

American Cinematographer

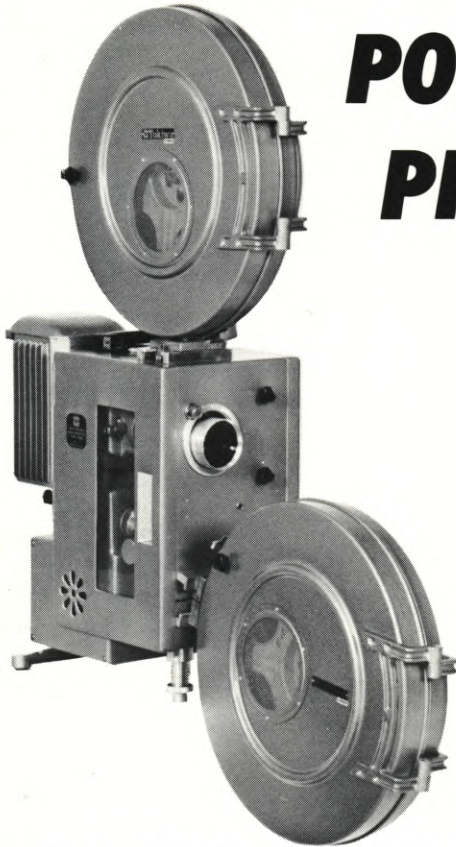
International Journal of Motion Picture Photography and Production Techniques

September 1973/75 cents



FILM 73 in London

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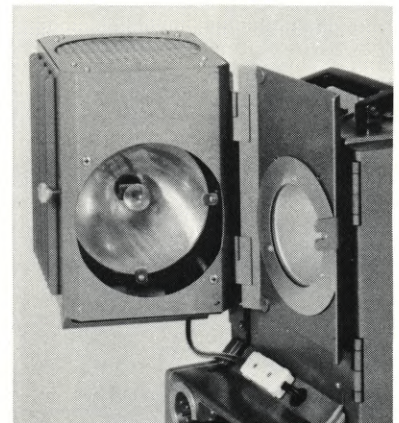
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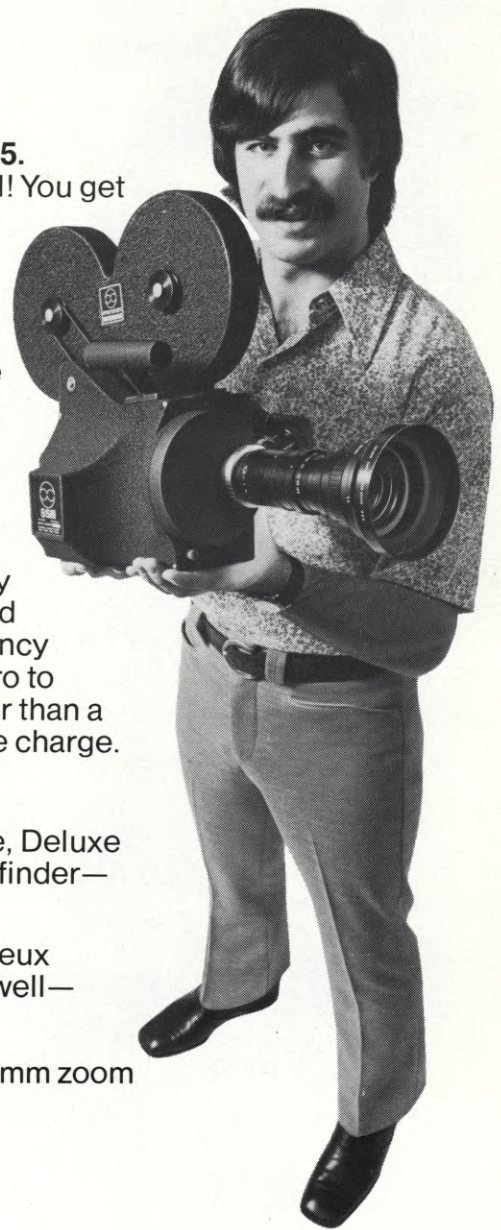
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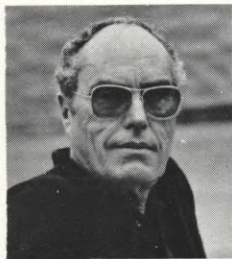




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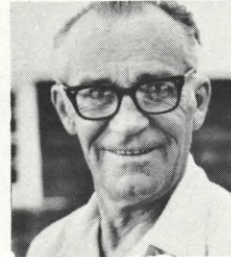
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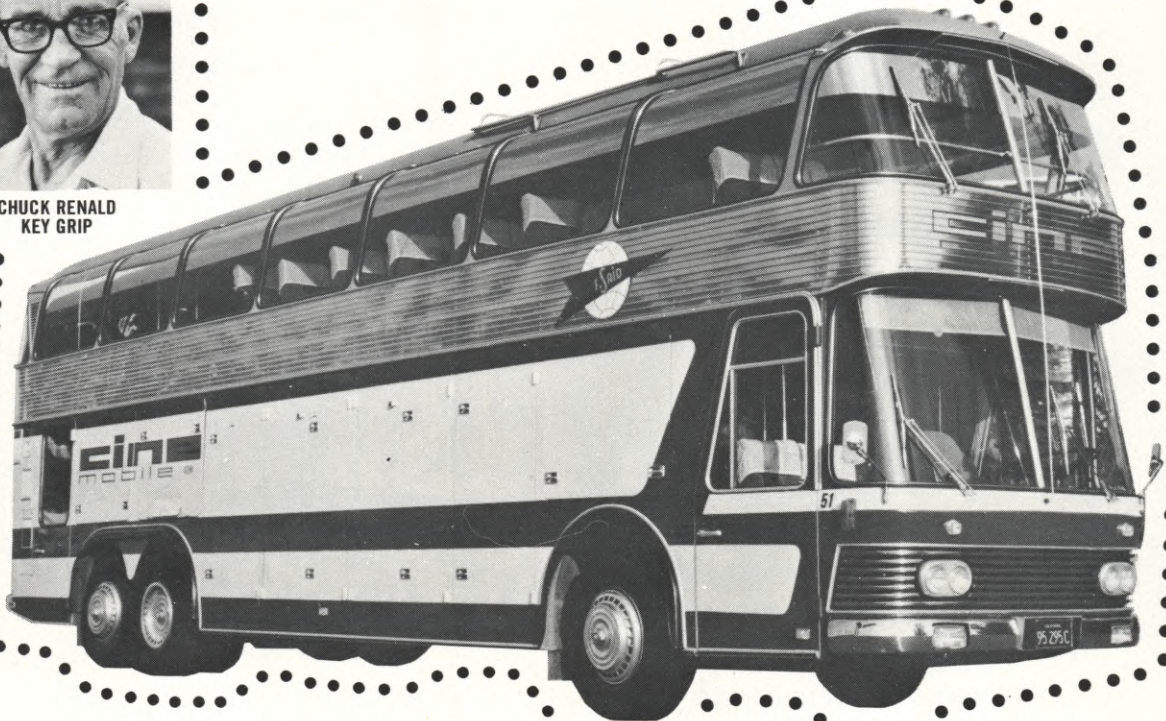
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American Cinematographer

International Journal of Motion Picture Photography and Production Techniques

SEPTEMBER 1973

Vol. 54, No. 9

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• FEATURE ARTICLES

- 1118 **FILM '73: Film Plus Tape**
- 1122 **The State of the Art**
- 1128 **Single-camera and Multi-camera Lighting Methods**
- 1132 **The Choice Between Film and Tape**
- 1134 **Two Years' Experience with Color Negative Film Transmission**
- 1138 **16mm Film Production in United Kingdom Independent Television**
- 1140 **Atema 166 Editing Table**
- 1144 **The Tycho S.A.4 Speaker/Amplifier System**
- 1145 **Neilson-Hordell Junior Animation Stand**
- 1148 **P.A.G. Modular Sound Dubbing System**
- 1152 **The CP-16 Camera/Nagra SN Connection**
- 1153 **Westrex 5035 Film Carrier Assembly**
- 1156 **The Fleximount: Hand-held without Tears**
- 1160 **Northfield Appliances Ltd. Time-lapse Equipment**
- 1174 **Filming "TEARS OF BUDDHA"**
- 1178 **"THE MAN FROM LOX"**
- 1182 **"THE SHEIK OF CHICAGO?"**

• DEPARTMENTS

- 1084 **What's New**
- 1088 **Questions & Answers**
- 1092 **Cinema Workshop**
- 1100 **The Honor Roll**
- 1104 **The Bookshelf**

ON THE COVER: A stylized tribute to FILM '73, third biennial International Technology Conference and Exhibition, sponsored by the British Kinematograph Sound and Television Society, held recently in London. Cover design by PERRI & SMITH.

The A.S.C. is not a labor union or a guild, but an educational, cultural and professional organization. Membership is by invitation only to those who are actively engaged as Directors of Photography and have demonstrated outstanding ability. Not all Hollywood cinematographers can place the now familiar initials A.S.C. after their names. In a sense, the A.S.C. membership roster is as exclusive as the legendary London Club for it has become one of the highest honors that can be bestowed upon a professional cinematographer, a mark of distinction and prestige.

AMERICAN CINEMATOGRAPHER, established 1920, in 54th year of publication, is published monthly in Hollywood by ASC Holding Corp., 1782 North Orange Drive, Hollywood, California 90028, U.S.A. **SUBSCRIPTIONS:** U.S. \$8.00; Canada, foreign, including Pan-American Union, \$9.00 a year (remit International Money Order or other exchange payable in U.S.) **ADVERTISING:** rate card on request to Hollywood or New York office. **CHANGE OF ADDRESS:** notify Hollywood office promptly. Copyright 1973 ASC Holding Corp. Second-class postage paid at Los Angeles, California.



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"I knew it the moment the producer showed me the script.

"But more important than the Emmys and other awards that 'Brian's Song' won was the fact that it was the highest-rated made-for-tv movie ever. I mean, people wanted to see this movie. Maybe even needed to.

"That's why thousands of them packed Chicago theaters to see 'Brian's Song' just a few weeks after it had been on television.

"And, as a cameraman who has been in the business for fifty years, working on 'Brian's Song' made me feel good. You know, jumping from one medium to another without a hitch.

"That's why I like the flexibility and freedom of something like Eastman film. And why I'll stick with it.

"After all, I never know when another 'Brian's Song' might come along."

Joseph Biroc. Award winning
Director of Photography, "Brian's Song."



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WHAT'S NEW

IN PRODUCTS, SERVICES AND LITERATURE



NEW SUPER-COMPACT BAUER STAR XL CAMERA FROM AIC PHOTO

The smallest "existing light" Super-8 movie camera, with a fast f/1.2 9mm lens, is being introduced by AIC Photo, Inc. Called the Star XL, the new Bauer is extremely compact, only 6" long, and ideally sized to carry in a pocket or handbag. When used with the fast 160 ASA film it is capable of shooting movies by room light or even candlelight—not possible previously when using harsh and unwieldy movie lights.

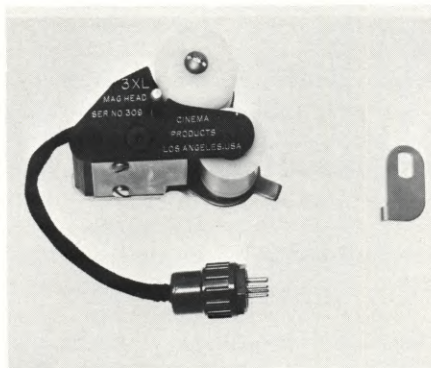
The Bauer Star XL has a CdS cell behind-the-lens for accurate exposure control across its full aperture range of f/1.2 to f/32. It also has a filming speed of 18 fps, a single-frame feature, and a two-position distance setting four feet to nine feet for close-in shooting, or nine feet to infinity.

Another engineering "first" in this handy, easy-to-use Star XL is the 230° shutter which delivers 40% more light than conventional shutters (equivalent to one-half f-stop) and the Double-Vane Exposure Control which allows all light from the subject to reach the film—adding to the camera's low-light capability.

Users of this handy, easy-to-use Bauer Star XL will enjoy the brilliant reflex viewfinder which is parallax-free. Important controls are shown in the viewfinder and include the film advance and the film-end indicator, battery charge light, and f-stop indicator. An electro-magnetic "soft release" is conveniently positioned for steady shooting, and the camera has a single frame cable release socket. Other features include a built-in type A filter for daylight correction, an adjustable eye piece (plus or minus 5 diopters) automatic reset film counter when cartridges are removed, film type indicator window, and tripod socket.

All camera functions, film drive and exposure control, are powered by 2AA Penlight batteries. The compact new Bauer XL (6" long, 3-5/16" high, and only 1-3/4" deep accommodates films of 40 ASA and 160 ASA with automatically adjusted exposure controls. The camera is complete with a soft leather case and suggested retail is \$134.95.

Further information is available from Interstate Photo Supply Corp., the U.S. distributing division of AIC Photo, Inc., 168 Glen Cove Road, Carle Place, N.Y.



PRE-AMPLIFIER ACCESSORY FOR CONDENSER MICROPHONES AVAILABLE FOR CP-16/A CAMERAS

Cinema Products Corporation announces the availability of a new *Pre-Amplifier* optional accessory designed to accommodate Sennheiser 804/805-series condenser microphones. The *Pre-Amplifier* optional accessory provides the CP-16/A camera system with an *additional* condenser microphone capability—without requiring the use of the Crystasound Auxiliary Mixer (Model 6C). When the *Pre-Amplifier* unit is plugged in, the CP-16/A Crystasound built-in amplifier will *still* accept two low-impedance microphones and one line input *as well as* one Sennheiser 804/805-series condenser microphone, with all systems controlling the Crystasound built-in amplifier remaining fully operational. All required power is supplied by the same NC-4 nicad battery pack powering the entire CP-16/A camera system. The new *Pre-Amplifier* optional accessory is easily mounted or removed from the CP-16/A Crystasound amplifier cover. It is priced at \$175.00. For further information, please write to Cinema Products Corporation, 2044 Cotner Avenue, Los Angeles, California 90025.



ZERO HALLIBURTON CUSTOM CASES FOR ARRIFLEX 16L AND 16 S/R CAMERAS

NEW CUSTOMIZED HALLIBURTON CAMERA CASES FOR ARRIFLEX 16S AND 16BL CAMERAS

The Arriflex Company of America announces the availability of two customized Halliburton Camera Cases: One fitted for all Arriflex 16S Cameras, and the other for Arri 16BL cameras.

The case exteriors are made from heat-treated, hard aluminum alloys, formed and ribbed under tremendous pressure, to make a shell of exceptional rigidity. The cases use full length hinges and special latches designed to withstand the hard usage. Interiors are pre-cut foam, whose density is carefully matched to the purpose, and formed to surround and protect the camera completely against shock, moisture and dirt.

The Halliburton customized Case for the Arriflex 16S measures overall 26" x 18" x 9" and weighs 15 lbs. It accepts the basic 16S, zoom and fixed focal length lenses, 2 400 ft. magazines, torque motor, and other small accessories. Suggested user price is \$190.00.

The Case for the Arri 16BL measures approximately 21½" x 17" x 12"; and weighs 18 lbs. The customized case accepts the 16BL camera with zoom lens, 2 400 ft. magazines, matte box and other small accessories. Suggested user price is \$210.00.

Halliburton Customized Cases for Arriflex 16S and 16BL Cameras are available from all authorized Arriflex Dealers. For more information, write to: Arriflex Company of America, 25-20 Brooklyn-Queens Expressway West, Woodside, New York 11377.

PORTABLE RECORDER-REPRODUCER FOR FILM SOUND

Multi-Track Magnetics, Inc. R104U is the smallest of the 100 series building-block recorder reproducer units. The "baby" R104U is a rugged recorder-reproducer complete with electronics and accessories. The building-block design features a film handling mechanism in a vertical configuration.

The R104U is also a portable unit that fits into a 20 x 19 x 14-1/2 inch

Continued on Page 1205



FOBA

**Now
that's
what
I call a
tripod!**



There's no doubt about it. Foba's the most versatile, all metal tripod to hit the professional motion picture market in years. Its lightweight construction makes it ideal to carry on those tiresome location shootings and yet it is so ruggedly constructed that it will easily support a full range of professional cameras, including the Arriflex 16 and 35, Eclair NPR and ACL, Auricon, Beaulieu, Bolex, CP-16, Scoopic, Bell & Howell Filmo and many more. Its unique tubular adjustable legs allow the Foba to be used in standard or baby positions and it has two built-in features which are normally accessory items

on other tripods: triangle-type leg locks which lock legs into place with the simple tightening of a lever and an elevating riser plate which gives an additional 11" in height to the tripod. The Foba accepts Pro Jr., O'Connor C and 50, Miller F and Pro (with slight modification) heads. It has a Pro Jr. flat-top mounting plate and legs that can be raised or lowered individually or simultaneously by depressing a button near the top of the tripod. Maximum height with riser raised is 73", minimum, 18½", weight 16 lbs. Price is \$289.00. Come by today for a demonstration or write for additional literature.

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"My competition is starting to notice me."

When I opened Mobius Cine almost two years ago, I received six good luck cards and one potted plant from my competitors.

I've since lost the cards, the plant died, and my competitors treat me like a bad rash.

I can't say that I blame them.

With me around, the competition has



had to take a long hard look at their pricing structures on motion picture equipment. My prices are rocking the boat.

They've also discovered that expedience is no substitute for selling the right equipment for the right job. I don't look at customers with dollar signs in my eyes. Now they won't be able to, either.

It seems that the more customers who get comfortable with

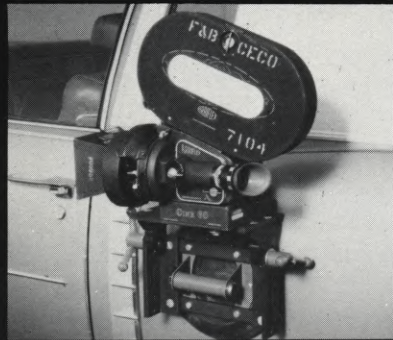
the way I do business, the more uncomfortable my competitors get. So if you're a legitimate competitor, I'll be happy to send you a Sy Cane dart board (at cost, of course). It'll help you get rid of some tension.



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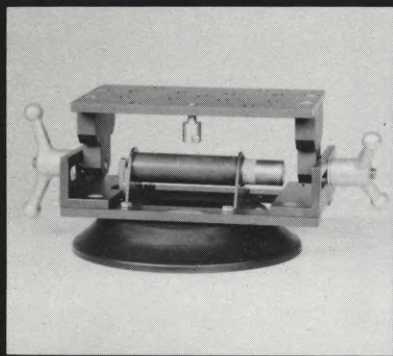


SOS POWER GRIP



The SOS Power Grip adheres to smooth surfaces at any vertical or horizontal angle, getting cameras into difficult positions for unique angle shots.

SOS Power Grip will not dislodge as long as vacuum is maintained. A special red indicator visually alerts you that the grip has lost maximum attaching pressure and must be repumped. The SOS Power Grip is so strong that it easily holds over 250 lbs. in place, which allows mounting of cameras and accessories on the top, side or bottom of moving vehicles or stationary objects.



10 INCH POWER GRIP
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*SOS Power Grip is complete, no special camera brackets, bolts or wrenches are needed.

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QUESTIONS & ANSWERS

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



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

Q I need help on the best methods for cleaning film. It seems the best method is ultrasonic cleaning but I need to clean my film at home. I have been using an ANTISTATIC cleaner but it seems to rub the color off the film and doesn't clean well.

A Kodak advises us that the ultrasonic cleaning machine which commercial laboratories use is excellent, but too costly for the home user. How well the film is cleaned at home is usually a matter of technique rather than the cleaning solvent used. It is necessary to use the proper cleaning cloth and to change that cloth before it becomes badly saturated with dirt. One should wind the film at a steady rate—being sure that the solvent evaporates before rewinding. The matter of color rubbing off is not one to be concerned about. The cloth used should be of velvet, Canton flannel or a similar soft, absorbent material. Kodak and other makers stock the proper solvent-lubricant. Full data are printed in Kodak's publication, HANDLING, REPAIR and STORAGE OF MOTION PICTURE FILMS, Pamphlet # D-23, obtainable from Rochester.

Q Is there a mathematical formula for converting f-stops into T-stops and vice versa?

A No formula is required for in both systems the lens markings are calibrated in f-stops. In the f-stop system the ratio is established between the size of the lens opening and its focal length. T-stops are established by the actual transmission of the light to the focal plane regardless of how many lens components or coatings are used, which is not the case in the f system. For convenience the older factorial (f-stops) are used to calibrate T-stops.

Q Kodak recommends using an 85B filter when using emulsion #7242 outdoors. Likewise, they suggest using an 85 filter for emulsion #7247 outdoors. Wouldn't the 85 filter serve both films?

A The 85 and 85B filters have slightly different color saturations and are specified to compensate for the differences in color sensitivity of the two emulsions. It is best to use the specified filter for each of these color

films, or any other.

However, rather than employ none at all, in a pinch, one or the other of these filters can be used. The laboratory then would have to make a color corrected print to compensate for the imbalance of color.

Q In your April 1973, Question and Answer column your answer for splicing mag-stripped film was unnecessarily involved. When I was a news-film editor at CBS-TV in New York, we used the regular "M-H" hot splicer, applied cement to stripe, wiped it off along with the the softened stripe with one stroke of an editor's glove, and proceeded as with non-stripped film. Simple, quick and requiring no special equipment.

Q My future work in cinematography will, for the most part, be with color film and involve subjects where good color quality will be vitally important. I have no experience as yet with color-temperature meters. Please explain their function and importance in color photography.

A The color qualities of light sources are widely variable. Our eyes can automatically adjust to the variability, but color films cannot. Color-temperature meters are an attempt to characterize the color qualities of the light so the photographer can adjust it through the use of filters to fit his film. The classical color-temperature meter samples, through red and green filters, two parts of the spectrum emitted by the light. A recent improvement samples light through three filters.

The assumptions on which the meters are designed hold pretty well regarding incandescent light sources—such as tungsten lamps and carbon arcs. They can be tricked, though. A sharp-cutting magenta filter will not affect a meter that bases its reading on red and blue. However, light sources with very bright emissions in narrow parts of the spectrum—such as fluorescent tubes or mercury vapor lamps, will give inaccurate readings. Otherwise, they can be useful in choosing filters or checking lamps for color shift.

For more information see "Color Temperature" in the American Cinematographer Manual. ■



What's in it for me?

Maybe we ought to start out by saying what is *not* in our new Model 2101 Aerial-Image Optical Printer.

To be exact, we left out mechanical gear trains, levers, one horsepower motors, shafts, stop-motion clutches, solenoids, relays, knuckle joints and a lot of other things like that. We thought of it as leaving out trouble. After all, if mechanical drive systems are going to wear, vibrate, backlash, gum up, drag or stick, you know when they are going to do it. Right in the middle of your rush job. When else?

Not any more.

Which brings us back to that original question. What we put in, in place of all that worry, was our space-age drive system called "PhotoTron". It's an all electronic film drive using computer-accurate stepping motors and solid-state electronics on snap-out circuit cards. That's right, *snap-out* circuit cards. They may not exactly eliminate down time, but they should put a pretty good dent in it.

If all that sounds pretty good, listen to this. We made our new printer automatic. Automatic zooms from 4X enlargement to 5X reduction, automatic dissolves, logarithmic or linear for perfect fades or dissolves without overlap, an automatic shutter that can be programmed, at the flip of a switch, over a predetermined fade count, and an automatic skip-frame programmer that gives you unlimited combinations at all speeds and with three heads at once.

Sound pretty impressive?

We like to think so, but there's more. By making the drive system all-electronic, it can be adapted easily to computer control or tape programming. So when you're ready for this, you'll know that your Model 2101 will be too.

Price? Brace yourself. The lowest in the industry for an optical printer with the same features. That's something you don't hear every day. But it's really very simple. By throwing out all that expensive tailor-made hardware and simplifying construction, advantage went up and cost of manufacture went down.

What's in it for you? Plenty.

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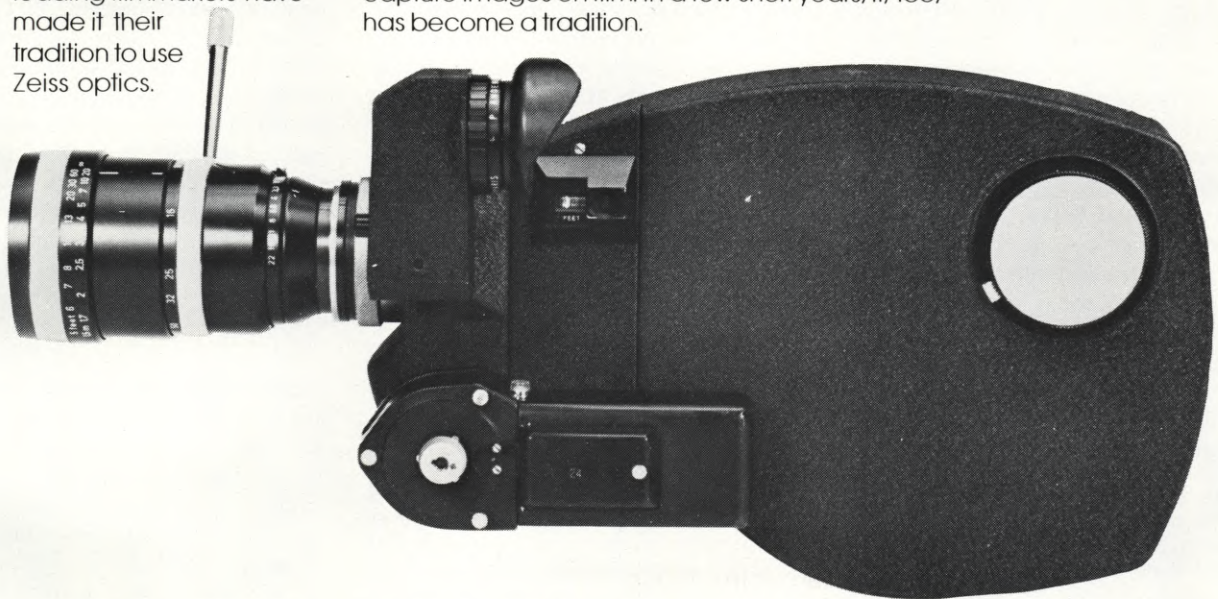
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The Eclair ACL. Its breakthrough design set new performance standards. In ease of handling. Versatility. Compactness. Reliability. And utter silence. But its most important contribution is probably unmeasurable: the many creative avenues opened and enlarged wherever people capture images on film. In a few short years, it, too, has become a tradition.



**The Eclair ACL is a great camera.
With a Zeiss lens, it's even greater.**

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By ANTON WILSON

GOVERNOR MOTORS

The variable-speed or "wild" motor has an extremely wide range of applications. Actually, there is only one thing it cannot do, and that is run a camera for double-system sound filming. When using the pilotone system, the camera must maintain speed within reasonable limits usually $\pm 1\frac{1}{2}\%$. If the camera speed should fluctuate more than this amount, the sound-resolving system will not be able to follow the resulting erratic pilotone signal. In an emergency, a custom resolving process may save an out-of-sync take shot with a wild motor. However, the process is costly, time-consuming and not always successful.

The governor motor was designed specifically for double-system filming using the pilotone/sync-cable method. The governor motor is designed to run at a specific speed and, moreover, maintain that speed to an accuracy of $\pm 1\frac{1}{2}\%$.

The heart of the motor is the governor points. The "points" actually form an electrical switch. The electric current

that powers the motor passes from one point to the other. Thus, when they are touching, the motor receives full power and when they become separated, power to the motor ceases. The points are mounted on a disc that is fastened on one end of the motor shaft. One point is stationary, while the other can swing out. This moveable point is kept in close contact with the stationary point by a spring which pulls them together.

When the camera is turned on, the motor begins to turn because the points are touching. As the motor speed increases, centrifugal force acts on the moveable point and attempts to throw it outward away from the fixed point. Eventually the motor speed will reach a level where the centrifugal force is greater than the spring tension holding the points together and the points will fly apart. When this occurs, power is shut off to the motor. However, within an instant the motor will slow down minutely and the points will touch again. This process will continue in-

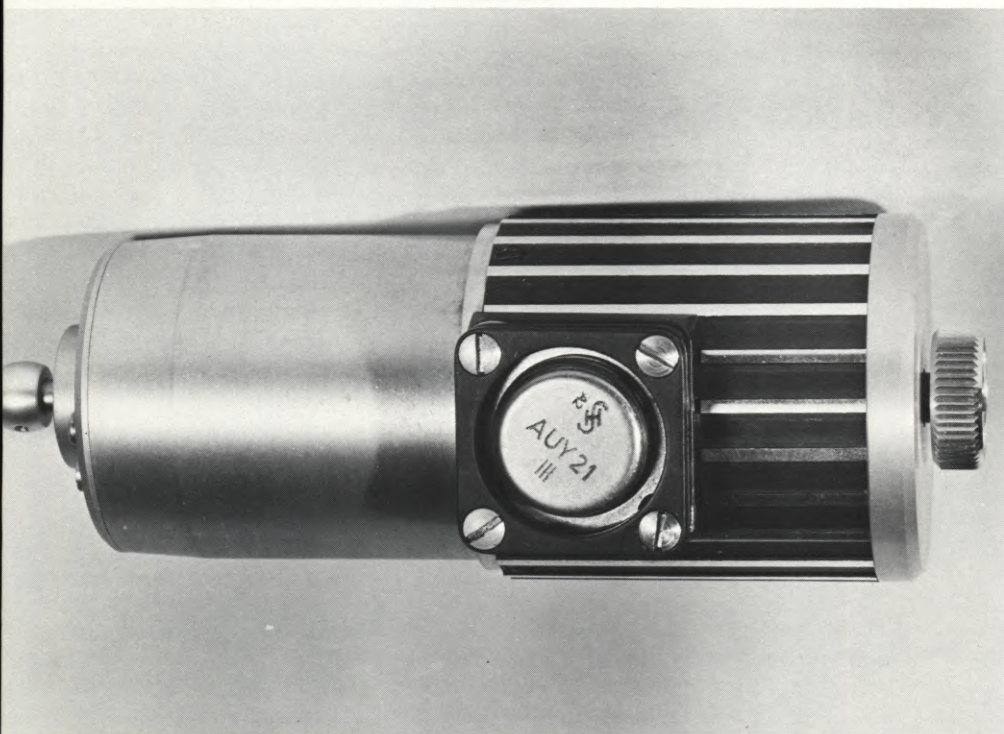
definitely, the points opening and closing thousands of times a minute. In a properly calibrated governor motor, the spring tension is adjusted so that the points will fly apart at exactly 24 fps (or any other standard).

The governor motor will maintain a constant speed even under varying conditions. Film drag may increase, temperature may change or the battery can wear down. However, the governor points will maintain a constant speed. How do the points maintain a constant speed over a range of varying conditions? We know that the points vibrate open and shut thousands of times a minute. Looking closely at one open-and-close cycle, we will find that the ratio of "on" time (points closed) to "off" time (points open) will vary according to load and voltage, but the overall speed will not vary. Thus, with high battery voltage and light load, we would expect to see the points closed for only 20% of the cycle and the points fly apart for the remaining 80% of the cycle. This is known as a 20% "duty cycle." If the load increases and/or the voltage drops, we would expect a high duty cycle such as 70% (points together 70% of the cycle and apart only 30%). Eventually the load can get great enough, or voltage low enough, where the points are together all the time (100% duty cycle). At this point, the motor is at maximum power. An increase in load or drop in voltage from this level will cause the camera to slow down, as the motor itself has reached its maximum power. Thus, when filming with a governor motor, one should never let the batteries run all the way down. While the motor will maintain speed over a wide range of loads and voltages, it obviously will slow down when the batteries poop altogether.

There are basically three areas of maintenance on a governor motor. Firstly, the spring controlling the points must be periodically checked for proper speed. Secondly, the points themselves can build up an oxide coating or become pitted. Usually they are silver plated and *cannot* be filed clean. If a piece of solvent-damp paper stroked

Continued on Page 1198

FIGURE 1—Governor motor utilizing transistors. By incorporating a transistorized circuit, only a small "triggering" current passes through the governor points. The main motor current is then switched by the transistor. The points will last much longer with this small trigger current instead of the full motor current, as in the older design.



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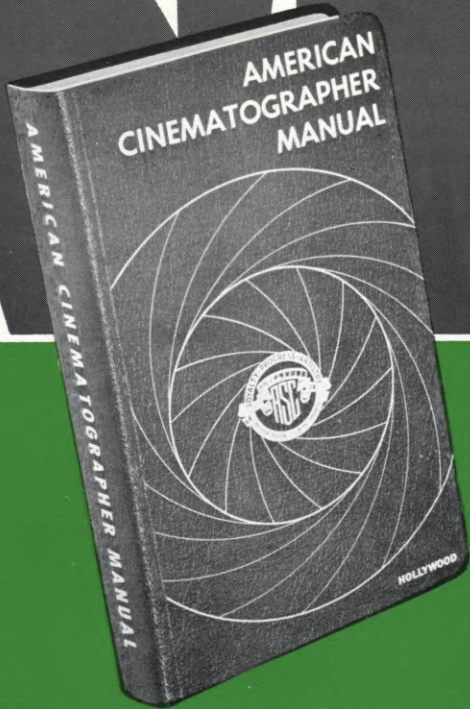
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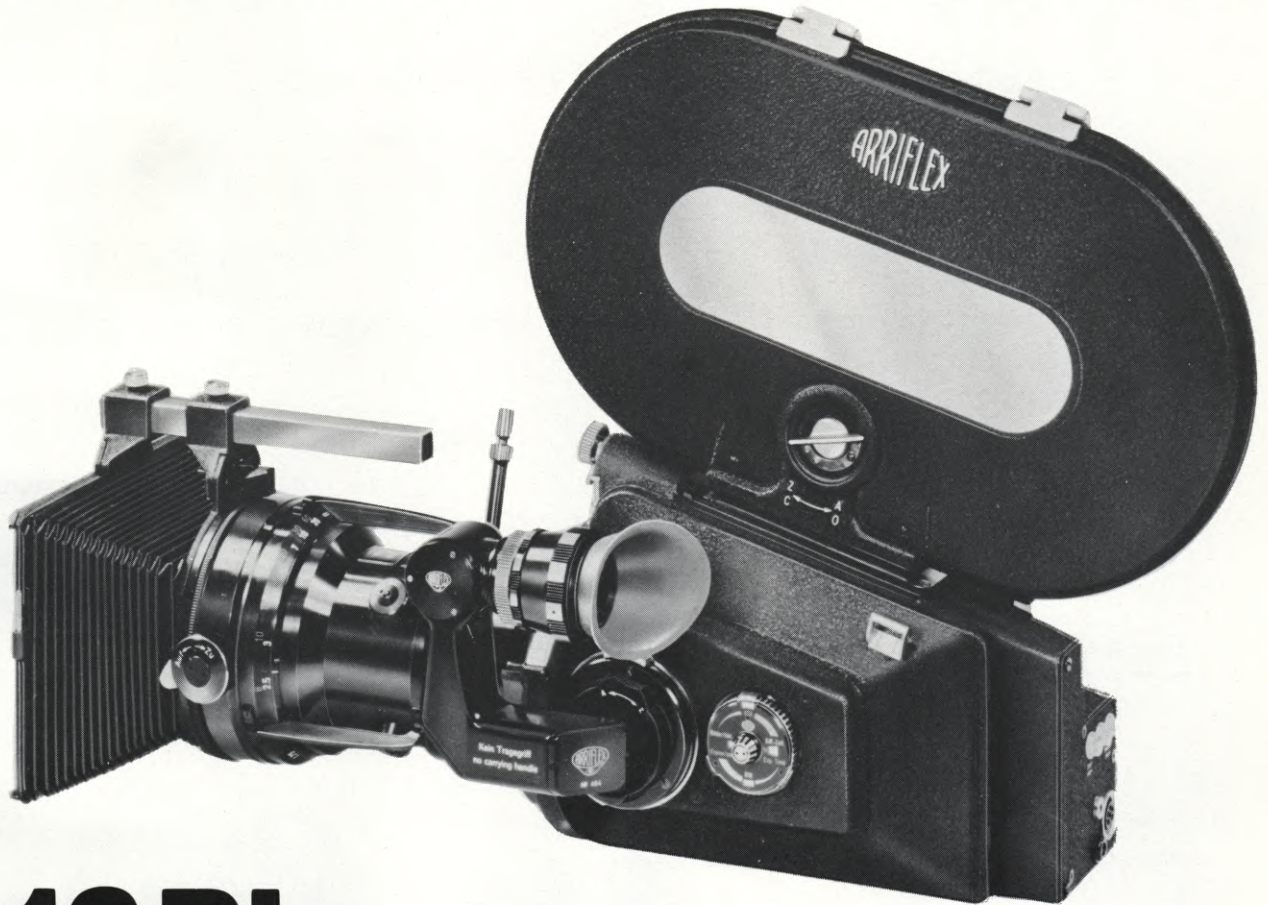
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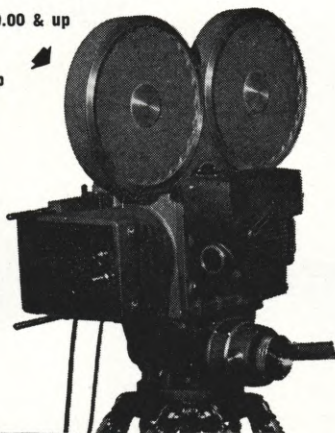


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THE HONOR ROLL



CHARLES W. HERBERT, ASC

In 1929 when Charles Herbert joined the ASC he was a Field Representative for Pathe and joined the News and Educational grouping in the Society. At the time he was doing news and novelty work in San Antonio, Texas.

He had then won, three consecutive times, the Fox News cameraman's annual contest in the field division.

He had also contributed continuously to Pathe Review, Lyman Howe's Hodge Podge and Curiosities and the Fox Varieties. Specializing in making small animal pictures, he had done complete subjects for Field and Stream, Eastman-Kodak Company and Bell and Howell Cine Libraries.

His application also included the information that he had handled a number of commercial contracts in Florida and Montana and Wyoming, made family library films for W. J. Bryan, Gar Wood, Thomas Edison, H. S. Firestone, Ruth Bryan Owen and F. S. Groves Jr. and was adept at writing scenarios for commercial and education productions and editing films.

Although Herbert has always been an out-of-town member, he contributed quite heavily to American Cinematographer magazine in 1938, 1939, 1940 and 1941 until he was able to get into the service.

As so many others at that time, Charles Herbert knocked at many doors in order to get an assignment in the Signal Corps, photographic division, to be a part of the war effort. Having successfully located a spot for himself in the Army, he proceeded to sell his cameras to the government, since he would not be using them personally and it was necessary war material in those days. When he finally arrived at his assignment and was given his equipment to use in the Service, he found that the cameras he had sold to the government were to be used by him in his new job.

During the many years that Herbert wrote for American Cinematographer, he specialized in informing the reader of the best way to make travelogues.

Since Charles Herbert's career in the 30's consisted of doing part of the

Magic Carpet series for Movietone, which entailed traveling all over the world, he learned to speak French, Spanish and some Italian and Arabic. As a cinematographer he found he had to learn to work with the government officials in the various countries he traveled in to get permission to photograph, to locate subject matter and to obtain special concessions of co-operation from railroads, steamship companies, hotels, tourist agencies, government press bureaus, etc.

The assignments often became diplomatic missions since there was a great deal of leg work for him to do before he could even aim a camera in the direction of his subject.

As the owner and operator of a small motion picture production company for

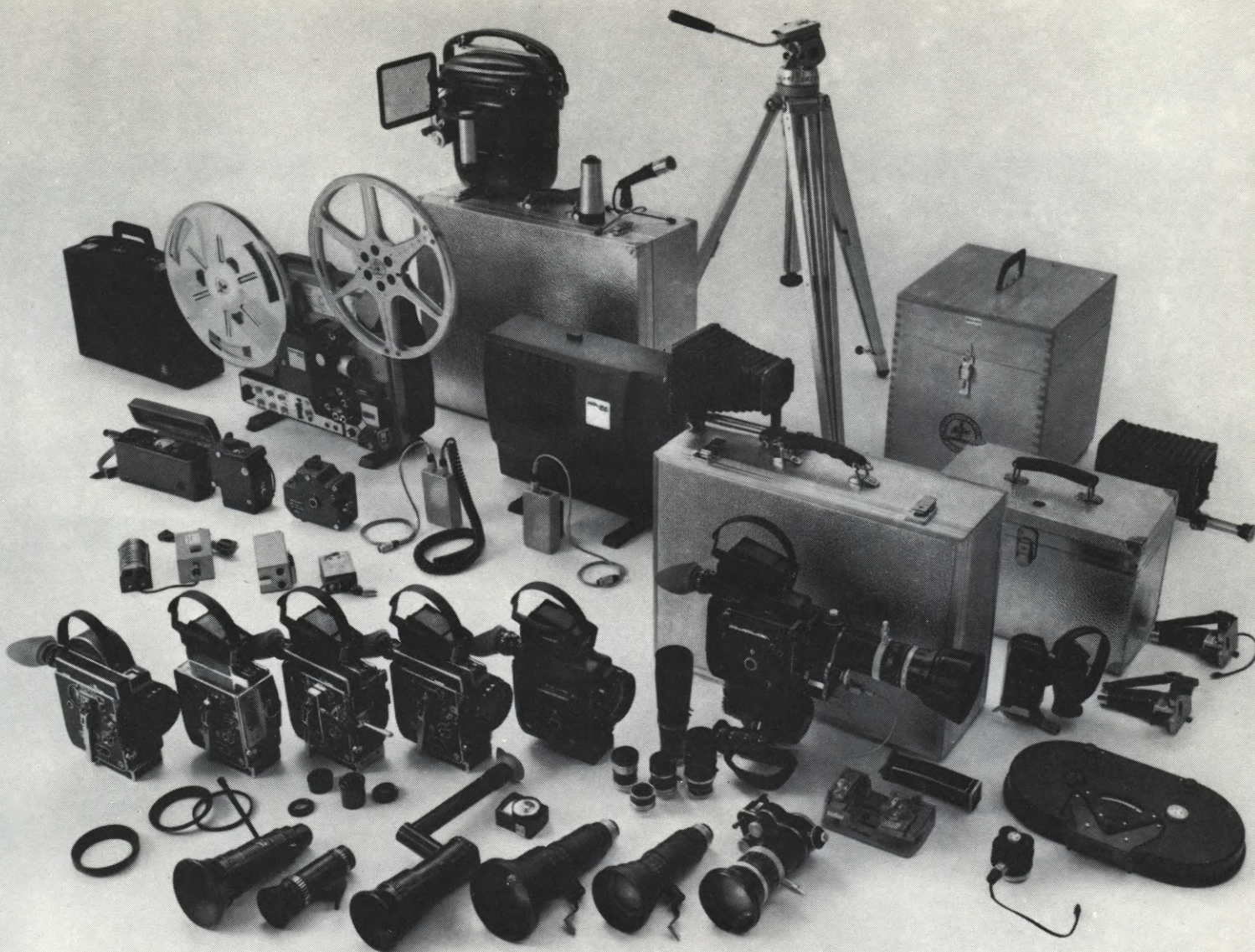
publicity and educational motion pictures he has always worked independently in locating and producing motion picture material, although he free-lanced for five years for Fox, Paramount, Pathe and MGM news and various other companies buying travel, news and educational material.

He photographed, edited and distributed a series of publicity films for Northern Pacific Railway and was, for five years, in complete charge of the Movietone field outfit engaged in making news material as well as one-reel travelogue features.

After World War II, Herbert settled in Tucson, Arizona, and is still running a production company making movies for anyone who needs a movie made.

An interesting scene can always be handled like this. Writer and Cameraman Herbert shows his tools to Captain John R. Hughes, oldest living ranger captain, at El Paso, Texas. The captain's work on the Ranger force is done with a six-shooter.





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The lenses: With the Bolex system, you can choose from 7 fixed focal length lenses, ranging all the way from 10mm super wide angle to long 150mm telephoto. And they all have built in macro focusing, automatic depth of field scales and diaphragm presetting so you can step down the aperture without taking your eye off the reflex finder. You can choose a lens as fast as f/1.1, or one that can focus down to one inch without accessories.

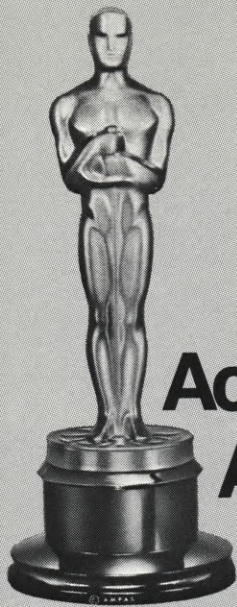
The system offers you seven zoom lenses with zoom ranges from 5:1 to 10:1. One of those is the Vario Switar 100 POE-4 with built-in power zoom, automatic light measuring through the lens, focusing as close as four feet and picture sharpness equal to any good fixed focal length lens.

The works: You can extend your basic equipment almost indefinitely with a wide range of accessories.

For instance: if you choose a spring-wound camera, you can automate easily with any one of three auxiliary motor drives, for time-lapse or animation, for variable speed shooting or for filming with sync pulse generator or crystal. The system offers you tripod; monopod; camera grips; blimps; an automatic fading device; cable releases; matte boxes (complete with masks); an underwater housing; attachable exposure meter; 400' magazine; closeup lenses; extension tubes; optical magnetic sound projector.

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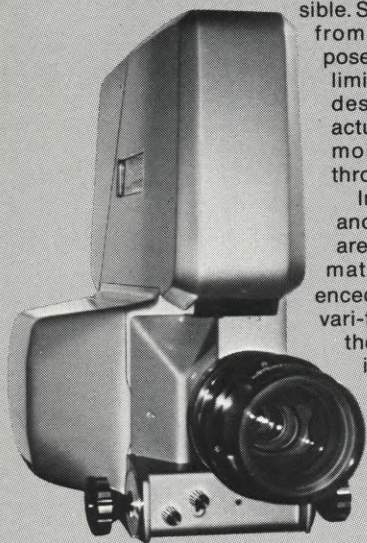
Incredible. Fantastic. Time and again these comments are heard from noted cinematographers who experienced the Canon K-35. A true vari-focal lens, it was used as the *prime* lens for the filming of *A WARM DECEMBER*, the recently released motion picture — directed by and starring Sidney Poitier. "We never had it off the BNCR the entire ten week shooting

schedule!" says British Lighting Cameraman Paul Beeson. In Hollywood, Universal Studios has equipped its Camera Department with eighteen Canon K-35 Macrozoom lenses. Not surprising considering the extraordinary features of the K-35 lens. Such as macrofocusing to within 2" of the front element. Or the combined use of macro ring, focus ring and zoom ring, which creates multi-point focus effects. Or its unique foreground-to-background perspective control.

The Academy of Motion Picture Arts & Sciences *Scientific/Technical* award citation reads: "This large-aperture, high definition lens, because of its macrozoom capability, permits extreme close-up photography, in addition to its normal and extended zoom functions."

However, words alone won't do. The Canon K-35 Macrozoom lens has to be experienced to be appreciated. Once you have used it, you'll want to use it again and again so you can explore its full range of aesthetic capabilities, giving free rein to your imagination.

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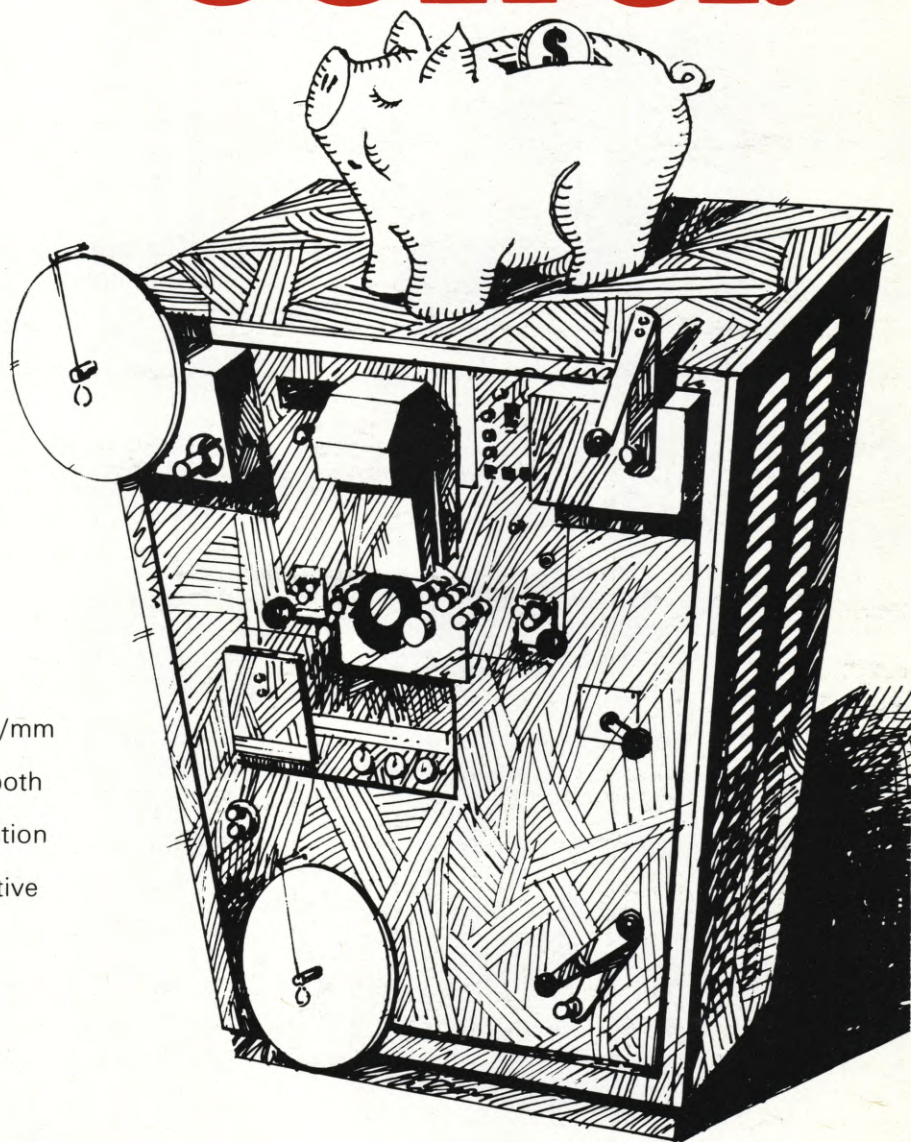
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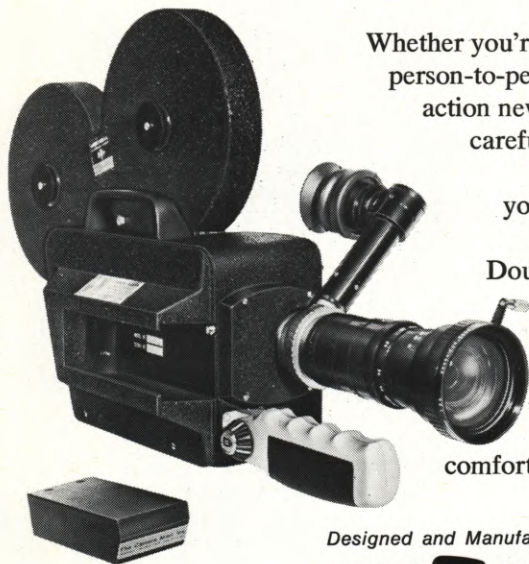


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THE BOOKSHELF

By GEORGE L. GEORGE

The Busby Berkeley extravaganzas, that high-water mark of Hollywood's distinctive achievements, are brilliantly recalled in a volume as spectacular as its subject, *THE BUSBY BERKELEY BOOK* (N.Y. Graphic Society \$14.95) by Tony Thomas, Jim Terry and Buzz himself. A magnificently illustrated large-size tome, it includes Berkeley's exciting life story and a complete filmography.

* * *

Director Tay Garnett, still going strong at 75, fills in the details of his adventurous life and career in *LIGHT UP YOUR TORCHES AND PULL UP YOUR TIGHTS* (Arlington \$9.95). Written with Fredda Dudley Balling, it is one of the lustiest confessions of recent years, reflecting a witty hedonist's pursuit of happiness through film-and-merry-making.

* * *

A collection of writings by Soviet director Alexander Dovzhenko, *THE POET AS FILMMAKER* (M.I.T. Press \$8.95) reveals the subtle creative process whereby such classical masterpieces as *Arsenal* and *Earth* emerged from Dovzhenko's love for his native Ukraine and its people. His sensitivity, his gift of lyrical vision, his identification with his homeland's myths and realities permeate this unique record of an artist's experiences and motivations. Aply edited and translated by Marco Carynnyk, the book comprises Dovzhenko's autobiography, his war-time diary and notebooks, and a full filmography. A bibliography of Dovzhenko's complete writings is available from M.I.T. Press.

* * *

Like many pioneers of the cinema, the British inventor memorialized in Ray Allister's biography, *FRIESE-GREEN* (Arno Press \$11.), was also a cameraman. His projector/camera, using a roll of sensitized paper, was demonstrated as early as 1887. His eventual losing out to the brothers Lumière is a vivid tale of perseverance and disappointments against a background of personal drama.

* * *

The progress of *Jesus Christ Superstar* from record album to Broadway show and to film is tracked by Ellis Nassour and Richard Broderick in *ROCK OPERA* (Hawthorn \$8.95/3.95). The saga of this unusual metamorphosis dwells at length on the location facilities the Israeli government provided for this Todd-AO super-production directed by

Norman Jewison and photographed by Douglas Slocombe.

* * *

Kalton C. Lahue's *RIDERS OF THE RANGE* hails the sagebrush heroes of the sound film period, a sequel to his saga of silent film era cowboys, *WINNERS OF THE WEST* (Barnes \$10. ea.). Biographies of some 30 performers—Gene Autry, William Boyd, Tex Ritter, to name but a few—and 250 memorable stills evoke a happy, uncomplicated bygone era.

* * *

Recent re-issues of long-out-of-print books illuminate the progress of camera techniques. An 1899 work by Henry V. Hopwood chronicles the development of projection equipment from the early 18th Century to the late 1890's. His *LIVING PICTURES: THEIR HISTORY, PHOTO-PRODUCTION AND PRACTICAL WORKING* (Arno \$10.) is well researched and annotated.

Originally published in 1915, David S. Hulfish's *MOTION-PICTURE WORK* (Arno \$25.), is a comprehensive reference book covering in specific detail diverse aspects of movie-making, from assembling the Edison Kinetoscope and repairing standard projectors to exposing and developing film, hiring actors and managing a movie house. Numerous technical drawings and stills illustrate the text.

Gerald Fort Buckle's 1926 *THE MIND AND THE FILM* (Arno \$4.50) is an ingenious and stimulating attempt to relate such visual devices as fades, dissolves, soft focus, lighting and trick photography to the psychological factors that affect the interpretative faculties of our senses.

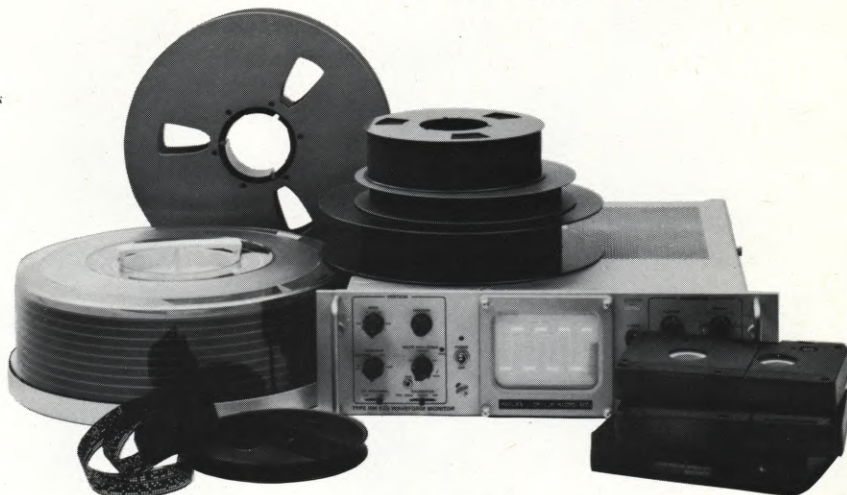
* * *

The extensive holdings of UCLA's Theater Arts Library are listed in an indispensable guide for librarians and collectors. Prefaced by Librarian Andrée Malkin, *MOTION PICTURES: A CATALOG OF BOOKS, PERIODICALS, SCREEN PLAYS AND PRODUCTION STILLS* (G. K. Hall \$70.) is a 2 vol., 1169-page compilation reproducing in alphabetical order and by category the Library of Congress cards of all relevant items in the UCLA collection.

* * *

For finding your way around the Western U.S. entertainment industry and related fields, the *WEST COAST THEATRICAL DIRECTORY* (Gousha \$6.95) is a compact, thoroughgoing and useful guide. It lists, under appropriate headings, all facilities, services and organizations in 17 states from California to Texas and, for good measure, throws in Alaska, Hawaii, Mexico and British Columbia. ■

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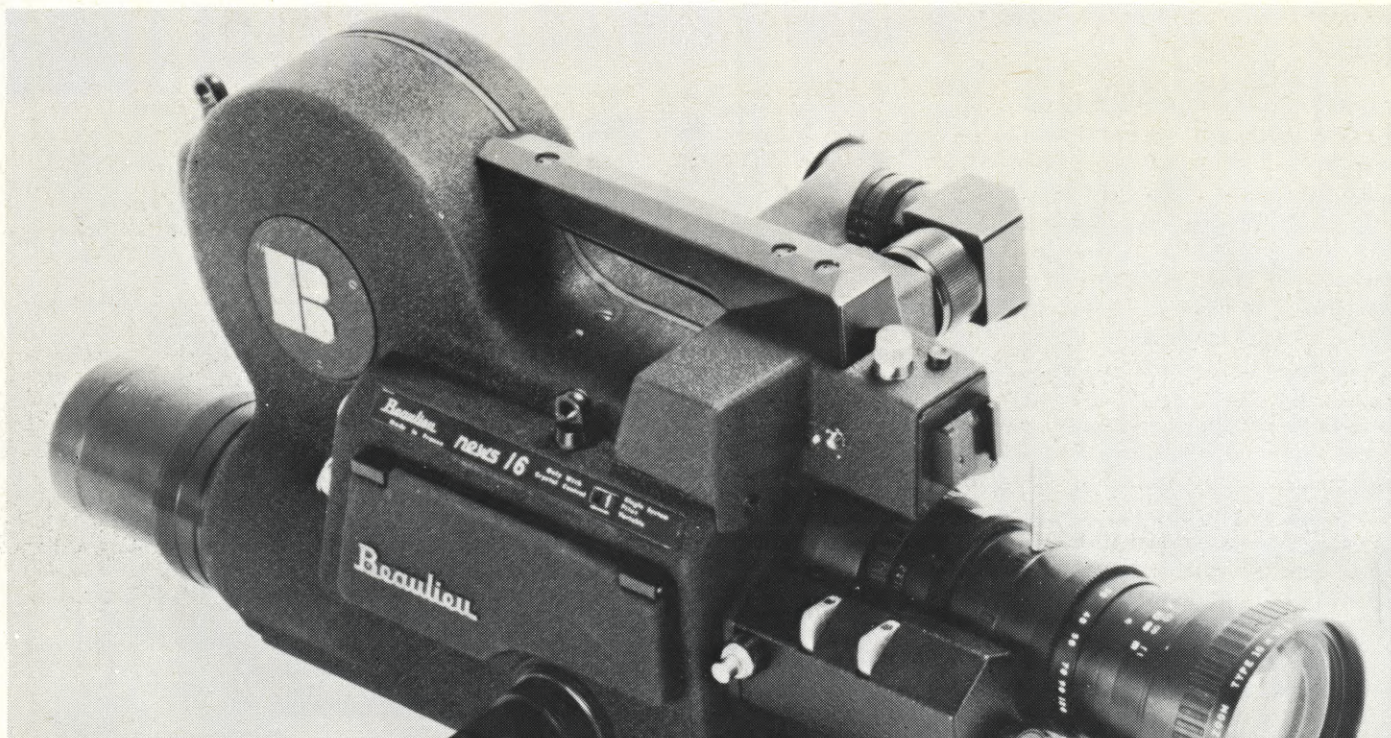
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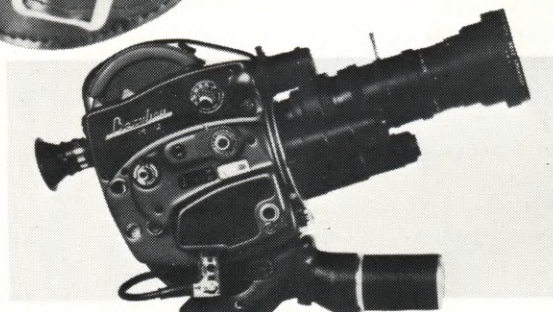
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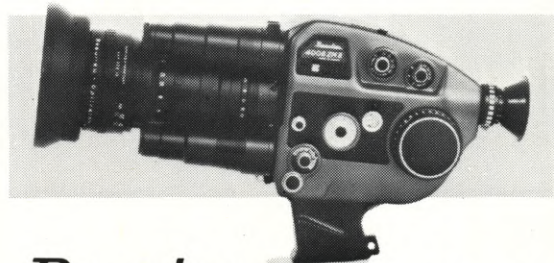
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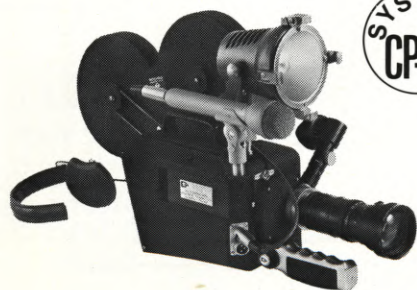
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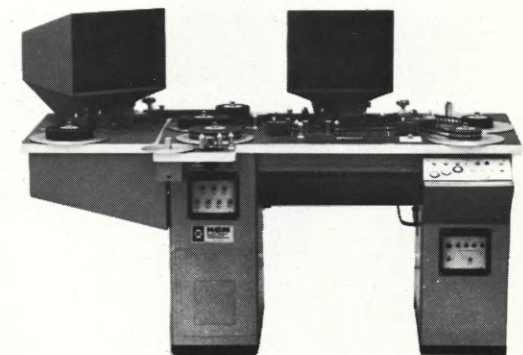
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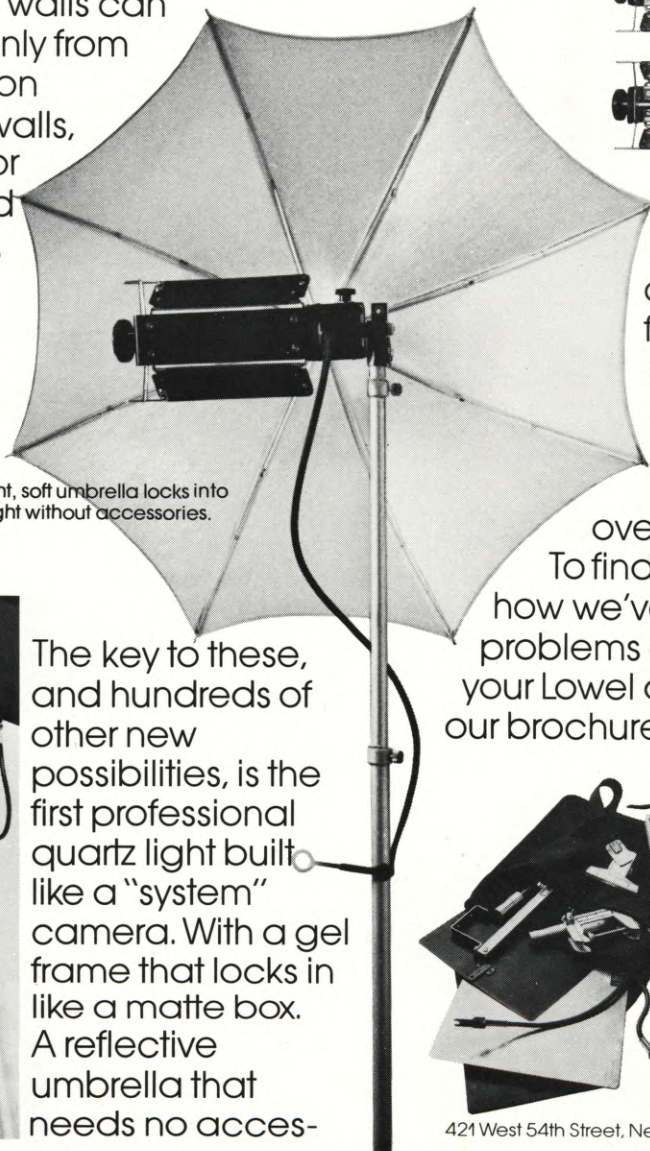


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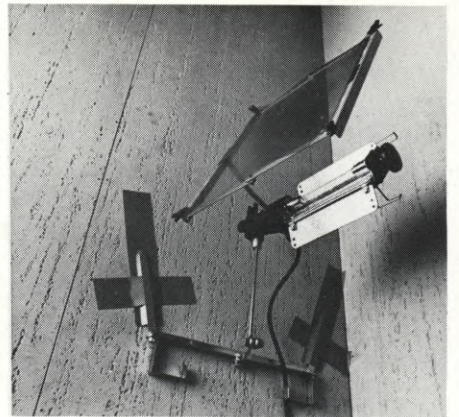
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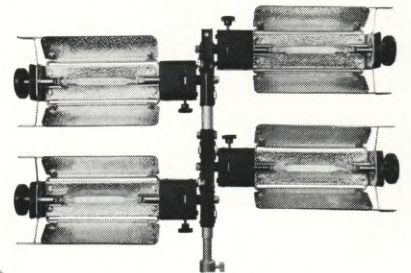


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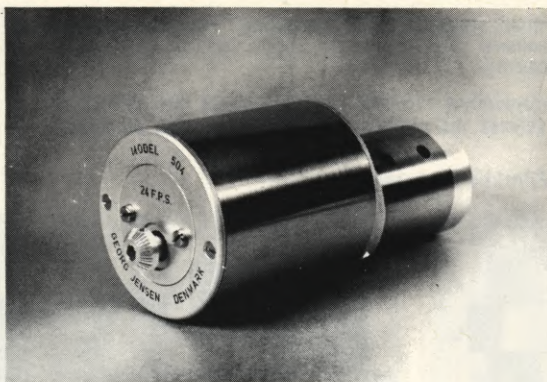
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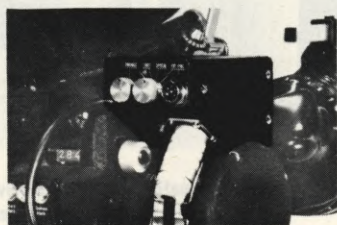
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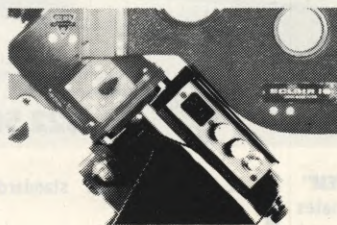
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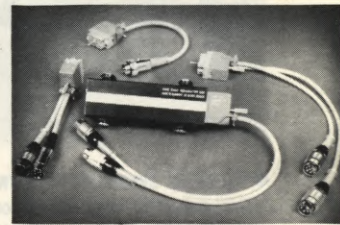
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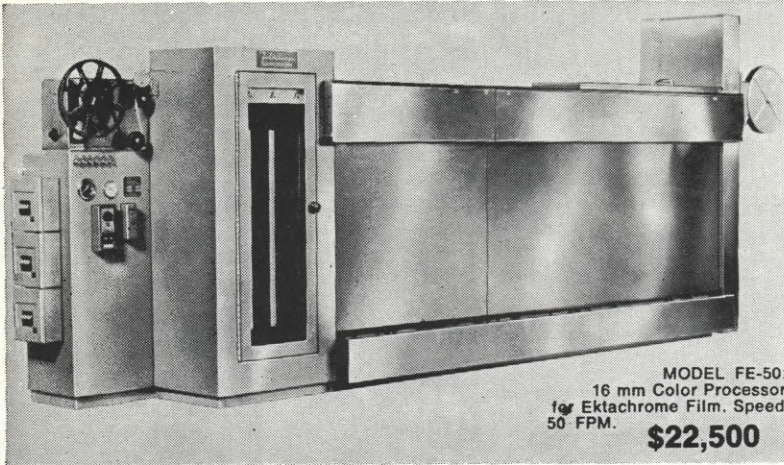
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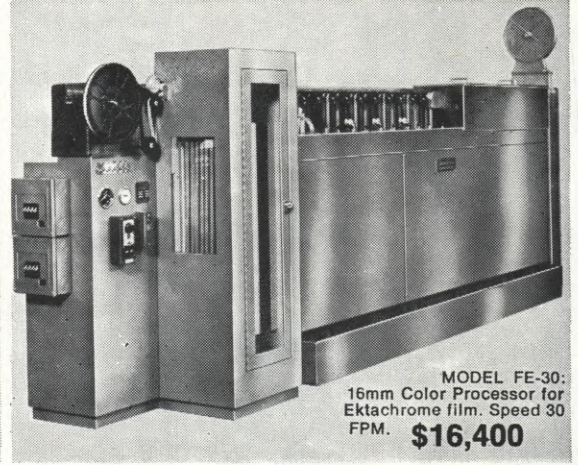
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SET #	LOCATION	PHO
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No.	MAKEUP	Time	No.	RESTAURANT
4	Makeup Artist 2 NY	6:30A		Breakfast For:
	Extra MU		100	Lunches HC
	Extra MU		200	XXXXXX B
	Body MU	6:30A		Suppers
	Hairstylist 4 NY			Gals Coffee FO
	Extra Hair			Doz. Donuts FO
	Extra Hair			Gals Coffee POLIC

No.	WARDROBE	Time
4	Wardrobe Man 2 NY	6:30A
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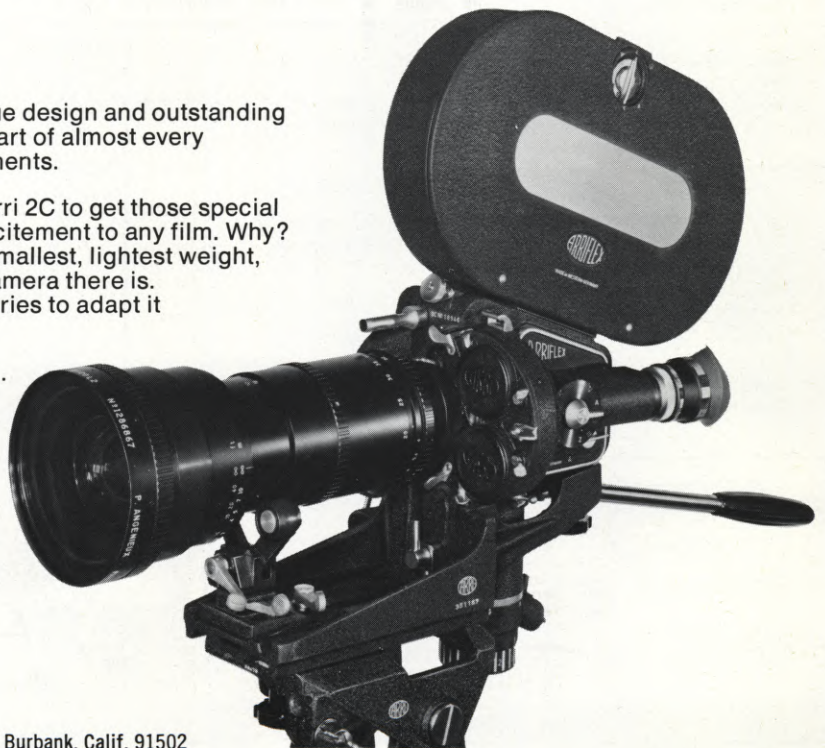
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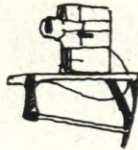
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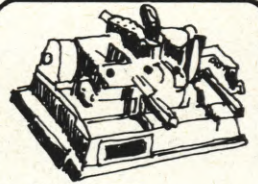
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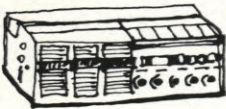
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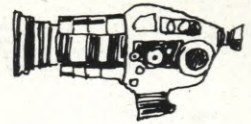
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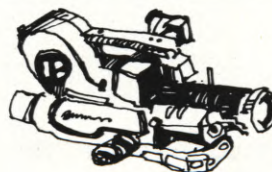
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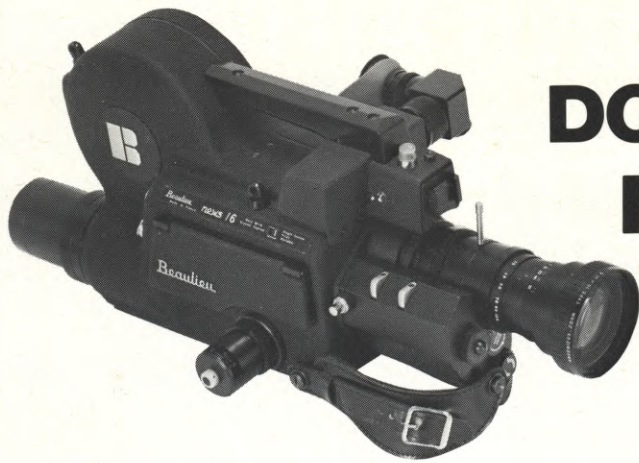
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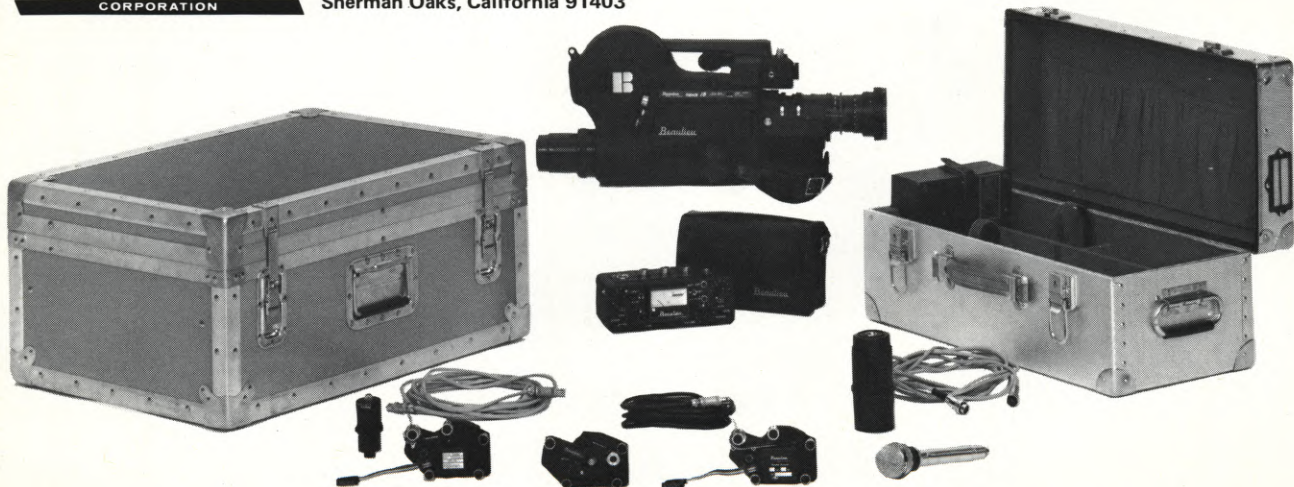
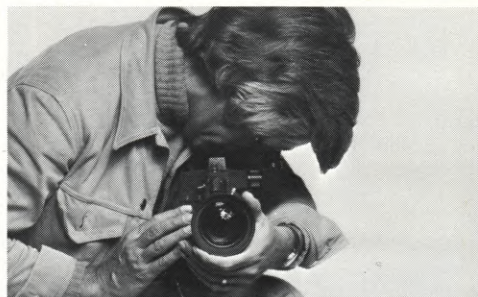
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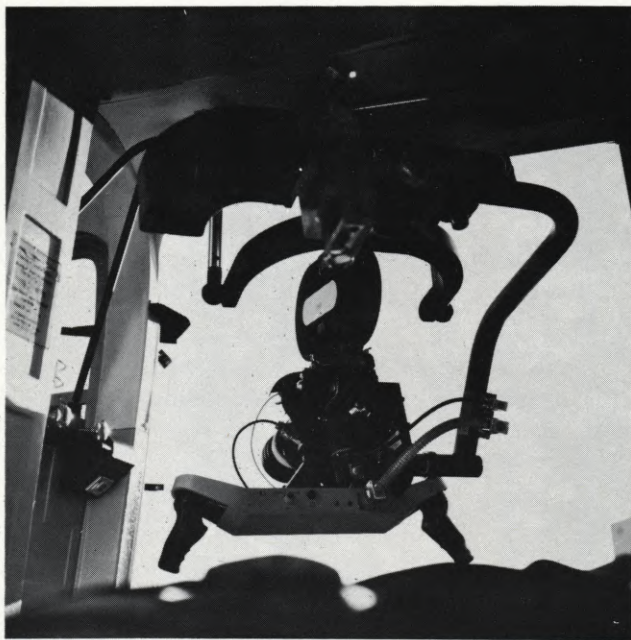
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FILM '73

Film plus Tape

In London, the British Kinematograph Sound and Television Society holds its third biennial International Technology Conference and Exhibition

By HERB A. LIGHTMAN

On the plane, *en route* to London, I speculated as to whether FILM '73 could possibly turn out to be as much of a crashing success as its predecessors, FILM '69 and FILM '71, had been.

This event—sub-titled: International

Technology Conference and Exhibition—is held every two years and has elements of *Photokina*, an SMPTE Conference and a UNIATEC Conference. Yet, it is a duplicate of none of these—having a distinct character all its own.

Looking back now, I can say, in all sincerity, that FILM '73 was very definitely a successful and memorable event. Sponsored by the British Kinematograph Sound and Television Society, and headquartered at London's Royal Lancaster Hotel, it was extremely well organized—with BKSTS Secretary Paul McGurk serving as chief organizer.

From the logistics standpoint alone the affair was impressive. More than 1,000 delegates from thirty-three countries attended—including sizable delegations from Russia, the People's Republic of China and the U.S.A., all of which reinforced the reputation of the conference as the largest film and television industry convention to be held outside of America.

The theme title of the Conference: "FILM PLUS TAPE", rather definitely acknowledged the growing importance of video as a technological partner with film in the presentation of program material (for television, at least) and served as a basis for some lively debates.

Thirty-two papers, presented in eight separate sessions, formed the basis of the papers program at FILM '73. These

papers covered a wide range of topics concerned with the film, television and allied industries.

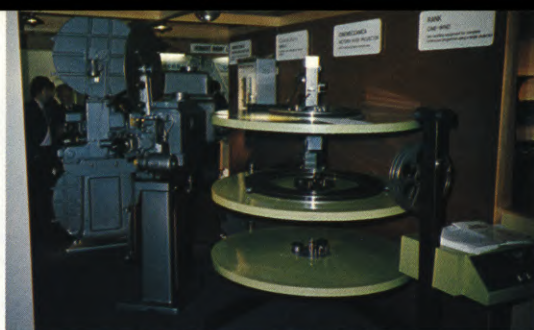
In a separate exhibition hall, on the hotel's lower level, manufacturers of various forms of communications equipment demonstrated some of the latest developments in this field. In all, 55 manufacturers were represented in the equipment exhibition. There were quite a few new items which I found to be interesting, and there are product reports on some of them, beginning on Page 1140 of this issue of *American Cinematographer*. Unfortunately, space limitations preclude reporting on all of the items worthy of such recognition, but we will try to cover them in future issues.

There were so many Americans (mainly from Hollywood) attending FILM '73, that I almost felt as if I hadn't left home. Among those whom I recall having encountered were: Dick Sullivan and Ken Mason of Eastman Kodak (Hollywood); Loren Ryder, of Ryder Sound Services; Sid Solow, of Consolidated Film Industries, Neal Keehn, of DeLuxe-General Laboratories; Herb Farmer, of the University of Southern California Cinema Department; Stan Miller, of Rosco Laboratories, Inc.; Technical Consultants Milton Forman and Richard Glickman; Ed Di-Giulio and Abbott Sidney, of Cinema

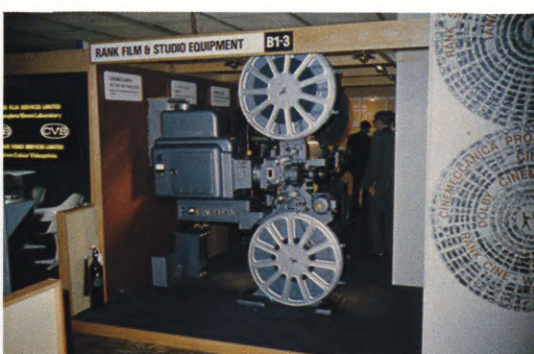


(ABOVE LEFT) London's Royal Lancaster Hotel, headquarters of FILM '73. (BELOW LEFT) Delegates from thirty-three countries crowd the Nine Kings Suite of the Royal Lancaster, as the Papers Program gets under way. Initiated in 1969, this Conference is the largest film and television industry convention to be held outside of America. (RIGHT) The lower level of the hotel was devoted to an exhibition area.





Glimpses of a few of the many booths in the lower level exhibition area of the Royal Lancaster Hotel. During FILM '73, motion picture and television equipment presented by 55 manufacturers was on display in this exhibition hall. The Conference alternates, in odd years, with Cologne's Photokina as a focal point for the introduction of new film and television equipment.



Products Corporation; Harry Teitelbaum, of Hollywood Film Co.; and several others.

Among those from other countries whom I enjoyed seeing again were my British buddies (too numerous to name)

and such luminaries as Prof. B.N. Konoplev, Technical Director of Mosfilm Studios in Moscow and Lars Swanberg, Technical Director of the Swedish Film Institute. Conspicuously missing (and very much missed by those of us privileged to call him "friend") was David Samuelson, Immediate Past President of BKSTS, who was, unfortunately, indisposed, due to illness. (At this writing, he is on the mend and doing nicely—thank you.)

The papers program covered such general categories as: Survey of the State of the Art, Image Quality, Electronic Reproduction of Film, Studio Lighting Methods, Film Versus Tape, Sound Recording Reproduction, Education and Training, and New Film Equipment.

Certain selected papers, which we felt would be of particular interest to

American Cinematographer readers, are excerpted in this issue, beginning on Page 1122.

In these days of rapid evolution (some say *revolution*) within the film

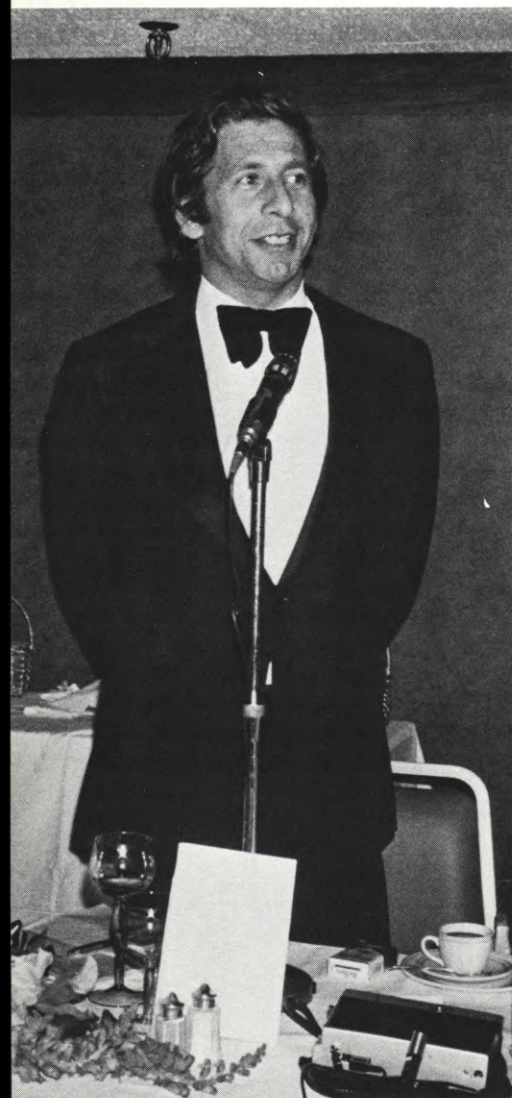


BKSTS

WELCOMES YOU TO



A welcome to FILM '73 delegates is flashed onto a great, wide projection screen at the front of the conference hall, by means of a battery or 20 Carousel slide projectors. This computerized display, which formally opened the Papers Program of the Conference, was one of many produced by Magic Lantern Limited and Roundel Productions to enliven the affair with striking multi-screen graphics and accompanying music.



and television industries, there are specific topics of unusual importance to those who would keep current with contemporary production trends. These interests were well-served by the inclusion of such papers as: The Preservation of Image Quality in the Film Laboratory, Color Film Telerecording, New Light Sources for Film and Television, Two Years Experience with Color Negative Film Transmission, 16mm Film Production in United Kingdom Independent Television, Improved Telecine Image Quality, The Choice Between Film and Tape, Film or Tape for Television Newsgathering, The Use of Television Techniques in Motion Picture Feature Production, and A Major Review of Education and Training for Film and Television.

With few exceptions, the people chosen to prepare and deliver these various papers were acknowledged top experts in their respective fields, and they spoke with that special authority which such people naturally radiate. They were, without exception, very well-prepared, in terms of text and visual materials to illustrate the points presented. Unlike that which sometimes happens at other conferences I've attended, there was no "winging it" from a few notes hastily scrawled on the backs of match books. Every speaker had done his "homework" very thoroughly.

What always delights me about British speakers, in particular, is the flair

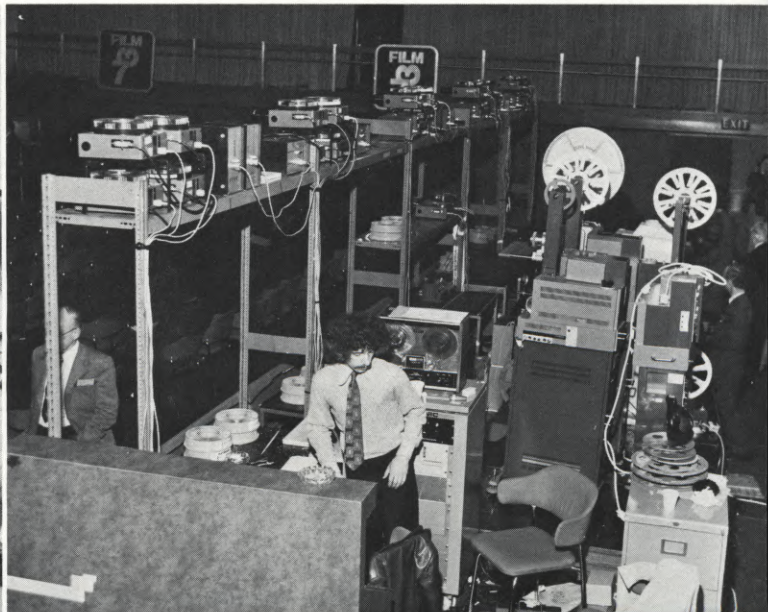
they show in shooting each other down quite savagely in debate, while remaining perfectly polite and charming through it all. This was especially evident in the discussion so innocently entitled: Single-Camera and Multi-Camera Lighting Methods.

In the donnybrook that erupted from that topic, the Messrs. Jim Richards, Bill Lee, Paul Beeson and Ossie Morris (urged on by the Chairman) tore into each other with devastating gusto. My friend Ossie—ordinarily the most sweet-natured of mortals—"ploughed to the attack" like a barracuda in heat, chopping heads and gouging eyes (figuratively speaking) and saying in between, to his opponents, such things as: "Sorry, chaps—but you asked for it." Through it all, even when the heat got the worst, there was that famous British dry humor (or *humour*, as they spell it) which kept the crowd chuckling.

One of the topics of special interest to those attending concerned the matter of time-code systems for synchronization and editing, and this subject was thoroughly explored in the texts of four different papers.

A sidelight to the topic entitled: "Lighting for the Munich Olympics" was a plea by Michael Samuelson (who had been in charge of the technical aspects of filming that event for Wolper Pictures) to the effect that designers of lamps and luminaires for the lighting of such spectacles should pay closer attention to the special lighting requirements

(ABOVE LEFT) Guest of Honor Chaim Topol, genial star of "FIDDLER ON THE ROOF", pays tribute to film technicians during witty speech at closing banquet of FILM '73. (BELOW LEFT) At the rear of the Papers Program conference hall, a bank of slide projectors, 35mm and 16mm film projectors and VTR equipment stands ready to illustrate the various papers presented. (RIGHT) A behind-the-scenes view of the complex set-up.



of those assigned to film them.

He illustrated his point by screening a film clip from the Olympics which revealed a quite horrendous "breathing" type of flicker emanating from the lamps when the cine cameras were run at high speed. He expressed the fervent hope that those charged with designing the lighting of the stadia for the upcoming 1976 Olympic Games in Montreal would pay heed (starting right now) to this very serious problem.

The stunning novelty of the Papers Program at FILM '73 was the series of multi-screen sequences produced by Magic Lantern Limited. A great wide projection screen (actually encompassing five areas) stretched across the entire front of the Nine Kings Suite, where the sessions were held. At the rear of the

municate creative knowledge and it held the audience spellbound for about ten minutes. Showmanship at its best!

As is the custom, FILM '73 wound up with a formal banquet and dinner-dance on the final Saturday night. The Nine Kings Suite, glamorously transformed from its previous academic atmosphere, was packed with smartly attired delegates and their ladies.

I received a warm greeting from the Guest of Honor, Chaim Topol, Israeli star of "FIDDLER ON THE ROOF", and we laughed about funny aspects of my visit to that company while it was shooting in Yugoslavia. On short leave from his stint at the Chichester Drama Festival, and looking about thirty years younger than he did in "FIDDLER", Topol was introduced by BKSTS Presi-



An extra-curricular highlight of FILM '73 was the evening buffet reception sponsored at its headquarters by Samuelson Film Service Limited to welcome foreign delegates to the Conference. Representatives from thirty-three countries attended and spent a pleasant evening getting to know one another and exchanging ideas.

hall was a bewildering array of computerized electronic equipment, complemented by 20 Carousel slide projectors.

Each separate session of the Program was introduced by its own spectacular multi-slide show, accompanied (in some cases) by narration, and always by a superb multi-channel musical score.

In addition to the Papers Program sequences, there were a number of colorful multi-screen modules presented by Roundel Productions.

One that stands out vividly in my memory was an absolute smasher called: "THE FOURTH DIMENSION". It traced Man's quest to acquire and com-

ment B.J. Davies. After being presented with a huge cake (which he donated to a children's hospital, he said:

Mr. President, Miss Wendy Toy (his director at Chichester and companion of the evening), Ladies and Gentlemen:

I'm not sure you really know how much we actors envy you. When I say you, I mean the people on the technical side of the camera in the film industry. Personally, I always really envy the Lighting Cameraman, who comes out with his light meter, looks at the lamps, looks at the meter, puts it in front of my nose (he can't get too close), looks at the meter again, kills some "babies"

Continued on Page 1204

PAPERS PROGRAM

FILM '73

Filmplus Tape

SESSION 1 THE STATE OF THE ART

Monday
June 25th
1445-1700

101 A survey of technical progress in the film and television industries over the past two years, with special reference to the way in which changes in production requirements have brought about developments in technique and technology.

Speakers:
Howard Thomas — Television
John Trevelyan — The Cinema
John Chittock — Documentary and Industrial Films

SESSION 2 IMAGE QUALITY

Tuesday
June 26th
0945-1100

201 Exposure as a Determinant of Image Quality with Colour Film. Daan Zwick, Research Laboratories, Eastman Kodak Co.

202 The Measurement of Granularity. Max Rottaler, I.R.T., Munich.

203 Studies of Visual Reproduction of Graininess in Colour Photographic Images. A. M. Ermolayev, U.S.S.R.

COFFEE BREAK

204 Super Achromatism and Super Achromats. F. Determann, Optical Design Department, Carl Zeiss

205 The Image Quality of Zoom Lenses M. Mukai, General Manager, Optics Division, Canon, Tokyo.

206 Mechanical and Optical Tolerances in the lens/camera system for 16 mm film. P. Manns, Engineering Division—B.B.C.

LUNCH BREAK

207 Specification of Density and Colour Balance of Television Films. Daan Zwick, Research Laboratories, Eastman Kodak Co.

208 Optimum Colour Separation Characteristics of an Image. N. V. Alexeyeva, U.S.S.R.

209 A new C.C.T.V. System for Negative Grading. L. B. Happé — Technical Manager, Technicolor Ltd.

Arthur Maxfield — Consultant.

TEA BREAK

210 On Establishing a Correlative Connection between Measured and Visual Evaluation of Cinema Image Quality. S. M. Kozlovsky, U.S.S.R.

211 The Preservation of Image Quality in the Film Laboratory. Dr. F. R. Gloyns, Director, Rank Film Laboratories.

212 Modulation transfer function analyzer Model FPK-1. Adam Kolasa, Polish Film Research Centre.

SESSION 3 COLOUR FILM TELERECORDING

1700-1800

301 Colour Film Telerecording—A review of Current Methods. Richard B. Glickman, Consulting Engineer.

302 Recording and Reproduction of Holographic Images. V. G. Komar, V. D. Petrov, U.S.S.R.

SESSION 4 SOUND RECORDING AND REPRODUCTION

Wednesday
June 27th
0945-1100

401 A Crystal Controlled Time Code for synchronising film and audio tape. M. Stubbs, I.R.T., Munich.

402 A Standards proposal for a crystal-controlled time marking system for film. Leo O'Donnell, National Film Board of Canada.

403 The new 'Synchrotrone' Process for absolute synchronisation between stereo tape and film. Georges Quillet, Stellovox.

404 Medway—A time-code system for Sound Dubbing. Gunter Karn, Thames Television.

COFFEE BREAK

405 Duo-Supmag: A 16 mm Twin-Track Compatible Standard. C. Henocq, Design Department B.B.C.

406 A Modular Film Dubbing System. P. Surman, P. A. G. Films Limited.

407 Looking Back at Photographic Sound. David Rees, Audio Consultant.

408 Is Redevelopment of Optical Sound Tracks on Colour Positive Print Film still required? K. Stass, Research and Development Laboratories, R. Verbrughe, Aste-Gevaert, Belgium.

LUNCH BREAK

SESSION 5 LIGHTING AND STUDIO METHODS

1415-1530

501 New Light Sources for Film and Television. K. Scott, Thorn Lighting Limited.

502 The use of Metal Halide Lamps on exteriors. C. Ryle-Gibbs, O.R.T.F. Paris.

503 Lighting for the Munich Olympics. H. O. Westermann, N.V. Philips.

Gloeilampenfabrieken Eindhoven, Holland with comments by M. Samuelson, Samuelson Film Services.

TEA BREAK

504 Discussion—Single-Camera and Multi-Camera Lighting Methods. Jim Richards—B.B.C. Television.

Bill Lee—Thames Television. Jack Cardiff and Ossie Morris (Directors of Photography) subject to filming commitments.

SESSION 6 ELECTRONIC REPRODUCTION OF FILM

Thursday
June 28th
0945-1100

601 Two years experience with Colour Negative Film Transmission. L. H. Griffiths, Head of Engineering (Television Recording) B.B.C.

602 16 mm Film Production in United Kingdom Independent Television. Norman Greene, Research Liaison Officer, I.T.C.A.

603 Pre-programmed and Automatic Colour Correction for Telecine. D. J. Kitson, Design Department, B.B.C.

D. T. Wright, Research Department, B.B.C.

SESSION 7 FILM PLUS TAPE

1100-1115
1115-1230

COFFEE BREAK

604 Improved Cathode-Ray Tubes for Flying-Spot Scanner. D. H. Bramall, Rank Electronic Tubes.

P. W. Blaxtan, Rank Precision Industries.

605 A system using Colour Television for the Quality assessment of Colour Negative Film. R. Godden—Research Department, Kodak Limited.

606 Improved Telecine Image Quality: The Influence of Black Level. Henry A. Barrett, Richard E. Bartow, Robert C. Lovick and John C. Norris.

Bill Lee—Thames Television.

LUNCH BREAK

607 New Concepts in Telecine Design. D. Day—Marconi Communications.

608 The present design and future development of Telecine. J. R. Sanders, Research Department, B.B.C.

609 Requirements for Telecine Systems. M. V. Antipin, U.S.S.R.

TEA BREAK

SESSION 8 WHO PROFITS FROM TRAINING

Friday
June 29th
0945-1230

801 A Major Review of Education and Training for Film and Television. Colin Young — Director, National Film School.

John Tasker — Thames Television Ltd. Paul Read — Marketing and Educational Centre, Kodak Limited.

Gerry Graham — Director, Planning and Research, National Film Board of Canada.

THE STATE OF THE ART



FILM 73 kicks off with a three-part analysis of progress in the film and television industries during the last two years, plus knowledgeable speculations for the near future

The Papers Program of FILM 73 was soundly launched by a Session entitled: "THE STATE OF THE ART", and described as: "A survey of technical progress in the film and television industries over the past two years, with special reference to the way in which changes in production requirements have brought about developments in technique and technology."

In kicking off this Session, Mr. D.J. Craven, Chairman of the Papers Program, paid tribute to the organizers on his team who "had done all the work in procuring the papers and persuading the reluctant lecturers to come to the Conference and deliver their papers, and even to write them."

In commenting on the title, "THE STATE OF THE ART", Mr. Craven went on to say: "I'm sure that none of you need me to say that there is no true conflict between technology and art. Conflicts there are, but these are conflicts that can be resolved—because it is only through the exercise of craft or technology that the artist can express himself. And it's only through the exercise of imagination, sensibility and something worth saying that the technologist finds some expression, whether it be through science, or whether it be through art. It seems to me, therefore, that there is no profound division about the particular problems that confront the technologist in dealing with the so-called artist."

He went on to introduce the speakers of the Session: John Trevelyan (The Cinema), whom he noted had been a British censor for 13 years; Howard Thomas (Television) and John Chittock (Documentary and Industrial Films).

Following, and slightly edited down to meet space limitations, are their respective remarks:

JOHN TREVELYAN—The Cinema

Ladies and gentlemen, from the papers relating to this Conference, (that I have yet to have time to read), it appears that the Conference is about new ideas and I think that the first new idea that has emerged must be attributed to the program planning

committee for having, as the first speaker of this Conference, someone who knows absolutely nothing about technology.

I had what was called a "classical education" which was mainly on the dead languages of Latin and Greek, of which I do not remember one word. There are perhaps advantages. A man called Russell Green once said that the advantage of a classical education was that it taught you to despise the wealth that it prevented you from acquiring. A certain amount of truth in that. At least, I've not acquired the wealth, but whether I have despised the money is an entirely different matter, because I think I can claim that throughout my work in censorship I did have great respect for the commercial elements in the industry.

The film industry, as I've said so often, is just as much an industry as the boot and shoe industry or the steel industry. People are in it for the purpose of making money. Our chairman has already referred to two main elements in this. We have the technician and we have the artist and I want to start by saying a little bit about their relationships. Obviously it is, or should be, a relationship of interdependence. And any relationship of interdependence is one that needs a mutual understanding.

Now, I know a number of filmmakers and many of them are my good friends. I know some who have a lot of technical ability and knowledge and some who have none at all. To give you two examples: Stanley Kubrick, an American film director, was, of course, a still photographer in the early days, and a very skillful one, and knows a great deal about it indeed. Stanley's house, not all that far from London, is full of all the latest electronic gadgets one way and another and I don't suppose there is much they are going to show in this conference that isn't available there.

On the other hand, Joe Losey is a creative artist in filmmaking and I remember an occasion when he and I sat with some others in a room at the Sunday Times which had no outside

lighting at all. It is a very horrible shut-in little room with very poor old incandescent lighting—I believe that is the phrase—and a still photographer came in with a nice-looking camera. I said to him, since I'm an amateur at this kind of thing, "I suppose you've got Tri-X stock." And he said, "Yes, I have." I said, "I don't think you'll get anything at all in this lighting." He said, "Oh yes I will." He was right, incidentally, but I said to Losey, "This fellow says he's going to get results in this terrible lighting with Tri-X. Do you think he's right or not?" And Losey said to me, "Don't ask me. Never in the whole of my life have I pressed a camera button. I don't know one thing about it."

Therefore, you can have a creative artist who knows the practical side; you can have a creative artist who doesn't know a thing and relies on the technicians, and both can be successful.

Now, there's one point I want to make at the start. I think that when one does a job, one always tends to think that it is the most important thing of all. Almost everyone feels that way, if they like the job particularly. I've known administrators who are good administrators but suffered from the belief that administration was far more important than anything else and even more important than the purpose it was set up to serve. Now, this, I think, is important with technology. Technology is not an end in itself. It exists to serve a purpose, it can't produce anything worth having unless it's got other people using what technology produces in order to create. And, therefore, I think it is very important indeed that any technician, any technologist, should have a wider view and not just be narrowly confined to his own technology.

The purpose of technology—as I see it in Cinema, at least—is to serve the creative artist and make his job easier and make it better. Of course, without the technology, the creative filmmaker can't achieve anything. He can't create a film without the technical equipment or the technical ability to put what he wants to create onto a screen, and so it's a two-sided thing.

I went to Italy fairly recently in order to see some of the most marvelous works of art in the world, in Florence and Venice. Some of those things that I saw, paintings and sculpture, I hadn't seen before, but I had seen photographs and copies of them most of my life and they were not the same as the originals. There is some peculiar magic about the original creation which cannot be conveyed in a copy. Now, a film *is*. It suddenly struck me that it is an original thing. The film is a creative original and is something which is not created by one person; it is created by a team of people—not only technicians, but writers, actors, directors, producers. All of them create a film.

At the present time cinema is not at its brightest and best, except in individual films, which I still think are better than films made in earlier years, but there are things that can be done. Some of them are fairly obvious technical improvements and, secondly, which is vitally important, improvements which will, at the same time, reduce costs. I don't think we are going to get 20-million-dollar pictures in the future because nobody, obviously, is going to produce 20 million dollars to make one. But if we can get the quality at a reasonable cost, pictures will be made and the public can enjoy them, if they are good. The old theory was that the more a picture cost the better it must be. This is a theory that I think has often been totally discredited. If we can combine technical improvements with reduction of cost, then we are going to get somewhere.

A lot of things have been done in recent years and are being done now and will be done very shortly. Now, if, in any comments which I make about technical improvements, I talk nonsense, please realize that this is because I don't know.

First of all, I want to mention improved lenses. I've seen, in the last 13 years, enormous improvement in lenses and I read of still better lenses which are able to shoot with clarity and quality in weaker lighting conditions. That's fine. I see that you have papers later in the week on the zoom lens and, while I think zoom lenses are marvelous, I sometimes regret that they ever came into existence—but merely because in my opinion, they have been often misused, rather than used properly. I think lenses are all-important. You can't get a good picture without a good lens.

You've got multi-camera systems. Now, multi-camera systems are fairly new to me but, for the right subject and rightly used, I think they offer a considerable possibility because, again, they

can reduce costs. If you can do pickup shots at the same time as you take your master scenes, that's fine. What you don't want to do is to sacrifice your quality for the sake of production costs. Provided you don't do that and provided the thing is properly planned out from the start, I believe the multi-camera system is valuable.

Even with the increased mobility of equipment you've got to cart around tons and tons of heavy material and you have 35mm cameras that have got to be mounted on all kinds of pedestals and dollies and things. It's a lot easier if you've got something lighter in the way of camera equipment. Lightness of

ship—which is always terribly difficult—I never wanted to destroy a scene. Sometimes we've had to say, "Alright, we've just got to get rid of that; how do we do it? We can't just cut a few odd frames because you've got the difference between sound and picture. It's going to be a deep cut, a heavy deep cut and that's going to be appalling."

Now, with that electronic composite printing, if what it's claimed to do does work, you can alter a section of a scene without altering the rest. I can remember that, years ago, there was a picture called "TOO HOT TO HANDLE" with Jayne Mansfield. There were potential problems, so I went out on the shooting



Delegates from 33 countries crowd the Nine Kings Suite of London's Royal Lancaster Hotel to attend opening "State of the Art" Session of the FILM 73 International Technology Conference and Exhibition. Discussing progress in the film and television industries were: John Trevelyan, one-time British film censor; Howard Thomas, Managing Director of Thames Television, and John Chittock, Industrial Film Correspondent of the Financial Times. Large screen was for projection of a number of multiscreen slide sequences produced by Magic Lantern Limited.

weight is an extraordinary function. Mobility is important. If you can do 35mm hand-held, that's fine.

I read a document here some time last year about electronic composite photography and electronic composite printing. I think that this sounds most exciting and I hope it works. I've heard many stories. Some people say it's marvelous and other people say, "Wait and see," but I believe that in the very near future quite a lot will come out of this. For instance, in my work in censor-

and I was introduced to Jayne who came in looking very bosomly, and very nice, you know. And I said, "What's wrong with that? That's alright." She was doing a number in it, but Otto Heller was lighting that picture and when I saw the results of Otto Heller's lighting, I mean, the dress just might as well not have been there at all. Since, in those days they hadn't got any technical means of dealing with this, some poor devil had to sit down with paint brushes and paint sequins on frame after frame

after frame. That's a true story. Nowadays we can deal with it in another and easier way. Certainly, as I understand it, electronic composite printing could have dealt with it in one day.

There have been improvements in such things as editing equipment. Improved editing equipment is so important. So much can be done on proper editing equipment without losing a lot of money and wasting a lot of time—which is the same thing.

There has been improvement in the quality of music recording and reproduction. There has been improvement in special effects techniques. Finally, in relation to film stocks, I am told that there are great improvements coming along—particularly in 16mm stocks—and I think that is very important, indeed.

Now, what else is needed? I can only think of one thing. There must be lots of others—but this is my own simple experience of sitting in a theatre and watching pictures from every country—and that is improvement in dubbing techniques. I'm not talking about the dubbing of the voice of the actor in his own language. I'm talking of the dubbing the other way around, of dubbing the foreign-language films into English or English-language films into foreign. I always said that dubbing voices used to come from actor's boots, or something of that kind. They always sounded so totally and completely unreal. I remember there was a time when they started to solve the foreign-language problem by having multilingual actors and actresses, but what I found there was that the person acting in his or her own language was fluent and free, but when acting in somebody else's language was stilted and boring. I even saw all the sex taken from Brigitte Bardot in a film when she spoke English. That required something.

I would be delighted to think that dubbing techniques have improved, because now, as we know in the cinema world, we need the world market to get marketability and without the world market we are not going to get it. It's no good thinking we are going to get it in our own country, especially our relatively small market.

I was delighted to see in the program that a section has been devoted to training technicians. This seems to be absolutely vitally important. You people can devise the best and finest and most marvelous and wonderful magical apparatus, but unless it is properly used, it is wasted and you can get idiocy.

I think there are improvements needed in other areas, of course, areas such as distribution and exhibition.

Distribution seems to me a management problem. I know a little bit about management—not all that much, but I am impressed, more impressed than I expected to be, about some of the experts in what is called "operational research". This is a sort of new science and everyone is suspicious of new sciences like I am. But, on the whole, they talk sense and I think they might do an awful lot to help with distribution problems. I only know, as an ordinary filmgoer these days, that my opportunities of seeing films are limited because I'm still rather unsatisfied with the pattern of film distribution.

Then again, there's exhibition. Now, this really does involve technology. I'm glad, now that you've got automated projection and I'm all for that, provided that it works. The manager can come in, take the tickets at the box office, go press the button and the automation goes on. He goes back and takes the tickets and makes the tea and sells the ice cream. All of this cuts costs down, provided it works, which I'm sure, with your ability, it will. I think, from what I hear, that automated 16mm projection is a considerable answer to small theatres, but, of course, to me at least, the quality should be equal to that of 35mm and I gather there are changes coming along which will make it so.

One other final point—I think when television came along the film industry made a mistake, a vital mistake, which I hope and think they regretted. That mistake was deciding that television should be regarded as a competitor and as a rival and not as a partner. I think, if, at the very start, Cinema and TV had got together and worked out a pattern of partnership, we would all have been the better for it and I hope from now on that they will regard each other as partners and not rivals. We've all suffered in Cinema from declining audiences and declining audiences mean declining profits. If there is a future—and I hope there will be—I think it's going to be very much up to technology to produce it.

The Cinema started 'round about the time when I was a small boy. I've loved it all my life. I've been through the whole history of Cinema in my lifetime. I'm very old now, but I've still got a few years to go. I wouldn't want Cinema to go yet—thank you very much. I want to maintain it and I want you to help to maintain it, you people who are technologists in different countries of the world. I still think that Cinema really is the best mass entertainment devised. TV could learn a lot from it. I want it to continue and I want you to help it continue. Thank you very much. ■

HOWARD THOMAS—Television

Mr. Chairman, Ladies and Gentlemen, three years ago, speaking at the Royal Television Society, I expressed, rashly perhaps, the view that in television the pacemakers have proved to be the engineers. The television engineers had invented, pioneered, blazed trails—but unfortunately, I said, the program-makers have been slow to rise to the challenge.

Well, there has been a dramatic change. The creative men of ITV and BBC have now seized the new weapons you've provided and made remarkable advances. We, and especially ITV, have doubled the output of programs. The resulting demand for more programs by the existing studios has absolutely galvanized productivity. So, sheer output seems to be becoming the largest creative force in world television and I would put it to you that, in terms of quality, Britain seems to be the leader now—apart from the fiction film factories of Hollywood.

Much of this progress is because advanced, lightweight, pioneering electronic equipment provides magnificent working tools. Flexibility and portability have speeded up the entire process. The system in this country of state broadcasting competing vigorously with commercial broadcasting has brought forth an elite of technicians, producers, directors and writers of exceptional creative ability.

Now, opponents of additional television outlets always fall back on the argument that there isn't enough talent available to meet extra demands. In fact, in Britain, I feel this is precisely the opposite. We have a new generation of very professional, talented men and women and, in the last six months, I've found he skills here, especially among writers and directors, to be envied to a man all the way from Sydney to New York. This pressure of demand has unearthed the rich seams of the talent which has always been our heritage. That's why I support the government in its expansion of television and why, although I'm in the television broadcasting business, I welcome a fourth channel, paid TV, cable TV and the video tape cassette.

Let's just look at the new implements which have come into the hands of our producers and broadcasters during the past two or three years and see how effectively they have been applied, how they have improved and accelerated the techniques of television and, indeed, how new developments are beginning to rejuvenate the traditional processes of film-making.

The most arduous advance, I find,

has been in the refinement of television techniques. Because of these developments, the television director is now able to match the film director in precise picture editing and sound dubbing. While television has slowly improved in these respects since video tape was introduced in '57 and '58, the most significant advances have been made over the past two years.

Outstanding, of course, is the very sophisticated American device, CMX-600, which is now installed in Wardour Street by Rank Video Laboratory. This edits television pictures using a computer and magnetic disc storage system. The CMX-600 provides slow-motion, stop-frame, forward and reverse as required. There are alternative methods, of course, available, not quite so sophisticated, and these are coming from Germany as well as the United States and Canada.

Then we have the Medway system, a precise sound dubbing of video tape sound tracks which has been developed in the UK by Thames Television. We have found that it was difficult to sell our programs in Europe; we'd been handicapped by the language limitations of the sound track. There were no difficulties in the small proportion of our programs on film because of the separate sound track. The problem we had was to extract speech, music and effects recorded on video tape simultaneously with the picture.

Well, they found the solution as they usually do when you challenge them. The solution was Medway, which was spelled out music, effects and dialogue—Medway. This equipment allows music and effects to be dubbed on after the dialogue has been recorded. It uses an inexpensive helicon scan video recorder as a picture source and, therefore, it doesn't tie up our more expensive equipment.

The sound quality, as you know, has always been the disappointing feature of television, but we are moving forward with innovations like Medway and by increasing usage of multi-track techniques for music. A recent example was a series of Tony Bennett at the "Talk of the Town", for which 8-track recording was used in the video tape recording.

Of course, the other advance is in the field of special effects which are now very much more reliable and effective in color television. In particular, as most of you know, there's Chroma-key, which is the television equivalent of the travelling matte process of the old film days. Chroma-key is now widely used for providing a range of backgrounds and trick effects. You can see examples on our tv screens while you are here.

"Doctor Who", "Pardon My Genii" and "The Tomorrow People". It's a boon to the director because he can see in a split second the result on his screen and it's a long way from that tedious and expensive method of sending out opticals to a specialist laboratory.

Now, apart from these improvements in the art of television, there are other developments which have speeded up the gathering of pictures and sound for news and for actuality programs. What has pleased me most has been the big advance in the manufacture of hand-held TV color cameras. These, in general, seem to weigh less than 20 lbs. and the results are surprisingly good. They

delight when I see the increasing perfection of the hand-held TV camera and I submit to the demands of the department for more and more of these little aids.

Effective use of this equipment is made by our news service, the ITN. They have a two-camera vehicle based on the Range Rover chassis—fully self-contained except for AC power. At Thames the outside broadcast unit has constructed a portable control room which consists of two hand-held cameras, video tape recorder, sound and vision mixer and monitoring, air conditioning, etc. Again, self-contained except for AC power. This unit is truly



More than 1,000 delegates from many countries attended the Conference. Launched in 1969, this biennial Conference attracts a richly cosmopolitan audience from many countries and serves as a valuable international forum for the exchange of ideas and techniques pertaining to the film and television industries. Its equal concern with both of these areas of communications was crystalized this year by the theme: "Film Plus Tape".

are being used increasingly for program inserts and this trend, I believe, will continue.

When I worked in the film industry I was a great supporter of the hand-held camera. It always seemed to me that the little Eyemo was underrated for its possibilities in comparison with the mighty Mitchell camera. Then, when I went into the TV business, I felt that the big awkward electronic cameras were almost a step back and a handicap to production, so you can imagine my

portable and, in fact, has been designed to fit into the air freight compartment of an aircraft.

Speaking of hand-held cameras, at the recent Montreux convention, Philips demonstrated a model with pick-up tube which gave a good picture in very low light conditions, 2.5 foot-candles. That's about a 20th of the light which we normally require. Nor, should you overlook the advances in mobile sound recording. I was brought up in BBC
Continued on Page 1170

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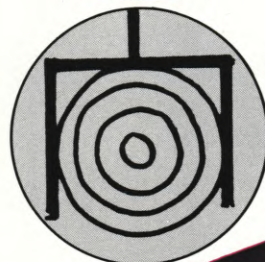
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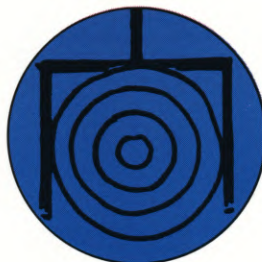
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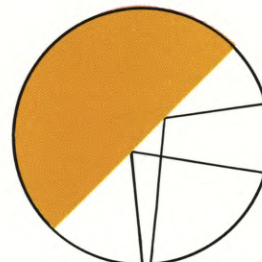
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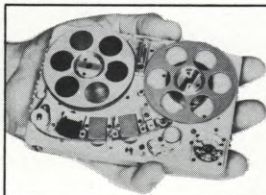
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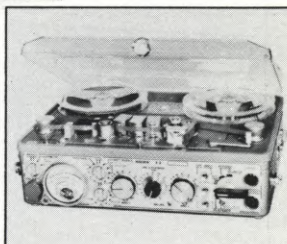
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Four top professionals of the film and tape industries square off in gentlemanly, but passionate, debate in defense of their respective favored shooting techniques

One of the most hotly debated subjects at FILM 73 arose out of the Session rather innocently entitled: "SINGLE-CAMERA AND MULTI-CAMERA LIGHTING METHODS".

The hammer-and-tongs tone of this discussion was set by the Chairman, who, in his opening remarks, said: "We are concerned here with studio floor problems, the advantages and disadvantages of single-camera or multi-camera operations, and the associated lighting techniques.

"I've asked our four speakers to be deliberately provocative. They are all, by nature, gentlemanly chaps—but they are going to bring out the very real differences that do exist in the various techniques in the short time that is available. We must state the issues starkly, and they have promised to do so.

"On my right—in the multi-camera corner—is Jim Richards, who is Head of Lighting for B.B.C. Television Operations. Next to him is Bill Lee, Lighting Director at Thames Television. Bill was, at one time, a film lighting assistant, so he's had a finger, at least, in the other camp—or one toe.

"On my near right—in the single-camera corner—is Ossie Morris, leading Lighting Cameraman and 'Oscar' Award-winner for his photography of 'FIDDLER ON THE ROOF'. Next to him is Paul Beeson, who is President of the British Society of Cinematographers and Lighting Cameraman on many feature films, including 'JANE EYRE'.

"Finally, let me say that we are covering the common ground between the two techniques—that is, lighting for story-telling, musicals and drama—but not for reporting and not for sport."

JIM RICHARDS—B.B.C. Television

What is meant by a multi-camera lighting technique? It is a suitable lighting treatment, not only to meet the dramatic requirements of a production in purely aesthetic terms, but suitable, also, to maintain the standards, over a wide range of taking angles, from a number of cameras used in continuous shooting sequence.

Does this, of necessity, call for a compromise in the quality of the lighting? Is it true that we can only "illuminate" under these conditions? Must a

single-angle treatment always produce the optimum results? We are here to debate the pros and cons, and Bill Lee and I would like to offer some support for the multi-camera case.

The following factors serve to effect a measure of comparison: Firstly, finance, a very basic consideration. Secondly, time scale. Thirdly, artistic objectives. Three very fundamental factors.

One and two are closely related. But is the standard of lighting necessarily so dependent on time and money? In the multi-camera case, let us consider a drama production of one and a half hours' duration. The financial budget will probably be one-tenth of that for a comparable feature film. The time scale is worth analyzing a little more closely. A one-and-a-half-hour television drama will be allocated a period of six to eight weeks for preparation and execution. During this period, any inserts will be shot on location and three weeks allowed for non-studio rehearsals. The factor of major importance is the detailed planning that is carried out at a number of meetings held, at which all members of the production team are involved. All aspects of visual presentation will be considered, including the development of the camera shooting script. In the studio only three days are available. A morning for luminaire setting allows two-and-a-half days for rehearsal and recording.

A number of different types of recording routines are favored. Firstly a single recording session, with long continuous sequences, interspersed with breaks for make-up, costume and scenery changes. The ratio of recording time to finished product on tape is normally three to one. Secondly, a number of shorter recording sessions spread across two-and-a-half days. So, finally, rehearsal of a short sequence, followed by immediate recording.

This pattern, repeated over two-and-a-half days, is favored by some and has a similarity of style with a film operation. Many directors who are working a number of media find this to their satisfaction—but with all these methods, the multi-camera technique is invariably retained, although pressures for the lighting director will vary.

Eight weeks' production time is probably only one-tenth of the time taken to produce a comparable feature film. In terms of the actual shooting time involved, a two-to-three-minute daily film output must be compared with a 30-minute multi-camera TV productivity rate—and here we have a factor of ten again, but at what price? Here we must consider number three of the main factors: the artistic objectives.

To light for one angle at a time would appear to offer the best possible conditions for the lighting director, but the overall continuity of style may be affected. Perhaps there will be time to develop this thing further, but to light for a number of camera angles at once would appear to demand a compromise, and I suggest that this is not necessarily so. At the highest level of operation, an essential requirement to lighting for multi-camera operations is that all luminaires must be remotely controllable—*dimnable*, that is—and current lighting standards demand the use of the most sophisticated light control facilities.

An electronic cameras system utilizing these control facilities allows for instant appraisal and control, not only to achieve a basic static lighting balance, but to go much further. It is possible to change the balance and character of the lighting within a given continuous sequence and, by so doing, to maintain optimum keying angles or complement the changing mood of changing action. A modern console has the ability, not only to recall groups of luminaires, but to retain many previously balanced levels of intensity for each individual unit. The art of lighting for multi-camera operations develops from a keen eye for detail at the planning stage.

There is a good sense of visual anticipation at the plotting stage through to the artistic control of the studio's treatment. This treatment must be capable of producing a number of widely differing atmospheric moods for many scenes superimposed on a given set. The artistry of the lighting director will be evident when he can develop this thing further, after assessment of the picture quality at the instant of rehearsal.

Electronic camera operations can also be undertaken on location. The

lighting rig is a temporary installation, but multi-camera operations are still possible. The advantages of the electronic system for the rest of the production team are self-evident. No one person can act in isolation, and perhaps, by so doing, create problems for other colleagues. Blemishes are instantly assessable and corrective action taken. It is essentially a team operation, but with all contributions remaining as individual as ever. The advantages have been stated: A saving in time and money without sacrificing artistic standards. It can be additionally claimed that continuity of atmospheric style is more consistently maintained. But, also, many subtle lighting changes are possible at any time during a production sequence.

This ability to vary the lighting treatment in sympathy with the developing action is a major asset for the multi-camera operation. This continuity of effect is very difficult to produce in the single-camera film operation, with its inevitable need for post-editing, where integration of all the separate takes makes overall appraisal possible for the first time.

The disadvantages must also be stated. The lighting director certainly has some extra problems to overcome. The objectives are clear: to light artists with an appropriate modeling treatment from all camera angles for the many positions they may occupy during a continuous sequence. Nevertheless, this treatment must also provide for long-shot atmospheric requirements which, on occasion, will conflict with the close-up balance already achieved. This is the basic problem inherent in the multi-camera case, a continuous dilemma for the lighting director.

A simple example serves to illustrate the point. Camera run is a wide-angle lens and offers an establishing shot to include the artist and most of the set. Ideally the face will be frontally lit with a little soft light reflected from the walls. The picture is dramatically keyed, we imagine, by strong sunlight through the window. The next shot is on camera two, a close-up. Unfortunately, this may well exclude any reference to the window and we are presented with a picture of a dark face against what should be a dark plane, the window wall. The balance of this shot is not acceptable for other than the very shortest appearance once the window reference is lost.

For single-camera operations, I suggest a subtle side-lighting from a low angle might be introduced between the long-shot and the closeup shot. How is this solved in the multi-camera case? There are many solutions to the close-



A highlight of the FILM '73 Papers Program was a knock-down-drag-out debate on the relative merits of "Single-Camera and Multi-Camera Lighting Methods". The multi-camera school of shooting was enthusiastically endorsed by Jim Richards (B.B.C. Television) and Bill Lee (Thames Television), while the single camera method was vociferously defended by Lighting Cameramen Paul Beeson, BSC and Ossie Morris, BSC. Equally spirited was the audience-participation questions and answers session that followed.

up/long shot problem. Use of a sophisticated lighting console is an essential aid. Imagine this basic example repeated and superimposed in many areas of a large set to include many camera angles and you have the measure of the problem. The demand for instant closeup and long shot variations threatens the artistic standards of the lighting, but also the mechanics of the two operations are very different.

A single camera angle allows for the optimum positioning of the luminaires to give best modeling results—invariably from floor stands. In the multi-camera case, floor luminaires inhibit the free movement of cameras and artists, so that most units are sited above the acting area, apart from a small portion of low-level filler. This calls for very careful planning, so that accurate positioning of the overhead rig will give optimum vertical and horizontal keying angles. In a complex production, a number of lighting treatments will need to be superimposed and integrated as one rig.

The plot can be built up initially by recording the artist's position in a given set. For instance, we could have a dawn situation where we depict the artist's position, a nighttime situation, additionally—even a daytime situation.

So we are faced with this problem of having to light for a number of scenes in a given set. The lighting treatment will be built up in the same way, but in the final composite plot, whereby careful assessment is increased by a factor of, say, .3 rather than three times the basic lighting treatment.

In the multi-camera operation, an additional hazard exists for the lighting director in that continuous sound pickup is also required—normally by the use

of sound booms—with the need to avoid boom shadows, and further pressure to accept a compromise exists. That these problems are overcome is a tribute to the skill of the lighting director. That results of the highest artistic quality are achieved, not mere illumination, as is sometimes suggested, is a tribute to the artistry of the lighting director. To sample any television channel of an evening will show instantly examples that testify to the highest standard of lighting for multi-camera production in British TV.

PAUL BEESON, B.S.C.—Lighting Cameraman

Mr. Chairman, Ladies and Gentlemen—To talk about lighting motion pictures is a very difficult subject to get over, the main reason being that the approach to a film is an individual one. There are no two cameramen, probably, who will light a sequence the same way. What one cameraman thinks is correct, another one will think is wrong.

What I would like to say is this: I prefer the single-camera technique for many reasons. We mustn't get mixed up too much with television. I mean, it is happening in the cinemas now. Today, we are getting feature films made from television productions which are very successful on television, make a huge amount of money in the cinema—but only the once. The second time they seem to fall flat.

You know, we are a medium on our own. All this marvelous automated equipment is fine for television when they are under pressure and, as we have been told, for a 90-minute film play, they only have three days in the studio. This is a means of recording a play, getting it onto either tape or film as

quickly and as cheaply as possible. On the feature side, we have the advantage which we don't want to give up; it is an advantage, subject to our budgets and schedules, of getting as near to perfection as possible and only by lighting with a single camera technique can one maintain this sort of standard.

I can give you some examples. I have just done a multi-camera technique film for ABC Television in America. I made it work because I *had* to make it work, but the whole thing was a compromise. We shot something like seven hours of film in nine-and-one-half weeks, and with four cameras for three weeks on a courtroom sequence. Now, when you're lighting, the lighting can only be correct for one camera. If you have a back light or a kicker light, when you look through the camera and you balance it, you get it absolutely right, the way you want it. The second camera may be picking up a closeup and the angle of reflection of that kicker or back-light is far too strong. There is nothing you can do about it. I know that in electronics they can control these things, but we are talking about using film for the cinema.

I know there are quite a few producers who are trying to bring in multi-camera techniques to shoot films very quickly. I'd like to say that this is only a means of *recording*; it is not *picture-making* and I would hate to see the proper way of making films sort of disappear just because of some economic situation.

We have, in the studios today, some very old-fashioned equipment and some very modern equipment. The old-fashioned equipment gives perfect results—if we know how to use it. The new equipment saves time and this, also, is an added advantage, but we mustn't let the tail wag the dog. We are cameramen—*Directors of Photography*, we like to call ourselves—and we still like to have the full control of our medium. From the charts and things that we've seen here, I believe that, in television, the tail is wagging the dog, because I cannot see how, artistically, you can put down on a piece of paper how you are going to light a set. You can give a rough rig and then, after that, you know, it is the individual's eye that creates the final mood for the film.

Some directors have said to me, "With a multi-camera technique it's marvelous because you can have two cameras opposing one another. You can shoot the over-the-shoulder shots at the same time." Now, this is fine in theory, but it just doesn't work, because if we are lighting an over-the-shoulder shot, for instance, the person in the fore-

ground, back to camera, is usually kept down in light level, mainly because he is out of focus and also because we don't want the audience to look at him too much, because you are photographing the *other* person. If we have an opposing camera to that shooting the opposite over-the-shoulder at the same time, we have to light that person fully again. So now we've got a person who is fully lit in the foreground, out of focus, which makes it look as if there is twice the amount of light as there is on the other person and you are not concentrating the audience's eye on what you want it to look at. This is just a simple example of how it doesn't work.

The other way it doesn't work, with multi-camera technique, is when you have a camera photographing a long shot, and other cameras, with zoom lenses, picking up closeups of artists from a huge distance away. This can be very unflattering to the artist, because all the lights are forced up high because of the long shot camera. One tends to get dark shadows under the eyes, you can't individually treat a lady's forehead with a shadow or shade the brow because it is too white and, therefore, you cannot make the best of portrait photography when you are reaching for it on the end of a long zoom.

Another thing is that the zoom lens, I think, has made everybody very lazy. The zoom lens is a marvelous tool, when used correctly, but today, I mean, people try to force you into shooting closeups with the long end of the zoom when it only takes three minutes to wheel a camera down there and another five or six minutes to polish up the lighting and do the job correctly.

I don't think I've got very much more to say, but I have an excerpt from "JANE EYRE" which I'd like to show you, and from it you can get an idea of why I think floor lighting only can be used in photographing this type of sequence. The whole set had a ceiling on it, with candle effects when the people were walking about. All this had to be lit from the floor, with lamps hidden by artists as they walk around, and things like that. We had many light changes as the actors moved about. It will give you an idea of the problems we have with a single-camera technique.

(EDITOR'S NOTE: At this point a short sequence from "JANE EYRE" was projected on the screen—very low key lighting, with all of the illumination apparently coming from candles carried by the actors.)

The entire candle sequence which you have just seen was lit from the floor; there was no rigging up at all, mainly because of the ceilings in the set.

I chose this piece because this is the sort of thing that I'm certain cannot be done with a multi-camera technique or with any automatic lighting rig, no matter how complex. These lamps had to be put on the floor, hidden from the camera.

I know it is an old-fashioned way of doing it, but it's still the best way, I think.

BILL LEE—Thames Television

I'm going to counterattack Paul and I'm going to propose that there is no valid reason for lighting to be restricted to a single camera, provided that pictures can be viewed accurately and exposure can be controlled from a remote position. Indeed, it might reasonably be claimed that single-camera shooting for a complete production is an outdated concept, belonging to the past rather than the present and sustained through custom and practice. It's based upon the premise that control of lighting and exposure is only practical from the single-camera viewpoint. This was true when pictures had to be viewed through the single eyepiece of the camera or a simple optical viewfinder. Picture balance and tone were then assessed and exposure was calculated by meter. Under such circumstances, it was a complex task to create imaginative photography, even from the single-camera setup.

Modern equipment has removed the limitations to lighting that previously existed. This has not meant changes in the principles of lighting—simply an extension of the technique already used in single-camera work. Indeed, any scene in which the camera and the artist change their axis during the scene involves the use of similar techniques with either system.

Is it really a fact that the closeup is so inferior when lit for multi-camera? In multi-camera television enthusiastic producers are forever telling us that it is a medium of the closeup. The screens are usually filled with faces, to the despair of design and costume. The face is the basis of our multiple-camera lighting. We plan its relationship to the camera and position the lights so that it is lit advantageously. It surely cannot be claimed that on every occasion where a closeup is required the only way to light it in a satisfactory manner is by breaking the natural flow of action and lighting each face independently of the master shot. And on location, inside or outside, it doesn't make sense to shoot master shots and then separate closeups with the interminable delays due to weather, aircraft and all those disconcerting happenings that seem inevitable

on location, when the whole scene might be recorded in one go if multiple cameras were used.

Lighting of the highest standards is possible with multiple cameras, provided that the whole visual design team cooperates adequately in advance. The director, in particular, must think creatively before the production commences in the studio.

We suffer at times, in television, from what might be called a "cowboy director." He places as many cameras as possible across the front of the set, shooting his way out of trouble, spraying camera shots at random—rather like a Western shoot-up. Good photography is improbable if the director is incapable of thinking creatively in advance, or, as sometimes happens, if he is too lazy to do so.

It is perhaps pertinent to raise the question of what incentive the single-camera lighting specialist has to encourage the use of multi-camera shooting. Perhaps the most tactful answer is that few advantages would accrue to the individual. However, the pattern for single-camera photography was set by Hollywood in its heyday and so was the important relationship between the lighting man and the production—a relationship to be envied by we multi-camera moguls—but the equipment available at the period offered no valid alternative and the elaborate and sophisticated craft evolved 35 years ago should not dictate the manner in which we make use of the equipment available today.

Multi-camera lighting is a practical and satisfactory method of making programs. A method that will certainly be used for all types of programs in the not-too-distant future.

If modern aids had been available and used when many of the great feature films of the past were being made, would they still have produced the superb photography that aroused so much admiration? I believe that the lighting cameramen would simply have adapted their enormous talents to the newer techniques and the results would have been just as good—in multi-camera. ■

OSSIE MORRIS, B.S.C.—Lighting Cameraman

Ladies and Gentlemen, Mr. Chairman, before I plough into the attack I would like to make one comment. I thought that Jim Richards spoke very quickly so that I wasn't able to pull his argument to pieces too quickly. But I did grab onto a couple of things which I would like to correct him on before I get into my part of the program.

He said that a television drama would take about eight weeks to produce, which was one-tenth of the time that it took us to make a film. I would like to point out to Jim, that I've never had the pleasure of having 80 weeks of shooting in my life. Jim did say, with great pride, how there was a dark foreground in part of the video tape. I thought that he was so surprised that he even got a dark foreground that it was quite an event. Also, I thought the video tape was a classic example of where there is no audience involvement, and that is the basic difference between multi-camera and single-camera techniques. You are an onlooker in looking at that machine; you are not involved in the action and I would just like to make that point.

Regarding Bill Lee—he made one comment which I must call him to task on. He said that as long as you've got the right exposure and the correct projection facilities, you're virtually home and dry. I don't think that's right at all. I think it's where you put the lights that's the most important part and I think that's the weak part of the multi-camera argument—which I will come to later.

I still think that some of the best photography you see on the television screen today is in the old movie films. They were done with the single-camera technique and, as far as being old-fashioned and out of date—well, I wouldn't mind having the Mona Lisa.

Now to plough to the attack. The multi-camera system, I think, is brought on purely and simply by economic necessity—and, in any art form, if you've got that over your head, you're a dead duck, because the economics are always going to dictate what you do. I think that the film industry, and the television industry are designed to tell a story in pictures and if you do that, you must have complete freedom to express it in an art form. Bill showed us some wonderful lighting rigs—marvelous they were. I mean you couldn't see the roof for lights, but who wants that? All right, you can pull a light down very quickly, but if you can't get it in the right place it's wasted. It's far better to bring in one single light quickly, put it on the floor and work from that.

The multi-camera technique, I think, was devised as a result of the insatiable thirst of television for product. They just can't get enough product. It's an endless pit there and you can just pour film into it and they'll use it, and I think that's one of the reasons why the multi-camera system has come into being. If that product source were reduced by 50 percent, I think you would find that, very quickly, there would be a



President of the British Society of Cinematographers, Paul Beeson, BSC, characterized the single-camera method as "old-fashioned, perhaps, but still the best way."

switch back to a single-camera technique.

Multi-camera technique, as they both admit, is quick and it is cheap, but artistically it is dull. You just can't do the things you can do with single-camera technique. There is little or no chance to vary the style. You can't do a form of color control to any degree because you are trying to think of three or four cameras at the same time. You can't get colored costumes against a particular background you want because, if you do it for one camera, you can't get it for another. And it's those little things that make the difference, I think, between ordinary photography and very good photography.

I maintain that you can never get the cameras in the right position; they are always tied in knots, one photographing the other. What they do is settle for this awful compromise where they get sort of three-quarters to the right position and they kid themselves that it's there. But, as you saw on that VTR, there wasn't one closeup where the person was looking almost into the camera, unless they walked in the most bogus way towards the position that they were told to go to because the camera happened to be there. Maybe the actor doesn't want to do that, but he is forced to do it by the system, and that's where I think the system falls down.

The classic example, as we all know, is the two-shot, a medium two-shot, Continued on Page 1164

THE CHOICE BETWEEN FILM AND TAPE



Must there necessarily be a choice between film and tape—or is it possible that these two vital media can continue to co-exist, grow and complement each other?

"The Great Film-Tape Debate", as it has been called in these pages (see *American Cinematographer*, October 1972), has raged for some time now.

The arguments for and against both media are, by now, quite well-known, but rarely have they been crystallized so succinctly or compared so lucidly as in the FILM 73 Session entitled: "THE CHOICE BETWEEN FILM AND TAPE".

The two gentlemen involved were both from the B.B.C., both consummate professionals with a comprehensive knowledge of their respective medium, and both extremely articulate and witty speakers.

Representing the Film side of the question was Mr. J.H. Mewett, O.B.E.—General Manager, Film Operations and Services, B.B.C.

His opposite number on the Tape side of the fence was Mr. G.D. Cook—Assistant Chief Engineer (Operations), B.B.C. Television.

Mr. Cook stated his case first and was followed immediately by Mr. Mewett.

Both gentlemen presented—on monitor and on the screen, respectively—visual evidence of the excellence of their preferred medium, and both examples were first-rate.

Both men also presented, in slide form, various statistics, logistics and cost comparisons to support their claims of financial advantage. Since this is an area fraught with a multitude of considerations and is, at best, like comparing oranges with apples, the better part of valor would be to call it a draw and let it go at that.

Be that as it may, both of the speakers laid out the facts with incisive clarity and an absolute minimum of excess verbiage. Because it is felt that these facts may prove enlightening to *American Cinematographer* readers currently caught up in the Film-Tape middle and wondering which way to turn, the following transcripts of "The Choice Between Film and Tape" are being published herewith, only slightly edited down to accommodate space limitations:

MR. G.D. COOK—Tape

Well, Mr. Chairman—I rise, I think,

an electronic Daniel in a celluloid lion's cage, and it's with a certain fear that I approach film gentlemen to try and convert them, but let's have a go. I'm here to put the case for electronic methods of production. My background is basically a television one and the experience on which I draw is the making of drama programs for television using electronics.

Now, what are the special things that our directors like about electronic production? The director on a television monitor can direct both his artists and cameramen from either a monitor in the vehicle or from a monitor at the scene of the action. He can have instant replay; this can save time and money. If the first shot is wrong, the director knows straightaway and can reshoot before leaving the location. Electronic cameras make no noise; they can accommodate a greater range of light levels and color temperatures than do film cameras. Recent advances in editing technology can make video tape easier and even more sophisticated than film editing techniques. Indeed, in Hollywood, some programs are shot upon film, edited by CMX on video tape before transfer to film for release.

Recent developments in electronic cameras have resulted in the introduction of lightweight hand-held equipment. Color correction on film itself I think you have to agree, is a cumbersome process. Electronic correction is both simple to operate and sophisticated in concept. Many electronic processing sophistications can be used to enhance pictures and provide special effects and, if one must have a film end product, there are a number of excellent systems which enable electronic material to be transferred from tape to film, providing quality suitable for projection on the large screen and among these systems are the CBS laser beam recorder, the Image Transform System, Vidtronic, and Color Video Services.

I don't propose to claim that tape is better than film, or that film will be superseded by electronic methods of production. Each, I think, has its place. Clearly the supreme ability of the film cameras is essential in certain productions, but the recent use of miniature

electronic cameras in the drama field is of interest. This is both in the BBC and in the independent companies.

We are building a lightweight unit with two miniature Fernseh cameras to gain further experience. There are two sections to the vehicle. The rear end is the production department, containing essentially simple sound and vision mixers, basically a two-channel vision mixer and, in the engineering end, the usual engineering facilities and space for a VTR. We expect that this will be a helical scan machine. Thames Television has recently built a skypod control room. It's designed to fit into freighter aircraft. This means that Thames can drop an electronic mobile control room into a freighter and I'm told that their particular unit is dashing around Europe at the present time.

I think we should now look at the economic situation. A 16mm sound film unit costs approximately 10,000 pounds and maybe that's terribly cheap when you look at the sort of prices that we have involved ourselves in. I know that the lightweight unit with two cameras, with helical scan VTR will cost 150,000 pounds and one can look down at the other capital costs.

Material costs on the electronic side begin to look quite attractive. 70 to 100 pounds an hour of video tape material, and that's reusable. 45 minutes of original shooting stock, answer prints and show copies—about 1,600 pounds, and you can't really use film again. I'll show later that comparisons on a total costing basis, taking into account script style, can favor electronic equipment.

We've done a very considerable number of location dramas. In the main they have been of the classical series type and we go to these fine old houses where one can get the exteriors very happily and, with script styles which accept the limited mobility of conventional television cameras, we've been producing highly satisfactory dramas as viewed by our head of drama group. For some interiors—we've learned a little from the film industry—we, too, hide men under tables holding microphones to overcome sound problems. The lighting man, in my opinion, achieves some excellent effects, particularly in the two and

one-camera set ups—lighting effects which, I think, compare with the sort of things which one is accustomed to on feature film.

The production of drama with standard cameras has, inevitably, introduced many limitations. They are bulky; one can't move them around very quickly. The first generation lightweight camera was the CBS Minicam. We say lightweight. Cameramen may not agree. In fact, we had to put scaffold tube grafts into their spines. The camera was of the order of 48 lbs. and really a little too heavy to trot around with. However, these cameras have done yeoman service, both in the sports field and in the drama field, but recently, in the last 12 months, a German company, Fernseh, has produced a camera which I think

often repeated a number of times until the director was satisfied and the director expected to indulge in considerable editing after filming—and, if I dare say, the evil that film men do lives after them.

It seems unlikely that the film industry will be able to make a major increase in productivity. When television first started there were no means of recording either on film or on tape. Productions were mounted in real time using multiple cameras and a vision mixer to cut or "mix" between the cameras. In our studios today, directors are expected, or required, to produce 25 to 30 minutes of program material in a day and our studios' shooting ratios seldom exceed 1.5-to-1 and are usually nearer to 1.2-to-1. For location work, a film

with a mixer follow television production methods—immediate assembly and all the things which one would expect from television productivity. The cameras can operate from mains or battery and, as far as editing is concerned, all the well-known facilities are available. Properly used, and given a suitable script style (we'll come to this later), the costs can become very competitive with film. And, as you have seen earlier, color film recording systems are available for transfers from film to tape. Clearly we can't take on things where great camera ability is required, but given a script style which is suitable, electronics can compare in cost terms very favorably with film.

It is interesting that film and television techniques have joined together in systems such as video film recording, and at least one camera manufacturer is marketing a camera with an electronic viewfinder which will give a remote picture on a monitor to a director. Indeed, one, from time to time, hears of directors who say this is something they would like with film, and maybe they wish to break through some form of film cameraman barrier.

In the BBC at the present time, there is a great demand for production staff to make use of electronic cameras for location work and, while it's a field in which I have no personal experience, it's clear that many more agencies intend to make television commercials using electronic equipment.

Video tape cartridge machines could have an influence here. It's not without significance that new facility companies are setting up with VTR, slow motion disc machines, CMX editing, laser beam film recorders. In Wardour Street, that bastion of the film empire, there is a building called Film House and, by God, it's crammed full of electronic equipment. Is it going to change its name to Tape House? A bit further down the road there is even more of this stuff and maybe one day Wardour Street will become the headquarters of tape.

Film cameras are, I think, largely incapable of much further development. It's just possible that more sensitive film stocks will appear on the market, although one has, I suspect, reached certain physical and chemical boundaries which will inhibit much further major stock development. Electronic equipment, on the other hand, will inevitably be developed further and who knows what the future holds for electronic equipment?

In conclusion, recent developments in broadcast standard electronic equipment have resulted in a reduction in

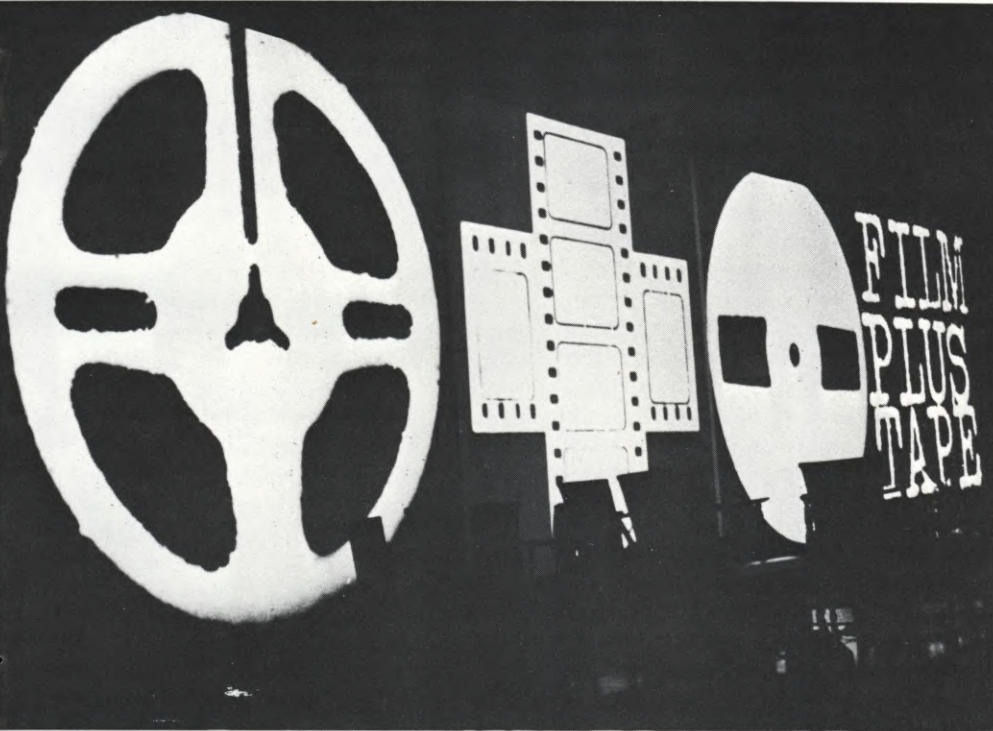
Continued on Page 1212

one can say is really the first genuine lightweight camera which we've seen. The shoulder weight is about 15 lbs.; the backpack weight is 8.8 lbs. One can have 60 feet between camera head and the backpack if the backpack is an embarrassment, and one can operate on up to 2,600 feet between the camera man and the vehicle on 12mm cable. A very attractive camera and getting down to the sort of size which we think is very practical.

The difference in productivity between television and film is largely historical and, when the movie industry first started, it was customary to break down the script into small manageable portions. They seldom exceeded two-minute takes. Individual takes were

unit may achieve only 2, 3, or 4 minutes of complete material in a day. The target for an electronic unit, given a suitable script style, would be about 20 minutes a day.

The main advantages of electronics are: we can offer greater camera sensitivity—up to two stops at the present time—and this can result in reduced lighting costs. 5-to-1 light intensifiers are coming along. They may be expensive, but, as they become available, their prices may come down. There are no problems in matching studio sequences. The director can preview and monitor takes. He can have instant-replay for review and the camera can be color-balanced to previous takes, which can be important. Two or more cameras



TWO YEARS' EXPERIENCE WITH COLOR NEGATIVE FILM TRANSMISSION



(EDITOR'S NOTE: The following are excerpts from a paper delivered at FILM '73 by Leslie H. Griffiths, Head of Engineering-Television Recording, B.B.C.)

Negative film is certainly very good on transmission, but I would just like to add a note of encouragement and say that we will still be requiring a few prints in the future.

The B.B.C. has been transmitting color negative film for about two years, and the potential of this system—and its problems—are much clearer now than they were in the beginning. I should like to explain why the system was developed and what our experience with it has been.

You can divide B.B.C. film transmissions into three main categories: brought-in films, news films and specially-shot films. You can immediately discount the first two categories because they are virtually always normal positives. So, you are left with the specially-shot films.

This type of film covers all categories of program output and it is frequently copied for sale to other users abroad. We've always gone to some trouble to keep the technical quality of this sort of film as high as possible, both because the program material demands it, and because it is often used for inserts in television studio programs.

We use negative film rather than high-speed reversal because it has much greater exposure latitude, better color accuracy and the ability to produce good prints. Admittedly, its speed is lower, but that can be offset by increasing the lighting.

Up until about four years ago, we still used some 35mm film—but the operational advantages of 16mm film, and its greater economy, finally prevailed. It was this change to a virtually exclusive 16mm operation that first stimulated our interest in transmitting directly from the negative. We'd already made useful progress in improving our 16mm film quality by replacing old equipment and generally improving the consistency and control of the processes

involved. But it was clear that there was a practical limit to what could be done, and the next logical step was to omit some of the processes.

We could see that, if we had suitable equipment, we could transmit the original negative and that if we did this, we could avoid the losses which we get in the print, in terms of resolution, steadiness, linearity and color accuracy.

Converting the telecine for negative transmission involves two basic changes. You have to modify the channel to invert and gamma-correct the negative signal, and you must provide additional light to overcome the density of the orange mask in the negative film.

Now, the implication of these changes are different, according to whether you are considering a flying spot telecine or a photo-conductive telecine. But, certainly, you can convert both types of machines to transmit negative. Our development at the B.B.C., as it happens, was applied to flying spot machines and the comments which we are making in this paper relate, of course, to the flying spot system.

The signal channel modifications do not present any major design problems. In effect, what you do is to reverse the signal polarity and introduce a very large amount of white stretch. The real difficulty with the flying spot system was to find a scanning tube which had a phosphor very much brighter than the normal zinc oxide phosphor and which also had a much finer grain—because, as the telecine expands the contrast of the negative film, it also makes the phosphor grain more visible. I think it is very much to the credit of the tube manufacturers that they've solved this problem so effectively. There are tubes of this type which are now available from several manufacturers and we shall be hearing more about these tubes later.

Essentially the tubes are very much brighter visually and they also have a much shorter after-glow than the zinc oxide tubes which we've used hitherto. These factors jointly result in a signal-to-noise ratio improvement on the telecine, even when you reduce the EHT somewhat. The simple fact is that signal-

Why the B.B.C. decided to use 16mm original color negative for some of its flying spot telecine transmissions—with a frank analysis of the advantages and disadvantages of the system

to-noise ratio really isn't a problem any longer, whether you are transmitting positive film or negative film. You can very easily verify this fact by stopping the telecine, the noise—if you can call it noise in the picture—isn't moving. It's nearly all film grain.

Following the development of these tubes, we converted five telecines to operate in this way.

What about our subsequent experience? I think, in general, it's confirmed the technical potential of the system. If you allow for some exposure latitude on the negative you can still comfortably cover a contrast range of 100-to-1 with excellent linearity and the telecine replays this very adequately. The optical flare in the telecine, when you are transmitting negative, is redistributed into the white areas of the picture where you don't notice it, and the color saturation you can enhance to whatever degree you wish by the use of electronic masking. Also, of course, you've lost the unsteadiness which results from the printing process.

The definition of negative film is, of course, inherently better, because you've eliminated the degradation of the print, but you must put in both horizontal and vertical aperture corrections to exploit this fully. When you make the print you get terrible compression in the tail and shoulder regions and, while this may be bad for the color and the contrast of the scene, it does make the picture look subjectively sharper.

Now, if you leave this compression out by transmitting from the negative, you've got to make the picture look sharp again by putting in aperture correction. While this doesn't present any problem, the real limit to what you can do in the way of aperture correction is set by the grain on the film and, therefore, what we are looking for now, in the way of future improvements, is a finer grain and improved resolution on the negative film—and I know that this is one of the things which the stock manufacturers are expecting to offer quite soon.

Now, what about the problems of the system? There have been three,

really. The first relates to color correction, the second to the visibility of dirt and the third to the strength of the splices in the film. When you make a print, the grader, of course, removes the variation in exposure and color balance. But, when the negative is transmitted from the telecine, the telecine operator has to correct for these defects. We find that substantial color and exposure corrections are required on two out of three negatives and, of course, these corrections change quite abruptly from shot to shot, so that an operator riding the telecine controls in the usual way cannot really respond quickly enough. Consequently, we've developed a thing which we call an automatic color correction programmer.

Essentially what happens is that the telecine operator rehearses his film in the normal way and the corrections which he applies are recorded and are subsequently back-dated when you replay the film from the end to the start of each shot. So you don't see the operator chasing, trying to find the right correction. Now, to do this, the system has to know where the shot changes occur, and there are two ways of doing this. Basically, one is to mark the film with a metal patch when you edit it and the other is to look at the telecine signal with a special device and deduce from that whether a shot change has occurred or not. I think, at this stage, all I need say is that the programming system does cope very adequately with the variety of shot-to-shot corrections which we require in practice.

While I am discussing color fidelity, perhaps I should mention two minor problems. First of all, the required degree of electronic masking which was originally computer-calculated did turn out to be rather high. It is not an easy thing to calculate, there are so many imponderable factors to take into account; so, in the final event, what we did was to adjust that degree of masking

on the basis of some practical tests. The second problem is that, on bright outdoor scenes, there is a tendency, sometimes, for the sky to turn pink and we think we know why this is. We believe that it is a combination of mistracking in the negative film at very high exposure levels which gets accentuated by the electronic masking in the telecine. We are looking into it and we have to get this right quite soon.

Now, to turn to the question of dirt on the film. Dirt, of course, is always troublesome on negative film and, if one transmits from the negative, the large amount of white stretch, which I mentioned before, looks at this dirt and turns it into a super-white, so that it becomes very noticeable. So you must keep a very high standard of cleanliness all through the processes.

In addition to the usual precautions which you have in telecine areas, we now clean the negative film immediately before transmission and we do this on quite a simple cleaning machine. It was originally an old waxer. It's just got a little tank of fluid and some velvet pads and it's rather slow, but it seems to work reasonably well. We've also found a proprietary type of dirt-collecting roller which we are trying on our telecines and this is available in Canada. This roller has a sort of self-rejuvenating viscous surface on it and, as the film runs on the roller, the dirt from the film is picked up and ingested into the plastic surface of the roller. The rollers are rather expensive, but they certainly seem to help.

We also looked at another technique at one stage, which you can apply to a flying spot telecine, and this was a system which looked for particles of dirt on the surface of the film, detected them electronically and then suppressed that element of the picture, rather as a video tape drop-out compensator does. Well, we proved the system would work, but, in the meanwhile, the rather simple

method of just cleaning the film in a cleaning machine seems to work rather well, too, so we've put that one on the shelf for the time being.

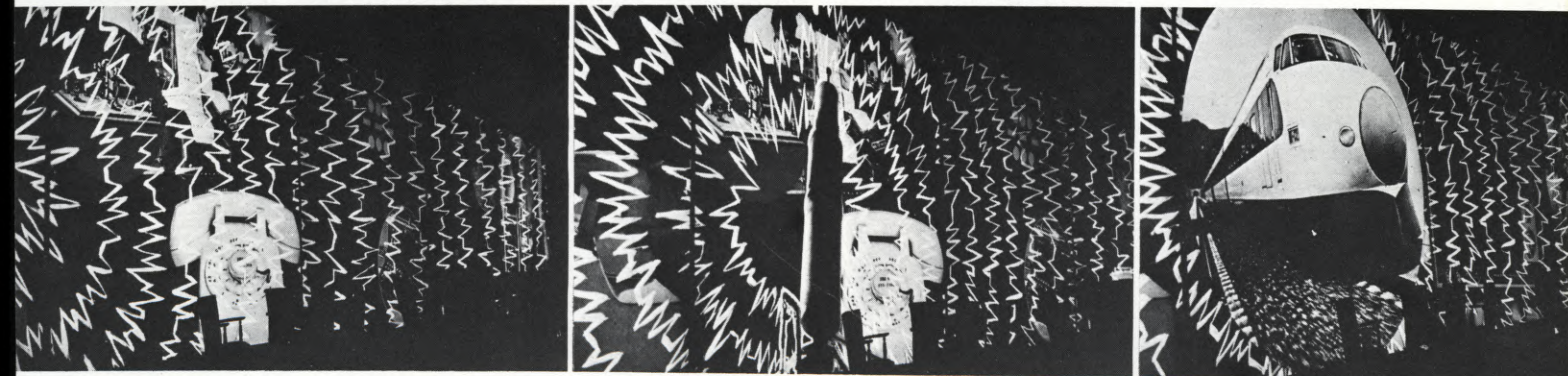
There's one point there which is rather interesting, actually. If one develops such a device, of course, you could suppress the dirt electronically when you are transmitting from the negative, but, if you made a print, you'd print the dirt in so that you couldn't suppress it. So, paradoxically, you could have a lesser visibility of dirt from the negative than from the print.

Damage to the negative film, which you might think would be a problem, in fact, hasn't been a problem, but splices, on the other hand, do present real difficulties. A print, of course, normally doesn't have any splices, but when you take a negative film that probably has 400 splices in an hour length and you are going to transmit that directly, you require some very reliable splices.

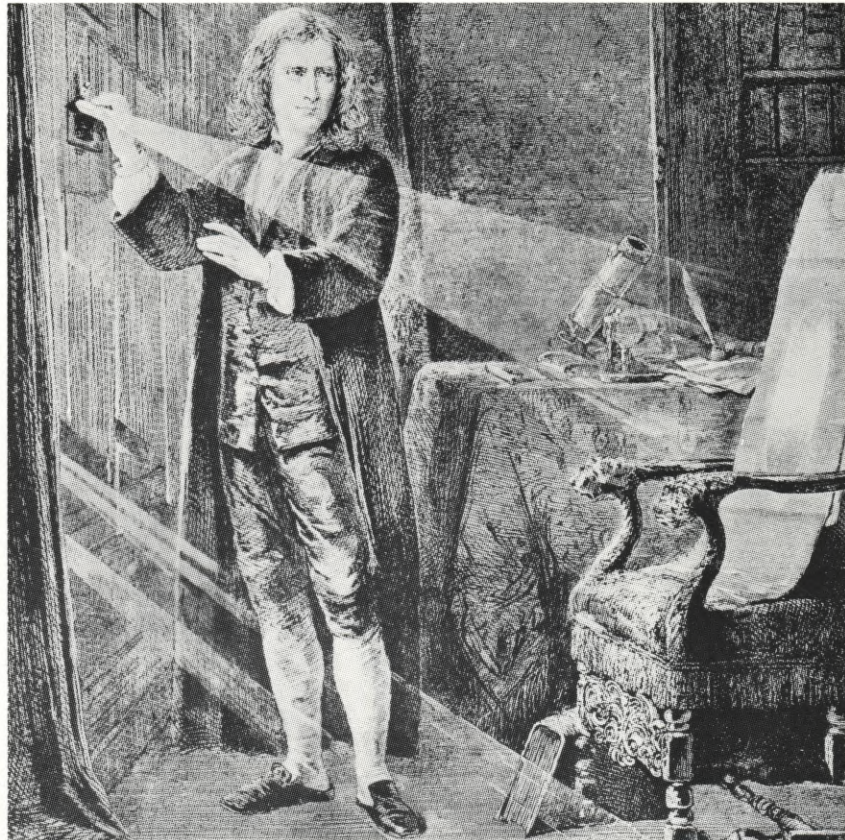
If you use the normal cement splices, you tend to see them in the picture, and they can also give you a slight disturbance on the telecine. So we try to overcome that by using welded splices, but we've found that those were rather brittle and they break sometimes, particularly during rewinding. The other alternative, that of the tape splice, is certainly very reliable, but it can cause unsteadiness on the telecine—although we think that, probably, that can be put right by improving the accuracy of the perforation on a splicer.

Alternatively one can use a narrow cement joint and that's not obtrusive, doesn't cause noticeable unsteadiness—but, of course, it isn't quite so strong as the full-width splice. So, what we do is to use tape splices where we are not backing the telecine or transferring it to video tape—and where we have a backing copy or have transferred to tape, then we use a narrow cement splice. I think we've got further development
Continued on Page 1139

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16mm FILM PRODUCTION IN UNITED KINGDOM INDEPENDENT TELEVISION



The 16mm format, with its lower film stock costs and increased maneuverability of equipment, offers many advantages, but there are still certain problems—hopefully, to be solved in the near future

(EDITOR'S NOTE: Following are excerpts from a paper presented at FILM '73 by Norman Greene, Research Liaison Officer, I.T.C.A.)

Over the past few years, we've been used to seeing our favorite dolly birds in color with superb quality at home on the television, and we've been very satisfied in seeing all the various details of our favorite women. So why has everybody suddenly gone to the moon and started using 16mm film?

Well, from the production point of view, it has several advantages. The prime one is the cost of the stock. If you compared ten minutes of running time in 16mm and 35mm, you would find a cost difference of somewhere between two and three-to-one, including the various processes throughout the production of the film.

In a production costing 50,000 pounds, the saving in the use of 16mm stock amounts to about 8%. If you go

to 35mm stock, you have to gross this out by about a 2.5 to 3 factor, and, as you can see, on a series of 13 or 26 episodes, this amounts to a very significant increase in cost.

The other advantage that 16mm gives to production people is a general increase in maneuverability and accessibility, with a resultant greater speed of production. Cameras can be hand-held; they can be set up very quickly in very odd locations. Gun Mikes can be used to help the sound problems, as can very small tape recorders and radio microphones. There are no umbilical cords, when using crystal sync-lock systems. These all contribute to the speed of production.

Now, of course, as with everything, you come to the disadvantages. First of all, you have the weather conditions. The 16mm system, due to the resolution of emulsion and the lenses, is very marginal when used outside under very bad weather conditions and, when you

are planning any 16mm production, you must take this into account by providing weather cover for every day you are shooting, so that, if the weather should turn bad, you can immediately go inside and shoot interiors. This has to be very carefully planned because all 16mm film series productions run to extremely tight time schedules—shooting, on average, about seven or eight minutes a day.

The second disadvantage, at the moment, is that, up until recently, in this country, there has been no really acceptable method of producing optical effects in 16mm. Also, this includes titling, and for nearly all the 16mm film productions shot for Independent Television, the title sequences are first shot on 35mm film and reduced to 16mm.

The third disadvantage, really, is the old grain problem. We are still waiting for these very long-awaited new emulsions which should have improved grain and resolution, but once we can get the grain down, with the use of vertical aperture correction, the resolution of 16mm film should be extremely acceptable for television.

The real problem has been, over the last couple of years, deciding whether to use zoom lenses or fixed-focal-length lenses and there has been a compromise arrived at, generally. This is that, normally, fixed-focal-length lenses are used for most shooting, and zoom lenses are used only where a certain artistic effect is required by the director. This is mainly due to the fact that zoom lenses do suffer, occasionally, from mechanical problems—tracking, focusing, etc.

With 16mm production you have to be very careful in your maintenance of the camera. Lenses must be collimated on the cameras that they are going to be used with—not collimated on a standard camera back at a maintenance workshop and then sent out into the field. This must be done on a regular basis to insure maximum performance at all times.

The other great problem with 16mm film production is lighting. Experiments have been conducted as to what is the best key-to-fill ratio of lighting. Four-to-one and three-to-one are quite accept-

Audiences attending sessions of the Papers Program received a comprehensive overview of the film and tape industries in transition. Of special interest were those sessions which included question-and-answer periods, during which members of the audience joined in lively discussion of the topics presented.



able, but do tend to give rather dark shadows. But a two-to-one ratio, with flesh color being about 30% reflection, the whites being about 70%, and black about 4%, seems to be very acceptable at the moment.

The other thing that one tends to lose sight of in film production is the fact that there are still lots of people with black and white receivers and, therefore, compatibility in costumes and backgrounds, etc., must always be looked at very carefully.

The other thing we come to is film stock. It is now generally accepted that if you are making prints which you are going to send out for projection, for sales purposes, you will have them done on a normal contrast stock, but if you are going to produce a print for use on the telecine, then one will use a low-contrast stock.

The other thing that great improvements have been made in during the last couple of years has been the grading of the prints. This has been brought about, I think, mainly by the use by broadcasters of television assessors, and they are far more aware now of the grading problems before they actually get the film in the telecine.

The other great improvement that is now coming into use, is the utilization of vertical aperture correction, but, of course, the amount that one can add is rather dependent on the grain of the film.

H.T.V., one of the regional companies of Independent Television, has recently been using 16mm for its general flexibility in production for producing a series about Arthur of the Britons and this has been shot entirely on location, somewhere, I believe, in Wales. London Weekend Television also shoots a 16mm film series—again, entirely on location—and they are very fortunate that this farm that they use has everything that they require for this children's series—farm buildings, a lake, a canal, a wood, cottages, you name it. It's all there, about 15 miles from London. The stories concern a little girl and her horse and one of the most interesting things they've done out at this farm is to improve the contrast range of the picture. All the exteriors of the barns (and the interiors, as well) have been painted a very light brown, which has been flecked up in grey, rather than the old black planks that the barns originally consisted of. They are also using a new zoom lens made by Rank-Taylor-Hobson, the new 5-to-1 Varitol lens.

I'd now like to move on to Thames Television which has a base out at a place some three miles from here in a very old school, St. Paul's School, where,

as a matter of interest, D-Day was planned. Out there, they are doing the whole of the filming of a sort of detective series called "Special Branch". Now, "Special Branch" is very interesting because it was, in actual fact, originally done in the studio on video tape. The whole thing has now been transferred to film, and it takes about 20% less man-hours to make it on film than with the equivalent studio production—but on a cost basis, laborwise, it is roughly the same, due to the levels of salary that film people are paid.

Now, Thames are rather interesting in the fact that they shoot a resolution chart every morning and this helps them to keep a track on whether anything has happened to the camera in its moving around from location to location. They are using a range of fixed-focal-length lenses exclusively and using the zoom only occasionally. ■

COLOR NEGATIVE TRANSMISSION

Continued from Page 1135

work to do in this particular area.

A significant limitation with negative transmission is that a single-strip negative can only handle cuts between shots. By comparison, a print will normally have been made from A&B roll negatives with full facilities for mixing and titling. This limitation can be overcome by using two synchronous telecines and replaying separate A&B film rolls with electronic mixing. We've equipped two telecines at Television Center to work in this way and they have been used on a number of programs.

What happens is that the two telecines feed into a television studio and you mix between them, as you would mix between two television cameras. Certainly this is a facility which we expect to be using increasingly.

The attractions of negative film transmission vary greatly from one program to another. For light entertainment, the ability of the film to give you bright and highly-colored pictures is quite important and, also, the time which you save through not having to wait for the color print is important. You also save some money, but that cost saving is really rather small in this situation. But, if you have a current affairs program with a 12-to-1 shooting ratio, the cost saving is much more important. In this case, if the program were transmitted as a print, the original negatives would all have to be printed and edited down, but, for negative transmission, the editing is all done with monochrome prints and, finally, you cut the color negatives to match the monochrome copy.

An alternative, of course, would be to shoot all the material originally on reversal film, but this is not so attractive technically. We don't think the quality is as good, and that is particularly true if you have to make a print afterwards, which, of course, we may have to do because somebody abroad may want a copy of that program.

The present usage of this system is still fairly small—about one hour a week—but it is increasing rapidly and the limitation has not been one of inadequacies in the system, so much as the need for ancillary equipment, such as color programmers and vertical aperture correctors. The manufacture of those is quite well advanced, so we are expecting a sizable increase in negative transmission.

Producers have shown great interest in the system and it has been used on a wide variety of programs. It clearly raises many possibilities for future operations, but this is not the time to discuss them because they will be covered in detail later. I'll simply suggest that negative film transmission is quite an important step in the integration of television, film and video tape recording, and that it will give producers complete freedom in the future to choose the techniques which suit their programs best. ■

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ATEMA 166 EDITING TABLE



From Sweden, a unique new editing console, with sound so good, its designers maintain, that it can be used as a mini-dubbing unit

The ATEMA 166 has been under development for over five years and was put into full production in late 1972. It is already in service with major film and television companies throughout Scandinavia, France and South America.

The designer, Jan Carlström, has built into the machine features which enable the user to develop a complete AteMa system incorporating recording facilities, sound transfer from Nagra, sound transfer from track to track on the machine itself, interlock with other AteMa Tables or sound channels and remote control for dubbing.

MAIN FEATURES

The Functions control panel incorporates illuminated switches for each channel in synchronous lock, projection lamp, work lamp and inspection panel. Current models also include a stop

switch. The Main Control switch governs sync speed, forward and reverse, plus high speed. To the right of this and just below the picture interlock switch is the inching control.

The Sound Control Panel incorporates a separate gain control for each channel, master gain control, bass and treble controls, optical-magnetic selector switch, headphone socket—which disconnects the main speaker. The speed filter automatically cuts the sound when the machine is run at high speed.

The Operating Module contains all the electrical components and controls all mechanical functions of the table. The module contains relays in plug-in sockets, plug-in boards for the variable-speed control and trim points. On the panel are the mains input, remote control unit, electronic display counter (available soon), interlock and the fuses.

The ATEMA 166 six-plate editing table. Manufactured in Sweden, the unit is actually a complete system, with great versatility in the area of sound recording, transfer and dubbing. The machine is pre-wired for every foreseeable future development. Completely modular, the ATEMA is easily serviced, with all units accessible from the top.

The Picture Head incorporates the mains switch for the machine, interlock and remote control switches and a warning lamp to indicate the spooling plates are off. There is also a knob for picture racking and a selector for screen/video scanning.

The Power Supply is through a specially wound Toroid-type transformer to reduce hum and vibration. Rectifiers and filters are on a separate printed board. All AC and DC voltages are easily accessible for measuring. All amplifier voltages are stabilised.

SERVICE:

The basic concept behind the AteMa system is to reduce time out of service. All components are modular and can be replaced in seconds. Even the main drives and motors have been made easily accessible for repair or replacement. The sound heads simply plug in and are interchangeable. The Picture Head can be lifted straight out of the main body of the machine for transportation and service.

The whole machine fits comfortably on the rear seat or in the boot of the average car and weighs approximately 170 lbs. (80kg.).

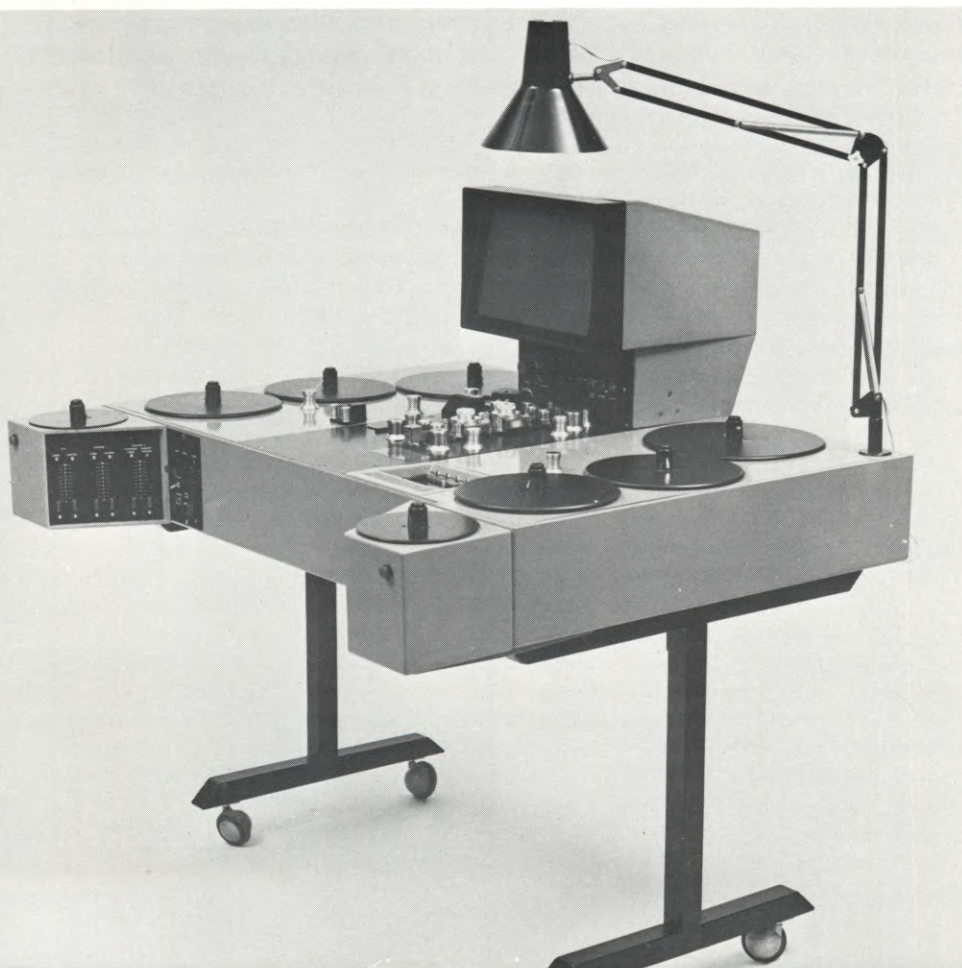
A Factory-trained service engineer will install the AteMa system on the customer's premises and make regular service calls.

A complete stock of spares, including circuit boards, relays, lamps, etc., are held by F.S.I. Limited.

In an informal description of the ATEMA 166 and its capabilities, a company representative states the following:

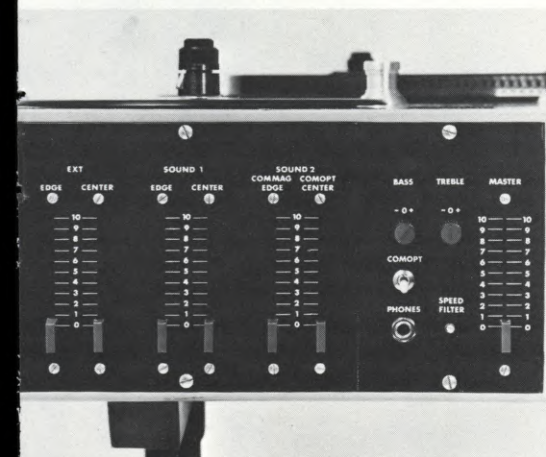
The ATEMA 166 is a six-plate editing table that will perform all of the normal editing functions, just like other editing tables of its type, but the sound transport system of this machine is so stable that you can record either directly from the Nagra by means of a synchronizer unit or, later, from our own built-in synchronizer unit—or you can transfer from track to track on the machine, from optical to magnetic, from single-system stripe to center track, from edge-track to center-track, or both.

The ATEMA 166 can, in effect, be





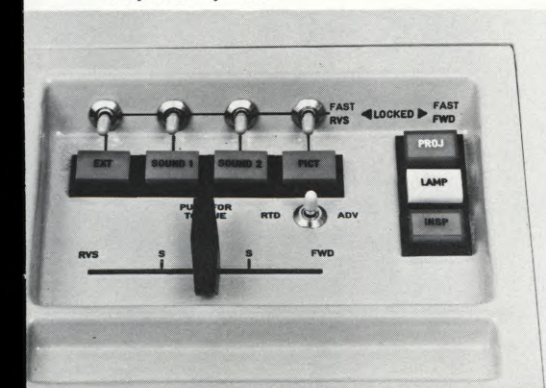
The Operating Module contains all of the electrical components and controls all mechanical functions of the table. It contains relays in plug-in sockets, plug-in boards for variable speed control and trim points.



Sound Control Panel incorporates a separate gain control for each channel, master gain control, bass and treble controls, optical-magnetic selector switch and headphone socket.

utilized as a mini-dubbing theater. You can lock another table to it to provide extra sound channels. You can lock it to a standard 16mm projector, provided that it's got a synchronous motor. You can lock it to a Westrex unit; you can lock it to a Perfectone unit; you can lock it to an RCA unit; you can lock it to almost anything, and the sound recording quality is, we feel, as good as

Functions Control Panel incorporates illuminated switches for each channel in synchronous lock, projection lamp, work lamp and inspection panel.



that of the Nagra.

The wow-flutter figure on the recorder transport is an average of .08—although, on some machines, we've gotten .05. The standard sound transport is about .12 on playback, but because you use a slightly different threading path to record on this machine, you get much better stability.

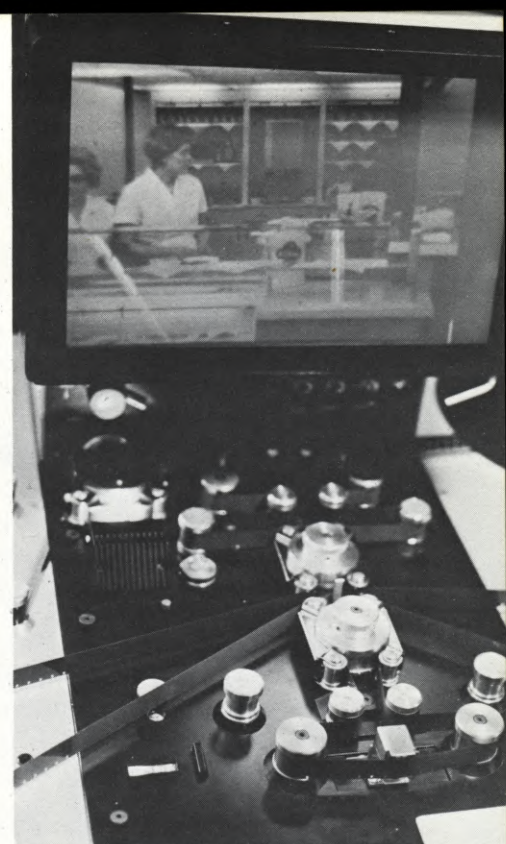
The machine is pre-wired for all future foreseeable developments. It is pre-wired to take a six-channel mixer. It is pre-wired to take a synchronizing module to lock the Nagra to. It is pre-wired for the new European standard heads. It is pre-wired for a cue-track. It is pre-wired for a mini-computer which will locate scenes for you, which will locate frames within scenes for you, which will locate the appropriate sound track and synchronize it for you.

The ATEMA 166 is not simply an editing table as such; it is the beginning of a system which will enable small production units to do a lot of things themselves that they now have to farm out to other people—and it will enable them to do it at a price that is a lot less than buying a separate editing table, a separate sound transfer unit and separate dubbing facilities. These capabilities are all there in this one machine. All that is necessary is to add on certain modules which we are producing for this table.

The changeover from standard 16mm to Super-16 requires only the simple flick of a lever located just below the picture head. You don't have to replace modules. You don't have to replace anything.

This machine is totally modular and it's a very simple thing to replace any of the modules. We realize that customers never read maintenance manuals, but if they are capable of using a screwdriver, by loosening two screws they can lift the whole module out, give us a ring and get a new module.

If the table doesn't run—no matter for what reason—you can be sure that there's something wrong in the Opera-



Viewing screen is in the 1.66 aspect ratio and change from Standard 16mm to Super-16 is made simply by flicking a lever. No replacement of the module is necessary.

tions Module, and we don't expect our customer to do anything more than just remove the case and slip the new module in. If the customer is experienced and can read he will even be able to replace relays, because there are full directions and sketches to show him how it's done.

With any kind of sophisticated equipment, whether it's cameras or editing tables, the service is always the big stumbling block. As a small and new company—we are only a couple of years old—we have to compete constantly with the big companies by providing excellent service and extra facilities.

The machine weighs 170 lbs. and can be broken down into compact components to make it easily transportable.

Another interesting factor about
Continued on Page 1190

TECHNICAL SPECIFICATIONS OF THE ATEMA 166 EDITING TABLE

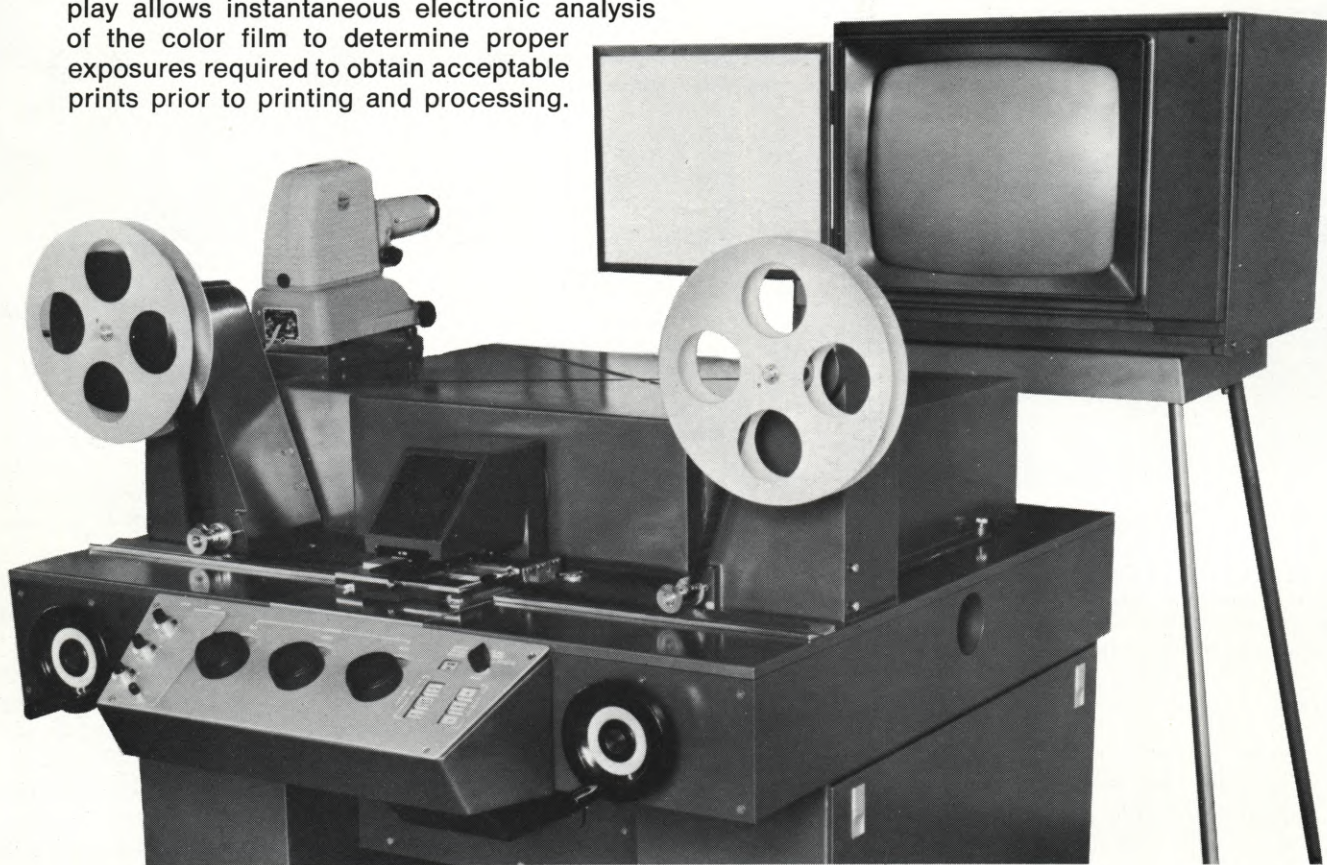
- Standard or Super-16 Picture change at the flick of a lever.
- Picture Capacity—1,200 feet (350 metres).
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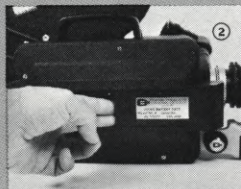
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⑧ Cameras perform equally well in all types of weather, from extreme heat to extreme cold.



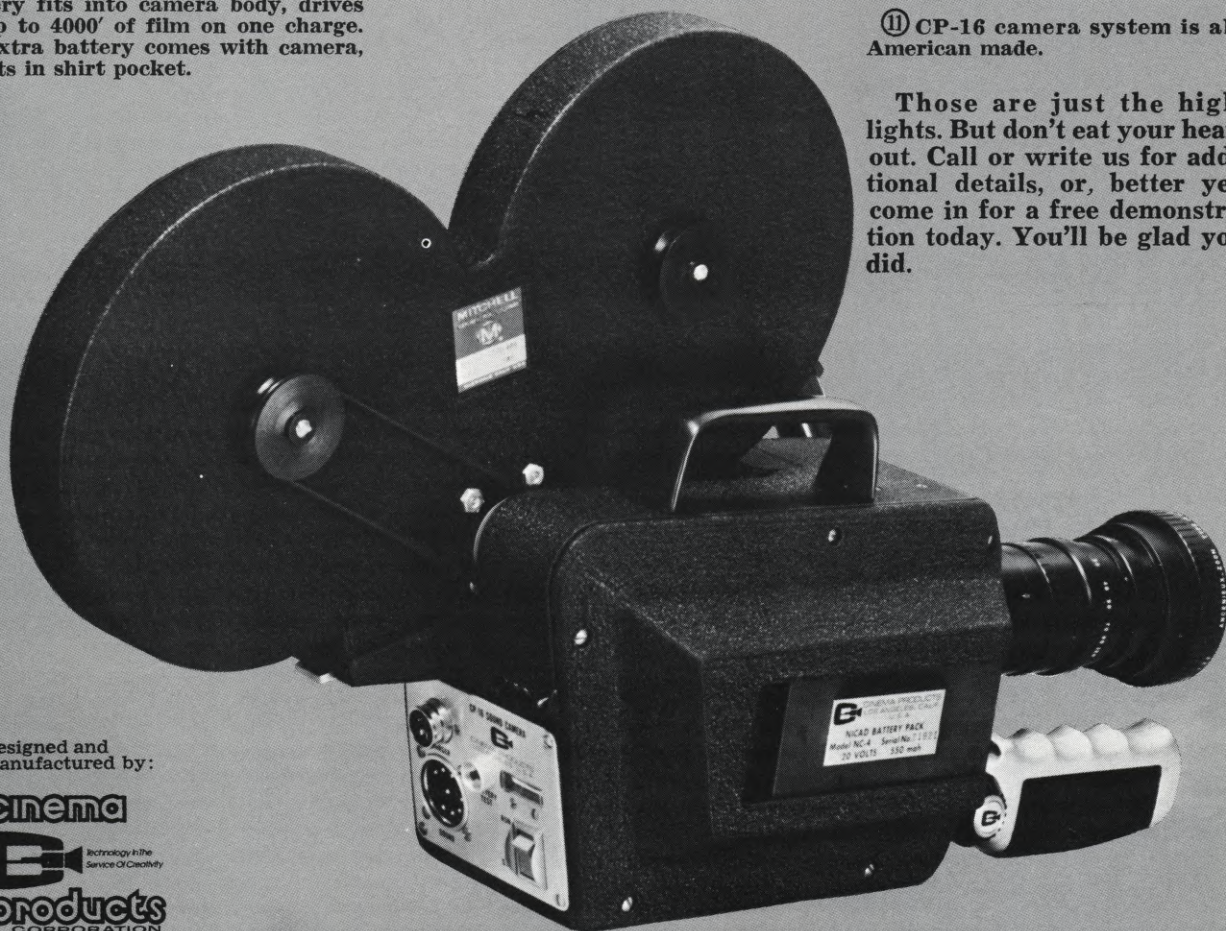
⑨ Standard Mitchell-type 400' or 1200' magazines can instantly be snapped on or off camera with unique quick-release button.

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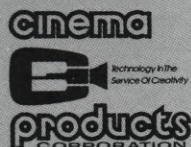


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THE TYCHO S.A.4 SPEAKER/AMPLIFIER SYSTEM



At last—a high-fidelity speaker/amplifier system to aid editors who have long struggled to read tracks accurately with primitive sound reproducing equipment in the cutting room

Ever since the advent of sound films, dubbing editors have struggled against the handicap of using primitive sound reproducing equipment on synchronisers and editing machines. Although the fidelity of large-scale and expensive editing machines has recently improved, the use of synchronisers as sound reproducers continues to be severely handicapped by the very low-grade track-reading equipment generally used.

TYCHO FILMS were the pioneers in the design of high-fidelity sound equipment for use in the film editing room. Their latest development is the TYCHO S.A.4 SPEAKER/AMPLIFIER, officially launched at the B.K.S.T.S. Exhibition, "FILM 73".

The S.A.4 has a specially designed, low-noise pre-amplifier for use with film synchronisers, which enables the Editor

to hear everything on the track with the same degree of clarity with which the sound will later be heard in the cinema or on television. The good bass response enables the Editor to wind slowly and hunt for the precise modulations on which to cut the track. The low noise enables him to make accurate assessments of the background of the recording, including wind and camera noise, and tape hiss.

The S.A.4 also has facilities for reproducing pre-amplified signals, such as from a tape recorder, cassette player or disc reproducer, so the Editor can select music or effects for use in the film. Provision is made for the installation of pre-amplifiers in the synchroniser to improve the rejection of induced hum or radio pick-up. A Phones socket is also provided, which is connected to give

"both ear" mono reproduction when stereo headphones are used.

A significant feature of the design is the use of the "audiobloc", a matched-power amplifier/speaker module. The power amplifier characteristics are carefully controlled to correct the response of the speaker, so that clear and precise response is achieved from the compact speaker, little larger than many "book-case" units. Output is 10W R.M.S.

The enclosure is made from the best, high-density materials and the smart white laminate finish also has the effect of improving the rigidity of the panels.

Power requirements are 110V or 240V A.C., 50Hz or 60Hz. A green neon on the front of the unit indicates that mains are on. All the electronics are modular in construction and Light-Emitting Diodes are used internally for rapid diagnosis of faults.

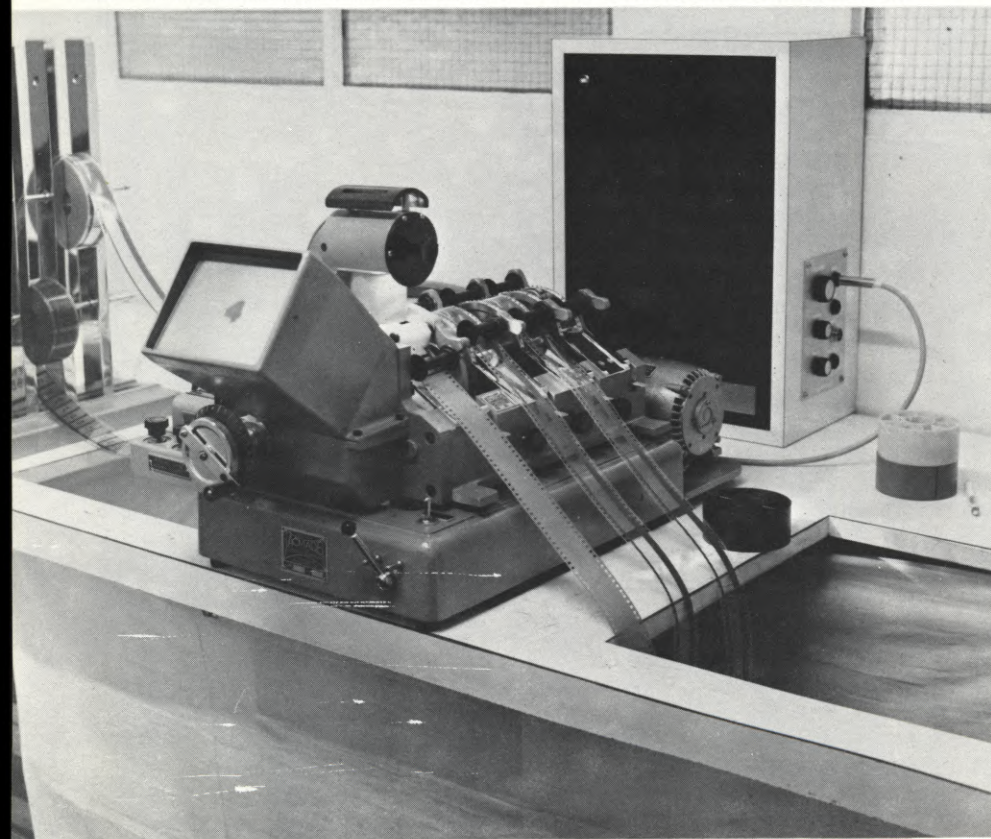
The high-fidelity specification of the design makes the S.A.4 a versatile unit, which can be the basis of a complete editing room sound system, including picking up signals from the editing machine, to give a great improvement in all track reading.

Being film-makers themselves, the people at TYCHO FILMS have been able to appreciate the need for efficient reproduction from synchronisers and have adopted an approach based on up-to-date electronic techniques and sensible design criteria to greatly improve the quality of editing room sound equipment.

They maintain the editors using their equipment find that the ability to hear everything recorded on the track has liberated them from much of the worry about precise editing of sound tracks. Problems such as traffic sounds, wind rumble or camera noise can be dealt with and "buzz tracks" edited, without testing each cut in expensive viewing sessions. In particular, the extended bass response enables the editor to hear the low-frequency "growl" of hand-inching clearly, facilitating close identification of syllables. This is a particular advantage for animators, who need to analyse sound tracks in exacting detail.

For further information, write or call
Continued on Page 1210

The TYCHO S.A.4 SPEAKER/AMPLIFIER, shown linked to a 35mm synchroniser/viewer unit. Its specially designed low-noise pre-amplifier enables the editor to hear everything on the track with the same degree of clarity with which the sound will later be heard in the cinema or on television. It reproduces subtle background sounds, including wind and camera noise and tape hiss. This eliminates the problem of having to test each cut in expensive viewing sessions.



NEILSON-HORDELL JUNIOR ANIMATION STAND



A low-priced, compact and highly versatile animation stand, with a range of accessories uniquely designed to meet the needs of smaller professional studios, universities and colleges

Intended for the smaller professional studio, for Universities and Colleges, the Neilson-Hordell Junior Animation Stand is designed to achieve maximum versatility within a limited price.

Designed for the new Neilson-Hordell Model 86 16mm Animation Camera, it may however be fitted with almost any amateur or professional Camera.

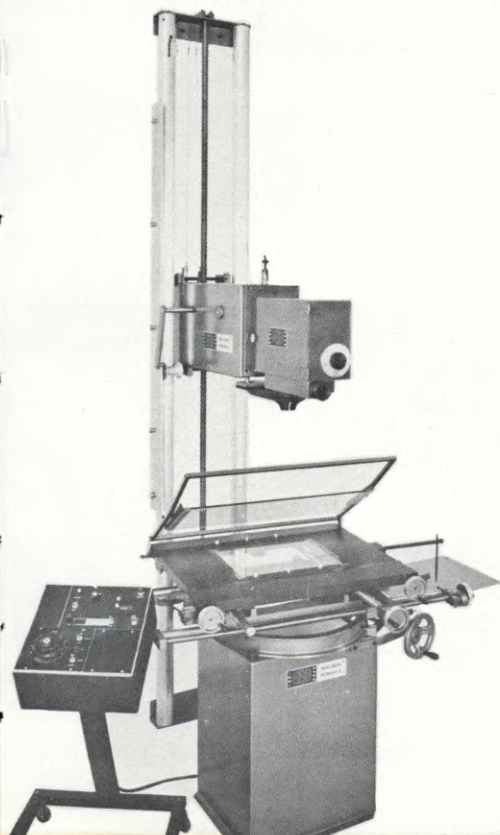
Unit construction permits one to purchase only what is needed for the type of work being undertaken; additions may be made later as the range of work increases.

Complete with accessories, the Neilson-Hordell Junior Stand readily accomplishes all the following:

Photography of art work, titles, etc. The table pans North/South and East/West and rotates. Diagonal pans are facilitated by rotating the table so that the E/W movement becomes diagonal.

Zooms by up or down movement of the Camera either by hand wheel or electric motor. Automatic follow focus holds focus during zoom.

The Neilson-Hordell Junior Animation Stand is shown here with the Neilson-Hordell 16mm Animation Camera, but may be fitted with almost any amateur or professional camera.



Cartoon animation. Cartoons and cels are accurately registered on pegs mounted in E/W travelling peg bars. Independent panning movements of up to three layers of cels are possible by using two peg bars and the E/W table movement.

Photography of transparencies. There is a clear glass insert in the centre of the table and underneath lighting may be fitted in the base.

A hole in the side of base allows for back projection or aerial image.

The Neilson-Hordell JS 25-02 Junior Stand is made up of three units; the stand, the base with rotation unit, and the table top with compound. Any may be purchased separately.

Unit 25-10: BASIC STAND

This comprises two vertical precision ground plated steel columns of 2½ in. (6.26 cm.) diameter carrying the Camera carriage. The columns are fixed at their lower and upper ends to the floor and wall respectively. The carriage is raised and lowered by a hand wheel mounted on the columns.

Also obtainable is a zoom hand wheel mounted at the front of the table base in place of the standard hand wheel mounted on the columns (25-11).

It is also possible to have this movement controlled by a variable speed electric motor (25-12). A Zoom counter reading the Camera position to 1/100 in. (0.25 mm.) allows accurate positioning for working out zooms or repeat shooting (25-13).

For automatic follow-focus (25-40), fixed to the Camera Bracket and the Camera is mounted on a slide movement and is operated by a Lever from a vertical cam. The price is dependent on the type of Camera fitted.

Unit 25-20: BASE AND ROTATION UNIT

The base is of sheet metal construction and the interior is painted matte white so as to act as a light box when a light is placed inside.

The base carries a 360° plain bearing rotation unit. On this is mounted the table top and compound (see Unit 25-32).

Unit 25-32 TABLE TOP AND COMPOUND ASSEMBLY WITH TWO PEG TRACKS

The table top of 26 x 21 in. (66 x 53 cm.) has a centre aperture of 12 x 9 in. (30 x 23 cm.) with a clear glass insert for underneath lighting. The table is mounted on a compound N/S, E/W movement running on 1 in. (2.5 cm.) diameter ground steel bars and operated by hand wheels through lead screws. Counters read each movement to 1/100 in. (0.25 mm.). Total N/S movement is 13 in. (35 cm.) and total E/W movement is 16 in. (41 cm.).

The table is fitted with two travelling peg bars. Each travelling peg bar is operated by a hand wheel at the front of the table with a counter reading its position in 1/100 in. (0.25 mm.). The peg bars are fitted one North and one South of the aperture in the table.

The removable peg plate may be attached to the peg bars for either 12 in. or 18 in. field format. (Note: A field is measured East/West.)

For holding cels or art work flat on the table, a pivoting glass platen (25-33) is available.

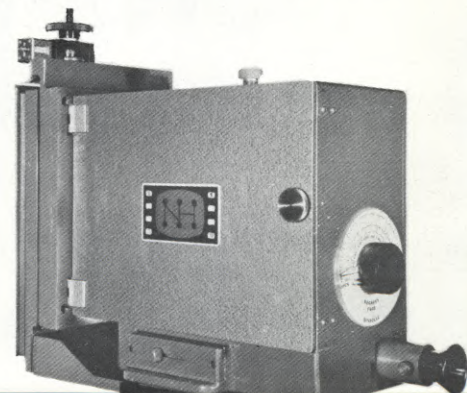
DIMENSIONS

Height	108 in. (2m. 75 cm.)
Width	41 in. (1m. 3 cm.)
Depth	51 in. (1m. 30 cm.)
Zoom Travel	48 in. (1m. 22 cm.)
Weight of Complete Stand (Without Camera)	350 lbs. (159 kg. approx.)
Packing Weight	450 lbs. (204 kg. approx.)

NEILSON-HORDELL 16mm MODEL 86 ANIMATION CAMERA

The Camera has been designed and built specifically for single-frame and
Continued on Page 1211

The new Neilson-Hordell Model 86 16mm Animation Camera has a built-in stop-motion motor, 167 f.p.m., manual dissolve and fade control.

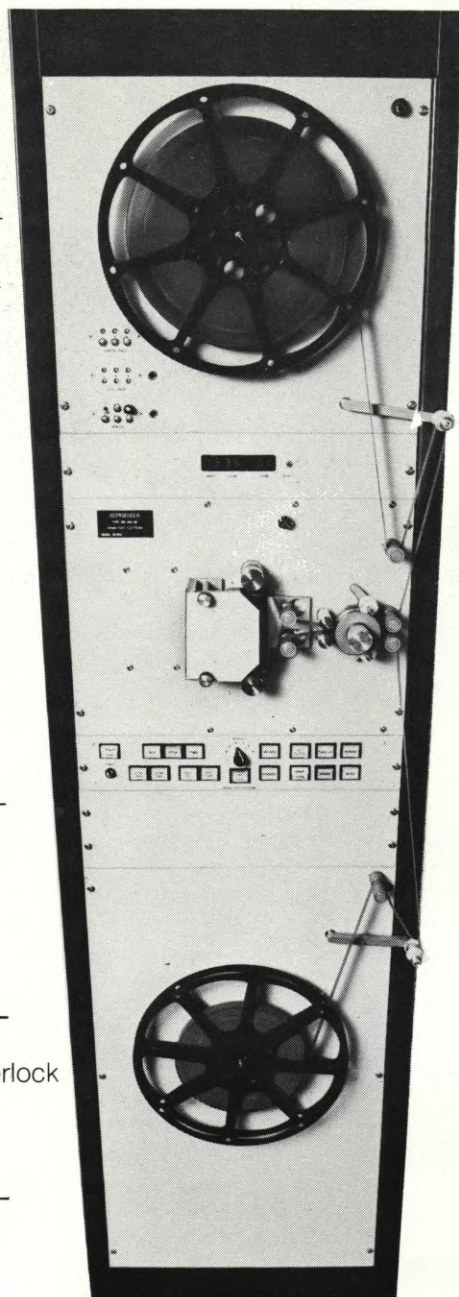


The state of the art in film sound just took a giant step forward. In Speed, Flexibility, Safety, and Ease of Operation. For sound transfers, looping, re-recording, double-system screening and telecine interlock.

Magna-Tech's new 600 Series is the reason. This versatile new system features electronic interlock, foolproof IC logic and improved mechanical and electrical design. Incorporating traditional Magna-Tech reliability and durability, the MTE 600 Series provides expanded capabilities and superior performance in any application from the most compact studio to the largest mixing complex.

Among its many features are:

- stepping motor sprocket drive
 - optical/electronic high-speed interlock system
 - local or remote advance/retard of individual films in interlock
 - operates at 6-times-sync speed through sprocket in interlock with Magna-Tech high-speed intermittent projector, via optical encoder
 - operates 10-times-sync speed in interlock with video tape recorder
 - operates local at sync and 10-times-speed through the sprocket
 - 115/220 volt—50 or 60 Hz operation
-
- flywheel accelerators for rapid start
 - film retracted from heads in all modes except sync speed forward
 - servo-controlled film take-up tension provides gentle handling of spliced tracks
 - automatic safety shutdown
-
- compatible with conventional interlock systems
 - multiple machine operation—as many as desired—in interlock via distribution amplifier
 - 6-buss interlock selector switch for studio delegation
 - can be cued on and off buss while running in interlock
-
- pushbutton-selected 16 or 35 speed and 24 or 25 frame rate, forward or reverse
 - local inching forward or reverse
 - plug-in head assemblies for play-only or erase/record/play, interchangeable for 16, 35, 17½ and multi-tracks
 - multi-track pick-up recording with selective erase
 - 3000-foot (1000-meter) reel capacity

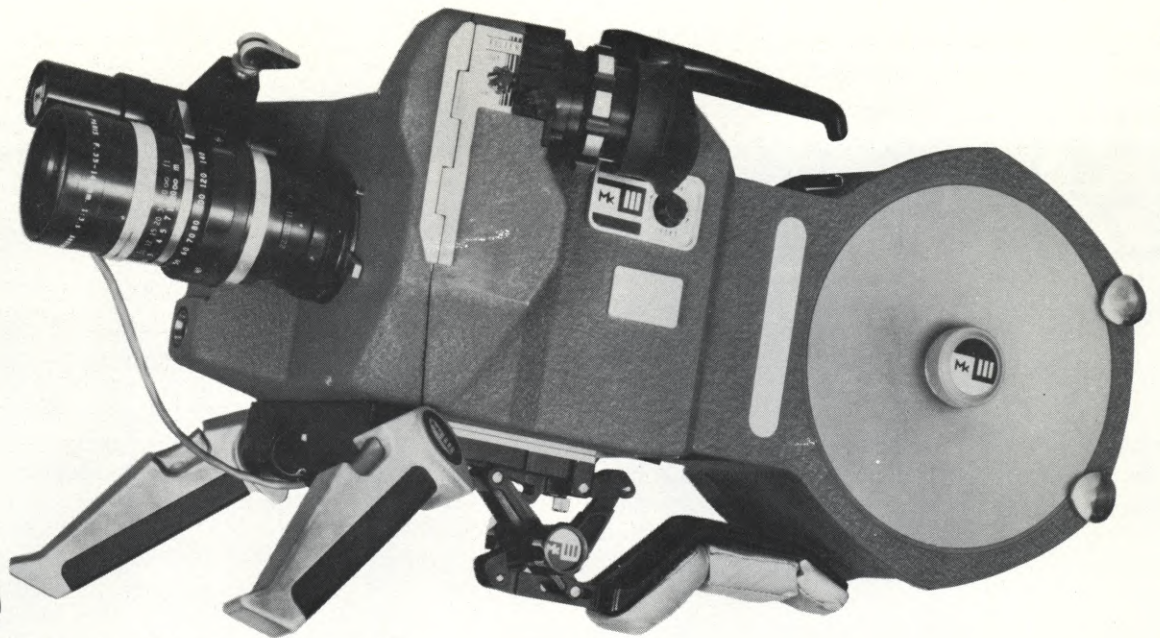


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P.A.G. MODULAR SOUND DUBBING SYSTEM



A system of compact, light-weight, portable dubbing modules that can be "stacked" to provide any required number of 16mm sound channels for dubbing on location or in the studio

Exhibiting at FILM 73, P.A.G. FILMS LTD. of London presented a unique system of compact, light-weight, portable dubbing modules that can be "stacked" to provide any number of required 16mm sound channels for dubbing work on location or in the studio.

The system is based on a modular concept in order to make it as flexible as possible. The heart of this is the sound plate module which consists of the film transport and head assembly; associated directly with this is the rewind plate module which holds the two take-up motors with their corres-

ponding switching and controls. The sound plate has been developed over a long period and incorporates various original design features which help to produce exceptional performance from a very compact unit.

There are three standard machines in the range all using the same basic modules.

The Mini-Rack, by P.A.G. FILMS LTD. of London is a self-contained projection/dubbing unit that can hold up to four magnetic transports (two on each side), all driven by one single-phase synchronous motor. Shown here in combination with Hokushin Polestar projector. The Studio Rack is taller, holds up to four sound channels and uses a three-phase interlock motor.

The Mini-Rack is a self-contained projection/dubbing unit and is the least expensive multi-channel system in the range. It can hold up to four magnetic transports, all driven by one single-phase synchronous motor.

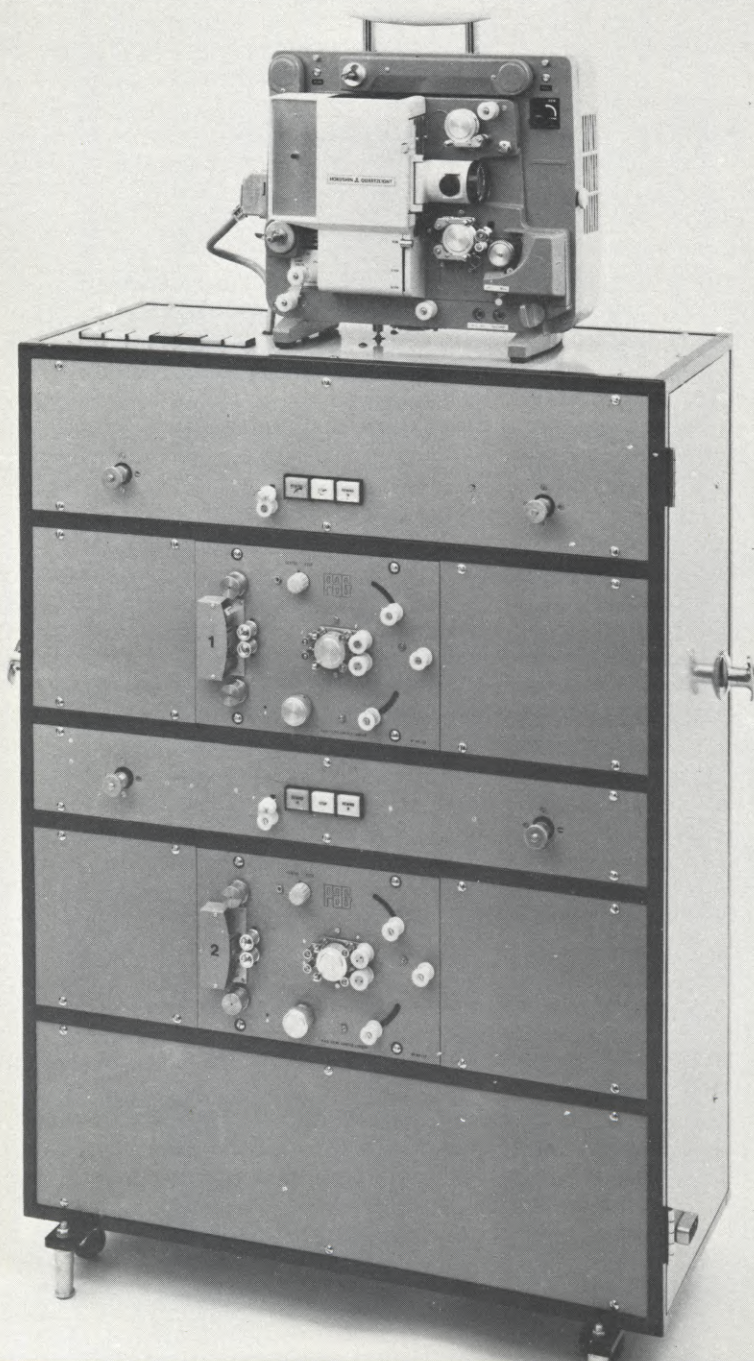
The Studio Rack is much taller than the Mini-Rack and can hold up to four sound channels. It uses a three-phase interlock motor and, therefore, can be locked with other racks and projectors.

The Portable single-channel recorder can be used either as a self-contained synchronous recorder for transfers or it may be interlocked with any projector fitted with a suitable P.A.G. encoder unit for double-head purposes. It is also possible to drive it from other machines and to link several Portables together. It is ideal for compact installations and location use.

The range of machines enables the customer to suit virtually any requirement. He can have one unit on a table or a full dubbing set-up with ten channels, but they are all composed of the same basic modules. Because all these modules are standard the manufacturer has been able to put them into relatively large-scale production without sacrificing quality in any way. The subsequent cost savings have been passed on to the customers.

The whole system, including the projector, is driven by a single-phase synchronous motor situated at the bottom of the cabinet. The basic cabinet is pre-wired to accept all four channels and it is, therefore, a relatively easy job to fit further channels at a future date on site.

The cabinet contains the power supply for the whole rack and the electrical switching. The rewind panels will accept spools up to a diameter of 345 mm. The feed motor may be switched to wind emulsion in or out,



and there are facilities for rapid rewind in both directions.

A Mini-Rack can be used as a double-head projector with only one channel, or even as a simple transfer unit without projector, with the facility of expanding into a full dubbing machine as and when required.

The electronics cards all plug into a hinged mother board which is fitted on the front door of the cabinet. It is, therefore, very easy to replace the boards and to adjust them.

THE STUDIO RACK

The sound plates of the Studio Rack are all driven by a three-phase interlock motor situated at the bottom of the cabinet, but all the other basic modules are identical to those in the Mini-Rack. The rack is pre-wired to accept all four channels, enabling the installation to be easily enlarged at a future date.

The Studio Rack is designed for larger installations where it is desirable to have the sound channels completely separate from the projection equipment. It is, therefore, normally fitted with a three-phase synchronous interlock motor which enables it to be used as a self-contained synchronous recorder or interlocked with an almost unlimited number of similar units. The motors can be fitted on almost any type of 16 or 35mm projector and, of course, other film recorder bays. P.A.G. can also undertake to modify customers' projection equipment or to supply complete units.

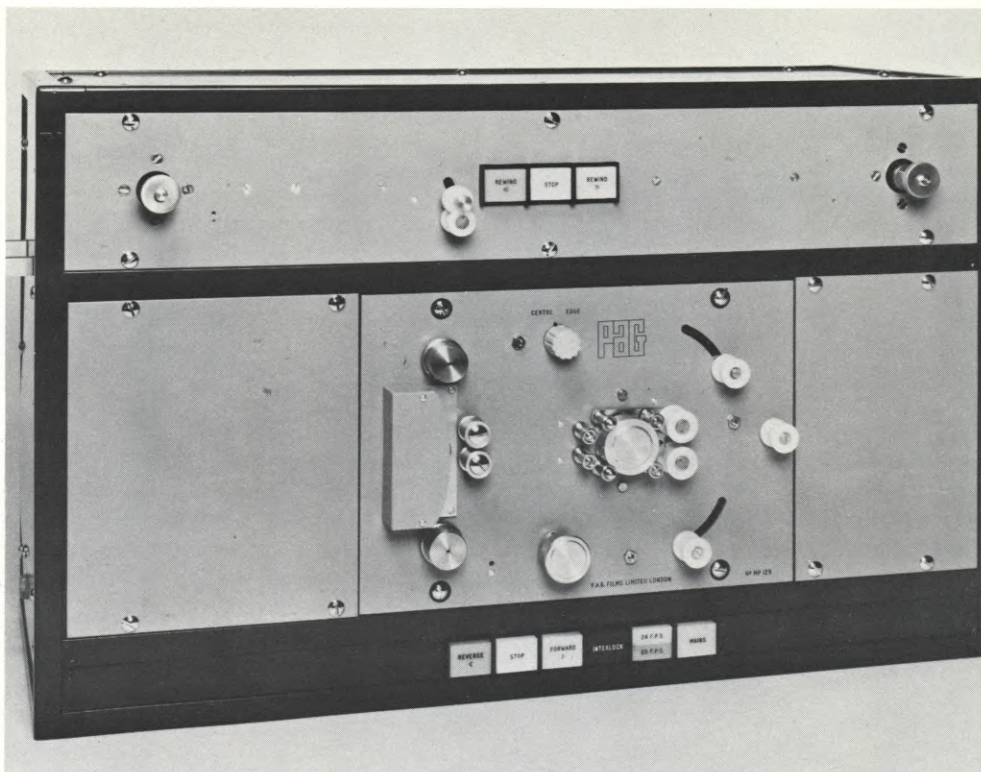
16mm PORTABLE RECORDER

The special feature of this unit is the D.C. motor which drives the transport. The machine is controlled by pulses which are fed into a special electronics card which supplies the motor. The pulses can be derived from various sources:

- 1) From the mains supply (synchronous).
- 2) From a special P.A.G. optical encoder fitted on a projector or camera.
- 3) From a crystal oscillator.
- 4) From other P.A.G. units, giving multi-channel facilities.

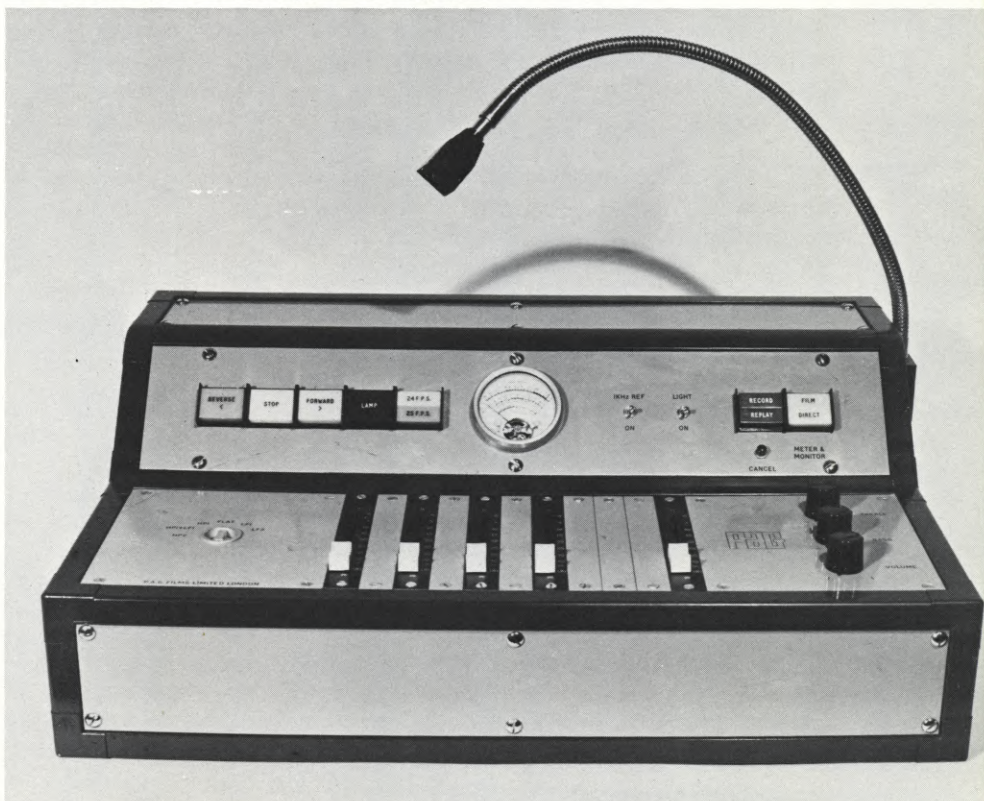
It is, therefore, possible to build a complete dubbing system out of single channel units with facilities for locking to the projection system.

The rewind panels will accept spools up to a diameter of 345 mm. The feed motor may be switched to wind emulsion in or out, and there are facilities for rapid rewind in both directions. The machine is available in replay only and
Continued on Page 1188



The P.A.G. 16mm portable Recorder has a D.C. motor which drives the transport. The machine is controlled by pulses which are fed into a special electronics card which supplies the motor. The pulses can be derived from various sources. It is possible to build a complete dubbing system out of these single-channel units, with facilities for locking to the projection system.

The P.A.G. Mixer is designed to provide remote control of the rack functions, with basic level monitoring and dubbing facilities. It incorporates a low-impedance microphone preamplifier whose output can be jacked to whichever fader is convenient. The power amplifier, which is protected against short and open circuit loads, is an optional extra. Bass and treble equalization can be provided on controls adjacent to each fader.



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■ **Basic** because the same camera can shoot through a microscope, telescope, or periscope. (Yes, underwater housings, too.)

■ **Basic** because at a little over six pounds fully equipped you can pick it up and grab those fast moving hard to get hand-held shots.

■ **Basic** because of a reliable pin-registered movement that holds the film rock-steady — under cranked or over cranked. And a tachometer, so you *know* how fast it's running.

■ **Basic** because you really can't go without it—no matter what kind of films you shoot.

16 S/B





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THE CP-16 CAMERA/NAGRA SN CONNECTION



Samcine technicians ingeniously integrate Cinema Products camera with miniature recorder to create the world's first completely self-contained single-system/double-system camera/recorder package

By JOE DUNTON

Samuelson Film Service Limited

Basically, the idea of installing a Nagra SN recorder in a CP-16 camera originated between myself and Syd Roberts of Samcine Sales. The possibility came up in discussion and we asked ourselves: "Why don't we put an SN recorder into a CP-16 camera?" We talked about it some more and a method of doing it evolved. It seemed quite practical that we could make a "sandwich" between the motor body and the battery compartment of the CP-16, and we ended up by designing a sandwich approximately 1-1/8 inches wide, which contains the Nagra SN recorder, a power supply for a Sennheiser condenser microphone and a roll-off base attenuator pre-set—plus a microphone program facility, so that you can program for a Sennheiser microphone, the Nagra static microphone (which is the matched microphone for the SN) or a standard dynamic microphone. This amounts to an extra built-in facility, since the SN normally works only with its own standard microphone.

We've installed an interlock warning system to let you know if the machine is running and pilot lights so you can tell which microphone you've set the mike program on.

As regards the practical usability of this modification, it becomes apparent that we now have the first single-system/double-system 16mm camera that is self-contained in one complete unit without any cables or separate

external recorder.

It is possible to have a CP-16A camera with the audio built into it, so that you have the audio amplifier for the edge track and the Nagra SN for a separate magnetic track. It is possible to do a line feed to the SN so that it will receive exactly the same quality of sound as the magnetic track, which means that you will have a complete Nagra specification recording of the sound on the SN. If you need a very fast newsreel print of that footage you would run it with the magnetic track, but if you wanted to use it later in a documentary program with a dubbed track, you would have a clean track from the SN to use. This track would be in sync because the Nagra SN is crystal-controlled to the CP-16. There will be a sync-mark light system between the CP-16 and the SN. Hopefully, the SN will run at the same rate as the CP-16, as far as the start is concerned, so that once you have established a sync mark at the beginning of the roll, it will stay in sync throughout the roll. As you switch on the camera, there is an interlock system that automatically switches on the recorder.

The versatility of this combination makes it possible to record sound independent of the film. If you want to add commentary to a piece of film you've shot, you can do it. If you're shooting, let us say, a folk music session or a group playing, you can record atmo-

sphere music to add to the picture you've shot. In a documentary situation you can use it as a way of keeping in touch with the editor. For example, if you are on a six or ten-week production

Continued on Page 1208



Rear view of "sandwich" between CP-16 camera motor housing and battery compartment, showing pilot lights for microphone program and interlock warning system.

Photographs showing how the tiny Nagra SN professional recorder slips neatly inside a "sandwich" approximately 1-1/8 inches wide, designed as a modification by technicians of Samuelson Film Service Limited, London. Adaptation permits use with Sennheiser microphone, the Nagra static microphone or a standard dynamic microphone. Ingenious integration of the CP-16 with the Nagra SN makes this the first single-system/double-system 16mm camera that is self-contained in one complete unit without any cables or separate external recorder.



WESTREX 5035 FILM CARRIER ASSEMBLY



A unique film carrier assembly that will run a two-and-a-half-hour movie program through a 35mm projector, then rotate on its turntable to effect rewind up to ten times normal speed, while the show goes on

The 5035 Series of Film Carrier has been designed to cater to the need to run a complete film programme with minimum attendance and no change-overs. This is achieved by providing film capacity of 2 x 13,500 ft. Where the programme is longer than 2½ hours and there is no designated interval a convenient natural break can be chosen to allow the mechanism to be rotated and the incoming part of the programme fed into the Projector. This interval need be

Westrex 5035 Film Carrier Assembly rotates on turntable after continuous 2-1/2-hour film program, so that reel can be rapidly rewound on other side, while show goes on.

no longer than 2-3 minutes.

Re-winding and examination of the film can be carried out on the non-operating side of the Projector whilst the remainder or alternate programme is being projected.

It is not obligatory to remove the reels from the mechanism as the extremely smooth control of speed allows the programme to be made up directly from the transit reels onto the large reels and reverse procedure carried out at the end of the film run. The reduced amount of manual handling of the film together with many fewer threading cycles greatly reduces the risk of film damage. A feature of the device is the very wide degree of speed control ranging from a few frames per second up to a re-wind capability of up to ten times normal projection speed, thus allowing a rapid and controlled re-winding.

A controllable braking system reduces the possibility of film damage in the

event of a film joint parting in either the projection or re-wind mode.

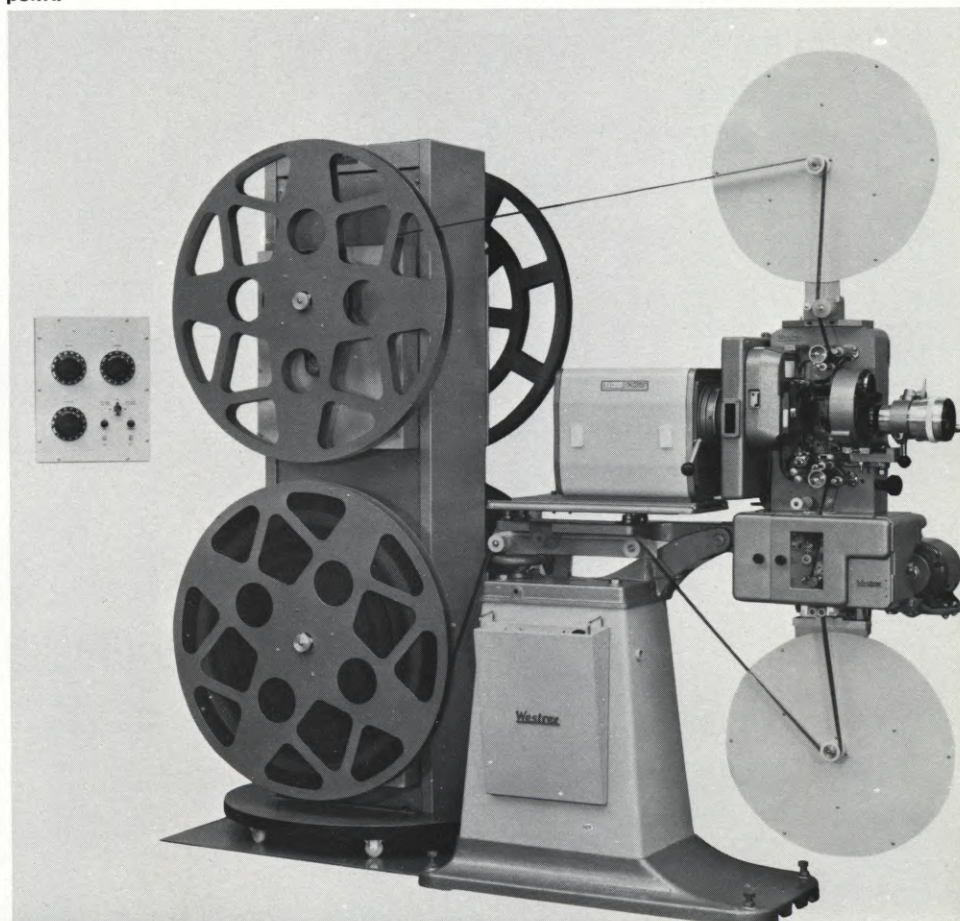
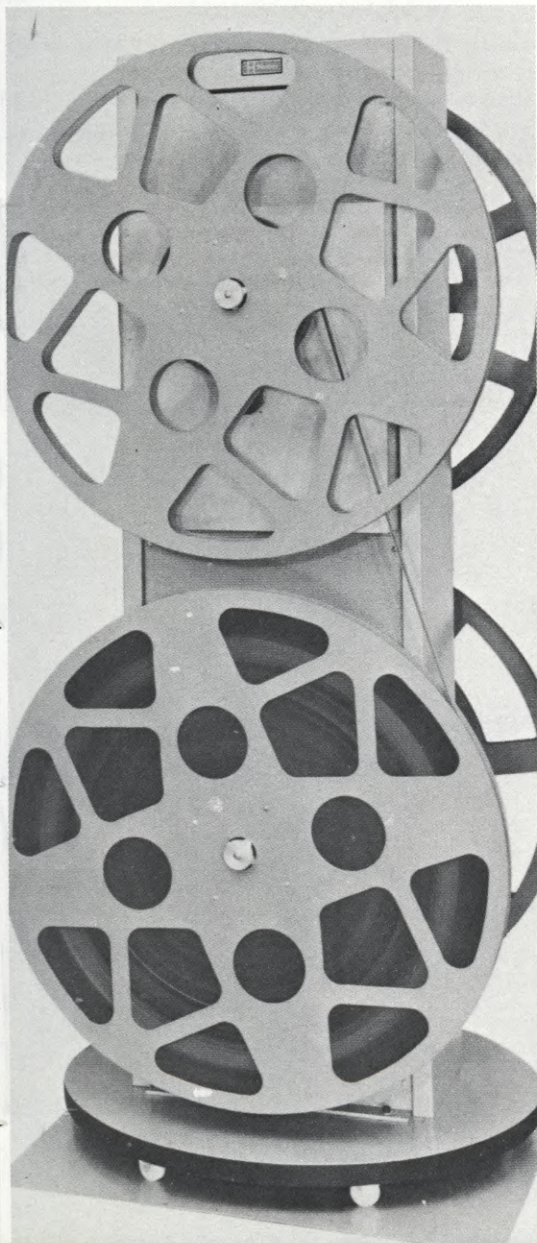
The mechanism may be situated either at the rear or at the front of the Westrex Projector assembly. Local projection room considerations will decide where the mechanism is to be mounted. For front location a space 3'6" (106 cm) in diameter will be required with a height clearance of 7'10" (239 cm) maximum. For the rear position the height requirement is reduced to 6'9" (206 cm).

In cases of extreme projection room limitations the 5035 Film Carrier may be located alongside the projector on the non-operating side and at 90° to it. The film is then conveyed by means of angled roller assemblies.

Conversion of the 5035 mechanism from rear/side to front configuration and vice versa is an on-site operation.

To take full advantage of the 5035
Continued on Page 1209

Westrex 5035 Film Carrier Assembly shown in combination with Westrex Projector. Carrier may be situated at rear or front of the projector, or may be located alongside projector, at 90° angle to it in cases of extreme projection room space limitations. In case of a film splice parting, carrier and projector are automatically switched off and brake applied, as alarm is sounded at a distant point.



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MEMORANDUM

TO: PROFESSIONAL CAMERAMEN
FROM: DAVID MARX, VICE PRESIDENT, SALES
SUBJECT: THE NEW PRO-16

For several years, my wife Celia and I have been looking for an opportunity to associate with a progressive company capable of developing a truly professional "cameraman's camera" which would incorporate the best characteristics of today's cameras together with certain breakthrough features designed to overcome limitations in existing equipment.

Our search is over and we are proud to announce our new association with the Maurer Company.

We were delighted to see that Maurer was able to blend its "space age" moon camera technology with a realistic understanding of the professional cameraman's needs. The features of the new Pro-16 include a single all speed motor 0-96 frames, automatic self-threading magazines, semi-automatic exposure control system, a new 360 degree reflex viewfinder, and last but not least, a completely new preventative maintenance concept due to a modular design that offers quick in-the-field service.

The Pro-16 will be exhibited at the SMPTE show in New York the week of October 14th. We'll be there to demonstrate it. You'll be surprised and, we feel, delighted at its many new features. We trust you'll agree that the Pro-16 sets a new standard in professional cinematography.

Come and see us! MAURER

PRO16

Maurer Commercial Products, Inc.
47 East 44th St.
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THE FLEXIMOUNT: HAND-HELD WITHOUT TEARS



An experienced cameraman, dissatisfied with mounts available for hand-holding cinema cameras, designs a unique flexible harness that takes the strain off the operator and allows the camera to "float"

By MERVYN WILSON

I was assisting an experienced camera operator one day on a very complicated shot, at the end of which he said to me: "Always make yourself comfortable before you start to shoot."

I think he said that to me because he half-sensed that I was quite impressed with the way he'd executed the shot. Well, I *was* impressed, but I had an immediate mental picture of a camera operator lounging in a plush armchair, one hand on the pan bar, the other on a big cigar—*comfortable* being the operative word.

Anyway, those words stuck in my memory, so that when my chance came to operate, I understood exactly what he was getting at.

Some of the tricks an operator uses

to make himself comfortable include paying attention to such details as: the way a track is laid, the angle of the Moviola dolly, the balance of the camera on the geared or fluid head, the unwanted reflections in the Mitchell viewfinder (in pre-reflex days), someone to lock off the pan and tilt at the end of a tricky shot and the correctly selected gear on the Worrall or Moy head. All these details and many more contribute to the operator's being comfortable during the shot, and being able to concentrate fully on getting a nicely composed scene.

Having proved his advice to be sound, there was still one aspect of filming which I found to be very short on comfort—namely, hand-held shooting.

1967 was about the time that *cinema verité* and the ever-moving camera came into vogue. I found, as did other camera operators, that I was frequently asked to make hand-held shots (both for TV commercials and for features). What was lacking was not only muscle-power to carry and point the camera, but some form of harness that would support the camera and allow the operator freedom of camera movement.

Up to that time, existing camera supports allowed for no camera movements, other than a form of panning. They all had one thing in common: a rigid plate for the camera. One's breathing was transmitted through the equipment to the camera, and the result showed on the screen. No tilting was possible, other than that achieved by bending one's body backward or forward—which was uncomfortable, since the mount dug into the poor old stomach.

And so was born the Fleximount Camera Sling and Harness.

The first prototype was, naturally, rather crude, but it fulfilled its intended function. Now, instead of the camera being rigidly fixed, it was "floating".

The next step was to introduce it to a few cameramen and operators in order to find out their impressions of it. Most of them approached it warily and were very suspicious of it—although, once it was on their shoulders with the camera in position, they were pleasantly sur-

prised to find that the camera was free to pan, tilt and even roll, with the weight evenly distributed on the shoulders.

By this time, I realized that the Fleximount would have to be universal and adaptable enough to support several types of cameras of differing configurations. This posed some design problems, which were eventually overcome, so that now the Fleximount accepts most cameras, other than those that rest mainly on the right shoulder (Eclair NPR, ACL, Arriflex 35BL).

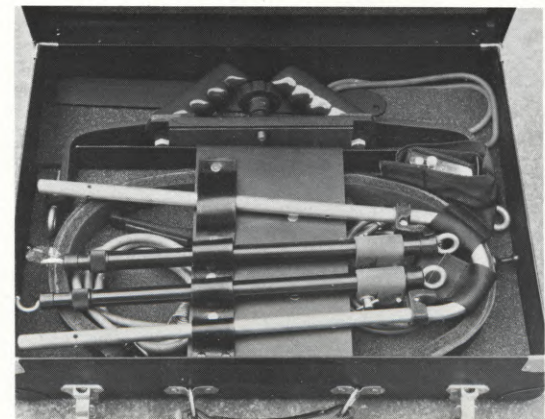
Whenever the opportunity arose to do a hand-held shot, I naturally put the Fleximount to good test. I found it to be so comfortable that I could be more adventurous with my shooting. I could discuss a shot before and after shooting with the director, with the camera still in the shooting position and without my arms trembling. If I was lighting/operating, I had a free hand for my meter. I could repeat a hand-held shot as many times as the director wished, and with every take as good as the first (for *me*—not necessarily for the director).

This opened out the field of hand-held filming and solved many problems. For example, filming from a speedboat (or any boat) had previously necessitated either a tripod (no good because of a rolling horizon) or straight hand-held shooting (too exhausting). The same applied to shooting from aircraft and helicopters—a changing horizon, plus a

The Fleximount (weight: 6 lbs.) breaks down completely for transport. Total weight in sturdy executive-type carrying case: 15 lbs.



(ABOVE) The Fleximount permits one-hand operation. (BELOW) Mounted camera can be tilted easily from sitting or standing position.



new problem: vibration. This the Fleximount damps out most effectively.

At all times I was careful to assure the director that the shots using the Fleximount would not *look* hand-held—that is, wobbly and shaky. Indeed, some of the shots that have been attempted with the harness look on the screen as if they had been made with the camera mounted on a fluid or geared head.

I found that not only could I use it standing or seated, but I could also "track" with it (albeit, walking like Groucho Marx). Small crane-up or crane-down shots were effected with ease, as well as static shots, when using a long lens. I was able to do all of the requisite camera movements, while having the added advantage of being able to adjust my set-up during the shot. Sometimes a move of a few inches to the right or left makes all the difference in the composition of a shot—and this is not so readily achieved when the camera is on a tripod.

(Lest the reader be under the impression that I do nothing but hand-held shots, let me reassure him that this is not the case. I am referring only to certain specific situations.)

Up to now, the Fleximount has been used by all types of cameramen and operators working on documentaries, newsreels, TV commercials and features—and shooting from a variety of camera platforms, including: boats, aircraft, camera cars, dollies, wheelchairs, etc.

I have successfully used a Panavision-adapted Arriflex on the Fleximount, shooting with normal lenses as well as with the Panazoom.

To date, some 200 Fleximounts have been manufactured and sold throughout the world—with the users, hopefully, being more *comfortable* during their stints of hand-held shooting, and with an end result that the material on the screen is of better quality. Some technical details:

The Fleximount weighs only 6 lbs. (2½ kgs.)

The camera is supported in a sling and on two flexing tubed arms which are countersprung at the back of the harness.

There are adjustments for balance to cater for the different camera shapes and weights.

Construction is in light aluminum alloy and castings and the harness dismantles and stows away in an executive-type case.

All-up weight, in case: 15 lbs. (6 kgs.)

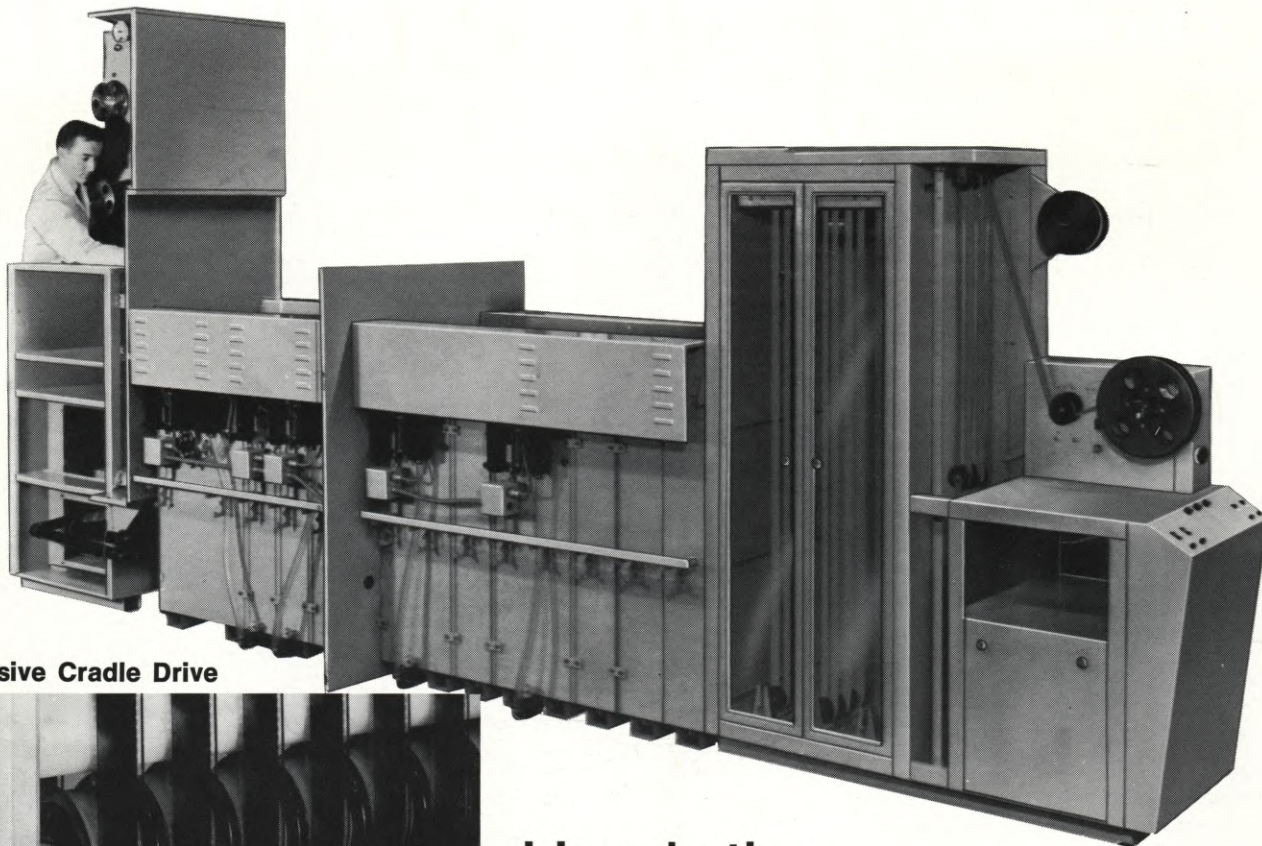
For further information on the Fleximount, please contact: MERVYN WILSON LTD., 5 Harwood Close, TEWIN, Herts., ENGLAND ■



Camera, supported by the Fleximount, is not rigidly fixed, as with most other mounts, but "floats" for easy panning or tilting. Salient feature is that it is considerably more comfortable than conventional mounts, relieving a great deal of the strain inherent in hand-holding heavy cameras. Fleximount's "universal" design makes it adaptable enough to support several types of cameras of differing configurations.

Inside small helicopter, the author easily hand-holds camera on Fleximount, which, he claims, effectively dampens vibration of the aircraft. The mount has been used successfully for shooting from a variety of camera platforms, including: boats, planes, camera cars, dollies, wheelchairs, etc.





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Pako has a full line of Ciné Film Processing Systems for processing virtually all film types presently available. Although each system varies according to process and capacity, they all share many of the same innovative design and operational features. Each features Pako-originated modular construction for easy installation and service, plus adaptability for future changes. The following features are standard with all Pako Ciné Processing Systems:

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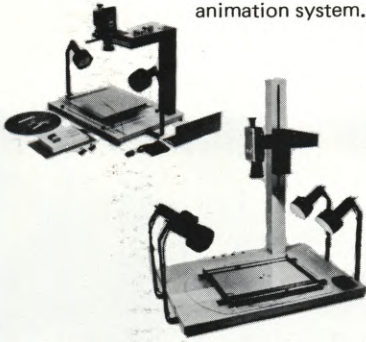
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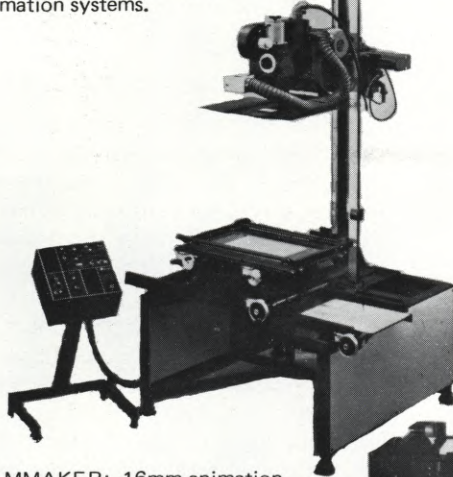
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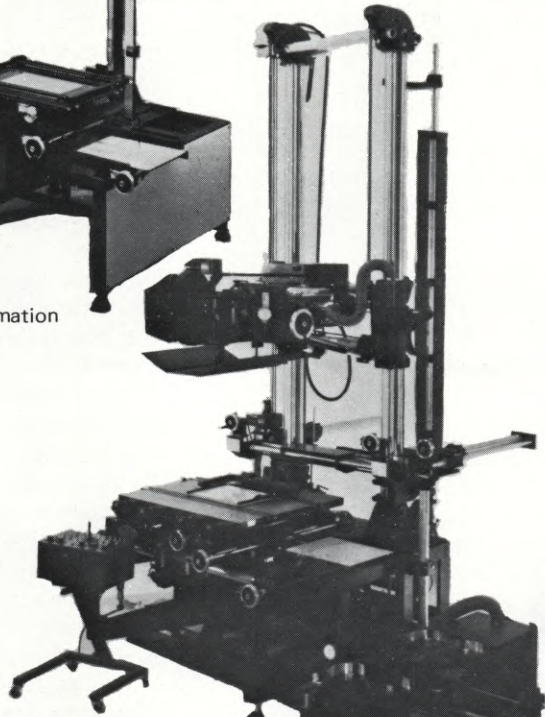
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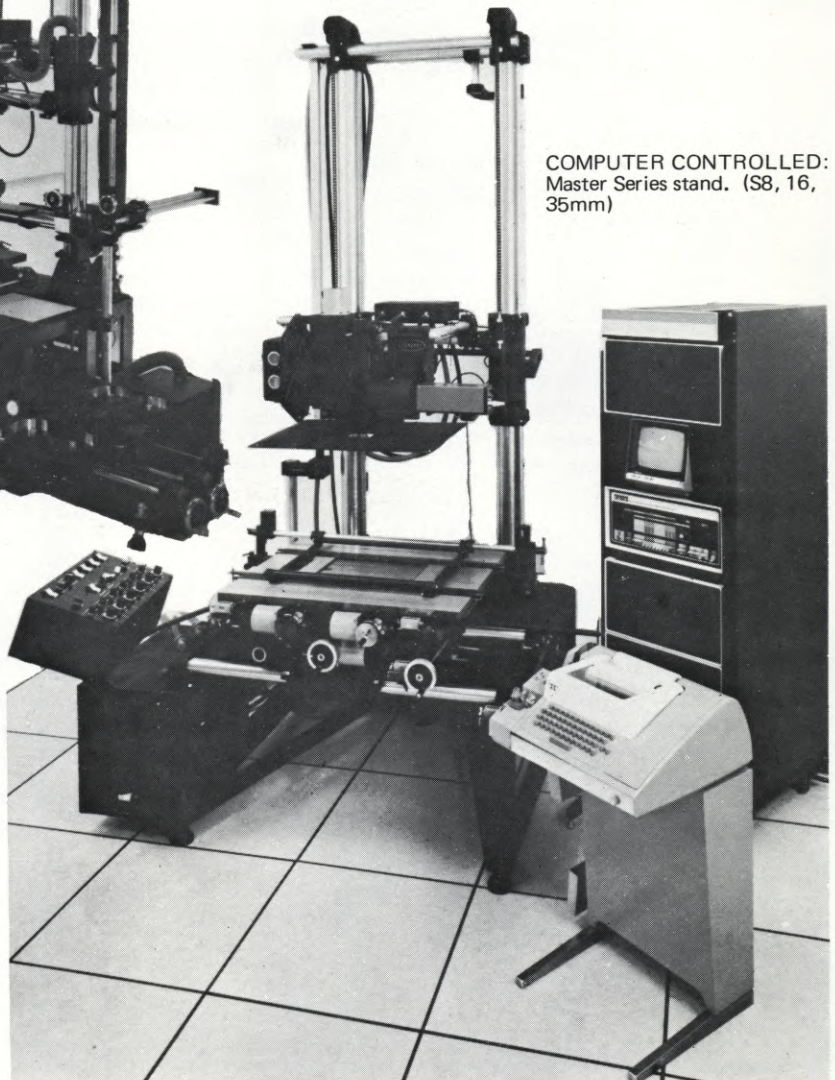
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A full line of compact, sophisticated units designed to meet basic requirements of all classes of time-lapse work, and permitting the photographer to use his own familiar cameras, lights and flash gear

Shown at FILM 73 were a number of units of time-lapse equipment designed and manufactured by Northfield Appliances Ltd., a small company which, for the past few years, has devoted itself to the development of such equipment.

The original ideal was to produce an instrument which provided practically all of the basic requirements for all classes of time-lapse work and leave the photographer to make use of his own equipment, thus, first, cutting down the initial cost and secondly, enabling him to use his own familiar cameras, lighting units and electronic flash, etc.

MULTILAPSE

INPUT

Mains A.C. 240/250-Volt 50 Hz. standard with transformer tapplings for 115 V.A.C. 50 Hz.

SLOW TIMER

A Crouzet six-stage timer driven by an A.C. Mains voltage synchronous motor gives interval times of 1 second to 45 hours. A test button is fitted to allow for additional frames to be exposed for testing or for other purposes.

FAST TIMER

Fast time intervals are obtained by switching to the fast circuit which gives times between 5 frames per second and one frame every 1½ seconds.

FUSES

Fuses are fitted to protect primary, secondary and flood lamp circuits, all available from the front panel.

The MULTILAPSE unit is mains operated to control cameras, lights, flash, background curtain and a wide variety of additional equipment.

FLOODS

Two 500-watt flood lamps can be controlled by the unit. When switched to "auto" the lamps come on just before the exposure is made, first in series or half-power and then change to parallel or full-power. Alternatively, they can be switched to "manual" and run continuously in either the series or parallel condition. Lights can only be operated under "manual" when using the fast circuit.

ANCILLARY OUTLETS

Two Mains voltage 2-pole-outlet sockets are provided on the front panel, each controlled by a separate switch and fuse.

REMOTE COUNTER

A socket is provided for a remote counter on the front panel; this is controlled by a separate switch and can be used with an extension counter, if one is required in the picture.

SWITCH SOCKET

This is a 3-pole unenergised socket controlled by relay with a capacity of 2 amps. Power taken from one of the mains outlet sockets connected through this 3-pole socket will give a white light for the interval time and a filtered or polarised light for the exposure cycle.

CURTAIN WINDER

A 3-pole socket is provided for the curtain winder unit.

SHUTTER HOLD

If it is required to expose more than one frame at each cycle, the delay knob can be set to allow the camera to take up to 12 or more frames in a cycle according to the camera employed and the speed setting on the camera.

RELEASE THRUST

The power of the shutter release solenoid can be adjusted to suit the camera employed by adjusting the shutter thrust control.

ELECTRONIC FLASH

Electronic flash can be charged from the unit main voltage supply and the flash can be triggered to agree with the camera shutter in its fully open position.

FRAME COUNTER

A frame counter is fitted to the panel

and counts the frames exposed and can be reset to zero. When multiple exposures are used the counter only counts the cycles and not the individual frames exposed.

MINI LAPSE UNITS MARKS 5 & 6

Minilapse Mark 5 is the latest in the Northfield range of time-lapse equipment and is the first to use the most modern, solid-state transistorized circuits, to give a unit which is more reliable, more robust, smaller and more economical to run.

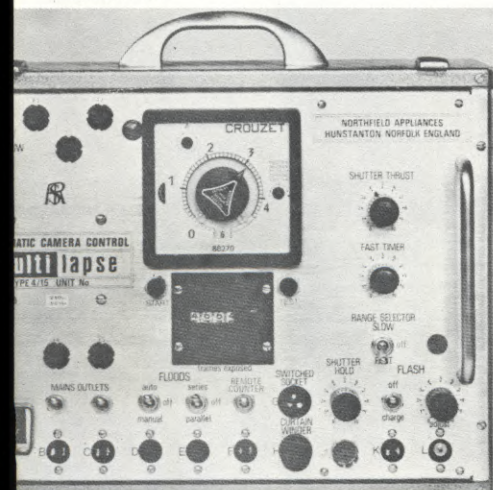
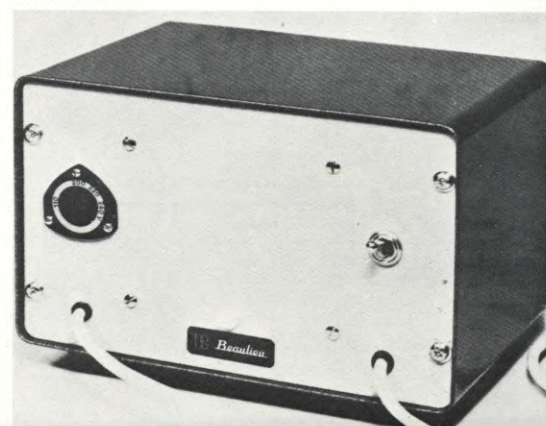
One drawback in the past was that most units were made to run from A.C. mains only; the new Minilapse has overcome this problem by making Mark 5 and 6 to run from an ordinary 12-volt car battery as well as from the mains; this now makes work in the field simple and reliable.

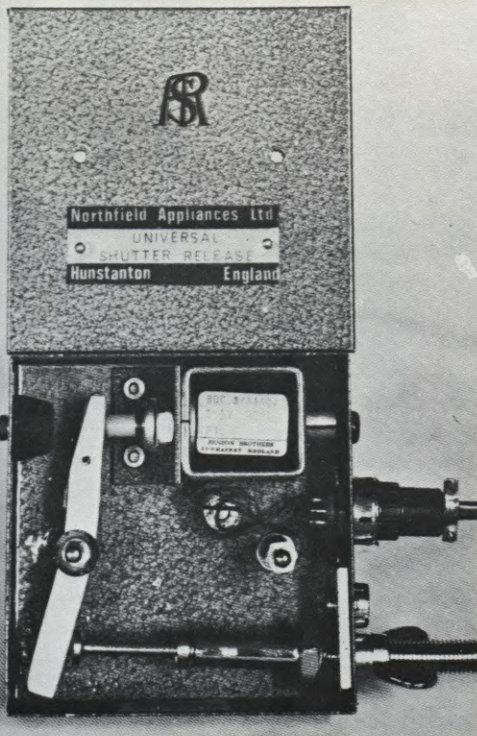
In the search for reliability it was eventually decided to use a well-tried and unique solid-state timer made by Nandel Electronics Ltd. and around this was built an inverter to give an elevated voltage to operate the shutter release, a flash-triggering circuit to control and synchronise a standard electronic flash unit, and a trickle charger to keep the battery topped up.

The Mark 5 is made for 220/240 volt A.C. 50 Hz. and the Mark 6 for 110/115 volt A.C. 60 Hz. and both units also run from an ordinary 12-volt car battery.

When running from the mains with the battery connected the battery receives a trickle charge and it will take over in the event of a mains failure and keep the unit operating until mains

CAMERA POWER PACK, specially made to run the Beaulieu range of cameras direct from A.C. mains.





UNIVERSAL SHUTTER RELEASE consists of a solenoid operated by a pulse and hold current from the unit to trigger a cable release.

current is restored, thus providing a really "Fail safe" feature.

The timing interval range is from 1 second to 2 minutes, which covers the great majority of time-lapse requirements.

UNIVERSAL SHUTTER RELEASE

The unit consists of a solenoid operated by a pulse-and-hold current from the unit; a lever arm takes the impulse thrust from the solenoid and transfers it to the cable-release to operate the camera.

A control on the unit panel regulates the power to the solenoid.

The length of the thrust from the cable release can be either 6 mm when the assembly is fitted to the lower location position and 10 mm when fitted to the upper position.

The length of the pin projecting from the cable release can be adjusted to suit the camera employed.

As an alternative, a Bowden cable can be fitted to allow the cable release inner cable to be employed in tension instead of the normal cable release which is in compression; this allows longer lengths of cable to be employed and can be made to suit cameras not fitted with the usual release mechanism.

If the Bowden cable is used with the normal camera a reversing box must be used to change the pull of the cable into a thrust to operate the camera.

Tripod bush is fitted to the box for positioning and a spring clip is also included for alternative fixing.

It is essential that, when operating

the shutter release, the box is kept in the same position in relation to the camera; otherwise the adjustment will be slightly altered and will have to be reset.

When setting up, it is necessary to adjust the release to the camera employed.

POWER PACK

The Power Pack is an A.C. Mains-operated unit, specially made to deliver the correct rectified current to operate the Beaulieu range of cine cameras.

Mains input can be 110, 200, 220 or 240 volts A.C. 50 Hz. and the correct voltage can be selected by setting the voltage range selector on the front of the panel.

The Voltage Range Selector carries a 3-amp fuse reached by removing the centre core.

A neon light indicates when the unit is switched on.

The outputs for the 16 mm Beaulieu cameras are 7.2/3.6-volt rectified D.C. This also suits the 4000 ZM super-8 camera.

A special voltage model is made for the 2008 super-8 camera, which requires a voltage of 4.8/2.4.

The circuit is fully stabilised and smoothed and with solid-state rectification and transistorized circuitry.

MULTIPLE RELEASE UNIT

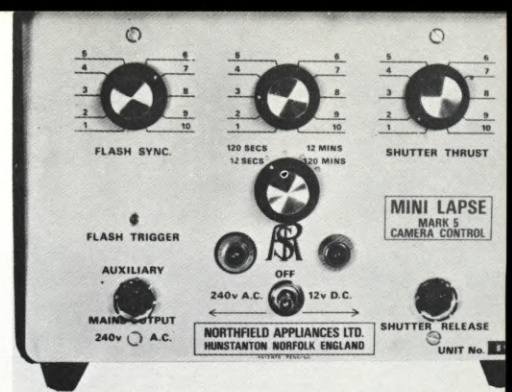
This unit has been specially designed for the occasion when two or three cameras are required to operate simultaneously to obtain two or three different angles on the same subject.

The unit is plugged into the Multilapse and at the start of the cycle the release unit is energised and, for any time up to 5 minutes, mains voltage is fed to the flash unit. When this is fully charged the cycle continues and the shutter releases are pulsed and the flashes triggered.

It will be appreciated that time intervals, when using the Multiple Release, will be governed by the time taken to charge the flash unit. If, however, the flash is charged from an external source, the time intervals can be of the order of three or four seconds.

On long time-interval work, it may not be considered advisable to leave an electronic flash on continuous charge, and here the Multiple Release can be used with the knowledge that the flash unit is only being charged for the minimum period necessary.

Each Multiple Release unit is supplied with three flash synchronisers specially adapted to suit the unit. It is not possible to use the built-in Multilapse synchroniser.



MINI LAPSE MARK 5 is the latest Northfield unit and first to use solid-state transistorized circuits.

CURTAIN WINDER UNIT

This is a separate unit which can be used only in conjunction with the Multilapse Control Unit.

The unit consists of a control box connected to the Multilapse by a 3-core cable and plug to engage with the socket on the Multilapse panel.

An aluminium tubular frame supports a circular black cloth curtain 2'9" diameter by 5'6" high, hung on a circular steel rail supported by mono-film cables.

In operation, the subject is placed within the curtain, which is opened on one side to allow the camera and lights to "see" the subject.

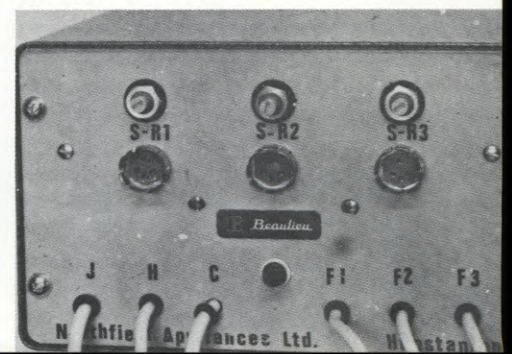
At the start of the Multilapse exposure cycle the curtain rises from the floor to its full height when the lights are switched on and exposure made and then falls to the floor to await the next call from the unit.

The curtain background is very useful when photographing flowers or plants in a greenhouse where the changing position of the sun would create difficult and unwanted shadows; also in a laboratory where the existing lights could interfere with the photographic lighting of the subject.

World-wide sales for the equipment described above have been entrusted to Beaulieu Cinema Ltd.

Their Headquarters and Title have recently been changed and their name and new address now are: A. V. DISTRIBUTORS (LONDON) LTD.; 26 Park Road, Baker Street; London N.W.1, 4SH; 01-935-8161. ■

MULTIPLE RELEASE UNIT has been specially designed to operate two or three cameras simultaneously.





THE SLAMS

a **Gene Corman** production





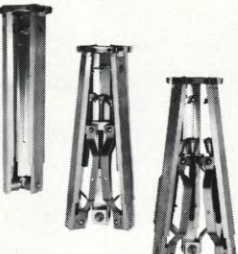
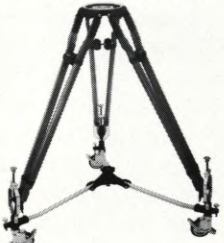

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 <p>SHOULDER PODS The Superior The Mini . . . weighs only 2 lbs. The Junior</p>  <p>Lightweight, fully-adjustable units that free your hands for action. 3 adjustments fit pod to body, 2 more fit camera to your eye. Your body points the camera, your hands are free to zoom, focus, iris at all times.</p>	<p>TRIANGLES</p>  <p>Fits all tripods. Made in 3 different types: Plain model, screw-down clamps, and the new spring-loaded model with positive lock. Construction is aluminum, tied down clamps of steel. Sturdy, heavy duty units that anchor your tripod firmly, temporarily or permanently. All parts precision machined for accurate leveling, and pierced for screwing or bolting to any type of flooring.</p>
<p>TRIPOD DOLLIES & LARGE TRIPODS</p>  <p>Lock or free each leg independently for stability or maneuverability. Use alone or on tracks. Big, silent, swivel wheels. Folds in seconds from 46" open diameter to easy-to-store 10" unit. Rugged aluminum tubing gives solid base for even the heaviest camera. Tripods available in 5 different popular sizes.</p>	<p>CUSTOM BUILDERS OF SPECIALTY ITEMS</p>  <p>If you have a special need for cinematographic equipment for an unusual application, we'll be happy to work with you in design and construction. Phone or write, describing your problem and any special requirements. We'll analyze the problem, design a solution, and give you a cost estimate — at no cost to you.</p>

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SINGLE & MULTIPLE-CAMERA

Continued from Page 1131

where two actors are talking and then one of them—don't ask me why—walks clear up towards the camera, stops, looks and thinks, and says something and then you find two other cameras poked in around the sides to get two close shots of each, individual shots of the actors, photographing their ears. We are not interested in people's ears; we are not interested in the backs of people's heads; it's their faces, their eyes, that we are interested in and you just cannot photograph into the eyes on multi-camera technique to any great degree, in my view.

Sorry, chaps, but you asked for it.

Now let's consider the lighting question. Well, I really think that's a laugh. It's a classic example of black sockets for eyes, the overhead lighting. You simply cannot do anything with all this light strung overhead, completely out of control, and it really *is*. There is so much light there that you don't know what to do with it, but all you get is black sockets for eyes and you cannot move decently into closeups.

I'm probably sticking my neck out, but I would think that one or two of the closeups that we saw there may have been specially set up. I don't know, but I'll give them a chance to answer that later on. I know that often does happen—they slip in one so that it looks all right.

The next thing I must shoot them down in flames about is the question of magnification, and neither of them mentioned this. We have to, on a single-camera system in the film industry (the poor relation), be prepared to project our work onto a screen—well, bigger than this, much taller than this. The screens at the Odeon Marble Arch, the Odeon Leicester Square, the Dominion Tottenham Court Road. I have seen my work on a Moviola, the big Moviola with the projection screen, which is not unlike that of a television receiver, and I thought it looked pretty good, and then I've gone and seen it in the Odeon Leicester Square and I thought it looked awful—and that is another basic difference. The multi-camera system may work for a medium where you only project to a small size, but it would never work on a very big screen such as those in the West End cinemas.

The classic example of that happened to me a few years ago. I was doing my first multi-camera picture and the director asked that we have television operators working the cameras because they were very fluid and very flexible. We were considered to be a bit square and

downbeat in the film industry then and it was agreed, because of various political problems, that we have a film operator and a television operator on each camera.

We started off, at the director's request, with the television operators working the cameras and they came in to see their rushes the next day and, I have to tell you, the magnification beat them every time. They were all terrified of it. What they thought were little bumps, little inaccuracies in the normal television process, were found to be totally unacceptable on the bigger screen and slowly, as the week went by, (and we only had a week to shoot this), we were back on film with film operators. That's another example where you cannot just write off the single-camera system, a system which I'm frankly very proud of.

Now, as far as the single-camera system is concerned, I think there are a lot of arguments in favor of it. In the film industry, the economics dictate that usually a picture is set up on what we call the "star system". It still is. A certain script is prepared. A director is approached, and, if a big name is procured to make this film, he or she will guarantee that the bank will advance much more money. So, for that reason, we are geared to work that way and I cannot see some of our temperamental ladies and gentlemen of the silver screen subjecting themselves to three cameras all at the same time. A lot of them just won't wear it. A lot of them don't like the continuity of the performance. A lot of them prefer to learn their lines day by day and to work on it and get it really perfect. All right—some of our films take four weeks; some of them take twenty weeks, but I think that we have learned a lot from the multi-camera system. I think that we are reducing our schedules, but I don't think that you can write off the single-camera system by any manner or means.

Another thing about the single-camera system is that there are no alibis. You can have no alibis and no compromises. When I first started to light I remember that I wasn't very pleased with what I was doing and I used to say, "Oh well, I only had half-an-hour to do that and that's probably the best I could do." Or "I only had a certain amount of money and I couldn't have the equipment I wanted." Then, call it luck, or call it what you may, I was given a chance to do a film and to have anything I wanted and to do it exactly as I wanted, but I had to be responsible for it. Now, that is a terrifying experience, but it is also a very stimulating experience, because it means you cannot alibi



Academy Award-winning cinematographer Ossie Morris, BSC, "ploughed to the attack" with gusto in favor of the single-camera technique.

on anything at all, and I think that is the sort of system we want. That is the way we want to aim at making pictures—no alibis, no second thoughts. It's done in half-an-hour; it's done in two days—nobody cares about that. It's what it looks like on the screen that matters.

You have complete color control with a single-camera system which I don't think you have with the multi-camera. You have complete control foreground and background. You can't possibly do it with the multi-camera system. I was quoting three cameras, but Jim—I detected a note of boasting—was talking six. I mean I wouldn't know what to do with *three*, let alone *six*, but that's his prerogative.

Let's take one other example and then I'll show you some film. I think we've talked mainly about factual presentation without any reference to impressionistic photography. Now, a lot of the most successful films, the films that have won critical acclaim for their photography, have been slightly impressionistic in their approach. They are not absolutely true to life. There seem to be people who view life normally, and so on—but they'd like to see *impressions* of life. In a lot of those films they've broken all the rules, the whole book of rules. Lens manufacturers have gone out of their way to make lenses crisp and sharp and they say how marvelous it is. We've seen all sorts of graphs up here and it looks very impressive, but when you go to photograph a woman with that she looks horrible. I mean we do all sorts of things to break that down because the scientific side and the artistic side seem to be poles apart.

Early on this afternoon we had ex-

Continued on Page 1202

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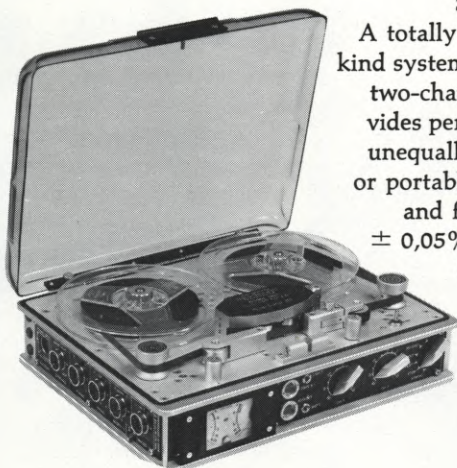
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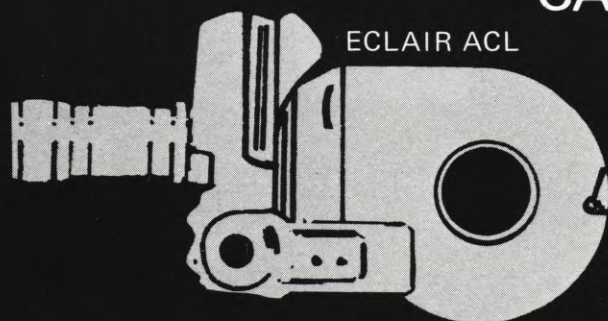


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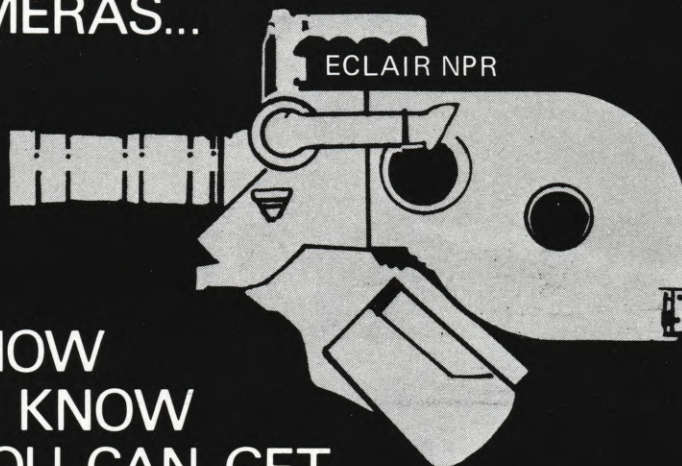
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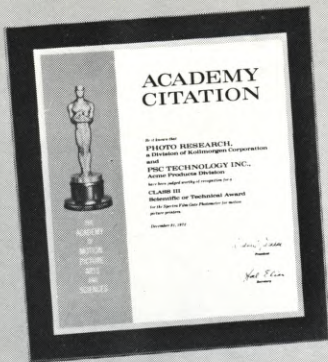
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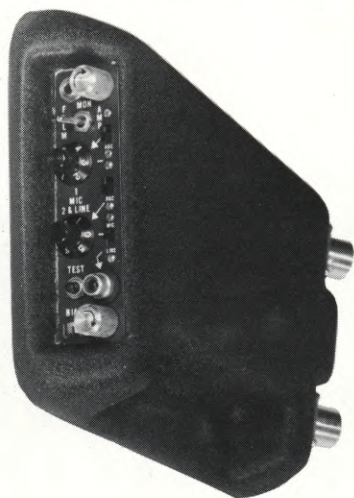
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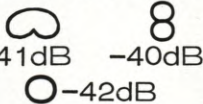


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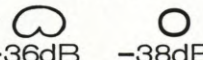
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"STATE OF THE ART"

Continued from Page 1125

Radio and I went through all the processes of box microphones and outdoor mikes that made a breath of wind sound like a hurricane. Then came the film phase with the mikes on booms like giraffes, or interviewers having to talk into a hand-microphone with yards of cables trailing down their trouser legs and behind the sound mixer. Today, we can zoom in from roof level to a dialogue taking place half a mile below, without a microphone in sight. These miniature mikes concealed in chests and bosoms—without benefit of censor, Mr. Trevelyan—with their mini-transmitters, have achieved a miracle of sound recording which I don't think really has received proper acclaim. It's a departure and advance which you haven't fully publicized.

Of course, the tube sensitivity has also made great headway. We've been trying, in this country, to televise the House of Commons, to get permission to do so and, of course, one of the objections is the additional lighting required. With recent improvements we think that objection will disappear and the only heat will be in the debates.

Again, in November, when we go to Westminster Abbey to televise the Royal Wedding, the lighting will be less of a problem than it was 20 years ago when I made a film of Queen Elizabeth's Coronation. I remember, in those days, on a cold September morning, walking through the Abbey with the Archbishop of Canterbury and he was complaining to me about the trial lighting we put up burning down on his bald head. He asked how we could expect the Queen to bear that heat and light, but Her Majesty did, and cheerfully. She suffered the ordeal of those lights surrounding her, even though in the heavy robes and during a very long ceremony. It must have been an ordeal, but now we do have a film record in the archives of that bit of history.

The other wonder of television, of course, has been the satellite. Television grew up with a limitation of a 50-mile radius. We used to say: "as far as the eye could see." Now, we take for granted that pictures come in from Washington as casually as they will today from Wimbledon.

A great advance here in this country has been the converters which have overcome the lineage difference between American and British television. Again,

the pressure of demand speeded up progress. The need for instant conversion of satellite pictures was followed by much-improved quality of video tapes made on different lineage systems. It's become very important to Britain, because sales overseas have improved greatly with this new market and today—I was with American networks last week—they are accepting the fact that British video tape production quality suffers no loss in the conversion.

There is one more evolution in method, the installation of video tape cartridge machines by all the ITV companies, one after the other. Southern Television is leading the way in this. They are leading the way in the conversion of ITV's complicated tape and telecine transmission to a fast, simple and automatic video tape operation.

Finally, a word or two about television's use of film. The change to 16mm is now complete. All of the staunchest defenders of 35mm, including myself, have capitulated and we accept the 16mm 1973 vintage as measuring up to the highest standards. By meticulous attention to detail and with rigorous discipline in shooting techniques (for example, we limit zoom lens usage), we

Continued on Page 1191

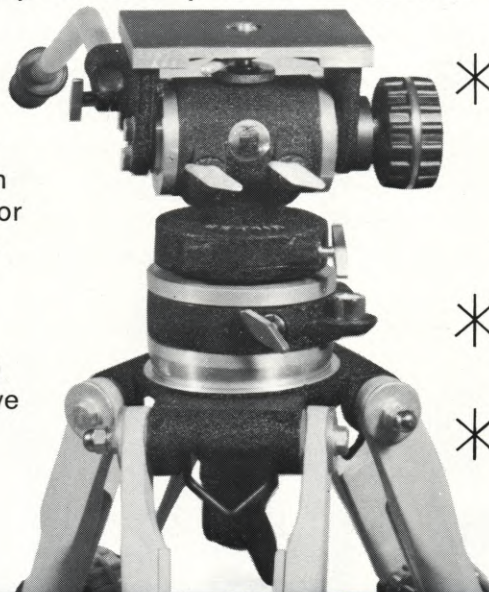
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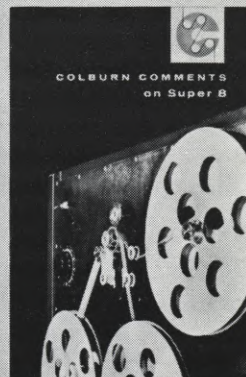
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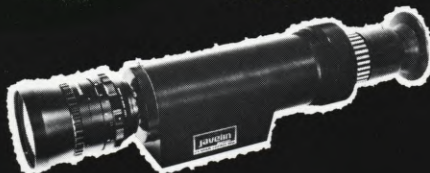
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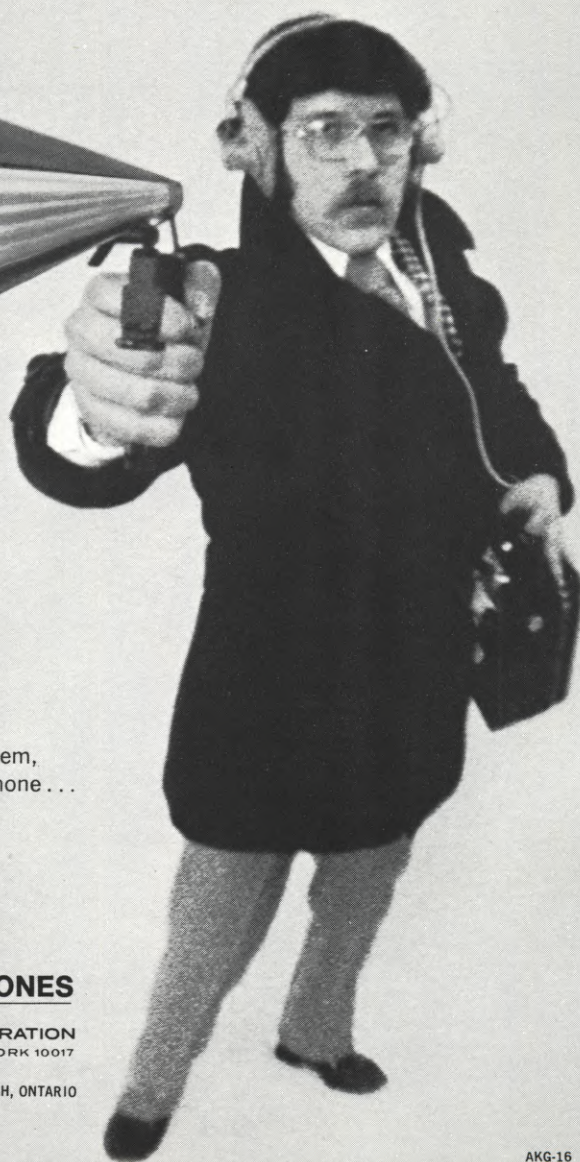
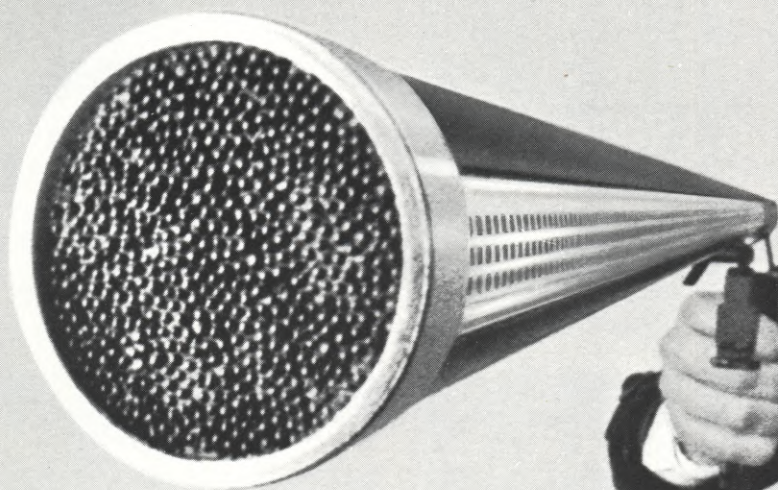
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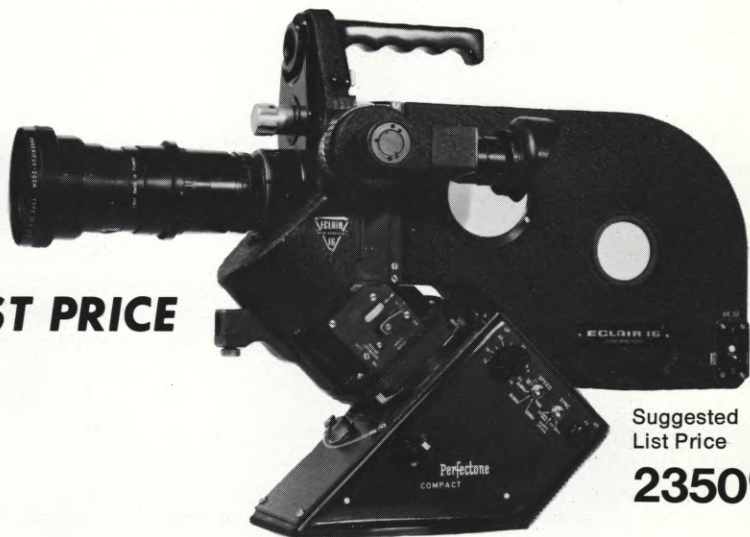
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





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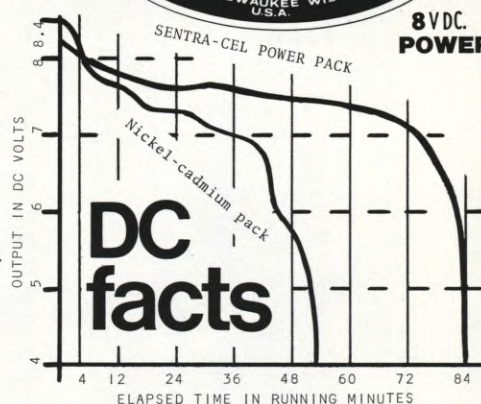
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FILMING "TEARS OF BUDDHA"

UCLA Cinema student from Korea visits his native land to make a film, after several years away, and rediscovers his own country

By EUI HONG

(with a little help from his friend, RUSS KINGSTON)

Five years ago, I came to the United States to study filmmaking at UCLA. I had always wanted to make a film about Korea. This desire increased during my time away from home. I found that since the Korean War, Americans had forgotten about that country, or else their memory was a negative one. Because of the misconceptions and vagueness surrounding a land rich in culture, and also because I longed to return, I decided to record an image of my home as I knew it.

Korea is a country unique unto itself. Many people think of it as a mere extension of Chinese culture. But there is a distinct quality of artistic and social expression that exists there. Perhaps this individuality of culture, as well as people, is a result of the rugged terrain of Korea. It is a country made up of high ridges and deep valleys. In these valleys the people live close to what land is given to them. This and continual assaults by foreign armies have created a

After several years away from his native land, Korean Cinema student Eui Hong was able to see and appreciate his country in a new way.



resistant, individualistic people. Yet, in this machine-oriented age, one of their most important qualities may be their earthiness. Most Koreans are engaged in agriculture and work close to nature.

As a child of seven I remember the scene of two American missionaries passing through our village. They were attracted by the sound of wooden mallets which my mother and I were using to make rice cake. They came and watched us, then gave us candy and left. I never understood their fascination until I came to America. Here I found a real nostalgia for the sounds of natural human life, the smell of soil, and the taste of pure water. This longing made me appreciate even more the beautiful color, grandeur, and natural vitality of the land which I had left. I decided to film my native environment.

After researching for a couple of months, I looked for sources to back my project with money and crew. Since I had last year completed my MFA thesis film "SUSAN AND SOO" for the Motion Picture Department at UCLA, I was unable to take any further production courses and could not use their facilities. Fortunately, there was another program which incorporates filmmaking with ethnography and ethnomusicology. This anthropological program has lots of film equipment. My project was approved, thanks to John Boehm and Richard Hawkins, staff members of that department. Luckily, I met another filmmaker, Russell Kingston, who had also graduated from the UCLA Film Department. After completing his own film "POSING", he had spent a couple of years working independently, and was happy to do the camera work. H.S. Park, a Korean film businessman in this country (Pacific Studio), decided to produce the film.

Russ and I carefully chose all our equipment. We took three of the Ethnographic Department's zoom lenses down to Eclair Corporation, had them checked, picked the best one, and overhauled it. We decided to use the Angenieux 9.5-95mm lens, because we thought we might need a wide angle in certain locations; and I was glad that we had it, especially when shooting in a small room of the cave temple SUK-KULAM, an underground dome built in the mid-8th Century, and later in the

royal tomb of King Mooyul, who lived 1500 years ago.

We shot some test footage at F&B Ceco before we left, bracketing exposures every ½ stop between F/2.2 and 22. This was to test the resolution of our lens, the accuracy of our meters, the latitude of the film stock, and the development and printing range of our lab. We decided on a three-stop underexposure for a day-for-night effect. This was used during the filming of a fire game in which thousands of people ignited their torches and staged a mock battle to welcome the rising of the Harvest Moon. This event used to occur once a year at night, but is now performed in bright sunlight as part of a larger festival. Removing the 85 filter and underexposing three stops gave the scenes a crisp moonlit effect, making the orange flames stand out in harsh relief against the sky. It worked beautifully.

I was able to get a 12-75mm zoom Beaulieu as a support camera, which we also used for single-frame shots. Most of the time I recorded sound with a Nagra III, but during the Korean Olympics, I grabbed shots of the torch runner and the release of the doves, while Russ covered from a higher angle the lighting of the Festival Fire.

We weren't sure whether the Korean current standard was 110 or 220 volts, so we decided to take along a transformer, a good precaution, or so we thought. We were told that the cities were in the process of changing from 110 to 220 volts and, as a result, old buildings still had 110 plugs, while new ones had 220 plugs. But in the new hotels, despite the fact that the plugs read 220, the current was still 110 volts! Thus, we didn't need the transformer to charge our Sun-Gun and batteries, and we had few lighting problems (other than our 220 lights running a bit low!).

The day before we left, I bought 10,000 feet of film (ECO & EF) from Kodak and registered it at L.A. Airport Customs, along with the rest of the equipment. We arranged to send CFI some footage from Korea and have them cable us if any problems arose. The Korean Consulate in L.A. promised us all possible cooperation. Everything seemed ready, but I never thought

Continued overleaf



(LEFT) A long line of male dancers and musicians, dressed in colorful native costumes, moves in an intricate choreography at Festival. (CENTER) As ceremonial orchestra plays, Eui records wild sounds of ancient court music. (RIGHT) Squatting in the background, Russ shoots over musicians' shoulders in filming performance of the Kayukuem.



(LEFT) Giants on stilts parade in colorful procession at the Kyungju Festival. (CENTER) After Russ let one student look through the Eclair viewfinder, 20 others surrounded him and demanded to see also. Afterwards, Russ noticed that the shutter had stopped in a position to block vision through the eyepiece, but the kids were happy anyway. (RIGHT) A giant lion and tiger watch the festival at Kyungju.

(LEFT) Russ was always surrounded by curious junior-high school students. They had never seen an Eclair NPR camera—or a bearded cameraman. (CENTER) Against a background of colored light, a singer performs in a Seoul nightclub. (RIGHT) Russ shoots and Eui records performance of student dancers during the birthday celebration of an ancient king.



(LEFT) Highlight of the Festival was the tug-of-war, with one hundred girls pulling either end of a three-ton rope. (CENTER) Russ takes a light reading in Bupju Temple for a sequence in which he used a Sun-Gun for lighting. (RIGHT) Two lovely Korean actresses who introduced the film-makers to local women's dress styles, and the leisurely pastimes of swinging and the see-saw.



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about the possibility of our equipment being overweight until we checked in at the airport. That was my first mistake. Two thousand dollars was charged for being overweight. We all despaired. If we had to pay that much money, it would have been impossible to make our trip. We called the Korean Consulate to ask for help. Mr. I.S. Bai and Mr. Y.C. Lee, consuls, called Korean Air Lines for us and negotiated with Mr. K.C. Lee, the head of KAL in the States. Finally, KAL decided to allow us to board without extra charge, thereby becoming one of our sponsors. Each time we checked in and out, we made sure to state: "Please do not x-ray our film and equipment!" They didn't.

When we boarded at Los Angeles Airport, the inspector regarded Russ suspiciously. His beard and brown leather jacket made him look like a potential hijacker! Russ was also holding a small metal camera kit in which he kept all his accessories. In the box, the inspector found a hammer and screwdriver, which he viewed as weapons, and seized them. But after some persuasion, they let us board.

The Korean government treated us as VIP's at KIMPO Airport, near Seoul. They didn't bother to check our luggage at all. Because the landing schedule was changed suddenly, I was unable to meet my family at the airport. I was a little confused, because Seoul, the capital of Korea, had totally changed in 5 years. I couldn't believe my eyes! Many skyscrapers, highways, floods of automobiles and neon signs. I tried to find my house by myself, but I couldn't, so I had to stop at the police office nearby and, through them, I found my house in that new city.

Because there are some restricted areas and cultural properties which are off limits to photographers, we had to wait a few days to get a permit for shooting. Later they gave us not only the permit, but also an equipment van, a guide, and all possible help, so we traveled all around South Korea with few problems.

I was delighted with what I had forgotten. Life was so different from America, especially outside of Seoul. Everything seemed poetic and rhythmic, as compared to the depressing lanes of traffic that I had been accustomed to in Los Angeles. The women's flowing dresses, the harvest threshing, the washing of clothes on the river banks, the ancient architecture, and the choreography of the traditional dances. I wanted to capture those rhythms of life and to match them with the rhythms of film structure.

Continued on Page 1199

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The Man From LOX

Holding the audience's attention was the problem—and they solved it by filming a far-out five-minute safety "commercial", with pretty girls and a lot of laughs

By JOHN DUNKER, Film Writer

Naval Weapons Center, China Lake, California

Six 36B bras, a two-hundred-pound dummy and a 5'5" cutie are kind of unusual props for a Navy motivational film, but "THE MAN FROM LOX" is a somewhat unusual film. It's a five-minute "commercial" made by the Film Projects Branch, Naval Weapons Center, China Lake, California. The film reminds liquid oxygen handlers to be more careful on the job. The Advanced Technical Objectives Working Group on Fire Research sponsored the film which is distributed by the Navy Safety Center.

Because liquid oxygen is so temperamental, most liquid oxygen handlers had never seen or experienced an accident. It seems that the sailors weren't treating the highly explosive liquid oxygen with enough respect as they went about their daily tasks of filling aircraft breathing bottles. The sailors were told and told again that the liquid oxygen, or LOX, is dangerous. They'd seen films, attended lectures, watched demonstrations; yet nothing really seemed to get through to them. This was the problem

faced in starting out to make the film.

Rather than start out by saying "What can we teach them?," I began with "How can we get their attention and leave a long-lasting impression?" A short persuasive humorous approach was adopted. In a couple of days, I had a rough script which I and director Marty Shelton polished into somewhat final form.

The key character of the film is a Mr. Know-it-all sort, "THE MAN FROM LOX", played by Lindsay Workman. Into Workman's escapades we cut high-speed footage of staged liquid oxygen accidents and explosions. To illustrate that LOX can make a mess when dropped, Workman drops a jar of smoked salmon, which breaks into an ugly blob. He then drops a pint container of liquid oxygen which creates a significant explosion. At 2,000 frames per second, it's monumental!

To show a "wise guy" sailor, played by Dave Dominguez, that his safety coveralls aren't fireproof, we surrounded a 200-pound rubber instrumentation

dummy with oxygen and lit it off. The suit certainly wasn't fireproof and Dominguez reacts accordingly to an insert of the flaming dummy. A pair of LOX-soaked leather gloves vanishes in a ball of fire when struck with a weight, showing the same cocky sailor that a sharp blow can detonate LOX-contaminated material.

The "perfect" sailor, played by Fred Sommers, "a Navy LOX Handler," faces several temptations while returning his four-wheeled LOX trailer after completing his appointed rounds. However, duty prevails, and Sommers returns the cart to the proper area. He's amply rewarded.

A bra-burning "Women's Libber" makes the point that things that normally don't burn too well, really take off when oxygen is around.

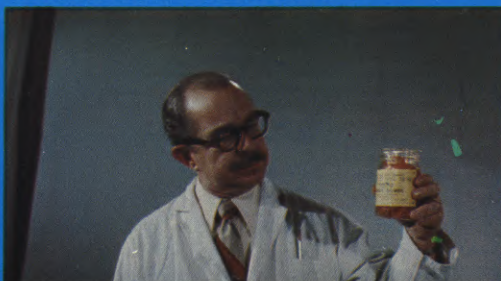
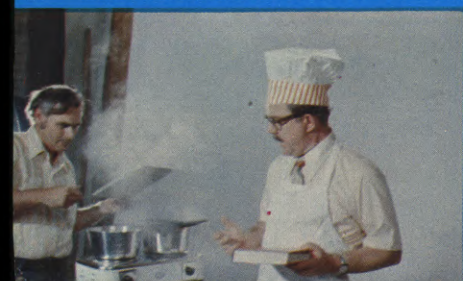
A five-cut hospital sequence, ending on a severely burned person, emphasizes the seriousness of carelessness and brings an end to the film.

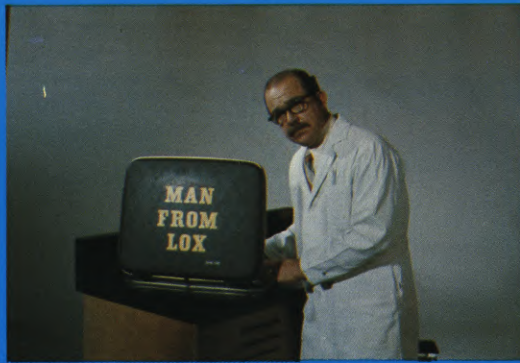
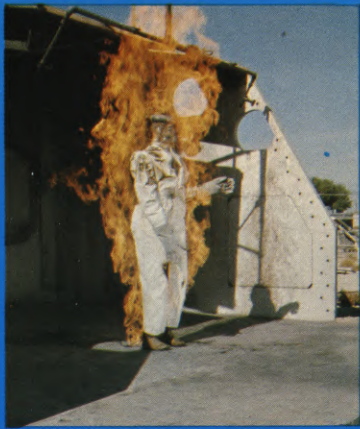
Most of the film was shot in limbo, using only minimal props. Shelton and I

(LEFT) LOX handler AME1 Fred Sommers unhooks his LOX cart. The Mole-Richardson reflectors did wonders for the shadows. (CENTER) Each cart holds 50 gallons of LOX. The vapor is venting oxygen. Needless to say, there was no smoking on this location. The Arriflex BL was used to shoot about 80% of this film. (RIGHT) Fred Sommers and Paula Smith relax, while writer-art director-gofer John Dunker adjusts the reflector. These reflectors work especially well in the desert sun.



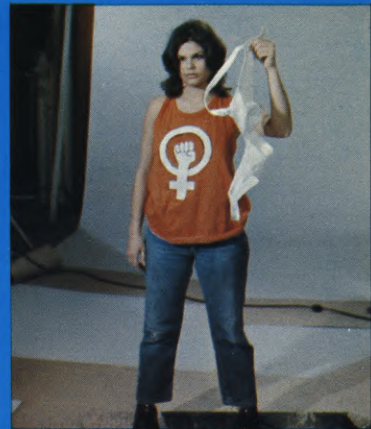
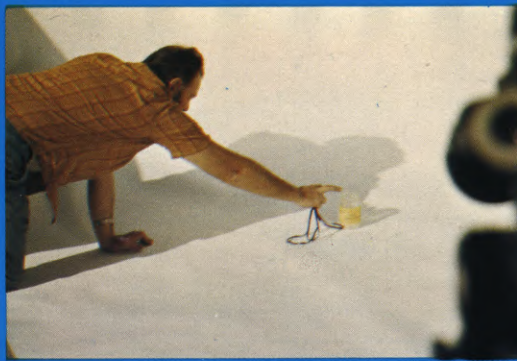
(LEFT) All sorts of mixtures were tried to make the pots smoke. Smoldering rags finally did the job. Assistant Cameraman Don Sherri demonstrates his cooking technique to Lindsay Workman. (CENTER) All that LOX—and no bagels. Workman's LOX jar is a breakaway version cast by Mole-Richardson. (RIGHT) The breakaway jars worked just fine. So did the LOX.





(LEFT) Sam, the dummy, faces his fate. Acetone and piped-in oxygen realistically simulated what would happen if LOX spilled on overalls and ignited. (CENTER) Lindsay Workman looks into his case of tricks. The letters are large punch-outs glued on. (RIGHT) Cameraman William Beasley, Director Marty Shelton and Writer John Dunker line up a scene on the Naval Air Facility Flight Line.

(LEFT) One Arriflex ran at 24 frames, the other at 48. The Hycams ran at 1,000 and 2,000 frames. The Mitchells were adjusted to 48 and 96 frames. (CENTER) Positioning of "drops" was very critical. Here Clare Grounds lines up prop for bra-burning scene. Purchasing a dozen bras through Navy paperwork was somewhat of a problem.



both realized that if the audience spotted any phoniness, they would dismiss the film as just another patronizing training film. I spent a lot of time gathering authentic and specific costumes, safety equipment and airplane parts, as well as gallons of treacherous liquid oxygen and the liquid nitrogen which was used on the set as a LOX substitute. The results were well worth the effort.

Casting was a problem, characters had to be believable. There was no doubt about character actor Lindsay Workman as the Man from LOX: his maturity and versatility fit the part exactly. Fred Sommers, a real LOX handler, and Paula Smith, play the tempted LOX handler and the temptress, respectively. Sommers was exactly the goody-good sailor we were looking for; his appearance and manner were perfect. Miss Smith had community theatre background and the physical assets that any effective temptress must have; costuming had to be specifically designed to show Miss Smith to advantage.

The women's libber and the second LOX handler became the hardest roles to fill.

In the first day of auditions Shelton and I drew a blank. We had "method" people spending more time in the corner getting into the part than the whole bit took; we had prospective women's libbers who didn't like the idea of taking off their bras; we had girls who couldn't take off a bra because they didn't have one; all this for a film rated GP at worst.

The second day of casting went better, three hot prospects for the two parts. Lisa Forman got the women's lib about 130 foot-candles on the subjects with little fill around the room; the lighting is harsh and realistic. A long run down a corridor was the toughest lighting problem. As our shot was wide and low, with the camera strapped to the side of the ambulance gurney, lights couldn't hang from the ceiling. Cameraman Beasley took advantage of several doors along the corridor, setting the lights high and far enough into the doorways to remain hidden. Fill came from a light behind the camera in the

hallway. Though not sparkling white, the walls of the corridor provided some reflected fill. The end footage of the burn victim was shot for us at the Brooke Army Medical Center in Texas.

For the exterior shots at the China Lake airstrip, Shelton picked what seemed to be the coldest day in December—a nice sunny day but near freezing, and super windy! It wasn't exactly the best weather for Miss Smith's bikini scene or an invitation to a beer bust at the pool. Makeup man Jim Nielson had his hands full of goosebumps and blue skin; he certainly earned his keep. The crew stood around shivering in sweaters and jackets, the cast shivered in bikinis, swimsuits and shirtsleeves, and the perspiration came out of the glycerine bottle.

Because of the dry cold, we expected static problems but none developed; we didn't expect wind problems but we got a gale. All the sound for that day was post-recorded on a rig designed by Shelton and assemble by Beasley. Through a patchwork of hastily soldered cords and assemble gear, loops

were run on a double system projector. In the studio, the talent heard the lead in beeps and dialogue on head phones. Replacement lines were recorded on a Nagra IV with crystal control. For the short takes, sync was right on. Longer takes took a little adjustment in editing to sync up because the projector wasn't slaved to the Nagra; the projector motor wandered a bit.

From a windy day in the desert, we picked up and moved to Los Angeles for the sound stage work. Crew increased to cameraman, assistant, gaffer, boom man, recordist, and makeup artist; a few more folks than at the China Lake locations. Two rolls of seamless white background paper turned the Cinesound stage into a limbo set and lighting eliminated most of the ripples in the paper. The seam between the two rolls was a little more stubborn and never did completely vanish, but it's one of those things that you don't notice unless you look for it.

We used liquid nitrogen on the set to simulate the temperamental LOX, it looks convincing and presented no extraordinary handling problems.

job. The LOX handler spot went undecided for two weeks. We finally selected Dave Dominguez a few days before shooting; he did a good job for us.

The actual shooting of the film

stretched out over a two-month period. Director Shelton wisely shot the LOX "accidents" and explosions first, as scenes and dialogue could be altered to suit what actually occurred with the LOX, rather than what was supposed to happen. With a few squibs, hot wires, and selective cutting, all the explosions and burns came off looking good. Burning the "safety" suit off the 200-pound rubber dummy was a problem; we couldn't actually dump LOX on the suit because the rubber dummy would have become extremely explosive. We didn't want the dummy to explode, just his LOX-soaked coveralls to burn, as it would in a real situation. After a day of experimenting, Shelton settled for a realistic combination of acetone on the suit and oxygen gas piped up through the trousers. The results were spectacular—the suit went off like a fire bomb; the rubber dummy was burned about one-half inch deep. If anything, the results would have been more spectacular had LOX been used, but the scene is impressive enough and very realistic as it is.

The restaging of an *actual* incident was another problem—making LOX-soaked, grease-stained gloves explode when struck sharply with a weight. The weight was right, the LOX was poured, the cameras were on, the weight was

dropped, and nothing happened. Four tries and 3,200 feet of high-speed film later, a match on a stick and the required LOX finally blew up the gloves quite nicely, ripping the leather into bite-sized chunks—perfectly illustrating the temperamental characteristics of LOX. The rest of the shots went off as planned. To be certain that the successful shots were captured on film, six cameras were running, all from slightly different angles. Clare Grounds operated two Hycams at 1,000 and 2,000 frames. Bill Beasley and Gail Falkenberg ran two Arris and two Mitchells between them. One Mitchell and one 16S ran at 24 FPS, the remaining Mitchell was adjusted to 96 and the other Arri ran at 48 frames. For the explosions and drops, the 1,000 F/S footage looked best. On the burns, the 96-frame stuff looked good.

The next sequence Shelton shot was at the end of the film, a brief scene in the NWC hospital. Condensed to a few cuts, the scene takes a patient from the ambulance to the emergency room, through the insertion of a "trach" tube and concludes with shocking footage of a 3rd-degree burn victim. Lighting in the emergency room was minimal for ECO,

Getting blobs of fish-"LOX" to dribble down the chest of lovely Gloria Gunn was another story. "Man from LOX" Workman is making the point that LOX can mess a person up. We had three clean jumpers; our schedule allowed three LOX dumps. The first try, all we got was a big blob of gunk; more salad oil in the jar made the second take a little better. Improved pouring technique on Workman's part got a print on the third take, but we still needed an insert. A hurried washing session in the Cinesound sink, some lighter fluid and paper towels took most of the oil out of the last jumper and we got our insert.

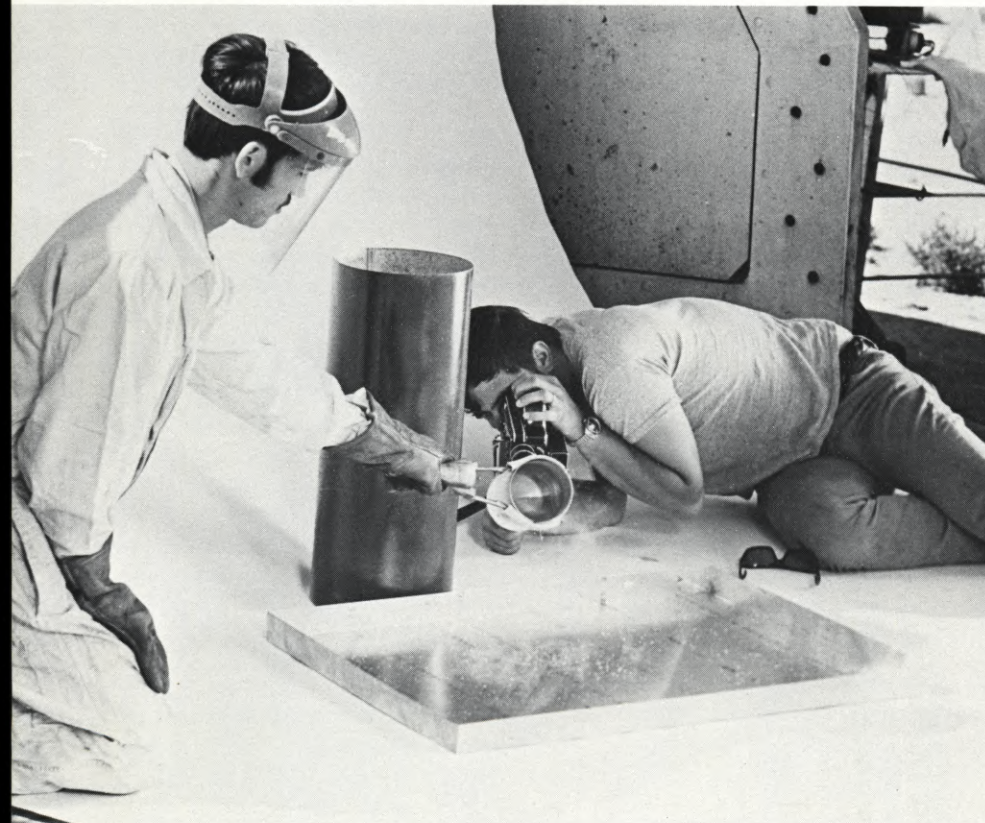
After a dozen tries, Lisa Forman as a tough-looking "women's libber" convincingly strips. Trying to light a match on the seat of her pants involved a little sandpaper and gaffer's tape which worked pretty well. Lisa didn't pick up any splinters and only broke a few matches. The only problem with that scene was purchasing a dozen bras through the Navy Procurement System.

Editing was done at China Lake on Shelton's traditional Moviola. The picture kept getting shorter as every frame of non-essential film was removed. The film ended up pretty tight. Sound, with the exception of the looping, was done at Cinesound in Hollywood. They generated the effects and pulled the music stings from their various libraries.

The response to the completed film

Continued on Page 1206

As LOX handler Steve Nelson dumps LOX into a drip pan, John Dunker grabs a back-lighted cutaway. Spring-wound cameras were used for shooting in close, in order to avoid spark hazards. Test footage from all cameras was checked for frame-line match.



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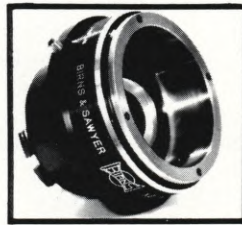
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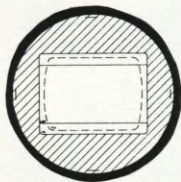
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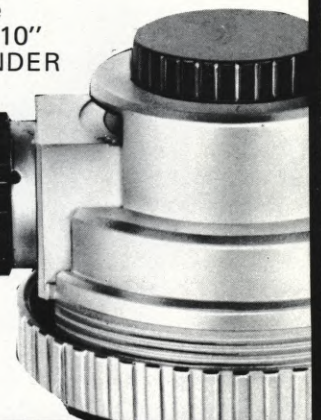


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"THE SHEIK OF CHICAGO?"

or MAKING MOVIES LIKE THE BIG GUYS

Tired of shooting TV spots, and inspired by Valentino, young Chicago film-makers spawn their own far-out flick—just for the hell of it!

By MIK DERKS

PROLOGUE

In a motion picture world of sometimes impossible dreams, the "theatrical short" represents an attainable goal. Furthermore, the short is an excellent proving ground on which to find out if you can indeed tell a story via the motion picture medium, and ultimately, if that story is worth being told. Finally, the fifteen-minute short is a good tune-up for a ninety or one-hundred-minute feature. This is how our short, "ANOTHER SATURDAY NIGHT", came into being:

CAST OF CHARACTERS

STEVEN B. POSTER—Once a simple cinematographer, miraculously transformed into a cinematographer/director/producer.

MIK DERKS—Writer, given his baptism in the giddy ecstasy of directing one's own script into the movie "it should have been."

BILL FOSSER—Production Designer, whose talent and flair make his eternal pessimism a charm.

JIMMY RYAN—Prop-Man, whose name was somehow left out of the screen credits, and so is mentioned at every possible opportunity.

MARK RUSSI—The Sheik. He always was the sheik, and now he always will be the sheik.

BARBARA GAINES—The Lady. In a project that provides the means for many people to establish their talents, she sets the level of professionalism.

WILLY—The Horse, who, when asked to go faster, obligingly

moves more of himself with great commotion, but maintains the same speed. And who eventually steals the leading man from the leading lady.

THE SCRIPT

FADE IN ON:

INTERIOR—POSTERS' KITCHEN—CHICAGO—JUNE, 1972

EXTREME LONG SHOT (ODDS: 10,000 TO 1)

Several disgruntled members of the Chicago Film Industry (it really does exist) are sitting at their communal desk—the Posters' kitchen table. Tired of making nothing but commercials and industrial films, and finally convinced that no "Hollywood Producer" is going to pop up and offer them a feature in the foreseeable future, a deceptively simple idea is hatched.

STEVE

Let's at least do *something* worthwhile this summer. We can make a movie!

THE OTHER PAUPERS

With what?

STEVE

We don't need any money. I've got a box full of short ends; I know I can get an Arri for a weekend; John has all his sound equipment; and we all have a lot of time. What else do we need?

Silence. No one has thought of making a movie for and by themselves since they left college and became "professional filmmakers."

(LEFT) An ornate tent, set up on the sands of the Lake Michigan beach-front, serves as set for the derring-do of "THE SHEIK OF CHICAGO", satirical short made for sheer love of the Art by young professional film-makers fed up with shooting commercials and industrials. (CENTER) The object is to get the scene in the can before the blazing braziers set the tent afire—which they finally did. (RIGHT) The Sheik spirits his love away on a parade Quarter Horse posing as an Arabian stallion.



(LEFT) An intimate scene in a bar commandeered for shooting on a Saturday morning. (CENTER) The durable heroine, Barbara Gaines. After being roughed up by the horn of the poorly-disguised Western saddle during the abduction scene, she faces a fate worse than death in the Sheik's silken tent. (RIGHT) Mark Russi, every inch a Sheik, plays the Valentino role to the hilt. He'll never be the same again.



STEVE

Then it's agreed: We'll make a weekend movie. It'll be our summer project. Mik, go write a script for a film that can be shot for nothing in no time, and make it an Award Winner (a term used very loosely among Chicago filmmakers).

MIK

Why am I always the first one you pick on?

ALL

Because you're a writer!

CUT TO:

MIK'S OFFICE

TIGHT SHOT (BECAUSE IT'S SO SMALL)

Three days after seeing "The Rudolf Valentino Story" on TV, Mik has finally come up with an idea for the short, based, coincidentally, upon Valentino's most famous characterization: The Sheik. He furiously types up the twenty-page script in a single sitting, and then rushes over to show Steve the rough draft before cleaning it up.

STEVE

Perfect! I love it!

He rushes off to the downtown Xerox Service to make copies and get the show on the road.

MIK (CALLING AFTER HIM)

But that's only a rough draft... I haven't cleaned it up yet.

STEVE

What do *you* know? You're only a writer.

DISSOLVE TO:

STEVE'S OFFICE (THE KITCHEN)

REVERSE SHOT

Steve shows Mik the breakdown and production board he has just finished.

MIK (READING)

Four shooting days, singles' bar interior, day and night city exteriors, day and night desert exteriors, sound-stage set, two principals, fifty extras, one well-trained horse... What kind of weekend summer project do you call this?

Steve holds up the original rough draft of the script.

STEVE

What kind of a "no sets, no costumes, two-day-shoot" script do you call this?

MIK

Well, I cut out sync-sound, didn't I?

Steve does not accept that answer.

MIK

Just because *I* can't control myself doesn't mean you shouldn't either. And besides, that was only a rough draft anyway.

(PAUSE)

What are we going to do?

Unfrightened by all the things that would scare the Hell out of them if they knew anything about making a full-scale fifteen-minute short, the intrepid duo decide to do the script as it stands.

MIK

We'll need a full crew, won't we?

STEVE

I'll just make a list of everybody and everything we need to make this movie the way it *should* be made, and then I'll ask them to do it. I'll pay all the direct cost and ask everybody to throw in their labor for a percentage. Haven't you ever heard of "participation"?

MIK

Yeah, that's when you work for a piece of a film

that never gets finished.

STEVE

That's the Chicago definition.

MIK

We're in Chicago! Nobody's going to agree to anything like that.

STEVE

I can always ask.

CUT TO:

SAME SCENE—SEVERAL DAYS LATER

Mik is surveying the list of people (all union members in good standing) and services who have agreed to participate: production designer, make-up man, prop-man, assistant cameraman, lighting director, costume designer, electrician, grips, gaffers, talent, horse, shooting stage, equipment, lights, etc., etc.

MIK (INCREDULOUS)

Nobody said no?

STEVE

Nobody.

MIK

How could you ask people to give up their nights and weekends just to prove that *we* can make a movie?

STEVE

There's always the chance they'll make some money off it.

MIK

How could you ask people to give up their nights and weekends... for nothing... just to prove that we can make a movie?

STEVE

How do you think I feel?

Steve and Mik both feel so bad that in the middle of everything, they duck out to a posh girls' camp in Maine to do a short documentary.

QUICK CUT TO:

CHICAGO AGAIN

SHOOT SEVERAL DIFFERENT ANGLES

Steve and Mik, rested and coherent, step off the plane only to find "THE QUESTION" waiting for them (condensed here to help the reader avoid the monotony experienced by the authors):

BILL, JIMMY, MARK, BARBARA, ET AL.

Who's going to direct?

STEVE AND MIK

We both are.

ALL

That's wonderful, but who's going to direct *me*?

STEVE AND MIK

It's like this: Our tastes are the same, but our training and talents are different. Mik can conceptualize; he knows what should be in every shot and how those shots will all fit together. Steve puts it all on film.

ALL

So who's going to direct *me*?

Steve and Mik sigh, shaking their heads sadly, alone in a world of non-believers.

STEVE AND MIK

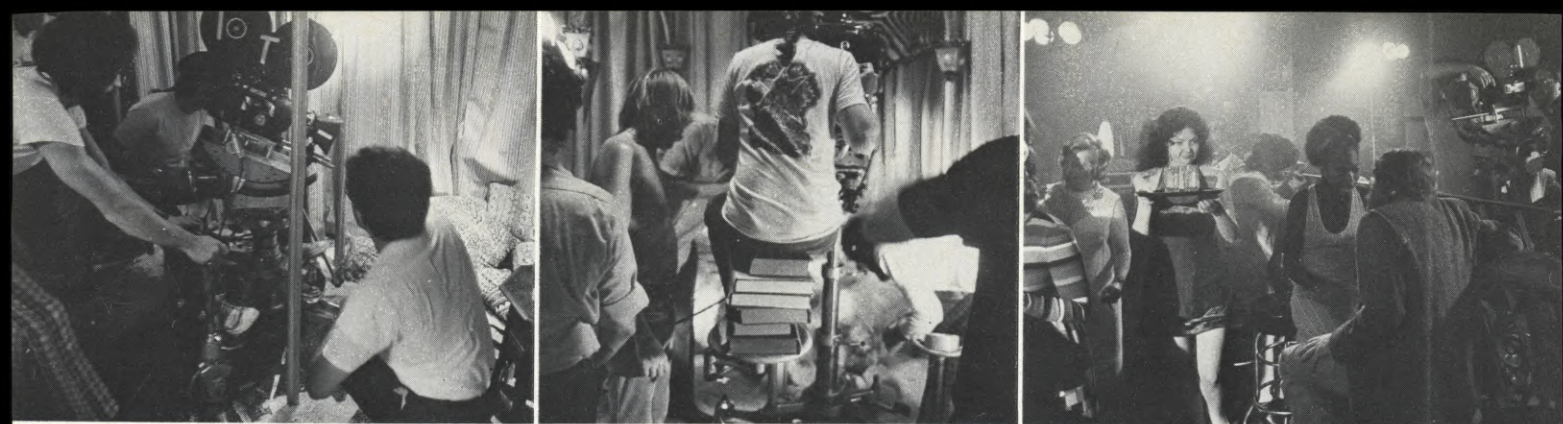
We both are, but whenever you ask a question, only one of us will answer.

FADE OUT.

FADE IN ON:

INTERIOR—SHOOTING STAGE—NIGHT

Mik, going strong on his fifth 18-hour day in a row as



(LEFT) Eager young crew, working strictly for the love of the Art, lines up for a shot inside the tent. (CENTER) Perched atop several thick books, piled beneath his seat of learning, the camera operator is finally in position to shoot the nude scene. (EDITOR'S NOTE: Since this is a family magazine, we can't show the nude.) (RIGHT) Lured by visions of being discovered (and lots of free beer), about 50 people turned up on a Saturday morning to enact bar sequence.

delivery boy, messenger, crisis intervention specialist, phone artist, sweet talker, and nervous wreck, peeks in on Bill Fosse as he adds some essential finishing touches to the set, listening to the radio coverage of the opening night of the Chicago Opera Season. It is the first opening night performance he has missed in twenty years. A tear glistens in his eye.

MIK (VERY SOFTLY)
Gulp!

CUT TO:

INTERIOR—BAR—FIRST DAY OF SHOOTING

Steve and Mik are wandering around in a daze, amazed that everyone actually showed up, including the fifty extras who came out to drink beer early on a Saturday morning. Jimmy Miller sets the lights; Steve sets the camera and crew; Mik sets the actors and extras.

MIK
Ready?

STEVE
Ready.

Mik says all those things that have to be said for the camera to roll and the actors to act, and in a moment . . .

MIK
Cut! How was it for you?

STEVE
Fine for me . . . how was it for you?

MIK
Fine.

Steve and Mik stare at each other, struggling against their commercial training that insisted on at least a dozen takes, striving to believe that when you have it on film you should know you have it.

STEVE AND MIK
Okay everybody, let's do one more.

The two-director is launched in Chicago! By the end of the day, the crew has learned not to listen to Mik, who only confuses them by thinking alternatives out loud; and Mark and Barbara have discovered, to their delight, that two directors really *can* work together without asking two different things of the same person. Everyone is full of good feelings.

SUBLIMINAL CUT TO:

A RELIGIOUS EXPERIENCE

Steve and Mik are shaken from their Adrenalin Trances by watching Bill Fosse line up all the props to dress the set for the next day's shoot, and then, in a few moments, miraculously transform a rag-tag collection of material swaths and wood slabs into a stunning, make-believe fantasy world where anything could happen . . . and probably would the next day. It is the stuff inspiration is made of.

CUT TO:

**SHOOTING STAGE—NEXT DAY
LONG, LONG, LONG SHOOT**

Steve and Mik exchange furtive glances, wondering when they will have to reveal their dreaded secret to the rest of the crew. Eventually, somebody had to ask:

CREW
How many shots today?

STEVE
Fifty-four.

Stunned silence.

STEVE
Fifty-four includes title frames and some shots we really don't need . . . actually, we'll only be shooting about forty-six shots.

Stunned silence.

STEVE
But that's only about twenty different set-ups.

Stunned silence.

STEVE
When you think about it, we'll only be shooting in five different directions.

STUNNED SILENCE.

MIK
We'd better get going.

BEGIN UNDERCRANKING for fast motion as the camera is set up, actors placed, scene shot, camera moved, actors refreshed and reset, scene shot, etc., etc., going faster and faster until only Steve and Mik are still moving, all others having collapsed to the side. The day is saved when Kathy and Gail, the better halves (pardon the expression) of Steve and Mik, bring in a Chinese feast to succor the spirits and refocus the vision of everyone.

STEVE
I guess we should take a break.

There is a short break.

STEVE (TO MIK)
Can we do it?

MIK (TO STEVE)
If we don't, we'll need another weekend. That means we'll probably lose the crew . . . if we haven't already.

STEVE
We can do it.

MIK
Let's do it!

They do it. The crew does it. On this second day of shooting, the "participants" in somebody's summer-project-gone-wild suddenly meld into a motion picture company, cast and crew and directors communicating on a new and instinctual level to get all the necessary shots in the limited time left. Steve somehow manages to keep the lighting consistent and the

shadows in the right place; Mik somehow manages to revise and delete and keep track of all the shots that must eventually fit together.

Twenty shots in two hours and then everything slows to a halt for the last shot—the nude scene. It takes a while to set this one up because Steve and Mik have been too embarrassed to even think about it beforehand. The crew is suddenly in no hurry, anyway.

FADE OUT.

FADE IN ON:

CITY PARK—EARLY MORNING—A WEEK LATER
LUCKY TO GET ANY SHOT AT ALL

Much to the relief of the directors, the crew shows up again, rested from a week of normal film work, and raring to go. As is Willy, a parade Quarter Horse ready to masterfully portray a charging steed. Then it happens: A love affair to rival *the* love affair that the movie is all about. Mark falls in love with Willy. Before takes, during takes, after takes . . . they ride, ride in loving ecstasy.

MIK

You know, that's got to be pretty weird.

STEVE

What's that?

MIK

To wake up in the morning in your high-rise apartment and look casually down to the street below to see a Sheik in full costume riding his horse up and down the street.

CUT TO:

SAME SCENE—THE BEACH

STEVE

That's got to be pretty weird.

MIK

What's that?

STEVE

To be driving calmly down Lake Shore Drive and look over to find a Sheik in full regalia charging his steed along the beach.

CUT TO:

SAME SCENE—CHICAGO'S NIGHT CLUB DISTRICT—NIGHT

MIK

That must be weird.

STEVE

What's that?

MIK

To walk out of a bar and see a Sheik riding by on a Quarter Horse posing as an Arabian Stallion.

STEVE

Down here?

MIK

You're right . . . that's not so weird.

DISSOLVE TO:

MOTEL—MICHIGAN DUNES

WILD SHOT

A look of utter amazement fills the motel lady's face as a very strange-looking film crew descends upon her lodgings for the night. She sighs with relief that she had thought to get the five-dollar deposit beforehand. But then, where else can you find a desert in the Midwest? All proceed to their rooms for a short night's sleep, except for Steve and Mik and wives who save money by sleeping in the Winnebago, and

thus get no sleep at all. Steve giggles all night, no doubt at the ludicrousness of the situation he has gotten everyone into.

CUT TO:

EARLY MORNING—DUNES

NO SHOT

The company arrives at the location in time for the sunrise that is totally obscured by the cloud cover.

STEVE

I can't shoot day-for-night when there's a cloud cover.

MIK

Don't worry, it'll clear before noon.

Everyone retires to the vehicles to catch up on some of the sleep they lost the night before, except for Mark, who decides to go out and get a little riding in with Willy.

DISSOLVE TO:

SOMETIME BEFORE NOON—SAME SCENE

The sun comes out, and the company remembers the speed it had attained the Sunday before and resumes that same incredible pace. Meanwhile, the directors and gaffers and wranglers and anybody else who tries, find it impossible to comfortably pad the horn of the western saddle that has been disguised as an Arabian saddle. Barbara finds it just as impossible to sit on the horn of that saddle.

BARBARA

Ouch.

STEVE

Now, let's try one going the other way.

BARBARA

Argh!

MIK

We better do that tracking shot again.

BARBARA

Oooooooooohhh!

STEVE

Maybe we should have them coming down the dune.

BARBARA

Yyiiiaaaaeeee!!

MIK

One more should just about do it.

BARBARA

It already did . . . I may never walk again.

DISSOLVE TO:

SAME SCENE—THE OTHER SIDE OF THE DUNE

Bill Fosser, revelling in his pessimism, is leading the crew in a valiant struggle to put the tent up in spite of a strong wind. It looks hopeless.

MIK

Don't worry, the wind will die down by dusk.

CUT TO:

SOMETIME AROUND DUSK

The wind dies down and the tent is made ready. Steve and Mik eye the naptha braziers perched ominously on the corners of the tent, waiting to be fired.

MIK (TO BILL)

Can we be reasonably sure we'll have time for more than one take before the tent catches on fire?

BILL (AFFRONTED)

We *are* professionals, you know . . . we *have* done this kind of thing before.

He walks off.

Continued overleaf

MIK (TO STEVE)

It's going to catch on fire.

STEVE

Of course it's going to catch on fire. We'll shoot it once without the fire just to be safe.

The scene is shot without lighting the braziers, then Jimmy Ryan sets the torches to them. It is now a race against time and the inevitable. They race through the first shot . . . they race through the second shot.

MIK

Look sleepy guards . . . stretch and yawn . . . that's it . . . and CUT!

STEVE (FRANTICALLY)

You forgot the PAN UP!

The awning of the tent is already beginning to catch fire.

MIK (HYSTERICAL)

Damn! Hold it . . . everybody back in their places . . . okay, ROLL CAMERA.

The flaming fragments are falling around the extras who are pretending to ignore them, trying to protect their heads without the camera noticing.

MIK

Ignore the fire . . . look tired, relaxed . . . PAN UP . . . PUT OUT THE FIRE!

The entire company charges the tent, throwing sand everywhere and yanking down material and getting in each other's way and finally managing to douse the fire. All stand breathlessly amid the smoking and ramshackle mess, wondering what to do next.

STEVE

Okay everybody . . . that's a wrap.

DISSOLVE TO:

DOUGHNUT SHOP—3 O'CLOCK THE NEXT MORNING SLIP SHOT

Steve and Mik are waiting for what they hope will be a final cup of coffee to get them through what they pray will be one final chore. They are completely exhausted; the day has steadily refused to end.

WAITRESS

That'll be 58¢.

Steve stands up to get into his pockets, all twenty or so of them.

STEVE (TO MIK)

You have some money, don't you?

Steve continues to go through his pockets, even as the inevitable realization dawns on them both.

Bush-league Valentino, saddling up in the shadow of posh apartments along Chicago's lakefront, provides a mind-boggling sight for the local residents.



MIK (TO EVERYONE)

You're kidding!

STEVE (TO ANYONE)

You're kidding?

They are not kidding. At the zenith of their short careers, having experienced for one glorious week the ecstasy of heading their own production, having only hours earlier held incredible control over not only a large group of people, but over their hopes and memories as well, these two bruised, battered and beat dreamers can not even pay for a cup of coffee and a doughnut! They are saved by one of their own, a child in faded jeans and precious golden curls, with a Rubenesque mouth that hides a Picasso smile.

WAITRESS

Don't worry about it.

They always will.

FADE OUT.

FADE IN ON: EDITOR'S OFFICE—THREE DAYS LATER SURPRISE SHOT

STEVE

When can we get started cutting?

EDITOR

We already started.

MIK

When will we be able to see the rough cut?

EDITOR

Right now.

STEVE AND MIK

How did you do that?

EDITOR

By following the script.

Steve and Mik are astounded by the simplicity with which the pieces all fit together. In three more days the final cut is done, every single shot used in the scripted order.

CUT TO:

MAGIC INSERT

The baby of the Chicago Film Industry is born; all it needs now is to start breathing (crying?). Jimmy DiPasquale comes in to do the score.

STEVE AND MIK

Listen, we don't want to scare you or anything, but as far as we're concerned, it's all up to you now.

JIMMY

How much time do I have?

STEVE AND MIK

Well, we wrote it in one day, shot it in four and cut it in three . . . how much time do you need?

JIMMY

The only number you missed was two.

Two days later the score is finished. And by the time the wondrous music is recorded, it is hard to believe that the film could ever have existed without it.

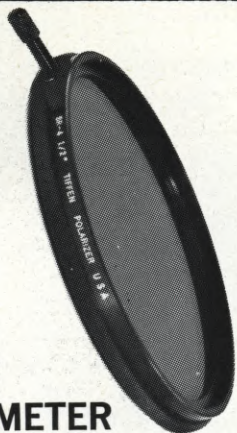
CUT TO:

THE FAREWELL SCENE

Leaving Steve in the city to take care of all the final details, Mik packs up and moves to a Wisconsin farm for some peace and quiet and a chance to recover from the trauma of dealing with so many people in so short a time. (And primarily, to prepare some feature scripts and treatments.) Steve, the Producer, meanwhile, finds that his work has just begun. He saves himself by compiling miles of lists and checking off

Continued on Page 1203

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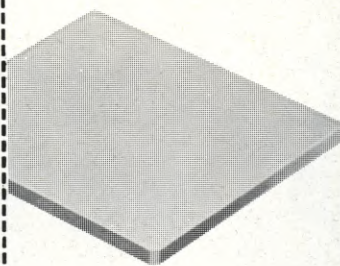
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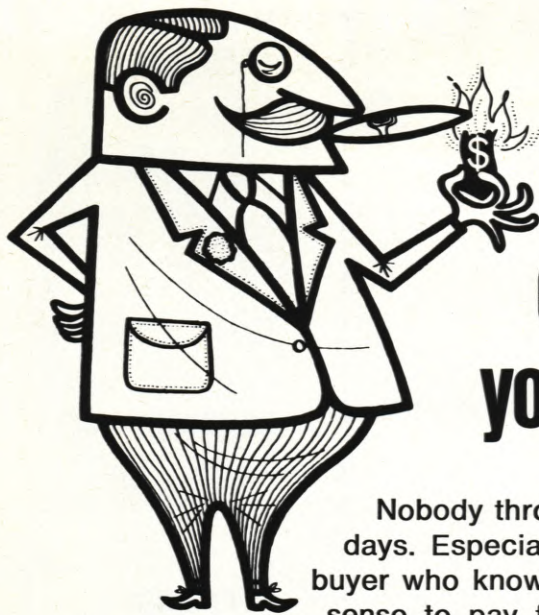
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P.A.G. SOUND SYSTEM

Continued from Page 1149

record/replay versions, and, on the latter, a peak programme meter and level control are fitted on the front control panel.

ELECTRONICS

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ELECTRONICS FADER Operation of the D.C. record enable control smoothly fades the audio feeding the record amplifier.

All audio inputs and outputs and the stabilised supplies are brought onto a 26-way connector on the electronics door. This may then feed either a P.A.G. mixer or lead directly into studio lines.

All the circuits are on plug-in fibre-glass printed circuit boards. The playback preamplifiers and line drivers carry equalisation and gain adjustments. If overloaded, the stabilised power supplies are designed to switch off and remain so until the power is removed for 30 seconds and then reapplied.

The Azimuth adjustment of both record and replay heads is very simply made. An Allen key is used to turn a gear machined at an angle through one face which forms part of the head foot, thereby altering the head angle. This system has the considerable advantage of involving no springs, thus eliminating the problems of head vibration, and assisting in obtaining a high-frequency response.

P.A.G. MIXER

This mixer is designed to provide remote control of the rack functions with basic level monitoring and dubbing facilities. The mixer incorporates a low-impedance microphone preamplifier whose output can be jacked to whichever fader is convenient. Four fader inputs are provided, balanced if required, and feed a mixing amplifier and then a master fader control. Monitoring at this point, or of deck 1 playback, is provided by the Direct/Film illuminated push-button switch. The selected monitor output appears as a line level signal (also suitable for 600 Ohm headphones) and at the speaker output sockets, after passing through the volume and tone controls on the right of the fader panel and the built-in power amplifier.

The power amplifier, which is protected against short and open circuit loads, is an optional extra. Bass and treble equalisation can be provided on controls adjacent to each fader. The record button changes colour when depressed and is cancelled automatically when the machine Stop button is pressed, thereby preventing erasure by rolling back in the record mode.

PROJECTION

P.A.G. normally supplies the Hokushin Polestar projector with its systems, although it will modify other makes to customers' requirements. P.A.G. also provides a module which uses the Eumig Super-8 projector and, on the Mini-Rack, these two projectors can be interchanged in only a few moments.

The company claims that it chose the Hokushin because it fulfills all of the basic requirements of a dubbing system. It will run single and double tape splices forward and reverse with no problems, has very good picture brightness and steadiness and "is the most reliable projector which we have tested."

For further information on this system, contact: P.A.G. FILMS LIMITED, 492 Kingston Road, LONDON SW20 8DX, England. Tel 01-542 1171.

Distributor for this equipment in the United States and Canada is KINGSWAY FILM EQUIPMENT LTD., 821 Kipling Avenue, Toronto 18, Ontario, Canada. ■

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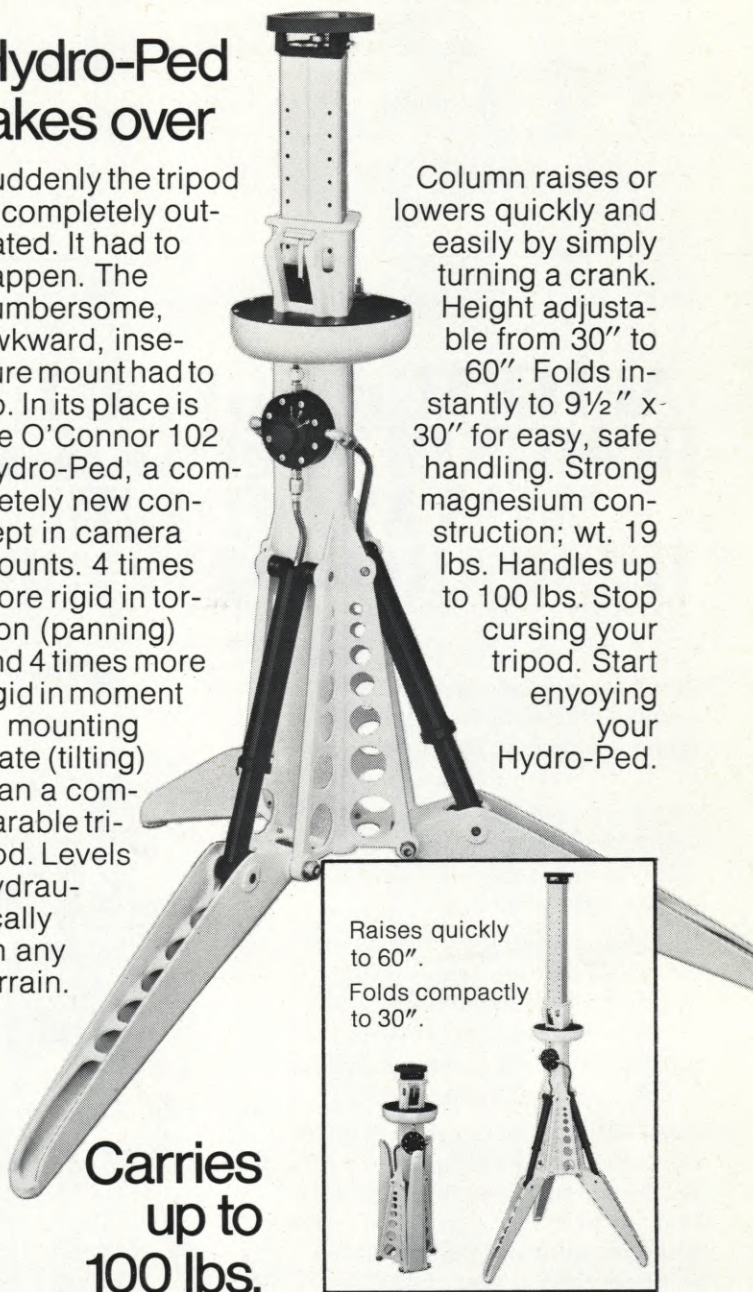
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ATEMA 166 EDITING TABLE

Continued from Page 1141

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"STATE OF THE ART"

Continued from Page 1170

believe we are close to 35mm standards. Professional perfection is, I agree, still around the corner, but we are waiting hopefully for the new Kodak color stock which promises a big improvement in resolution and grain size.

Meantime, of course, we are all striving here for that overdue marriage of film and Television techniques. There have been a number of attempts with multi-camera filming, as you know, in the main feature film studios: Elstree, Pinewood, Shepperton and at pop concerts, but so far, alas, the breakthrough has not taken place and our major feature films are, of course, still being made in the classical manner. But maybe, Ladies and Gentlemen, it is at a convention like this, when experts do meet that expertise will advance. Maybe this conference could mark the milestone. This could be where we see the amalgamation of film and television professionalism. ■

JOHN CHITTOCK—Documentary and Industrial Films

I'm labeled as talking about certain matters pertaining to documentary and industrial films. I regard this as a slight misnomer because, in a sense, if one takes a broad futuristic view of documentary and industrial films today, one cannot help but also look at the way in which the boundaries are changing, about the way the definitions are changing. In fact, if there is going to be any future trend at all, the applications are going to become so closely integrated and overlapping that labels such as "documentary" and "industrial" for films will become meaningless in the future.

The history of the medium did start with record-making functions, documentary functions, and had much of its early grammar rooted in the films of the documentary film-maker—then evolved to go on through fiction and the escapist era of Hollywood and the entertainment film. It came a little bit back towards factual content with the innovations of TV and now seems to be almost at the crossroads, where we're all arguing whether the future is going to lie in entertainment for the masses through new media or whether it is going to be through education and training or whether, in fact, all of these things are going to converge.

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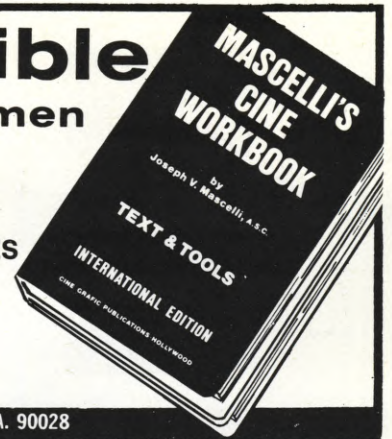
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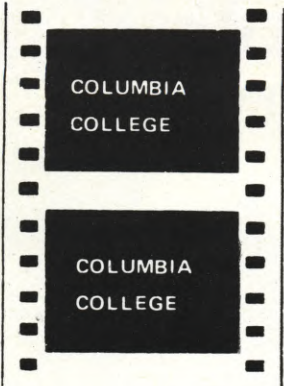
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technologists and technicians, I first applied my mind to the consideration of how much film production technology and television technology have influenced production in the documentary and industrial film. I came up with the answer, really, that I don't think that they have affected it very much at all. The only impact that I consider significant has been under really three headings. One is the introduction of noiseless or self-blimped cameras and of lightweight sound equipment. That's an obvious one that you would expect. It has had a consequence which I think those in this part of the industry should be less than happy about. I think that the introduction of hand-held blimpless cameras with lightweight equipment has encouraged, on the one hand, a much freer style of production—but, in consequence, it has also tended to encourage slightly sloppy attitudes towards production. Where, nowadays, it is much easier to get onto the screen some interest in the content by merely using talking heads, 15 years ago, one would have had to think much more precisely in visual terms to have made a film interesting. In some areas, therefore, I think that this has had an undesirable influence, at least on the creative levels of this kind of filmmaking. There is much more of a tendency to just throw a unit in there and grab some talking heads and get the message on the screen that way.

Also, other innovations which have been important in this area, have, of course, been the improved film stocks and the lightweight lighting equipment—both of which, again, have combined, I think, to make people less attentive to the creative use of lighting. Nowadays, it is much easier to shoot by available light. You can shoot color film in the underground railway system without any lights at all. This means that when you are shooting in a studio, there is a tendency, with this kind of production, not to worry too much, not to bother too much about trying to make the lighting work in some kind of creative way.

The third technical innovation, and the one which I regard in creative terms as being more serious, has been the innovation of video tape recording. Though most methods of distribution for documentary industrial and education films still rely on 16mm film, there has been a tendency for some productions to start coming along—not many, but a few—where original production has been carried out on video tape in a video tape studio with the intention that it would be subsequently transferred to film for release.

One of the criticisms that I have and that this has generated is that some of the commercial operators in this field have sometimes (I think they've changed their tune a bit now) said that we can do it much cheaper on tape, and there has also been the tendency for internal units, such as in universities equipped with these wonderful new toys, to have a bash with all kinds of things on video tape, adopting much the same logic: "We can do it quicker and cheaper."

In actual fact, I found, on looking at some of the tapes that have been produced, that what they really mean is: "We won't bother with the scripting. We won't do three months' research, as would have been done on a sponsored industrial or educational film. We'll just get all the people together in the studio and we'll do it in half a day and it will be pretty well ready." Most of the video tape productions of that kind which I have seen, bear witness to this, particularly in university departments or other places where the money or capital investment has not been in abundance, where they may not even have two cameras. If they've got two cameras they could do with three or four. There is a tendency to play such production from a fixed camera position, maybe with a bit of panning and a bit of zooming, but rarely a cutaway, rarely the kinds of creative devices which some documentarians were brought up on in the beginning. Sergei Eisenstein would turn in his grave, I'm quite sure, if he saw what has happened on video tape.

The other claim which has been upheld for video tape is its speed. Well, there is no doubt about it that speed is one advantage that video tape, in industrial application, has got—a great advantage—but I would remind you that just in the last few months, a case happened when a very large group in the UK decided that they wished to introduce a new policy within the group, which involved management and workers and so on. Like so many new policies, it was very important that it shouldn't leak out quickly through the wrong channels and be misunderstood. They had to make one sort of national announcement overnight and get it through to all the people involved rapidly.

Now, here is a classic case for video tape. An announcement from management on video tape could be disseminated quickly to 13 centers within the group. In actual fact, after a lot of discussions on price and speed, they did it on 16mm film. The first briefing with the production company was held on Wednesday morning and the first answer

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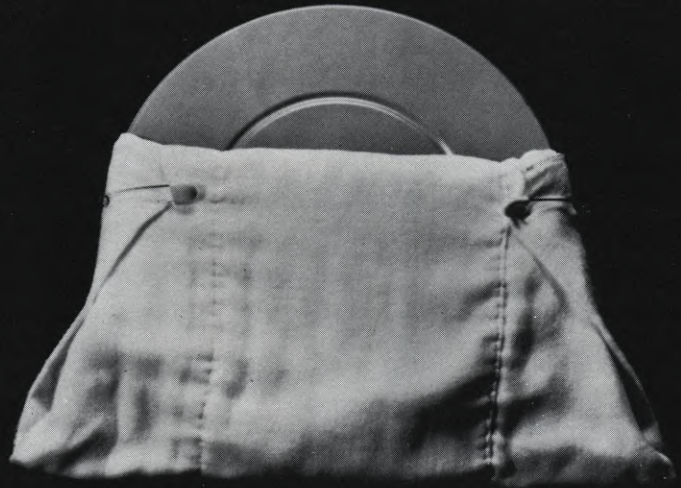


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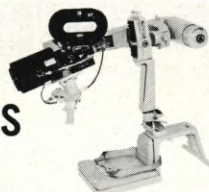
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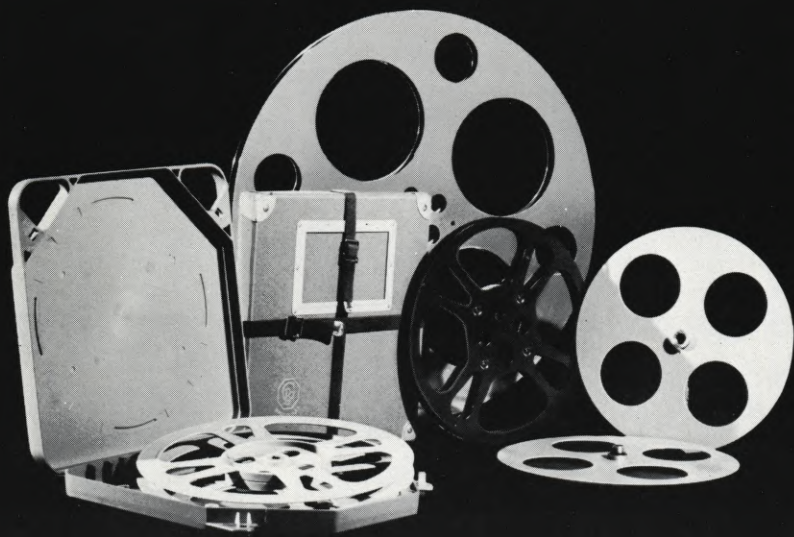
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prints were on their way to the centers by that Friday evening. And, interestingly enough, of the 13 centers, they found that out of 11 in UK, five of them already had 16mm projectors, so they didn't have to worry about heaving video equipment around. In a way, what I'm really trying to say is that although one has been impressed by the impact of the new technology of video tape on this field, there have been a lot of exaggerated claims made for it and I think one should keep them in perspective.

Another area for which there have also been exaggerated claims has been the video cassette field and I hope you will forgive me for dwelling on this at some greater length. There have been so many claims made for the video cassette that a new kind of malaise has crept in. It is the malaise of complacency which says, "I've heard all that rubbish before. Don't mention video cassettes to me, it's not going to happen for years, all the publicity and so on."

Well, there has been an overreaction; that is absolutely true, and now there is, I think, tending to be an overreaction the other way. For example, let me just give you some facts. (Of course it hasn't happened on the scale yet that we believe it's going to happen, but it's beginning to happen.) Already one little bit of news that dropped on my desk, only during the last few days, is that 96 tobacco distributors in the U.S. are installing Sony cassette video tape machines as a means of both sales training and product information for armies of salesmen all over the States. There are plenty of stories like this now coming from the States.

In the UK Chrysler, whom we've all about in the news recently, are equipping their dealers with Phillips VCR machines—again partly for training purposes, but also for showroom demonstrations and sales promotion use. Phillips claims that they have 1,450 VCR machines already in UK schools. This is a figure that some people have been surprised at. I'm surprised by the fact, because you can't get a VCR machine at the moment; there is a waiting list. But nonetheless, they claim that and that there are 1500 in German schools.

You will notice that these are all institutional, educational and industrial applications, but the really important development—and one which I think may affect everybody, even if they thought they were immune from it—was the news, only a couple of weeks ago, that one of the distributors of 16mm entertainment films to the merchant fleets of the world has placed an order

for 100,000 pounds worth of VCR equipment to go onto tankers. This is not the first order that has been placed for video cassette machines to go onto tankers; there are various other schemes now beginning to operate around the world, but what this means is—and this is why I think it deserves very careful thought—that the video tape cassette is going to start to take over in one important marketing area for the entertainment film that has been traditionally released on 16mm film. This means that that market may begin to vanish.

Now, in one of my capacities, I'm chairman of the British Federation of Film Societies, which is concerned with 800 film societies in Britain and I know, for a fact, that some societies are beginning to complain that entertainment films they want on 16mm are not available on 16mm film. The reason being, of course, that the economics of reduction printing and release on 16mm are very finely balanced—unless the market is big enough for 16mm entertainment films and, in the past, one of the mainstays of that market has been shipboard entertainment. With the video cassette now taking over on shipboard entertainment, I think that this may see the days of the 16mm entertainment film numbered. One consequence of that will be that there will be greater pressure put on 16mm projector owners to start using other systems because they won't be able to get entertainment films on 16mm. And one of the first in line is going to be the film societies.

I also have done a little bit of arithmetic and it is purely a guess, but I think that within three years, in the UK, there may be more video cassette machines than there are 16mm projectors and every 16mm projector owner is a potential user of an entertainment film at some time or another, even if it is a school or training institution. So, what is going to happen to the 16mm release print business when there are more video cassette machines in Britain than there are 16mm projectors? That is one trend which I see is going to have a major impact on the traditional film side of our business.

In tandem with this, of course, the people who have traditionally been in the entertainment sector are beginning to take very serious notice of what is happening on the other side of the fence. Five years ago, if I had met anybody in Wardour Street from the entertainment side of the business, including Mr. Trevelyan here, he would have known what industrial films are, but he certainly wouldn't read my column in the Financial Times, or, if he did, he'd read it just out of passing

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interest. Wardour Street, generally, just had this kind of attitude towards industrial films. One just couldn't generate great interest in that area. They were much too busy, and rightly so, with worrying about what was happening in the entertainment film business. But now, the story is a very different one; we have companies such as EMI, Walt Disney, Universal Pictures, all looking on the other side of the fence, all asking about what's going on over there.

EMI, with their first management training film (which cost about 20,000 pounds), grossed over 100,000 pounds in its first 12 months of release. The banks, which are now less willing to invest risk money in feature films, are beginning to invest that same sort of money into management training films, into educational films, etc. In fact, various projects are now in the wind where banks are going into co-partnership with people in the film business to make this kind of material. Maybe it will be released on video cassettes. In fact, I believe in the future it *will* be released on video cassettes. I also happen to believe that a lot of it will still be shot on film. I think film is going to become much more the production medium and video cassettes are merely going to become the distribution means.

On the other side, ironically we've got some industrial companies who are putting money into feature films. In the States, Mattel Toys, Quaker Oats, General Electric and in this country, one or two companies such as John Player, have done likewise.

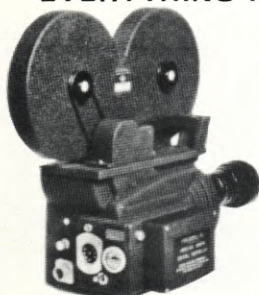
So, what I'm really saying, in this instance, is the thesis of my own particular contribution this afternoon, about films, television, tape, film and tape, documentary films, industrial films and entertainment films; they are all moving together. They are heading—perhaps not on a collision course—but toward a point where, at some time in the future, there is going to be such an integration between what were previously different, isolated compartments that we won't be able to talk in terms of these labels any longer.

Finally we have the deliberations of how this may affect the future of legislation in regard to film and TV. The Television Advisory Committee, which is a committee that was set up in the United Kingdom to investigate the technical impact of these developments on broadcast television, said that it didn't think that video cassettes would affect broadcast television until well into the 1980's.

But, in actual fact, the situation is that a sponsor, an industrial company,

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could today make an entertainment program for video cassette release to the general public and there is nothing to stop him. The only thing that stands in the way, at the moment, is that there aren't enough players in the public's hands. As I've just outlined to you, the first markets, anyway, are going to be industrial and institutional. But, nevertheless, let's bear in mind that already Phillips claims to have 40,000 VCR's in production or already on the market. They are now producing about 4,000 a month, which they say will be increased to 8,000 per month and that is the only player of any significance that is now available in UK, apart from the EVR machine which is a rather special case on its own which I wouldn't like to argue this afternoon. But soon we will have the Sony machine arriving on the scene, which means we will see a head-on conflict between Sony and Phillips. Whatever happens in that conflict, it means that there will be more players available, including, by the beginning of next year, the Telefunken video disc player, so I would suggest that well before the 1980's there will be enough players around in the hands of enough kinds of people for entertainment programs to become a viable proposition for industrial companies who wish to sponsor them, and there will be nothing to stop them. No laws, because with freedom of access on this kind of distribution at the moment, there is no impediment to it.

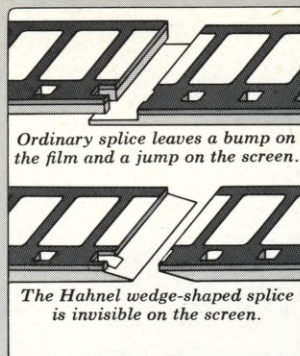
So one of the other effects of this could be that whereas, at the moment, traditionally everybody has freedom and access to the printed word, nobody has freedom and access to the ether without obeying the laws of the country in which they operate. We have this new phenomenon coming along where people may have freedom of access to motion pictures on television screens, although they may not come over the ether.

Already, in Britain, as has happened in North America, we've got this other new manifestation coming along known as "community video" where people are beginning to do just that and I believe that the results of this are going to be that our whole definitions of what the media are and what access to the media means are going to have to be either re-thought or completely abandoned. Maybe the views of the Television Advisory Committee in the UK and what's going to happen to the future of broadcasting are going to be radically altered by the 1980's. In fact, it may have already happened and it may be that we shall have our own laws created by evolution, rather than by government. ■

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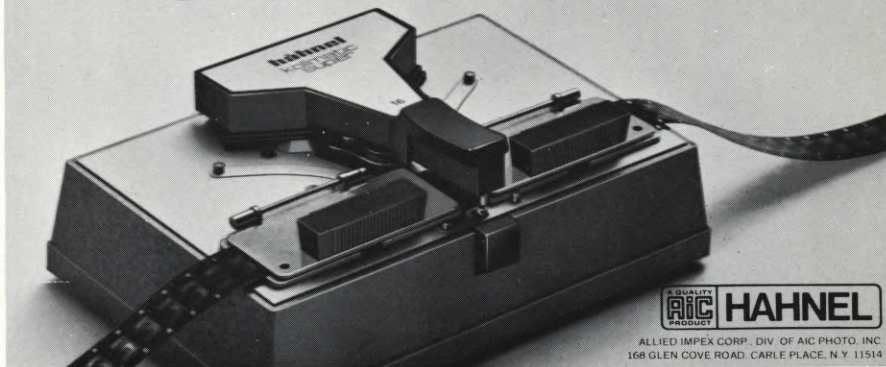


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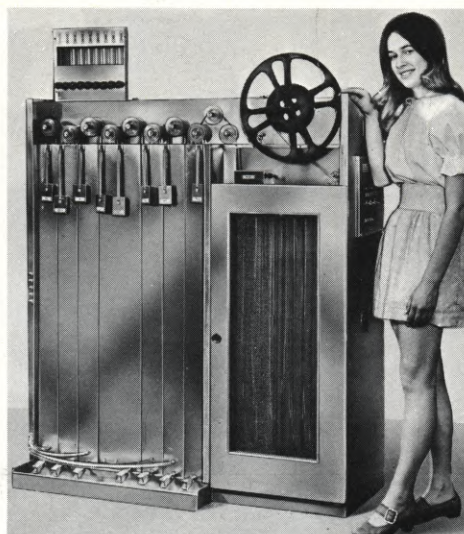
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CINEMA WORKSHOP

Continued from Page 1092

between the points does not solve the problem, the points should be replaced. Lastly, the governor points are electrically connected to the remainder of the motor system by a set of brushes and rings similar to the brushes that actually run the motor armature. These brushes should be checked for wear and replaced when necessary.

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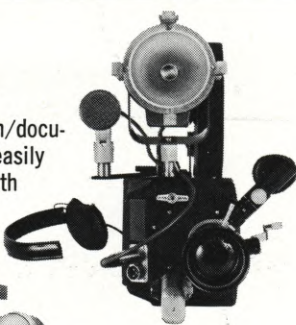
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"TEARS OF BUDDHA"

Continued from Page 1176

We sent some footage that we shot to CFI via government pouch. Later, we were encouraged by a long distance phone call telling us all was O.K. This is always good to hear when you are thousands of miles away from your lab and retakes are impossible. It was a strange experience talking to someone in Hollywood through a phone in a small Korean town, hearing his words as clearly as if I were talking to a neighbor.

I highly recommend taking along as many accessories as possible when filming in such a faraway country. Our 85 filter broke towards the end of shooting, and we couldn't find a similar size anywhere in Seoul. Finally, as a last resort, we had to use an 85 gel behind the lens. Also, our film ran out just before we had completed certain sequences of village farm life. As 16mm color reversal film is rarely used in Korea, all we could find was 700 feet of single-perf EF tungsten to wind up our shooting. Fortunately, we were able to make do.

And now, an enthusiastic word about Sun-Guns. For many night sequences of Seoul, and for the inside of a temple, a cave, and a tomb, a single Sun-Gun was our only source of illumination. This proved not only handy, but also rendered a great effect. The only tricky part was the Sun-Gun's short charging life. We had to charge its battery to the maximum each time, even after using the light for only a few minutes.

Food was the biggest problem we had during the shooting. Russ tried to get accustomed to Korean food before we left. There are a number of Korean restaurants in L.A., so we visited them a few times and tried some Korean dishes, especially *kimchi* (a typical, very hot food made of Chinese cabbage, red pepper, Korean radish, onion, and garlic). Russ seemed to like it, so I really didn't worry about the food at all. But after a few days' shooting, we all got diarrhea. I could understand this in Russ, since he was unfamiliar with Eastern foods (squid, octopus, sea cucumber), but I was surprised when my producer and I also became sick. It may have been the water, or slight differences between home-style Korean food and its American counterpart, but whatever it was, Mr. Park virtually lived off of pint bottles of Bacchus-D, a popular liver tonic. I decided to continue eating *kimchi*, but Russ no longer ordered much Korean food, except for an occasional dish of barbecued beef.

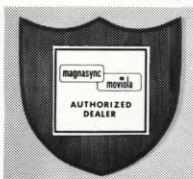
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can food in Seoul, but out in the countryside, it was more difficult. Beefsteak was the only American dish in a small town we ended up at, so Russ had to eat beefsteaks straight for one week. Russ is the kind of person who never gives up until he accomplishes what he sets his mind on. One day, in Taejun, his appetite craved apple pie. We had to search for it all over town for several hours. But, although many of the diners featured plaster apple pie models in their display windows, none of them served it. Finally Russ shouted desperately, "Damn it, I'll eat one of the models! Just give me a piece of apple pie!"

There are nearly thirty folk-art festivals occurring all across the country in October. I decided to use as the basis of my film a large festival representing groups from all over the country. The biggest one was the National Folk Art Contest between 15 different provinces held at Taejun, a city located centrally in the South. Each province presents their own unique games, such as tug of war, the fire-game, the chariot game, hockey, archery, and traditional dances. These are performed just as they were three thousand years ago.

But instead of simply showing them, I wanted to reveal the origins of each game by filming many of the social traditions that still exist today. As we filmed aspects of Buddhism, Confucianism, and the rural life, we heard echoes sounding back through thousands of years. Yet, we could not ignore the shock of change, the usurpation of tradition by technology. I had to contrast these elements in my film. I decided to avoid all the cliches of formal documentary films, but rather to make a visually subjective, imaginative study.

I cannot overestimate the contributions Russ made to this end. With my telling him little more than "Get good images," he would come back with sheer poetry: The headlights of Seoul strung out against the night like pearls on black velvet, the delicate grace of Korean maidens swinging through leaves of gold, the drama of a spider tying a struggling wasp to its web in the window of a graveyard pagoda, stone tomb figures that jump up to the camera as if hauntingly alive, a city laborer "walking" across the tops of thousands of taicabs. Russ would improvise, getting people to do things that the surroundings suggested (and without speaking any Korean, other than the words for "yes", "no", "goodbye", and "I love you"!)). He had an old man perform a prayer in an ancient cemetery, and he had a Buddhist priest remove his shoes

and walk across a colorful wooden porch as I interviewed him. We did this three times before he was satisfied. Russ gave life to the various giant Buddhist statues, making one towering figure seem to walk across the tiles of a temple roof, while the eyes of another appear to watch the viewer through windows and between forest branches. Intuitively, he created images that fulfilled my needs, and went beyond. A shot of a Korean party disappearing into the spaces of the autumn foliage perfectly captured my feelings for the close bond between the culture and the land. I was fortunate in having Russ, a fellow director-cinematographer, as a creative partner. The rapport we shared is essential to this kind of film-making.

I remember filming an old farmer dressed in his traditional clothes, neat and clean. He had a frame on his back taking some produce to market. He was walking along a road. Suddenly, a large new truck sped by, full of the same thing he was carrying. Afterwards, this stately, patriarchal man was covered with dust, and so were the goods he was going to sell. As he came closer to the camera, his eyes were moist. His face reminded me of a huge Buddha statue we had seen in Soklee Mountain. Russ made this face of Buddha seem in anguish, as though he were watching what was happening to modern society. It made me cry to see people struggling to preserve their sense of individual importance and a respect for natural beauty in the face of encroaching mechanization. I decided to call my film "TEARS OF BUDDHA". It is a film about naturalism, the old, the simple dignity tottering before the new, the "progressive", and the mechanical influence.

I am not saying the ways of technology are all wrong. But I am reminded of an old adage which says, "With every gain, you must also take stock of that which is lost." Though the people of Korea are rightly proud of their tremendous material advancement, may they not have buried their serene, earthy, individualistic way of life in the dust of progress? Let us hope for harmony between the two worlds.

When we returned to Los Angeles, the first words Russ said as we came from the airport were: "Where are all the people?" We had just come from the busy marketplaces, the festivals, the people walking in throngs of thousands down the streets of Korea.

"It's like a ghost town. People are hidden, packaged in their cubicle rooms and automobiles. Nobody shouts. Nobody touches. I wish we could go back."

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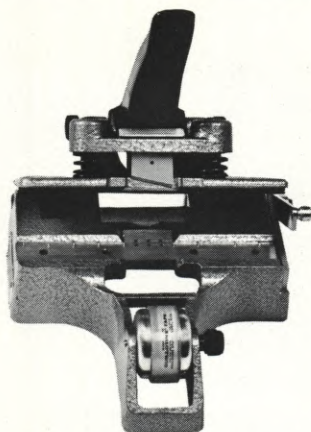
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SINGLE & MULTIPLE-CAMERA

Continued from Page 1164

amples of all these lights that they are thinking up now and they are marvelous; they really are. They are light-weight and efficient and they work off very little power—but that's only half the story. I'm not so much interested in that. I'm interested in the little bit of that light that goes onto the actor. But, if you noticed, everybody this afternoon dodged that piece. There's a big gap between when the light leaves the source and when the light gets onto the actor and that's one of the areas where I think we are lacking, but in a multi-camera system you don't get a chance to do anything like that. I mean they've got four sorts of lights in the roof. I think, a 2½-kilowatt spot and a 5-kilowatt spot and a so-called flood. The so-called flood is relative to the spot, but if you saw the spot it's like a damned great searchlight—so the flood, or the soft light, is only relative to that and I think such lights are far too harsh for ordinary color photography.

Anyway, I won't go on any more. I have a piece of film to show you and I would like to point out two or three things on this film. This was shot single-camera and I want you to watch every set-up in this little sequence and note that you could almost see why the director's put the camera there. It has a point; it has an intention; it has a meaning. I would also like you to note the style. It's impressionistic, but I think it is very interesting and I think it is the sort of thing that can only be done on film with a single-camera system.

(EDITOR'S NOTE: At this point there was projected onto the screen a sequence from "FIDDLER ON THE ROOF"—the all-male dance sequence—bottles balanced on the head, and all that—which precedes the wedding of the story. It is a softly lighted sequence with many varied camera angles and precisely matched cuts.)

Well, gentlemen, I'll go back to my place, being perfectly prepared to be shot down in flames. Just as a matter of interest, the whole of that sequence was photographed with a piece of ladies nylon stocking over the lens of the camera. This was done to break down, to coordinate the colors and I think that's an example where the single-camera system leaves the multi-camera system absolutely standing because of the variation of focal-length lenses. The effect of the diffusion on different lenses varies, and with a single-camera system you can get it right. ■

**"THE SHEIK OF CHICAGO" or
MAKING MOVIES LIKE THE
BIG GUYS**

Continued from Page 1186

each detail as it is taken care of. His "master's" touch is still with him as he arranges participation on opticals, laboratory, recording session, and all the other post-production services. The final result is a *finished* motion picture short, truly a product of the Chicago School of Filmmaking.

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Having viewed the finished short and elated with the results of their meager efforts, Steve and Mik and a few other members of the now-defunct production, are sitting around that same kitchen table. They all find it difficult to remember a time when the short was not the major focus of their activities.

MIK

We did it . . . I guess that means it can be done.

STEVE

It wasn't all that difficult, either. We certainly proved that Chicago Film people are capable of producing something besides commercials and industrials. It wouldn't be all that hard to do a low-budget feature.

MIK

Careful, you're sounding like a producer again.

STEVE

We've got everything we need. You can write it; we'll both direct; I'll shoot; Bill Fosser can design it; Johnny Bosko can do the sound; Jimmy Miller can light it; Jimmy DiPasquale can do the music; we'll use all the same people.

Exhausted silence.

STEVE

Then it's agreed . . . we'll do a feature for our next project. Mik, you go up to your farm and write a script that can be shot in a few weeks for a few dollars at existing locations. And make it an award winner (still a loose term).

MIK

Why do you always pick on me?

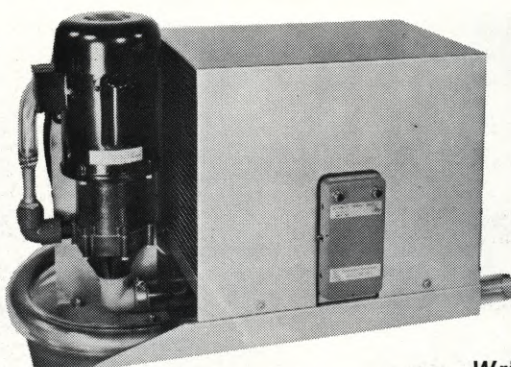
STEVE

Because you skipped off to the country and left me with all the post-production to take care of. And besides, you're a writer!

FADE OUT.

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FILM '73: FILM AND TAPE

Continued from Page 1121

around the set, then goes to the camera, moves something and stands quite still looking at me, as if to say, "Now I want to see what you can do. I'm sure of myself."

Well, Ladies and Gentlemen—we actors don't have a meter like this. On every shot we always really take a chance. Are we right? Are we wrong? We only know if we are right or wrong when the finished product comes out, and when the audience comes to the theater, we know, by their reactions, whether we were right or wrong—or the next morning when we read what the critics say.

You are lucky to have a mini-critic in your pocket that tells you whether you are right or wrong—and we do envy you, really. Perhaps, since I am your Guest of Honor tonight, you will tell me: Can you really read that meter, or are you just pretending? Sometimes I wonder.

Actually, I'm sure that you do. Otherwise you couldn't meet in conference like this, with people from all over the world, and exchange knowledge, information.

With us actors, it doesn't happen. When we meet—if we meet—it's always at a festival, and we're always competing against each other to get the "big one".

We do envy you in all respects. I hope you have enjoyed the Conference and have learned from one another.

And please, could you invent, somehow, a meter for us—so that we could check our abilities in what we do? I know it's difficult. It could happen only by a miracle, but as we say in our country—I come from Israel—we say in our country that we don't believe in miracles—we rely on them. Thank you.

FILM '73 ended on a cordial and festive note. It was, indeed, a great success. The people of the BKSTS who worked so hard to make it so are to be heartily commended.

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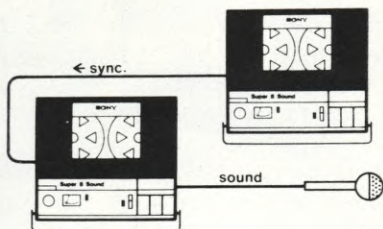
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WHAT'S NEW

Continued from Page 1084

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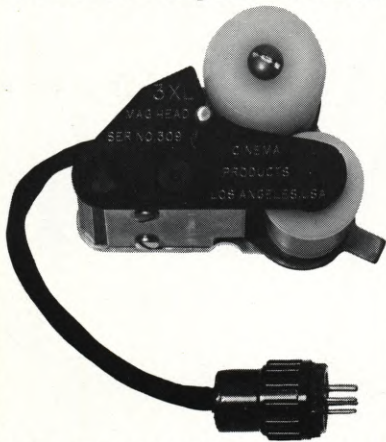
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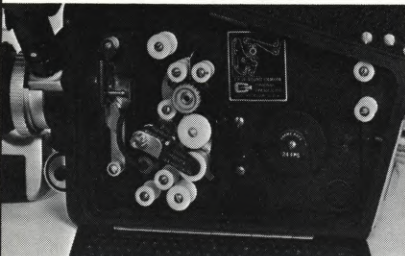
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"THE MAN FROM LOX"

Continued from Page 1180

has been quite positive; the original print order has been tripled. All the reports gotten back from Navy screenings have been excellent. The sailors appreciate the film's honesty and its break from the traditional "training" film mold. The Air Force and Army have also ordered prints. "LOX" has also had good success in competition, with the entry fees being covered by Branch Employees. So far the film's won:

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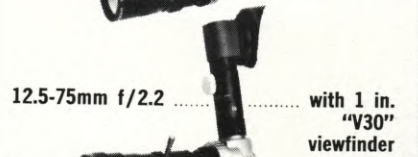
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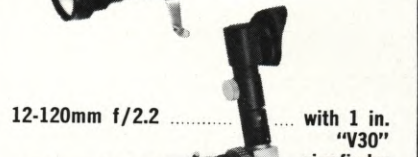
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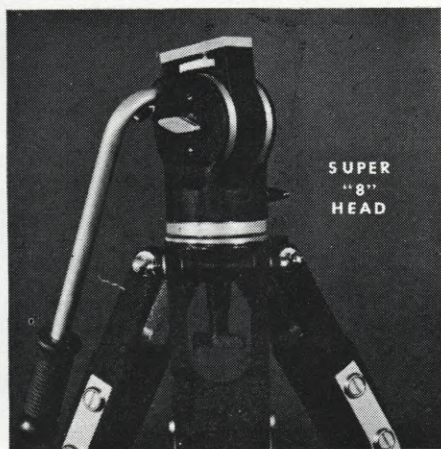
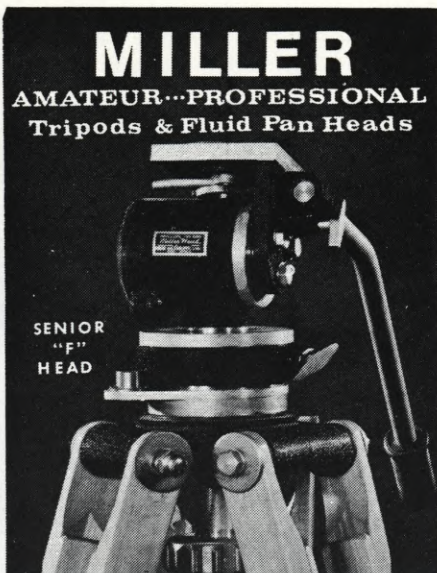
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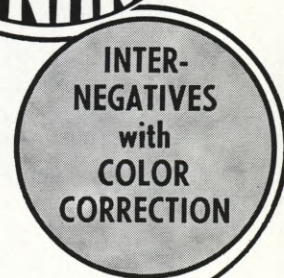
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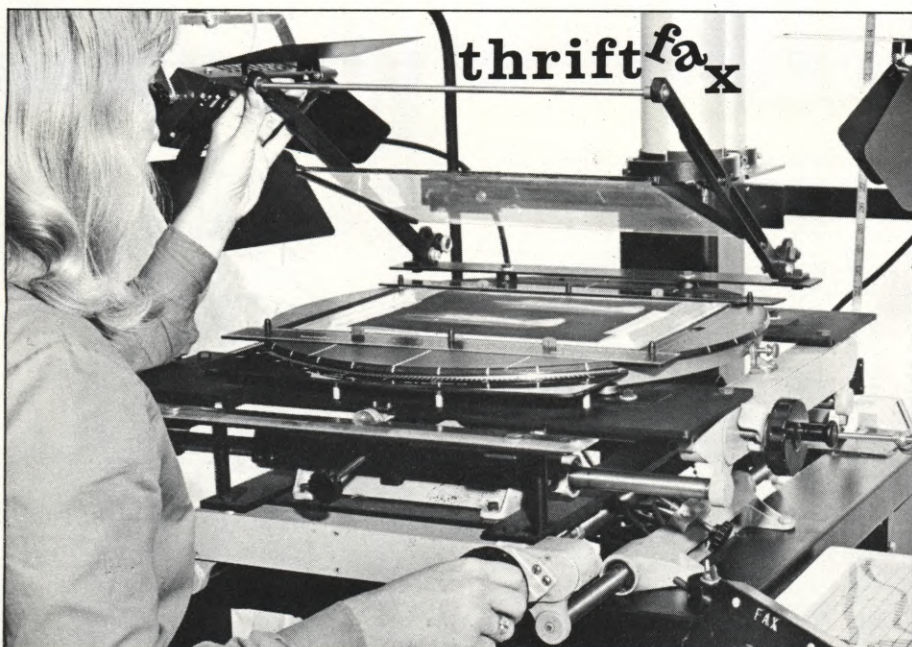
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CP-16/NAGRA SN CONNECTION

Continued from Page 1152

and are away from the cutting situation, you can record on the SN, as you are filming, a commentary of your thoughts about the material that you've shot—in that way keeping the editor precisely informed about what you want to do with the film when you get back. He can then get his ideas going and begin to line up whatever effects you might need.

You'll be able to send the SN tapes in with the magazines of exposed film and, if you make an arrangement with the laboratory, they can have a transcript typed up to be made available as notes with the rushes. Or your production staff can use it to get a rundown on the film that has been shot.

One roll of SN tape will cover two 400-foot rolls of 16mm film and you would reload sound after the two rolls of film had been shot. If you're working alone and have to work very fast, then, ideally, you might have two SN's, so that you could slip one out and the other in for a quick-change sort of thing.

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WESTREX FILM CARRIER

Continued from Page 1153

mechanism the source of illumination should be capable of running continuously for a maximum period of 2½ hours, an excellent example of which is the Westrex range of Xenex Xenon lamps ranging from 1000 watts to 6000 watts.

As the 5035 mechanism is free-standing there is no mechanical connection to the Projector so that one feature film can be re-wound whilst the other is being projected. To enable the selected film reels to be brought into register for projection or re-wind the assembly can be rotated about the vertical axis and thus the reel to be projected faces the operating side of the projector in the normal manner and the operation of changing from one side to the other is completed in the time that it takes to thread the film through the Projector.

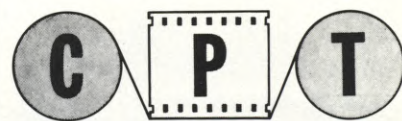
TECHNICAL DETAILS

The assembly consists of a cabinet mounted on a turntable and housing four 200 oz inch Torque motors driving the ½" diameter spool mounting shafts through a 2.1 step-down toothed rubber belt drive. Each driven shaft incorporates an electromagnetic brake which can be manually operated when the re-winding ceases. If it is intended that the equipment be left unattended for periods of time then the 16777 Contact Assembly must be fitted to the Projector; in the event of film joint parting this will automatically switch off the power supply to the Projector and Film Carrier assembly and at the same time apply the brakes to the film reels to prevent damage. Additional contacts are provided to operate an alarm at a distant point, e.g. Manager's office, Pay Box, Operator's Rest Room, etc.

So that the film can be conducted to and from the Projector, film roller details are supplied and coded LSL.16353 for the Upper and Lower Spool Arm Rollers and LSL.16358 Roller Block Assembly for the Intake Rollers.

To avoid film snatch between the 2000 Type Projector and 5035 mechanism a special two-position motor control switch LS.9395 is provided whereby the take-up and holdback motors are energised to take up any film slack before the Projector drive motor is energised. The run-up time is controlled to provide a smooth trouble-free start.

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TYCHO SPEAKER/AMPLIFIER

Continued from Page 1144

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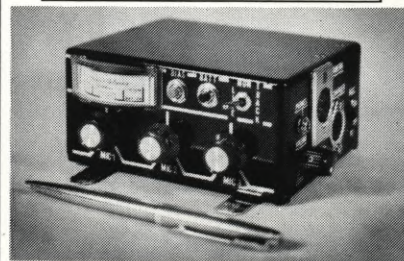
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Continued from Page 1145

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Under the new distribution plan, Eumig's national dealer network will stock and sell the compact Optasound Cassette Recorder (suggested list price: \$169.95); perforated Optasound Film/Sync Tape (\$2.79); and OOptasound prepaid envelopes (\$6.50) for processing and striping 50-foot loads of exposed Super-8 film and transferring the sound from the recording tape to the film stripe.

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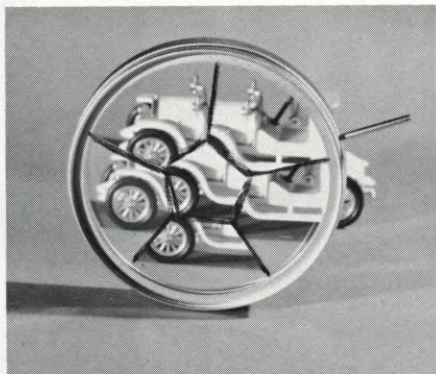
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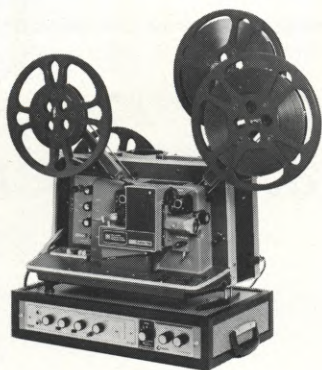
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Continued from Page 1133

size, weight and, in some cases, equipment costs. The capital cost of a small location unit is being considerably reduced, and you may not think, looking back at 150,000 pounds, that this is a considerable reduction, but it is and virtually all the operational problems have been overcome.

I foresee electronics and film methods of production continuing in partnership. Film will continue to have the advantages of supreme ability, but electronics will, over the next few years, make steady progress and perhaps I could suggest, Mr. Chairman, that you consider whether or not your next conference be entitled, not FILM 75, but perhaps TAPE 75. Thank you.

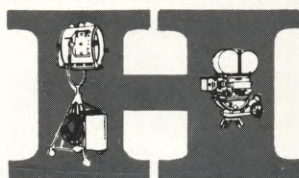
MR. J. H. MEWETT, O.B.E.—Film

Ladies and Gentlemen, Mr. Chairman—What are we discussing? We are certainly not discussing what is conceivable, because the film camera and electronic camera are, or soon will be, virtually interchangeable. There are obviously a few exceptions to this, like, for example, a Polar expedition, on the one hand, or a live outside broadcast on the other. But the issue is not, as I said, about what is possible but about what is *practicable*.

The choice between the two depends upon a hard-headed and realistic appraisal of the requirements of a particular program and a close and sympathetic understanding of the needs of the program maker. I want therefore to confine myself to those programs which, having regard to the technical developments foreseeable during, let's say, the next five years, occupy the middle ground between the two methods. That is to say, where either method could apparently be used and where technical and operational developments could, over the next few years, see the optimum solution change from one method to the other. Well, the factors that are particularly important seem to me, therefore, to be technical developments which can have both operational and quality consequences. Logistics, finance, and overriding all of these, the program requirements and the needs of the program maker.

Although not the most important of the factors, I do want to discuss technical quality first, because, in this instance, an analysis of short-term trends is a relatively straightforward matter, which cannot be said about the others. I would maintain that the quality of 16mm film has evolved now very nearly

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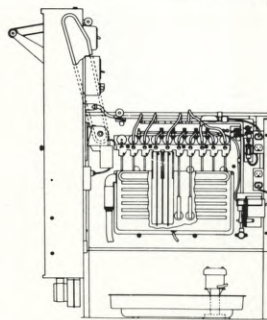
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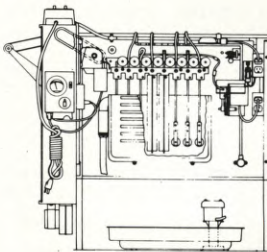


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to a level of complete acceptability and that the developments which I am about to outline should raise it to a point at which any criticism will probably be confined to a small group of people professionally concerned with image quality. Not that I wish to devalue their concern, for it has helped to make television film, from a technical standpoint, what it is today and our debt to them is considerable. But I do think that the quality of 16mm film will shortly reach such a high standard that the time and money required to improve it even further could be better spent elsewhere.

Now, what are these developments and how do they affect the future? Television filming must go, without doubt, to the new Eastman Color Negative, Type 7247, due to be marketed later this year. It is clear that an advance of really major proportions has been made and, on a straightforward neg/pos comparison, the quality obtainable will approach that of 35mm. Based on an initial appraisal, our own experience confirms this, both when viewing optically and when looking at the output from a flying spot telecine. I say this despite my profound distrust of test films, for even with all their resources, I have never yet seen a Kodak test film display the smallest amount of program flair. But, nevertheless, the 7247 test films made their technical point superbly well and seemed to me to be 3/4 of the way to 35mm in sharpness and 2/3 of the way in graininess. Accordingly, the new stock should remove the major disadvantages of the 16mm process; namely, grain and loss of sharpness. This is, of course, of particular importance when considering the relative quality of film sequences inserted into studio programs.

The next line of development, which is of equal importance concerns lenses. Even today with film stocks currently available, quality, particularly *sharpness*, is often partially lens-limited and the overall situation is far from satisfactory. We have to accept the fact that the standard lens for general filming is a zoom lens and the problem of combining speed, low weight, wide zooming range, close focusing, high performance, robustness, and freedom from critical setting-up procedures are formidable. There is at least one very good 10-to-1 zoom lens available at present, but its maximum aperture is limited to F/2.8 or T/3.3 and, if full advantage is to be taken of the new stock, it must be said that there are few, if any, fixed focal-length lenses at present on the market capable of exploiting its full potential within the range from F/1.4 to F/2.8 or



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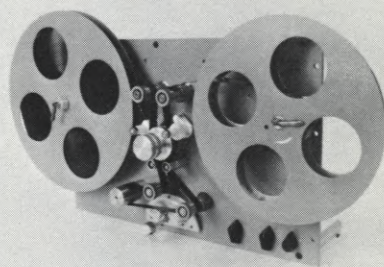
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thereabouts. However, we are working very closely with a lens manufacturer on the production of a set of fixed focal-length lenses optimized for 7247 and the television process. These will have a maximum aperture of F/1.4 or larger and, when they and the new stock become available, I would submit that the quality potential of the 16mm process will be entirely adequate for any program purposes.

The next major development is a new generation of film cameras. These are fully professional and weigh in, complete with 400-foot magazines, at about 14 lbs. This is not much more than half of the weight of the currently used cameras—but please make them silent. They both have clip-on magazines at the back for clearing low obstacles and, as there are no lens blimps, rapid lens changing should be possible. I'm given to understand that they can be equipped with lightweight accessories, cases and tripods and the consequent speeding up of the operations, together with savings in freight charges, should help to make a noteworthy contribution to the speed and the economy of the mobile film operation. Remember, speed and economy are amongst the major *raison d'être* of the 16mm camera.

Now I have some slides to illustrate these two film cameras. The first two are of the Arriflex 16SR and the second two are of the Beaulieu. That's not all. These cameras have got a very important advantage, indeed. They can quickly be adapted by means of plug-in extras for working with an electronic viewfinder and a director's monitor. Now, this, together with crystal-sync should really open up the possibilities of location multi-camera working and I have no doubt that considerable productivity improvements will occur as a result of a relatively small capital expenditure.

Mr. Chairman, I make no apologies for starting my talk by taking a look into the future. None of the developments about which I've spoken can be described as being speculative; they are all either with us now or have known introduction dates within the next 12 to 18 months, and I hope that, in the fullness of time, I shall be absolved from any charges of wishful thinking. Furthermore, as they all have a bearing on the points which I now want to make, I feel sure that their relevance does not permit them to be ignored. Indeed, I suspect that they are so important that their influence on decisions about the best way programs can be made, particularly on location, could well be felt for many years to come.

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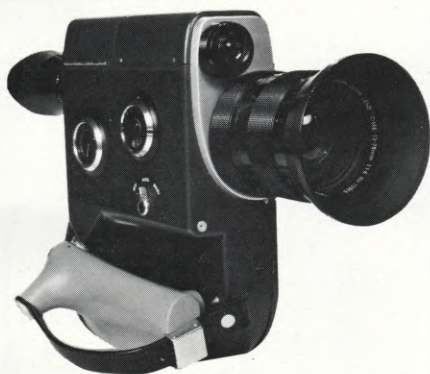
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matter: The television program and the program makers and how the operational advantages and disadvantages of film affect them.

I'd like to start with the location. For 90% of the time, location work takes place a long way from base, either at home or abroad, out of doors and in all sorts of weather. It is surrounded by uncertainties and, in these circumstances the first major advantage of the film process becomes apparent. This is the extremely low capital cost of the equipment involved. A three or four-man crew can take to the road complete with equipment and vehicles at a cost of about 11,500 pounds and the depreciation figure is very low. Furthermore, because the crew size is small, and as no maintenance is needed in the field, the revenue costs associated with the operation are also comparatively low. Thus, the unit is ideally suited to spending protracted periods away from base. The cost penalty of delays due to weather, to arrangements falling through, or to traveling between locations spread well apart from one another are small. Directors can, therefore, plan their shooting to the best advantage of the program and not be straitjacketed by the need to avoid the penalties of high daily depreciation charges.

This would seem to be an appropriate moment to discuss what can, on superficial examination, be one of the main charges laid against the filming operation—namely, productivity. At first sight a figure of between two and four minutes a day seems unduly low, but it should be borne in mind that these figures compare the output achieved with the total number of days charged to the program. Now, this includes reccie time, both before the start of the operation and during it. It includes traveling time, which is considerable in most location trips, particularly abroad, but because it is an overall charge it takes no account of the material shot and incorporated in a finished program which is subsequently either slight, drastically reduced in length or amalgamated with another program.

Now, in the event the amount of film shot in a day is determined by the director, the percentage of time wasted by the film crew has been found, in the past, to be extremely small. What does emerge is that the low daily cost of the film crew allows the director time and flexibility in his approach to program making. While low productivity is not inherent in the filming process, it is a fact that low productivity working can be contemplated and planned for without incurring extreme financial consequences, and this is one of the most

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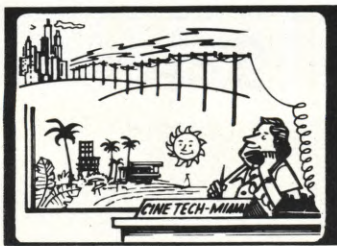
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valued features of this method of making programs. Indeed, it is very easy, from a simple cost-effective point of view, to discount the value of the quality of a day's work, compared with the quantity. All experience has shown that time is well-spent in achieving the highest levels of polish and refinement.

The new cameras with their optional viewfinders should lead to an increase in the use of multi-camera high productivity techniques and the economics should be favorable. The second camera requires just one more person and 7,000 pounds, I estimate, of capital equipment, while retaining the ability of film to preserve the editing options—this, because each camera is its own recorder. The second or third camera crew can be supplied as required and the size—hence the cost of the unit—can be adjusted to suit the needs of each different phase of the production.

The second point which has been studied is the perennial problem of shooting ratios. At present our average shooting ratio is about 9-to-1, although the spread is fairly wide. Once again, this is very largely a director-controlled option and the fact that the pictorial record is made on film and not on some other recording medium does not, *per se*, result in high ratios. The director, because of the flexibility afforded by one recorder per camera, has the choice and exercises it as he wishes. The point which I wish to make here is that, if there is a will to achieve low ratios, then there is absolutely nothing inherent in film to prevent it.

This leads me on to the problem of lighting and film sensitivity. It's sometimes claimed that a great deal of money spent on lighting could be saved by increasing the sensitivity of film stock, but surprising as it may seem, this is often not the case. A major area of lighting expenditure, particularly for television drama work, is for daylight location filming and here the cost is dictated, surely, by the area to be lit. This is because the intensity of light does not depend upon film speed, but depends only on the strength of daylight and the inability of the television system to handle a wide contrast range without burning out the highlights or crushing the shadows. Nevertheless, a faster color negative stock is urgently required and I find this a very difficult problem to resolve, because the decision to manufacture can only be a purely commercial one and will be made, in the first instance, by the raw-stock manufacturers. Surely, no new knowledge is required for them to do so, because film speed, sharpness and grain are intimately linked together and, at any moment

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in time, I would have thought a newer negative could now be produced having twice the speed of the present material with no loss of quality.

To summarize, therefore—amongst the advantages of film at the shooting end are: The location equipment is light, simple, robust and unobtrusive and is normally free from the necessity for expert attention while on location for many months at a time. It is robust enough to withstand the considerable rigors of freighting. None of it requires complex lining up or warming up; it all works straight from the cases and is, we hope, instantly available. The film camera contains the recording medium; therefore, when using crystal-sync, it can work as an independent unit. Multi-camera operation is simple; the continuous running of cameras allows the scene to be recorded simultaneously from more than one point of view. Within reason, the director can name the productivity figure determined by his view of the requirements of the program. He can afford to buy himself "decision time" whenever he feels it necessary, because the financial sanctions against so doing are not, in my view, penal ones. In addition, he is able to direct in whatever style suits him best. Given a monitor, he can work film style or television style, as the situation demands and because the equipment is portable, he is independent of any support operation, and so can generally ignore vehicle problems and cable run problems. He can change his mind about locations, come indoors when it is wet, go outside when it is dry. Changes of mind can be accommodated easily, both financially and operationally. He can ignore the effects of technical clutter and, above all, he can keep his creative options open for the cutting room.

These, then, I believe, add up to a powerful set of technical, operational and financial advantages and the offsetting disadvantages are few, some of which, in any case, are in the process of being rapidly overcome.

Now, what about these disadvantages? Well, first of all there's the cost of film stock. Film stock manufacturers in the audience will deny that this is expensive, but it's still costing about 150 pounds an hour until the rushes stage. I cannot, unfortunately, and I make no bones about this, envisage any significant reductions here. The only point I would like to make is that this cost is only incurred when the stock is actually being used—so, no shooting, no cost. When you add on travel days, rest days, rained-out days, artists-not-available days, preparation days and standby days to the total, then the relative

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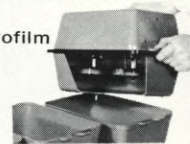
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importance of equipment depreciation costs becomes even more important than stock costs.

I'd now like to move onto the next stage; namely, that of editing. It's here that the question of capital costs really rears its head with a vengeance. I think we can take it as accepted fact that it's in the cutting room that the film is made, from the creative, artistic, and technical point of view. For the process to produce an outstanding result, two requirements must be fulfilled. The first of these is that the incoming material must be good and cover the subject fully, so that the creative options are not closed. The second is that sufficient time must be allowed for the material to be considered, arranged and rearranged, so that alternative approaches can be tried and rejected. It's important to emphasize that the creative part of the editing process is not a mechanical one, but is vitally dependent upon immediate access to a wide variety of alternative shots. In many cases, the mind of the director only needs to be triggered off. He does not have to review the whole week's work. All he needs to do is remind himself of his options as the work of refining proceeds and the number of these options begin to narrow and to sharpen.

At this moment in time, I find it inconceivable to think of any method of information storage and retrieval that can rival the cutting room, because a number of alternatives can be scanned in seconds and the choice narrowed to a few that can be then reviewed immediately. The capital cost required to make this possible is only about 3,000 pounds, it has a life in excess of 10 years and its maintenance needs are both modest and cheap. With this sort of capital investment and with only two other people involved, the director can book the editing time which his program needs, and the cost of his thinking will not become prohibitively expensive.

Now, this problem of the combination of fast access time, with low capital costs seems to me to be the crux of the matter. They are combined naturally and as a matter of course in the film cutting room. Over the years I've heard many alternatives put forward and they all involve such factors as the necessity for a reduction of choice in the incoming material, the need for detailed and infallible record-keeping operations and the provision of expensive and very complicated technical gadgets—even to the extent of involving computers, of all things, which, as far as I'm concerned, should, at all costs, be kept as far away as possible from the business of film-making.

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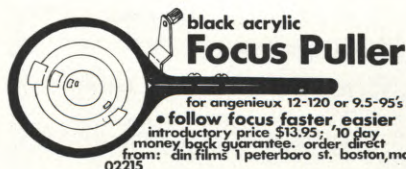
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All of the aspects of the filming operation which I've been discussing up to now have been labor intensive and not capital intensive, but in the dubbing theatre, of course, the capital costs begin to approach those found elsewhere in television. A dubbing theatre uses between 25,000 and 35,000 pounds worth of equipment. However, it is my opinion that this capital is well spent because the facilities provided help to insure a high output of work and, consequently, the cost of this facility program is kept low. Like the cutting room, the dubbing theatre and the film medium are well matched to each other and, by using the low cost cutting room to pre-assemble complicated sound tracks, a very high level of sophistication can be achieved at a satisfactory cost. This leads me to the transmission stage.

We have to depend here on our engineering colleagues, just as we do for the maintenance of our equipment, and I'd like to say this: that we have a very close and fruitful spirit of mutual help and cooperation. In its final stages, film goes into the film library where it retains all of its operational advantages, such as flexibility and fast access and it is now becoming apparent that the storage life of color film is very long. What is it? Well, that remains uncertain because it is fortunate that, so far, deterioration in our library due to aging has yet occurred. Indeed, indications are that previous safe estimates of ten years or so for archival material can be doubled, but only time will tell.

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Next year, I feel that the picture quality problems will be a thing of the past and you should be able to direct from a monitor if you wish to. Your equipment is cheap, light, mobile and robust and it, indeed, is becoming increasingly so. The creative and artistic possibilities of the film camera are well-known to all of us here and do not require any prolonged analysis from me. One has only got to recall from our own



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output, "DON QUIXOTE". "HISTORY OF AMERICA" or the recent "ASCENT OF MAN" to recognize its strength. Accordingly, I make no apology for having concentrated so much on logistics, on quality and on forthcoming developments. I'm sure we're here to discuss film for television in the context of the next five years and not in the context of the last five. The use our program colleagues will make of these new developments in their productions remains, as yet, unknown. But I'm sure that the potentialities are exciting and extend farther than what would have been thought possible a few years ago.

And I think what pleases me most, and certainly my colleagues in our film group, is that the new developments are all *liberating* ones. They involved better quality, cheaper and lighter equipment, greater flexibility and improved economy. They all point in the direction of greater freedom and not in the direction of any form of straitjacketing due to capital costs or technical requirements.

Having said that, I now would like to show you two sequences from our film output and I've selected them because they demonstrate some of the points which I've attempted to make—particularly those of mobility, flexibility, dramatic shooting and editing and the use to which we put the comparatively small self-contained unit which is required to travel all over the globe.

(EDITOR'S NOTE: At this point, film clips were shown from Alistair Cooke's "HISTORY OF AMERICA" and Ken Russell's "DANCE OF THE SEVEN VEILS".)

I'm not presenting film as a valid, or economic or technical alternative to electronic methods. Both, as you said, have their part to play in any television organization—however big or small. Just as I think that "DON QUIXOTE" could not have been made by electronic cameras, I know, that the "HENRY VIII" series was absolutely right made as it was in our electronic studios, albeit with a substantial film contribution. I consider that the choice of media will be a straightforward and simple decision, as it was in the past. Both sides of the house have their jobs to do. Both, will, in my view, continue to flourish, and I certainly don't see any dramatic change in the situation for some time to come. Thank you, Ladies and Gentlemen. ■

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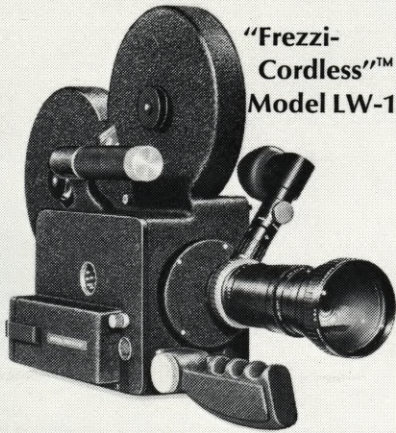
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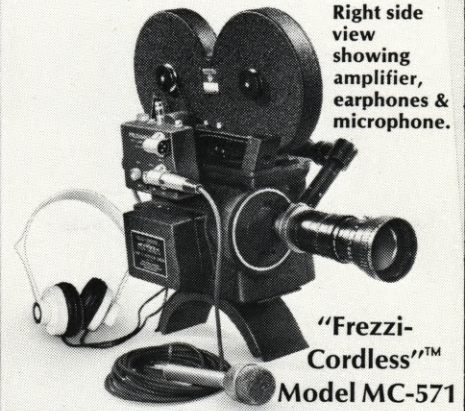
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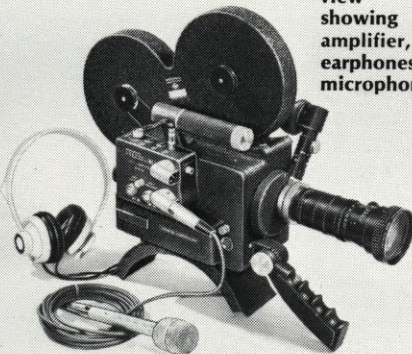
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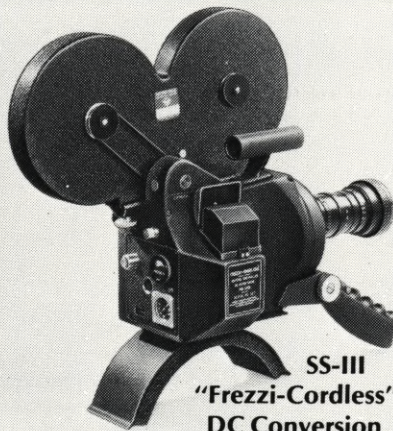
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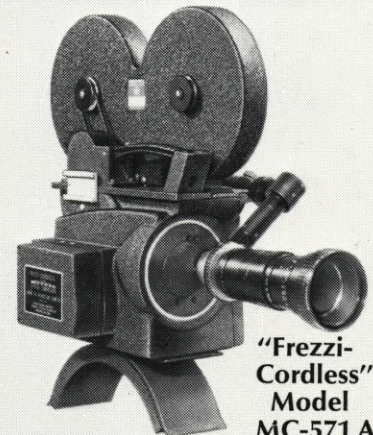
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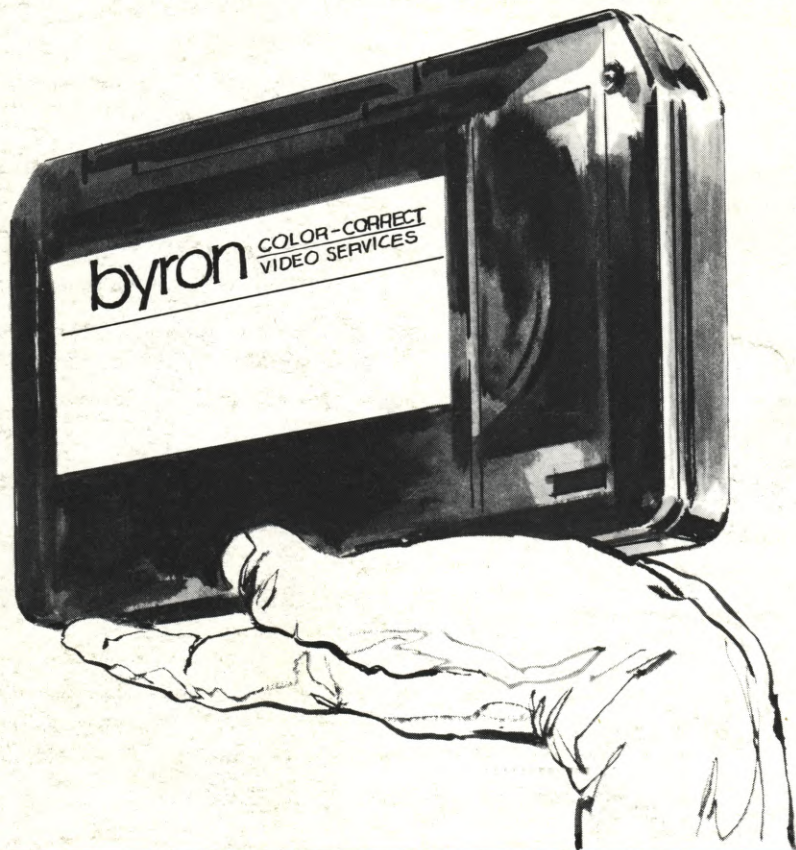
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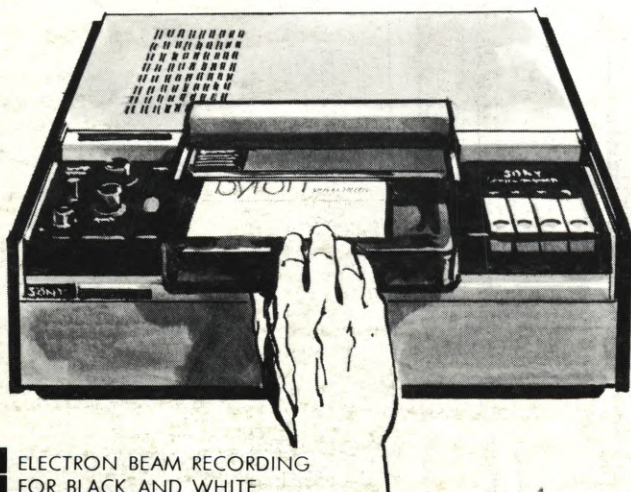
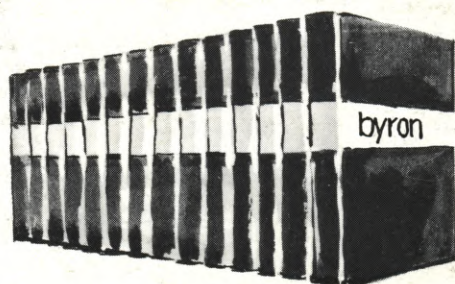
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
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