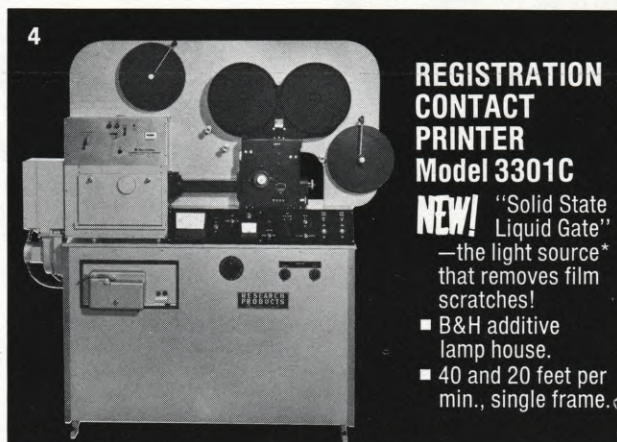
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Between takes, Wilder studies a scene on the playback monitor of the Samcinevision through-the-lens closed-circuit TV viewfinder-replay system, hooked up to the Panavision R-200 camera. A similar system was pioneered by Jerry Lewis and is invaluable to actors who are directing and acting simultaneously, affording them the only way to check instantly the action of the scenes in which they appear.

**SHERLOCK HOLMES**  
Continued from Page 1173

*must be considered. So you've got to think in terms of how you can help define the situation visually, without hindering it by adding the wrong atmosphere. Most of us cameramen like to create atmosphere and it's very easy to make the mistake of doing so — in the strict acceptance of the term defined as "mood" — when such a definite atmosphere is really not*

**A cat can look at a queen — which is what Gene Wilder seems to be doing here in a scene with a make-believe Queen Victoria. Under the tutelage of madcap writer/director Mel Brooks, Wilder has starred in "THE PRODUCERS", "BLAZING SADDLES" and "YOUNG FRANKENSTEIN". On his own this time out, he seems to be proving that he can handle the comic film scene all by himself.**

*needed. For example, many of the pictures I've done have been very moody, atmospheric films, in which one clings very hard to a definite lighting theme within a sequence — like a dull day in a room at four o'clock in the afternoon. In a comedy you would never need to make that presupposition. Probably it would never come up.*

**QUESTION: In terms of lighting, what concessions have you had to**

**make because the action of this film takes place during the Victorian period?**

*FISHER: It has been a gaslit thing throughout — no electric lamps. We have a lot of little oil lamps on the set, but that, of course, is useful in that it gives you a chance to enhance the lighting, in the sense that low lamps on tables are always nicer to work from, I think, than a chandelier hanging in the middle — or fluorescents, for example. I certainly like lighting what I suppose could be called "medium low-key subjects", in which you've got the gentle glow of light from oil lamps, rather than from conveniently bright sources. I use a combination of lighting methods anyway; I don't have just one. I very often use a combination of reflected light and direct light, but not consistently. I mean that it's not a sort of total overall approach. I use light through soft panels, but I also light directly and from bounced sources. What I'm actually trying to do most of the time is disguise what I'm doing.*

**QUESTION: What specifically do you mean by that?**

*FISHER: What I mean by that is that I'm happier if the results, while pleasing, don't necessarily show that they were achieved deliberately — but, rather, kind of accidentally. I want things to look like they just happened. For example, you sometimes go into a house on a Sunday afternoon and the way that the light strikes the sideboard is accidental, because it's only there at that particular time. Similarly, one can engineer lighting in such a way that it enhances what you're seeing without it looking like somebody said: "Ah ha, I'm going to put a light there and I want you to see it." On the set you might be aware that a certain lighting scheme looks very complicated, but the results on the screen don't look complicated; they look simple, but fortuitous.*

**QUESTION: You mentioned earlier that you are essentially a location type of cameraman and that it's quite a change for you to be back working on a full-scale studio production again. Do you have any preferences as regards location versus studio shooting?**

*FISHER: That question requires a very complicated answer, of course, because one very often enjoys a location and your problems are so varied. Then, too, there are certain things that would be rather tedious to*







(LEFT) Wilder adjusts the fedora of "YOUNG FRANKENSTEIN" sidekick Marty Feldman, who seems to be popping his eyes in two opposite directions at once. Madeline Kahn, his co-star in "SHERLOCK HOLMES", also appeared with him in "FRANKENSTEIN". (RIGHT) Wilder listens to a playback of the sound track between takes. He is impatient with himself because he has, as yet, been unable to learn everything about film technology, but as cinematographer Fisher says, "It takes a long time to know everything and most of us never will anyway."

do in the studio, but which automatically become easier to do on location. For example, if you're shooting a scene inside a room with large windows that show a considerable expanse of exterior scenery in the background, filming it inside a studio stage would entail lighting a background which would require considerable time and equipment. Furthermore, no matter how much time you spent on it, the

result would probably not look any better than what you could get in a real room by simply balancing your light to the exterior background. On the other hand, on location you would have to cope with the problem of variations in lighting during the day — especially here in England. Even that, however, can sometimes work for you because it's often useful not to have the high-key exterior. It means that you don't need

as much light to balance the interior and you don't need to go to things like filtering the windows in order to cope. Of course, a studio is better in the sense that you've got much more freedom, especially in terms of set. You also have the possibility of making movements you couldn't make in a real location — particularly for this kind of film. Many pictures, of course, I feel are  
Continued on Page 1207

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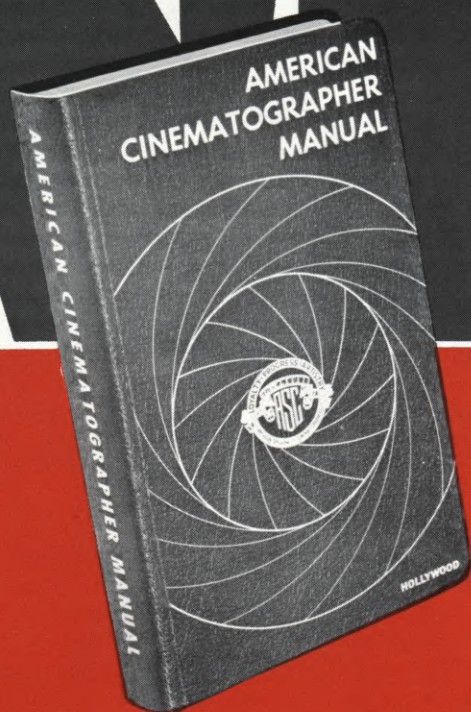
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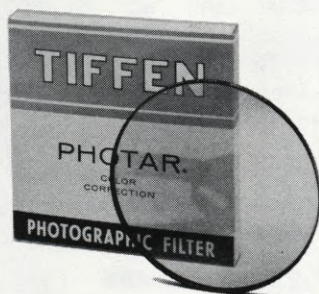
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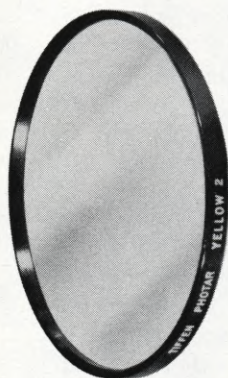
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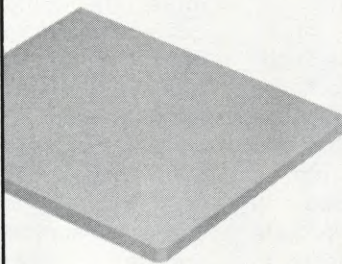
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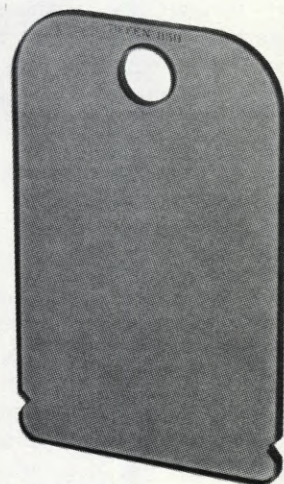
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## THE CAMERAMAN AND SPECIAL EFFECTS

Continued from Page 1176

some functions have been omitted and new ones will be conceived.

The Effects-cameraman needs to know what can be done optically, as it will often make it possible to display an effect that is impossible to photograph in real life.

Since most of his work will require the use of a dupe negative, the Effects-cameraman should know what makes film tick. As an example, in color photography there is no way to change the original contrast other than making narrow band EK5235 separations developed to gammas that will produce a dupe negative having the desired contrast. For example, if the original photography is too flat, higher than normal gammas will be used in the separations. Conversely, should the original be too contrasty, lower gammas will be used. The ability to separate the multilayer color negative into its red, green and blue components via the use of Black and White silver emulsions opens the way to change the original photography in a legion of ways. Should the red and blue records be switched, the faces would be bluish. If a flatter than normal Red record is used the highlights will be cyanish and the shadows reddish. If a contrastier than normal Red record is used the highlights will be reddish and the shadows cyanish. It is interesting to note that by using this contrast technique a pseudo two-color scene may be made from a black and white original.

Consider a World War II scene of a formation of B17s photographed in black and white, using a red or yellow filter, against a blue sky with white clouds. From the negative

make a high-contrast positive and call it the red record. Make a very flat positive and call it the Blue record. The thinking behind this is that had this scene been shot on color negative and separations been made, when viewing the Red separation the white clouds would stand out against a dark sky area and the aircraft would be a middle tone.

Viewing the Green separation, the sky area will not be as dark or the clouds as white as in the Red separation. The aircraft will remain a middle tone. Viewing the Blue separation the clouds and the sky area will almost merge and the aircraft will still be a middle tone. Comparing the three positives made from the Black and White negative, it will be apparent that they simulate the separations made from a similar scene that was photographed in color. Therefore, when a color dupe is made from the positives made from the Black and White negative the clouds will be white and the sky area will be blue and the aircraft a middle tone monochrome.

Often fog sequences are made and the economics of production, plus the capriciousness of the weather, make it impossible to photograph all of the scenes in a matching fog condition. These sequences are edited and turned over to the optical department where flat separations are made and a dupe is exposed on an optical printer. Various fog filters are used in the optics of the printer and usually a flash exposure is added to the dupe negative. This scene-to-scene doctoring will produce a sequence in which the fog seems to remain consistent.

In closing, I hope the reader is aware that the various techniques discussed are subject to innumerable variations and that the Special Effects cameraman best be a Jack-of-All-Trades. ■

## LIGHTING COMPARISON

Continued from page 1148

Unfortunately, the incandescent lamp uses prodigious amounts of electrical power in comparison with xenon or Metallogen® lamps, and its already low efficiency is further degraded whenever filters are used.

### Metallogen® HMI LAMPS

The Osram HMI lamp is a high-intensity light source with discharge zone dimensions quite similar to those of a carbon arc, and somewhat less compact than the xenon lamp. A proprietary combination of rare earth elements within the envelope provide the lamp's excellent approximation to natural daylight. In contrast to xenon and carbon arcs, HMI lamps operate from an AC source, thereby simplifying the electrical support equipment. All that is needed is an ignition circuit that furnishes a brief burst of high-voltage pulses for initial gas ionization, plus a ballast to stabilize operating current, and thereby the light output and color spectrum, once the lamp attains working temperature.

### SUPPLEMENT TO METAL-HALIDE LAMPS

Metallogen® lamps are expected to supplement rather than compete

across the board with conventional metal-halide lamps. (Metallogen® lamps are a metal-halide type, too.)

Except for rather specialized types, such as used for in-flight motion picture projectors, conventional metal-halide lamps are not point sources and, therefore, are not used where accurate optical control of light is of paramount importance. Also, the light from conventional metal-halide lamps does not match the excellent spectral distribution of Metallogen® lamps and of the three other point light sources discussed previously. On the other hand, conventional metal-halide lamps are economical in terms of initial cost, energy consumption and operating life; and their remarkably well-balanced light output is widely accepted as a standard in general lighting applications.

Nevertheless, Metallogen® lamps are expected to find applications where conventional metal-halide lamps are now the predominant light source. In a sports facility, for example, Metallogen® lamps can be used very effectively to "highlight" the playing field, boxing ring, ice surface, or tennis court, while conventional metal-halide lamps can serve for the general illumination of the entire arena or stadium. Selective supplementary illumination of sports events, political

conventions and similar events is particularly desirable when television coverage is involved.

### COMPARATIVE COSTS

Metallogen® lamps carry high price tags, but illumination with such lamps is less costly than it seems. A comprehensive cost comparison of various light sources is beyond the scope of this article. Nevertheless it is clear that when all costs of illumination are considered, Metallogen® lamps are more costly than conventional metal-halide or tungsten halogen lamps, but are distinctly less costly, in the long run, than carbon arcs and xenon lamps.

### INCANDESCENT LAMPS


The cost comparison of illumination by Metallogen® lamps versus high-powered incandescent lamps is not so clear-cut. Metallogen® lamps require relatively costly ballasts and ignition circuits (approximately \$600 for a 1200-Watt lamp) and the lamps are not inexpensive (\$400 for a 1200-Watt lamp). Tungsten-halogen lamps are far less costly to be sure (approximately \$30 for a 1000-Watt unit), and they require no ballast and high-voltage ignitor. However, a 1000-Watt tungsten-halogen lamp has a light output of approximately 30,000 Lumens; a 1200-

Continued on Page 1219



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# THE BREAKTHROUGH TO FLICKER-FREE HMI LIGHTING

With HMI the most revolutionary advance in motion picture lighting since tungsten-halogen, its new square-wave ballast, as one famous cinematographer stated it, "may well mean the end of the Brute."

By DAVID W. SAMUELSON

As is now well known, Metal Halide lighting ("HMI" or "CSI") units produce several times as much light for the electrical energy they consume compared with normal tungsten lamps. Anything up to seven or eight times as much, depending upon the circumstances.

To the cinematographer this means more light when the supply of power is limited, a greater possibility of being able to utilize a domestic power supply, rather than the necessity of taking a mobile generator into the area of filming, lightweight cable and the possibility of considerably reduced operating costs, due to the portability of the large HMI units as compared to tungsten or carbon arc lamps of equivalent light output. Compared with arc lamps there is also a reduction of the time taken to set the lighting and the elimination of the time-wasting and frustrating periods required to re-carbon after every twenty minutes or so of burning time.

From this it should not be assumed that HMI lamps are only intended as replacements for the large units used for grandiose feature film shooting. Far from it. The most popular units are the

smaller ones which might easily be used on a TV documentary or news shoot, offering the possibility of a more useful number of lamps to light an area than if tungsten lighting were to be used.

HMI lamps have an additional advantage. When used for "daylight fill", for which they are eminently suitable, the light they produce is rated at 5000°K (179 mireds), and with a spectral distribution very close to that of a "black body source".

HMI lighting does, however, have limitations. The lamps require an AC power supply; they take approximately two minutes to warm up initially (after which they may be instantly relit); a fairly heavy "ballast unit" (usually placed at the foot of each lamp stand) forms part of the equipment and the light emitted is not of constant brightness, but pulses twice during every AC cycle. If the AC frequency powering the lamps and the camera speed/shutter angle are not constant and compatible, then uneven exposure of successive frames ("flicker") will result.

The purpose of the ballast unit is (1) to provide an electrical resistance when the arc is struck, thereby preventing a

dead short across the supply and effectively extending the life of the electrodes and of the bulbs, (2) to smooth out small variations in the mains supply; (3) to keep the volt/amps relationship constant throughout the life of the bulb (as the bulb ages and the electrodes burn away, the gap increases, causing a drop in amperage and a rise in voltage), and (4) to reduce the voltage at the lamphood as required. In short, it may loosely be described as an electronic "shock absorber".

Under controlled conditions, the uneven exposure of frames (flicker, beat, scintillation) is not normally a problem. 50 Hz mains/24 fps/173° shutter or 60 Hz mains/24 fps/144° or 216° shutter with a permissible small cumulative tolerance of two to three percent either way, can be arranged if the will is there. It should be stressed, however, that the closer to the optimum that can be achieved, to allow for variations elsewhere, the better. In Europe and other areas where 50 Hz is the norm, we have an additional advantage in that when we operate the camera at 25 fps (normal practice for TV) then any shutter opening is acceptable, and in the USA and elsewhere where 60Hz is the norm and provided that everything is "spot on", then 24 fps/180° shutter (with very little tolerance) is possible.

Use a wild motor, however, or a camera with a fixed shutter angle which is not compatible, or an alternator to power the lamps which does not have an accurate speed control — then you play Russian roulette with your lighting.

In sports stadia and other areas illuminated by groups of three MH lamps set closely together, each one connected to a different leg of a three-phase supply and each lamp covering the same area at the same intensity, no flicker will occur at any camera speed, shutter angle, or supply frequency. The advantages of MH have been seen to be so great that to have to operate even with restrictions on the acceptable camera speed/shutter angle settings is "worth the candle", so to speak. Hardly a single leading British Director of Photography of my acquaintance has now not used this form of lighting where to do so is advantageous. Even so, despite the undoubted proven

**The new square-wave ballast (top of which is shown here), developed by QuartzColor Ianiro, eliminates the last and most important obstacle to the use of Metal Halogen lighting, namely the flicker which heretofore occurred at various shutter angle/frame rate combinations. With the flicker gone, "the light that gives the most lumens per watt" should open up vast new horizons to the cinematographer.**





validity of the arithmetic and the care taken, rare instances still occur, especially when operating off a mobile alternator, when flicker is observable, particularly to someone with a trained eye searching to see it.

Happily, in the foreseeable future this inconvenience will be behind us. At FILM '75 QuartzColor Ianiro showed a "square-wave ballast unit" which, they claim, completely eliminates the problem. Others are on their way. With the elimination of the flicker problem it is safe to say that in time to come we shall see far fewer Brutes in use and, in many cases, the Mini-Brutes, Maxi-Brutes, nine-lights and other bulky and high-current-consuming forms of luminaire currently in general use will give way to Metal Halide. Other manufacturers showed units at FILM '75 which work on the principle of a high-frequency sine wave, which, they also claim, will eliminate the flicker problem.

Having read my article in the June edition of *American Cinematographer Magazine*, in which I detailed many of the permissible fps/degree of shutter angle/Hz permutations, Giovanni Ianiro and his chief engineer, Mario DeSisti, said to me, "If we leave the new unit with you for a few days after the exhibition, would you please test it for us in any way you like and then write about whatever you find, be it derogatory or complimentary?"

To one who has a particular affinity to new technology, this was, as they say in Italy, "an offer I could not refuse."

Back at the office I devised the most fiendish test imaginable to compare an HMI light using the new ballast units

with a similar lamp using a standard choke type ballast and, as a "control", with a normal tungsten-halogen lamp.

To do this I had a board cut approximately four feet square onto which were attached three dividing partitions, two feet deep, radiating from the center. With this set up, each segment could be illuminated independently and simultaneously without spill light affecting any other segment. It was an instant, do-it-yourself, split screen. I had the whole lot painted mid-grey so that the colors of the different lights could be compared, especially with regards to different types of gelatine filters which I tested at the

same time, with either type of lamp.

As promised, immediately after FILM '75, the prototype unit was delivered to Geoff Smith and Terry Walters of our lighting division (Southern Lighting Associates Ltd.) and they were able to take a good look at it from the electrician's point of view to make their own assessment as to its practicality. The prototype unit is capable of handling any one HMI lamp up to the 4000-watt size, which, under normal circumstances, gives off more usable (daylight color temperature) light than two 10K tungsten lamps and almost as much as a 225-amp Brute arc.

When one considers how much light

**(LEFT)** At a technical seminar held in Rome a few weeks ago, approximately 90 cinematographers and technicians of the Italian film industry (a record number for this kind of meeting) turned out to see demonstrations of the Cinema Products camera stabilizer, the Panaflex camera and the new square-wave ballast for Metal Halogen lighting. The *American Cinematographer* Editor (with interpreter) is shown here addressing the group. **(RIGHT)** After the formal meeting, cameramen flock around David Samuelson (dark jacket) to ask questions about the Panaflex and examine it. For most, it was their first encounter with the new camera.



Technician at the QuartzColor Ianiro plant is shown at work on the company's new square-wave ballast. In prototype form, the unit (which will handle HMI lamps up to the 4000-watt model) is admittedly large and heavy, but may be left in place on the generator or equipment truck up to 100 feet from the lamp location. Production units should be smaller and lighter in weight.





all of this is, in terms of foot-candles or Lux, one may more easily appreciate the potential of this unit. Smaller units, of lighter weight and able to work off 120v or 220/240v AC or 110/120v DC, are in the design stage.

One has to say that the prototype was both large and heavy, but as cable runs of 100 feet or more between the unit and the lamp head are permissible, then when working on location there is no doubt that it will usually be possible to leave the ballast unit *in situ* on a silent mobile generator or on the equipment truck and cable out from there. On other occasions it will just have to be wheeled to some central point. No doubt the smaller, more compact units, when they are produced, will be light enough to be carried by hand.

To operate from a central distribution unit was never a problem in the days when boosted lights were popular and I see no reason why it should raise any more objections today.

One of the first things that we noticed, and liked, was the safety feature incorporated, which made the unit inoperative until such time as the supply was properly "grounded" and, indeed, an indicator light shines to show that this necessary safety connection is satisfactorily made.

As we were only intending to use one 2500-watt lamp off the unit for our tests, it was only necessary to attach an ordinary domestic plug and we were able to operate out of a normal (240-volt) mains outlet. This meant that we were drawing a little over 10 amps. Had we used a 4000-watt lamp, then we would have needed a 17-amp supply. The 1200, 575, and 200-watt versions would have drawn 5, 2.4, and 0.85 amps respectively.

When it came to shooting the test we started off with a number of shots where it was known that all three lamps should show no flicker under known conditions. To do this, it was necessary to operate off an alternator to simulate the conditions not necessarily obtainable off British 50 Hz 240v mains. The alternator we used produces 220 volts (the standard for the continent of Europe for which the lamps are primarily designed) at 50 or 60 Hz.

An interesting fact about MH lighting, incidentally, is that as the voltage at the lamphead goes up, the color temperature goes down, the very opposite to tungsten-halogen lighting.

Our tests off a 220v supply showed a noticeable color difference from those off a 240v supply, being somewhat warmer off the higher voltage. The camera was a Panavision PSR (except as noted), operated at 24 fps (except as noted), crystal-controlled, with a shutter set at 173° (except as noted).

Test One was off a 50 Hz alternator, where we deliberately varied between 49-51 Hz. This confirmed the fact that, even with such variation, the lamp using a normal choke type ballast unit is acceptable. The lamp using the square-wave unit was as steady as that of the tungsten.

Tests Two and Three were shot with the alternator set to produce 60 Hz. With the camera shutter set at 144 degrees there was no problem and even at 180 degrees, with a slightly varying alternator speed, few would complain of the flicker. After this we ran the lighting on 50 Hz, 240 volts mains for the remainder of the series.

At shutter openings of 100 degrees, 120 degrees and 150 degrees, the area illuminated by lighting controlled by the

normal choke type ballast unit throbbled like it was about to have a convulsion, while the lighting from the square-wave ballast unit remained as constant as that from the normal tungsten lighting, conclusive proof that this new device completely eliminates the flicker problem from MH lighting.

From then on the tests were somewhat academic. We proved once again that 170 degrees was just on the verge of acceptability and 173 was perfect all around, and that at 180 degrees a flicker on the normal ballast unit was discernible and at 200 degrees we were back to violent pulsing on the normal choke type, and still rock-steady on the square-wave ballast unit.

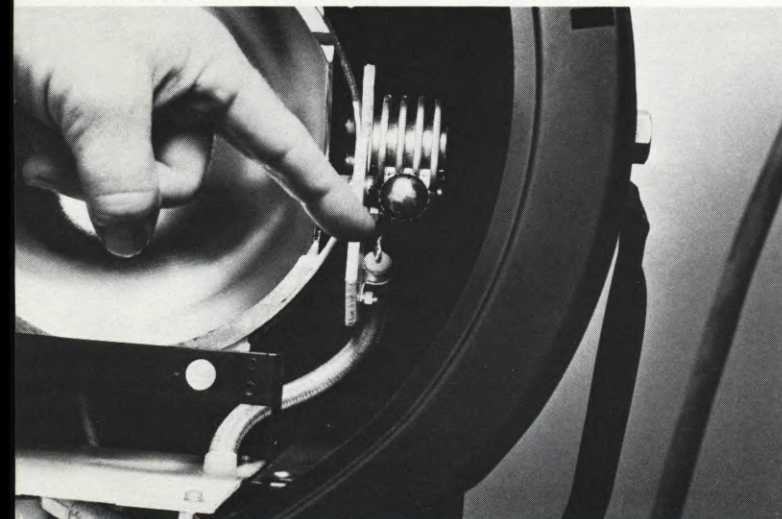
At 36 fps/173 degree shutter, as we would now expect, there was bad pulsing from the old type ballast, none from the new.

We then changed cameras for a few shots and tried 48 fps/173° (one pulse per frame) and had no problems, at 50 the old type was bad and at 96 fps/173 degrees it was almost jumping off the screen, while the lamp connected to the new square-wave unit remained as steady as ever.

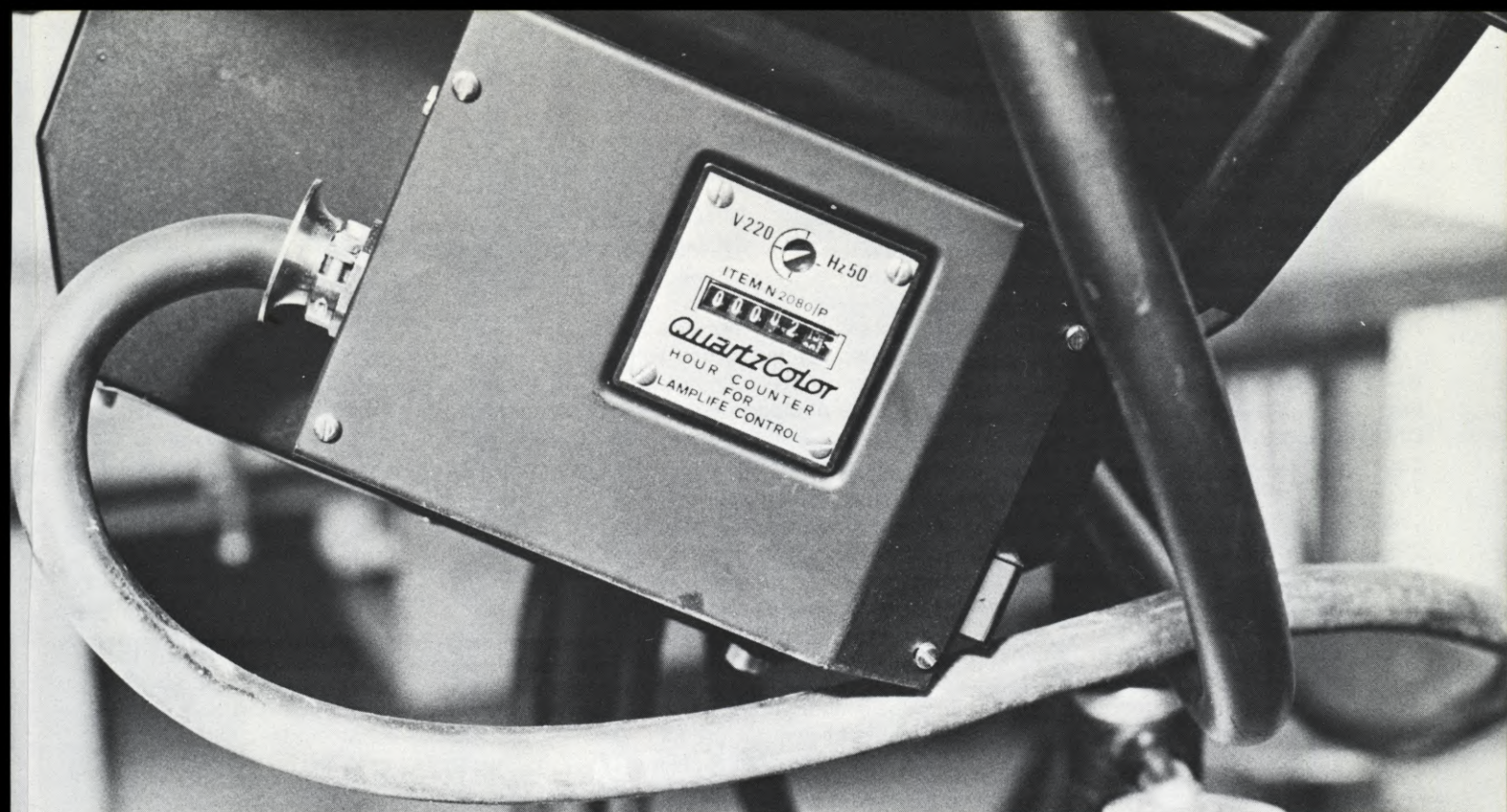
Color was another aspect we looked at. To the creative Director of Photography color, of course, is what he wants it to be and he would, in any case, normally use filters to effect control and give character to a scene. No one handed Leonardo da Vinci, when he was painting the Mona Lisa, a tube of paint on which was the statement "correct flesh tone for 3200°K." He colored the face as he wanted it to look.

With this in mind, my filter tests were more in the nature of proving that it is possible to balance HMI to tungsten, and vice versa, by the use of suitable

(LEFT) Finger points to location of the high-frequency striking unit (not actually visible) which, for reasons of safety, is located deep inside the HMI lamp housing and is not accessible even when the door is open. The thin wire (where the finger points) leads to the igniter. The thick shrouded cable below is the lead-in from the ballast unit. (RIGHT) The plug which links the lamp cable to the cable of the ballast unit, which may be located up to 100 feet away. The voltage beyond the ballast carried by the cable into the lamphouse is reduced below that of the voltage coming from the mains.







An hour counter for lamplife control is mounted on the side of the QuartzColor HMI luminaire, which makes it easy to calculate the amount of discount applicable in the case of a lamp which burns out prematurely. The lamp manufacturers say that metal-halide lamps need be discarded only when the color temperature has changed to an unacceptable degree with usage (about 1°K per hour) or the electrodes wear away, usually after about 500 hours, when restriking becomes impossible. The ballasts for QuartzColor HMI luminaires have a variac control which permits compensation for color temperature drop-off during lamplife.

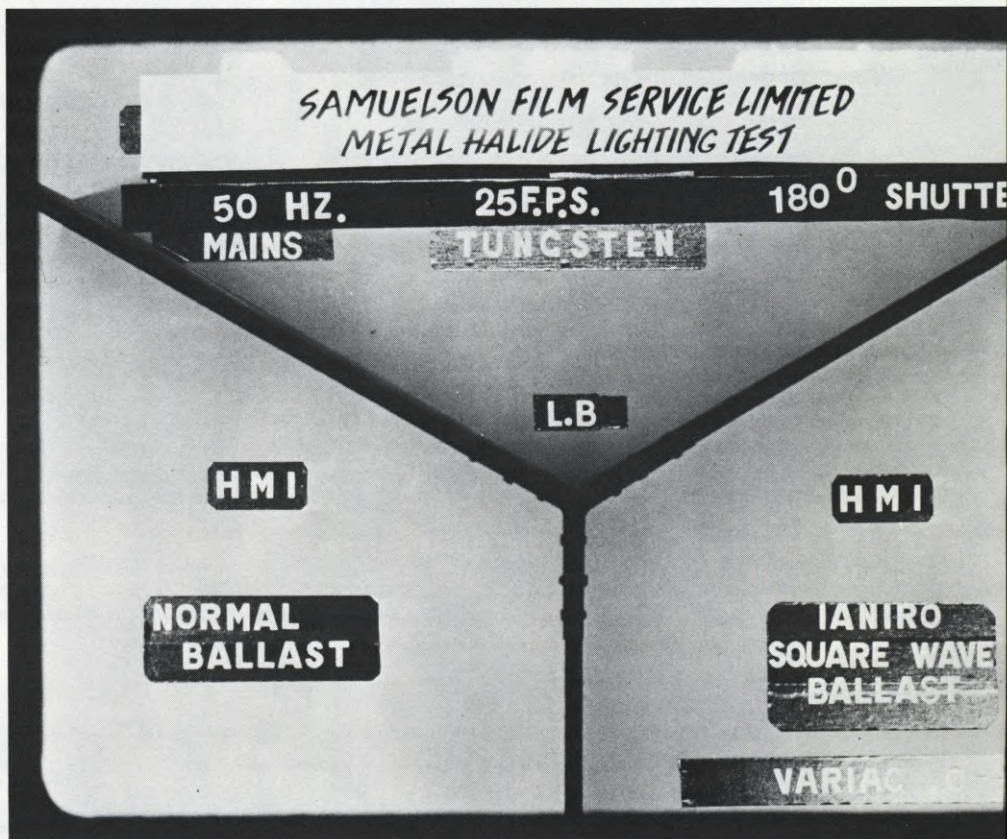
filters. In the present state-of-the-art, however, I would recommend that cameramen make their own tests using more than one make of filter gelatine and to watch their voltages carefully. The same rules apply as when matching daylight and tungsten. An additional advantage of the Ianiro square-wave unit was a voltage meter and Variac voltage control which offers the opportunity for fine color adjustment and the light-hungry cameraman a few extra foot-candles (Lux) when it makes all the difference between an acceptably exposed negative and otherwise.

We, therefore, shot a series of tests showing the degree of control available over five increments of voltage adjustments. Not a great deal of color change was discernible, but it was definitely there and sufficient to balance one lamp with another or to give a fine degree of "cold" or "warmth" to a scene.

These were essentially practical tests and, as such, very successful. Not proven were the effects that this system might have on the life of the bulb or its efficiency.

One of the nice things about MH lights is that they are virtually indestructible, the envelope having to be immensely strong to withstand the internal gas pressure, and there are no

Blown-up frame from the film test of the new QuartzColor square-wave ballast illustrates the precise set-up devised by David Samuelson for making the test. Onto a board approximately four feet square and painted neutral grey were attached three dividing partitions, two feet deep, radiating from the center, permitting each segment to be illuminated separately and simultaneously without spill light affecting any other segment. The top panel was illuminated with tungsten-halogen light, as a "control". Left panel: HMI light with normal (choke) ballast. Right panel: HMI light with the new QuartzColor square-wave ballast.





# THE IANIRO STORY

This latest in a series of tributes to manufacturers of outstanding motion picture equipment honors a company responsible for various lighting innovations—including the new flicker-free HMI ballast

By HERB A. LIGHTMAN

## ROME

In order to background my present visit to the Eternal City, it is necessary to refer to the filming of the 1972 Olympic Games in Munich (see *American Cinematographer*, November 1972).

The various arenas and stadia to house the events for that super sports spectacle had been outfitted with banks of metal-halide lamps, a relatively new form of lighting with an incredibly high lumens-to-watt ratio. Aside from the obvious objective of providing brilliant illumination of the events for the benefit of the paying customers attending the Games, an almost equally important reason for the selection of this type of lighting was the fact that it would provide the scores of video cameras covering the various events with an average light level of 250 foot-candles in each location.

The metal-halide lamps had already been tested for video use with great success, and now the film technicians who were to photograph the events for the Wolper Productions feature, "VISIONS OF EIGHT", were delighted to learn that they would have a uniform high-level source of light available wherever they chose to shoot, a circumstance that should prove most valuable for telephoto and high-speed filming in particular. They were delighted, that is, until they began to view the dailies. Michael Samuelson, who was in charge of the shoot, and the rest of us involved in the filming were horrified to note that in some of the scenes, *especially those filmed at certain high frame rates*, there was a very pronounced and most disconcerting flicker or "breathing" effect.

Then it was that the horrible truth dawned — namely, that the normal

choke-type ballast units being used for running the HMI and CSI lamps (the two principle types of metal-halide lighting) produce two pulses of maximum illumination for every cycle of AC current, and that between the peaks of these pulses the luminosity of the light drops by 60 percent for CSI lamps and 95 percent for HMI. Hence the very obvious flicker, when filming under certain conditions of shutter angle and/or frame rate.

At the 1972 *Photokina*, which took place a few months later in Cologne, a few rudimentary CSI and HMI lighting units were rather tentatively shown. Visitors to the exhibition were astounded at the huge amount of light put out by these units when they were simply plugged into the mains, but the word had already gone out that they couldn't be trusted for cinematography. **Continued overleaf**

(LEFT) Exterior facade of the main QuartzColor Ianiro plant in the suburbs of Rome. (RIGHT) An overview of the mechanical assembly area of the plant. The Ianiro Brothers began their operation with a small machine shop after World War II, elected to specialize in lighting equipment for the film and television industries and now supply innovative lighting equipment for those industries world-wide. Their latest accomplishment, a revolutionary breakthrough, is the development of a square-wave ballast to make possible flicker-free HMI lighting.



(LEFT) The QuartzColor Ianiro Export Office, a very busy department, since the company enjoys a world-wide trade. (CENTER) Production Planning. Antonio Ianiro, Production Manager, in the far background. (RIGHT) The Engineering Department, where all of the ideas for new products or improvements come together and are drawn up in schematic form by draughtsmen. A constant "looking ahead" psychology prevails here.





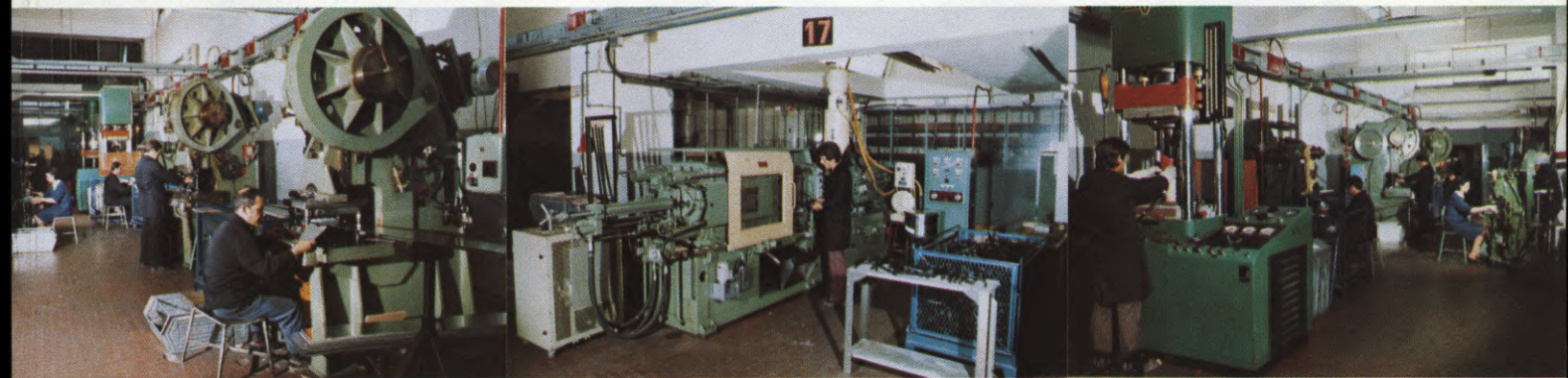


**(LEFT)** The Electrical Assembly Department. **(CENTER)** The TEsting Room, where electronic equipment is used to test various elements. **(RIGHT)** The Measurement Room, where the light curve of each lamp is scientifically measured and recorded on graph paper by the apparatus on the left. Each individual lighting unit is subjected to multiple tests and measurements before being approved for shipment from the plant.



**(LEFT)** A bank of welding machines in the main plant, with a hand-welding operation being shown here. **(CENTER)** Cutting machines and mechanical assembling facilities **(RIGHT)** Thermo-moulding machines making IANEBEAMS, the very popular small lighting units which have highly durable fiberglass housings. In addition to the manufacture of its various products, QuartzColor Ianiro designs and makes all of its own tools in the main plant.

**(LEFT)** Power presses in operation. **(CENTER)** This new fully-automatic thermo-plastic injection moulding machine greatly expedites the manufacture of certain parts. **(RIGHT)** Detail of the fiberglass housing manufacturing process for the IANEBEAM units. It is an axiom of Ianiro design that, whenever possible, parts for new products are standardized for interchangeability, thereby holding down inventories and costs of spare parts.



**(LEFT)** An overall view of internal operations at QuartzColor Ianiro. **(CENTER)** Another view of the mechanical assembly facilities. **(RIGHT)** The Tooling Department. Designing and manufacturing all tools in-plant results in direct and precise control of the entire manufacturing operation. All new products at QuartzColor Ianiro are a direct result of exhaustive in-the-field market research and response to the demands of customers.

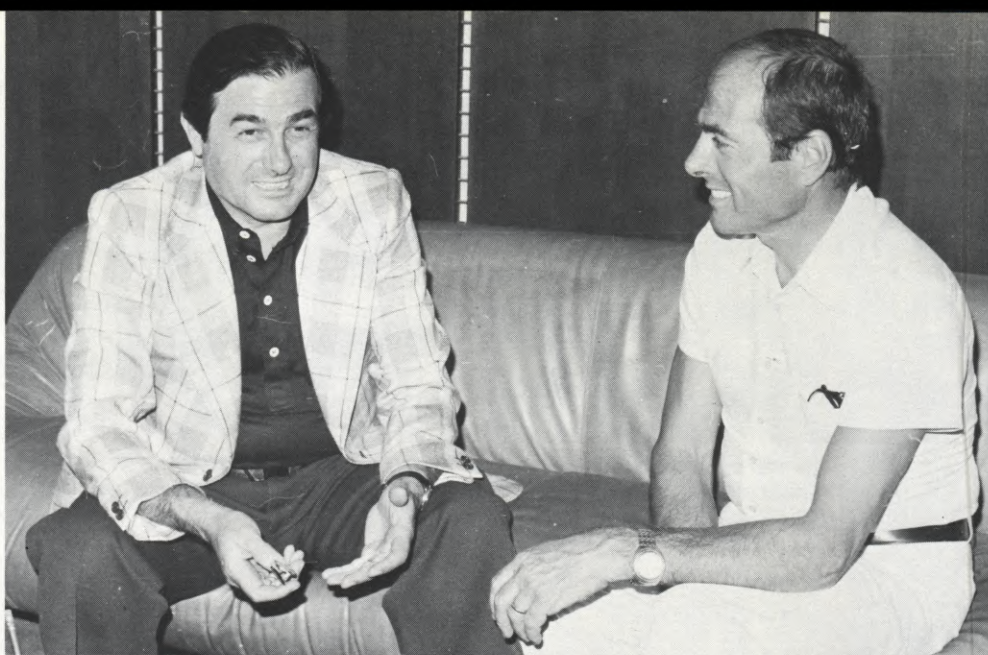




graphic use because of the flicker problem.

Despite that indisputable fact, however, two years later, at the 1974 *Photokina*, no less than 10 different lighting manufacturers displayed metal-halide units — with two manufacturers (QuartzColor Ianiro and LTM) showing very extensive lines of such equipment.

Because I had long since decided in my own mind that metal-halide constituted a “wave of the future” for lighting certain motion picture situations, I assigned two writer-technicians, Anton Wilson and Thomas H. Lemons, to research the current state-of-the-art in metal-halide lighting, as represented at *Photokina*. Their findings were distilled in separate articles which appeared in the December, 1974, issue of *American Cinematographer*. The consensus, as indicated by this research, was that the flicker problem was still as much of a problem as ever, but that once that problem was solved (an eventuality that



The Brothers Ianiro — Giovanni (left) and Antonio. Up until 1945, Giovanni had worked as a designer, while Antonio (having returned from service with the navy) specialized in mechanics. In 1947 they started “a new life” with their own small mechanical workshop. Living near the famous Cinecittá film studios, they became interested in motion picture lighting and started to manufacture lighting accessories. The rest — as they say — is history.

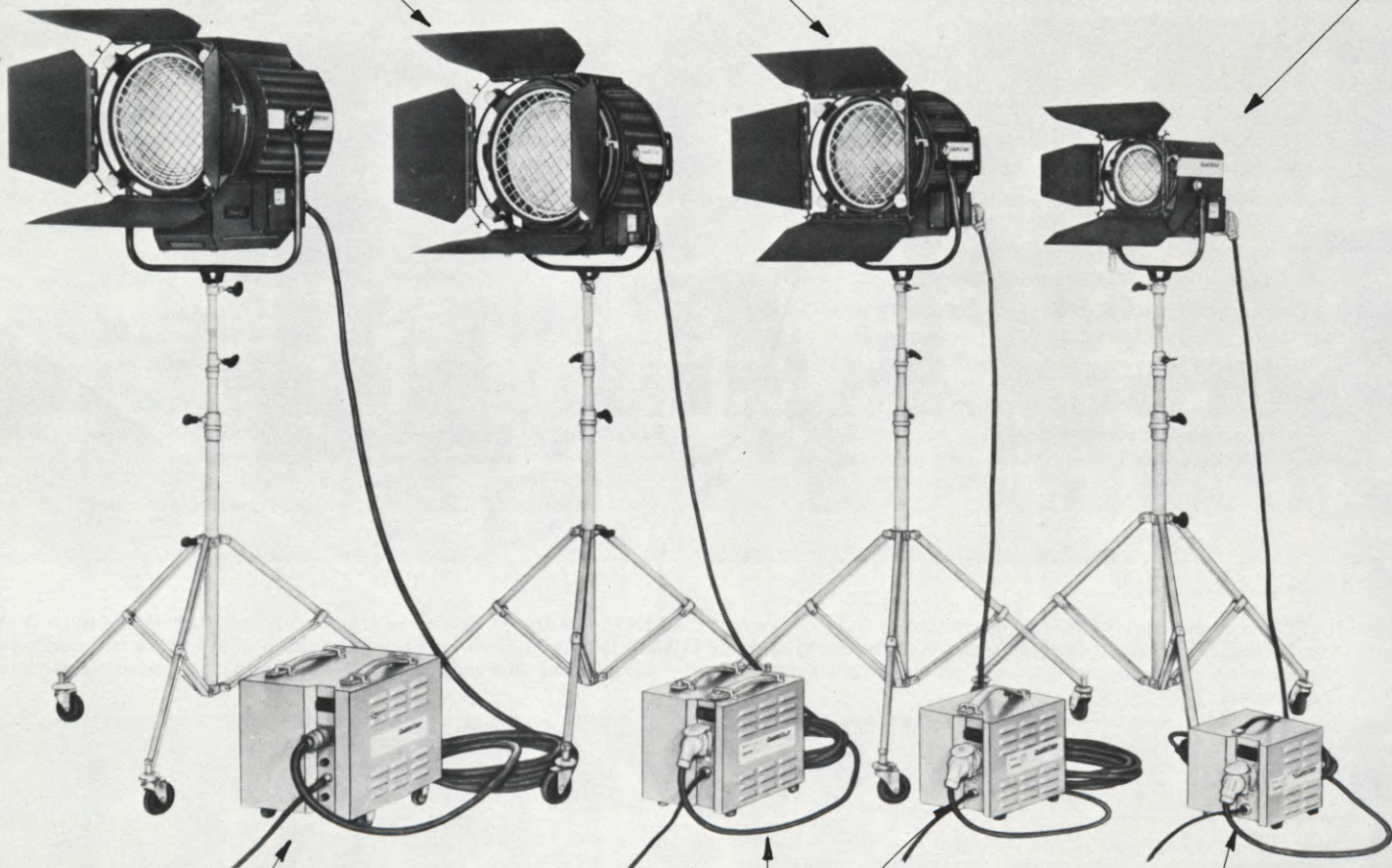
The four QuartzColor “Sirio” HMI spotlights, with their respective ballast units, introduced by Ianiro at *Photokina '74* in Cologne last fall. The units range from 575 watts to 4000 watts and have an efficiency of 85-96 lumens-per-watt (nearly four times greater than that of filament lamps). They have an equivalent color temperature of 5600°K and, in most cases, will operate off an ordinary mains circuit, requiring no cumbersome auxiliary power supply. The new and revolutionary flicker-free square-wave ballast, developed by Ianiro, will operate any of these units. Although it is larger than any of the normal (choke) ballast units shown here, being packed with electronics, it can be located in a stationary position on an equipment truck or generator up to 100 feet from the lamp.

MOD. 2090 SIRIO  
4 KW H.M.I. (M.O.)

MOD. 2080 SIRIO  
2500W H.M.I. (M.O.)

MOD. 2070 SIRIO  
1200W H.M.I. (M.O.)

MOD. 2060 SIRIO  
575W H.M.I. (M.O.)



MOD. 2091 BALLAST  
FOR SIRIO 4KW

MOD. 2081 BALLAST  
FOR SIRIO 2500W

MOD. 2071 BALLAST  
FOR SIRIO 1200W

MOD. 2061 BALLAST  
FOR SIRIO 575W



was "just around the corner") metal-halide lighting would, indeed, become a tremendous new tool for the motion picture industry.

During the year that followed, American cinematographers unanimously refused to take the Big Gamble on CSI and HMI lighting, even though they longed for something that could compete favorably with the mighty Brute arc. Some of their more adventurous colleagues abroad, however, especially in England, played a little Russian roulette by using CSI and HMI units on some of their assignments. Mostly they lucked out, but occasionally they would get caught with their flicker down. For example, on one occasion I journeyed all the way from Hollywood to Corsica to interview a certain famed lighting cameraman who was elated over the results he had been getting with lightweight CSI units. I never wrote the story, however, because a few days later the "flicker problem" struck with a vengeance, wiping out two days of shooting and causing an abrupt cessation of CSI use by the embarrassed cinematographer.

Having admired the line of four handsome QuartzColor "Sirio" HMI spotlights (and their respective ballast units) displayed at *Photokina '74*, I had rather candidly said to the company's president, Giovanni Ianiro, and its head of engineering, Mario De Sisti: "They look great, but you can never hope to have them universally adopted by cinematographers until even the slightest possibility of a flicker, under any conditions, has been entirely eliminated."

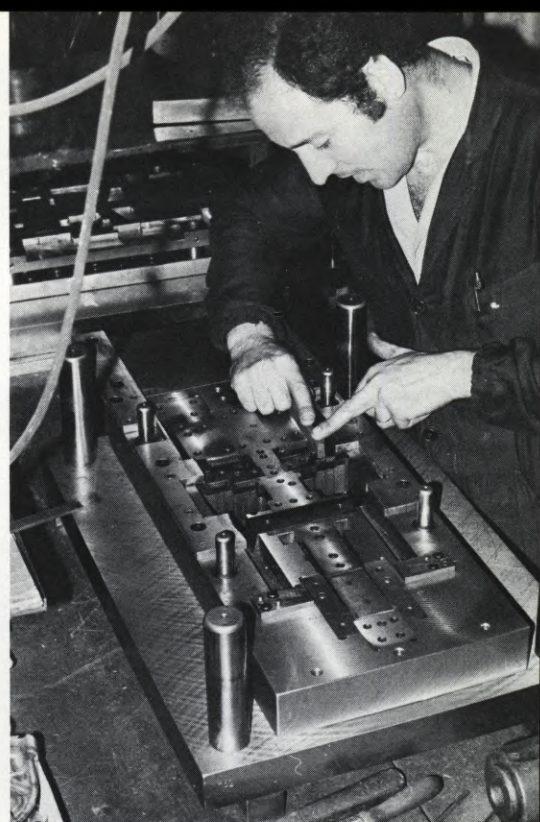
They had listened carefully. "We have been studying this problem and working very hard to solve it," De Sisti assured me, "and we feel that by next year we will have an electronic ballast unit to control the flicker effect."

Then came FILM '75 in London, and the Messrs. Ianiro and De Sisti proudly informed me that they had indeed brought with them the prototype of their new square-wave ballast unit designed to eliminate the flicker problem from metal-halide lighting.

I congratulated them, but said (again rather candidly) that seeing was believing and that I couldn't conscientiously announce such a breakthrough to *American Cinematographer* readers until I had seen, with my own eyes, a comprehensive film test of the new ballast, made by an objective party, shooting under every possible condition that might remotely result in a flicker.

The gentlemen were more than willing for such a test to be made and they readily agreed when I suggested David Samuelson as the "objective party" to do the testing. They knew that he had done more research on this type of lighting than just about anybody and had been constantly reporting its progress in these pages. They very kindly offered to leave the prototype ballast with him, at the conclusion of FILM '75, and they were as good as their word. David went gleefully off with his new toy to devise "a fiendish sort of shakedown" for it, while I returned to Hollywood to put *American Cinematographer* on the press.

Now, two weeks later, we have converged on Rome — David and I and Stephen Futers, the amiable technical chief of Pinewood Studios, who is also a noted authority on motion picture lighting. So important is David's film test of the new ballast considered to be that Mr. Ianiro has arranged to have it shown a couple of nights hence before an invited group of the top cinematographers and film technicians of Rome. This takes great courage, because no one but David has seen the test, and the equipment is to be presented



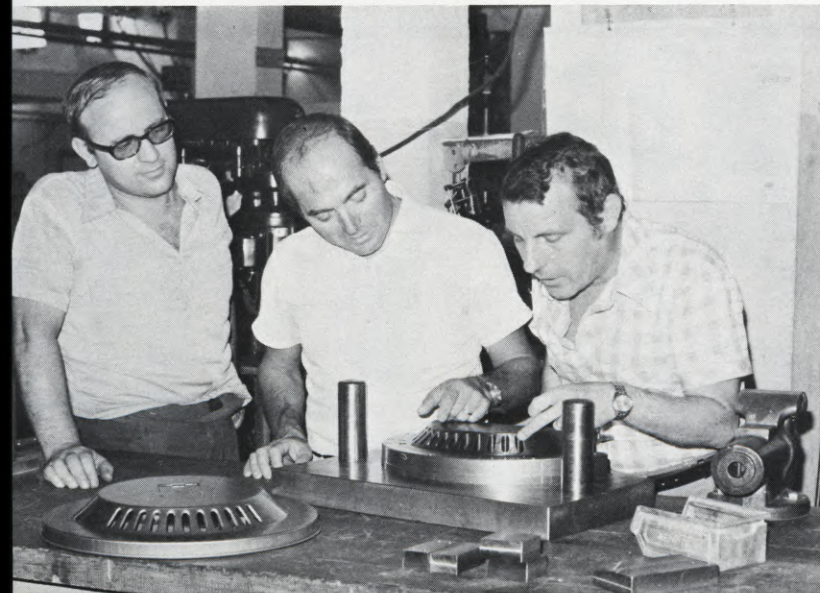
Precision work going on in the Ianiro tooling department. Unlike most manufacturers, this company makes all of its own tools.

"warts and all" before the most highly critical audience imaginable.

In the meantime, we are given a very complete tour of the QuartzColor Ianiro plant facilities, located in a suburb of Rome, not far from the famous Cinecittà Studios. It is a large, busy, well laid-out facility, utilizing the most sophisticated manufacturing equipment. Plans will soon be implemented to build an extensive annex onto the existing structure.

It is very impressive — especially when one considers the quite humble beginnings of the company. Up until 1945 Giovanni Ianiro had worked as a  
Continued on Page 1198

(LEFT) Antonio Ianiro (center) discussing a lamp part with Antonio Leonetti (Production Manager) and Alberto Petrini (Tooling Department Manager). (RIGHT) Head of Research Marion De Sisti analyzing a design with his assistant, Giorgio Del Sasso. De Sisti has been with the Ianiro organization for 22 years and, since he is now only 34 years old, simple arithmetic indicates that he literally "grew up" with the company. A very hard-working and dedicated member of the team, he spends a third of the year traveling to find out first-hand what lighting technicians need.





# THE PRODUCTION OF "SMILE"

The behind-the-scenes film story of a beauty/talent pageant, shot entirely on location, provides some fascinating insights into this special world, besides posing some interesting technical challenges

By MICHAEL RITCHIE

The production of my latest feature film, "SMILE", came about in a rather interesting way. I live up in Mill Valley, California, about an hour's drive south of Sonoma County, where the action of "SMILE" takes place. About two years ago, because I had a friend up there, I was invited to become a judge in the "Miss Sebastopol Apple" contest. I went up there and had a great time. After that I was invited to be a judge in other, similar pageants.

I've always loved the "Miss America" and "Miss Teenage America" pageants and the others of that type and, because of my enthusiasm for such events, I got the idea of doing a film about "a week in the life of a pageant" — but also one that would show what happens to the rest of the town during that period. Unlike "AMERICAN

GRAFITTI", which concentrates only on the kids, I wanted to show the interlocking relationships of the kids and the adults, similar to the way Peter Bogdanovich handled it in more serious terms with "THE LAST PICTURE SHOW", where all the relationships of the community became clearer as the separate stories criss-crossed each other.

So, with this idea based on my experiences in the pageants and some characters who were amalgams of people in real life, I went to David Picker, who was then an independent producer for United Artists. I started to tell him my idea, but when I was five or ten minutes into the telling, he stopped me and said: "You've got a deal. Go out and make the film. Hire anybody you want to write it and when the script is finished let me see it."

So we finished the script and sent it

to him in New York, where he was at the time. Two hours after he received it, he called me up and said: "You've got to start July 7th." And that was it. I've never had a project happen that easily before. "DOWNHILL RACER" was a series of confrontations between some of the studio people who wanted to make it and some who didn't — people who thought the script was good and people who didn't. But this was almost like an incident out of the old Hollywood, where King Vidor writes something on the back of an envelope and says: "I think I'll call it 'THE BIG PARADE'." It was that kind of experience and it was thrilling. I'm very grateful to David Picker for the opportunity to make the film that way. He was the Executive Producer and I was allowed to get together my own production company.

Tim Zinnemann was the Associate



(LEFT) A "cherry picker" is pressed into service as a camera crane on location for "SMILE". (CENTER) In a scene from the film, a pint-size Peeping Tom gets turned on by gazing through a window into the room where girl pageant contestants are changing clothes. (RIGHT) As the camera moves in for a close shot on the stage of the auditorium, Director Ritchie gives instructions to one of the "contestants".



The author maintains (with a straight face) that the production was inspired by his love for pageants of the type portrayed. However, "SMILE" is much more than a labor of love. It is a hilarious and scathing satire on such spectacles, plus small town manners and mores. The social commentary includes a clear view of the intrigue, back-stabbing and downright skulduggery that often underlie such "wholesome" events — all portrayed in an entertaining manner.





Producer on the film and wore three or four hats. It was the first time I'd worked with Tim, but he was terrific and made it possible to get the picture made for a million and a quarter dollars — which is today's variation of the old million-dollar movie, allowing for inflation. We had, within that budget, the opportunity to spend the money any way we wanted to and, to me, one of the most important things was getting Conrad Hall, ASC, as the Director of Photography. So we bent in other areas in order to be able to afford Conrad, and I'm glad we did.

Somehow, Hall had acquired the reputation, going back to the "BUTCH CASSIDY" days, of being a little bit slow, of being a perfectionist and so forth. But Tim Zinnemann, who had worked with him on "THE DAY OF THE LOCUST", which was no quickie production, nevertheless said: "Hey, that picture went at the pace that John Schlesinger wanted it to go, and Conrad is as fast as you ask him to be."

That proved to be exactly my experience in working with him. Connie was extraordinary, and no matter how fast we moved it all looked wonderful. There was no variation in photographic quality between the day that we got seven set-ups and the days that we got 45 set-ups. It was all perfect within the look and consistency that we wanted.

Of course, we always had to be aware of the dollars in making the film, because there just was no room for going over budget. I mean, we would have lost the picture if it had gotten out of hand.

The way the pageant was staged in "SMILE" reminds me of those MGM musicals, where Mickey Rooney would say to Judy Garland: "Hey, we've got a lot of kids here with a heck of a lot of talent. We've got a barn. Why don't we put on a show?" And that's exactly what we were doing in the Veteran Memorial Auditorium in Santa Rosa, California. We were gearing our rehearsals and shooting toward putting on a live show for 1,500 paying customers who could come in and see a two-hour pageant complete with a winner crowned.

None of the girls knew who was going to win. We kept the last pages of the script away from all of the actors. Nobody but David Picker, myself and the writer knew who the winner was going to be. The audience was going to help select the winner and all of the girls would be sharing in the excitement and nervousness of the competition, all the things that would happen in a real pageant. The guys in the crew were, too. They were discussing and arguing about who they thought was



Director Michael Ritchie peers through the viewfinder at an over-the-shoulder angle involving actor Bruce Dern, who plays a super-earnest Junior Chamber of Commerce type with chilling realism. A high point of "SMILE" is the reenactment of an actual J.C. "deinitiation" ceremony for coverage (35) eager beavers. It is an absolute gem of ritualistic absurdity.

Cinematographer Hall lines up the camera angle, while Ritchie (in chic chapeau) waits to check it out. Commenting on his relationship with Hall during the shooting, Ritchie observes: "It's tremendous when a director and a cameraman are 'in sync' the way we were, and there is a give and takes of ideas that go beyond the cinematography."





# CONRAD HALL AMERICAN MISS



certainly wasn't to feed the coffers of the production. I'd had an experience with free crowds when I was making "THE CANDIDATE". We said: "Come and See Robert Redford." The crowd that showed up was mostly teenagers, and we didn't want that for this film. We wanted the kind of audience that actually turns out for a state-level finals pageant, and that includes a lot of important people in the community — mothers and fathers and grandmothers.

So we went to the Santa Rosa Arts Council and arranged to do this as a benefit for them. We said: "You get us the audience and you sell the tickets and you keep the proceeds." They were delighted. They made several thou-

**(ABOVE LEFT)** Using his "director's finder", Conrad Hall, lines up a camera angle on the stage of the Veterans Memorial Auditorium in Santa Rosa, California, where the pageant was staged. Lighting the pageant was enormously difficult, because he had to do a single lighting job for the entire vast auditorium — backstage, front stage, the back of the hall, the orchestra pit, group shots, close shots, everything — for three cameras roaming everywhere.

going to win, taking side bets, the whole thing.

During the intermission we went out and counted the audience ballots, mixed them in with our own story needs and wrote up the sealed envelopes. Then I went in and whispered to Conrad Hall and the additional two operators we had shooting, just what the order of winners would be, so that the cameramen could swing their lenses toward the right girls.

The reactions of the girls show a spontaneity that we couldn't have gotten in any other way. It's like the kind of thing you get at the Academy Awards, when people get Oscars and they're so stunned they walk off the wrong way. You can't stage that; it has to happen in real life.

We had a reason for making the audience pay to see the show, and it



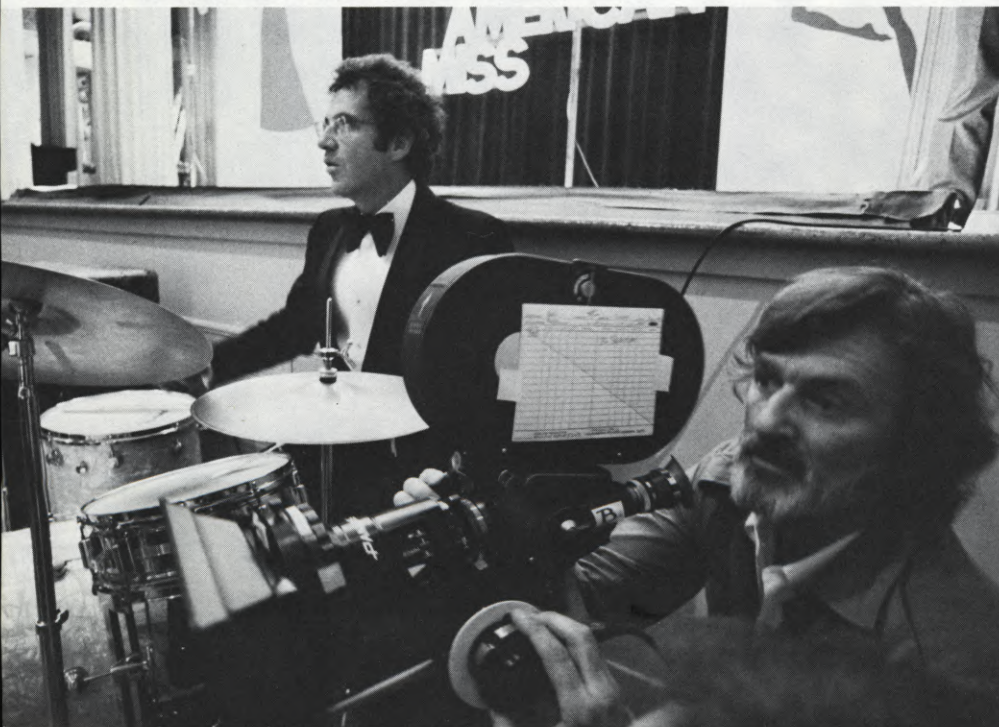
**(ABOVE RIGHT)** The "fringe benefits of being a director. Michael Ritchie gets to be the centerpiece to a cluster of "flowers of young American womanhood". **(BELOW LEFT)** During the pageant, Hall was all over the place. One moment he would be on the stage. The next moment — like the Roadrunner — he would be in the orchestra pit.

sand dollars off the film and we got an audience that had exactly the look we needed.

Lighting that pageant was enormously difficult for Conrad Hall, because he had to do one lighting job for the whole auditorium — backstage, front stage, orchestra pit, the back of the auditorium, group shots, close shots, whatever — for three cameras which would be roaming at will all over the place.

We held a dress rehearsal on the afternoon of the pageant and I had a "battle plan". I showed every one of the units where they had to be, but I couldn't physically be with all the units. I had to move back and forth from one unit to the other. All of the camerawork

**Continued on Page 1210**





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**THE IANIRO STORY**  
Continued from Page 1193

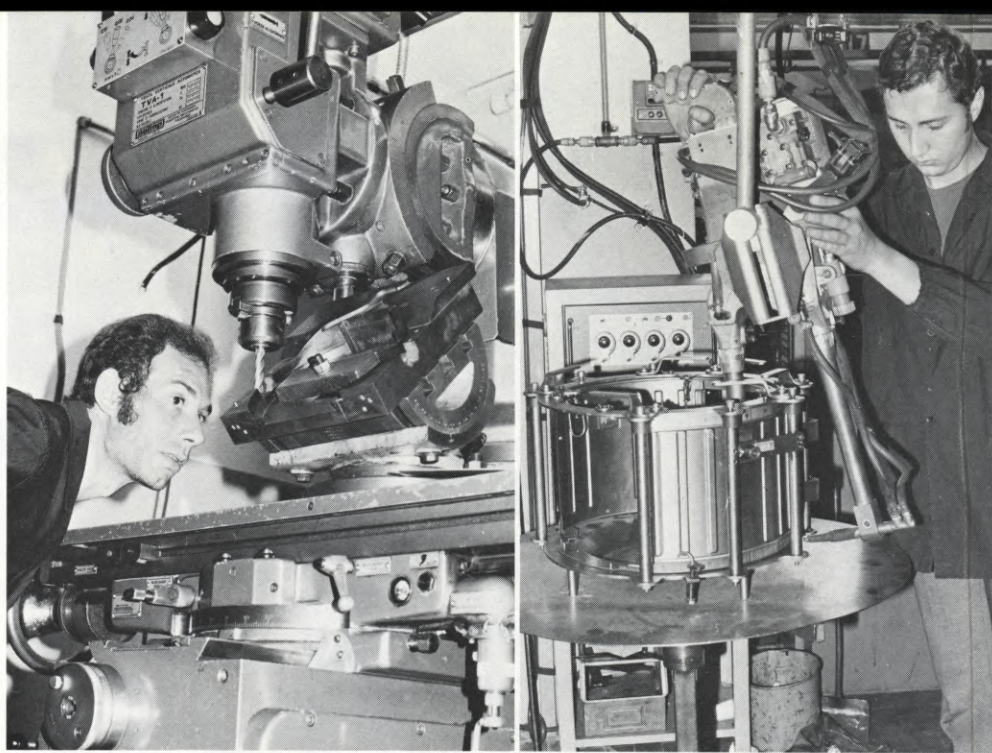
designer. His brother Antonio, who had just returned from service with the navy, specialized in mechanics. As Giovanni relates it, "By 1947 we realized that it was necessary for the both us to start a new life — no longer a life based on the uncertainty of war, but a life based on looking toward the future."

The descendants of a dynasty of craftsmen, the brothers quite logically began their new joint career by setting up their own small mechanical workshop. Giovanni looked after the administration, researching and designing the various projects, while Antonio ran the shop and supervised the mechanical execution of their products.

"At that time (1947), Antonio and I were both living with our father in the vicinity of Cinecittá, the famous movie studios," Giovanni says, "and because of that, we couldn't ignore the film industry. In my first contacts with the film people I found the lighting aspects of their industry to be interesting, and so we started to make accessories pertaining to lighting fixtures. It was tremendously difficult to get raw materials because, in the first five years following the war, the supply was very scarce."

Nevertheless, they continued to make accessories for other lighting companies and, eventually, a few small lights of their own. Encouraged by the acceptance of this limited range of products, they extended their line to encompass, more ambitious designs, including "boostable" lamps. These proved to be a great success in Italy, as well as in other European countries.

By 1960, the original small workshop had grown to a factory of respectable size with its own structure and 40 employees. It also boasted an Engineering department and a proto-



(LEFT) A high-tolerance mill used in the Tooling Department. (RIGHT) Hand-welding of a 5000-watt luminaire. The manufacturing plant incorporates some of the most sophisticated automated equipment that is available. Yet there are still some precision operations that must be done by hand.

type shop.

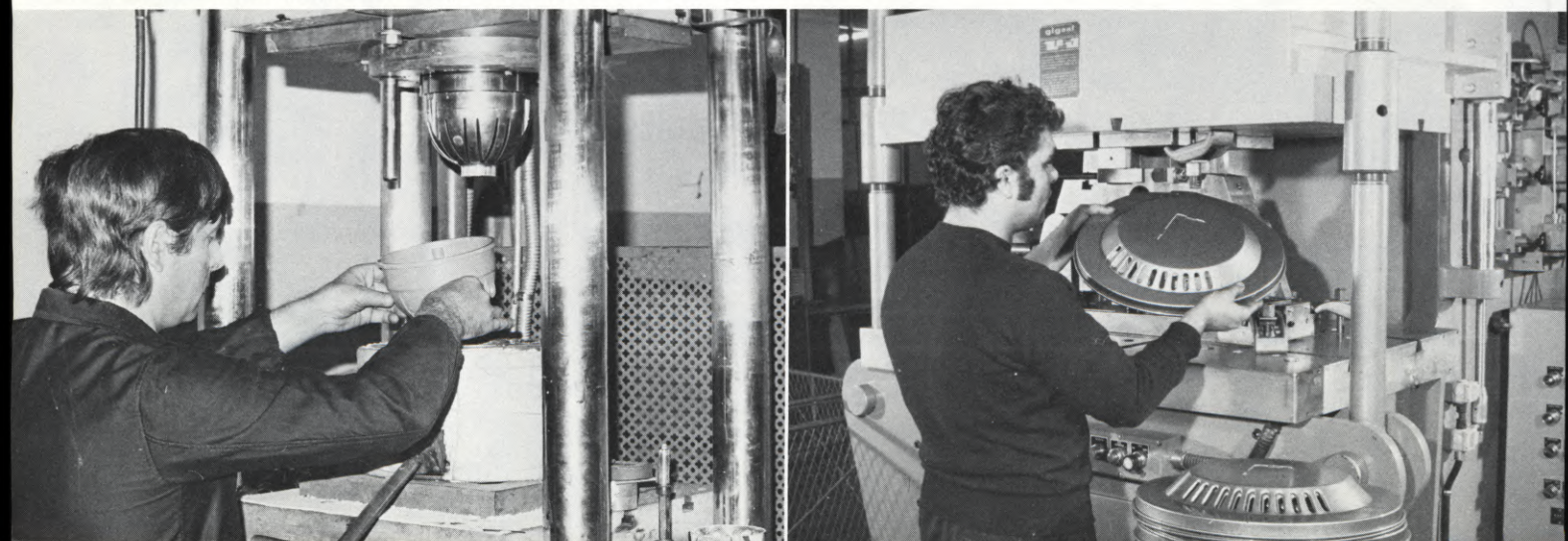
It was in this year that the Ianiro brothers introduced to the European market a series of spotlights that were compact and 30% lighter in weight than competitive units, although comparable in performance. These well-accepted lights brought prestige to the company and enabled it to take over most of the domestic market and also to export 10% of its total production throughout Europe.

The company was growing and Giovanni realized that, since the domestic market would very shortly be almost saturated, it was time to begin searching out other markets. This led to a world-wide market survey in depth, covering both the commercial and technical aspects of lighting for television, motion pictures and still photography. The survey indicated that there

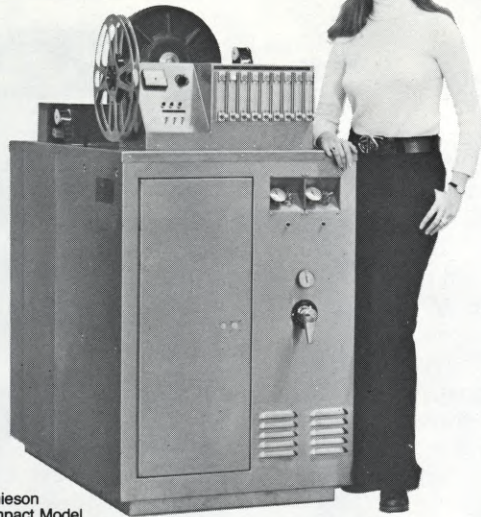
were few manufacturers making technically up-dated equipment for these fields, using the latest industrial and economical systems — and also that relatively little attention was being paid to research and development.

Early on, Mario De Sisti had joined the company in a very minor capacity but, through the years, had collaborated more and more closely with Giovanni and Antonio Ianiro. He says, with pride, that he has worked in the company for 22 years, and since, at this writing, he is just 34 years old, it takes only simple arithmetic to indicate that he has literally "grown up" with the company. A very hard-working, thoroughly dedicated member of the team, he was, in 1965, appointed Head of Research and Development. In that capacity, he was asked to design a new  
Continued on Page 1202

(LEFT) A fiberglass housing for the "IANEBEAM" unit is taken from the press. The "IANEBEAM" was the first in a line of quite unique products manufactured during the past several years, and it signified the first usage of fiberglass as a luminaire housing. The very compact units can be "hidden" easily for location shooting. A fantastic success, they are still manufactured in very large quantities. (RIGHT) An extension press, shown stamping out rear ring components for the 5000-watt fixture.







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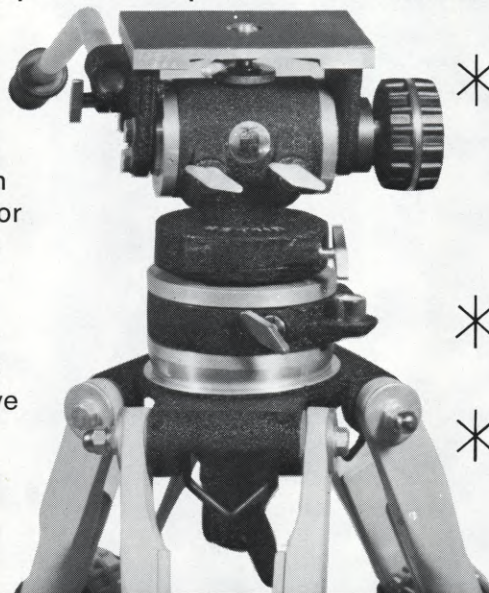
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**FLICKER-FREE BREAKTHROUGH**  
Continued from Page 1189

filaments to be broken when lamps are mishandled during transportation.

The manufacturers say that you only discard MH lamps when the color temperature has changed with usage by too great an amount to be acceptable (1°K per hour, they say) or the electrodes wear away, usually after about 500 hours, when restriking becomes impossible.

When I screened the tests of the new unit with Billy Williams, BSC ("WOMEN IN LOVE", "THE WIND AND THE LION" and many others) not only was he enthusiastic about the freedom from flicker, but also about the light output from the 4000-watt HMI lamp, which I showed him and which he was seeing for the first time.

"It may well mean the end of the Brute," were his exact words. Billy is particularly sensitive about color and explained how, on every feature and commercial on which he has used HMI lighting during the last year or two, he never ceased to be impressed by how well its color temperature matched that of natural daylight.

Being very practical, he pointed out another great advantage: the lack of heat. That 4000-watt HMI light gives out less heat than the conventional 5K (a watt of heat is a watt of heat) and this

means that he can match the intensity of daylight inside a room on location without turning the place into a sauna bath or using ND and 85 acrylic or other filters on the windows. "You can even work with the windows open or have practical doors or archways leading to the outside and still balance the light," he said.

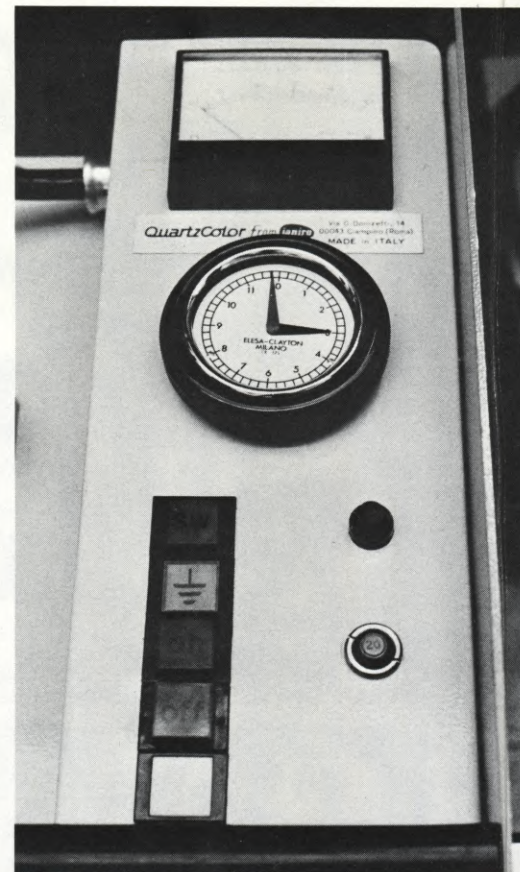
Of course, the new unit has still to be proven in practice and on location while films are actually being made. For that, then, there is no substitute.

Neither does it solve the problem of the location or occasion where MH lamps are being operated off normal, less-expensive, choke ballast units (perhaps rigged in by a TV company) and are not triplicated on the three phases. On these occasions it will still be necessary to get the shutter/camera speed/Hz arithmetic correct.

In Britain and elsewhere where HMI lamps are now frequently used, questions have been raised regarding the safety aspects—especially in regard to electrical safety, actinic UV emission, the danger of explosion and any other possible hazard.

The results? That properly constructed and correctly used MH lamps are no less safe than tungsten lamps operated off AC at similar voltages.

In regard to voltage, it has been noted that all the lamps so far produced require a 220v supply to the bal-



A meter on the ballast control panel indicates prevailing voltage and a Variac unit permits varying the voltage to control color temperature.

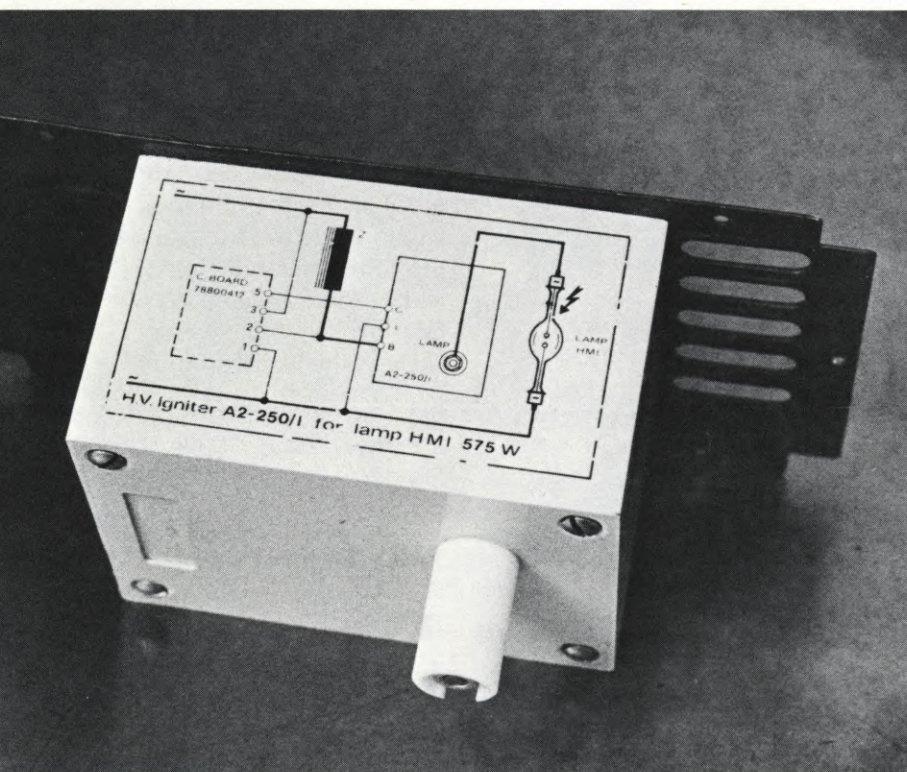
Igniter unit for the HMI 575-watt lamp. The power required to strike the arc initially is transformed to a higher voltage inside this insulated and isolated box set within the lamp head and provides high voltage/low current that lasts for less than one second when the arc is struck. To insure safety, a microswitch disconnects all electric power to the bulb when the lamp door is opened.

last unit, with the exception of the 4000-watt version, which requires a 380v supply. After the ballast unit, the voltage to the actual bulb is considerably reduced — to 95v, 100v and 115v, respectively, for the 575-watt, 1200-watt and 2500-watt lamps, and 200v for the 4000-watt.

In addition, a small current at 220v passes through other cores within the multi-core cable connecting the ballast unit with the lamp head. These supply the ignition circuit, the ignition switch and the "hours elapsed" meter (a check for lamps which fail prematurely, in order that a proper discount may be claimed on the replacement). In the case of the QuartzColor laniro (and most other lamps) these higher voltages end in a separate sealed box which is attached to the outside of the lamp housing and remains inaccessible even when the front of the lamp is opened.

The power required to strike the arc initially is transformed to a higher voltage within an insulated and isolated box set within the lamp head and is high voltage/low current and lasts for less than one second when the arc is struck.

A microswitch disconnects all electric power to the bulb when the





lamp door is opened. As an additional precaution, this microswitch actually touches the front glass rather than the door frame, so there is no possibility of the lamp being lit or the connections live if the door was closed but the glass removed.

This safety measure also prevents any chance of the lamp causing UV burns. Like any other arc, the light emitted by an HMI lamp has a high UV content which is filtered to an acceptable level as it passes through glass. Like any other arc, HMI and CSI lamps should never be operated "open".

In 1½ million hours of operation, Osram says they have not had a single bulb explode accidentally. Only when it has been caused deliberately for test purposes has this happened, under which circumstances the explosion was entirely contained within the lamp housing, albeit making a mess of the reflector.

Even when deliberately sprayed with cold water, I am told that HMI bulbs have remained intact.

Having tasted the future of these lamps with the prototype laniro square-wave ballast unit, we must now await the production units. These, I am told, will include smaller models of the 200, 575, 1200 and 2500-watt bulbs and the additional possibility of 110/120-volt AC or DC operation. Given this, and provided that costs are contained, the future of Metal Halide lights is "very bright" indeed.

Finally, I offer a creative suggestion for those who photograph cinema and TV commercials. I've written in this and other articles about the means of eliminating the flicker problem with MH lighting, but there might be something to be said for deliberately inducing it when lighting the product in product shot situations. Using HMI lighting with choke-type ballast units in conjunction with totally incompatible fps/shutter settings, to create a maximum amount of light pulsing, the product can be made to scintillate and stand out from the background (lit with normal tungsten lighting) in a truly vibrant manner. ■

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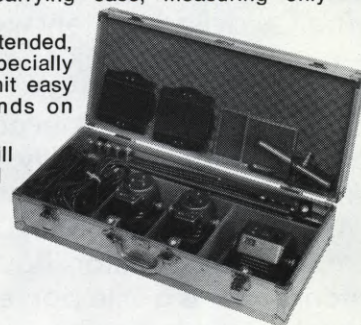
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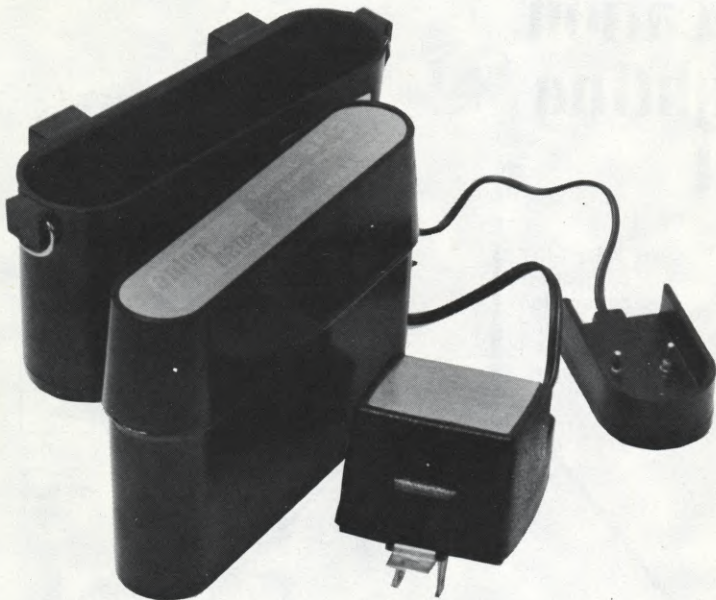
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THE IANIRO STORY  
Continued from Page 1198

range of products, based on the outcome of the market survey.

The first unit introduced was the "IANEBEAM", a very small "hideaway" luminaire made of fiberglass. This marked the first time that such a material had been adapted to the lighting industry, and the unit was a fantastic success. It is still manufactured in large quantities.

Later came a range of spotlights designed to accept tungsten-halogen lamps — and, again, overall dimensions and weight were reduced by as much as 50%, as compared to some existing equivalent units manufactured in other countries. Ianiro also introduced a wide range of open-face fixtures, using direct and reflected light.

The problem of illuminating cycloramas was solved through development of the "IRIS" units that evenly illuminate cycs of up to 12 meters high — lighting only from the top, with no need for bottom units.

Last year, as previously mentioned, the company introduced its range of fresnel fixtures for HMI lamps, using a conventional (choke) ballast. And now, to bring the march of progress up to the present, it is introducing its new square-wave ballast for flicker-free HMI lighting, suitable for 120v-220v, 50 and 60 Hz.

QuartzColor Ianiro is now a share company, fully owned by Giovanni and Antonio Ianiro. At the moment 95% of its total production is exported and 70% is distributed world-wide by the Rank Organisation.

Having been given a brief history of the company, I find that I have several questions, which I pose to Giovanni Ianiro as follows:

**QUESTION: I'd like to ask about your approach to the development of new products. Where do your ideas come from and how do you go about deciding to manufacture a certain product?**

*IANIRO: I believe our approach is different from that of other companies, who feel that the Head of Research must stay behind the desk in his office all the time — or at least operate completely within the factory. We believe that he must be everywhere that lighting problems are being discussed, that he must be in personal contact with customers all around the world, and that he must go often to exhibitions where lighting equipment is shown and talked about. Only in this way can he absorb the various points of view and*



understand the problems customers might be having, because the needs of customers tend to differ from country to country. By having this direct contact he can do a better job than he could do by staying in the office. Our Head of Research is Mario De Sisti and we can trust his judgment. We have made our products well because he has "lived" with the customers, with the users of lighting equipment. Of course, it's simple to make such a statement. The main problem is finding a man who is sensitive enough to work in that way and who has the capacity to understand the various points of view. He must also be willing to spend one-third of the year traveling. It is not easy to find such a man, but if you do find one you are most fortunate.

**QUESTION: What else decides the direction you will go with a product?**

IANIRO: Besides having our own man in the field, we rely on the input that comes to us from other people whose judgment we trust — just as we are doing now on the HMI lights with David Samuelson. We have a lot of people helping us to get points of view in various locations, people we have worked with for many years. We also find it helpful to talk with other manufacturers. For example, we've gotten a lot of help on the HMI development from Osram. I take the information from all these sources, mull it over, maybe even dream about it. I'll make sketches while I'm riding in the car or sitting in the office, searching for a solution to the problem. When I think I've found a solution I call all my assistants together — the men from the optical, mechanical, temperature and electronics departments and the draftsmen. I give them my sketches to use in making the prototype and each man has his job to do. Meanwhile, I am free to go around the world, keeping alive relationships and exploring markets. When I come back I check the stage of their progress in developing the idea, and I can modify it, or perhaps add to it some last-minute information I've gained. That is more or less our system of research.

**QUESTION: What is the next step beyond that?**

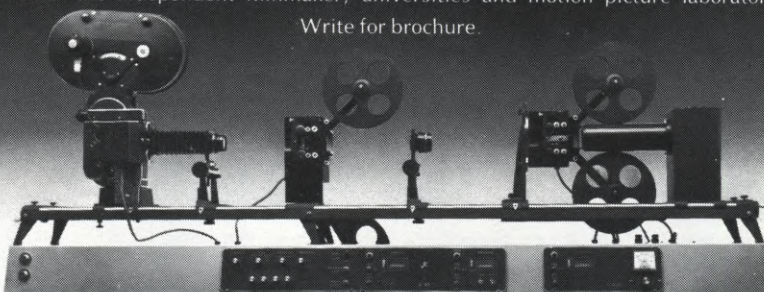
IANIRO: After all of our tests have been made — optical tests, temperature tests, mechanical tests — we arrive at the finalization of the prototype.

We may make one, two or three prototypes and we will show these prototypes to our major customers and

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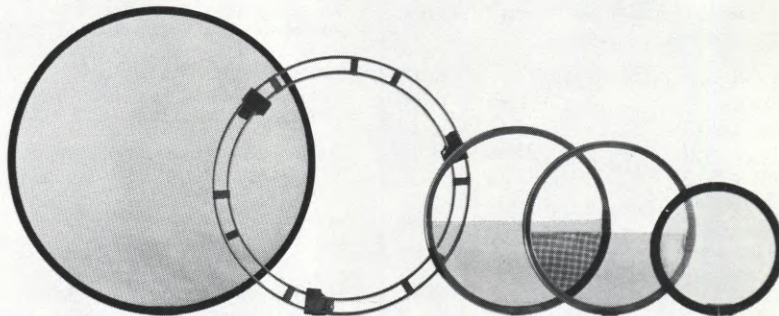
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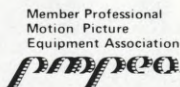
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our main agent in order to get their reactions to what we have been doing. They tell us if various features should be added to the prototypes or modified. Their suggestions are very valuable, because the theoretical side and the practical side do not often go together. This is why we must have discussions directly with the customers. We make changes based on their suggestions. When they finally agree on what we have developed, and have no other suggestions, we can go ahead with the production. But first it is necessary to have that dialogue with the customers until they accept what we have done. As a result, we usually approach the first production run with a lot of orders for the product we have developed.

**QUESTION: What are the steps in moving from prototype to production?**

*IANIRO: We take the prototype back to our laboratories and analyze it in terms of methods of production and possible manufacturing problems. We always explore the possibility of incorporating standard components, in order to keep the unit price down for the customer and make it easy to obtain spare parts. We make so many units with similar components that some of them can be standardized to fit new products. The drawings are passed on to the production department so that the tools can be made. We make 95% of our components, including all of our own tools.*

**QUESTION: Backtracking a bit, let's say that you've arrived at a product that has initial acceptance. Enthusiasm has been expressed for the prototype and you have a certain number of orders, on what basis do you decide how far to commit yourself — in terms of the quantity of the first production run, for example?**

*IANIRO: On the basis of the feedback we've received from our contacts with customers and agents. From the commercial point of view, estimates have to be made in terms of quantities per year for the various products. For this information we rely heavily on the recommendations of agents who have researched the market. They tell us.*

**QUESTION: If you arrived at a certain product which you knew you could sell only to a relatively few customers — yet you knew it was very important to those customers — would you manufacture it, or do you limit your production only to**

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**Items that can be sold on a large scale?**

*IANIRO: We have to have a basic market large enough to give us an excuse to manufacture a product, so that we can keep the price down. Sometimes a product developed for a limited market can be modified or adapted to other markets, as well, giving us the quantity potential to make its manufacture feasible. For example, if we talk about the film industry in Europe, we can say that it is more or less completely saturated for certain types of equipment. But if we talk about the American film industry, we give it very serious consideration, because we think there is a very large market there. If we receive a request from that market, we may be able to modify a product we have already designed for Europe. Or we will make something special — something completely new. We would be willing to do that for the American market because we feel it can absorb very large quantities.*

**QUESTION: How does what we have been discussing apply to this new square-wave ballast that you've developed for HMI lighting?**

*IANIRO: We have found the solution to the flicker problem with the square-wave ballast, but we must now arrive at the final solution, that of producing it commercially. We feel that we can have it on the market in the early spring of next year. We have been working on it continuously since FILM '75 — adding on other devices to make it more versatile and figuring ways to get the price down. In the meantime, we continue to work also with the normal ballast, because it has certain advantages in terms of weight, size and price. But we are confident that we will arrive at all the solutions for commercially producing the square-wave ballast and that it will be available by early spring of next year.*

On the evening that the square-wave ballast film tests are to be shown, almost 90 cinematographers and other technicians of the Italian film industry are on hand — an enormous turnout for a technical meeting, our hosts tell us, especially on a night in the middle of the work week. Never has there been anywhere near such attendance before.

The evening leads off with cocktails and buffet and, for me, it is an opportunity to renew acquaintances with many people I've met before from the Italian film industry, including cinematographer Pasqualino De Santis, whom I haven't seen since the night he won

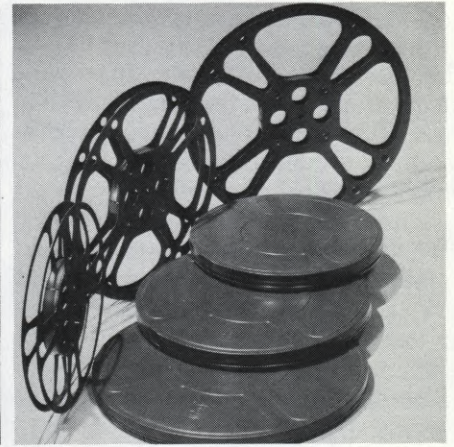
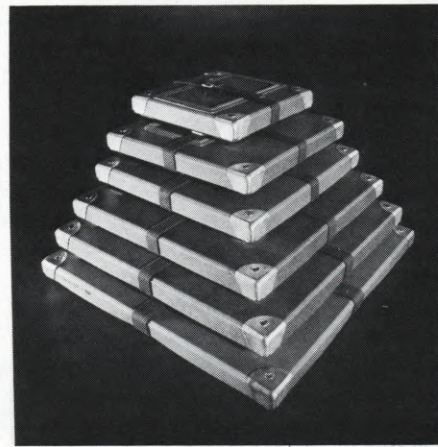
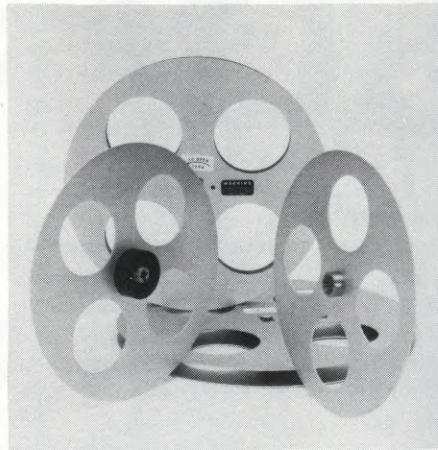
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the Academy Award for "ROMEO AND JULIET". Absent, unfortunately, is my dear friend Giuseppe "Peppino" Rotunno, ASC, who is busy shooting night scenes for "FELLINI'S CASANOVA" on which he is Director of Photography. (We will, however, meet him and Fellini the next day on the set at Cinecittà.)

The technical part of the evening begins with a screening of a demo film shot with Cinema Products' new camera stabilizer — a stunning *tour de force* of mobile camera virtuosity. Then David Samuelson demonstrates the Panaflex camera which he has brought over from London for the benefit of the Italian cinematographers, most of whom have not yet had an opportunity to examine the handsome device.

Finally comes the *pièce de résistance*, the screening of the new Quartz-Color Ianiro square-wave ballast film tests. The reel is only six or seven minutes long, but it is a stunner. David has, indeed, run this new ballast through a grueling gauntlet, an obstacle course of widely varying frame rate/shutter angle combinations, at both 50 and 60 Hz. The HMI light linked to the new ballast shows nary a flicker. It remains rock steady under all conditions, while the light operated from the conventional (choke) ballast pulsates madly in several situations.

The test is projected a second time, and leaves not a shred of doubt in anybody's mind that the new square-wave ballast is a complete and unqualified success. QuartzColor Ianiro has, indeed, achieved the long-awaited breakthrough to flicker-free HMI lighting, and, clearly, cinematography will never be the same again.

The assembled technicians are obviously thrilled by what they have seen and Stephen Futers aptly sums up our collective excitement when, following the screening, he tells the group: "We have seen tonight several most exciting and interesting new developments, but for me, as a lighting engineer, my 'light' of the evening has been the demonstration of the new square-wave ballast.

"I'm sure that all lighting cameramen realize that this is an historic moment in lighting. This is a real breakthrough. This is the light that studio engineers and lighting cameramen have been wanting for many years. At last we have a big light source that we can plug into the mains and one which will give no trouble whatsoever to the film cameraman.

"I would like to take this opportunity to congratulate the Ianiro people on their truly revolutionary technical accomplishment." ■



**SHERLOCK HOLMES**  
Continued from Page 1181

actually made better by virtue of the restrictions imposed by actual locations, because you are not distracted into making false and over-generous camera moves, which are really not doing what you think they're doing. So the fact that you are prevented from doing them means that you very often concentrate on a much more truthful dramatic representation of what the story is about. That's not a hard and fast rule, of course, but being able to rely on taking out walls, for example, can make you lose sight of the fact that your scene isn't working. If you have actors who aren't captive to the arbitrariness of the studio, very often their performances are improved by the concentration forced by the claustrophobic quality of a location. Then again, that's not a general rule either, because the better actors can do much more within the framework of the studio, since they know how to use the system. It's a complicated question and there are very definitely two sides to it.

**QUESTION:** On the set I saw that you have been using the Samcinevision through-the-lens, closed circuit TV viewfinder-replay system, in conjunction with the Panavision R-200 camera. How has this been working out?

**FISHER:** Well, of course, it's really invaluable for somebody like Gene Wilder who is acting and directing at the same time. He can replay the action and decide instantly whether he's got what he wanted, instead of having to rely upon somebody else to make that decision for him. It's much better that he can play it back. The picture is in black and white and you can't, of course, really judge the photographic quality from it, but for evaluating the action or how the actor looked in his performance (particularly if he's also directing), it's a most valuable tool. I don't use it as much as Gene does because I'm used to looking at what's happening in front of me and having to know that what we intended has, in fact, happened. It's a very economical device, oddly enough. It's true that when you have a playback facility there's a tendency for everybody to stop and look at the tape before deciding whether or not they want to go again, and there's the short time taken up in doing that, but at the same time, when you've done several takes you can play them all back to see immediately, in terms of action, which takes to print. I've known it to be used

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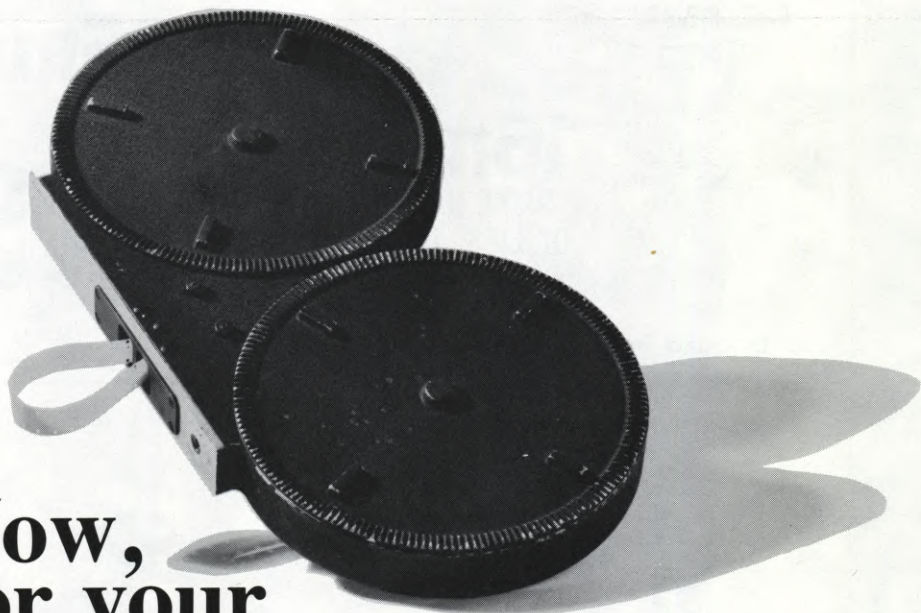
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in shooting commercials and that's where you can really economize, because you can sit down and take half an hour at the end of the day and actually decide whether to print Take Three or Take Five or Take Seven or the take you shot first thing in the morning. When you come to look at them you can see straightaway that Five doesn't work, so you don't print Five. From that standpoint you are saving on the print costs and you can actually make it work quite economically. I think the danger would be to rely on it too implicitly to the point of becoming lazy and not being attentive enough to your operation at the time of shooting.

**QUESTION: Since this is Gene Wilder's first picture as director, what is your method of working with him?**

*FISHER: Well, of course, I reacted to his script first, which I thought was one of the funniest things I'd ever read. There was a question of how we would work together, in the sense that he said: "I haven't directed before and I don't know about camera angles and things like that." So in the beginning he would say: "Why are you doing this?" and "Why are you doing that?" He's a very painstaking man and he wants to know everything, but, of course, it takes a long time to know everything, and I don't think any of us ever will anyway. However, it meant that for the first few weeks you had to explain why you were doing this or that and why this worked and that didn't, and so on. Once he started to see his rushes edited he became very involved, so that right now he is itching to get at the camera and do the set-ups. That's alright, because his ideas are very good. It's been quite a useful exercise for both of us really. I've been given the freedom and liberality from the beginning to sort of make suggestions which, even if he didn't understand, he accepted in the spirit in which I offered them — that of being helpful. These were not simply suggestions for making the lighting better or something like that, but things to do with the story and the script, because he knew I understood those elements. I think he's slightly annoyed because he hasn't yet mastered how everything is being done. He can't see why it's being done or why it's happening, because he's too busy concentrating on other things, but I think he will thoroughly master it all eventually. I can often see him studying, when he's got the time, to see what we are doing in terms of the lighting, for example.*



**QUESTION: What would you say was the most unusual, bizarre or challenging sequence which you've shot thus far for this film?**

*FISHER: I think we had as much fun, and as much true reward, out of anything we've done when we shot the hansom cab chase — which was a combination of a large-scale exterior with night and fog effects, reproduced interior shots inside the same coaches and a sort of fight going on on the roofs, as well. The reason it became interesting was because Terry Marsh and I decided we wouldn't do it in process. We didn't want to get hung up with projectors and rear-projection screens, because we knew the actors would want to go on for take after take to perfect their action, rather than being involved with the technicalities of process work. It was a fog sequence, too, so we didn't want to go to process and have to introduce that element. Instead, we built a 35-foot revolving drum — which, of course, is going right back to the earliest days of the silent film comedies — in order to keep the people still and shift the scenery behind them. We shook the coach, of course, and had to make it safe to work, as well. It was quite hectic moving this drum, because we had to have people inside it. It's quite a long way around a 35-foot drum — which provides a hundred feet of backing — so it takes quite a while for the whole background to pass the camera. Not only that, but we arranged things so that it had lights inside which lit certain windows the first time around and were turned off the second time around, making the background seem even longer because we weren't repeating exactly the same thing. But the howl that used to come up from inside this contraption was the funniest thing, because it took about 12 men to push it around and we kept saying: "Faster, faster!" Finally the producer was sent for and he said that he couldn't understand why they were having trouble making it go faster. So they invited him in to try it. Two takes later he emerged staggering and said: "I'll never complain again." They finally got it going fast enough, with all the effects of the passing lights and fog being blown in, and it was such a funny sequence anyway that it worked out just fine.* ■

**MOVING?**

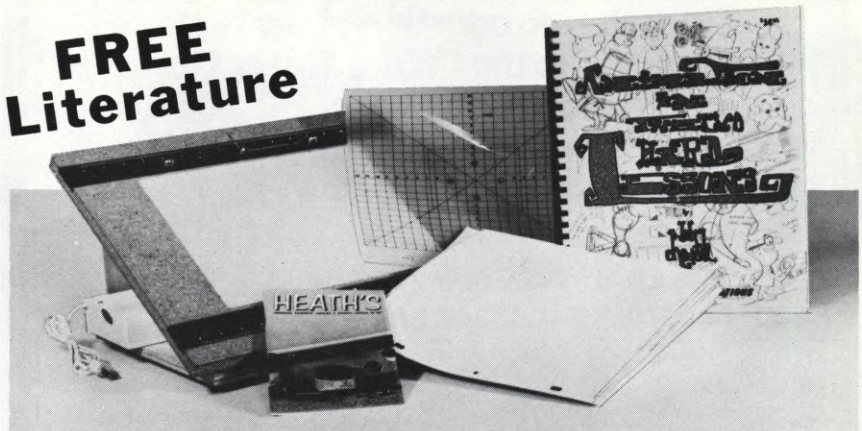
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## PRODUCTION OF "SMILE" Continued from Page 1196

was hand-held, except for the zoom shots made on the PSR camera. We shot seven-and-a-half hours of film during that two-hour pageant and Connie was all over the place — God bless him. The curtains would open on a new talent act and he'd suddenly be there, standing behind the girl on a ladder. Then the curtains would close and moments later — like the Roadrunner — he'd be down in the orchestra pit. It was extraordinary. The amazing things was that even though the entire pageant had to be filmed with a single lighting set-up, some of that footage was among the best photographically that we have in the entire film.

Connie had an overall visual concept for the picture that we talked about before, and it involved keeping all the colors to soft pastels. There were no hard colors. We worked very hard on the coordination of the costumes and the locations to keep that pastel look. We wanted it to be soft and for the teenagers to look beautiful, even though certain aspects of the comedy were very hard and abrasive and there were even pratfalls. So everything throughout the film was shot with very light diffusion. This worked out fine for the release prints, because the CRI, being a dupe negative, tends to pick up a bit of contrast, but since we had started off with this soft diffused look, the contrast did not become bothersome.

Another thing that Conrad Hall did — and he made tests of this, because he'd never tried it before — was to not use fill light on the exteriors, but instead to take care of the harsh shadows and the bright blue skies by underdeveloping one stop to create a thin negative) and then print up. The thinness of the negative takes out the harsh shadows, but it means that you don't have to use fog filters or pre-fog the film or do any of the other things that people are fooling around with these days.

I don't say that this method would work for "THE FRENCH CONNECTION", where a kind of dark and dirty look was desirable, but where you want real colors, where you want to have the faces of girls look soft and pink, rather than tan and ruddy, this technique is absolutely perfect. Conrad did tests outdoors with one of the girls and we would try various levels of underdevelopment and overdevelopment, with and without diffusion, and the differences were extraordinary.

He didn't use the kind of diffusion he used on "THE DAY OF THE LO-



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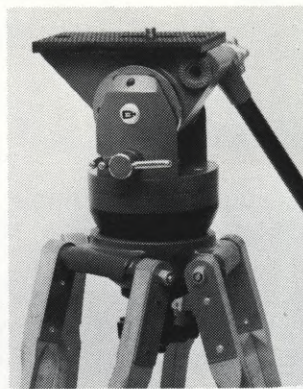
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CUST", which looks marvelous. That was quite a different kind of film and he was going for much more stylized effects. Our film being comedy, we wanted photography that wouldn't make people stop and say: "Wow, what a great shot!" It would just seem very truthful and the girls would look pretty and the town would appear like a charming bit of Norman Rockwell Americana.

We never did a moving camera shot or a zoom shot that was not motivated by the action. No one is aware of the camera moves. That's something of a "first" for me. I had hand-held shots in "THE CANDIDATE" which I wanted everyone to recognize as hand-held shots, because I wanted a kind of news-reel photographer's point of view. We had zap zooms in "DOWNHILL RACER" because we wanted to go an almost stylized sports action way — since the action of sports is often treated with zap zooms. But we didn't do any of that in "SMILE" — no rack focus, none of those things. I won't say I haven't been guilty of using those techniques in the past, but they all have their place. This idea was to be John Ford Simple — which is not really that simple, because I don't let scenes run on without editing, fixed on a two-shot, the way, let's say, Francis Coppola does a lot, or the way John Ford did in his classic time. The reason is that I believe the best performance is a combination of many performances of an actor. In other words, "Take One" may have something that will never be as good again; whereas, "Take Twelve" will have something that is far superior to "Take One" — and you can go on and on. The secret of film is being able to put together all those moments and create a performance that never existed. The idea of saying: "I'm going to do it all in one shot," doesn't do anything but impress a film student who is looking at it for the 438th time. The audience doesn't care. Editing is the language of film and it's there to help performances and to help the director. I think part of the problem is that there are some cameramen who work so long to make one angle absolutely perfect that they try to talk you out of taking the scene from another angle. On the set they'll say, "What a shame to break it up," or "You don't have to break it up, do you?"

There have been times when I've been tempted to go along on that score and play the entire scene from one angle. But always, just for protection, I've said to myself: "I'd better do another angle, or shoot a couple of close-ups, or whatever." Thank God  
**Continued on Page 1224**



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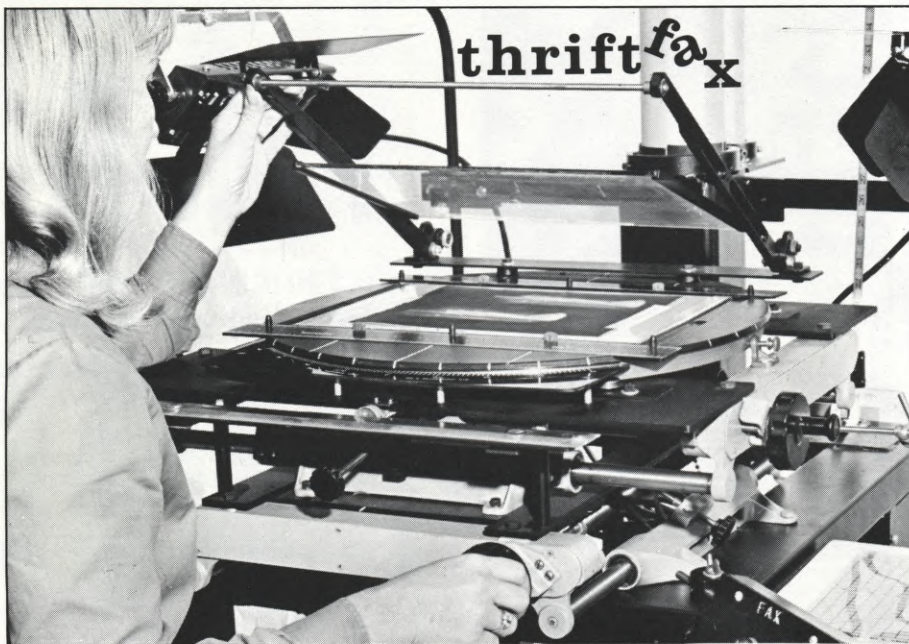
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**SAFETY IN FILMING**  
Continued from Page 1165

moral for a client not to advise the producer of the details in advance. I have always instructed our production people as follows: *if you are confronted with performing under unsafe conditions, see that they are made safe or do not perform.* We make many safety films, and I am not about to have one of our people hurt during their production!

Once we were filming the loading of fuel in a new nuclear power plant. We had 30 cameras and lights positioned around the huge circular chamber. Each was held down by a different man. And each of those men and our crew had been searched to remove any coin, toothpick, match or loose button which could fall into the chamber. If it did, it would cost the contractors *millions* of dollars to remove and clean the area.

Now *that's* safety discipline.

Work clothing is as important in our trade as any other. Every man on the production crew should own a fitted hard-hat and carry it with him in case he needs one. He should report to all location work with steel-toed safety shoes and ear protectors.

Editors work with film cement and cleaner, which should be treated with respect. Goggles or eyeglasses will protect eyes from a dropped bottle of film cement. Well ventilated editing rooms will remove chemical fumes.

The special physical actions of film-makers often lead to accidents. A cameraman loses much of his self-protection when he shoots. He cannot see an approaching hazard and must have an associate to protect him. Even old-time editors occasionally wrap up bloody hands after getting fingers caught in rewinds and reels, or cut by film edges. Falling tripods, light stands and props have hurt many a person on the set.

Lifting puts many a back in trouble. Extremely heavy motion picture equipment should be lifted with legs and not backs, and by as many people as required. Casters attached to equipment cases make sense. So do portable luggage dollies.

Scripts calling for moving shots should also call for safety precautions, because dolly, trucking and walking shots are *inherently unsafe*. If the talent deserves a director, so also does the cameraman deserve a director of all moves.

Aerial photography demands exceptional safety measures because such work often finds the cameraman perched in an open chopper, legs dangling. Man and equipment should be



doubly secured.

Producers owning or renting mobile units should be sure the driver knows how to drive the vehicle (don't laugh; most car drivers have not checked out van operation and procedure.) The vehicle should be equipped with correct mirrors and back-up alarm.

Unsafe equipment comprises a problem in itself. Years ago we were taking off in a single-engine plane in East Africa when someone shouted "Fire!" We circled and landed to find that our early version of Sylvania's portable Sun-Gun had switched on inside a soft-wall case and caught the plane's upholstery on fire. Shortly thereafter Sylvania redesigned its unit to include a safety cover over the switch, and paid for the plane repairs in full.

As in all safety matters, *human beings create or aggravate most hazards*. I have seen production people in a hurry mount a well-made ladder and *fall* — simply because the ladder was too short for the job, set up backwards, upside-down or at an improper angle.

A little alcohol can go a long way to create safety hazards. Whether it's a parade of beers the night before or a couple of cocktails at lunch break, liquor does not belong in safe production of films.

Nor does *fatigue*. It is not *reasonable* to expect a crew to drive for hours, set up equipment on location and then perform at peak efficiency. Crews should be well rested and in complete physical control the instant the first take begins. And shooting schedules should not go deep into the night hours or rob crews of a reasonable number of hours of sleep. If crews must work without rest, they should be aware of their limitations.

Perhaps we have one hazard in our industry that is incurable: *the Cowboy Instinct*. Riffle through the pages of almost any filmmaker's trade journal and you are confronted by articles of filmmakers' derring-do. "Shooting Hawaii's Erupting Volcanos — from Inside". "How I Got Those Chuteless Shots and Lived". "After 25 Days Adrift, 7252 Doesn't Taste Half Bad".

So long as filmmakers insist on proving their masculinity and creating a mystique about their profession, we're going to lose a few. ■

(ABOUT THE AUTHOR: WALTER J. KLEIN has been president of the Charlotte, North Carolina production house bearing his name for 27 years. He is founder and past president of the International Quorum of Motion Picture Producers [IQ] whose 118 member production houses span the world. His firm has won 31 recent festival awards and has produced a number of safety films.)

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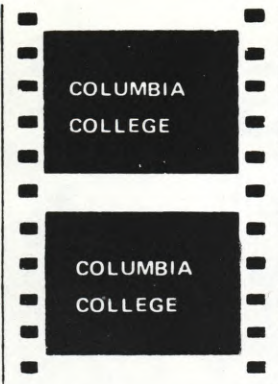
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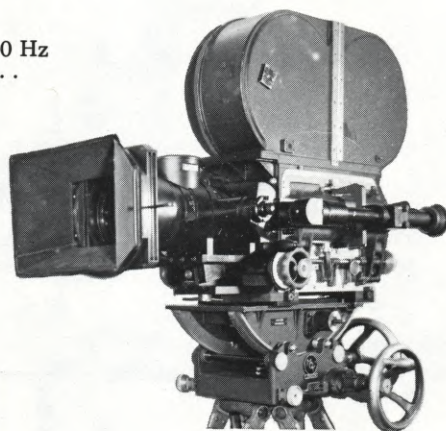
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Continued from Page 1161

"I do a lot of sports shows for Wide World of Sports and many lend themselves to the special mounting of cameras. Some of these are skiing, surfing, motorcycles, air races and car races. Most of the mount work has been limited to camera helmets with Mini-Cams Gzaps or a mount using a Mini-Cam Gzap. Now, Jackie Stewart has supervised the building of a fantastic camera car that mounts professional 16mm cameras. His camera car helped capture the excitement and feel of speed that had not been possible before. Being able to record sync sound added another new dimension to his achievement," Shoemaker comments.

Another of Wilson's lead cameramen at Monaco was director-cameraman-editor Peter Silver, a transplanted Californian who now freelances out of New York, and has been shooting for ABC Sports for 10 years. Silver was not surprised at how well the Eclairs held up under the beating they took on Stewart's camera car.

"I have a three-year-old NPR that has handled more than a million feet of film without a problem. If it hadn't been for the reliability plus the portability and quick-change advantages offered by the NPR, I wouldn't have been able to get the shots we needed while filming the Grand Prix. I was in the midst of the huge crowd at the chicane, hand-holding the camera, and obtained some excellent footage. I can well understand why Stewart outfitted his car with Eclairs, having been an Eclair man myself for years."

Lenses on the Eclairs included 5.7mm and 5.9mm wide angles on the outside cameras and a 10mm on the camera in the back seat. The recorder was a Nagra SN mounted on the floor console to the left of the steering wheel of the right-hand drive car. On-off control switches inside the car started cameras and recorder, which were crystal sync. The film used in all cameras was Eastman Kodak 7252.

As for Stewart, his "EXPERIENTIAL TREATMENT" proved to be a success. His idea has brought viewers the thrills and tensions of auto racing that heretofore had been impossible to convey. He plans to use his camera car to film the world's major raceways and to bring audiences a completely new insight into motor racing, especially from the driver's point of view.

There's no question that a whole new era of auto racing filmmaking dawned just last May in Monaco. ■



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## CINE PUEBLO Continued from Page 1147

credibility with those producers; and (4) to improve the competence of Mexican movie technicians.

"We're aiming our sights at the smaller, independent Hollywood filmmaker," Elias told us. "We have enough young talent in Baja California who have the background and who need the chance to work on motion picture productions right here. We can eliminate a lot of the expense of flying technicians and other personnel from Mexico City to productions being filmed at Cine Pueblo by hiring local people. We are trying to create a local industry, so that Hollywood producers will automatically think of Baja California when they have location subjects to film.

"And, most important of all," continued Elias, "we are offering this equipment and the facilities — including housing for all the crews and cast — at around \$200 to \$300 per day! That's about 10% of the cost of shooting at any other location site."

How can Elias and his partners (of whom the government of Baja California is one) do it? Simple. Elias asks for participation in the foreign distribution rights — especially Mexico — of all films produced at Cine Pueblo. Of course, to make sure he's not getting a bomb or a porno flick, he maintains first right of refusal on all scripts.

According to Bob Jacks, president of Lorimar Productions and producer of "The Waltons" and "Zorba the Greek", the Baja Films/Cine Pueblo project has enormous advantages.

"No one really realizes what Baja California has to offer in the way of topography," stated Jacks. "I know that the Governor and the Lt. Governor are very sincere in wanting to overcome a bad impression that exists in American/Mexican filmmaking. They want to offer the ultimate in cooperation to attract production to Baja — not on a runaway basis, but to create more production for American companies, to create jobs and to bring money into Baja California." When asked about what the impact of this new facility would be on the Hollywood industry, Jacks replied: "I think it will stimulate production in Hollywood, rather than take anything away from it. It won't have an enormous impact; but since we're so close to Tecate, and the fact that there are some incredible locations here — the pine-covered mountains, deserts, lakes and the ocean — it is definitely very attractive. I think this whole thing is a very healthy thing for both Baja Cali-

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fornia and for the motion picture industry as a whole."

Bill Fraker, ASC, noted cinematographer ("ROSEMARY'S BABY", "THE PRESIDENT'S ANALYST") had this to say: "I think it's tremendously advantageous for us to come down here. They've done a beautiful job. Most importantly, though, they have some of the top people in Mexico filmmaking connected with the project. The upper echelon Baja California officials are behind this thing all the way. They know what we need. They've enlisted the support of people from Mexico who've been dealing with us for years — and I think they'll break their backs to help us. The thing that I was most impressed with was the fact that all the equipment and services needed to make a film are being supplied by Baja Films, so that all you need to do is bring down a cast and crew.

"I definitely think it will be a boost to the Hollywood scene — it's so much closer to Hollywood than other, typical location sites. Both Baja Films and Cine Pueblo are bending over backwards to provide Hollywood filmmakers with the best equipment and services available," Fraker concluded.

Francisco Santana, Lt. Governor of Baja California, told us: "We have been working very hard to finish both projects (Baja Films and Cine Pueblo) at the same time — the buying of equipment for Baja Films and the construction of the town — so that we could start shooting films anytime after this grand opening. We know that we are going to have to buy more equipment as we go along to meet the requirements of the producers. And we're prepared to do so.

"Let me emphasize that this is a government project in partnership with private initiative. We think that this will generate a great deal of work for our people in Baja, and that it will let Baja California be known all over the world. If we're careful and we help the producers keep their costs down, they'll continue to have faith in us. I think we're on our way to having a new industry in Baja California."

Commenting on a question regarding previous bad feelings between American producers and Mexican entrepreneurs Santana told us: "We are hoping to correct any mistakes made previously. We're going to try to be born clean, and to work hard to keep this always at a proper business level so that when someone wants to make a movie here they can be assured that they will be treated fairly. And, most importantly, that they can save money by coming to Baja California for location shooting."

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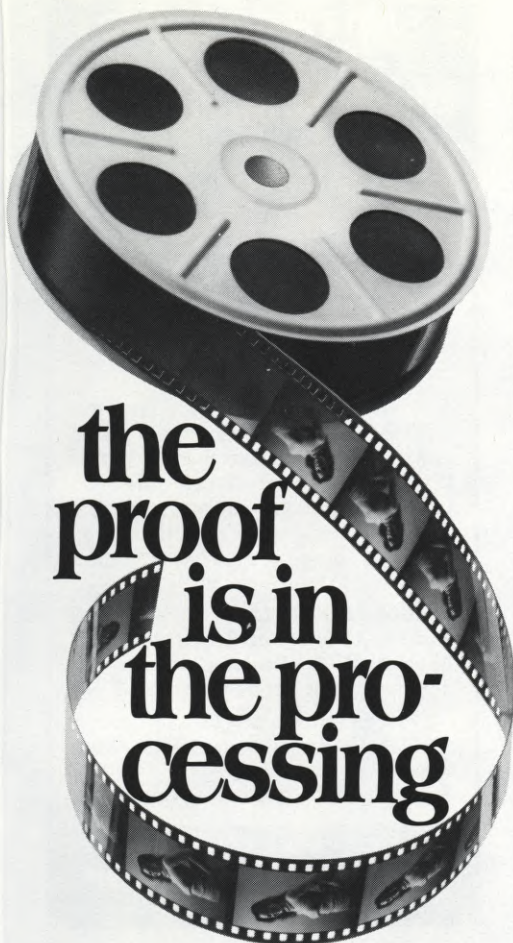
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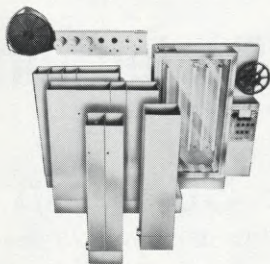
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Writer/director Charles Washburn volunteered these comments: "Being a writer, I get a lot of impressions of things that I see. And from these impressions spring many story ideas that I hope will make entertaining movies. I think that there are not enough westerns being shot now — for whatever reason. I'd like to see them come back. I'm one who loves westerns and grew up on them as so many persons did. I hope to get some kind of encouragement to write some stories on western life that can be filmed down here. I appreciate this experience. I like what they're doing. I like the gesture, the hospitality here. It's a marvelous experience — I'm glad I came." Continuing, Washburn said, "There are a lot of people here who will go back to Hollywood and give serious consideration as to how they can film their productions in Baja."

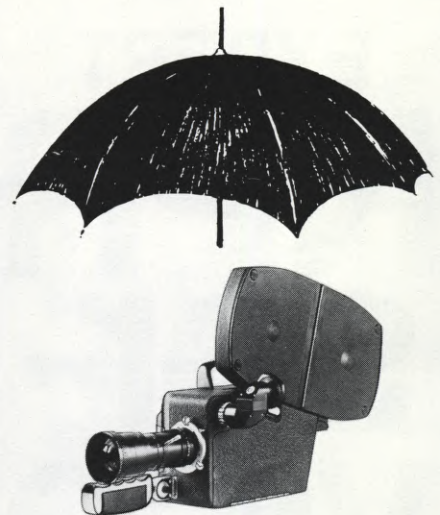
Milton Castellanos, Governor of Baja California, gave this statement to *American Cinematographer*:

"This (project) can only benefit the people of Baja California in a positive way. We're putting together a facility that will give work to many people in Baja. The combination of Cine Pueblo and Baja Films offers a great opportunity for Hollywood production companies and we welcome them to our State.

"The union between Baja California and Hollywood will be very positive, but we project even further than that. We are thinking also of the jobs that this will provide, not only for the people of Baja, but for people who will come from Mexico City as actors and tradesmen — many workers in the Mexican film industry will be provided with jobs through this project."

When asked if he felt that there will be future developments such as this in Baja, Governor Castellanos replied: "I believe that this will further the development of employment in the State. The sets and equipment are very reasonable. Our natural scenery is totally free. Thus, we can offer such economical production costs that producers will come here. And in doing so, they will make the movie industry a going thing in Mexico. I feel that this is just the start; this project will develop into something bigger if we can take care of it and provide the proper accommodations that the production companies need to make films.

"There is a fundamental thing that I would like to clarify: This activity (Baja Films & Cine Pueblo) should not be thought of as competition to anyone. We truly feel that we are not being competitive with anybody. We believe



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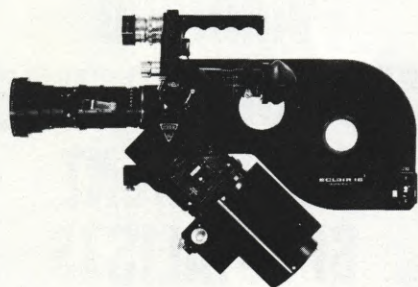
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that we are *with* the Hollywood industry all the way. We think that the motion picture industry should progress far beyond what it is now — that it should return to its former greatness. And we sincerely believe that we are contributing towards this end with this effort here in Baja California," the Governor concluded.

Producer Wes McAfee stated: "They certainly picked a wonderful spot here. I think the plusses are the nearness and the ease in getting here. Of course, there are other problem areas that will have to be worked out — such as local labor — but I'm sure there are plans afoot to take care of it."

McAfee then added, "It seems that they've tried to synthesize the whole thing and have gotten the best of everyone's ideas for what would be a great location site. And, of course, the production costs one would save in an operation such as this would be considerable.

"In our business we would certainly like to see something like this go over, because it means more business for everybody. An effort such as this is to be appreciated by all," McAfee concluded.

Hal Klein, producer and president of Klein Film Assn., made these comments: "I'd like to see whether the Sindicato (the Mexican Film Syndicate) is going to cooperate — whether it's going to be a unit thing. I'm sure it will all work out in time. I understand they plan on using actual sets as housing and dining areas for the casts and crews — which is certainly unique."

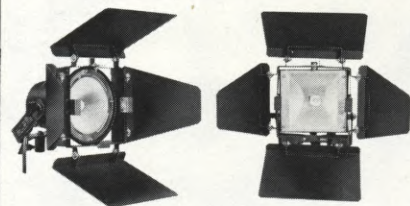
Klein added that, "The fact that they have an airstrip right here and are making available the customs and immigration officials right at the strip is a great idea — it will certainly facilitate the movement of crews in and out of Mexico."

As we walked through the make-believe town of Rumorosa sipping a cool Tecate beer and listening to the Mariachis, one thing became apparent: This was not just another movie ranch. It was a well-planned and thought-out project that could, indeed, bring jobs and prosperity to the people of Baja. And it could definitely be a tremendous boon to Hollywood filmmakers.

But after all the carne asada had been eaten, all the margaritas and cerveza had been drunk and all of Octavio Elias' maroon and silver fleet of 32 vehicles had returned to the Baja Films compound, would there be any action?

From what we saw and heard it looks as if there would. But, then again, "¿Quien Sabe?" ■

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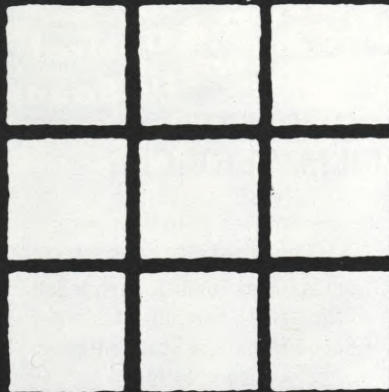
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## LIGHTING COMPARISON Continued from Page 1184

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Also, a 1200-Watt Metallogen® lamp, when ballasted with a TDC STABIL-ARC® CP Ballast, can be plugged into a conventional 15-Amp outlet. Four 1000-Watt tungsten-halogen lamps, on the other hand, on a 120-Volt circuit, draw current at the rate of approximately 35 Amps, thereby possibly further increasing the cost because of the heavy wiring necessary to energize such lamps.

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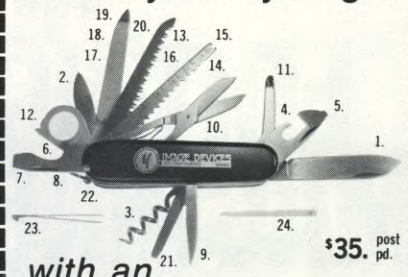
Daylight-corrected high-powered tungsten-halogen lamps, as used in motion picture lighting and professional photography, have a life as short as 15 to 30 hours. The labor cost alone of physically replacing such lamps, and the resulting down-time costs, are quite substantial. If one adds the cost of the number of such lamps used to equal the life of one Metallogen® lamp, one quickly reaches a point where illumination by tungsten-halogen lamps turns out to be more expensive than with an equivalent Metallogen® lamp installation.

### HEAT AND POWER

Costs, of course, often are not the deciding factor in choosing an illumination system. Tungsten-halogen lamps run extremely hot and can cause discomfort to people because of radiated heat and its effect on air conditioning. Metallogen® lamps, by comparison, radiate approximately 75% less heat for equivalent light output. Also, Metallogen® lamps permit better optical control of light — which is one of the principal reasons for selecting point-source or near-point-source lighting.

The choice of Metallogen® lamps, particularly for temporary short-term usage, often hinges on the power level available near the area to be illuminated. Because of the Metallogen® lamps' low power consumption, such lamps can turn out to be by far the most economical choice, because alternative carbon arcs, xenon or tungsten-halogen lamps become impractical when they require installation of

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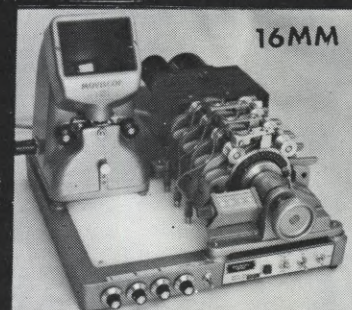
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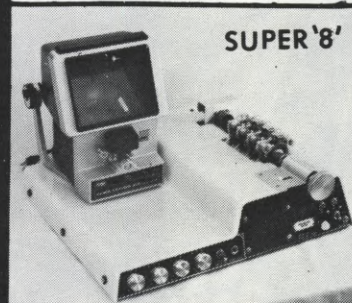
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and television applications. In addition, the lamp gives camera crews independence from variations in natural daylight, caused, for example, by changing sun position, different locations, clouds, and so forth. The lamp also simplifies the indoor-outdoor shooting transition by illuminating both indoor and outdoor scenes with the same light. Use of HMI lamps also cuts the electrical power generating capacity that is transported from one shooting location to the next.

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The HMI lamp's high intensity, efficiency, and ease of optical control opens up interesting, but as yet unexploited, possibilities for lighting buildings, signs, billboards, and special displays. For example, it may be necessary to project the light over a long distance to an illuminated target (sign or building), simply because no space is available to locate the lamp more closely. In this case, accurate optical control puts more of the light exactly where it is wanted.

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**"PROBES IN SPACE"  
Continued from Page 1145**

astonishingly matching Death Valley landscape. Amusingly, this device may have worked in reverse for some people. For I was to be later asked by a gentleman at the premiere of the film how we created the "wonderful model of the sandstorm". I trust my sandy and enigmatic smile did not reveal our technique.

The response to "PROBES IN SPACE", both from audience and reviewers, has been gratifying. Perhaps the nicest compliment, however, has been the apparently large percentage of viewers at the Space Theater who fail to notice that "PROBES" is exhibited in a smaller-than-usual format.

Much is owed to Jay Connor's able cinematography, Paul Novros' music, and Malachi Throne's narration. Their talents enhanced the final form of "PROBES IN SPACE".

In a sense, "PROBES" is still unfinished. We have a habit at Graphic Films — to the consternation of our accountants, though to the appreciation of our clients — of working to perfect a film, even after it is released. Last week, for example, we renarrated "PLANET OCEAN". You see, I've thought of a more exciting technique to treat a species of Jupiter's clouds. And there's still the volcano that got away.

All this makes for an awkward posture: my eyes searching the skies for appropriate Jovian storin clouds, while one ear is cocked westward, listening for the re-eruption of a Martian volcano called Mauna Loa. ■

**"PROBES IN SPACE"  
CREDITS**

Director/writer/producer  
Cinematographer  
Music  
Narration

George Casey  
James Connor  
Paul Novros  
Malachi Throne

Models  
Collin Cantwell  
Marion Connor  
Don Moore  
Dietrich Friesen  
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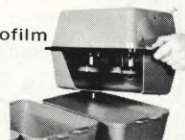
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## CONRAD HALL SEMINAR Continued from Page 1139

seminar and all felt the time was well spent.

In addition to the screenings there were hands-on hardware sessions with representatives from several equipment manufacturers. Other activities included cocktail, lawn and dinner parties, outdoor screenings and many informal gatherings. The idea was to also provide the students and Mr. Hall an opportunity to socialize and discuss film on an informal level. These informal gatherings definitely served their purpose. The students were from very diversified sections of the country and involved with different areas of film making and, thus, there was much comparing of notes.

All in all, the seminar was a complete success, as well as an enjoyable change of pace. I only regret that I had but one day to spend in Maine. The people who run the Workshop assured me that the seminar program will continue next summer with the addition of other motion picture-related seminars. Keep your eye open for announcements in the Spring or write: Maine Photographic Workshops, Rockport, Maine 04856. I can't think of a more enjoyable (and constructive) way to spend a summer week. ■

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### PRODUCTION OF "SMILE" Continued from Page 1211

I've said that, because if you do a scene from one angle only, very often when you see it on the screen it just hangs there, and you say, "My God, where do I go from here?" Fortunately, on "SMILE", Conrad never once said to me, "Why do you have to break it up?" I know that he was acutely aware of the importance of editing to the creative process.

On that subject, one of the negative things that is happening in the film industry is, that because of economic factors, directors are being required to rush their films into the theatres and there is less and less time in the editing room. This accent on speed is also very evident on the set and it is especially hard on the cameraman. Whereas, the director, if he has that freedom in his contract, can try different things with the editor in the cutting room and not stop until he thinks he has arrived at the best possible way to do something, the cinematographer is always having to compromise on what he might really like to do. He may say to himself, "Boy, if I had another two hours I could really make that look great." But there are all those dollars riding on the sound stage.

On the other hand, there are cameramen who are so instinctive that in 20 minutes they can do as good a job as they would do in three hours. Then again, that often depends upon the type of film that is being made. I'm sure that Conrad would not have liked to have to do "THE DAY OF THE LOCUST" as fast as he had to do "SMILE" (33 days), but, at the same time, I never heard him complain about not having enough time on "SMILE".

I would work again with Connie any time and anywhere, because it is tremendous when a director and a cameraman are "in sync" the way we were and have a give and take that goes beyond the cinematography. Throughout the entire filming, he maintained a constant awareness of my problems and a willingness to contribute to the solution of them.

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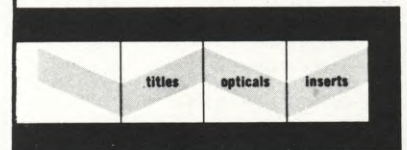
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## STUDIO PRODUCTION EQUIP.

One LW Special analytical projector, 16mm case rough but unit itself is brand new. This unit has control box with short cable for single frame, slow speed and 24 frame forward and reverse, \$500. One Bauer 16mm P6 synchron 24 fr. sync. This unit in super mint condition, \$1000. W. E. SULLIVAN, 4319 Penn Avenue North, Minneapolis, MN 55412.

FILM PROCESSOR, Hills 16mm 7381 & 7271 films. 82 ft. per minute. No track applicator, only 1 year old and in excellent condition, \$13,000. HILLS MFG. CO., INC., Box 125, Chalfont, PA 18914. (215) 345-1944.

BELL & HOWELL 70 DRs w/normal lens, \$350 to \$450. Like new demonstrator, \$550. Slotting, \$50 extra, Frezz bracket, \$10. Model 70 HRs w/400' mag., motor, case, 1.9 lens, \$675. Bolex H-16M body, mint, \$175. Like new demo, \$275 w/finder. Same converted to 400' B&H mag., w/Unimotor, battery pack, AC trans & case \$775. SBM w/POE 16-100 zoom, \$1,495. Bolex accessories NEW: Unimotors, \$75. With battery & AC trans., \$128. #804 mag. TU-motors, \$100. #787 Electric Camera grip, \$47.50. Aluminum case for 3 mags, \$75. Unimotor "B" battery case, \$45. New Schneider-Kreuznach 75mm "C" f2.8 w/sunshade current list, \$180, sell \$50. Berthlot 17-70 or 25-100 "C" w/finder, \$225. Angenieux 17-68 "C" f2.2 (mint) \$275, w/finder \$425. All models used B&H & RCA projectors on request. Angenieux 15mm & 75mm "C" lens, \$100, .95 25mm, \$250. THOMCO, (2846 N.W. 59th, Oklahoma City, Okla. 73112, 405) 848-4868.

10-100 Zeiss Zoom blimped Arri-BL w/zoom motor \$1,800. SCARPA (201) 865-6963 after 7PM.

35 Mitchell-5 Baltars, 3 mags., head, motor, etc. in 5 cases, \$1500 or trade (609) 799-1382. NJ.

ARRI 16 BL. 12-120 Angenieux lens, crystal-sync motor, built-in Apec exposure meter, 2 400-ft. magazines, Cine 60 battery belt, 2 viewfinders, matte box, filters, cables, sound Barney, all accessories, original aluminum carrying case. O'Connor head, tripod & carrying case. Not used much. Excellent condition. \$15,500. Call evenings (212) JUN1-7030.

BOLEX H16 with three lenses, Stevens 12 volt motor, critical focuser, open back, flat base attachment, extra door, plus 400 ft. magazine that needs mounting bracket, \$150. MARDON, P.O. Box 2345, Sarasota, FL 33578.

GYRO — Kenyon KS-6 heavy duty gyro stabilizer. Used once. Perfect w/batt. & charger, \$475. Beaulieu 16 w/battery & charger, Exc., \$450. MOVING & TALKING PICTURE CO., 508 Pine St., Phila., PA. 19103 (215) 922-1660.

VINTEN 35mm standard & hi-speed, rack over, pilot pin w/Mitchell motor. 4 mags, 4 cases. Like new. Cost \$6000. First \$1200 takes this English beauty. 1793, AMERICAN CINEMATOGRAPHER.

MOVIOLA — Model UL-20-S with 4x5 screen and footage counter. Very good condition (little use since the flatbed arrived). Address offers to: ELI PRODUCTIONS, 1518 P St., N.W., Washington, DC 20005.

ARRIFLEX 16BL with Angenieux 9.5 to 95, two 400' magazines, matte box, universal synchronous motor, power cable, filters, shoulder mount, carrying handle, mirror compartment case and Anton Bauer power supply (3 batteries, belt, control module, charger and unipack). This outfit is in mint condition, one year old, and has had only 12,000 feet of film run through it. \$13,000. (512) 472-4165 or (512) 442-7168.

20-120 ANGENIEUX zoom new with Arri & BNC mount, \$7650. 25-250 Angenieux zoom with Arri and BNC mount, mint condition, \$3150. (213) 454-9903.

MAGNASYNC X-400 16mm recorder, new heads, complete overhaul, \$800. (213) 466-3234.

HOUSTON Fearless Panaray dolly including hi-hats, Serial no. 367. Fast sale to first reasonable offer. Contact Dave Cruise, EQUIPMENT GUIDE-BOOK CO., 3980 Fabian Way, Palo Alto, CA. 94303. (415) 494-6100.

## STUDIO PRODUCTION EQUIP.

SELSYN distributor (220 volts-3 phase) and reversible footage counter. Special \$3,500. Console and Op Amp kits, fish pole booms. Write to: STUDIO ELECTRONICS CO., 1653 W. Balmoral Ave., Chicago, Ill. 60640.

CLEARANCE priced!! TO MOVE FROM OGDEN, UTAH, Houston Fearless A-11, 16 & 35 neg-rev. & pos. developing machine, \$750 ea. F.O.B. Ogden, Utah. Have 5 left. LLOYD'S CAMERA EXCHANGE, 1612 Cahuenga Blvd., Hollywood.

16 ARRI S high speed (80 f.p.s.), 12-120 Angenieux zoom, 3-400' magazines, 2 torque motors, \$3350. (213) 454-9903.

STEREO NAGRA: Nagra SL, 2 track sync recorder; QHT case: ATN: QSGX-60 sync generator (crystal); QCLS amplifier; DT-480 Beyer Stereo head-phones; Excellent condition, \$3,950. NAGRA SLO resolver; like new, \$950. Contact: Mike McNamara, ODYSSEY PRODUCTIONS, 123 NW Second Ave., Portland OR 97209 (503) 223-3480

UHER 4000L recorder with sync pilot, case, mic, like new, \$435. J. B. WALKER, 740 Dakota Dr., San Jose CA

SYNC BEEP — ¼ inch tape prerecorded with high-level 1000 Hz tone, backed with special pressure-sensitive adhesive for quickly affixing visual and audible sync indication on any magnetic film or tape. Industry-wide acceptance. Send \$2.50 cash, check or money order for prepaid packet containing 20 strips totaling 100 35mm frames. D. P. UPTON CO., P. O. Box 5052, Tucson AZ 85703.

BOSTON Filmmakers Flea Market will be held Oct. 22-26, 1975 at 31 Stanhope St., Boston, Mass. Hours 10am-5pm including Sat. & Sun. Tables full of bargains: Film cameras, lenses, accessories, sound, editorial, projectors, still cameras, the works! Also hands-on demonstrations of the new BOLEX EL camera and OPTOSOUND self-resolving sync-sound recorder. Come early for best selection, free refreshments. Bring cash, BankAmericard or Master Charge, no checks, all sales final, no advance list available. Inquiries: COMQUIP., 366 S. Maple Ave., Glen Rock, NJ 07452. Phone (201) 444-3800.

16mm ARRIFLEX BL package complete, includes 12-120 Angenieux, 1-400' magazine, matte box, power belt, case. Perfect working condition. 60-day guarantee. \$4800 firm. Mr. Milne (212) 598-3705.

STELLAVOXES used with pilot, \$890 up. Crystal, resolver, microphones, headset and other accessories extra. Any modification available. All in perfect condition. 6-month guarantee. MERICKA (212) 246-9094.

ECLAIR NPR, 12-120 Angenieux, magazine, 12vdc motor, battery, charger and case. Best Offer. (702) 739-7705.

NAGRA 4.2 with two QPSE-200's, ALC, QSLI, ATN, shipping case, leather case, cables and straps; Beyer DT 480 headphones; Sennheiser MKH 815 with power supply, pistol grip, shock mount and windscreens; Sony ECM-50; and ElectroVoice RE-50; Shure M67 mixer; mike stands, cases and cables. This gear is one year old, in perfect condition, \$4500. (512) 472-4165 or (512) 442-7168.

16mm hi-speed Milliken DBM4C 28vDC 64-128-200-400 fps., pin registered, \$1375. 1794, AMERICAN CINEMATOGRAPHER. (213) 691-1652.

ECLAIR NPR, 400' magazine, Perfectone 24 f/s motor, Angenieux 12-120 zoom, power belt. Excellent condition, \$5,000 or best offer. SAN FRANCISCO (415) 526-1694

FOR SALE: Eclair ACL, Arri S, Eclair CM-3 (T-Scope), lenses, O'Connor 100 head, Colortran dolly, Nagra 4.2, Magnasync 2200 series machine console with distributor interlock, Moviola UL-20-S and D-20, editing benches and equipment; all in top shape at attractive prices. (414) 962-4037.

MITCHELL NC 35mm, camera, magazines, lens, dolly, gearhead, sync motor, etc. \$5,949. Terms. Nagra III slightly used, \$1995. (213) 892-6737.

## STUDIO PRODUCTION EQUIP.

ARRIFLEX BL, new condition. Owner retired. New, sharp 10 to 100mm Zeiss, two magazines, Barney, case, speed control, two cables and batteries, matte box, ARRI body brace, many filters, \$7500. Never used for rental or news. STANYAN, 1907 Buchanan Street, San Francisco, CA 94115 (415) 567-2337.

ECLAIR NPR, 4 mags, 9.5-95 zoom, 2 batts, Miller Pro head, tripods, cases, extras, excellent condition, \$8000. ALAN CAPPS, 137 S. LaPeer Dr., Los Angeles, CA 90048, (213) 276-3724.

ECLAIR NPR almost new used only for one film with new Aeton motor, 2 magazines, 12-120 zoom, battery, cases (213) 454-9903.

**SURPLUS STUDIO EQUIPMENT SALE**  
A complete re-recording and editing facility, consisting of 35mm and 16mm interlock equipment. Complete to the last detail. All RCA and Westrex components. Inventory far too much to list here. Send for our complete inventory list. WARREN SOUND STUDIOS, 35 N.E. 62nd St., Miami, FL 33138 (305) 754-9539.

ACME Optical printers; several used models available such as Model 102 three head with auto follow focus on aerial and camera excellent condition, \$60,000 complete. New Model 103 aerial \$60,000 complete. Call or write D. E. Stults, PSC TECHNOLOGY INC., 1200 Grand Central Avenue, Glendale, CA (213) 245-8424, Telex 69-8231.

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If you are in this specialized cinematographic field, write us your needs. LLOYD'S CAMERA EXCHANGE, 1612 Cahuenga Blvd., Hollywood.

ARRIFLEX 16 SB. 12-120 Angenieux, 400' magazine, torque motor, wild motor. Mint condition, \$4950. (206) 523-4646.

## SERVICES AVAILABLE

ENERGY PRODUCTIONS, Mendocino coast, offers complete production services in 16mm and 35mm, Kem horizontal editing, crystal sync shooting, special effects, animation, and location services. Library of nature and wildlife. P.O. Box 154, Elk, CA 95432 (707) 877-3327 or 877-3244.

HIGH Quality opticals 16, 8, 35, S16. Titles, CRI, 16 to 35 blowup, all effects. MIKE SHANNON (415) 397-0172 or write 592 Chestnut St., San Francisco, CA 94133.

LOCATION recording throughout the world. Either stereo or sync. JACK CLINK (703) 521-8282. Cable address: CLINKSOUND.

## MISCELLANEOUS

AMERICAN CINEMATOGRAPHER MAGAZINES — 1934 June to December; 1935 thru 1947 complete, 1953 Jan. to April. Best offer write to JULIAN BERGMAN, 3-35 147 Place, Whitestone, NY 11357.

WE WOULD LIKE TO GET IN TOUCH WITH TELEVISION FILM DISTRIBUTORS IN JAPAN AND EUROPE. BERGHMANS FILM PRODUCTIONS. 12 Morning Glory Lane, Manheim, PA 17545 (717) 665-7956.

BIDS INVITED EK 16mm 50 ft MAGS USED w/o film, quantities 100-12,000 available due to broken contract (standard black — not G.I.) MANDLINFILM, 250 W. 99 st. NY 10025 (212) 850-8172.

EASY, fast way to estimate cost of producing 16mm films. New pre-calculated cost system saves hours of time, provides complete, accurate estimates. For details, send \$1.00 to FILM-ARTS, 4704 Normandy, Memphis, TN. 38117.

RATES: Ads set in lightface type 40¢ per word. Minimum ad, \$4.00. Text set in lightface capital letters (except 1st word and advertiser's name) 50¢ per word. Modified display format (text set in boldface type, capitals or upper-and-lower-

case) \$4.00 per line. Send copy with remittance to cover payment to Editorial Office, American Cinematographer, P.O. Box 2230, Hollywood 28, Calif. Forms close 1st of month preceding date of issue.



**WANTED**

RAWSTOCK FILM NEEDED. Highest cash paid for 16 or 35mm color negative or reversal film, including any EF (7242) mag. stripe. B&W reversal also wanted. FILMEX, (Filmbrokers) (416) 964-7415 collect.

WANTED: Professional motion picture equipment, 16mm and 35mm. Cameras, lenses, lights, sound, editing, projection, lab, for outright purchase or consignment. Supply complete technical description and price for immediate reply. Ted Lane, ALAN GORDON ENTERPRISES INC., 1430 Cahuenga, Hollywood, CA 90028, (213) 466-3561.

WANTED: Nagra or other sync recorders plus accessories, immediate cash, no hassle. RICHIE (212) RA6-6832.

FILM STOCK, 16/35mm will consider all types. Sealed, opened and ends. RAFIQUE, 814 Broadway, NY 10003, (212) 228-2757 or 475-9110.

EQUIPMENT WANTED: 16mm Mauer camera (05 Model) Body only preferred. Contact: DAN MCLAUGHLIN, Theater Arts Department, University of California at Los Angeles, 405 Hilgard Ave., Los Angeles, CA 90024. (213) 825-5829.

WANTED: Everything to completely equip production unit. Sync and wild 16mm cameras, tripods, lights, recorder, dubber or sync Siemens, editing, etc. Whatever you have for sale we probably need. (206) 523-4646.

**SITUATIONS AVAILABLE**

CINEMATOGRAPHER/EDITOR: Complete technical knowledge of the business. No hacks. Work under direction of seasoned producer. Send resume, state minimal salary requirements. Don't try to con us. Production Manager, HARDMAN, 213 Smithfield, Pittsburgh, Pa. 15222. No phone calls.

VICTOR DUNCAN, INC. has opening for camera repair technician. Must have practical background in mechanics, electronics, optics. Call ROBERT BURRELL, (313) 371-4920.

**RENTAL**

KEM rentals in Hollywood. HORIZONTAL EDITING STUDIOS, (213) 461-4643.

STEENBECK Rentals delivered to your premises. KLM ASSOC., INC. (West Coast) (213) 931-6151 — East coast (301) 299-7259.

NAGRAS for rent. Nagra IV-L, QSLI, crystal, \$85 a week, \$225 a month, Nagra III, with crystal, \$50 a week, \$150 a month — call (212) 548-1439.

PRODUCTION Equipment at sensible prices... for example \$15.00 per day for Nagra III recorder or 12-120 Angenieux zoom lens. The rest of our prices are just as low. For more information on rentals, sales or service write: CINELEASE, INC., 209B Old Durham Road, Killingworth, Conn. 06417 or call (203) 663-2222.

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