

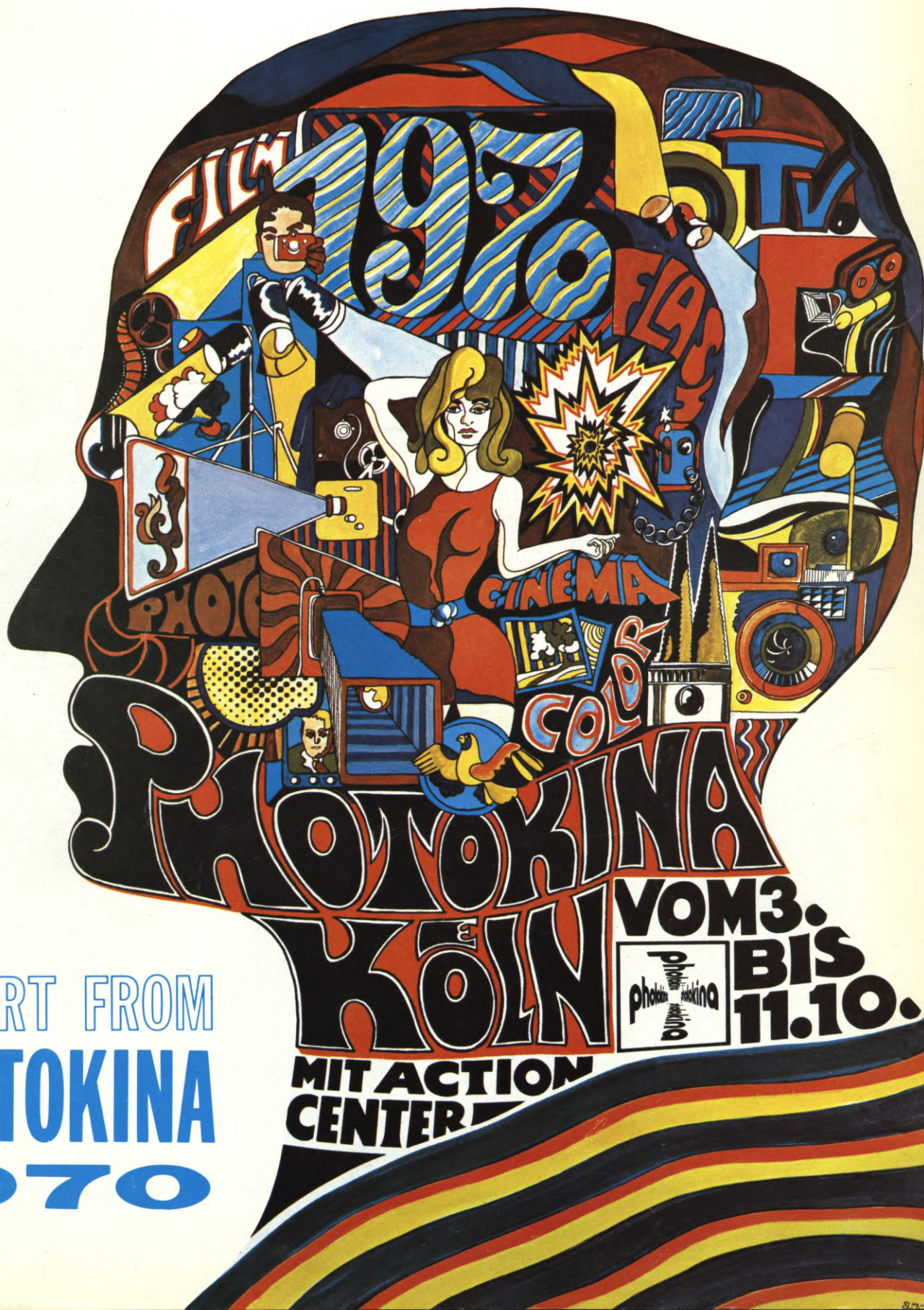
DECEMBER 1970

AMERICAN

75 CENTS

# Cinematographer

International Journal of Motion Picture Photography and Production Techniques



REPORT FROM  
**PHOTOKINA**  
**1970**

MIT ACTION  
 CENTER

VOM3.  
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 11.10.



# they said it - we didn't!

Read what the pros say  
about the CSC Reflex BNC.

**"Believe me, I've tried them all.  
The CSC Reflex BNC is the quietest,  
best performing, most professional  
conversion on the market today."**

**Andrew Laszlo, A.S.C.**

recent credits: Out of Towners,  
Popi, Lovers & Other Strangers,  
Divers Five, The Owl &  
the Pussycat.

**"I've shot four feature films  
exclusively with reflex BNCs.  
The only one, in my opinion, that  
functions reliably from day to day,  
hot or cold, is the CSC Reflex BNC.  
It's excellent!"**

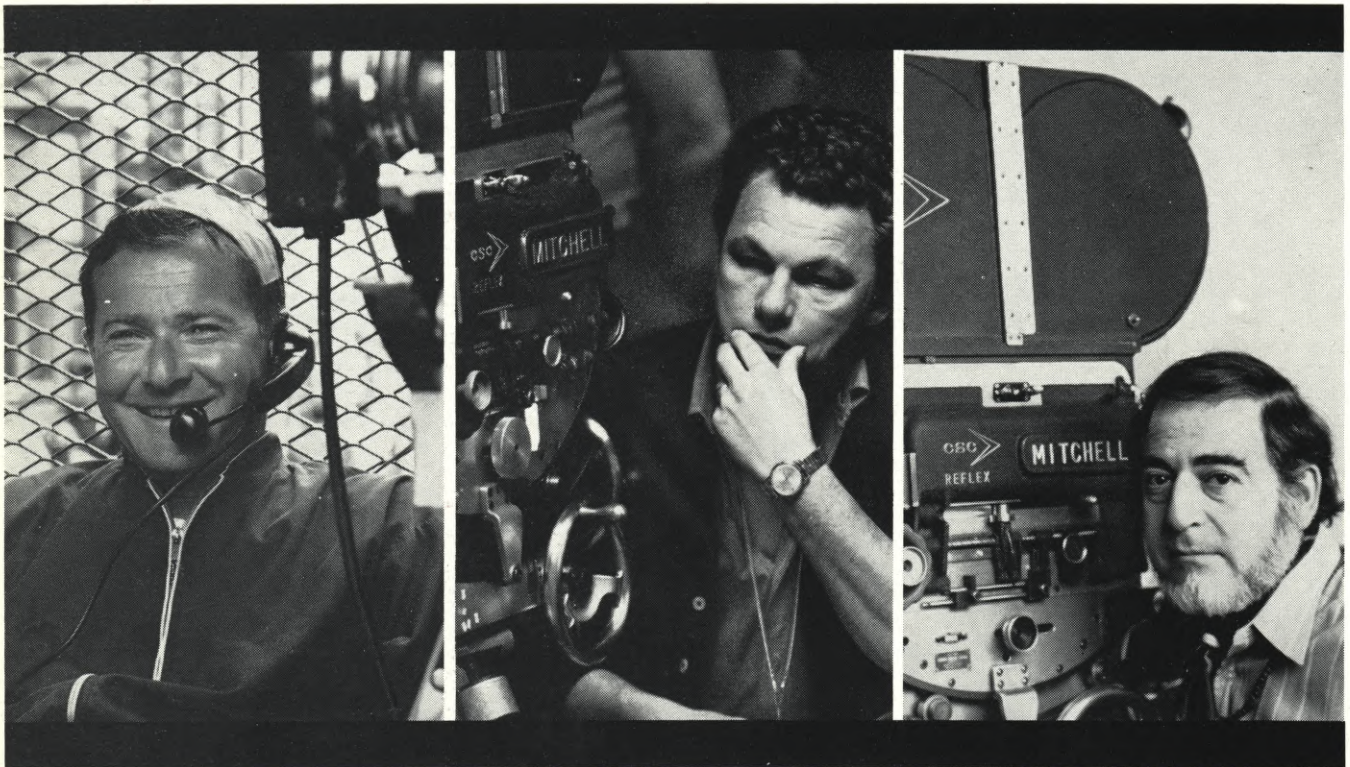
**Gordon Willis**

recent credits: End of the Road,  
Loving, Landlord, People Next Door.

**"My last three films were  
photographed with the CSC Reflex  
BNC... it's a really fine camera...  
I even took it halfway around the  
world to Japan for feature filming."**

**Gerald Hirschfeld, A.S.C.**

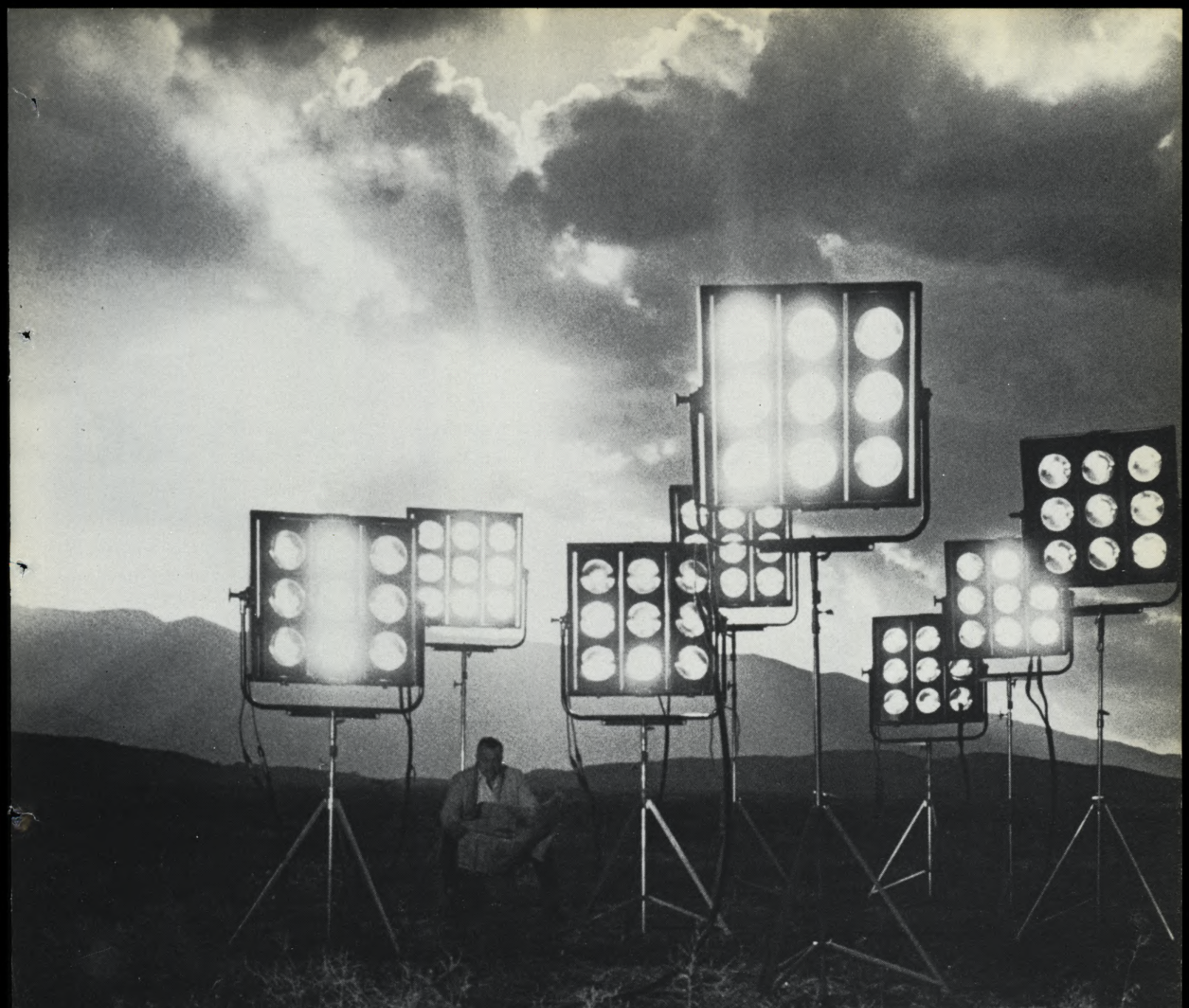
recent credits: Goodbye  
Columbus, Last Summer, Cotton  
Comes to Harlem, Diary of a  
Mad Housewife.



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It won't flicker and foul up your shot.

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 Photo Inc. 

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It's the lightest 16mm single/double system sound camera available.

But the best thing about the SSIII is the way it works. Like a charm. Under the worst possible conditions. It performed on the Arctic voyage of the S.S. Manhattan. And in the

swamps and jungles of Vietnam.

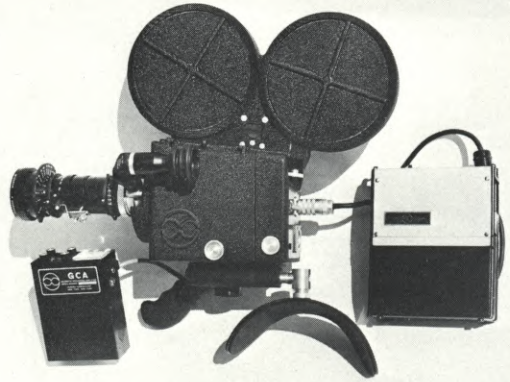
Wherever it goes, it does the job. Without doing a job on the cameraman's back. Our Peter Waldeck can give you prices and specifications.

Give him a call (212/LT 1-1060) and we'll put our camera where our mouth is.

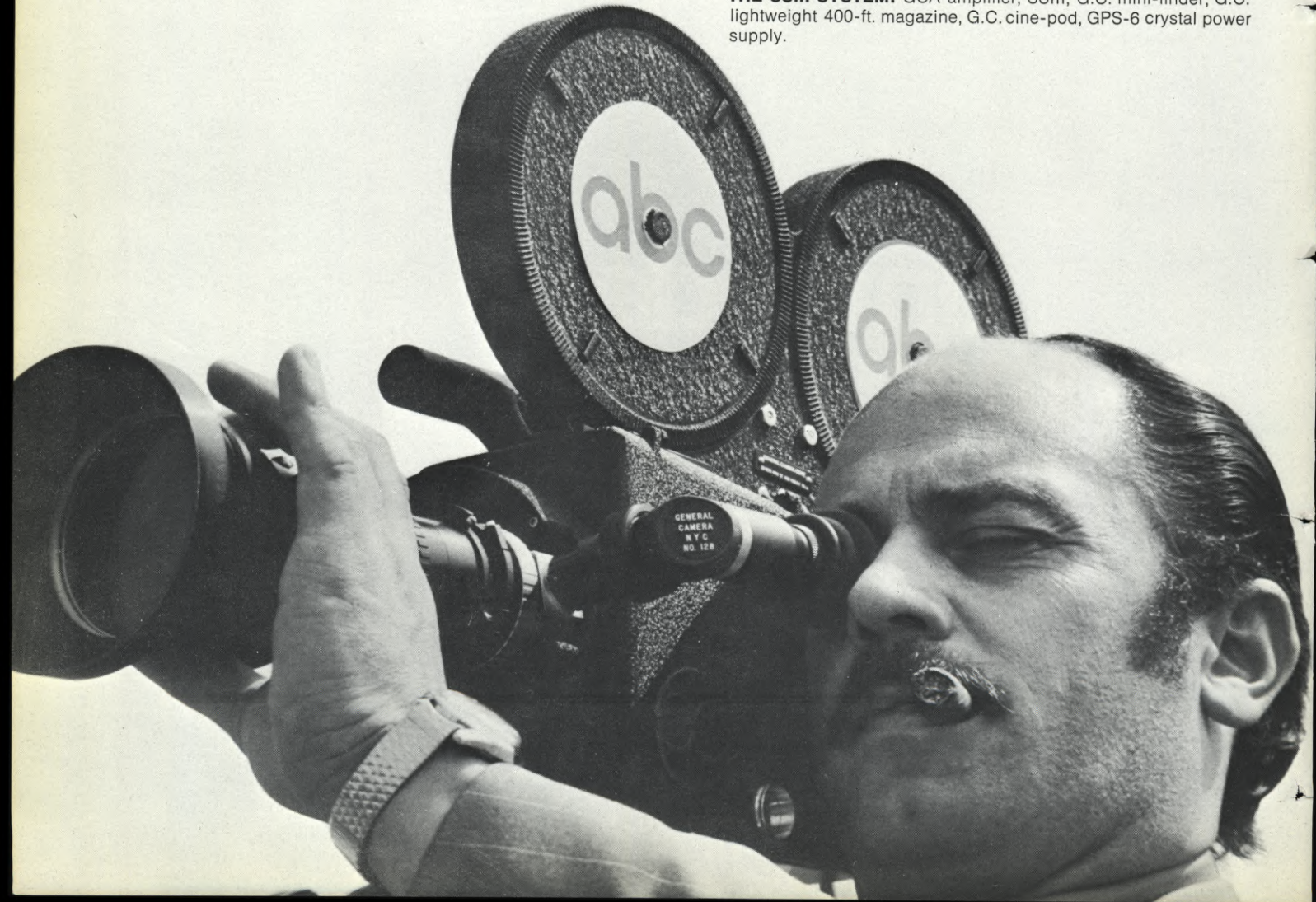
**General Camera Corporation**  
321 West 44th Street  
New York, N.Y. 10036  
(212) 581-1060



# We think a cameraman should work with his head. Not his back.



**THE SSIII SYSTEM:** GCA amplifier, SSIII, G.C. mini-finder, G.C. lightweight 400-ft. magazine, G.C. cine-pod, GPS-6 crystal power supply.



# AMERICAN Cinematographer

International Journal of Motion Picture Photography and Production Techniques

DECEMBER, 1970

VOL. 51, NO. 12

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ON THE COVER: Basic design motif by S. Junger for the official poster of *PHOTOKINA 1970*, World Fair of Photography, held at Cologne, West Germany.

**AMERICAN CINEMATOGRAPHER**, established 1920, in 51st year of publication, is published monthly in Hollywood by ASC Agency Inc., 1782 North Orange Drive, Hollywood, California 90028, U.S.A. **SUBSCRIPTIONS:** U.S. \$7.00; Canada, foreign, including Pan-American Union, \$8.00 a year (remit International Money Order or other exchange payable in U.S.) **ADVERTISING:** rate card on request to Hollywood or New York office. **CHANGE OF ADDRESS:** notify Hollywood office promptly. Copyright 1970 ASC Agency Inc. Second-class postage paid at Los Angeles, California.

**Troubled** by out-of-focus pictures?  
**Troubled** by emulsion  
 pile-up in your camera gate?  
**Troubled** by distracting camera  
 noise when shooting subjects who  
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 they are doing?  
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 always in need of repair and  
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# Magna-Tech's electronic method of altering sound tracks makes "looping" obsolete.



If you are still making hundreds of loops for a single feature, then consider a fast, precise and economical method of altering sound tracks that makes "looping" obsolete.

The new Magna-Tech system electronically synchronizes a reel of picture with a reel of full-coat magnetic sound-recording film. Footage and frame "PRESETS" permit the recordist to select the scene to be "dubbed" and to fully control the advance and return of the film as the actor voices the line to be "dubbed."

The system is so accurate it will even permit the change of a single word without danger of erasing an adjacent word.

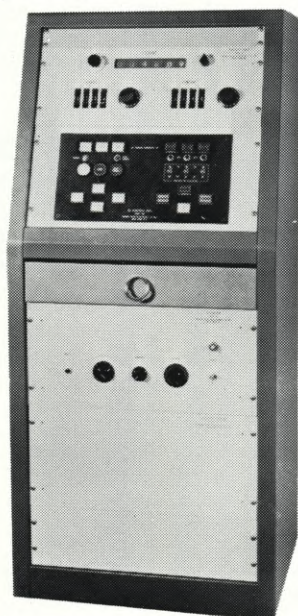
High speed return of the film to "start" saves time and permits new starts without waiting for a "loop" to complete its trip.

Actors, who so often succumb to the rhythm of a loop, are spared this hypnotic interference. Acceptable "takes" can be stored on the 3-track film and replayed for final selection.

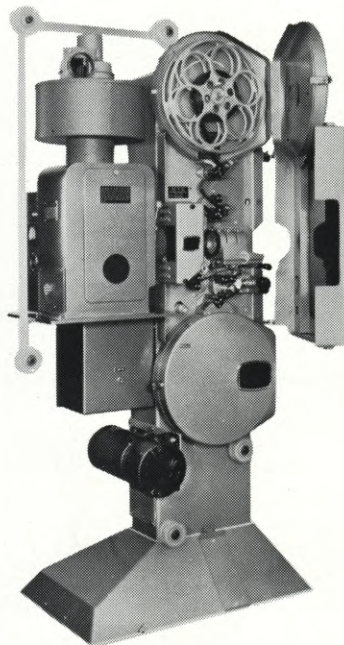
A complete remote control system is provided the director so that, once the recording engineer has preset footages, the director can take over if he wishes and directly control every facet of the recording.

The Electronic Looping System precludes the need for cutting loops and eliminates the need for editing of the track. Complete reels of the motion picture are run in synchronization with the full-coat magnetic film on which the sound track is recorded. Transfer of the best takes is then made to the third track of the same recorder.

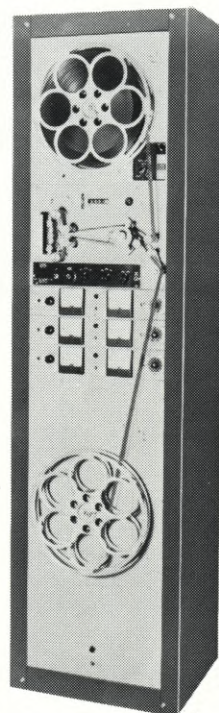
This track now has all of the final takes in sequential position and ultimately permits the screening of the picture and the final edited track in perfect synchronization. From this point the track is ready to go to a mix and no further editing is required.



Electronic Looping Console



35mm Projector



Master Magnetic Pick Up Recorder with Selective Erase



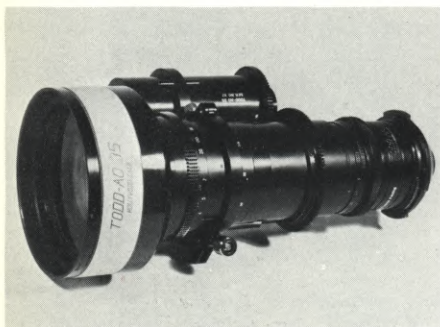
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# WHAT'S NEW

IN PRODUCTS, SERVICES AND LITERATURE



## TODD-AO ANNOUNCES NEW LENSES for 35mm. CINEMATOGRAPHY

The new TODD-AO 35 anamorphic lens system for 35mm. photography is now available for both testing and production, according to Fred Hynes of TODD-AO and Dr. Richard Vetter, developer of the lenses. The new lenses incorporate several new computer-designed concepts together with the long-established TODD-AO reputation for exceptional quality.

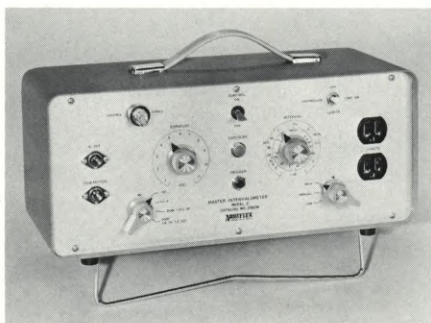
The lens system is for anamorphic "scope" photography, providing a 2.35:1 aspect ratio. Focal lengths of 38mm., 50mm., 75mm., 100mm., 200mm. and a motorized 10-to-1 zoom lens of 50mm. to 500mm., are now available. The 200mm. telephoto lens also serves as an insert, or macro lens with a unique 1:1 close-up capability. An extreme wide-angle lens and several telephoto lenses up to 300mm. are also available for special purposes. Existing "scope" projection lenses are utilized for exhibition of films photographed in TODD-AO 35.

Among the features of the new anamorphic lens system is a constant compression ratio at all focus distances from close-up to infinity. This important capability insures that faces photographed at any distance are reproduced accurately on the screen without distortion. Other features include faster speeds at both f and T-stop calibrations, along with smaller size and lighter weight. The lenses mount on BNC, BNC-R, Arriflex and Mark II cameras and are supplied with interchangeable mounts. A change from one camera mount to another can be accomplished with ease in the field by the camera crew.

Rental arrangements for TODD-AO 35 lenses and accessories are tailored to meet the exact needs of the

user. There is no minimum rental requirement for TODD-AO 35. Either one lens, a full set, or a complete equipment package is available according to the producer's requirements. There are no additional costs beyond the established competitive rental charges.

Further information regarding TODD-AO 35 can be obtained from Fred Hynes of TODD-AO (1021 N. Seward Street, Hollywood, California 90038) or Dr. Richard Vetter, developer of the new lenses. Sales representatives for TODD-AO 35 are Carl Williams and Lawrence Hatch, and Douglas Fries of the TODD-AO Camera Department.



## NEW MASTER INTERVALOMETER DESIGNED FOR ARRIFLEX ANIMATION MOTORS

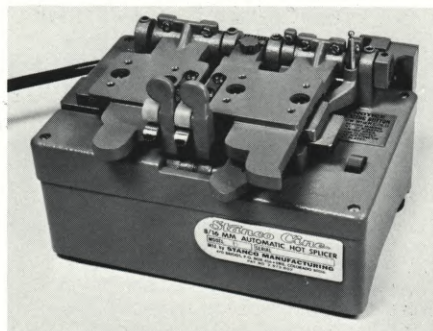
The Arriflex Corporation of America has announced the availability of their new Master Intervalometer, a device which automatically programs camera, lights, and other auxiliary equipment in correct sequence for special motion picture applications such as time lapse studies, animation and titling, data recording etc. It provides pre-settable time intervals from 3 seconds to 1 1/4 hours and time exposures from 1 second to 11 seconds.

The Intervalometer was specifically designed to operate in connection with Arriflex animation motors but can also be used for any other application requiring the pulsing of instruments at predetermined time intervals.

The Intervalometer is designed and built according to latest electro-mechanical and electronic standards using printed circuits and top quality components throughout. It is self-contained in a rugged instrument case with all controls located on the front panel. A hinged pedestal on the bottom of the

unit puts the panel into a comfortable back slant position for ease of operation.

The Master Intervalometer is listed in the Arriflex catalog under the number 339-334 and sells for \$796.00. For detailed information please contact the Arriflex Corporation of America, P.O. Box 1050, Woodside, N.Y. 11377 or 1011 Chestnut Street, Burbank, California 91502.



## STANCO CINE 8/16mm AUTOMATIC FILM SPLICER

Stanco, an experienced company in the manufacturing of film splicing equipment is marketing a newly designed automatic film splicer known as the Stanco Cine Mark VI. Features include: automatic emulsion removal, uniform platen temperature, accurate film alignment and "low visibility" splice. The unit is finished in organosol paint (epoxy base) for easier cleaning and longer wear.

The splicer meets all the requirements of the film industry; yet it is easy to operate . . . allows operator to make perfect splices every time. Extra hard platens practically eliminate damaged platens through human error.

The Stanco Cine carries a full year manufacturer's warranty and is available in 8/16mm as a standard, super 8, 8/16 and super 8 combination, and 35mm. Prices start at \$275.00 for the 8/16mm standard. For more information write Stanco Manufacturing Company, Box 456-A, Erie, Colorado, 80516.

## FOROX MODEL SS SLIDE/STRIP CAMERA AND COPY STAND

Forox Corporation is introducing its Model SS Slide/Strip Camera and Copy Stand, designed for the rapid production of slides and filmstrips. The rugged cast aluminum camera features an externally operated film cutter which enables the take-up magazine to be easily removed without the need for rethreading

Continued on Page 1218



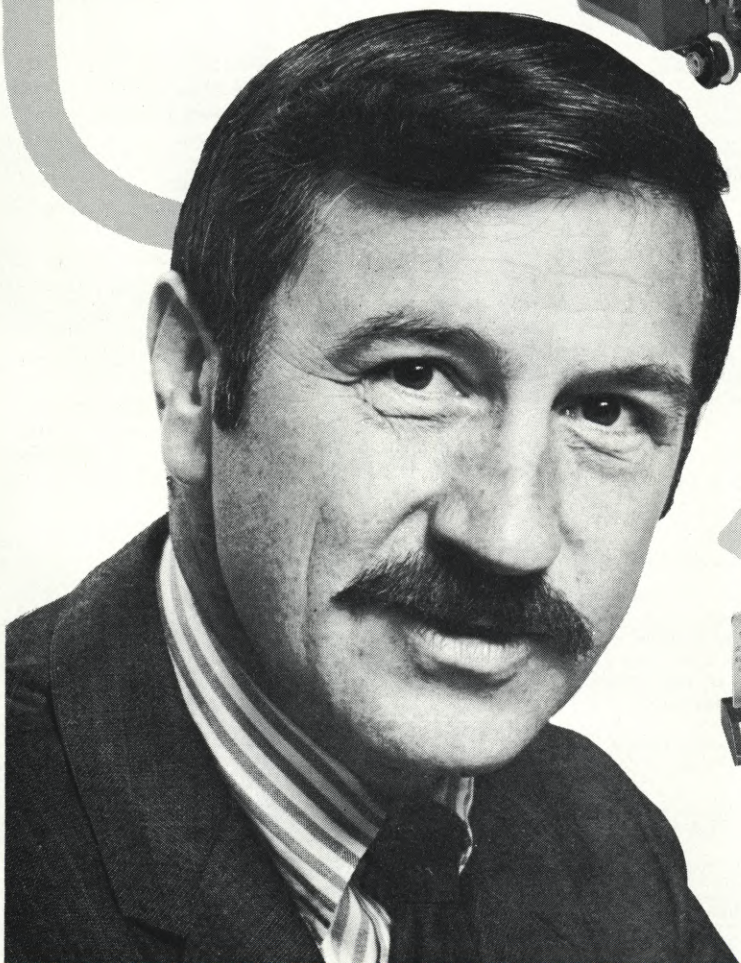
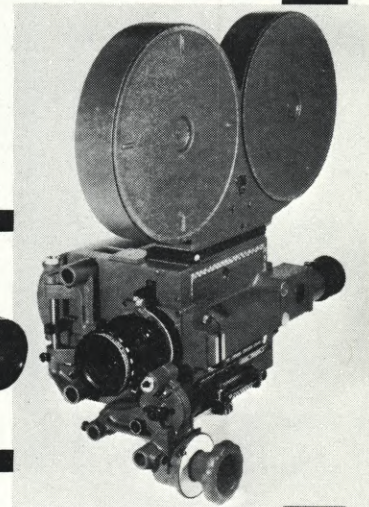
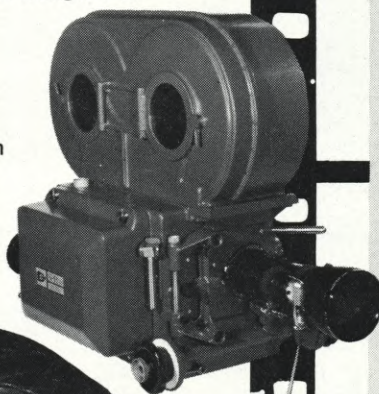
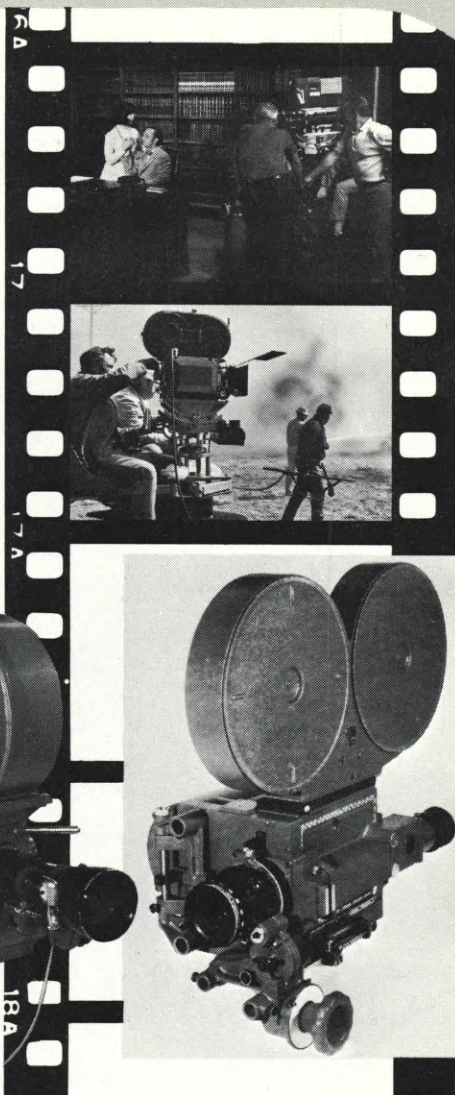
**Whether  
you're  
"in"  
or "out"  
CONVERT!**

*Ed Di Giulio says*

"SPR® conversions are 'in.' They are the most popular reflex BNCs available today. Paramount has 16; Universal 10. We've completed over 60 BNC conversions to our Silent Pellicle Reflex® System for the world's leading feature and TV film makers. **In fact, there are more of our SPR® conversions in use today than all other types combined. This includes both new and all other conversions of reflex BNCs.**

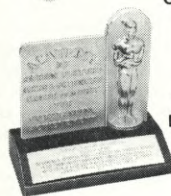
"SPR® conversions are 'in' for 'outsiders.' Cinema Product Development Company has just completed the design of an NC Reflex conversion. Mark Armisted has 3 and we recently shipped another back to Chevereau in Paris.

"Converting your old NC today makes sense . . . not only does your camera perform better than new but its value increases from 400 to 500%! Ask anyone who uses our Academy Award Winning SPR® Conversion System. When we "convert" your camera it's better than new.



**THESE TV PROGRAMS AND FEATURE FILMS ARE MADE WITH OUR ACADEMY AWARD WINNING SPR®-CONVERTED BNC CAMERAS:**

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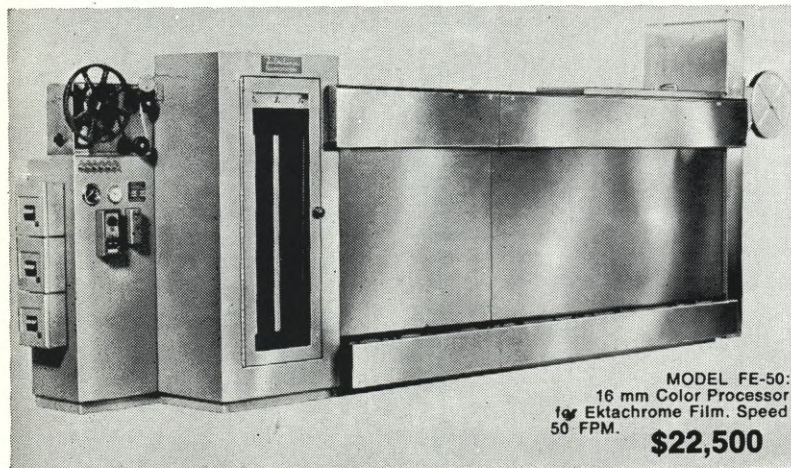
# The Money-Makers

## FILMLINE'S professional color film processors for motion picture laboratories.

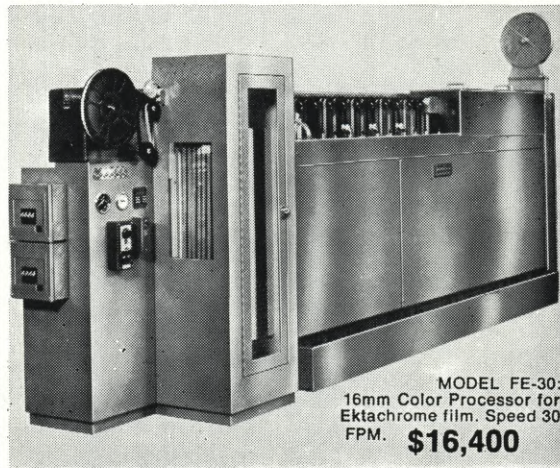
The Filmline Models FE-30 and FE-50 are fast, foolproof, troublefree and long-lasting. They turn out consistently superior work. The design is backed by Filmline's reputation as the world's leading manufacturer of film processors for the motion picture laboratory industry.

Now enjoy the benefits of professional equipment incorporating exclusive Filmline features that have paced the state-of-the-art in commercial, industrial and defense installations at a cost lower than processors offering less.

Check the exclusive Filmline features below:



MODEL FE-50:  
16 mm Color Processor  
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50 FPM. **\$22,500**



MODEL FE-30:  
16mm Color Processor for  
Ektachrome film. Speed 30  
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- **"FILMLINE OVERDRIVE FILM TRANSPORT SYSTEM"**  
This marvel of engineering completely eliminates film breakage, pulled perforations, scratches and operator error. The film can be deliberately stalled in the machine without film breakage or significant change of film footage in solutions. The heart of any film processor is the drive system. No other film drive system such as sprocket drive, bottom drive or simple clutch drives with floating lower assemblies can give you the performance capability of the unique Filmline Overdrive Film Transport System.
- **"TORQUE MOTOR TAKE-UP"** gives you constant film take-up and does not impose any stress or strain on the film itself. Completely independent of the film transport system. This FILMLINE feature is usually found in professional commercial processors but is incorporated on the FE-30 and

FE-50 models as standard equipment. Don't settle for less!

- **"TEMP-GUARD"** positive temperature control system. Completely transistorized circuitry insures temperature control to well within processing tolerances. Temp-Guard controls temperatures accurately and without the problems of other systems of lesser sophistication.
- **"TURBO-FLOW"** impingement dryer. Shortens dry-to-dry time, improves film results, and carefully controls humidity content of your valuable (and sometimes rare) originals. Immediate projection capability is assured because the film dries flat without the usual curl associated with other film processors.

**"ZERO DOWN TIME"** The reputation of any film processor is only as good as its reliability. The

combination of the exclusive and special added Filmline features guarantees trouble-free operation with absolute minimum down-time and without continual operator adjustments. Recapture your original investment in 2 years on maintenance savings alone. Filmline's "Push the button and walk-away processing" allows inexperienced operators to turn out highest quality film.

- **"MATERIALS, CONSTRUCTION AND DESIGN"** All Filmline machines are constructed entirely of metal and tanks are type 316 stainless steel, heliarc welded to government specifications. The finest components available are used and rigid quality control standards are maintained. Compare Filmline features to other processors costing more money. Feature-by-feature, a careful evaluation will convince you that Filmline offers you more for your investment.

### Additional Features included in price of machine (Not as extras).

Magazine load, daylight operation ■ Feed-in time delay elevator (completely accessible) ■ Take-up time delay elevator (completely accessible) ■ Red brass bleach tank, shafts, etc. Prehardener solution filter ■ Precision Filmline Venturi air squeegee prior to drybox entry ■ Air vent on prehardener ■ Solid state variable speed D.C. drive main motor ■ Bottom drains and valves on all tanks ■ Extended development time up to two additional camera stops at 50 FPM ■ Pump recirculation of all eight solutions thru spray bars ■ Temperature is sensed in the recirculation line ■ All solutions temperature controlled, no chilled water required ■ Built-in air compressor ■ Captive bottom assemblies assure you constant footage in each solution ■ Change over from standard developing to extended developing can be accomplished in a matter of seconds ■ Impingement dryer allows shorter put through time.

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Laboratories: De Luxe Labs, General Film Labs (Hollywood), Pathe-Labs, Precision Labs, Mecca Labs, Color Service Co., Capital Film Labs, Byron Film Labs, MGM, Movie Lab, Lab-TV, Technical Film Labs, Telecolor Film Labs, Guffanti Film Labs, A-One Labs, All-service Labs, NASA Cape Kennedy, Ford Motion Picture Labs.

TV Stations: WAPI-TV, WHP-TV, WMAL-TV, WXYZ-TV, WWL-TV, WMAR-TV, WJXT-TV, KETV-TV, WTOP-TV, WEAT-TV, WCKT-TV, WAVE-TV, WAVY-TV, KTVI-TV, WCPO-TV, KTAR-TV, WSYR-TV.



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in complete motion picture  
camera systems and  
accessories.

**Beaulieu 16mm.** The R16B with automatic exposure control and mirrored shutter gives you important features of 16mm reflex motion picture cameras which cost (and weigh) nearly twice as much.

**UHER <sup>4</sup>martel.** The Uher 1000/N "Sync" Tape Recorder is ideally suited for use with the Beaulieu R16B and other professional motion picture cameras. (Exclusively distributed in the United States by Hervic.)

**Hervi-Quartz LIGHTING.** Highly efficient portable "quartz" location lighting systems... lightweight, rugged, self-contained.

**Hervic HYDROFLUID JR.** The fluid tripod with integral ball for quick leveling.

**Beaulieu 4008ZM SUPER 8.**...the ultimate Super 8 motion picture camera with motorized macro focusing (to one millimeter) and many other exclusive features.

**Heurtier** The Heurtier Dual (8mm and Super 8) Projector operates as a silent projector or (with the addition of the transistorized Sound Module) as a sound projector... high fidelity sound and 10 speeds!

**angénieux** Complete selection of Angenieux and other fine precision motion picture lenses.

**Hervic VIEWER-EDITORS** (Super 8 and 16mm). All metallic construction. Large, clear image. Four-sided optical prism.



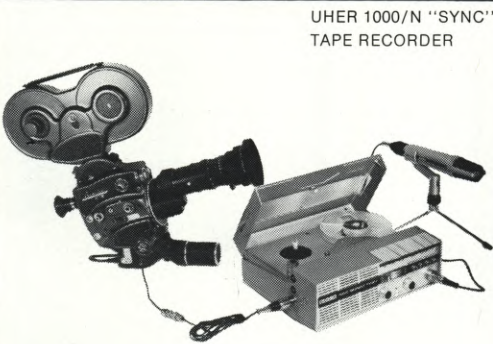
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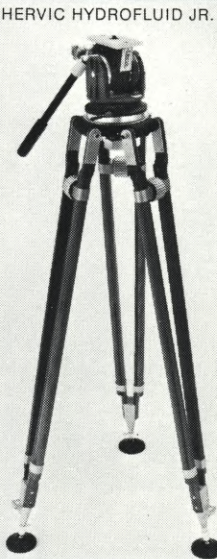
ANGENIEUX LENSES



BEAULIEU SUPER 8



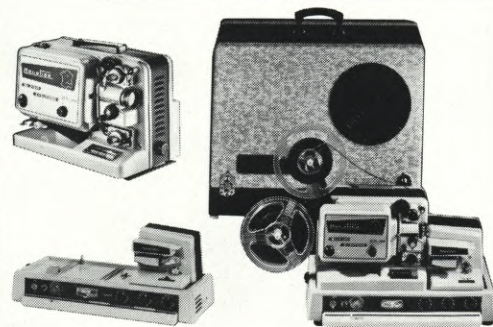
UHER 1000/N "SYNC"  
TAPE RECORDER



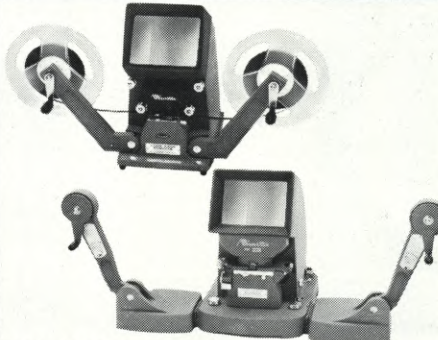
HERVIC HYDROFLUID JR.



HERVI-QUARTZ  
LOCATION LIGHTING



HEURTIER PROJECTORS



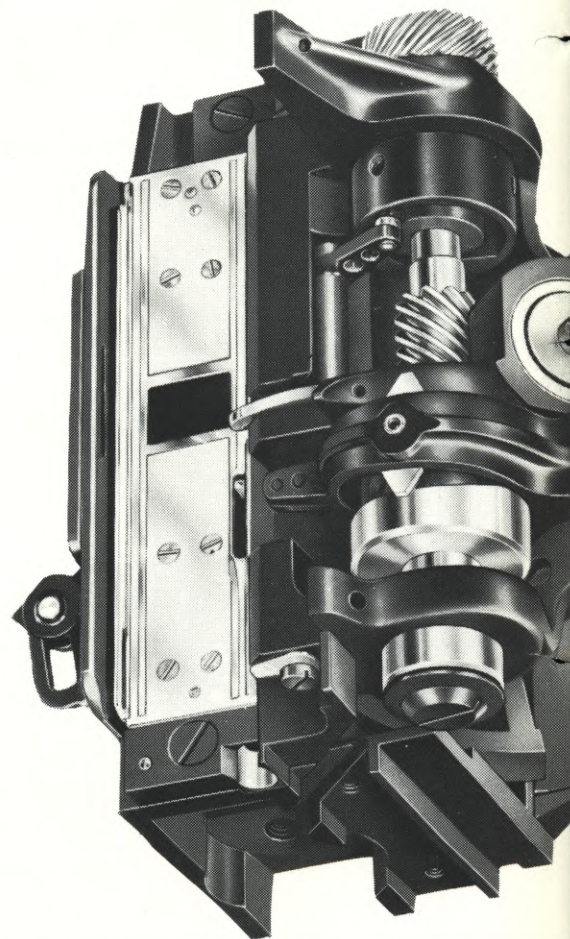
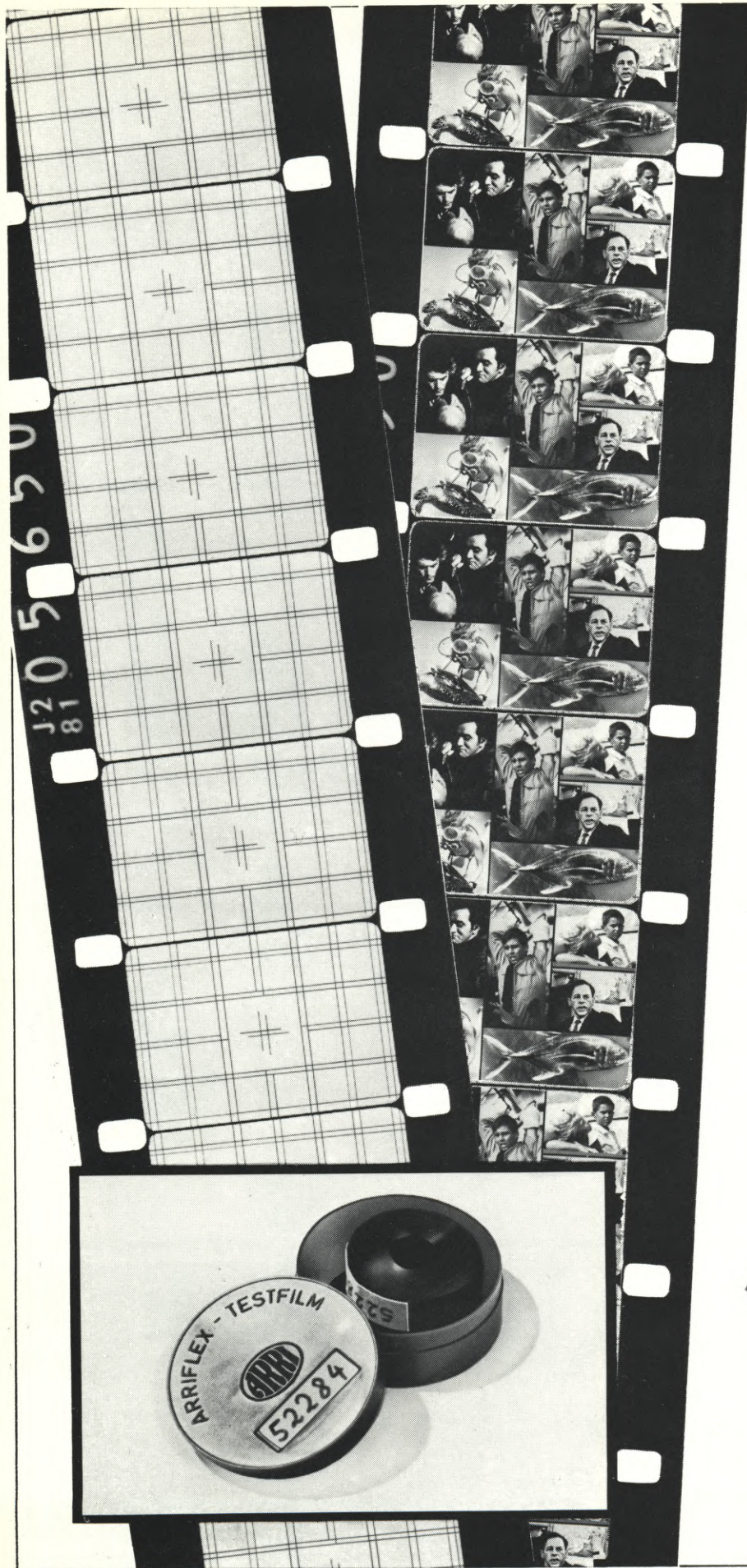
HERVIC VIEWER-EDITORS

For further information write to:

**Hervic**  
CORPORATION

14225 Ventura Boulevard  
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**Arriflex 16mm film transports provide the critical registration essential for the most sophisticated opticals . . . and each camera comes to you with the proof!**

The test film that accompanies each new 16mm Arriflex shows why these cameras are so successful in shooting master footage for optical effects. Multiple-image, split-screen, 16 to 35 blow-ups and other complex effects are as important in 16mm production today as in larger-format production—and absolute registration of the camera original is a pre-requisite if opticals of superb quality are to be made later in the laboratory. That such techniques can be produced without compromise in 16mm will be proven when you project the Arriflex test film.

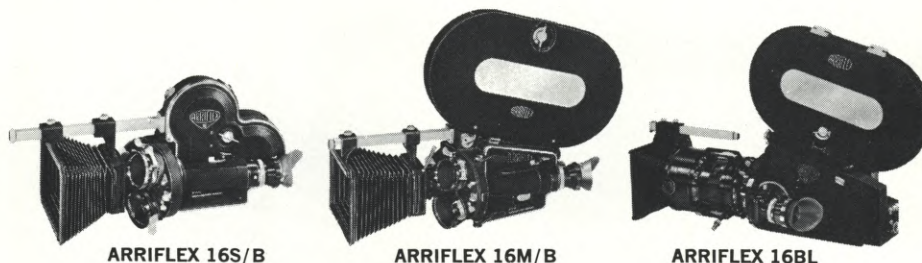
The test film was made in two exposures, with the test grid offset before the second pass. Had registration been anything less than perfect, you'd see it immediately on the screen as movement of the grid lines in relation to one another. But there is no such movement—you see the illusion of a single exposure—because of the unflinching constancy of each frame's registration.

The reason for such consistently steady footage is not only because of a true registration pin film movement but also due to the design and construction of the mechanism as a whole. It features many unique concepts for absolute film stability, followed through with the most durable materials. Its quiet, vibrationless precision prevails at all running speeds, forward and reverse, over millions of feet of film. Its ability to withstand shock and environmental extremes has been proven countless times over, since its introduction nearly twenty years ago.

Picture quality is the essence of any film, of course; whether or not a production involves opticals, registration and sharpness are among the elements producers and cameramen stake their reputations on. This offers one explanation why there are more Arriflexes in use throughout the world than any other professional camera. For the complete story, write for brochures.

#### \*THE SOURCE OF ARRIFLEX'S OPTICAL PRINTING ACCURACY

Pin movement locks each frame into position for exposure; long film channel with spring-loaded side pressure rail produces absolute lateral stability. Solid cast, hardened double cam mechanism resists wear, sustains vertical registration accuracy over millions of feet of film. Rear pressure plate (removed in this illustration to show registration pin) is an integral part of the movement assuring longitudinal stability (no film breathing).



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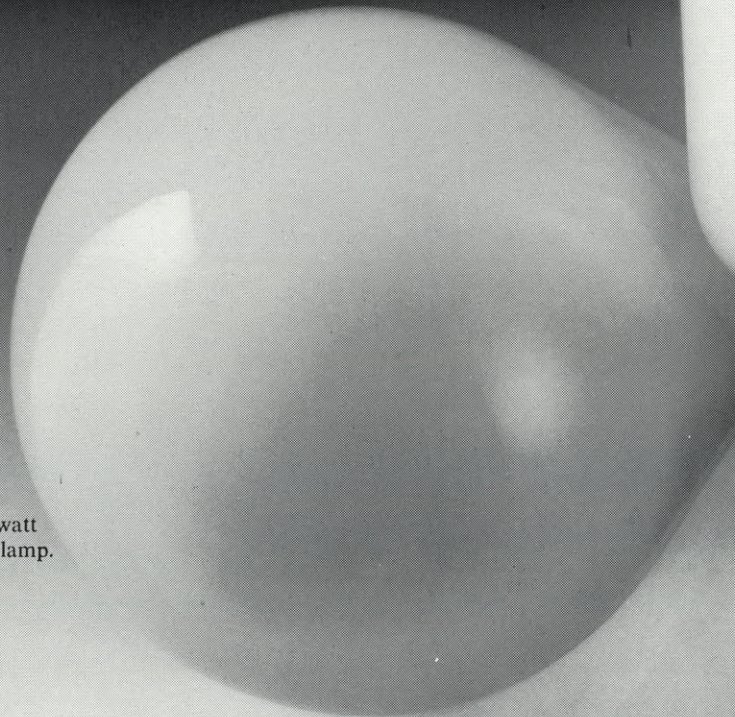
Our new krypton-halogen replacement for the PS52 fits the same fixture, lasts twice as long and maintains constant color temperature for life.

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New DSF 1500-watt krypton-halogen studio lamp.



PS52 1500-watt incandescent studio lamp.



When you replace a PS52 studio lamp you can replace it with something better.

The something better is Sylvania's DSF krypton-halogen lamp, which fits the same fixture as the PS52.

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as it was at the beginning. There's no darkening with age as in the PS52.

And its 3200° K color temperature is there right from the beginning. And it's still there 250 hours later. Constant.

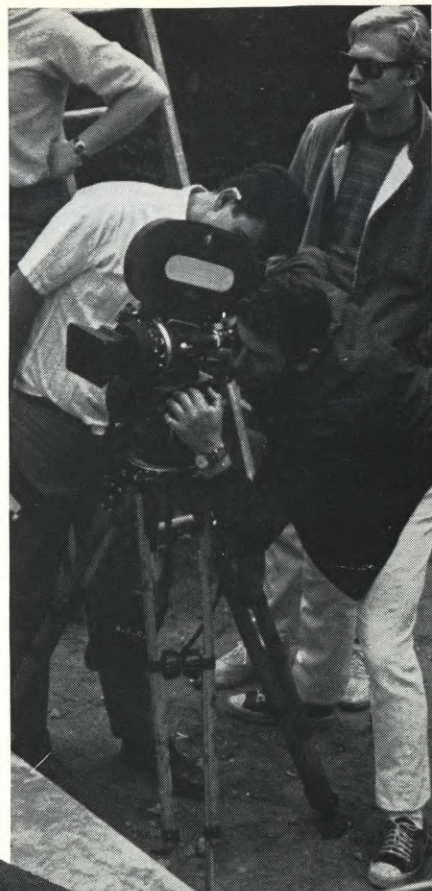
The DSF has low-noise construction. There are no loose parts to resonate when used with SCR dimmers.

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# CINEMA WORKSHOP



By ANTON WILSON

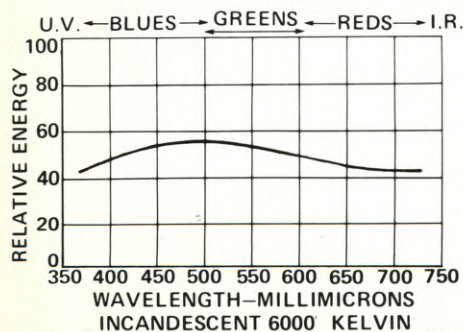
## FLUORESCENT LIGHTING

The principle of an incandescent light source is relatively simple. An element is heated until it glows or *incandescens*. From previous discussions it should be clear that the light emitted from an incandescent source is "continuous". This is reflected in FIGURE 1 where it can be seen that the energy level for all colors is approximately equal. This smooth even color response makes the incandescent source an ideal form of illumination for color cinematography.

Unfortunately one cannot always film by incandescent illumination. With "available light" cinematography becoming increasingly popular, many cameramen find themselves facing the cruel world of fluorescent lighting that exists in almost every public, industrial and office building. The fluorescent lamp does not exhibit the smooth color response of the incandescent source due to the fact that it operates on a totally different and more complex principle called *fluorescence*.

Before discussing practical methods for filming by fluorescent illumination, a short analysis of the fluorescent principle may prove beneficial. The fluorescent tube contains a gas composed essentially of mercury vapor through which an electric current is passed via electrodes at either end. This current causes the electrons in the mercury atoms to jump between several energy levels. Each time an electron jumps to a lower level, it releases a "photon" of light energy whose color is determined by the difference in energy between the

FIGURE 1



two levels. For a given atom, such as mercury, there are only certain energy levels that the electrons can occupy and therefore there are only certain specific colors that will be emitted. (This principle is most familiar in a neon sign where it happens that the only energy level available in the neon atom corresponds to pure red-orange light.) The mercury vapor will emit essentially 5 distinct wavelengths or colors of light which are represented in FIGURE 2 by the five vertical "spikes" at approximately 363, 405, 436, 546 and 578 millimicrons respectively.

It would be impossible to film with this limited spectrum. just as it is impossible to film by illumination from a neon sign. Unlike a neon sign, however, the fluorescent lamp has a phosphore coating on its inner surface. When the lines ("spikes") of mercury vapor radiation strike the phosphore coating, the identical principle occurs again, that is, the electrons in the phosphore begin to jump to higher energy levels and when they jump down, a photon of light is emitted whose color corresponds to the loss of energy due to the downward jump. The only difference is that instead of 4 or 5 distinct "spikes" of color, as was the case with the mercury vapor, the phosphore is an exact blend of chemicals with a multitude of available energy levels and thus the light it emits consists of a myriad of colors that approximates a smooth spectral curve. But not quite. For one thing, an appreciable portion of the light still emanates from the mercury vapor spikes. Secondly, even though the phosphores are blended very carefully, they cannot duplicate the smooth, even response of the incandescent source. (Compare FIGURE 1 and FIGURE 2) As a result the fluorescent source exhibits significant inconsistencies in its color response which make it generally unsuitable for color photography. Furthermore these inconsistencies are random and vary from one type of phosphore to another. Thus a "deluxe warm white" bulb may cause a brown tint while a "cool white" may turn everything green-blue on the film. The term "color temperature" is

absolutely meaningless when discussing fluorescent tubes.

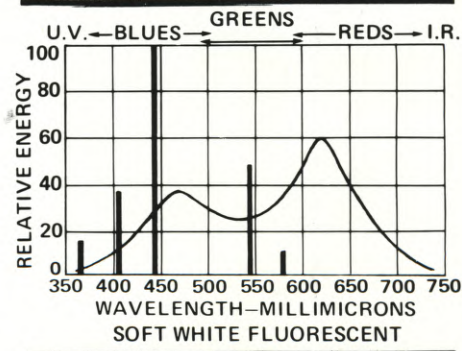
There are several ways to circumvent the fluorescent problems. Most obvious is to turn them off. If it is possible (and practical) to illuminate the area with tungsten halogen, simply turn off all fluorescent illumination in the area. In many cases this is not practical, as with large factories or office areas.

The second alternative is a filter pack. By analyzing the curve of the "soft white" lamp in FIGURE 2, it can be seen that it suffers from a strong peak in the red region, and a mild peak with a large spike in the blue region. By employing a cyan filter (minus red) and a yellow filter (minus blue) the red and blue peaks can be respectively reduced sufficiently to produce a relatively smooth response curve. Sylvania and GE have analyzed just about every fluorescent bulb in the above manner and publish a fluorescent filter chart which specifically recommends a given combination of filters for each type bulb and film stock.

This system has several serious drawbacks of which you must be aware. First it requires the cameraman to carry a complete set of cyan, magenta and yellow filters. Secondly, both GE and Sylvania stress the fact that their recommendations are just "starting points" for individual experimentation since bulbs change significantly with age. Most cameramen cannot afford to run a test prior to the actual shooting. In addition many rooms are illuminated with several different types of bulbs

Continued on Page 1223

FIGURE 2



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H Eyemo Q w/1", 2" and 6" lens, 400' magazine	\$ 395.00
H Mdl. 2709 w/Hi-Speed movement (200 fps)	\$ 950.00
H Mdl. 2709 w/unit "I" movement. Excellent for animation	\$1295.00
Reflex (U.S. version of Arri), body only. Missing some parts	\$ 95.00
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Bronn Scoopic complete w/13-76mm Zoom lens, built-in motor, 12V battery and charger, lens hood, filter ring, metal carrying case	\$ 795.00
Cine Special I, less lens, complete w/100' magazine	\$ 195.00
Cine Special II, less lens, w/100' magazine	\$ 295.00
Auricon 400' converted Cine Voice Camera. Three-lens turret, optical sound	\$1495.00
Milliken 16mm Hi-Speed camera DBM3, 16mm x 100', less motor, excellent condition	\$ 450.00
Milliken 16mm Hi-Speed camera DBM4, 16mm x 200', 28V DC, 400 fps, excellent condition	\$ 750.00
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Maurer Mdl. 05 complete w/two 400' magazines, optical viewfinder, matte box, 115V motor. Used, excellent condition. Price new, \$10,000.00	\$1995.00
Eastman Kodak K-100 complete w/25mm Ektar lens, viewfinder lens, 40' spring wind. Used, excellent condition. Price new, \$650.00	\$ 295.00
Doiflex 16mm complete w/25mm Schneider lens, pin register movement. Excellent low-cost animation camera, reflex viewing system. NEW	\$ 750.00
Eastman Kodak Reflex complete w/three Angenieux Ekton lenses, sync motor, 400' magazine. Like new. New price, \$2495.00	\$1595.00
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## LIGHTING EQUIPMENT

	Sale Price
ColorTran 500 flood 1000W LQK5/YMA. New price, \$59.95	\$ 29.95
ColorTran Scoop 1000W LQK-15, New price, \$110.00	\$ 37.50
CYC-Strip 1000W background light LQC10 12-3. New Price, \$300.00	\$ 150.00
CYC-Strip LQC 10 6-3. New price, \$170.00	\$ 85.00
ColorTran Soft Light 800W LQS 80-10P. New price, \$530.00	\$ 379.50
Lamps B532 1000W 3200K. New price, \$15.25	\$ 8.50
Heavy Duty Crank-Up Stands. New price, \$330.00	\$ 229.00
25' Power Cables, 4-way box, stage plug termination. New price, \$50.00	\$ 35.00
"C" Clamps w/hanger pin. New price, \$8.95	\$ 4.50
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M/R Duarc, head only, complete w/glass filters. Fully automatic twin arc. Ideal for lighting backings and for fill lights. New price, \$825.00	\$ 85.00
M/R T-5 spot, head only. New price, \$200.00	\$100.00
M/R single broad, Type 22, head only. Traditional stage light, uses PS52 globes, provision for barn doors and diffuser holder. New price, \$63.00	\$ 33.50
10K Pan, head only. Converted M/R 2231 cone light for use with 10,000W TKG96 globe. New price, \$250.00	\$ 75.00

## SOUND RECORDING EQUIPMENT

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Reevesound Magicorder Mdl. PV 100, 16mm 400' magazine, edge track recorder, complete w/two channel mixer and cables	\$ 150.00
Reko-cut Mdl. TR43H Transcriber, complete w/speaker, 13" turntable, microphone, recording transfer arm and blank discs. NEW	\$ 395.00
Sennheiser microphones. All models NEW: 104, 404, 804, Wireless SK1005, EM 1008	WRITE FOR PRICES

Uher Mdl. 4000L, complete w/case and microphone	\$ 225.00
Vega Wireless Microphone complete w/transmitter and receiver. Excellent condition	\$ 195.00
Westrex 35mm recorder-printer complete optical and magnetic sound system w/sound mixing console. Excellent condition	\$6500.00
Maurer Film Phonograph. Matches directly into the Maurer recording amplifier for re-recording and mixing. The highest quality reproducer providing the ultimate in play-back fidelity for judging the quality of sound track. New price, \$3000.00	\$1495.00
Maurer Dual Track Mdl. F-Prime galvanometer negative/positive equipped w/2.15 ampere lamp. New price, \$3300.	\$1595.00
Rangertone Professional 1/4" tape recorder. Originally sold for more than \$3000.00. As is, some parts missing	\$ 400.00
Westrex Mdl. RA1132C 35mm Sound Recorder complete w/galvanometer, magazine and amplifier. Used, needs repair. Good for parts	\$ 385.00
Hallen 16mm Magnetic Recorder	\$ 495.00
<b>16MM SOUND RECORDING SYSTEM</b> complete w/two dubbers. Magnasync X400 including three-channel amplifier and sync interlock motor. One recorder, Magnasync Mdl. 5-602 edge track w/interlocker motor. One recorder, Magnasync Mdl. 5-602 edge track. One B&H projector w/sync interlock motor. Two dubbers and one playback unit plus projector are selsyn interlocked. This equipment will be sold as a COMPLETE SYSTEM only. All items are in excellent condition and are presently in service. Complete system	\$4300.00

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Title Stand complete w/B&H 35mm 2709 camera, pin-registered movement and separate through the lens viewing prism. Stop motion motor, 13"x16" back and front lighted motorized easel. New price, \$25,000.00	\$4950.00
Traveling, all-directional, uniquely engineered special effects dolly. All moves electronically controlled. Dolly is power driven on a 40' track. Motor driven pan and tilt. B&H 35mm 2709 camera equipped with follow focus. Stop motion motor for sine framing. All movements are connected to Veeder counters for reversal of any shot. New price, \$25,000.00	\$4950.00
Acme Animation Stand. Standard in the industry, complete w/35mm Acme camera and animation motor. Complete and ready for operation. New price, \$19,000.00	\$9995.00
Custom-built animation stand, complete w/Acme 35mm Animation camera and stop motion motor. Complete in every detail. Must be seen to be appreciated. Write for full detailed information. New price, \$45,000.00	\$11,950.00
Animation Board w/double bar. NEW	\$ 115.00
Same as above w/magnetic peg board. NEW	\$ 135.00

## SOUND RECORDING ACCESSORIES

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Unidyne 555	\$ 24.50
American Mic D-3	\$ 17.50
EV 637	\$ 26.00

RCA 639B	\$ 39.00
Shure DY-30B	\$ 29.50
RCA BK5B	\$ 82.50
American Mic D33A	\$ 33.50
EV 666	\$ 79.50
EV 635	\$ 42.50
EV 635A	\$ 42.50
EV 654A	\$ 52.50
EV 646	\$ 72.50
EV 644	\$ 51.50
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Arriflex 16mm	\$ 35.00
Bolex	\$ 25.00

## EDITING AND CUTTING ROOM SUPPLIES

	Sale Price
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Harwald Splice-O-Film 16mm hot splicer. Excellent condition	\$ 99.00
Harwald Splice-O-Film 16mm hot splicer, Like New	\$ 139.00
Neumade film measuring machine 16mm Mdl. HM5S, complete w/counter	\$ 59.50
Acmade 16mm precision hot splicer similar to B&H hot splicer	\$ 99.50
Neumade two gang 35mm film measuring machine complete w/counter	\$ 67.50
Neumade one gang 35mm film measuring machine complete w/counter	\$ 55.00
HFC edge numbering machine. Edge numbers rolls up to 3000'. Complete w/numbering block. Mdl. ENM 16mm, reconditioned. New price, \$2675.00	\$1995.00
HFC edge numbering machine. Edge numbers rolls up to 3000'. Complete w/numbering block. Mdl. ENM 35mm, reconditioned. New price, \$2500.00	\$1895.00
Moviola 16/35 Cabinet w/drive motor, 16mm take-up arms, 35mm take-up arms. Many parts missing. As is	\$ 75.00
Paulmar Mdl. 75 16mm film inspection machine. Needs repair. New price, \$2400.00	\$ 325.00
16mm x 800' reel and can	Each. \$ 1.50
16mm x 1200' reel and can	Each. \$ 2.25
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16mm x 400'—1 reel	Each. \$ .50
16mm x 600'—1 reel	Each. \$ .60
16mm x 600'—2 reel	Each. \$ .70
35mm x 2000'—2 reel	Each. \$ 2.00
Film Cases, heavy gauge galvanized cases for 35mm 1000' reels only:	
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Houston-Fearless Mdl. 22-B 16mm neg./pos.	\$3495.00
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Houston-Fearless Mdl. PH-413-A, 16mm neg./pos. 7-15 fpm	\$1275.00
Houston-Fearless, 16mm Ansco Color, neg./pos./reversal	\$5950.00
Morse, A-8 16/35 Ansco Color, up to 50 fpm or B&W neg./pos./reversal	\$4500.00
Film Dryer Mdl. EL-13A, 16/35/70mm, 220V. Drying speed 35 fpm	\$1995.00
Film Dryer Mdl. C2A, 16/35mm, 200' capacity. Drying speed 30 fpm	\$ 385.00
Film Dryer Mdl. C2, 16/35, 200' capacity. Drying speed, 8 fpm	\$ 235.00

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B&H Mdl. D 35mm continuous contact, rebuilt like New	\$4995.00
Same as above, Reconditioned	\$3100.00
B&H Mdl. J 16mm continuous contact printer w/high intensity lamp housing. Reconditioned	\$4250.00
B&H Mdl. JA 16mm continuous printer w/high intensity lamp housing and roller gate. Rebuilt, Like New	\$5650.00
Depue Optical Reduction Printer, Mdl. K3-35/16. Reconditioned	\$5500.00
Depue Micro-film printer 16/35. Reconditioned	\$2350.00
Tel-Amatic 16mm continuous contact printer. Semi-automatic light change, 1200' capacity, 43 fpm printing speed. Like New	\$1695.00
Herrnfeld 16mm sound track printer Mdl. 1517B. "B" wind printer for one pass printing, 86 fpm. Like New	\$1795.00
Herrnfeld 35mm loop printer, Mdl. 1502A. Designed for multiple prints, filmstrips or slides. 1000W lamp, 43 fpm. Like New	\$1295.00
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Arriflex 35mm Step Printer w/punch tape control	\$ 995.00
Fish-Schurman Additive Color Head designed for B&H Mdl. D or J printers. Complete unit, including three-channel memory reader, key board and punch. New price, \$13,800	\$5500.00
Herrnfeld 35mm continuous printer. High intensity lamp, 21 light changes, shotgun filter changer. Complete, needs clean-up	\$1495.00

Houston-Fearless Mdl. EN5 16mm continuous Contact Printer, table top model, 22 light changes, printing speed B&W 60 fpm, color 30 fpm. Excellent condition	\$3450.00
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## LABORATORY EQUIPMENT

Sale Price

Neumade Neuvator film cleaning machine, 16mm	\$ 295.00
Neumade Neuvator film cleaning machine, 35mm	\$ 275.00
Welch Densichron Mdl. 3853D full color transmission light source densitometer. New price, \$400.00	\$ 195.00
Eastman 35mm film waxing machine w/ two flat wheels .001" wide and containers for cleaning solution and liquid wax, designed for bench mounting. A \$1500.00 value. Reconditioned	\$ 595.00
Herrnfeld Scene Tester, Mdl. 1508-B. Used, Good Condition	\$1295.00
Depue light control board designed for use w/Depue Optical Reduction Printers. Provides 22 light changes	\$ 685.00
Bausch and Lomb Densitometer, projection type. Measures light by spectrum lines on photographic plates. Original cost more than \$5000.00. Used, fair condition, some minor parts missing	\$ 750.00
Westrex Densitometer Mdl. RA-1100E. New price, \$5900.00	\$1595.00
Eastman Kodak Mdl. 1 color densitometer. New price \$145.00	\$ 95.00

## PROJECTION EQUIPMENT

Sale Price

B&H Mdl. 398 16mm. List price, \$595.00	\$ 325.00
B&H Mdl. 384 16mm. List price, \$595.00	\$ 350.00
B&H speaker in case. List price, \$97.00	\$ 45.00
B&H 16mm Mdl. D4, w/carrying case and speaker	\$ 350.00
B&H 16mm (JAN)	\$ 495.00
B&H 16mm, analyst type (JAN D-5)	\$1400.00
RCA 16mm Mdl. 400	\$ 225.00
Kodak 16mm Pageant Mdl. AV 151, w/speaker in case	\$ 275.00
Graflex 16mm TV Projector Mdl. 930 w/base and lens	\$1200.00
Graflex 16mm projector, Mdl. 820, w/remote controls	\$ 475.00
Graflex Overhead Projector, Mdl. OH 2000	\$ 155.00
Graflex Overhead Projector, Mdl. OH 3000	\$ 155.00
Beseler Master Vu-Graph Overhead Projector, Mdl. 6510-1C3	\$ 225.00
Beseler Slide King 3 1/4" x 4"	\$ 225.00
Keystone Overhead Projector for 3 1/4" x 4" slides	\$ 125.00
Pixmobile Rear Projector cabinet, Mdl. AV463. NEW	\$ 119.95
DeVry XD Portable 35mm Projector. New price, \$2500.00	\$1495.00
Century 35mm Projector Heads. New price, \$3000.00	\$ 850.00
Century Pedestals	\$ 125.00

## CAMERA ACCESSORIES

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Maurer 05 400'	\$ 155.00

### 35mm Magazines

Arriflex 400'	\$ 100.00
B&H A-6 400'	\$ 95.00
B&H A-6 1000'	\$ 95.00
B&H 400' fiber	\$ 19.50
B&H 400' metal	\$ 55.00
B&H 400' bipack	\$ 145.00
B&H 1000'	\$ 95.00
Eclair Camerette 400'	\$ 245.00
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### Tripods-Heads-Dollies

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Akeley Gear Head	\$ 125.00
Pro-Jr. all metal Baby Tripod	\$ 23.00
Pro-Jr. Hi Hat, New or Like New	\$ 19.50
O'Connor Mdl. 200 fluid head. New list price, \$2595.00. Reconditioned, Like New	\$1595.00
O'Connor Mdl. 100 fluid head. Used, Excellent	\$ 595.00

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Cine Special Blimp, Ceco	\$ 295.00
Cine 60 Blimp for Arri 16S	\$ 525.00
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Cinerama 16mm precision hi-speed or stop-motion pin registered	\$ 425.00
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Mitchell 35mm standard movement	\$ 995.00
Mitchell 35mm single system ultra silent movement	\$3500.00

Mitchell 35mm hi-speed movement	\$1295.00
Mitchell 35mm NC movement	\$3500.00
Wall 35mm single registration pin movement	\$ 285.00
Richardson Mdl. 35-8BH-8 projection movement. New price, \$2600.00	\$1250.00
Richardson Mdl. 35-4BHR-4 pin registered projection movement. New price, \$1800.00	\$ 950.00
Richardson Mdl. 35-4BHR-4 pin registered projection movement. New price, \$1925.00	\$1050.00
Acme 35mm film movement, registration pin tolerance to .001". New price, \$1150.00	\$ 695.00

## CLOSED CIRCUIT TELEVISION EQUIPMENT

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Blonder-Tongue CCTV camera Mdl. TC-1C w/1" lens. Excellent condition. New price, \$825.00	\$ 495.00
Sony Camera Recorder Kit, DVK-2400, completely portable videocorder and hand-held camera, battery operated, complete w/battery charger, Zoom lens, carrying case. NEW. New price, \$1250.00	\$1000.00
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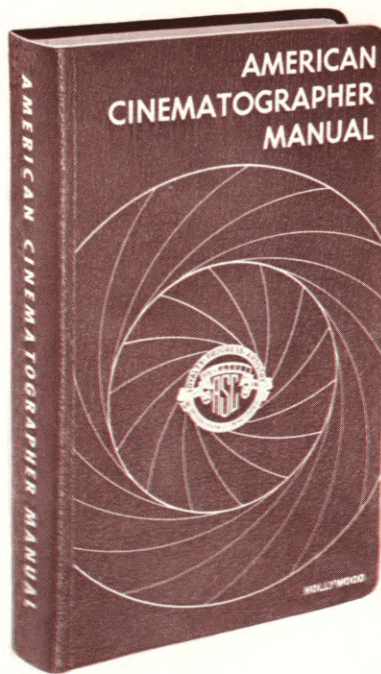
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"THE JPL STORY"  
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*Producer/Director—Martin Alford*

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"CONSTRUCTION OF THE BARTD TUBE"  
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"THE ARGENTINE YARD"  
*Producer/Director—Jerry Curto/Ron Born*

**T R W Systems Group**  
"BEATS READING THE ANNUAL REPORT"  
*Producer/Director—Charles Carpentier*

**Tonopah Test Range Division  
Sandia Laboratories**  
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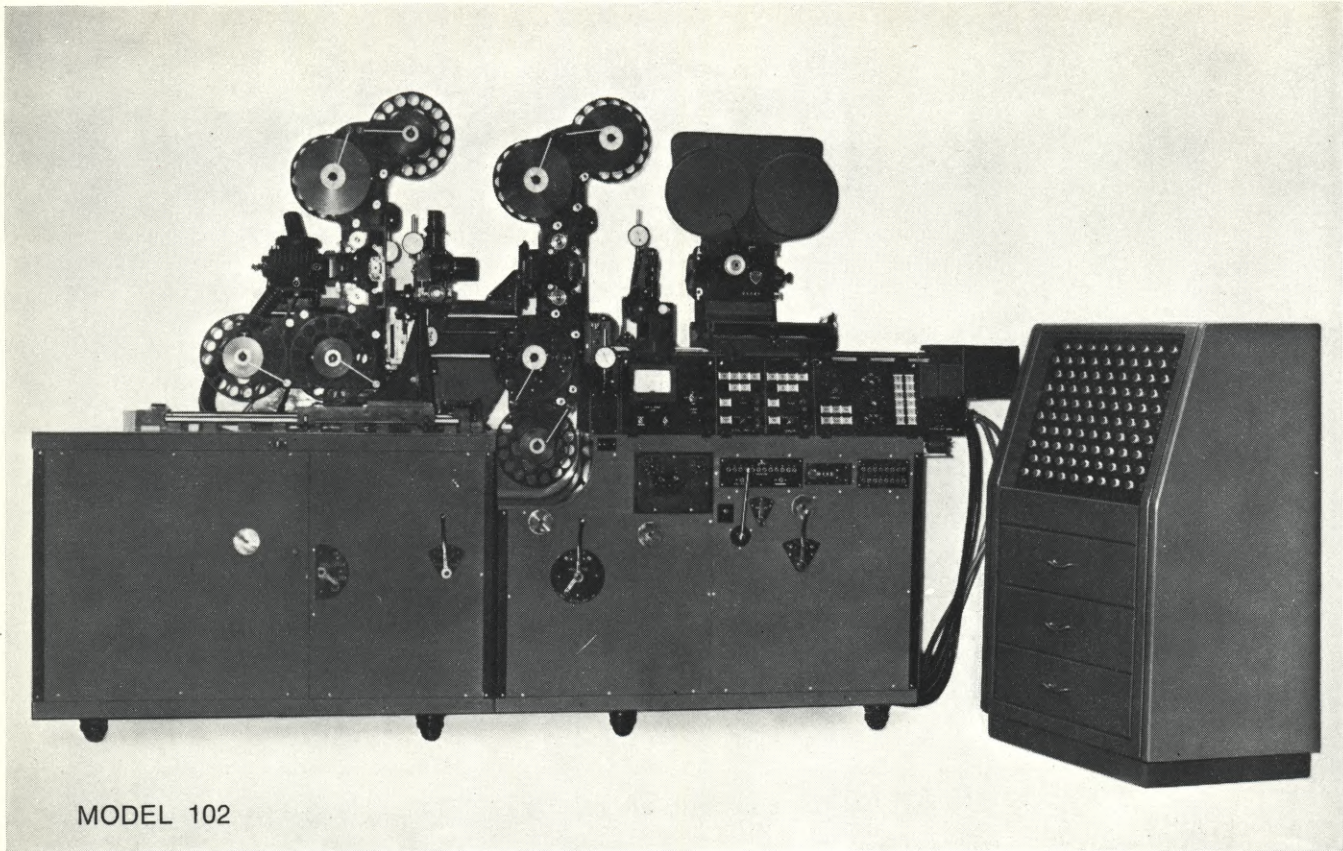
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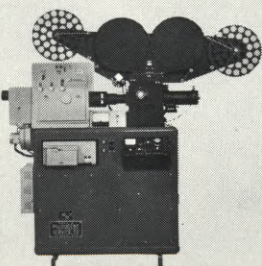
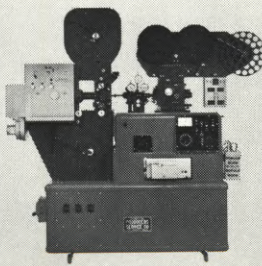
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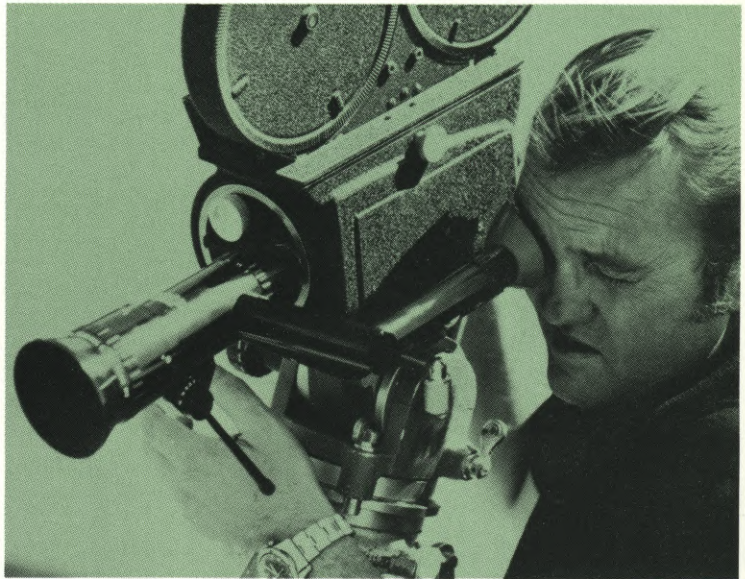
# "MONITAL is an unbeatable tool" says GENE BARNES\*

I have recently been accused of reversing my decision to use primary lenses instead of relying entirely on "zoom" or variable focal length lenses. I believe the discipline of fixed focal length lenses puts a far greater stress on your entire approach. You think again in film terms. Television brought the zoom lens into being for it helped smooth out the problem of awkward lens flipping for a different perspective. However, in searching for acceptable primary as well as zoom lenses I had encountered innumerable problems of quality, mechanical failure, and inadequacies and finally believed that "they just didn't make them like they used to."

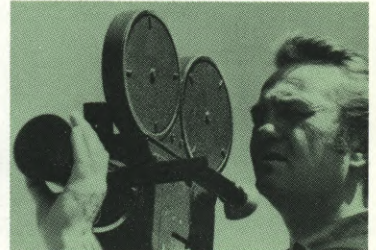
I changed my mind when I tested and used the primary lenses manufactured by Rank Taylor Hobson. These lenses had weight, focusing and iris rings that worked smoothly and stayed exactly where set. It was like being snapped into focus after experiencing a fuzzy nightmare. Encouraged I tested the Rank Taylor Hobson zoom lenses as well. The Monital 17-85 f/2 gave greater definition and clarity than many of the other lenses I had used. Also, smoother action and better color rendition than any of the wider zooms used. The real shocker was the Monital f/3.8 compact lens with a range of 17-85mm. It is an unbeatable tool when you need quick set-ups on a hand camera for it delivers exciting shots in beautiful color.

A final point on both Monitals and Rank Taylor Hobson primary lenses. I will again mention discipline. At times little thought is given to the size of the finished image when magnified many times over on the projection screen. I generally work within a 17-85mm range. The Monitals in the 17-85mm ratio achieve this objective.

When I really need a wide angle, the 9mm f/1.9 RTH Kinetal can be relied on to do the job. It is the crispiest wide angle lens I have ever used. Today's 16mm film makers should no longer be satisfied with less than the professional quality provided by Rank Taylor Hobson lenses.



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\* Winner of 12 "News Pictures of the Year" awards and "Golden Mike" awards. Has filmed over 50 documentaries and shot more than 2 million feet of film for NBC and prominent Sponsors in the last 18 years. Gene is now an independent Producer/Director/Cameraman.

*Gene Barnes*



All photos by Rick Neff.

For complete information regarding Rank Taylor Hobson lenses contact the RPI office nearest you.



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# REPORT FROM photokina 1970

The 11th *Photokina* in Cologne, which was opened on Saturday, October 3 by the West German President, Dr. Gustav W. Heinemann, and closed its doors on Sunday, October 11, after lasting nine days, provided an unparalleled world-wide market survey of the latest in photographic and cinematographic equipment, photochemical products and accessories and, particularly, electronic audio-visual media. It was truly the *World Fair of Photography* in fact, as well as in name.

There were 232,700 trade visitors, amateur photographers and other interested visitors from 114 different countries. This total included 30,700 visitors from countries other than Germany.

Total attendance was up 28 per cent over the previous (1968) *Photokina*.

Local attendance increased by 32 per cent, foreign attendance by 7 per cent. There was a particularly marked growth in attendance from overseas and from all Common Market countries.

In all, there were 732 exhibitors and organizations from 24 European and overseas nations. This total consisted of 356 German direct exhibitors, as well as 332 direct exhibitors and another 44 represented firms from countries other than Germany. Apart from West Germany, the countries providing the biggest numbers of exhibitors were Great Britain, France, the U.S.A., Japan, Italy, Switzerland and Holland. The gross floor space taken up in the 12 huge

exhibit halls was 1,076,000 square feet, the net space 648,290 square feet.

Boiled down to understandable terms, these statistics indicate that this most recent *Photokina*, in the 20th year of the exhibition's existence, set a record for the number of exhibitors (9% up on 1968), a record for the proportion of foreign firms with 51% as against 46% in 1968, a record for the number of countries participating, and a record with regard to floor space.

This year, for the first time, a greater degree of interest on the part of *Photokina* visitors was displayed toward motion picture equipment than toward still photographic equipment. Of special interest were those items emphasizing automated features, which may be partially due to the fact that many of those visiting Cologne's 1970 World Fair of Photography were oriented toward the use of audio-visual aids.

Once again the cultural section of the exhibition with its 17 photographic displays, Europe's biggest photographic show, took a front seat in cultural events at *Photokina*. The film parades, presenting 104 leading films from 23 countries of all continents, were very well attended. The action center with jazz, blues, beat and pop—a first-time feature of *Photokina*—was very popular among young amateur photographers as it offered them an opportunity for do-it-yourself photography and movie-making.

On the banks of the Rhine River a complex of 12 huge exhibition halls accommodated the displays of 732 exhibitors from 24 nations, and played host to 232,700 visitors from 114 different countries during the nine-day run of *Photokina 1970*, the greatest of all photographic shows.



The 11th World Fair of Photography, held in Cologne, West Germany, turns out to be the greatest in the 20-year history of the show and introduces many items of unusual interest to professional motion picture technicians



Observed from the very specialized viewpoint of the professional motion picture technician, the 1970 *Photokina* may justifiably be regarded as the most important cine equipment show to be held in recent years. That observation is based on the fact that several items of potentially enormous influence upon present and future cine technology were introduced at Cologne.

The three "heavyweights" (all of which had been rumored during the 1968 *Photokina* as being "in development") were, of course, the Arriflex 35 BL Camera, the Nagra SN Miniature Professional Tape Recorder and the Eclair ACL 16mm Camera.

There were, to be sure, a goodly number of other significant pieces of cinema-oriented equipment making their debuts at this year's World Fair of Photography—most notably in the categories of lighting equipment, vari-focal lenses and zoom, focus and automatic exposure controls—but it was the aforementioned "big three" that really captured the imagination of the film contingent and set a lot of mouths to watering, figuratively speaking.

For the most part they watered in vain because, almost without exception, the most tantalizing items of new equipment were shown in prototype or working model form only, with promises, promises being offered in lieu of locked-down market availability dates.

The resultant frustration was painful to observe. Working technicians and purchasing agents alike almost feverishly attempted to beg, borrow (or steal?) the working models on display. Failing in this, they tried to arrange secret caucuses with company officials in order to offer bribes ranging, presumably, from huge orders to bought-and-paid-for concubines. Nothing, as far as we know, worked. The manufacturers' representatives, in a spectacular display of collective iron will, simply shook their heads, turned their palms up, and said the equivalent of "Later!"

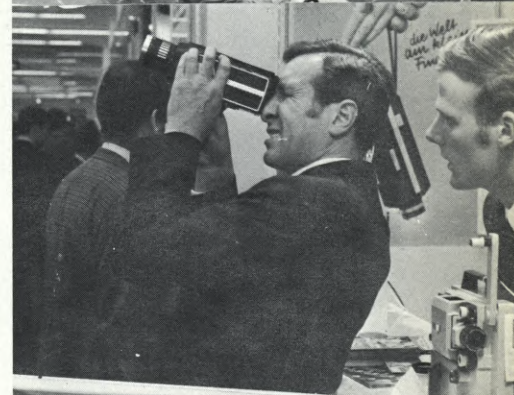
It was a shattering experience to hear well-heeled would-be buyers try to place firm orders for immediate delivery of, let us say, 50 Arriflex 35 BL's—or Nagra SN's—or Eclair ACL's—only to be turned down flatly, but it happened again and again. Representatives for the most popular items were not even accepting back orders.

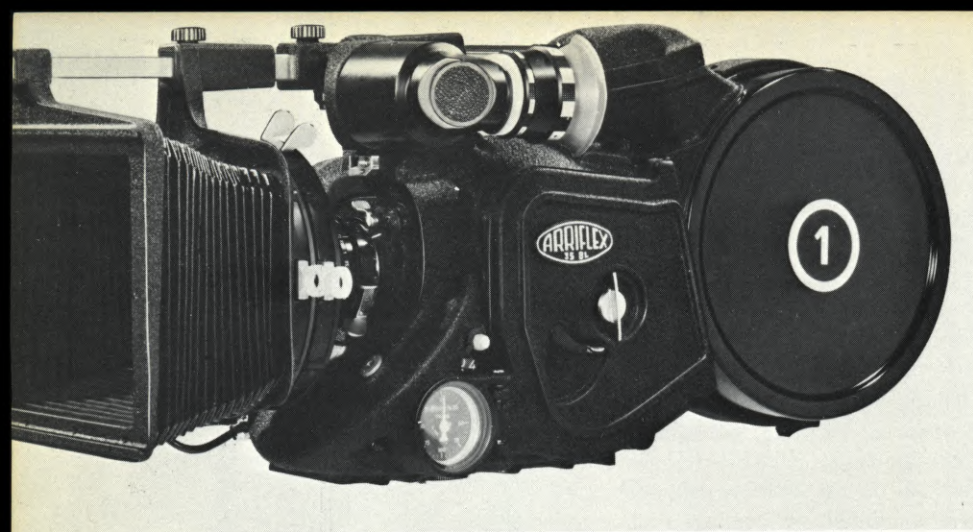
One got the distinct impressions that all of these companies had gotten caught in a giant time-bind, and had set their technical wizards to working around the clock up until the very last second in order to get prototypes ready for showing at *Photokina 1970*. In several cases they apparently did not even find time to have proper brochures made up.

At any rate, it constituted a very special kind of sadism to display all of

Continued on Page 1246

The 1970 *Photokina* attracted the "top brass" from motion picture-oriented companies all over the world. Shown renewing acquaintances here are (left to right) Paul Klingenstein (*Arriflex Corporation of America*), Dr. Robert Richter (*Arnold & Richter*) and David Samuelson (*Samuelson Film Service Limited*).





The long-awaited, self-blimped Arriflex 35 BL Camera finally makes its appearance and creates a not-so-minor sensation at the 11th World Fair of Photography



## THE ARRIFLEX 35 BL CAMERA

At the 1968 *Photokina* the rumor persisted that Arriflex had engineered a new 35mm self-blimped model, similar in "silent" characteristics to its famous and highly successful 16mm BL.

It was said, furthermore, that a prototype of the new camera was on the premises, stashed in a locked closet to await the psychological moment for its debut.

Whether or not there was any truth to the rumor, the camera did *not* make an appearance at that time—but it has been introduced at the 1970 *Photokina* with quiet fanfare and the predictable stunning effect upon those who had the opportunity to examine and handle the several working models on display at the Arriflex exhibit.

The new camera, called the Arriflex

35 BL, is a handsome, compact instrument of a totally new configuration, and definitely not a re-worked version of a previous model. It caused a great deal of excitement at the show, along with the inevitable flood of questions as to when it would become generally available. Arriflex personnel on duty at the exhibit quite honestly emphasized the fact that the "samples" being shown were working models only and that several more months would be required to put the camera into production. As to its general availability, no one would hazard a definite commitment, but the consensus seemed to indicate that it would take at least a year.

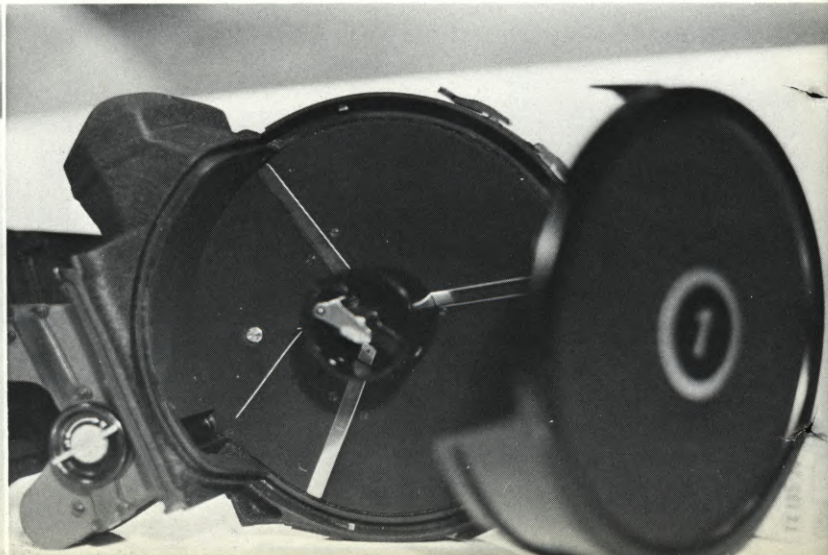
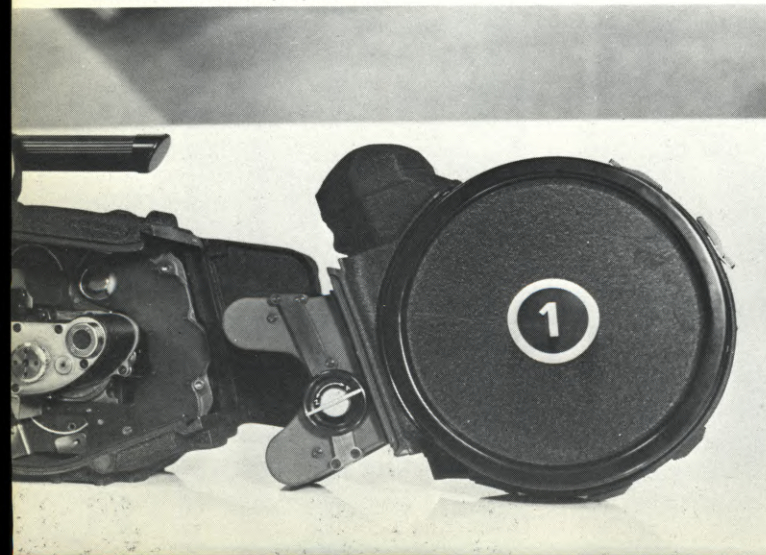
From the comments heard, it seemed evident that, had production models been currently available, several hundred could have been sold on the spot.

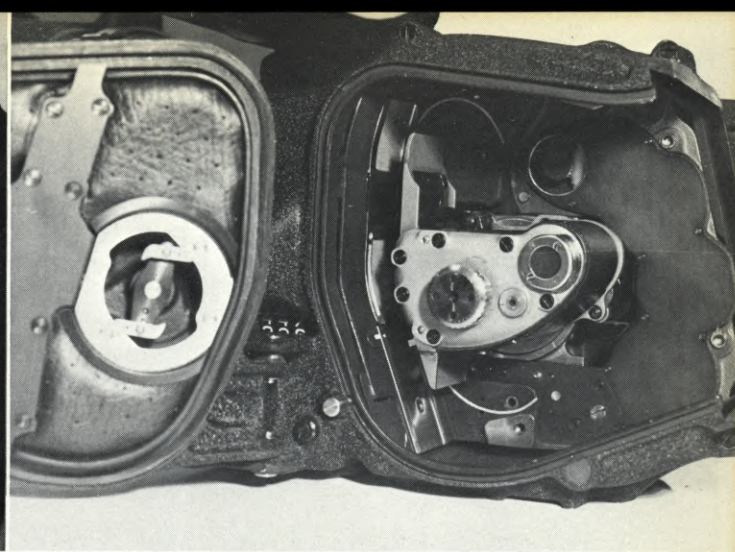
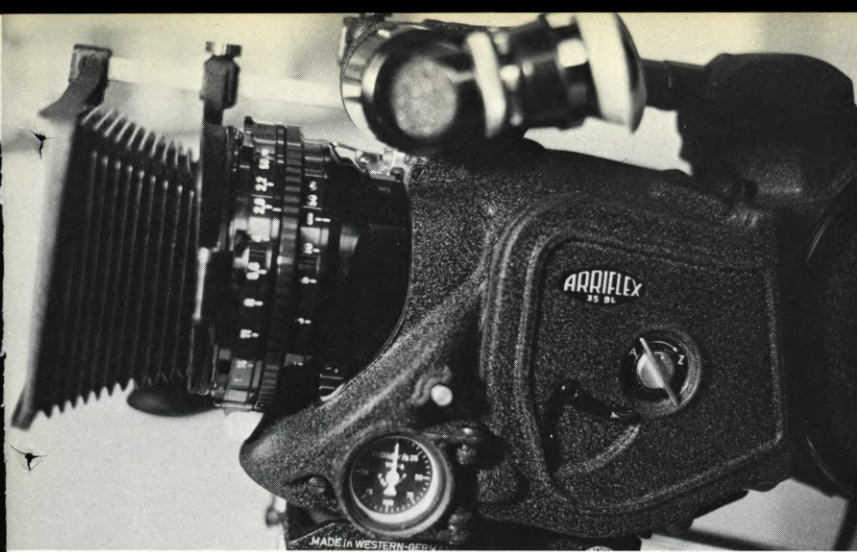
### —General Characteristics

The new Arriflex 35 BL is a self-blimped 35mm shoulder camera with concentric double-compartment magazine. The camera has been designed for professional synchronous sound filming. It is a quiet 35mm hand-camera which in its concept combines all the latest technological advancements made in motion-picture camera design. This camera was conceived in answer to the recent trends in feature and commercial film productions and puts heavy emphasis on ease of operation, light weight, low operating noise, plus mobility which, for the production, means reduced shooting costs.

Magazines for the camera are double compartment coaxial supply and take-up for compactness and weight. The

(LEFT) Compact 400-foot magazine slides easily into the camera body and helps balance it for use as a shoulder camera. (RIGHT) Magazines for the new Arri 35 BL are of the double-compartment coaxial type, with supply and takeup chambers aligned side-by-side. Both the camera and magazine mechanisms are mounted on rubber, which acoustically insulates them from their housings. 400-foot magazine is currently available, with a 1000-foot version in preparation.





(LEFT) Lens receptacle on the camera is of the conventional Arriflex type and will accept all standard steel, bayonet-mounted lenses, as well as the older style, non-bayonet "ARRI-mounts". (RIGHT) With the new double pull-down film movement system, a maximum framing rate of approximately 90 fps is attained, with forward or reverse travel. Small mass forces in the claw parts reduce camera vibration to a minimum.

gear-driven mechanism holds a constant sprocket-fed film loop and provides positive take-up. The camera is presently equipped with a 400-foot magazine, but a 1000-foot magazine is in preparation.

Camera and magazine mechanisms are mounted on rubber, which acoustically insulates them from their housings. The noise level of the camera with lens blimp is approx. 33 to 35 dB, depending on lens type. Without the lens blimp, the noise level is approx. 39 dB.

#### Camera Drive and Gear Train

Film movement, mirror-reflex shutter and magazine are driven by a printed motor which is directly coupled to the movement main shaft. This motor features high electrical efficiency.

An automatic safety switch protects the motor from overload. With this camera model, the transverse double-blade mirror-reflex shutter has an open sector of 180°. An automatic shutter inching device controlled by the motor electronics always brings the shutter in

viewing position. In addition, manual shutter inching is also possible.

Also driven by the transport mechanism are: the Pilotone generator, switchable from 24 fps to 25 fps (for a pilot frequency of 50 Hz or 60 Hz in the U.S.A.); the tachometer and the clearly visible "feet" or "meter" counter.

#### Film Movement and Film Guide (DBP)

With the new double pull-down film movement system, a maximum framing

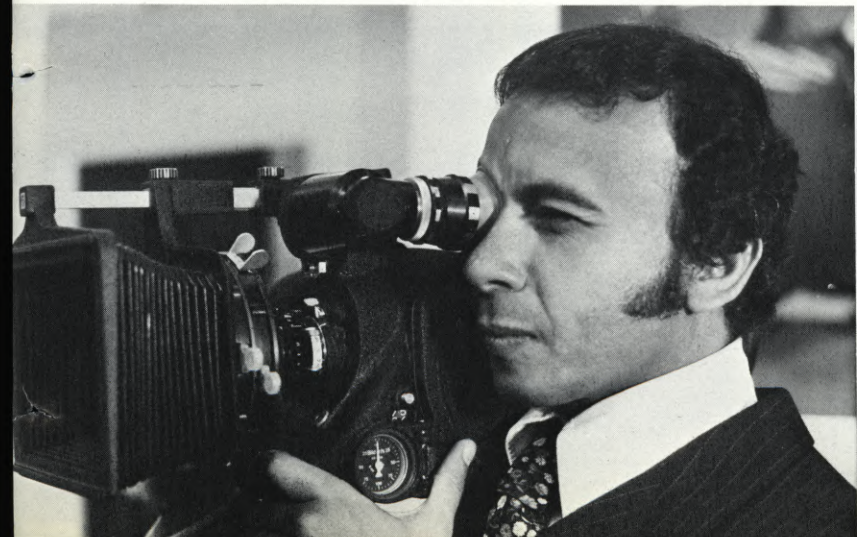
rate of approx. 90 fps is attained with forward or reverse travel. Small mass forces in the claw parts reduce camera vibrations to a minimum. The dual registration pins guarantee optimum frame steadiness. Film guidance and registration are accomplished by the registration pins alone, so that no special side guides and pressure gates are necessary. The spacer gate prevents "breathing". The obtained steadiness of

Continued on Page 1228

#### TECHNICAL CHARACTERISTICS OF THE ARRIFLEX 35 BL CAMERA

FILM WIDTH:	35mm
FRAMING RATE:	24 to approx. 90 fps
NOISE LEVEL OF THE CAMERA WITHOUT LENS BLIMP, MEASURED 3 FT IN FRONT OF THE LENS	approx. 39 dB
MAGAZINE CAPACITY	400 ft (1000 ft magazine in preparation)
LENS RECEPTACLE	ARRIFLEX mount
LOAD REQUIREMENT OF THE CAMERA AT 25 FPS-90 FPS	approx. 25 W-125 W
OPEN SEGMENT OF THE ROTARY SHUTTER	180°
DIMENSIONS	Length 19¼" Width 10½" Height 9"
WEIGHT OF OPERATIVE CAMERA	approx. 20 lbs 8 ozs
TRIPOD THREAD	3/8". Also for use with wedge plate

(LEFT) Cinemobile Systems President (and former "I SPY" foreign location Director of Photography) Fouad Said, tries the new Arri 35 BL on for size at *Photokina*. (RIGHT) The camera's compact configuration and weight-centered coaxial magazine enable it to balance comfortably and securely on the shoulder with no need for a body-brace. Carrying handle on top, designed to serve simultaneously as a matte box rod-holder, makes the camera readily transportable.



# THE NEW NAGRA SN MINIATURE PROFESSIONAL TAPE RECORDER



Introduced at *Photokina 1970*: A meticulously engineered, high-precision recording instrument you can hold in your hand promises new freedom and quality for sync-sound location filming

At each *Photokina* there is always one piece of equipment which particularly captures the imagination of the crowd. The word spreads fast and, as you encounter people you know in the various booths and aisles, the question is: "Have you seen the new so-and-so?"

This year that special conversation piece (among professional motion picture people, at least) was the new ultra-miniaturized Nagra SN tape recorder. The very concept of a high-precision recording instrument literally small enough to fit into the palm of a

hand staggered the imagination. Yet, there it was, in demonstration, booming out music in a loud, clear, high-fidelity voice.

The burning question was: "What are its applications to motion picture production?"

The immediate top-of-the-head assumption is that it will open up an entirely new scope of flexibility for dialogue recording, especially in tricky location situations. It is envisioned that each actor will be able to carry his own tiny recorder tucked away in a pocket

and remotely synced with the camera. All he will have to do is activate the "start" lever for a take, the volume being automatically controlled, and a new mini-microphone (which works extraordinarily well under a layer or two of clothing) will pick up his dialogue loud and clear, no matter how much he moves around.

This is a very appealing idea—especially to American film people who always insist upon trying for a clean original dialogue track, rather than relying upon a post-looping session, as is the customary procedure in several other countries.

Whether or not the Nagra SN will live up to these expectations, when given the acid test, remains, of course, to be seen. It is so new that, as far as is known, it has not yet been exhaustively field-tested under actual motion picture production conditions. But in the meantime, the possibilities boggle the mind.

The following comment on the new Nagra SN comes from famed Hollywood sound recording expert Loren Ryder, who is Vice President-General Manager of Nagra Magnetic Recorders, Inc. Not a man ordinarily given to overstatement, he says:

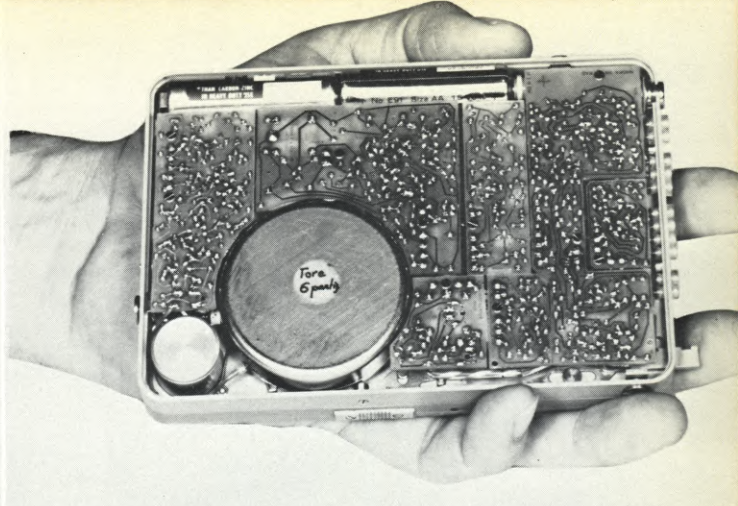
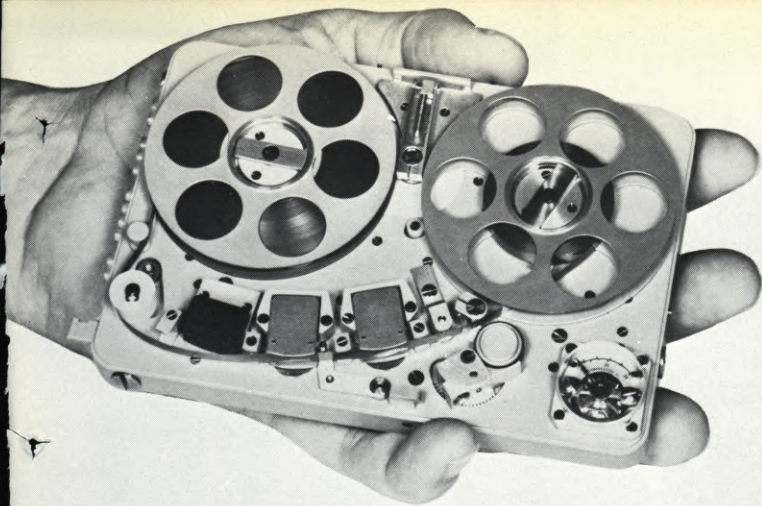
*The marvel of 1970 is a micro-mini tape recorder built by Stefan Kudelski of NAGRA fame. It was exhibited at the 1970 Photokina.*

The new Nagra SN Miniature Professional Tape Recorder, with top protective cover removed and lavalier microphone attached, is shown alongside a standard pencil for scale. Microphone, designed especially for the recorder by Stefan Kudelski, looks like a toy, but is a precision instrument that is not sensitive to handling or the friction of clothing. Recorder can also be used with any high-quality, low-impedance microphone.

(LEFT) The tiny, specially designed condenser lavalier microphone can be easily hidden on the person of the actor and records well under a layer of clothing. (RIGHT) Nagra SN Recorder is slim enough to be concealed in actor's breast pocket. He can then forget about it, as volume level is automatically controlled.







(LEFT) Top side of recorder, with protective covering removed. Tape is driven by electronically speed-controlled motor, in same manner as standard Nagra III and IV models. Miniature reel holds tape enough for 27 minutes of recording at 3 3/4" speed. (RIGHT) Bottom of recorder, with protective covering removed. Power source is two AA Manganese cells. Active circuits are essentially constituted by 7 plug-in boards, with gold-plated contacts.

*This little recorder is designed for use in place of radio microphones. It weighs 1 pound and 1 ounce and measures 1" x 4" x 5.8". It has two speeds 3-3/4" or 1-7/8", or on special order 1-7/8" or 15/16". At 3-3/4", it operates 27 minutes on one reel of tape and has quality equal to the NAGRA III at the same speed—incidentally, all Columbia, Screen Gems Production recording and now many other pictures are being recorded on NAGRA III's at 3-3/4".*

*Some of the Nagra SN's features, when viewed by the experts, seem impossible—but it works. It includes an automatic level control designed to go with its lavalier microphone. Mr. Kudelski has designed a new condenser lavalier microphone that is not sensitive to handling or to the friction of clothing. This recorder can also be used with any high-quality low-impedance microphone, either with the automatic level control or a hand-held mixer (still to come).*

*This recorder drives on 5 Volts from a 3-Volt battery through an ingenious DC voltage increaser that also furnishes 50 Volts of DC for the condenser microphone.*

*It has an erase head, a record head and a reproduce head with amplifiers for tape monitoring during recording. It has a "start" and "stop" lever but no switches. Switching is automatic. When you connect the microphone to this recorder, it is ready to record—remove the connector, and it is ready to reproduce. Rewinding is very fast by an ingenious geared-up hand crank.*

*Pins in the connectors are provided on all recorders for synchronization either by wire, radio or Time Sync Generators.*

*Pins provide facilities for remote "start" and "stop" by either cable or radio with power from the recorder. Speed control is also available for resolving or variable speed.*

*The radio control and Time Sync Generators will not be available for several months.*

*Brochure information will be available upon request. The price will be just over \$1,000.00 (\$1,095.00) plus accessories, microphone, earphones, etc.*

The following data, provided by the manufacturer, details a wide range of possible applications for the Nagra SN, plus its primary technical characteristics:

## PROFESSIONAL MINIATURE TAPE RECORDER NAGRA SN

### 1. INTRODUCTION

The superiority of the Nagra SN lies in the combination of the three characteristics:

- *Dimensions:* fits easily into a jacket pocket.
- *Quality of recordings:* corresponds to the requirements of broadcast reporting.
- *Reliability:* the SN is a professional recorder of sound construction, and as far as possible, made from material conforming to military specifications.

### 2. USE

It is easier to explain the possibilities of the SN by describing how to use it and some applications.

#### 2.1 Methods of Possible Use

##### 2.1.1 Normal case:

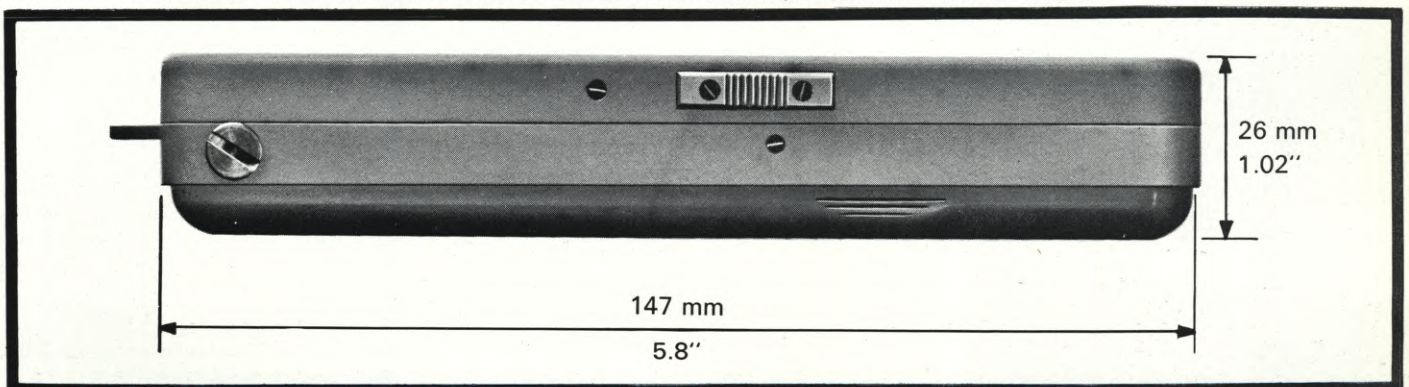
The operator makes sure that the people know they are being recorded (broadcast report).

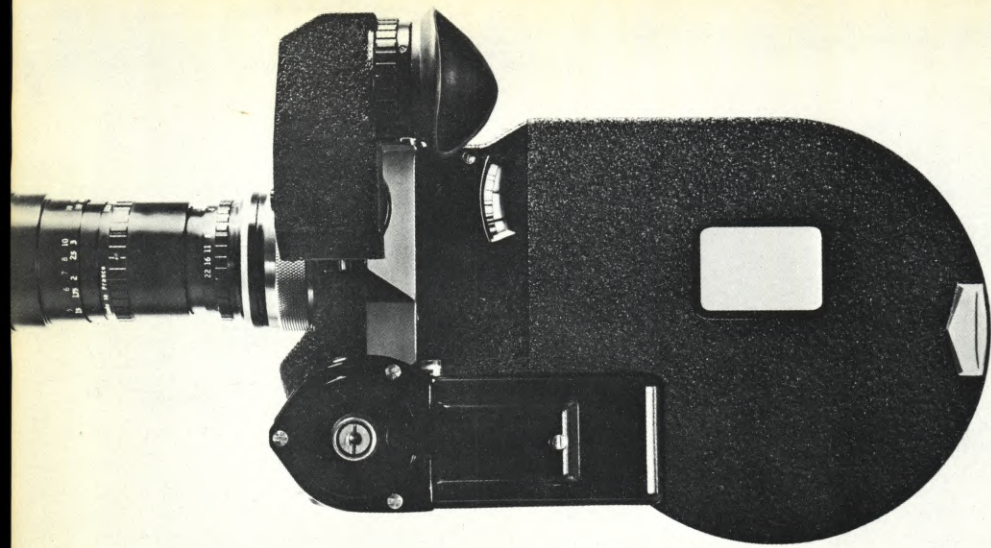
The SN is placed in the left jacket pocket. The "On-Off" switch is operated by the left thumb. The position of this switch can be checked by feel, without ambiguity. The microphone can be hooked to the outside of the breast pocket, thus giving a good balance between the reporter's voice and that of the person being interviewed.

It is also possible to hold the microphone in the hand, but this requires a longer cable. In practice, the SMR accessory is recommended.

Continued on Page 1234

The Nagra SN Miniature Professional Tape Recorder, shown slightly less than actual size, with both protective covers intact. The micro-mini recorder is designed to be used in place of radio microphones and should prove especially valuable for location shooting. Each actor can "wear" his own individual recorder and all can be effectively synced in with camera by means of crystal-control or other method.





An almost unbelievably small brother to the NPR, laden with a wealth of highly sophisticated modular options, makes a smashing debut at Cologne's 1970 Photokina



# THE ECLAIR ACL 16mm CAMERA

Creating its own special brand of excitement and drawing huge crowds at *Photokina 1970* was the new and long-awaited Eclair ACL 16mm camera, an incredibly small and compact, silent-running, sync-sound camera of precision design and full professional capability.

The new ACL is the brainchild of Mr. A. Coma, Director General of Eclair International who, back in 1965 (just after the NPR had been introduced) said he felt that a new, smaller and less expensive 16mm silent camera was needed. He saw it as a second camera for people who already had an NPR, but who would take it along to make quick pick-up shots and such.

Mr. A. Coma, Director General of Eclair International, discusses at *Photokina* the amazing new Eclair ACL 16mm Camera which his foresight inspired.



The new camera is of a compact configuration that is about half the size of the NPR. It weighs just under 10 pounds, complete with zoom lens and 200-foot magazine loaded with film. The sound level is the same as that of the NPR and the magazine can be changed in even less time than the 5 seconds for which its big brother is famous. The tiny ACL sits snugly back on the shoulder and is probably the first professional camera that can be operated with both hands on the lens.

Its universal lens mount makes it compatible with a virtually unlimited range of lenses made for dozens of other cameras (including Nikon, Mitchell and Arriflex). It was designed without a turret in order to keep size and weight to a minimum, but through the handle there runs a rod which accommodates not only a matte box and an eyelight, but a "parking space" for extra lenses.

The ACL has been designed on the "building block" principle, in that it is totally modular. The basic camera comes quite stripped, but its primary functions can be augmented by those offered by a wide range of highly sophisticated optional modules which simply plug into the basic mechanism. These include such conveniences as automatic exposure control and a wide category of sound options, including crystal sync and single-system capabilities.

In the offing is a unique time-base marking system that will mark each foot of film with the precise second after start and allows for synchronization with a theoretically unlimited number of other cameras and/or recorders oper-

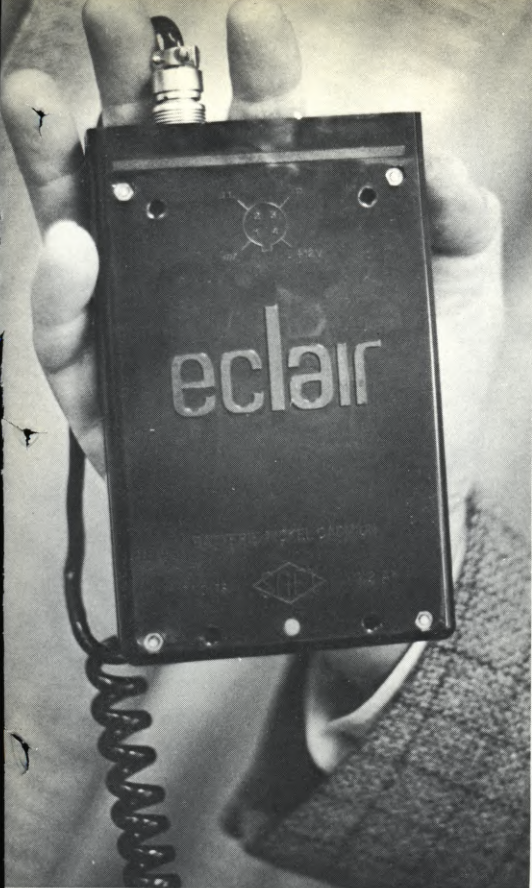
ating off of precisely the same time base. Simply explained, what happens is that at the start of shooting, all of the cameras and recorders to be synchronized are linked by a wire. A button is pushed which activates the counting mechanisms in each piece of equipment. The wire is then removed and each mechanism can be operated independently for periods of three or four hours while remaining in perfect, consecutively numbered sync with the others. This incredible module is scheduled to be available within the year.

As detailed below, the new Eclair ACL 16mm camera has many other exciting capabilities, which, if they all perform as indicated, will make the camera a most versatile instrument for the new age of film-making. Like the new Arriflex 35 BL, the Eclair ACL was shown only in working model form, with no definite delivery date announced. Also, like the Arriflex, it caused such a high degree of excitement that many units could have been sold on the spot, had they been immediately available.

Following is a run-down on the salient features of the new Eclair ACL 16mm camera.

1. The camera body incorporates the movement—the wedge-shaped claw that slides silently into the perforation; the oscillating mirror of glass-coated magnesium; and the rotating metal shutter. Plus the aperture plate, groundglass, lightmeter needle and lens mount. Everything else is detachable.

2. Semi-automatic lightmeter. The galvanometer and needle are built into the camera body. A plug-in module contains the photocell and electronics, which give a center-weighted reading of the light coming through



**Lightweight battery, small enough to be carried in a pocket, runs the ACL's motor, which draws only one third of the power needed by the NPR. It weighs about one pound.**

the lens. Settings are made by lining up two needles visible in the camera's viewfinder.

3. Fully automatic lightmeter. By plugging in a second module that contains a servo motor, Angenieux and other lenses can be set to adjust their diaphragms automatically. The automatic control can be defeated simply, by unplugging it.

4. Precise reflex viewing. Precise, because the groundglass is rigidly mounted beside the film aperture. Also versatile, since the viewfinder rotates through 360°, and an accessory extension tube enables you to use your left eye. When the camera is running, the image in the finder is actually brighter than that of the NPR. At rest, it's brighter still.

5. Universal lens mount. A threaded "C" mount is set flush into the camera face in front of the aperture. A steel collar screws into raised threads of large diameter on the camera face, encircling the "C" mount. Nikon, Mitchell, Arriflex or Eclair lens mounts can be ordered from Eclair. They are then held rigidly in position by the collar.

6. Clip-on magazines. Film is threaded and the loop is formed inside the ACL magazine when you load it, before shooting starts. To change magazines, you simply snap off the old one and snap on a new one. This takes well under five seconds. Both the 200 and the 400-foot-load magazines accept core wound film and daylight loading 16mm film spools.

7. Digital footage counter. All ACL magazines have a displacement-type footage counter built in. For greater accuracy, however, there is a Veeder Root digital counter that tells you precisely how many feet of film have been exposed.

8. The Crystal Control Motor runs silently on 12-volt DC battery power. It's a Hall Effect motor, absolutely static-free, which makes it the first motor that won't add hash to radio microphone signals. Since crystal

control is more accurate than any tachometer, this motor doesn't have one. It runs at 24 frames per second, (25 fps in Europe), or at other speeds by changing the crystal.

9. The variable speed motor also runs on 12-volt DC battery power; but it's transistor controlled, and it's equipped with a tachometer. This motor costs less than the other, but it isn't silent.

10. Crystal Control lets you shoot sync sound with no connection whatever between the camera and a crystal-controlled tape recorder. No sync cord; no AC power line; no radio signal. Sync error is less than 1/4 frame in one continuous 400-foot take. That's 16,000 frames.

11. The Kudelski radio start marker and scene slater can be simply fitted to the ACL's body. This unit sends a radio bloop to the recorder that is inaudible on the tape. At the same time, the film is edge fogged; and both the edge fog and the bloop can be used to indicate the scene number.

12. A sync pulse generator module can be plugged into the ACL, for use with the Crystal Control Motor. This delivers a reference pulse to the tape recorder, via sync cable. Useful if you want to use the ACL with a tape recorder that has no crystal sync pulse generator system.

13. Single system sync sound. In the past, the problem has been keeping wow and flutter low enough without extreme expense or cumbersome equipment. Eclair's completely new Beauviala Single System Unit compensates electro-mechanically for uneven film movement. Outside the camera, a small control box amplifier module regulates the sound. Inside each magazine, the film passes round a wheel that incorporates the recording head. No capstan is needed; no flywheel; no dashpots. The head-wheel module is relatively inexpensive, and can be fitted into any ACL magazine. Wow and flutter are less than 0.3% DIN. And the track is totally compatible with standard playback systems. Available soon.

14. Battery. Since the ACL's motor draws only one third of the power needed by the NPR motor, the battery can be much smaller. It weighs about one pound, and can be attached to the back of the camera body, if you wish. Or you can put it in your pocket.

15. Battery charger. A charger can be plugged into the battery; and the battery can be used with the charger in position, or without. You can run 1,800 feet on a single

charge. The NPR battery weighs 8 pounds, and lets you run 9,000 feet of film through the ACL at a single charge—about 3,000 feet if you're using the Eyefill Light.

16. A behind-the-lens filter slot in the ACL's body lets you use a small piece of gelatine as a filter, instead of glass. Glass, of course, can adversely affect image quality.

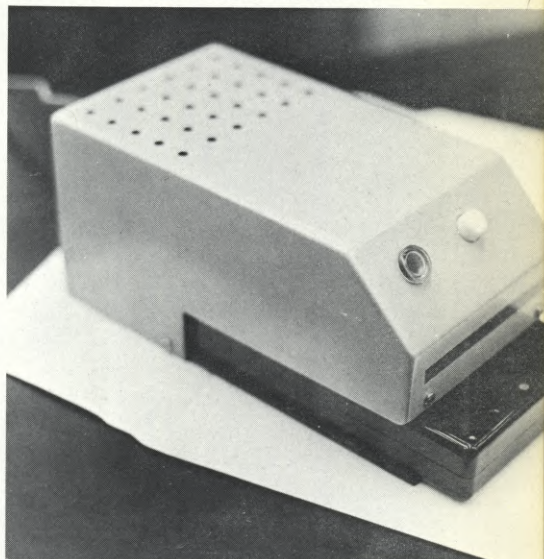
17. The ACL's matte box and double filter holder measures 4 x 6 inches at the front, 4 x 4 inches at the back—big enough to use with zoom lenses. An adapter reduces the rear opening to 3 x 3 inches, for use with smaller lenses.

18. The matte box rod fits into a hole in the accessory carrying handle, above the lens. Other things can be attached to the rod, such as: A flag on a gooseneck stalk, to shade the lens. A spare lens storage mount. An Eyefill Light.

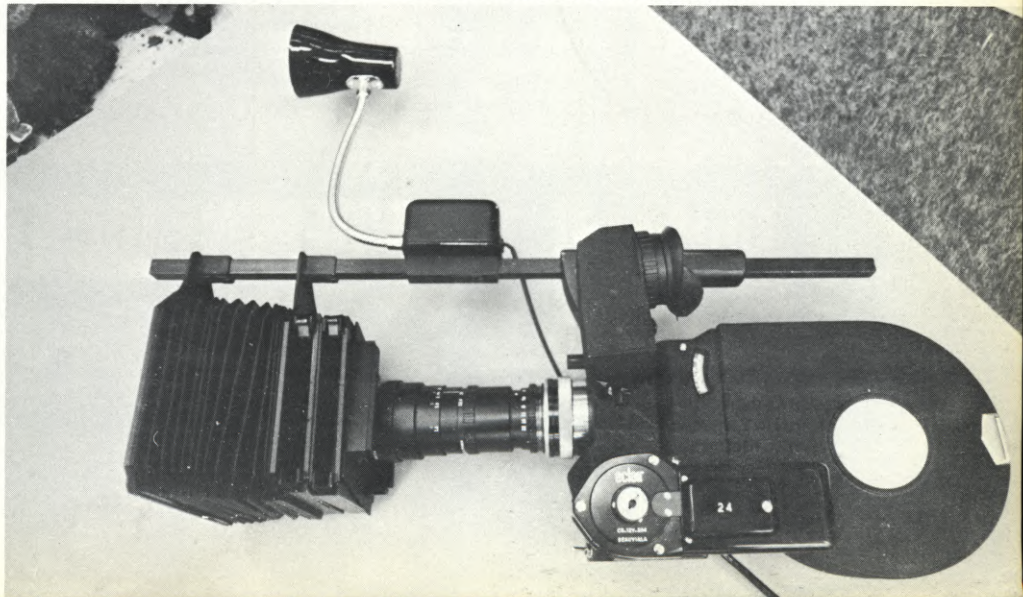
19. The Eyefill Light reduces the eye socket shadows encountered on location in overhead light. It's *not* intended to light the subject. Balanced for tungsten, it produces F2.2 at five feet with EF film. Built-in baffles permit varying the light output by two stops.

**Continued on Page 1233**

**Compact charger, shown here in operation, is said to bring new Eclair batteries from flat zero to full charge in about 30 minutes.**



**The Eclair ACL is shown here with matte box rod which fits into hole in the accessory carrying handle. In addition to the matte box, the rod is designed to support a flag on a gooseneck stalk, an "Eyefill" light and a mount for storing a spare lens. Tiny light is not meant to illuminate subject, but only to reduce eye socket shadows often encountered on location.**



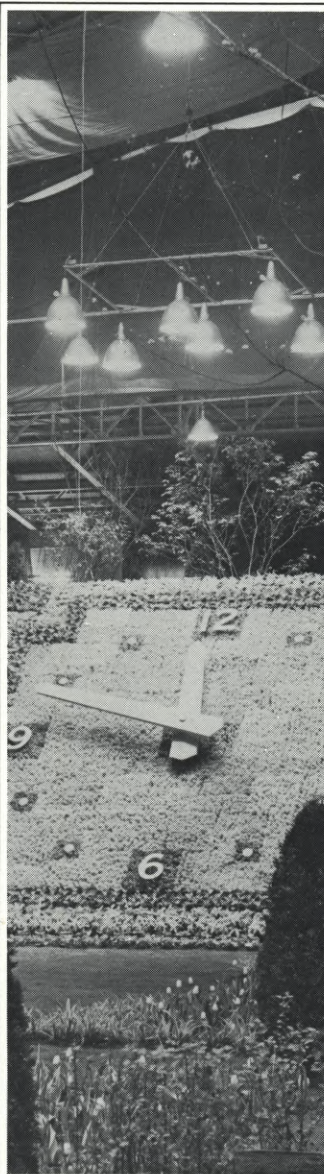
# LIGHTING THE SHOW FOR OVER 30 YEARS!



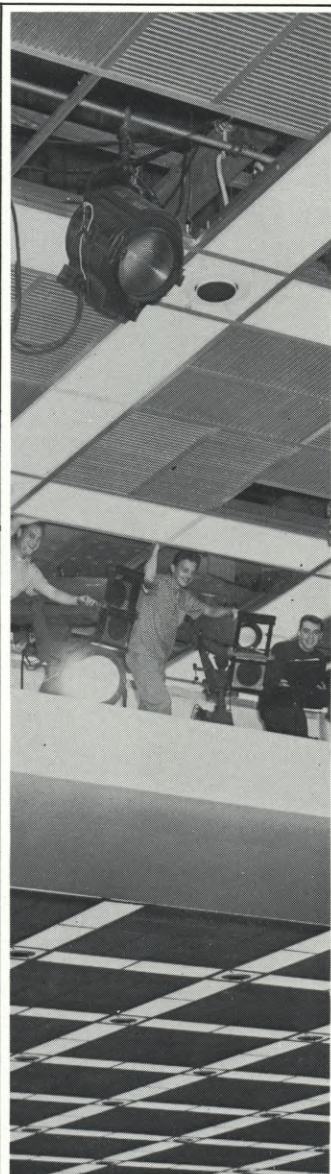
In 1956 thousands witnessed the *This Is Your Life* Network Show honoring Ernest Breech. Lighting was by Jack A. Frost.



Tons of Frost lighting equipment traveled to Havana for this 1958 Steve Allen TV Show. Today Frost experts are still lighting "the show" wherever temporary lighting and power are needed.



Frost has been creating artistic lighting effects for special exhibits, such as this Flower Show, for over a quarter of a century.



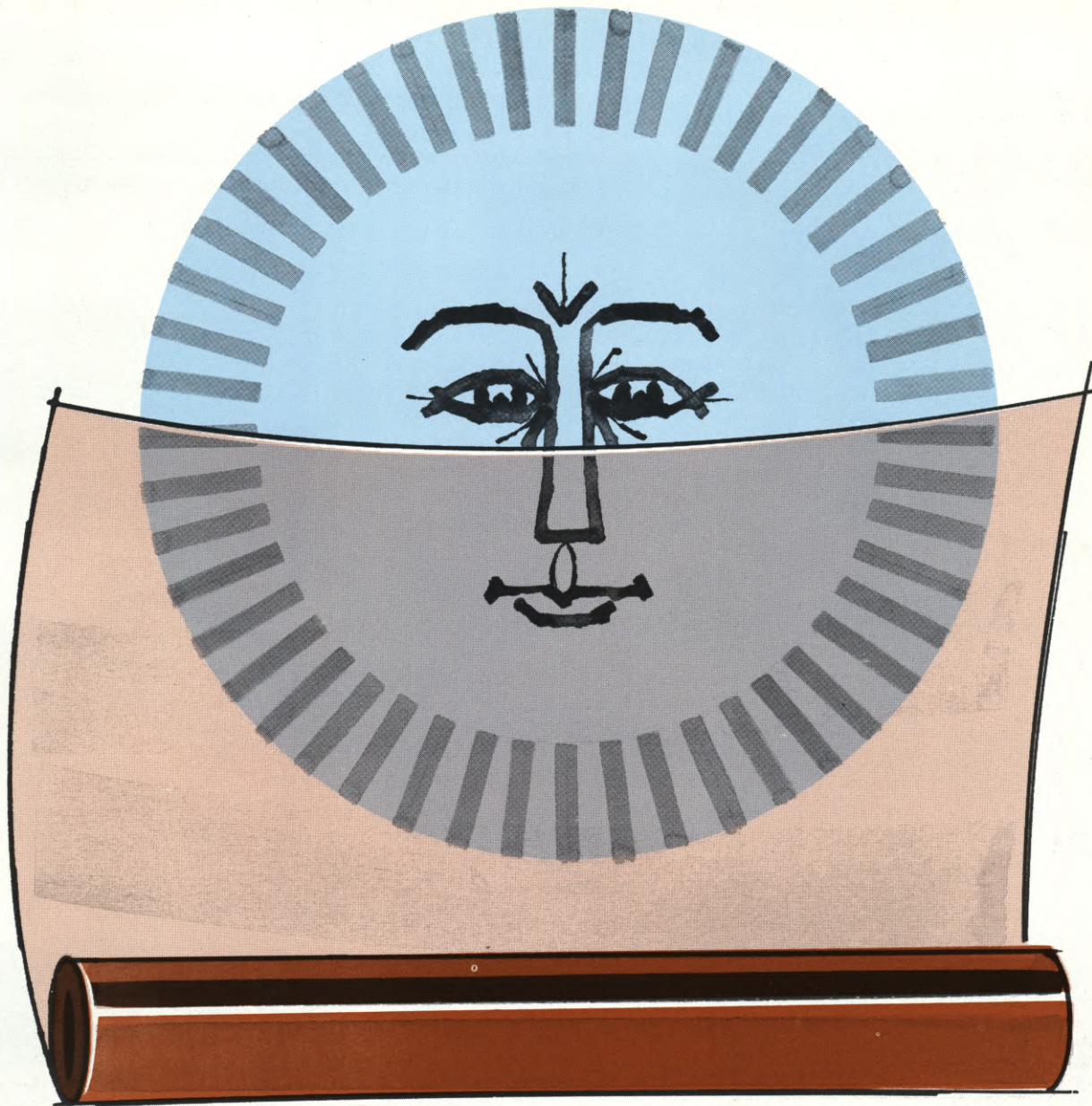
The first Auto Show in Detroit's Cobo Hall started right with lighting by Frost and Frost is still lighting these important shows.

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to warm up the sun...



## Cine 85

It's sort of instant 3200 K. Rosco Cinegel Cine 85 lets you warm the sunlight to match your indoor lighting. This 85 filter is made of Roscolene, a high-clarity plastic which is available in rolls to 48" width. With an eye on production budgets, it's quick and easy to put up and tape in place.

Cinegel is the name of Rosco's complete line of specialized cinematic color media designed to make light behave. It includes shades to warm or cool natural or artificial lighting situations as well as variations and combinations of neutral

density. To match media precisely to need, Rosco manufactures three different types of Cinegel. Roscolar is designed to withstand the concentrated heat of quartz lighting. Roscovin is a highly flexible material which adheres to glass. And Roscolene is a rugged plastic of high clarity. Cinegel comes in 30" to 54" rolls, in sizes designed to match the use. Before your next shoot, get full details and a free Cinegel color swatch book. Just write us.

**ROSCO**  
HARRISON, N.Y. 10528

# rosco cinegel

# MITCHELL *SERVOZOOM* CONTROL



A new electronic zoom control, so fully automated and computerized that it assures true "one-handed" operation, promises the cinematographer a higher degree of precision in the use of motorized lenses

**HOW THE SERVO-CONTROL WORKS:** The unique advantage of Mitchell's *SERVOZOOM* is its genuinely one-handed control of fully automatic actuation based on computer-like pre-programming. This is achieved by a closed loop servo system balanced through solid state electronic feedback elements.

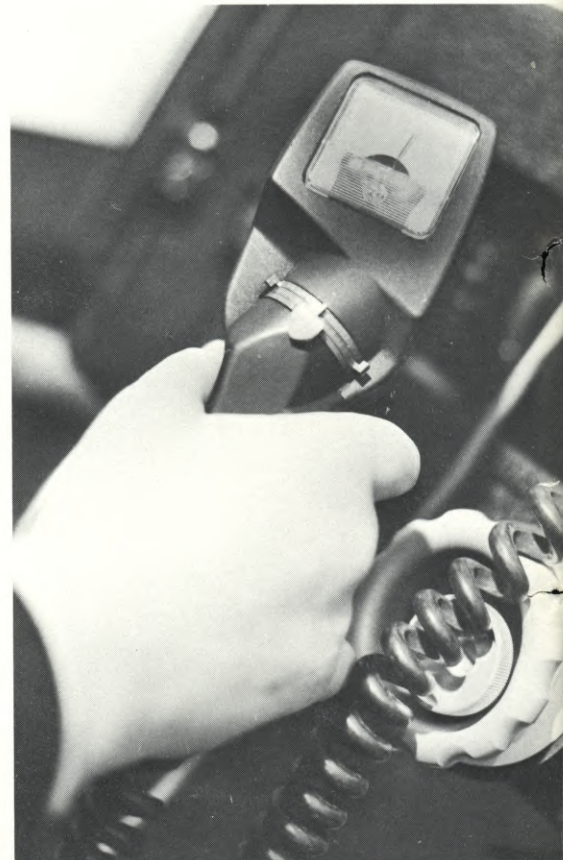
The desired zoom rate and upper and lower focal length set points are dialed on the Master Control Console. A lens position display meter on the Hand Control shows the precise focal length from moment to moment. The Hand Control permits stopping at intermediate points by watching the meter needle, without reference to the lens itself. Once the settings are established, actuation is commenced in either direction at a touch of the thumb of the same hand that holds the Control. Zoom is automatically terminated when a set stop is reached or when the thumb button is

Mitchell's new *Servozoom* electronic zoom control, shown mounted on the side of the camera, employs a closed-loop servo system balanced through solid state electronic feedback elements. The desired zoom rate and upper and lower focal-length set points are dialed on the Master Control Console (left). Lens position display meter on hand control (right) indicates precise focal-length from moment to moment.

returned to the null "dead band" area.

A tach-generator built into the driving motor transmits a feedback signal which is compared with an input signal from the rate-control potentiometer. Thus, increases or decreases in lens element friction, which would otherwise slow down or speed up the motor, are offset by proportionate increases or decreases in power to the motor. Zoom speed is locked to a value dictated by the rate controller, regardless of frictional variations during movement of the lens.

Automatic zoom termination is controlled by position-sensing feedback loops. A signal corresponding to the desired focal length set-point is programmed into the system as a voltage level. Changing output from the position feedback potentiometer is compared with this voltage. When the two voltage levels correspond, a semiconductor switching circuit de-activates the system.



Hand control, shown removed from camera cradle for remote usage, is "human-engineered" to fit either hand comfortably and is equipped with six-foot coil cord.

## MASTER CONTROL CONSOLE

Contains solid state electronic servo system and rechargeable NiCad battery pack. Front panel displays programming controls for zoom rate and upper/lower focal length set points, also on-off switch plus battery test switch and indicator light. Quick release bracket permits mounting on camera or dolly. Built-in socket holds Hand Control safely when not in use.

## HAND CONTROL

Holds lens position display meter with double scale to match focal length calibrations of Angenieux 6 x 20mm and 10 x 25mm lenses. Spring-loaded

Continued on Page 1220



# COOKE VAROTAL 5-TO-1 ZOOM LENS



Throwing its hat into the ring toward production of a zoom lens with prime lens sharpness, a famed designer of motion picture optics introduces a new precision instrument with unique characteristics

It is generally conceded by knowledgeable cinematographers that zoom lenses, as a generic group (and with rare individual exceptions), are not as sharp as top-grade fixed-focal-length lenses. The reason for this is said to be the fact that there are simply so many elements in motion that it is most difficult to maintain highly precise calibration all the way along the line.

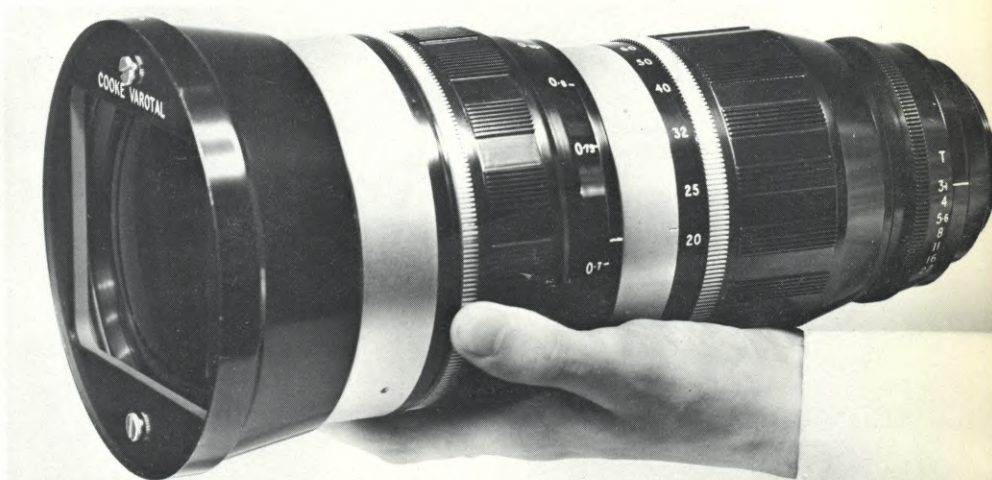
At the 1970 *Photokina*, the name of the game among the top manufacturers of lenses seemed to be that of remedying this situation. As a result, almost all of them introduced new zoom lenses touted as being "as sharp as prime lenses." In most cases, they even eschewed the term "zoom" (with its somewhat fuzzy image), preferring to designate their new optics as "vari-focal" lenses.

The Taylor Hobson design team of Rank Precision Industries Ltd. tossed its corporate hat into the ring with the new Cooke Varotal lens for 35mm cameras. Gordon Cooke, the foremost lens design wizard of them all, was on hand in person at *Photokina* to show the prototype of the new 20mm-to-100mm instrument (which the company unabashedly calls a zoom lens) and to explain its unique characteristics.

The Rank Precision people emphasize the fact that the new lens was not designed in an ivory tower, but rather as the result of a great deal of first-hand research by their top design and marketing personnel. These technicians toured the world, talking to motion picture executives, producers, directors and cinematographers.

"A lot of them had problems with cine zoom lenses," so the report goes. "Some of them wouldn't touch a zoom till the quality and performance was improved. Others just grumbled, accepted limitations and carried on shooting."

Far from being discouraged by this dismal state of affairs, the Taylor Hobson design team hied itself back to Rank Precision Industries and brainstormed its way to a zoom lens specification



THE NEW COOKE VAROTAL 5-TO-1 ZOOM LENS BY RANK PRECISION INDUSTRIES

which it considers to be revolutionary.

Following are the claims quoted from the company's brochure in relation to the new Cooke Varotal 20mm-to-100mm zoom lens:

*The Cooke Varotal gives you an infinite choice of focal lengths within a range at a ratio of 5:1. A choice of overlapping ranges will also be available.*

*The Cooke Varotal has such a short minimum object distance that you can shoot your subject only .34m (13.4 inches) away from the front glass without losing zoom characteristics.*

*The Cooke Varotal has a horizontal field width of angle as great as 58° when the lens is at its minimum focal length.*

*The Cooke Varotal gives you a fixed front element for the first time ever with motion picture zooms. So problems of fitting matt boxes and filters at the front of lens are solved.*

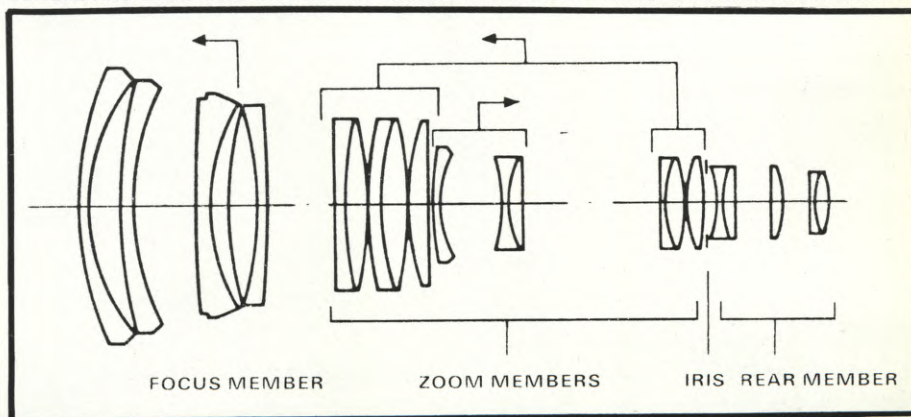
*The Cooke Varotal optics incorporate new types of antireflective coating on all polished surfaces together with types of glass specially developed for this purpose. The transmission factor can be held at the remarkably high value of 80% giving the f/2.8 lens a T stop of T/3.2.*

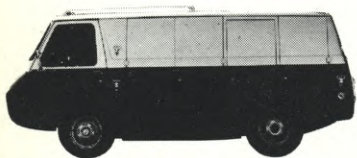
*The Cooke Varotal is designed to fit all known reflex viewfinder cameras.*

*The Cooke Varotal is designed to be used in hazardous conditions at ex-*

*Continued on Page 1224*

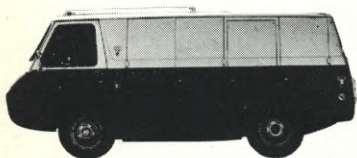
SCHEMATIC DIAGRAM OF LENS ELEMENT CHAIN FOR THE COOKE VAROTAL LENS





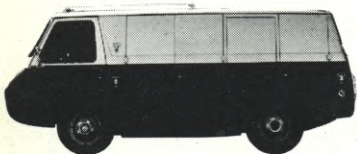
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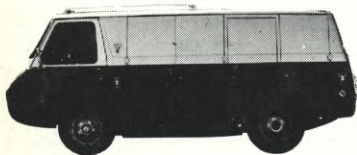
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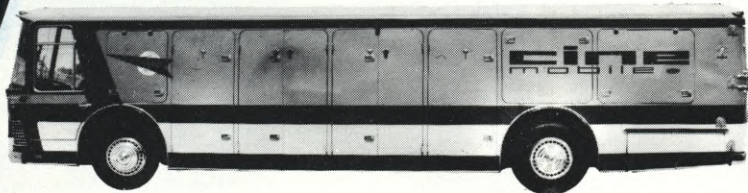
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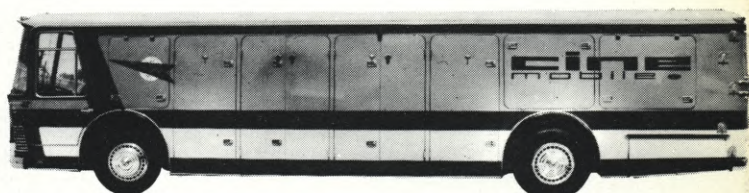
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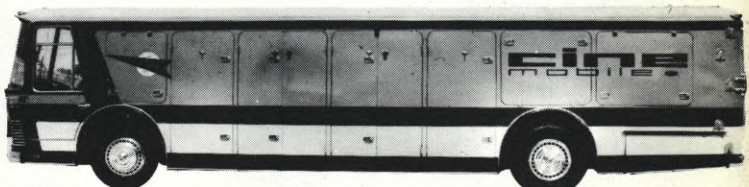
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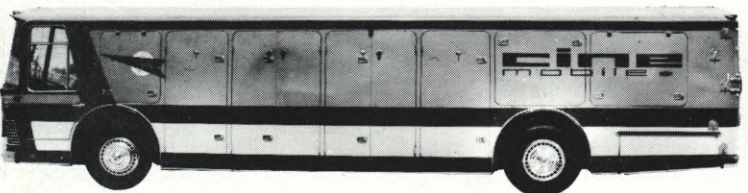
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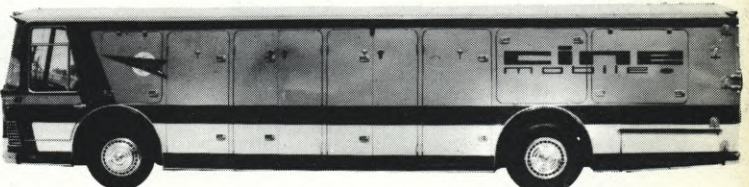
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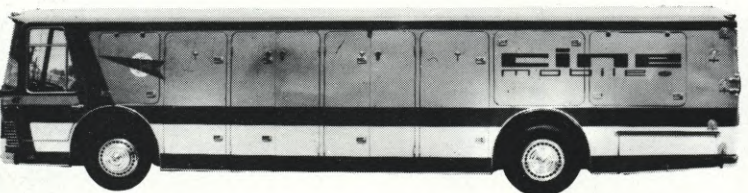
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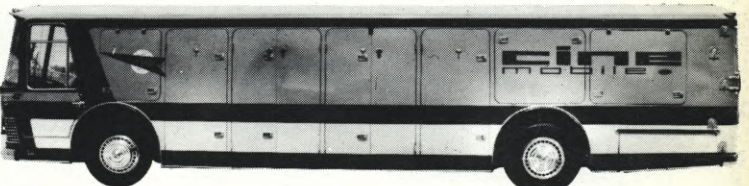
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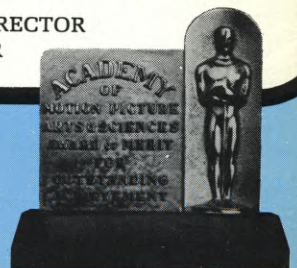


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# THE LOWELL SOFT LIGHT

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Unique and entirely new at *Photokina 1970*:

A true soft light that weighs only seven pounds, folds up flat, and puts out as much illumination as units drawing twice its power



Ross Lowell, President of Lowel-Lite Photo Engineering, sets up his new Soft Light for demonstration at *Photokina*. Most of the equipment he designs is to meet his own personal needs as a working cinematographer, who shoots frequently on location.

The group of luminaires known generically as "soft lights" includes a range of relatively large, indirect illumination sources that produce soft highlights and shadows—a quality of light very similar to that which prevails on an overcast day.

During the past few years, these units have become very popular with cinematographers. Some utilize them to establish a general, overall kind of fill light, while relying on "hard light" equipment to indicate key sources and provide dramatic accents. Others, enamored of the "natural" light quality which such units create (or seeking a quick and easy way of arriving at an exposurable light level) use them exclusively to flood sets with light, depending upon the colors of the subject matter to provide whatever separation is desired.

Standard soft light units are, by the very nature of their design concept, usually rather large, heavy and cumbersome. This presents no particular drawback on the sound stage where there are enough hands to mount them, raise them, lower them and wheel them around. But on locations, especially when shooting takes place in tight quarters, they often prove impractical. To get around this disadvantage, many cameramen have taken to using the various

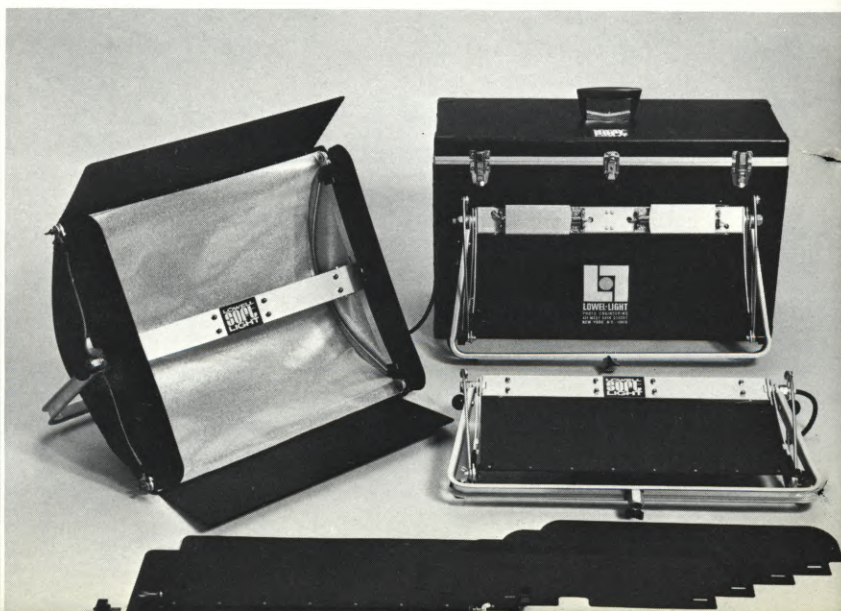
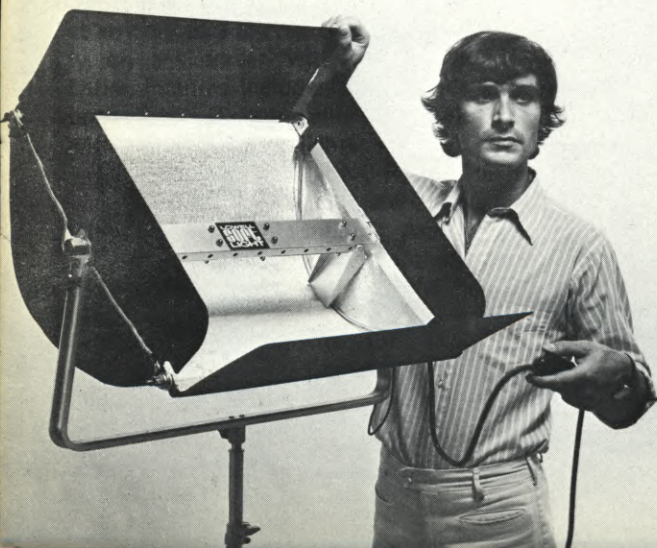
"umbrella" units, which are actually umbrellas made of highly reflective, aluminized fabric. When a light source (usually comprised of small tungsten-halogen units attached to the handle) is beamed toward the center of the umbrella, it acts as a parabolic reflector, flooding a respectable area of the set with a satisfactory quality of soft light.

The umbrellas, however, also have their disadvantages. They take a certain amount of time to rig and mount, a significant factor on location. Also, the very light source units utilized must be positioned in such a way that they often interfere with the proper distribution of light reflected out of the umbrella. The lights become so hot to the touch that they cannot be adjusted without the protection of heavy gloves. Finally, because of its inherently awkward shape, an umbrella of adequate size is frequently too deep to be used in tight quarters.

Clearly, what has been needed for location shooting is a very lightweight, extremely compact, preferably collapsible fixture with true soft light characteristics—but light and small enough, when collapsed, to be stashed in a car trunk with a lot of other location equipment, or hand-carried aboard an aircraft.

The new LOWELL SOFT LIGHT

(LEFT) The new design has true soft light characteristics, functioning as an indirect source that produces soft highlights and shadows, very similar to the light that prevails on an overcast day. (RIGHT) Portable kit immediately available consists of a sturdy fiber case that will accommodate three Lowell Soft Lights, complete with barndoors.



(patent pending), shown for the first time at *Photokina 1970*, is a unique piece of equipment calculated to meet every one of the requirements enumerated above. It was designed by noted New York cinematographer Ross Lowell, president of Lowell-Light Photo Engineering, who says of it: "A lot of the equipment I've designed has been created to fill my own personal needs as a cameraman shooting on location. Much of the studio lighting equipment is well thought-out and efficiently designed for use on sound stages, but is simply too hard to handle on location. Soft light units are especially cumbersome for such usage. Umbrellas are often helpful, but they lack the controllability required to cope with the spill light. I've never run across a barndoor system that would work with an umbrella. Barndoors, even when used with a soft light unit, make possible a subtle kind of shading that is valuable—as, for example, when you want to reduce the light on a white dress an actress is wearing. At the very least, you do need barndoors (or some other type of cutter) to protect the lens from glare."

Barndoors, incidentally, have been designed as integral accessories to the new **LOWELL SOFT LIGHT**, although they are listed as optional equipment. However, the unit boasts other features that are considerably more important. It is five times lighter and considered to be far more versatile than conventional soft light units. Equally significant, it is rated as twice as efficient in light output.

The Lowell Unit folds up into a fraction of its working size. It opens, ready for use, in seconds. There are no separate lights to attach and balance—as with umbrella rigs.

The standard reflecting surface is

quickly removable and a bright silver one substituted. The Lowell Soft Light is bright enough to use as a key or fill. Ten feet away, it provides 70 foot-candles, from only two 500-Watt lamps, but this is equivalent to a 2000-Watt conventional unit. It uses 50% less amperage for the same output.

Weighing approximately 7 pounds (instead of 36 or 40), it attaches effortlessly to the top of a door or floor-to-ceiling pole, and because it is only 7½ inches deep, it occupies far less shooting space than umbrella rigs.

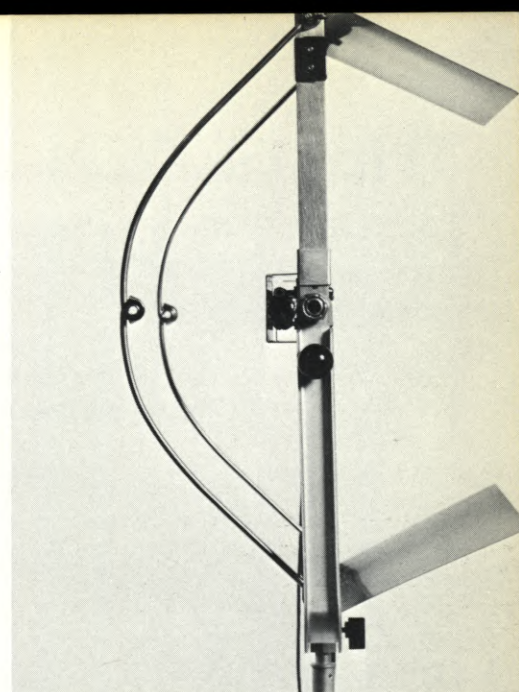
Three Lowell Soft Lights and accessories fit into a carry-case measuring only 10½" x 17" x 30".

The unit consists, basically, of an electrical core positioned inside a wire and metal frame that is hinged in several places to permit the entire rig to fold quite flat. There is a yoke with a standard 5/8ths-inch stud which makes it possible for the light to be mounted onto existing stands or floor-to-ceiling poles. The yoke and stud are also compatible with the Lowell-Link stand (weighing about three pounds), which will easily support two of the Lowell Soft Lights mounted side by side, through the use of an adaptor.

Because technicians often don't like to take the time or trouble to remove lamps when a light is being packed for transport, Lowell has attached to the electrical core two small metal flanges that fold down over the glass lamps to prevent them from being broken by striking against other metal when the unit is being transported.

To obviate the necessity for using gloves to adjust the light when the lamps are burning, two large bakelite knobs have been provided. These can be easily grasped for panning and tilting.

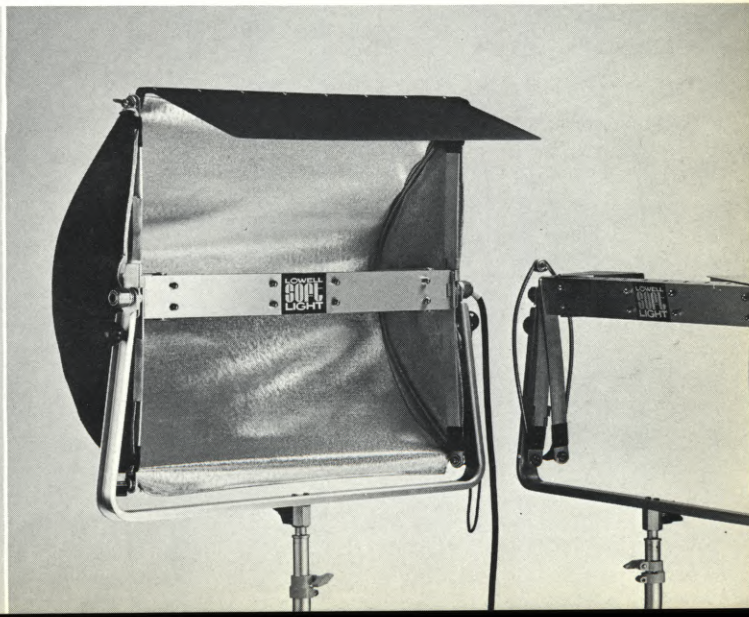
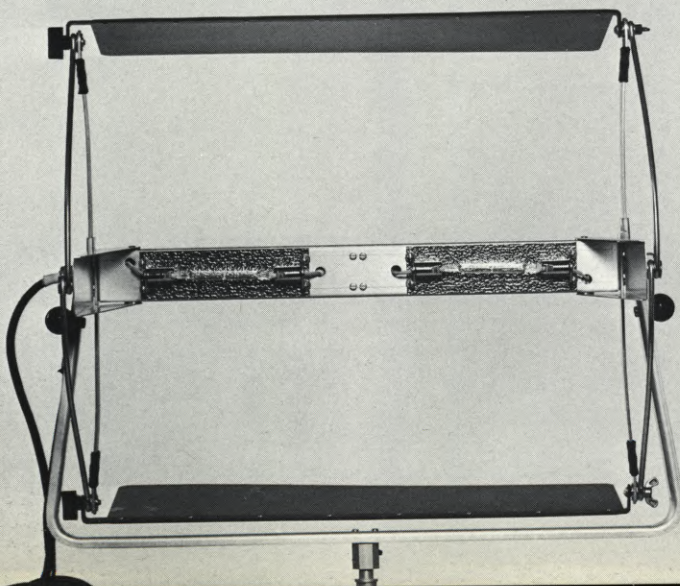
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Side view of the unit, with frame and top and bottom barndoors folded out, but lacking side pieces, fabric reflector shell and side barndoors.



(ABOVE RIGHT) Single-unit Lowell Soft Light can be carried in case not much larger than *attache* case. (BELOW LEFT) Electrical core of unit holds two 500-watt tungsten-halogen lamps, with metal flanges that fold down to protect lamps during transport. (RIGHT) The Lowell Soft Light ready for use and, next to it, another unit folded flat, ready to be packed for transport.



# THE HEDEN ELECTRONIC REMOTE CONTROL SYSTEM



One of the latest entries in the "zoom control derby" is a dual instrument that regulates both the rate of the zoom and lens focusing parameters

Officially introduced to the trade at *Photokina*, the Heden Electronic Remote Control System for use with zoom lenses on 35mm motion picture cameras is one of the most advanced instruments of its type and features several unique characteristics.

The unit actually performs two separate functions. One of these has to do with zooming of the lens from one predetermined focal-length to another. The second function is concerned with remote focusing.

The speed range of the zoom control is extremely wide, being variable from 2 seconds to 2 minutes. This speed can

Once two extremes of focus have been pre-set, the camera operator can shift from one to the other by flipping a knurled wheel, without having to take his eye from the viewfinder.

also be varied in mid-zoom by means of a pistol grip. The *maximum* speed is adjusted and set before zooming. Then, by depressing the trigger, the operator can vary the zoom rate from zero up to the pre-set maximum speed, depending upon how much pressure he applies to the trigger. This option makes it possible to gear zoom movement precisely to variable speeds of action within the scene.

The focusing control provides important versatility. It can either be affixed to the pan-handle and operated by the camera operator, or it can be operated remotely from several yards away by an assistant. It also has a capability for pre-setting two different focus distances. This becomes especially useful in scenes where there is a split focus situation (between two key actors, for example) and it is deemed desirable to change focus back and forth to shift attention emphasis or favor the actor who happens to be speaking. When the focus control is affixed to the pan-handle, the camera operator can accomplish this simply by flipping a small knurled wheel, without having to take his eye away from the viewfinder.

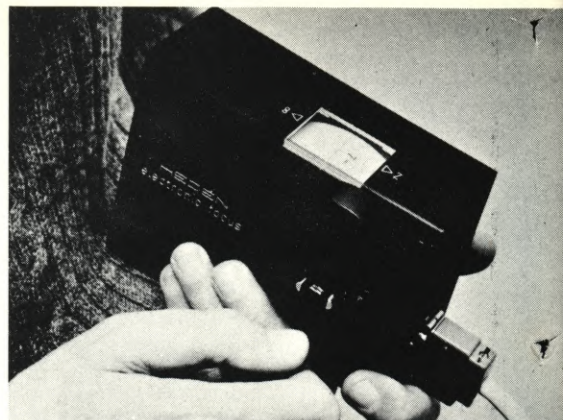
The electronics of the control unit, together with the motor unit, form a complete servo system. The precision of the equipment makes it possible to work with a closer graduation of the scale drum than the scale of the lens itself!

The part of the Heden control which is attached to the lens is mounted without any mesh, alteration or possible damage to the lens mechanism whatsoever. The movements are extremely smooth and any potential variations are precisely compensated for by the electronics.

The Heden equipment will fit inside Arriflex 120-S and 300 blimps, as well as inside the Mitchell blimp.

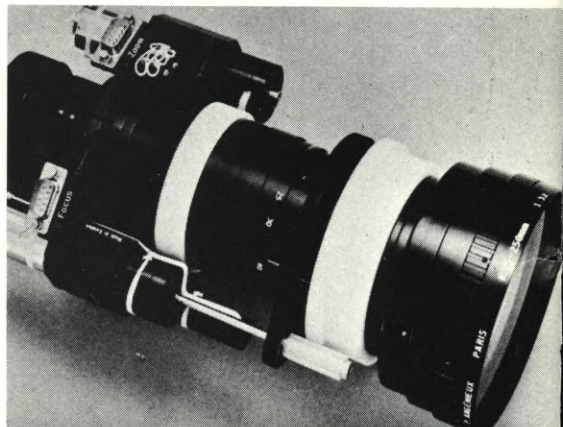
The equipment is manufactured by Heden Engineering Co., P.O. Box 102, 431 22 Molndal, Sweden.

It is exported by Olof Lindstedt & Co., Prytzgayan 4, P.O. Box 30, 431 21, Molndal, Sweden. ■

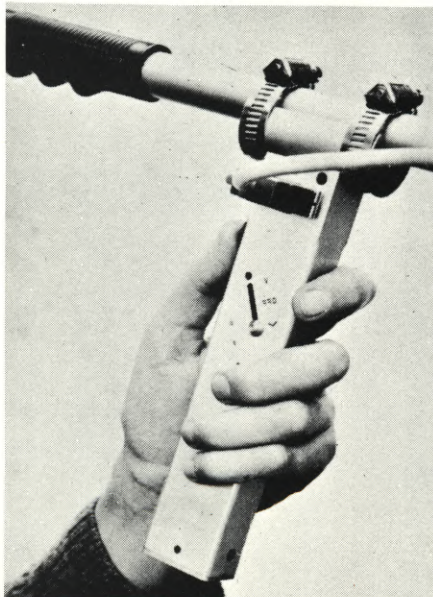


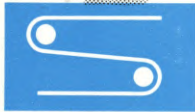
The Heden Remote Control System for use with zoom lenses on 35mm cameras has an extremely wide range of zoom speeds (2 seconds to 2 minutes).

The part of the Heden control that attaches directly to the lens is mounted without any mesh, alteration or possible damage to the lens mechanism.



The focusing control, when mounted on the pan-handle, can be easily operated by the camera operator, or remotely by an assistant from several yards away, when detached.



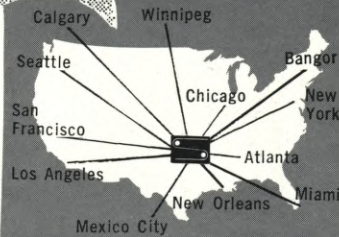


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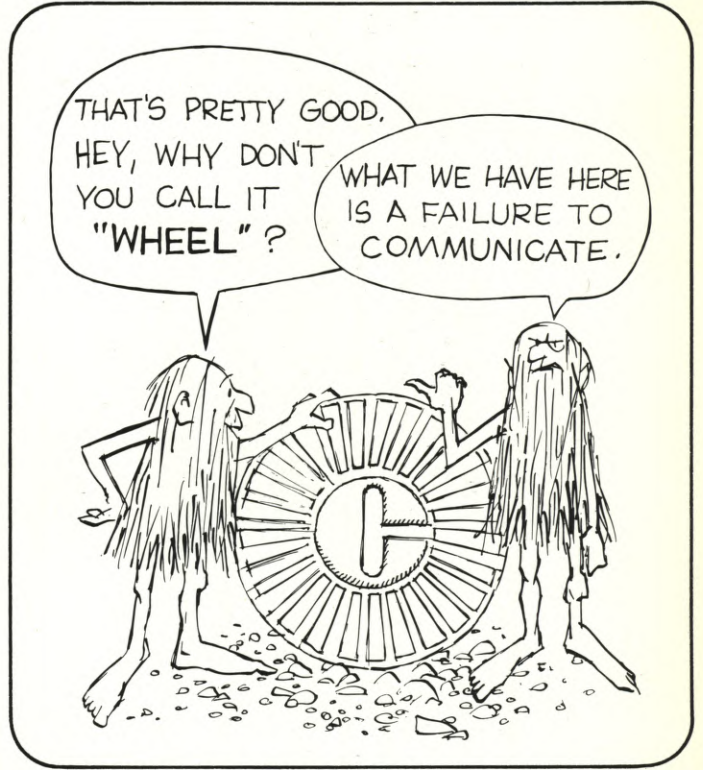
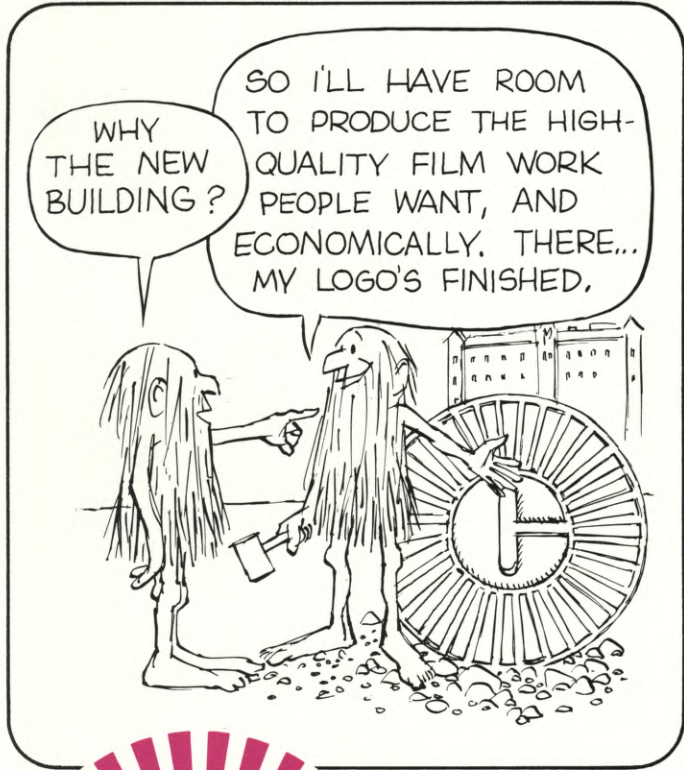
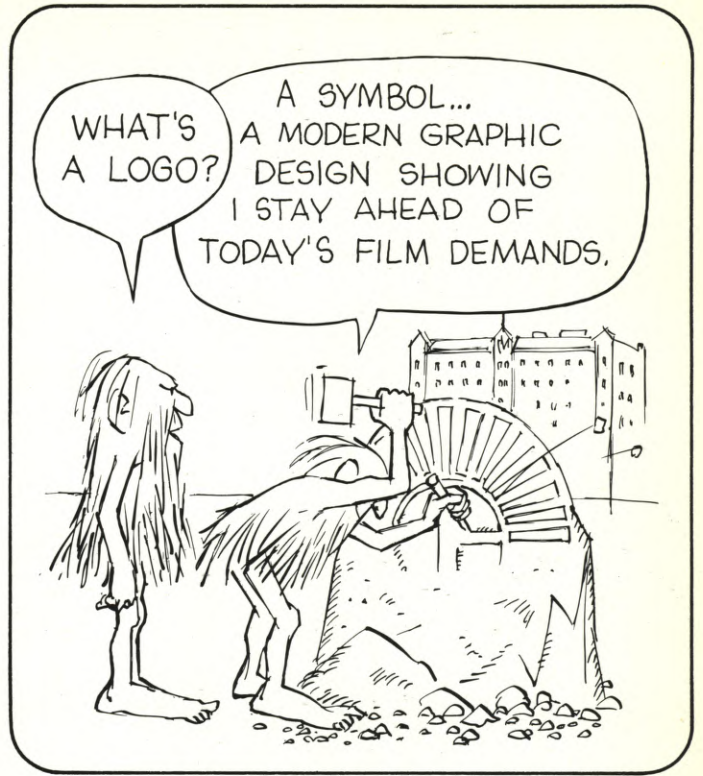
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# MOVIOLA'S NEW EDITING CONSOLE



After many years of "upright" service, a new model of the film industry's classic editing machine finally goes horizontal

According to the manufacturer, the Moviola "Anniversary Series" horizontal console editing table has been designed to meet the demands of all facets of editing within the motion picture and television industries. For the past two years the Company has conducted a worldwide survey study to determine the most desirable equipment features as related to contemporary editing techniques and future possibilities.

Most significant in this search for new ideas in equipment design was utilization of the overall engineering technology existing within the Magna-Sync/Moviola manufacturing divisions. This engineering and development staff has integrated many features from tape transport, computer and logic systems into the editing console. These features,

added to the new Moviola "Synco-Prism" projection system, provide the industry with an entirely new concept of editing capability and convenience.

Considering the requirements of motion picture, television, education, industry and documentation, the Moviola Console has been designed not only as an editing device, but as a "preview theater." The picture and sound quality have been far advanced over contemporary equipment, whereupon the operator can more precisely compose, edit and mix the program material. Since the unit is equipped with two sound heads and a composite optical/magnetic picture head, dialogue, music and effects can be cut to the picture with sound mixing and listening quality comparable to the final composite. Slide attenuators

Joining the parade of foreign manufacturers who have produced increasingly sophisticated flatbed editing machines during the years, America's Magnasync/Moviola Corporation comes up with its new Moviola "Anniversary Series" horizontal console editing table. The result of a worldwide survey study conducted to determine the most desirable features for such equipment, the new machine incorporates several that are unique.

(BELOW) Diagram illustrates "fold-up" modes which make new Moviola easily stored and "portable", despite its basic bulk.

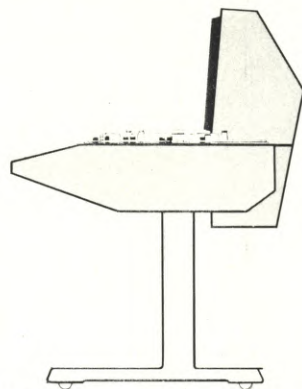


FIGURE #1. Console normal upright position complete with projection and digital readout system.

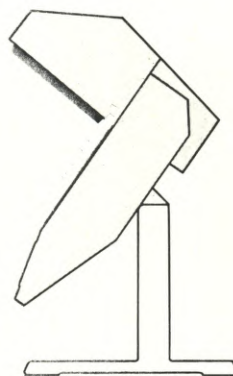


FIGURE #2. Unit locked in position for room to room mobility.

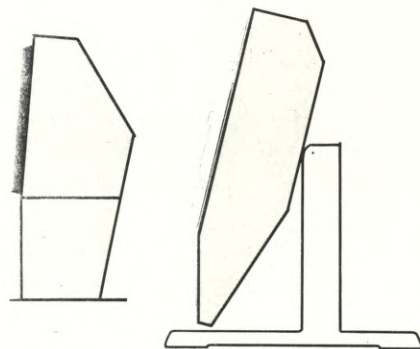


FIGURE #3. Projection enclosure removed and console locked in "storage" position. Unit is still mobile and will pass through 28" wide door opening.

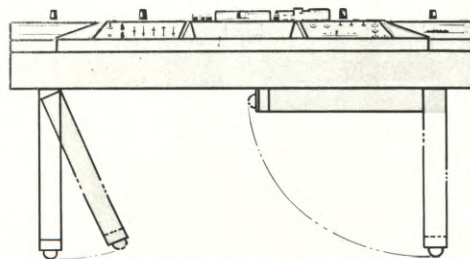
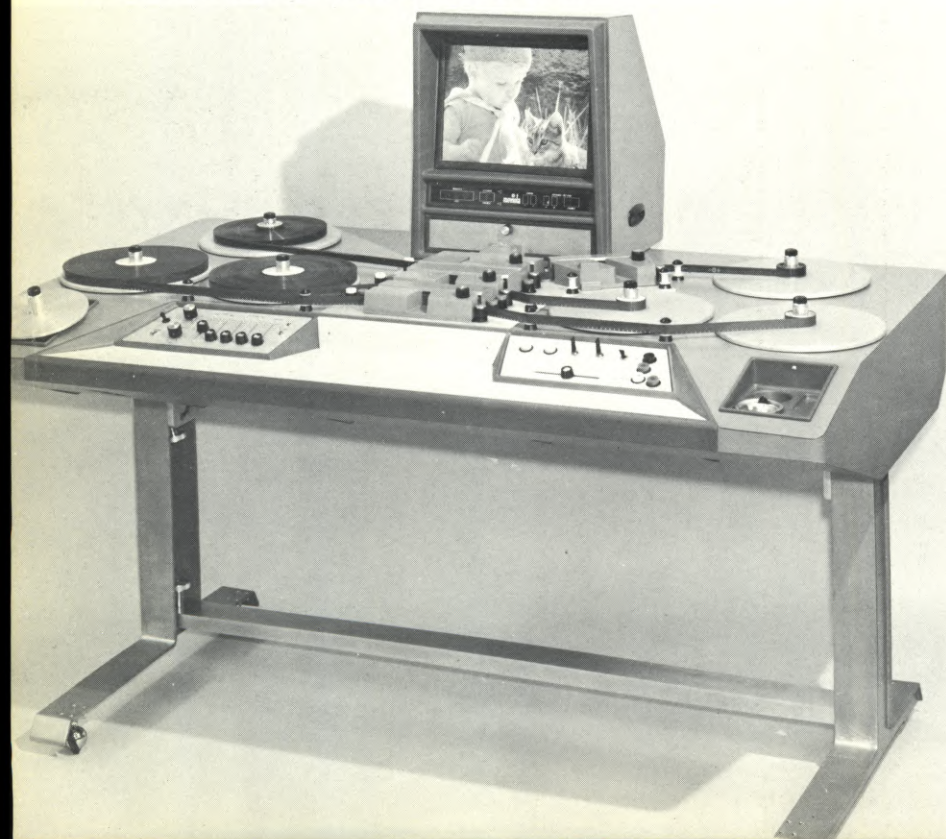


FIGURE #4. Pedestal assemblies of console fold inward to bottom of unit and lock into position. Assembly is then portable for transport in average station wagon. Projection enclosure is carried separately to reduce overall dimension bulk.





are used for each sound track plus a master gain control and high/low equalization controls.

#### Brake-Torque Film Traverse System

Differential brake-torque motor assemblies as used in computers and industrial tape transports are incorporated into the editing console. Each of the two sound heads and the picture head have independent torque turntable film handling assemblies. Selectively, the operator can traverse the film fast-forward or fast-reverse or a master push button will rapidly forward or rewind the picture and two sound tracks simultaneously.

In any mode the film feed-in and feed-out tensions are precisely maintained, eliminating excessive sprocket hole pull and film spillage. The rapid film traverse reaches a maximum of 15 times sound speed without film spillage or damage. Push button controls are used with the same "solid state" logic as is found in sophisticated tape duplicating systems. Differential brake assemblies are an integral part of each motor assembly. When the stop button is pushed, the respective brake differential causes the film turntable assemblies to precisely stop with no spillage or loss in tension.

#### Servo Sprocket Drive

The drive sprocket of the picture head and two sound heads may be electrically coupled or decoupled for framing purposes or for single frame viewing and locating picture and sound start marks.

#### Picture-Sound "Interlock" At Seven Times Sound Speed

The servo drive system is operated from a single slide control. The film can be moved from one or two frames per second up to seven times "sound speed" through the sprocket gate assemblies.

The movement of the slide control provides acceleration from "standstill" to sound speed and from sound speed, fast forward. With movement of the control to the left, the film is driven in reverse.

With micro-variable control over speed, the film can be stopped precisely at the end of a scene for ease in marking. Correspondingly, the rapid film traverse provides ease in scene selection.

When using the servo drive any of the three transports can be programmed for decoupling from the locked mode and the film rapidly moved forward or reverse. For example, sound track No. 2 may be rapidly rewound, while the picture and sound track No. 1 remain locked together and traversing at sound speed. Alternately the programming can be transposed or a single button will decouple from interlock all units for rewind or fast forward.

The new servo motor system maintains a constant torque ratio on the drive sprockets regardless of the speed. This breakthrough in film handling eliminates film spillage, buckling and damage. This feature, coupled with the constant tensions from the torque turntables, makes the console editor a unified transport assembly.



Large, bright screen and advanced picture-sound quality enable the Moviola Console to be used as a "preview theatre", as well as an editing device.

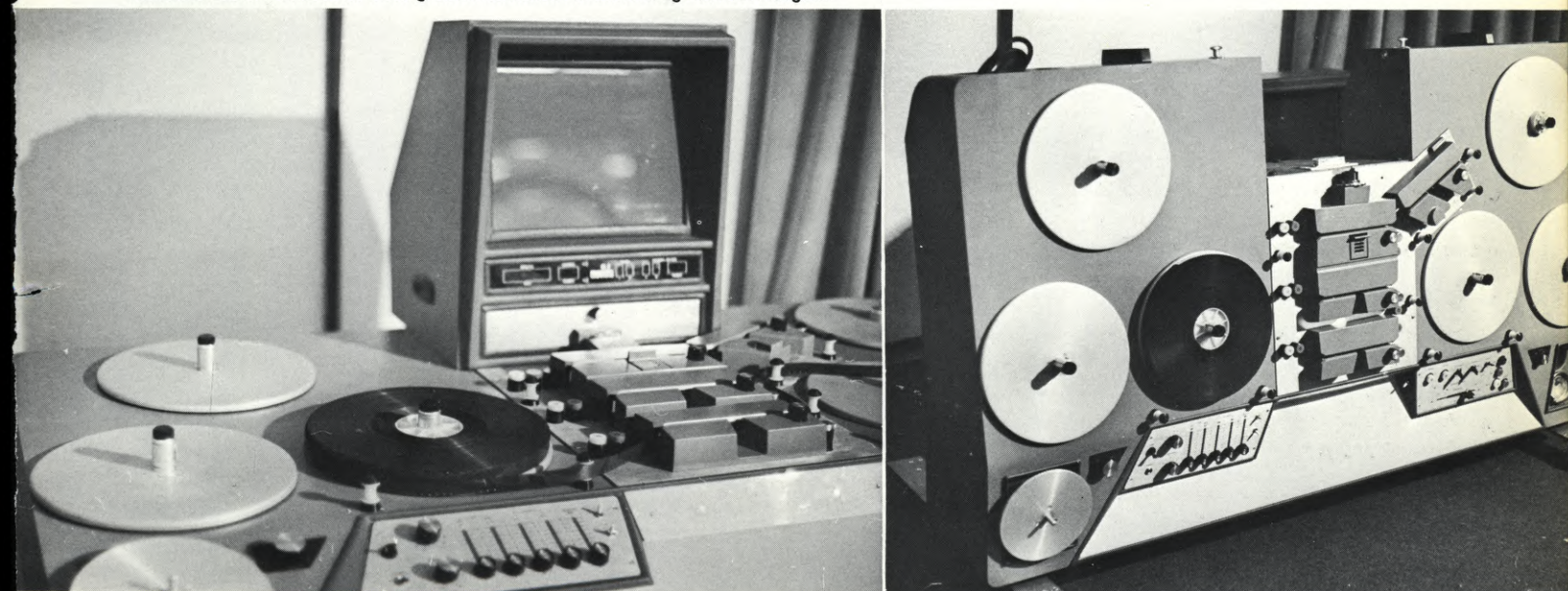
#### Electromatic Differential System

To speed the editing process and convenience, Moviola has developed a new system of film advance and retard. The system is completely electrically operated and controlled to provide selective advance or retard of both sound head transports.

While the film is in motion at any speed, through the servo drive either of the sound heads can be advanced or

Continued on Page 1230

(LEFT) Since the unit is equipped with two sound heads and a composite optical/magnetic picture head, dialogue, music and sound effects can be cut to the picture with sound mixing and listening quality designed to be comparable to that of the final composite. (RIGHT) Moviola Console Editor shown in vertically flat fold-down mode, a unique feature which makes it storable in a minimum of space when not actually in use, and easily movable room-to-room or over greater distances in an average station wagon.



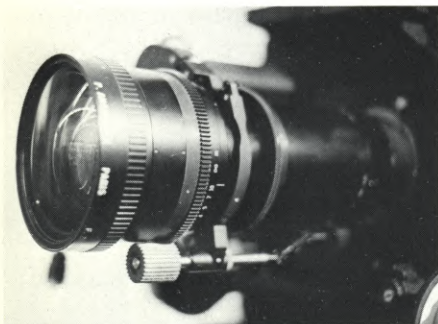
# NOTED AND NOTABLE AT photokina 1970



A veritable *smörgasbord* of new and advanced equipment for the professional film-maker stimulates a great degree of interest at the World Fair of Photography

Of the hundreds of items on display at *Photokina 1970*, the following pieces of equipment impressed our editors as being of special interest to *American Cinematographer* readers, in addition to those more fully covered in this issue.

Some of the items reviewed below would seem to merit a more comprehensive report and the reason that they have not received more complete coverage may be due to the fact that additional technical data was not available at press time, or the fact that several of the items are scheduled for a more in-depth analysis in a forthcoming issue of this journal.



**ANGENIEUX 6 x 20 L2 Zoom Lens**  
20-120mm F/2.6, T3 for 35mm Cinematography

As a result of numerous discussions with feature film and commercial producers, ANGENIEUX has developed the new 6 x 20 L2 Zoom Lens. The design meets four fundamental requirements:

#### Image quality

At full aperture and over the entire field, this lens has been designed in such a way that its performance matches that of the highest quality lenses, fixed focal length or zoom, that now exist.

#### Photometric aperture T3

Comprised of 20 elements, the 6 x 20 L2 has an excellent photometric

aperture of T3, which will allow filming under cooler lights and possibly even under ambient lighting conditions.

#### Wide angle 20mm focal length

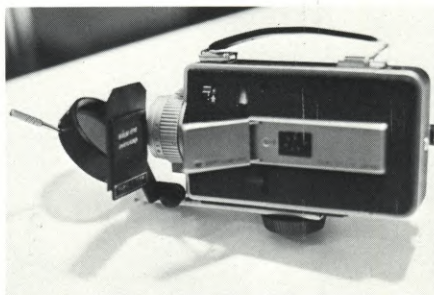
The short (20mm) focal length allows the freedom of camera movement necessary for the *Cinema Verité* techniques used today.

#### Close focusing:

##### 3 ft. from the image plane

To further satisfy today's techniques this lens focuses as close as 3 feet from the image plane. Close-up lenses are available to allow focusing as close as 23 inches from the image plane to subject.

The ANGENIEUX 6 x 20 L2 is available in the following mounts: Arriflex, Cameflex, Mitchell Mark II, and neutral mounts.



**ELMO SUPER 103T Super-8 Camera with Built-in Titler**

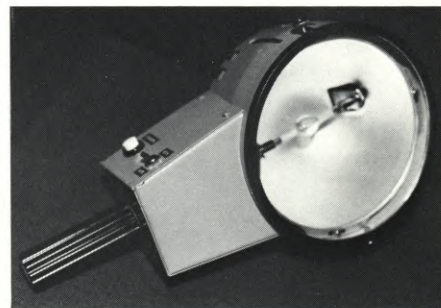
This compact little Super-8 camera has all of the usual characteristics one would expect to find in a quality piece of equipment, but its really unique feature is its exclusive *Superimpose* system, which makes possible double-exposed titles instantly, with only one pass through the camera.

A title or any other small object placed in front of the "Scope Lens" (actually a 45-degree mirror that folds out from the side of the camera) is superimposed automatically onto the scene that is being photographed

through the "main" (or *actual*) lens of the camera.

When the "main" lens is covered, ultra closeup shots through the "Scope Lens" are made possible. Objects as small as 30.8mm x 21.4mm (1.2 x 0.85 in.) may be filmed. Thus, in effect, the mirror performs the function of a macro lens.

In addition, the Elmo Super 103T features a "Back light control" (for shooting back lit subjects), a film run indicator in the viewfinder that indicates when the total cartridge has been exposed, and an under-exposure warning signal that appears in the viewfinder if the light is insufficient.



**"SPECTRA 6000" Handlamp**

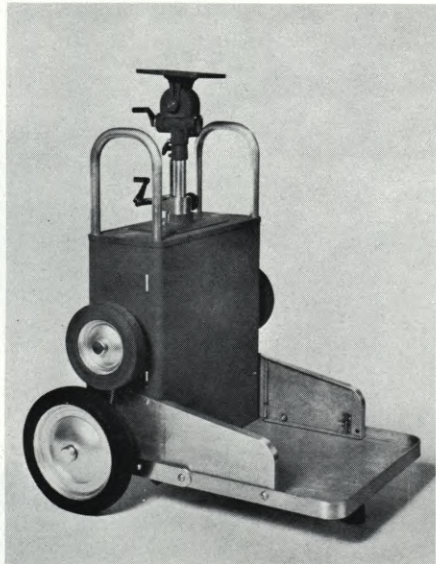
An extraordinary new development in lighting, the "SPECTRA 6000" is a compact tungsten-halogen unit which is so small and light in weight that it can be hand-held. Yet, it is "heavyweight" in performance.

Drawing only 575 watts of current, its light output is an incredible 46,000 lumens—and, at 10 feet its illumination level is identical to that of a standard 5000-watt "Senior" spot.

The "SPECTRA 6000" takes its name from its daylight color temperature of 6000° Kelvin. It operates on either 220 or 110 volts, and the "F" model is focusable. Though designed as a hand-held unit, it can also be mounted onto any standard light stand.

Far more powerful than any other tungsten-halogen unit anywhere near its size and weight, it would seem to be an ideal light for location work, although it can also be used in the studio.

The "SPECTRA 6000" is produced by G. & H. SCHNEEBERGER, Baldestrasse 14, 8 Munich 5, West Germany.



#### Camera Caddy

An all-purpose go-cart that serves as a small truck for moving equipment, a heavy-duty tripod and, we're told, even a dolly under certain conditions, the Camera Caddy would seem to be a handy piece of equipment for professional and advanced amateur filmmakers to have around.

It is touted as "the first *total* system for both studio and location photography!"—which may be a bit of an overstatement, but it does, nevertheless, have some versatile and unique features.

Of light and sturdy aluminum construction, the Camera Caddy can move a rather large load of tripods, power packs, light stands and camera cases with relatively little effort on the part of the mover. An integral shelf packs quite a bit of auxiliary equipment, as well. The Caddy itself is compact enough to go through any standard doorway.

It is said to roll along easily on its big, cushioned wheels—even through mud and grime. However, when you take it inside where you don't want any of that to carry over, one flick of a lever brings down the self-locking *interior* wheels, permitting you to move it onto the finest carpet in perfect safety.

The built-in geared column would seem to provide a sturdy camera sup-

port and is adjustable to a height of more than seven feet.

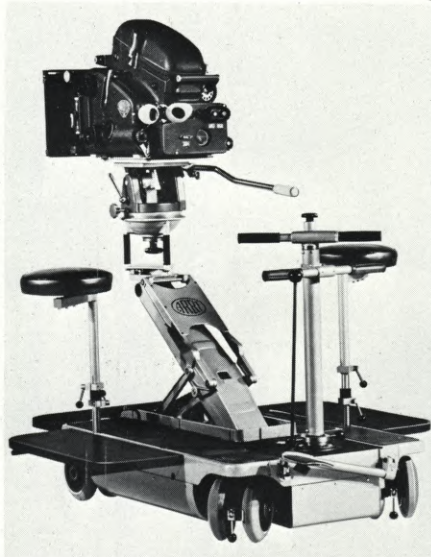
#### TECHNICAL SPECIFICATION:

Size when folded	28" x 28" x 17"
Equipment shelf	20" x 18"
Camera height range	inches to 7'-2"
Construction	Aluminum
Exterior wheels	Semi-pneumatic 12" dia.
Interior wheels	Semi-pneumatic 8" dia.

#### OPTIONAL EQUIPMENT:

Tripod legs  
Detachable belts for anchoring equipment

The Camera Caddy is available from: Mobile Equipment Manufacturing, 3937 E. Hastings Street, Vancouver, B.C., Canada.



#### ARRI Midget Dolly

This new construction, completely independent of external supply sources, is equipped with a hydraulic accumulator system. The accumulator is charged by a foot-operated pump. The stable, quiet-running ARRI midget dolly, equally suited for both studio and outdoor filming, can be used with all ARRIFLEX cameras and blimps. The camera, on the built-in camera boom, can be vertically raised from 10" to 30" in the focal plane. The addition of hi-hats allows an extension in the lift range.

#### Travelling Gear and Steering

The travelling gear consists of 4 dual wheels with soft rubber or low-pressure tyres; adaption for track use is in preparation. The wheels can be locked separately. The three possible dolly steering modes are controlled by a turning handle on the steering column: front wheel steering/rear wheels directionally locked, or rear wheel steering/front wheels directionally locked, and

crab steering. With the first two above-mentioned steering modes, the geometry of the trapezoid steering prevents the self-braking of the wheels in narrow curves. The steering column is removable for transport purposes.

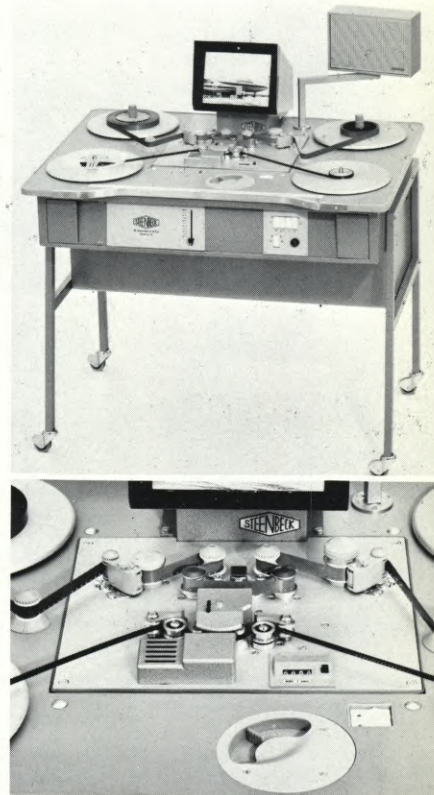
#### Function

By operation of the foot pump, in 2-3 minutes the pressure in the accumulator increases from a minimum of 70 up to 200 atü. This accumulated pressure is sufficient, depending on camera weight, for 10-15 full lifts of the dolly arm. The hydraulic valve for "up" and "down" travel can be operated by the cameraman or the dolly operator.

For studio filming only, the foot pedal can be easily replaced with a motorized drive.

Weight of the dolly: approx. 220 lbs

Packing dimensions: approx. 27½" x 39¼" x 9¾"



#### Steenbeck Super-8 Editor

Verifying the faith of those who have long considered Super-8 to be a potentially significant *professional* medium, W. Steenbeck & Co. unveiled at the 1970 *Photokina* a 4-plate horizontal console designed for editing Super-8 picture in synchronization with 16mm perforated magnetic sound-recording film.

The new item created a noticeable

Continued on Page 1200





## Past disruptions had led to a Stock Exchange rule: No cameras on the Floor. But Wolper demonstrated the unobtrusive Eclair NPR they would use—and got permission to shoot.

For their hour-long documentary special "Wall Street," sponsored by Xerox and screened by ABC Television, Wolper Productions obviously needed to shoot the action on the trading floor of the New York Stock Exchange. But because a Hollywood feature crew shooting there with its cranes, lights and cables had previously caused a drop in trading, the Governors of the Stock Exchange had made a rule: No cameras on the Trading Floor.

They had since made an exception for Life magazine, which was allowed to send a still photographer in onto the Floor with a Leica. Wolper told the Governors that sync-sound film footage could be shot with a camera no more obtrusive than the Leica, that no lights, tripods, clapstick or AC power would be needed, and that business would not be interrupted at all.

The Governors were skeptical; so Wolper brought an NPR and a Nagra to the office of the Stock Exchange's President. The Wolper cameraman, dressed in a dark suit, demonstrated that the NPR could be carried in one hand, like a briefcase, that it ran in total silence and that he would need no other equipment. So the Governors gave their permission and "Wall Street" got made.

For an NPR brochure,  
write to Eclair Corp.  
at 7262 Melrose Ave.,  
Los Angeles 90046.

# eclair

## NOTED AT PHOTOKINA

Continued from Page 1197

stir and brought exclamations of delight from those who have deplored the fact that there has not been, up until now, a truly professional piece of editing equipment designed to handle Super-8 film for double-system sound cutting.

The Super-8 console is so new that there was no literature or technical data available on it at *Photokina*. However, it looks almost identical to the Steenbeck Model ST 1600, and a company representative on the spot verified the fact that, except for its Super-8 picture format, the new machine is very similar in technical characteristics to its 16mm picture counterpart.



### ARRIVOX-TANDBERG Sync-sound Magnetic Tape Recorder Introduced

An important "first" at *Photokina* was the introduction of the new Arrivox-Tandberg portable battery-operated tape recorder, the result of a joint development in which both ARNOLD & RICHTER (manufacturers of Arriflex cameras) and TANDBERGS RADIO-FABRIKK of Norway combined their experience in the application and design of professional tape recorders for synchronous operation with motion picture cameras.

The new Arrivox-Tandberg recorder (described by an on-the-spot company representative as "an instrument of the highest quality, but in the middle price range") takes into consideration the special requirements of synchronous operation in combination with Arriflex cameras and functions with dry cells, accumulators, or with external power supplies. Other motion picture cameras equipped with Pilotone generator can, of course, also be used in conjunction with the Arrivox-Tandberg recorder.

ARRI and TANDBERG engineers have also put their heads together to create a special synchronizer for the

new recorder. The device operates on the indirect-control principle and makes possible the transfer of Pilotone recordings onto perforated tape with mains operation.

An important feature of this synchronizer is mains independent playback operation together with a battery-operated Arriflex camera equipped with Pilotone. In this mode of operation, the Arrivox-Tandberg recorder powers the synchronizer. When accumulators are used in the tape recorder, the synchronizer serves as battery charger.

A comprehensive report on the new Arrivox-Tandberg recorder and synchronizer will appear in an early issue of this journal.

### New Version of the PERFECTONE Model EP 6A II Recorder

Introduced at *Photokina* by PERFECTONE was a significantly redesigned version of its familiar Model EP 6A II 1/4-inch professional tape recorder. It is a silicon transistorized unit for portable and self-contained, cordless "lip sync" motion picture sound recording.

The tape deck unit, together with the controls and interconnections have not been modified but the electronics have been completely redesigned using the latest semiconductor techniques. The use of silicon transistors and diodes throughout has improved the performance especially for dynamic range and distortion, whilst at the same time providing increased temperature stability in severe climatic conditions.

The wide choice of pilot tone synchronisation together with the two mixable microphone inputs and 2 watt monitor/output amplifier makes the Perfectone EP 6A II S ideal as sound recorder for 16mm and 35mm films.

The new model is finished in a two-tone royal blue and light grey semi-matt enamel.

#### General Characteristics

Recording with 2 microphone inputs or 1 microphone and 1600 ohm line input.

Simultaneous recording and replay.

Recording of the audio on a central track 4.8mm wide leaving the 2 edge tracks for a separate synchronisation signal. This system allows a reduction of crosstalk between the synchro signal and audio modulation to better than 60 db.

Recording on a pulse head of an internal local or external pilot tone frequency, using the Perfectone system with two edge or centre tracks.

Pilot tone signal replay for control of the Synchro Tape synchroniser.

A possibility to fit an internal crystal oscillator 50, 100 or 60 Hz for recording a reference frequency. This system allows recording in perfect synchronisation with a crystal controlled camera without interconnection cables.

The possibility to connect the Perfectone Synchro Tape synchroniser for transfer onto perforated film and for synchronous playback.

Selection of the operating modes by means of a push button unit on the control panel.

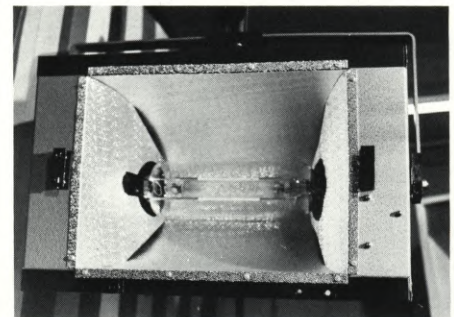
The motor speed is maintained at a strictly controlled speed by a centrifugal regulator and a transistor motor current switch.

Fast rewind by auxiliary motor. Tape spool diameter 12.8 cm (5").

Operating speed 19.05 cm/sec (7.5"). This being only professional standard for portable recorders.

Power supply using 12 1.5 V batteries or 12 rechargeable 1.2 V accumulators providing 18 V or 14.4 V respectively.

Operating time 12 hours for batteries 8 hours with rechargeable accumulators per charge.



### HALO 6000 Halogen Discharge Lamp

A compact, lightweight unit that gives a Brute arc a run for its money, the HALO 6000 represents a new development in the field of halogen discharge lamps.

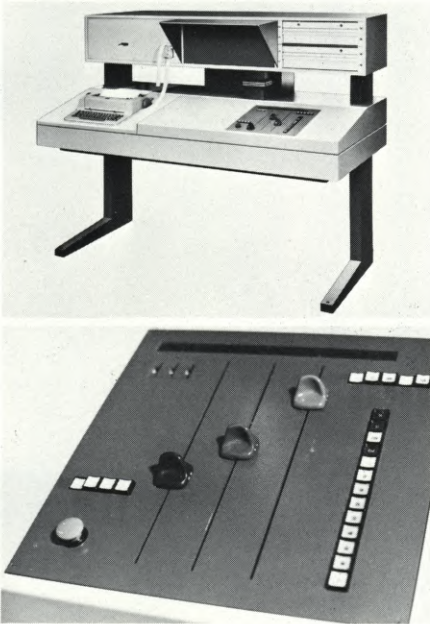
The luminaire itself weighs only 11 pounds and it has its own power supply

on wheels, weighing approximately 70 pounds. The dimensions of the housing are: Length—600mm, Height—360mm, Width—300mm.

Light output is 315,000 lumens, produced by three 500-watt lamps, and it has a daylight color temperature of 6000° Kelvin.

The ingoing current to power supply is 380 volts, 50 to 60 cycles. The light has an extremely broad angle of coverage—about 150°—and requires about three minutes to reach its maximum intensity and correct color temperature after being initially turned on. However, it does have an instant re-start characteristic—which means that it does not have to cool down before being re-started, as was necessary with mercury vapor lamps.

The HALO 6000 is produced by Profi-Color GmbH, 6 Frankfurt/Main, Schafheckstrasse 4, West Germany.



### ARRI Color Analyser

With the color analyser it is possible for the first time, to take all the factors influencing the printing process into consideration and to compensate the light values accordingly. Variables occurring during film development and printing, caused by film emulsion differences or the electronic image transfer—insofar as this process is used—are to a great extent eliminated with the ARRI color analyser.

### Film Material

In the ARRI color analyser, which is equipped with 600 m film flanges, 35mm, 16mm, and 4 x Super 8—positive or reversal film—can be used.

With negatives, a one-light test print or a two-frame print must be made.

### Construction

The ARRI color analyser can be supplied as basic unit, or as basic unit plus extension module. The entire electrical equipment is designed in plug-in modules. The analyser, which is fully transistorized with printed circuit boards, is immediately ready for operation without a long warm-up period. Calibration of the analyser is unnecessary due to a unique, built-in stabilization system.

### Function

The color and density corrections necessary for the printing of color films are accomplished by manual operation of the light control values for the primary colors blue, green, and red. Hereby, the spectral composition of the light can be varied in precise increments corresponding to the subjective impression of the illuminated color positive.

The image to be corrected is optically projected. It appears on a screen with a constant image area (for all widths except Super 8) of 164 x 226mm; with Super 8, the two middle images appear simultaneously on the ground glass screen; an illuminated surround facilitates ocular adaption for the operator; a reference image next to the screen facilitates color analysis.

### Light value information

The basic analyser shows, by means of numeral indicator tubes, the additive filter values corresponding to the printing steps 0,025 log E or, optionally, the subtractive filter values in 5% steps. The basic unit with extension module enables automatic recording of the established data. With the additive light determination, the color control head is connected to a tape punch. The completed perforated tapes can immediately be used for the control of Bell & Howell printing machines.

Subtractive filter values can be decoded by any printer with BCD input.

Perforated strip duplications and subsequent corrections are possible without complication.

Fades can be manually introduced.

Power supply of the unit: 115 or 220 V AC 50/60 Hz

Load requirement < 1 kW

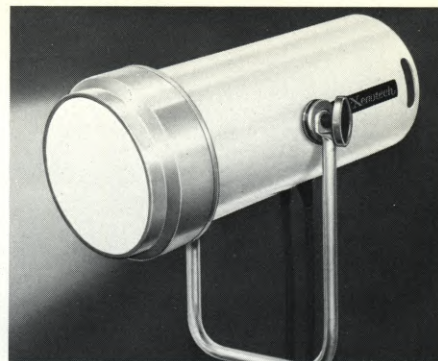
### Dimensions

#### Basic unit with extension module

Length: 72½"  
Width: 35½"  
Height: 55"

#### Basic unit only

45"  
35½"  
55"



### Xenotech Sunbrute

Although the Xenotech Sunbrute xenon lights were actually announced in April of this year and have since been field tested on several feature productions, *Photokina 1970* marked the official introduction of these unique lights to the trade.

The Model 4K Sunbrute, which was on display at the World Fair of Photography, produces a beam comparable in size and density to large carbon arc lights, provides 5950° Kelvin color temperature matching natural sunlight, stays constant over wide variations of input power, lasts for 1000 hours of operation, yet is so compact and lightweight that it can be carried easily from one location to another.

### DEBRIE Additive Lamphouse

ANDRÉ DEBRIE S.A. have designed a new additive lamphouse for colour film printing.

It has been initially conceived in a form adaptable to step printers of the TIPRO type but will eventually be available for all printers operating on the step principle.

The lamphouse uses the B.G.R. additive process. The incandescent light is divided by an interference filter unit into a blue, a green and a red beam. The intensity of each individual beam is modulated by an iris diaphragm controlled by a Bell and Howell type punched tape programme.

The form of the diaphragm is square and corresponds to the geometric shape of the printing aperture. The response of the system is completely compatible with the requirements of the step printing process. The optics are so designed as to ensure in all circumstances an even distribution of light over the whole surface of the image. As the complete beam of light passes through the aperture, there is no vignetting. In addition the surface coating of the lenses is to the mean wavelength of each colour band which ensures maximum light output.



# It Comes In 3hree Sizes

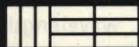
Our cloud comes in three standard sizes. Large, medium, and small, although custom clouds are quite common. Like the one we did that sits on the Pepsi Pavilion at Expo 70.

Our cloud is an official, non-polluting, pure water cloud. Just like the clouds in the sky.

Only you can turn it on or off. And up or down, changing it into a dense or shallow swirling fog. Plus it stays exactly where you want it. Through wind, rain or snow. Use over billboards, displays, for premieres and openings.

Use as projection screens for movies or advertising. Shine lights on it at night. Shoot lasers through it. Make cloud sculptures. Get lost in it. Our cloud is available now. Honest.

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## *Beaulieu* 16 B

THE AUTOMATIC 16mm  
REFLEX IN A CLASS BY  
ITSELF!

Available with Angenieux  
12-120mm F2.2 Auto. Lens  
**\$2067<sup>00</sup>**

Or with Angenieux  
12.5-75mm F2.2 Lens  
**\$1926<sup>00</sup>**

● Gossen light meter housed right in the reflex viewing system, measures light intensity coming directly through the lens. It electronically controls a miniaturized motor that instantly rotates the Angenieux lens's diaphragm ring to the correct aperture setting.

● 45° angled mirrored shutter eliminates the need for a prism between the lens and the film plane. This reciprocating shutter alternately directs 100% of the light onto the film or 100% of the light onto the reflex viewfinder screen.

● Weighs 10½ lbs. when equipped with 200-ft. daylight-load magazine, sync pulse generator, Angenieux 17-68mm zoom F2 lens, and 500MA nickel-cadmium battery.

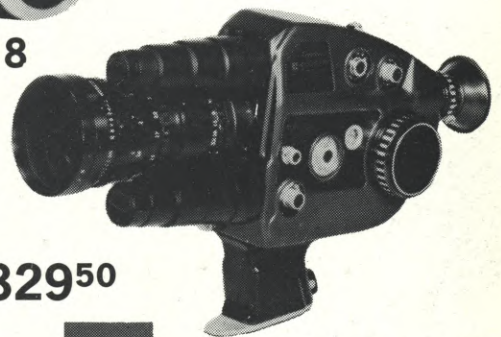
● Powered by a rechargeable nickel-cadmium battery that is built into the camera handgrip. A fully recharged spare can be installed in seconds.

● Variable film speeds anywhere between 2 and 64 fps plus single frame shooting. Remote control by cable or radio. Viewfinder eye piece adjustable to individual eye sight.

### We also carry the *Beaulieu* 4008ZM Super 8


● Motorized zoom lens has infinite number of speeds between 2 and 12 seconds. Macro focusing as close as one millimeter from subject. Filming speeds between 2 and 70 fps. Big, bright viewfinder has 27X magnification. Built in Gossen meter for automatic exposure control. F1.9 automatic 8-64 power zoom Angenieux lens. Variable shutter. Lens interchangeability.

**\$829<sup>50</sup>**



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# ON LOCATION WITH "Fiddler on the Roof"

A roving editor roves far afield to observe filming  
of the most popular world-wide stage musical of all time

By HERB A. LIGHTMAN

## Zagreb, Yugoslavia

It is early evening when the jet touches down at the Zagreb airport. Waiting for me is "FIDDLER ON THE ROOF" unit publicist Quinn Donoghue. My luggage is loaded into his car and he asks: "Do you want to check into your hotel first or go straight out to the location?"

The company is on a night shooting schedule and has already been at it this

evening for a couple of hours prior to my arrival. I don't want to miss a minute of it, so I tell him: "Let's go straight to the location. I can register at the hotel in the morning, when they've finished shooting."

Then begins a drive of 30 miles or so through the Yugoslav countryside past neat farms and villages, heading toward the location where the most popular

stage musical of all time is being painstakingly transferred to film by an expert and dedicated international crew.

The genesis of my presence here was a casual remark made to me in London a few days ago by David Samuelson: "Why don't you pop over to Yugoslavia and have a look at what Ossie is doing with 'FIDDLER'? I'm told he's getting some extraordinary footage."

(LEFT) The mythical village of Anatevka, as constructed on location in the countryside near Zagreb. (CENTER) Outside a Yugoslav cottage, used as exterior set and location Production Office, an actor is given a wardrobe fitting. (RIGHT) Camera rehearsal for a "magic hour" sequence in which the villagers leave their homes to attend a wedding ceremony.



"Ossie"—as almost everyone in the film industry knows—is famed British cinematographer Oswald Morris, BSC, whose long list of credits as Director of Photography includes such gems as "MOBY DICK", "MOULIN ROUGE", "REFLECTIONS IN A GOLDEN EYE", "THE TAMING OF THE SHREW", "OLIVER!", the most recent version of "GOODBYE MR. CHIPS" and the currently-in-release "SCROOGE".

I have long been an admirer of his artistry, not only as a cameraman, but as an *innovator*. He has never hesitated to stick his neck out to experiment in quest of new and unique ways to tell a story on the screen—which is why I am not at all surprised to hear that he is shooting all of "FIDDLER" through a brown silk stocking.

Somehow, during my many trips to England I have just missed meeting him personally—mainly because he has always been off on some distant location shooting something or other. This time I decided to remedy the situation by journeying directly to the location. An exchange of cables brings a warm invitation from Director Norman Jewison, whom I know from Hollywood, as well as from Ossie himself. Without further ado, I "pop over" to Yugoslavia—and here I am, driving through the night toward a village that never existed, except to the 30,000,000 people in 20 countries who have seen this hit musical on the stage.

#### Just South of Anywhere

The locale of "FIDDLER ON THE ROOF" is a small village in the Russian Ukraine called Anatevka, which, according to the program notes, is located "just south of anywhere." The period is 1905.

The rolling countryside outside Zagreb was chosen as the location filming site of Anatevka for a number of reasons. After an exhaustive, 4,000-mile location scouting trip which explored villages in Austria, Canada, Rumania and Yugoslavia, it was decided that the primitive towns of Lakenik and Mala Gorica had an inherent Chagall-like style



Chaim Topol, star of "FIDDLER ON THE ROOF", engages in a bit of blowzy horseplay with his somewhat long-in-the-tooth future son-in-law (played by Paul Mann) in front of the village tavern. The long-running stage hit musical is being filmed in two actual hamlets, doubling for the mythical village of Anatevka, and located about 30 miles from Zagreb, Yugoslavia.

that blended with the design of the film and the intent of the original story's author, Sholom Aleichem. Other secondary reasons include the experience of Yugoslav film craftsmen and the availability in not-too-faraway Zagreb of comfortable accommodations for the cast and crew.

The cinematic Anatevka (actually two small villages combined, through the magic of film editing, into one) is a hybrid creation. Some of the buildings, dating from the last century, are just as they were when the film crew arrived and have been left that way. Others have had false fronts added onto them. Still others have been built from scratch out of lumber that arrived as logs and had to be transformed into planking by local carpenters using old-fashioned chain saws and adzes.

Production designer Robert Boyle collected so much material he felt he could recreate the smell as well as the mood and touch of a village like Anatevka. Just to be sure, in his design for a small synagogue he collected over 100 plans of synagogues from the Ukraine. Many of the additional houses constructed near Zagreb are not made of new-treated wood, but wood taken from now-dilapidated homes that would have



"FIDDLER" Director of Photography (known in England as "Lighting Cameraman") Oswald Morris, BSC, lines up an angle with his favorite Panavision Reflex camera, the same he used in photographing "SCROOGE".

(LEFT) Director Norman Jewison and Cinematographer Morris discuss the filming of a "magic hour" scene on a Yugoslav country road near Zagreb. (CENTER) The director checks the scene through the viewfinder for playback filming of the "To Life!" musical number. (RIGHT) Panavision Silent Reflex camera on a crab dolly moves in for closer angle during shooting of musical sequence.





Inside a peasant cottage between camera set-ups, famed Israeli actor Chaim Topol, star of "FIDDLER ON THE ROOF", joins the inhabitants in singing local folk songs. The slightly anachronistic ski parka which he is wearing serves as protection against the bitter cold which prevailed during night shooting on the location.

existed at the same time Anatevka ceased to exist.

Down the road a piece, and in sharp contrast to the antique village, there rises a huge, white plastic, futuristic dome. It resembles a giant, marooned flying saucer, but is actually a pressur-

ized "portable" stage, erected to house the interior cover sets.

#### Another Time, Another Place

When we draw near to the location site, the car is parked at the side of a dirt road lined with trees. We grope our

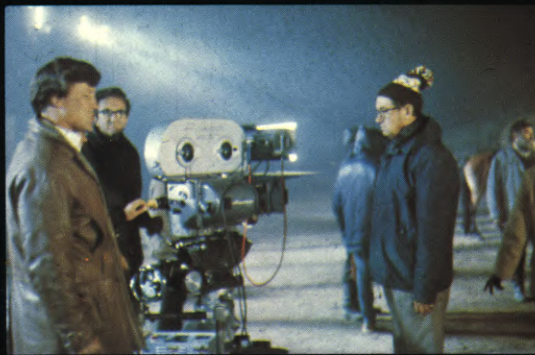
way through the moonless, jet-black night. And then, suddenly, there it is—the village of Anatevka—straight out of a painting by Marc Chagall and looking as though it had been there, slowly falling down, for centuries.

Just now the marketplace is ablaze with light emanating from a dozen or more arcs mounted atop towering parallels. The squawk of the playback is heard, as the company films segments for one of the musical numbers, the song called "To Life".

The scene they are shooting involves Topol, the wonderfully talented Israeli star, who scored such a resounding success when he played the lead role on the London stage—and Paul Mann, who plays his overage future son-in-law. Slightly tipsy already, they are romping through the village on their way to the pub to continue their celebration of the forthcoming wedding.

The scene is not an easy one to shoot. The Panavision camera, mounted on a small dolly, picks up the revelers as they come swinging, arm in arm, around a corner and then scurries ahead of them as they go loping down a grade that falls away at an angle of at least 30 degrees. Two brawny grips have all they can do to stop the heavy camera and

(LEFT) Outside the village tavern, a slightly tipsy Tevya and his overage future son-in-law celebrate the wedding-to-be. (CENTER) Director of Photography Morris discusses placement of the Panavision Reflex Camera for the next set-up with his crew. (RIGHT) Camera is set on a low parallel for filming of night-for-night shot in the village.



(LEFT) Morris checks light balance with his viewing glass prior to filming of "magic hour" sequence. (CENTER) Topol plays a man much older than his actual age in famed musical. His good humor prevailed despite this costume and intense cold of the night locations. (RIGHT) Morris takes precise light readings and uses hand signals to direct electricians tending Brute arcs atop high parallels.

Villagers carrying candles on way to the wedding are filmed at the "magic hour" just after sundown, when there is still enough light to pick up detail, but not enough to overwhelm candle flames.





Anatevka's village square is the film's main locale and the scene of much roistering about among the villagers. Some buildings were left as they actually existed—others were altered to the period by means of false fronts.



(LEFT) Topol as Tevya, the village milkman, drives his little milk cart as he makes his rounds. (CENTER) The women of the village pause in the square for their daily exchange of gossip. (RIGHT) Interior of the synagogue, designed authentically by Production Designer Robert Boyle after he had studied more than 100 plans for such buildings from the Ukraine.



(LEFT) Existing buildings at the location, with the inhabitants still living in them, are used as exterior sets, with false fronts added in some cases. (CENTER) Topol performs one of the many spirited musical numbers in the film. (RIGHT) Crew sets up the Panavision camera in a nearby field.



dolly at *all*, let alone smoothly, as it nears the end of the run. One slip and the whole thing could end up in Transylvania.

However, the scene goes off without a hitch and the company breaks for the next set-up. In the interval, I am greeted by Director Jewison and introduced to Ossie Morris. He is one of those genuinely warm human beings who, without at all trying, makes you feel instantly as though you've known him forever. He has the underplayed countenance of an English headmaster, but this impression is immediately dispelled by the wildly colored knit hat, with pom-pom, that sticks straight up off his head. I had been told in advance about Ossie's collection of colorful headgear, a sort of trademark which he wears, I should imagine, to show that he doesn't take himself too seriously and also to provide a bit of innocent merriment on the set. At any rate, he carries it off with a really elegant degree of dash.

Ossie is called away to supervise the next set-up and, in the meantime, I have a chance to talk with Norman Jewison, whom I haven't seen since he was directing "GAILY, GAILY" on the sound stages of the Samuel Goldwyn

Studios in Hollywood. Because I am aware that, during his earlier career as a live television director, he was considered something of a specialist at staging musical programs, I am a bit curious as to why he has never made a musical feature film until now, and I ask him about it.

"I've been trying to stay away from musicals on film because, to me, this is a very difficult form to handle in the cinema medium," he replies. "Musical comedy belongs, essentially, to the stage. There's a certain *reality* about film, but it becomes very artificial the

Continued on Page 1210

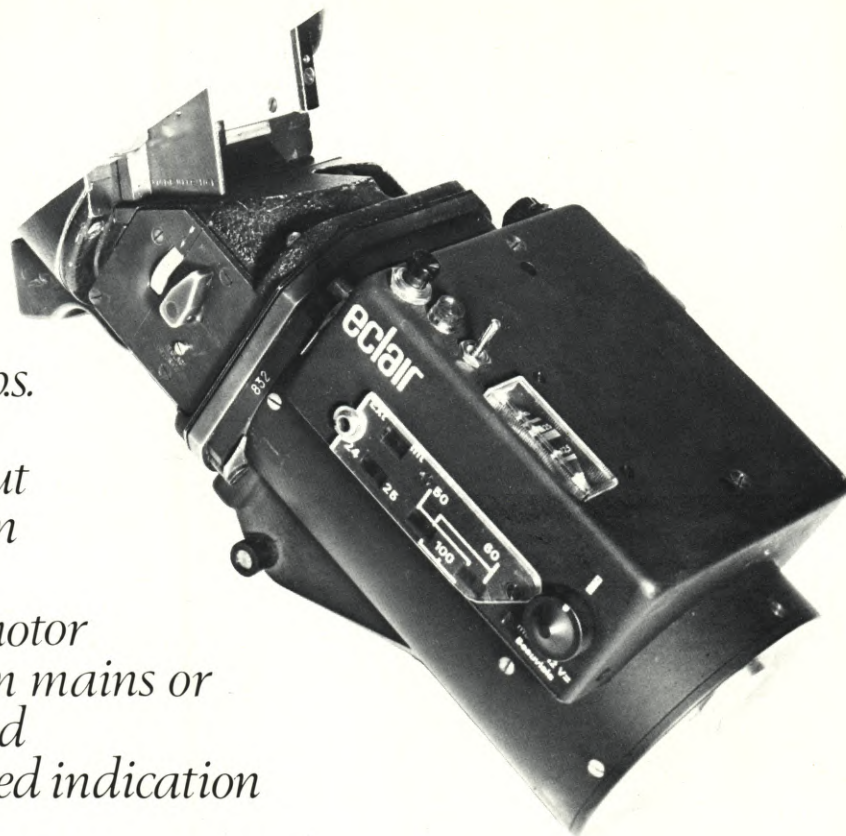
Technician, working inside sound truck, runs Nagra recorder on location. Most of the action observed by the author was the filming of musical numbers which entailed the use of playback apparatus. Sound crew tries for clean original dialogue tracks on location to hold post-synchronization to a minimum.



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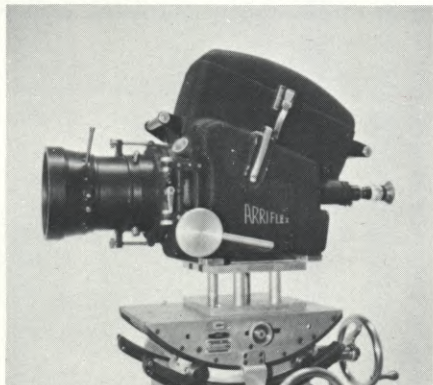
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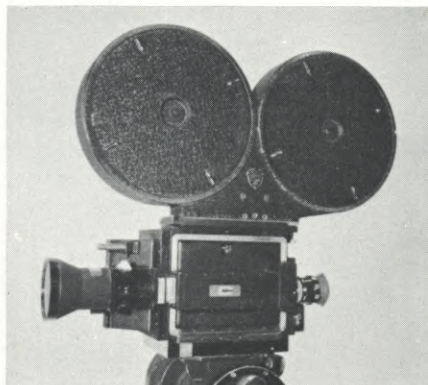
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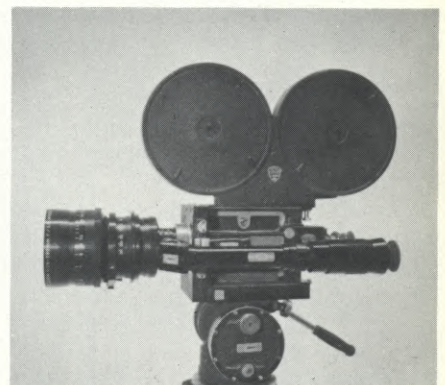
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## "FIDDLER ON THE ROOF"

Continued from Page 1207

moment everything stops and people begin to sing and a big orchestra begins to play. Reality disappears and it turns into purely an entertainment form. Outside of 'THE WIZARD OF OZ' and a very few others, there are not very many musicals which I've felt were really successful as *films*."

"I'm inclined to agree with you," I tell him, "but since you feel that way, what makes you brave enough to tackle something like 'FIDDLER ON THE ROOF'?"

He laughs. "Now that I've shot down the musical film form, that *is* a fair question. I think it's because I don't really regard 'FIDDLER' as a musical comedy. To me the strength is in the story, which I regard as a classic. The music is probably as well integrated as it

out with Ossie Morris prior to the start of filming.

"Well, we had an opportunity to spend some time together in England and also here in Yugoslavia, long before actual shooting began—and, of course, that kind of communication between a director and his cameraman can't help but pay off," he tells me. "We were searching for a distinctive visual style to use in this picture. We're shooting in Panavision and, frankly, the Panavision lenses are almost too sharp for my tastes—especially when the story is not contemporary. Modern life is perceived sharply, but the moment you move into a period it becomes, somehow, faded and a bit hazy. Your references to it are through old photographs and books and things. You don't see it quite as clearly as you see life today.

"Since the period of our story is pre-revolutionary Russia, just after the

films, this picture calls for a simplified camera approach and I'm trying to keep it that way. So, every time I start to lean on a zoom, or lift at the end of a number, or do something else tricky with the camera, Ossie sort of tugs me by the coat-tail and says, 'Remember what you told me.'

"I think—and hope—that we're achieving a very nice visual style, a look that's peculiar to this picture. We've taken out all the primary colors. There are no reds, blues, yellows or whites. We've gotten into earth tones for all of the costuming and sets—so, the picture is going to have a rather rich, earthy feeling—almost a black and white feeling, but in color."

He tells me that on this project he has been introduced to a few technical tools that are new to him and very useful, most notably the Panafocal lens, which he describes as a "marvelous



(LEFT) The mythical village of Anatevka, ablaze with light provided by a bank of Brute arcs on high parallels, shown during night shooting. Though Morris favors these large units for illuminating vast areas, he is gradually moving toward smaller, more compact quartz units for other types of shooting. (RIGHT) The fog begins to envelope the chill Yugoslav night, making it necessary to avoid camera angles in which the beams of the lights would be noticeable.

is in 'PORGY AND BESS' and, for that reason, I consider it to be more of a folk opera than a musical comedy, where everybody in the village suddenly starts to dance. I've cut down the choreography tremendously. The only dancing that appears in the film now is the kind that would naturally happen in life, such as at a wedding, or when men get drunk together. I love the music in this show. I grew up on musicals when I worked in television, and I think they're marvelous in the television form. I did nothing *but* musicals before I went into film, but this is my first professional contact with music in nine years. It's kind of good to get back to it."

I ask him about his visual approach to the picture in terms of camera, and to what extent he was able to work this

turn of the century, Ossie decided to shoot everything through a brownish gauze—a silk stocking, as a matter of fact. I think he must have looked at many ladies' legs before he finally came up with the right shade of brown.

"Outside of that, we are attempting to keep the camerawork very simple. I want the audience not to be aware of camera. A musical tends to force you to fall into the use of a lot of lifts and moves and crane shots and punctuations with the music—all of which seem very slick and very neat and very exciting on the set. But when you cut them together, you find that they have nothing whatsoever to do with advancing the story. Unlike 'THE THOMAS CROWN AFFAIR' (which was very high-styled cinematically) and some of my other

crutch" because it helps him keep compositions trimmed up without having to move the camera.

"We can slide in without the audience being aware of it and, thereby, keep the frame full," he explains. "You always have that problem when working with the anamorphic aspect ratio. It's a very unusual shape and not the easiest for a director to work with when he's trying to stage action gracefully and keep the frame full at all times. Being able to zoom within the short range of 50mm to 95mm with the Panafocal lens has been a great help to me in this respect."

As we have been talking, the Yugoslav night has grown very cold (34 degrees Fahrenheit, I'm later to discover), but the crew doesn't seem to mind





(LEFT) With the heavy Panavision Silent Reflex camera dollying down a grade of at least 30 degrees, a brace of strong grips is required to keep the rig from rolling clear to Transylvania. (RIGHT) A plywood base is laid over the turf to provide a smooth track for the crab dolly. (BELOW RIGHT) Director of Photography Morris exposes a gray scale chart on the end of a role for laboratory control purposes.

it at all. There is no grumbling or griping or slowing down. The crew members go about their tasks briskly, efficiently and with a certain easy good humor. They seem totally dedicated to what they're doing and I remark that it's refreshing to see technicians from at least three different countries working together so harmoniously.

"I really think this is one of the finest crews I've ever worked with," says Jewison. "The Yugoslavs are very hard workers and they are functioning beautifully in combination with the American and English technicians. We've been lucky enough to have our choice of the best people. Also, it's a great thrill for me to be working with Ossie Morris, because I've admired his work ever since he crossed new frontiers with 'MOULIN ROUGE', 'MOBY DICK' and some of his other films."

Despite the inevitable vagaries of the weather, filming has been proceeding on schedule, but there are several more weeks of location shooting yet to be done. In the final sequence of the picture, the villagers are forced by edict

of the Tzar to leave Anatevka. The procession wends its way from the familiar surroundings, with the village people headed toward eventual dispersion to Poland, America and Israel, with all of their belongings heaped on carts. Jewison sees all of this happening most poignantly against a background of forlorn, snow-covered countryside and he is hoping the snow will oblige by appearing on schedule.

When location shooting in Yugoslavia is completed, the company will move to London for several more weeks of filming on the sound stages of Pinewood Studios. The schedule will include interiors, plus elaborate production numbers such as the "To Life" ballet and a stylized dream sequence.

I ask the director when "FIDDLER" is scheduled for release and he tells me the date is approximately November 1st, 1971.

"But that doesn't give us too much time," he adds. "We won't finish shooting until some time in January and there will still be a lot of dubbing and scoring

Continued on Page 1222



(LEFT) With the camera on a crab dolly, a scene is filmed in which Tevye, played by Topol, and his future son-in-law roister about in front of the tavern. (RIGHT) Slightly tipsy revelers help a "smashed" buddy down the steps of the tavern. The small villages used for exterior sets still had the actual inhabitants living inside their cottages, and they gathered in fascinated groups each night to watch the shooting.

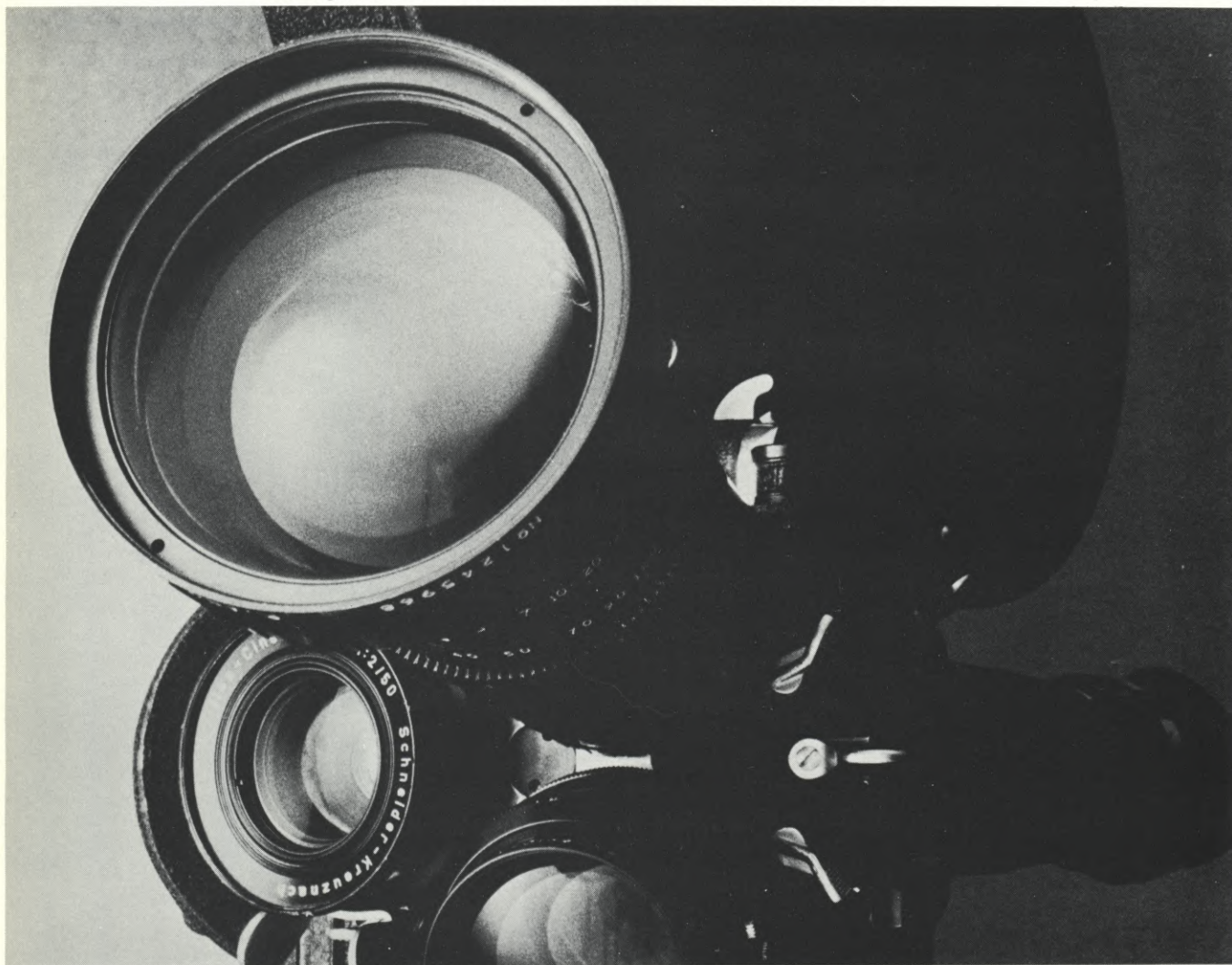


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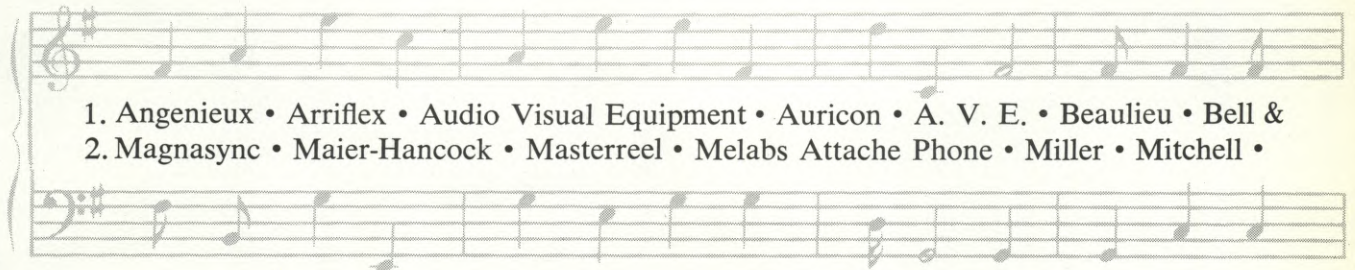
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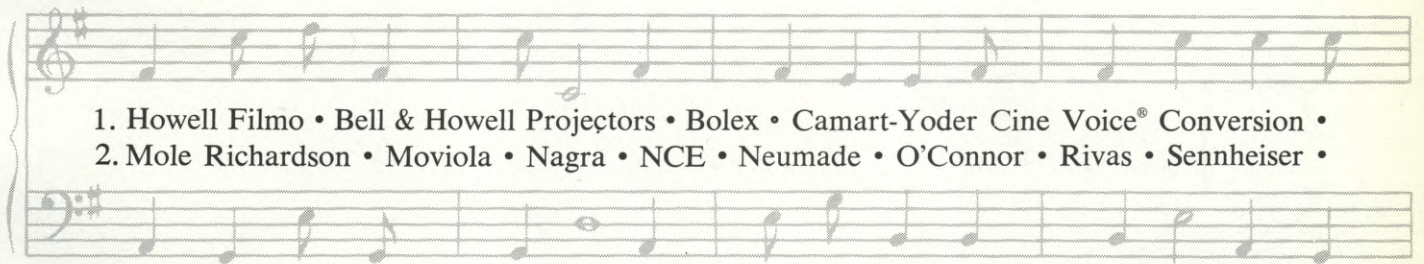
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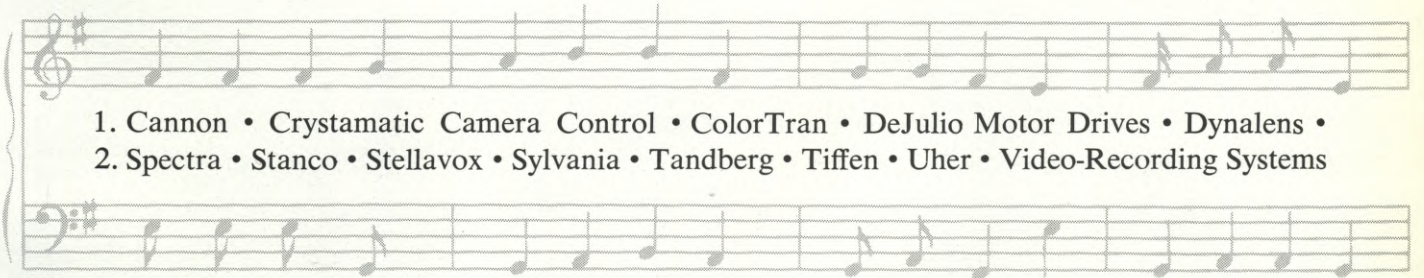
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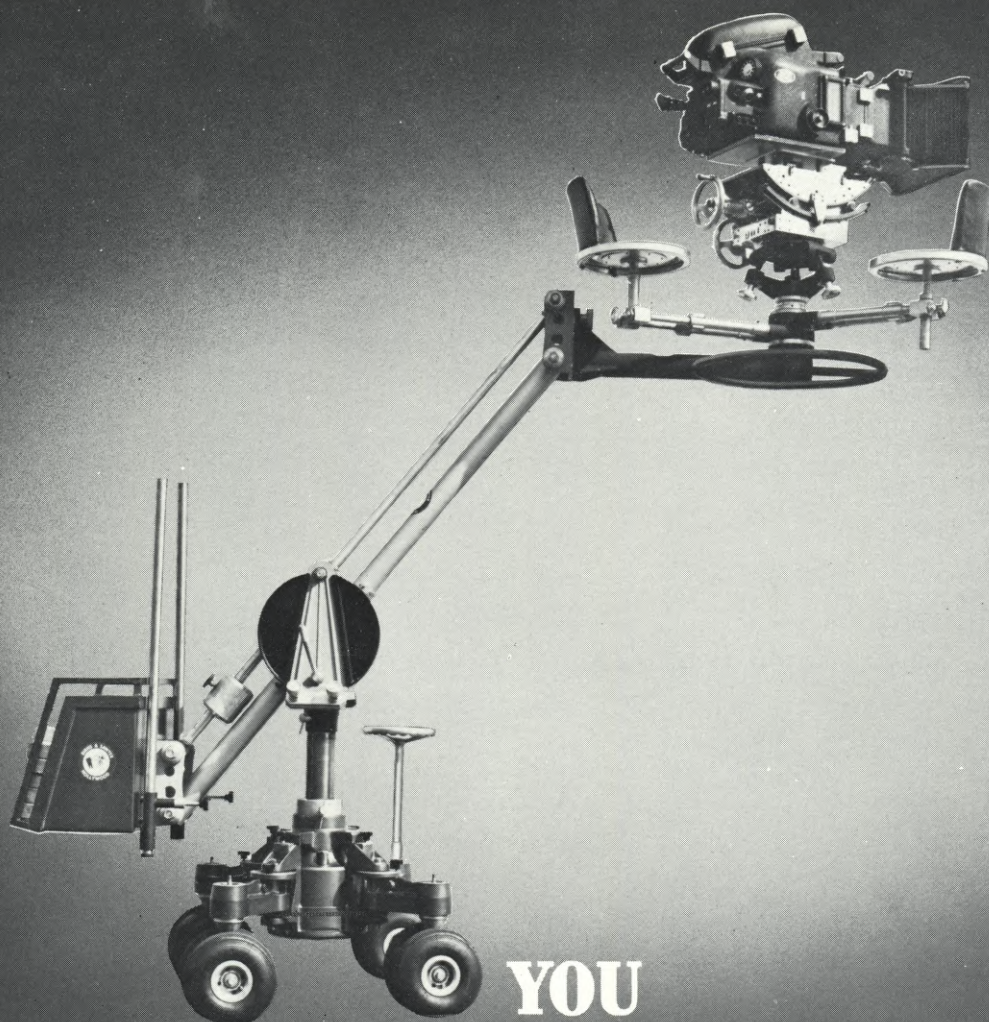


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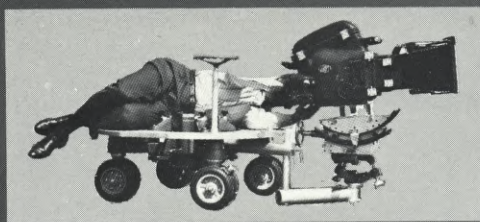
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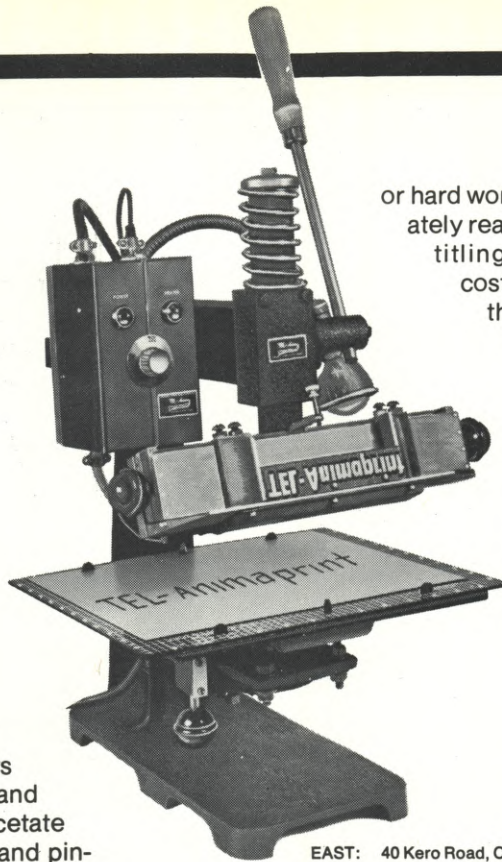


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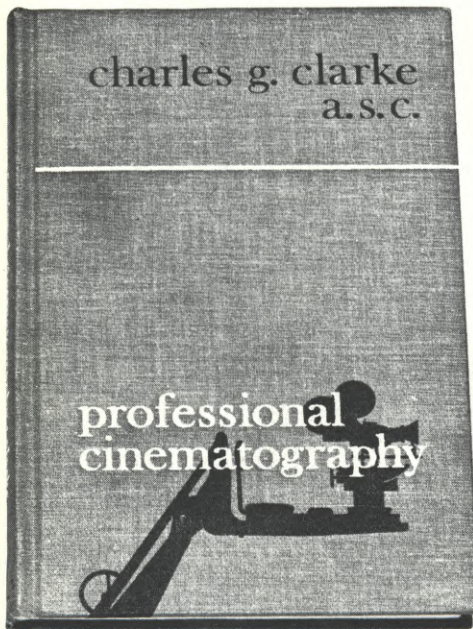
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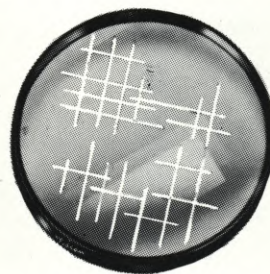
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Excerpt from "The 'Take One' Challenge of Filming Woodstock" by Michael Wadleigh, Director; October 1970 issue of American Cinematographer.

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## WHAT'S NEW

Continued from page 1154

the camera, as well as a film notcher for locating start and end of run. Precision film transport mechanisms position the film accurately within .001". These film movements are interchangeable and are available in 16mm single or double perf, 35mm EK or BH perf and 46mm perforated versions for both slide and filmstrip formats. A rotary shutter gives 1/4 second exposure with automatic timer control to 15 seconds. Forward and reverse film advance is independent of shutter, and interchangeable slide-in apertures are provided for full or half frame formats. The lens is a 55mm f3.5 Micro-Nikkor, having a preset diaphragm feature. The diaphragm opens for full illumination when viewing and stops down to set position when shooting. The camera is also supplied with individual 400 ft. magazines for feed and take-up. All controls are located on a single control panel, mounted for maximum operator efficiency.

The copy stand has an overall height of 10 ft. which is sufficient to copy material up to 48 inches wide. Two 500 watt quartz-iodine top lights mounted from the rear of the stand give even illumination over the 4 ft. table area. A 1,000 watt quartz-iodine lamp is used for copying transparencies up to 14 inches in size. All copy lights are controlled from the panel through an automatic dimming circuit. An automatic focus mechanism maintains critical focus of the lens while moving the camera up or down on the column.

Animation capabilities can be provided by the installation on a variable shutter for dissolves and fades and a compound with peg tracks, hand cranks, and a platen.

### PARK GRAPHIC LTD. TO DISTRIBUTE MOTOROLA EVR TELEPLAYERS AND PROGRAMS IN CANADA

Motorola Systems Inc., Chicago, has named Park Graphic Ltd., one of the Montreal-based Bellevue-Pathe group of companies, to distribute in Canada the EVR (Electronic Video Recording) Teleplayer manufactured by Motorola.

The agreement was announced jointly by Harold Greenberg, president of Bellevue-Pathe, and Lloyd Singer, vice president and director of Education and Training Products, Motorola Systems Inc.

EVR, a trademark of CBS, was devel-

**Cinema Research**  
CORPORATION



oped by CBS Laboratories as a system for playback of pre-recorded, cartridge film programs over any standard television set or closed circuit system. Motorola has the exclusive license for the manufacture and marketing in the United States and Canada of the Teleplayer through which the programs are played.

Singer said the agreement is a multi-million dollar deal for the acquisition of and exchange of rights to convert and market programs in the EVR format, as well as the Canadian distribution of the players.

"The agreement represents an outstanding opportunity for Canadian producers to expand distribution of their programs," Singer said.

Motorola earlier announced its intention to develop and market prerecorded EVR programs as well as the Teleplayer. The company plans to offer related groupings of programs in the EVR format to specific markets, such as hospitals, hotels and motels, educational institutions and public safety agencies.

Park Graphic and other Bellevue-Pathe companies form the largest Canadian-owned diversified photographic firm in Canada with extensive film making, production, and distribution capabilities.

Quantity deliveries of the Teleplayer into Canada will begin in October. Park Graphic's marketing plans call for assembly of total packages of EVR cartridges and players for educational and training interests across Canada.

Greenberg said, "We feel that our participation along with CBS and Motorola in the development of EVR in Canada will allow maximum penetration in all markets in the shortest period of time. Our facilities will allow Canadians to contribute quality programming and talent for eventual EVR distribution around the world."

With the EVR system, a special low-cost film packaged in a seven-inch cartridge is played through the playback unit which is connected directly to the antenna terminals of a television set. The cartridge is placed in the player—like a record on a phonograph, and the images on the film are picked up and converted to video and audio signals by an electronic scanner.

The EVR system offers ease of operation, a higher density of information storage for the amount of space used than any other audio-visual medium, and better economics than videotape or any other existing system.

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## MITCHELL SERVOZOOM

Continued from Page 1184

thumb control and adjustable stops permit instant, smooth attainment of pre-established zoom rate and range. This unit is "human engineered" to fit either hand comfortably and is equipped with 6-foot coil cord for remote actuation.

### ZOOM MOTOR

Closed loop servo feedback operates through reliable solid state circuitry to assure precise torque control of the DC motor with integral tach-generator. Maintains unvarying adherence to preset speed on zoom-out and zoom-in. Quiet toothed belt drive and removable shroud fulfill sound stage acoustic requirements. Universal mount with removable inserts fits different lenses and also allows for mounting of optional follow-focus drive shaft assembly.

### SERVOZOOM BATTERY PACK

Drop-in NiCad Battery Pack contained in sealed, thin-walled cast housing makes automatic contact through recessed gold plated contacts. Quarter-turn lock retains pack in console. Battery life is sufficient for one half-hour of normal zoom lens operation. Recharge time for a flat battery is approximately 8 hours. Weight, 29 oz. Part No. 125-G-323

### SERVOZOOM BATTERY CHARGER

This advanced design contains solid state circuitry, automatic input voltage compensation which maintains constant charging rate, and automatic transfer from fast to trickle charge mode. Output current is voltage limited and short circuit protected. Red and green lights indicate fast or trickle charge in progress. Internally adjustable for 115 or 220 VAC line input. Weight, 24 oz. Part No. 125-B-324

SERVOZOOM offers exceptionally smooth starting and stopping in either direction, as pneumatically cushioned electronic stops eliminate human error. Push the thumb button to start and a servo feedback circuit maintains unvarying zoom speed. When a preset stop is reached, the lens halts automatically—whether programmed for full or partial travel. This automatic control requires no attention and, therefore, does not distract the operator from concentrating on his main job.

The unit is capable of actuating an Angenieux 10 x 25mm lens throughout its complete zoom range in as little as one second or as long as two minutes . . . without vibration or objectionable sound generation.

## CINEMA WORKSHOP

Continued from Page 1164

which makes it very difficult to establish the proper filter combination. Furthermore, if one part of the area is illuminated with one type of lamp and the remaining area by another, the color balance will shift as one pans across the two areas. Last, assuming the proper filter combination can be established, the filter factor can be as high as two or more stops, which in many cases renders filming impossible.

There is one last alternative; there exists on the market two so-called fluorescent filters. One is the Optivision Company's Sing-Ray Filter and the other is Tiffen's "FL-B" and "FL-D". The performance of these filters is similar. The manufacturers have attempted to come up with a compromise filter combination that will render decent results with almost any type of fluorescent tube. To the delight of all documentary cameramen they have succeeded to a large extent. These filters will compensate for almost all types of tubes and mixtures of tubes, and combinations of fluorescent and small amounts of daylight or tungsten. In many cases the results are right-on, while in others, a slight color discrepancy is apparent. Most important, however, the results are almost always balanceable; that is, close enough so that most labs will have no trouble in correcting.

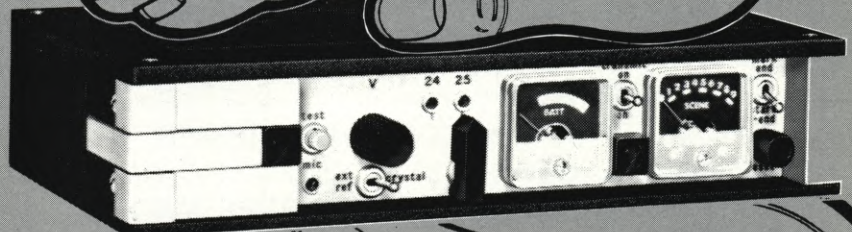
In summary, even though fluorescent light may look "white" to the eye, due to its color inconsistencies, the results on film can be a psychedelic nightmare. If fluorescent illumination cannot be avoided, some type of filter compensation must be employed and due to its unpredictable nature, a film test is recommended whenever practical. ■

### SPECTRA FILM-BALANCED THREE-COLOR METER

A new instrument to assist the photographer and the lighting man in obtaining correct color balance has been announced by the Photo Research Corporation. The new *Spectra Film-Balanced Three-Color Color-Temperature Meter* "sees light just as the film does," and reads-out in either color temperature or color-balancing filters. A successful test program conducted by the impartial Motion Picture and Television Research Center of Hollywood was described in a paper given at the recent S.M.P.T.E. Convention in New York.

For additional information, contact: Photo Research Corp., Division of Kollmorgen Corporation, 3000 North Hollywood Way, Burbank, California 91502.

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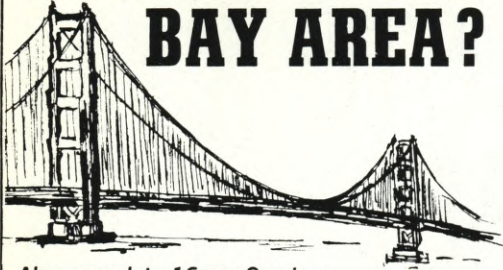
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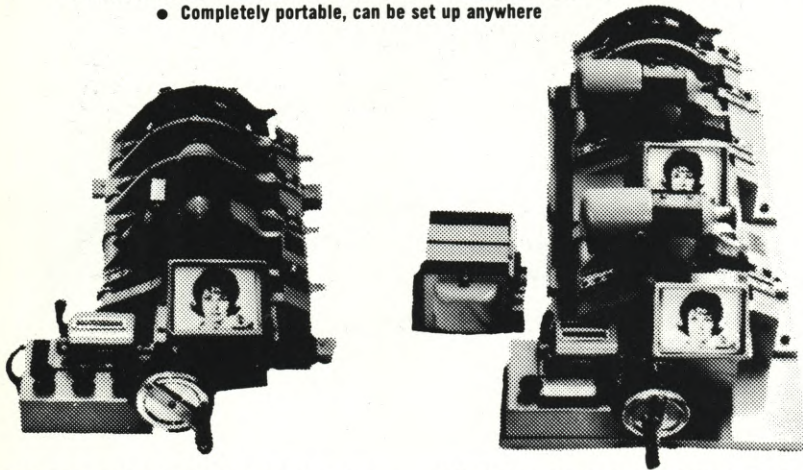
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## "FIDDLER ON THE ROOF"

Continued from Page 1211

to be done. We won't have a very long editing period, which is unfortunate because I'm notoriously slow in that area. We have two editors on the film and they have been doing some rough cutting. I tried to edit a sequence last week and just couldn't do it. I find that it distracts me too much, so I'd much prefer to finish shooting the picture and tackle the fine editing afterward."

In view of the hue and cry being raised in certain quarters relative to so-called "runaway" production, I ask him if, in his opinion the advantages of shooting in a distant location such as this outweigh the extra time, trouble and expense involved.

"Absolutely!" says he, most emphatically. "In trying to recreate the world of Sholem Aleichem and bring it to life, it would have been doing him and the property a great injustice had we not searched all over Europe to find exactly the right settings, the right villages, the right atmosphere and the Chagall-like quality that the film must have. We've come as close to it as possible right here, without actually going into the Ukraine. I just didn't want to start negotiating with the Russians again. I went through all that when we were filming 'THE RUSSIANS ARE COMING!' and after a year of negotiations, they said, 'Not this year.' I think we have found a really remarkable setting right here in Yugoslavia. We all feel that we are very close to the way life was lived in such a village at the turn of the century. It's inspiring to the actors and stimulating to all of us."

### Of the Earthy—Earthy . . .

Dinner break is called around 9:30 p.m. We wend our way up the hill, through the village of Anatevka to a clearing behind the synagogue where two large commissary tents have been set up and food is being served from mobile catering kitchens. It is good, wholesome country fare—the kind that "sticks to your ribs"—and very welcome on a near-Arctic Yugoslav night such as this.

I eat dinner with Ossie Morris and his crew, which gives us a chance to talk about the photographic aspects of shooting "FIDDLER".

"Norman Jewison and I had long discussions before we started this film as to how we would like it to take shape visually," he tells me. "I had never met him before, or he me—so we were two strangers, you might say. We had to break this barrier down and I think

we've done so very successfully.

"From our first meeting we were both in complete agreement as to how the film should look. The only problem was how to *get* that look. We made a series of tests and experiments, some of which were successful and some not. We were trying to create an unusual style. On each new picture I try to think of something different to do, because I feel it's much more exciting if one can think of a new idea, a new approach. I believe we've managed it on this picture, but we'll have to wait and see if anyone else agrees on that."

I ask him what governed the choice of photographic style and specifically what mechanics have been employed to achieve it.

"We've wanted to get that sort of earthy feeling of the land into this picture," he replies. "The families portrayed live so close to the soil that it's unbelievable—as, indeed, the families right here on the Yugoslav countryside do. I mean, if there is a failure with the harvest, or something like that, it really is disastrous. We've been trying to get that feeling into the picture, without letting it look dull.

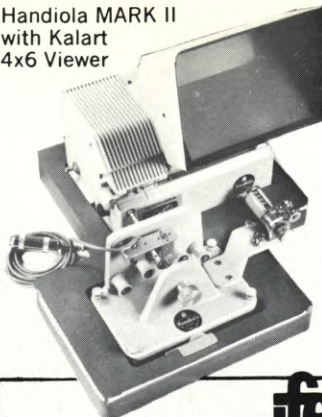
"One must never lose sight of the fact that we are making a *musical* and that there are certain pre-sold formulas which musicals are expected to follow. This I understand perfectly. However, that doesn't mean that one can't try for something a little bit different. In this case, we're attempting to combine the requirements of the musical film form with an absolutely honest realism based on the lives of these people.

"I suppose I could sum it up more simply by saying that both Norman and I would like to feel that the members of Tevya's family—the people portrayed in the story—are really making this picture themselves. They've bought a small camera, and they've probably got a little cart they can use for making simple dolly and tracking shots. They wouldn't have a zoom lens—I shouldn't imagine they could afford one—but they would keep things basically simple and very honest, because they'd know no other way of approaching it. Since it's their lives we're depicting, we've tried to use the same approach and I think, that within that context, we're getting something quite exciting."

I have to stretch my imagination a bit to visualize someone making a home movie with a Panavision Silent Reflex camera, but, despite the anachronism, I do grasp the analogy and appreciate the aura which he is attempting to create by means of his photography.

Continued on Page 1226

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## COOKE VAROTAL ZOOM LENS

Continued from Page 1185

changes of temperature and humidity.

If you've wanted to fog, filter or use matt boxes in the past you've been confronted with the problem that the front element has had to move as you focused on different distances. The matt box and filters have had to be spaced from the front of the lens—and at wide angles they've had to be unreasonably large. On the Cooke Varotal the front element is stationary so you can position these accessories actually in contact with the front of the lens. Another benefit of the Cooke Varotal's fixed front element—there's no pumping action, no tendency to suck in humid air and dirt.

It's now accepted that zoom lenses with a specification which permits close working can be used more effectively on reflex viewfinder cameras. The design provides an optical back focal distance for all known cameras of this type.

The Cooke Varotal can be provided with smooth manual, servo or motorised controls for zoom and focus. All three types of control will be completely silent. To avoid impairing the optical as well as the mechanical function of the lens we've tackled the problems of clamping accessory controls to the lens barrel. We've simply said there will be no question of clamping and we've provided tight tolerance diameters, tapped holes and incorporated built-in gear rings.

The Taylor Hobson design team could have designed the Cooke Varotal with simple, small and lightweight mechanics. The optics would have been just as brilliant. But we refused to compromise on durability when we

### COOKE VAROTAL LENS TECHNICAL SPECIFICATIONS

Focal length range	20–100mm
Maximum relative aperture	f/2.8
Maximum T stop	T/3.2
Light transmission	80%
Overall length	360mm
Maximum front diameter	145mm
Range of object distance (measured from film plane)	infinity to 0.7m
Clear aperture front glass	114mm
Maximum image field	27.2mm diagonal
Horizontal angular field of view	58°–11.5°
Minimum object width at maximum focal length and	
minimum object distance	98mm
Weight	3.5 kg
Total angular rotation a) focus	300°
b) zoom	120°
c) iris	45°

thought about the fairly rough-and-ready treatment that motion picture equipment is sometimes prone to and the environment in which it works. And we know that in hazardous conditions the danger of accidents involving lenses is fairly high. So the Cooke Varotal is designed to withstand maximum shock. The Cooke Varotal can also withstand extremes of temperature and humidity. Mechanics are on the principle of rolling action, not sliding friction, which means they are free from wear and backlash for the Cooke Varotal's entire working life.

It should be emphasized that the model of the new Cooke Varotal lens shown at *Photokina* was strictly a prototype. Questions as to its general availability on the market brought the answer that "it is currently in production," but no specific delivery dates could be quoted. ■

#### PICKER SUBSIDIARY HAS NEW 35MM ANALYTICAL PROJECTOR

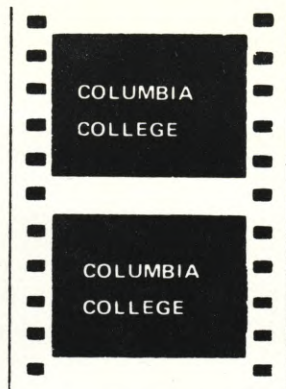
An analytical projector for 35mm cinefilm used in visual presentations, training, simulators and other instruction is being marketed by the Vertex subsidiary of Picker Corporation. What the company calls "flickerless" slow motion, stop motion and instantaneous reverse are selected by remote control.

In general, the unit provides the analytical features for 35mm cinefilm that, until now, had only been available in machines using 16mm film, Vertex said.

The design incorporates a Geneva-type film transport mechanism, three-element lens, interchangeable projection lamps up to 1200 watts, and solid state circuitry. According to the manufacturer, these features result in viewing at any frame rate without flickering, silent operation, optimum image definition, and ease of operation. A system of sensing switches and photo cells insures that film cannot be damaged, the company said.

The machine accepts up to 1200 feet of film on reels and 500 feet of film on cores. The unit uses a separate projection screen and with a 1200-watt lamp is "ideal" for large audience viewing, Vertex said. With a 500-watt lamp, the silent operation makes the unit excellent for small group viewing. The remote control provides every operation and viewing control including focus.

For additional information on the PICKER/Vertex 35mm Analytical Projector, contact Fred Meyer, Vertex Development Corporation, 10 Stepar Place, Huntington Station, New York 11746, (516) 271-6400.



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ON LOCATION WITH  
"FIDDLER ON THE ROOF"

Continued from Page 1223

Life Through a Nylon Stocking

Inevitably, the talk gets around to technical ways and means, and Morris quite casually confirms what Norman Jewison had quite casually mentioned to me a bit earlier.

"We're not using any fog filters on this picture," says he, in answer to a question of mine, "but your readers might be interested to know that the main piece of equipment we are putting in front of the lens is a bit of lady's nylon stocking. As I said earlier, we wanted to get the earthy feeling of the country into this film. The thing that seemed to come as close to an interpretation of the colors of the land as anything I could find happened to be a piece of brown nylon stocking. I suppose there are proper nets made in that same shade of brown, but I haven't been able to locate them. At any rate, the stockings are the correct shade and so easily available that we simply went to the local store and bought up a considerable number of pairs so that we wouldn't run short of the material."

"I can certainly see how the brown net will add an earthy quality to your exteriors," I tell him, "but what about the interiors? It would seem that you would have to use it there as well, in order to avoid an abrupt shift in textures."

"Oh, yes—It *is* going to be used on most of the interiors," he assures me. "The colors of these interiors are very much allied to the color of the land. I mean by that that if you go into a cottage you will probably find that it has a clay floor—which is exactly the color of the land—and that the walls seem to have gotten the same color impregnated into the wood. The costumes of the people don't change from outside to inside. They seem to wear the same clothes all the time, so there is no reason why one shouldn't carry this style through on the interiors, as well. We have, in fact, been doing it on those we've shot so far, and it seems to be working out very well."

By now, dinner is over, and it's time to get back to the set. We trudge through the village and down the hill again to where the action is being staged. The Brute arcs blink on and that makes us feel warmer, somehow. Shooting continues until almost 4 a.m. Then the company wraps it up for the night and it's "home and mother"—as we say back in Hollywood.

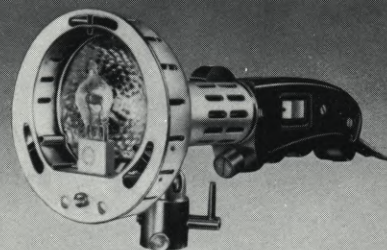
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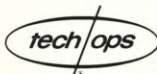
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### Breakfast in the Afternoon

At about one o'clock the next afternoon, cast and crew members begin to show up for breakfast in the dining room of Zagreb's International Hotel, where the company is billeted.

By three o'clock busses and limousines are loading up to take people out to the location. I ride out with the interpreter, who is the proud possessor of a Volkswagen of his very own (which, he tells me, costs almost as much here as a Cadillac would cost in the States).

When we arrive on the location, crew members are busily setting up to shoot a "magic hour" sequence along a dirt road lined with peasant cottages. Director Jewison tells me that there is a great deal of this "magic hour" work to be done on the film and, since they can shoot only a very little bit during each session, there is a scene or two included in each day's schedule.

The "magic hour" (called "mystic hour" by British technicians) is that short span of time between sundown and actual night when there is still enough ambient light from the sky to pick up detail, but it is generally dark enough for streetlights, bonfires, torches and lights shining through windows to pick up richly on the film. It is a convenient compromise between having to light huge areas night-for-night and being overwhelmed by the sunlight encountered during day-for-night shooting.

This evening's "magic hour" bit is a scene of villagers coming out of their cottages and walking down the road toward the synagogue where a wedding is to take place. They are carrying candles, which must pick up in the scene, and Ossie has a burning candle stuck on top of a fence that he keeps looking at through his viewing glass to make sure the balance is correct.

Despite the tricky co-ordination of action involved (which includes herding a flock of geese into the scene at just the right time), the scene is "in the can" in about four takes and the crew strikes the equipment out for a move to a different set in the village.

As we are walking in that direction, I ask Ossie if this picture is presenting any unusual problems, photographically speaking.

"Firstly, the biggest problem every unit encounters in Yugoslavia is the weather," he tells me, "but it is surprising what one can do if one breaks the script down into sequences and discusses with the director what should be

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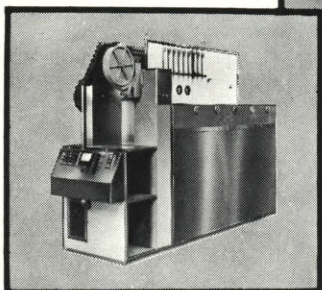
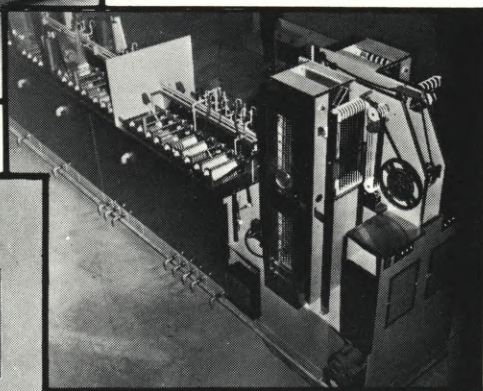
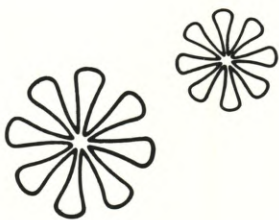
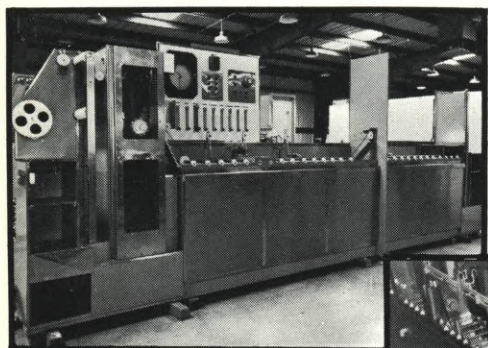
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Continued on Page 1244

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## ARRIFLEX 35 BL CAMERA

Continued from Page 1177

2 to 3  $\mu$  in the film gate enables rear stock shots also at maximum framing rates. The pull-down and registration pin location in relation to the aperture conforms to the international standard used in optical printing machines. The entire movement block is retractable for film threading and for cleaning of the film guides. Various film gates of diverse sizes are easily interchangeable.

Small mass/forces and the absence of eccentric connecting rods reduce camera vibration and movement wear to a minimum. All this, and a fixed gap film channel with only a small back pressure plate directly behind the aperture, insure optimum picture quality at all framing rates.

### Lenses

A lens receptacle with steel mount and bayonet lock for lenses with Arriflex mount guarantees the exact maintenance of the flange focal distance of 52mm. Lenses of all customary focal lengths can be used. The lens scales are clearly visible from the left side with both handheld or tripod operation.

The lens receptacle on the camera is the standard Arriflex type. It will accept



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all standard steel bayonet mounted lenses as well as the older style non-bayonet "ARRI-mounts".

A bellows matte box with double filter holder for 3" X 3" filters and rotatable rear stage for polarizing filters is used with fixed-focal-length lenses.

#### Viewfinder

The viewfinder, positioned for anatomical comfort, is swivel-mounted to allow adjustment of 120° in the vertical; the 6.5x magnified ground glass image remains upright in all viewfinder positions. A number of interchangeable viewfinder ground glasses with various format markings are available.

#### Film Threading

Two completely removeable magazine covers allow for effortless changing of the film rolls. The large camera door facilitates the sideways insertion of the magazines as well as the film loop. Hereby the film threading pin, which projects into the film guide with open film track, maintains the exact position of the film perforation in relation to the claw pins.

#### In addition

The individually adjustable camera hand grip with "on/off" switch provides for steady camera control during hand-held filming.

The Arriflex 35 BL is easily transportable due to the camera carrying handle which is designed to serve simultaneously as matte box beam holder.

#### Accessories

Standard matte box with double extension and double filter holder for 3" x 3" filters, rear filter holder rotatable for polarizing filters.

Standard lens blimp, applicable for focal lengths from 16 to 85mm; interchangeable focusing and diaphragm strips.

Special Varifocal lenses blimp with filter holder and adjustable matte box.

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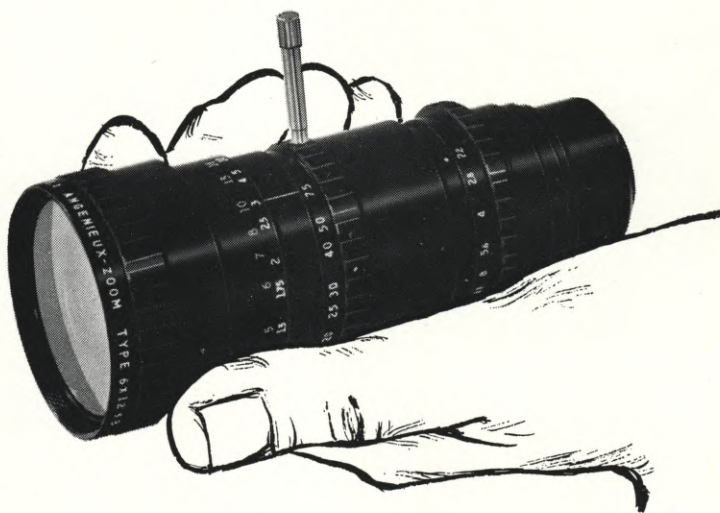
Noise level at 3 ft from the front window is approx. 21 dB.

All optical accessories for the familiar blimp models 120 S and 300 can be used for the new blimp, e.g., the front window for the extreme wide angle lenses, the matte box as well as the diverse front window extensions for the use of various Varifocal lenses.

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**MOVIOLA EDITING CONSOLE**

Continued from Page 1195

retarded at a rate of four frames per second at "sound speed" or a ratio of six to one at any speed at which the film may be traversing. For example, if the dialogue is out of sync to the picture, the operator can push either the advance or retard button to adjust for precise unity. For added convenience, the picture aperture and the sound heads are in parallel placement with index windows for precise marking.

The advance/retard capability also enables the editor to sync music and effects, such as a door slam, or have the music starting and/or ending on a precise "beat."

With only a single control for the picture-sound interlock for stopping and starting, time loss has thereby been minimized. The straight line push button gate assembly also adds to the rapid convenience of composing and splicing.

**Chrona-Tach Frame/Footage-Seconds/  
 Minutes Display System**

The Moviola chrona-tach system computes and displays frames and footage or minutes and seconds. The electronic tachometer output is coupled to the servo motor drive. Therefore, the tabulation begins from a single frame per second and will compute up to seven times sound speed. In other words, this would approximate 168 frames per second. Transversely, the computer will display seconds and minutes.

Considering film as a medium for television and the cost per second of prime time, the chrona-tach feature automatically displays its importance. Additionally, this computer readout enables the operator to post his log sheet for all facets of the editing process as well as support data for the final printing process. Details of each editing function can be maintained, whereas the exact frame and footage or exact seconds and minutes may be programmed for readout either in the forward or reverse mode.

**Advance Retard Readout Display**

The selective advance and retard of both sound heads are also tabulated in the display window. For example, if sound head No. 1 is to be advanced or retarded, a lever switch is thrown and the selection is displayed. The push of either the "advance" or "retard" button displaces the film and the rate is computed at a six to one ratio to the primary speed or four frames per second

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at sound speed. Two additional windows display the + or - command, and the film advance or retard count will read out up to 99 frames. All the sound head selections, the frame count and + or - "readout" will remain displayed until a new command has been programmed.

#### Straight Line Threading

To achieve the convenience of straight line threading and at the same time maintain stability for picture and sound heads, it was necessary to incorporate several designs from instrumentation recording devices. When the film enters the picture head, it is stabilized by flywheel capstan assembly, thus damping and stabilizing the film before it reaches the aperture gate. To stabilize the sound head, a flywheel capstan assembly is used for both the approach and retreat of the film, with the reproduce head located between the two damping elements.

#### Short Film Sections

"Short ends" of film can be traversed across the picture aperture, or the sound heads, either by hand or locked in the sprocket gate. With the sprocket hand knob, the film can be advanced or retarded for viewing or precise marking.

#### Threading

Threading is simplified with a single push button to open and close the sprocket gate assembly. Only two seconds are required to thread or remove the film.

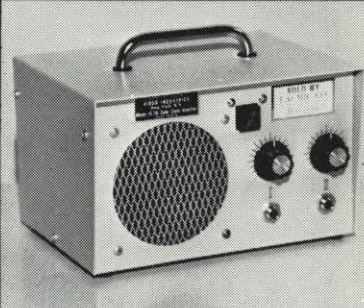
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There are four preamplifiers (one for each head) which are mixed with "slide attenuators" to a master gain control and monitor amplifier. A high/low frequency equalizer has a "normal" setting of flat response with boost and attenuation of both high and low frequencies.

The integrated circuits used are the plug-in type with the critical circuitry self-contained in the miniature "chip." The overall circuit reliability factor is enhanced due to the fewer number of external components involved. Additionally, the cost for replacing the integrated chips is far less than conventional "discreet component" plug-in type circuit boards.

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## LOWELL SOFT LIGHT

Continued from Page 1189

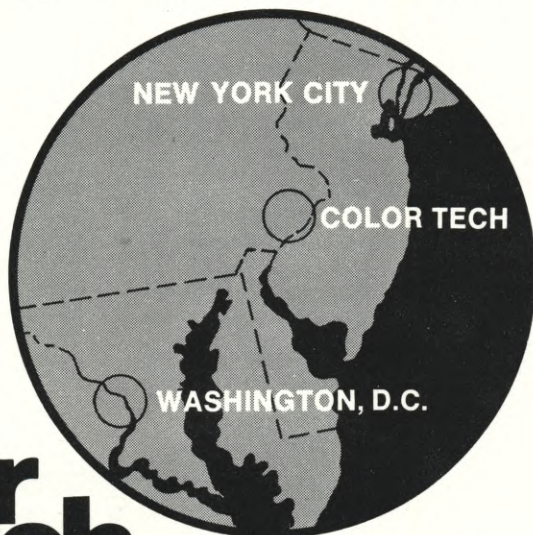
The reflecting shells are composed of a rugged combination of vinyl and fabric, coated with aluminized mylar. They are held fast to the curved back of the frame by means of pressure-fastening material that assures a tight fit and permits easy adjustment.

The standard shell has a soft surface, with the mylar dulled down to reduce reflectivity. The high-intensity reflecting shell isn't quite as soft as the standard shell, but is useful where a greater amount of light is needed. It adds approximately 2/3rds of an F-stop to the exposure. Currently being tested is a blue reflecting shell for use in combination with daylight. If successful, it will achieve a better color balance than that which is available with a dichroic filter and will eliminate the necessity of using a daylight gelatin in front of the lamp.

At present, two cases for the Lowell Soft Lights are available—one which holds a single light, and another which accommodates three lights. Both cases also include space for barndoors and reflecting shells. Planned for the near future is a series of different kits that will accommodate stands, extension cables and focusing quartz lights, in addition to the Soft Lights.

Ross Lowell comments: "The new Soft Light was designed strictly as a location unit. I don't foresee much usage for it in the studio—except, perhaps, in a situation where several lamps must be mounted on top of set units that are not substantial enough to hold heavier units. There is no one ultimate piece of equipment that is going to serve everyone's needs and solve all of the problems. One can only design a piece of equipment for a fairly specific use and then try to make it as universal and flexible as possible. That's what we've attempted to do with the Lowell Soft Light."

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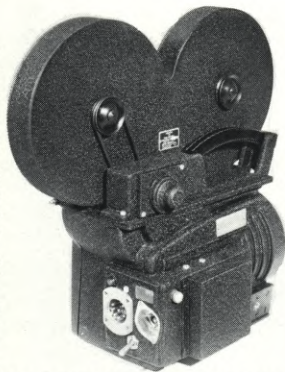
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## ECLAIR ACL 16mm CAMERA

Continued from Page 1181

20. Not surprisingly, the ACL has a special tripod. Most pro tripods are much too heavy for this camera; and still tripods aren't usually versatile enough. This one has aluminum legs and nylon slides, with the length control at the top. There's a cranked center column in a levelling bowl, and a fluid head.

21. Universal Clamp. The tripod head and levelling bowl can be detached from the tripod legs in seconds. It then becomes a high hat, or a two-way clamp that can be attached to the vertical edges of doors and the horizontal edges of tables, for example. Or to heating pipes, car bumpers—whatever.

22. The ACL Shooting Vest. This is a sleeveless, zippered jerkin, made of denim, with large pockets at the front and back. You wear it *over* your regular clothes—it's quite loose, and not constricting. A Velcro pad built into the right shoulder sticks to another piece of Velcro under the ACL's magazine. In the pockets you can carry two spare magazines, the battery, film spools, a slate—or the camera itself. ■

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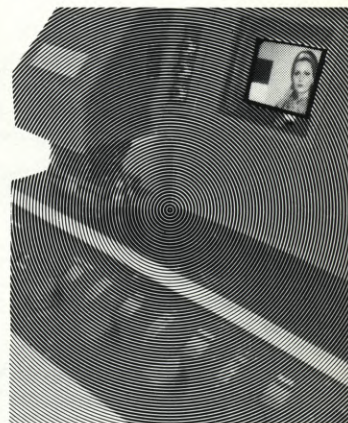
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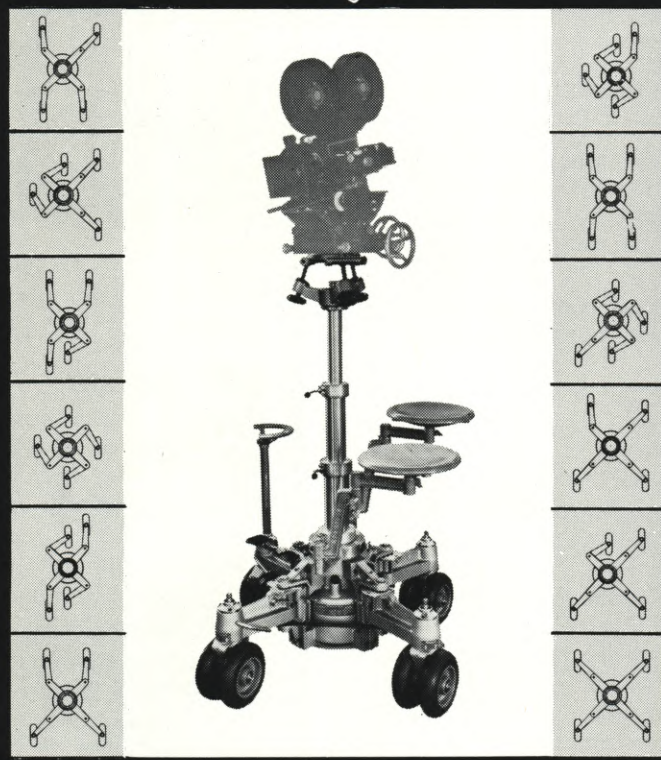
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## THE NEW NAGRA SN MINIATURE TAPE RECORDER

Continued from Page 1189

ed as a combination of hand-held microphone, level control and modulator. It also gives a choice of automatic or manual level control. A number of different condenser microphone capsules (cardioid, hypercardioid or omnidirectional) can be fitted to the SMR.

The SN can also be used in conjunction with a conventional dynamic microphone. The quality of the recorded signal can be checked at the time of recording, by means of a small earphone.

### 2.1.2. Nagra SN and Microphone on a Moving Person

When recording people in motion, it is difficult to follow them with a microphone. Under these conditions, it is preferable to place the recorder and its microphone on the person himself.

The method of carrying the recorder depends upon the clothes worn. People wearing jackets can place the microphone and recorder as previously described. Another solution is to place the SN in a hip pocket with the microphone attached to a belt.

### 2.1.3. Special Cases

The SN can be hidden in any object, such as a book, or something of similar dimensions. A mercury switch can be used for operating the SN by means of altering the position of its housing.

### 2.2. Choice of Tape Speed

The two tape speeds can be selected by means of a switch on the tape deck of the SN. Either Standard tape or Extra Thin tape can be used, but the best quality is obtained with Standard tape and the higher speed. Under these conditions, a reel provides 27 minutes of recording time. With the thin tape, 54 minutes of recording time is obtained, but with a higher modulation noise. With Standard tape and a lower speed, the sound quality is slightly muffled but perfectly intelligible. This speed is not recommended for "artistic" sound but may be used for "documentary" sound.

The lower speed in conjunction with Extra Thin tape gives 108 minutes of recording time. Speech remains perfectly intelligible. The SN may be supplied, to special order, with a still lower speed which allows up to 216 minutes of recording time, but the sound quality is mediocre in this case. However, it is still intelligible.

### 2.3. POSSIBLE APPLICATIONS

#### 2.3.1. Broadcasting

This is the principal application of the SN. The travelling reporter will appreciate its dimensions and weight. The tape reels are easily sent by letter post. It is also possible to retransmit the recording by telephone line from the SN by means of an accessory.

#### 2.3.2. Cinema and Television

With a quartz crystal stabilized camera and a corresponding generator connected to the SN, it is possible to record lip-synchronized sound with remarkable flexibility. The quality obtained is a function of the sound pick-up by a microphone which is hidden in the subject's clothing so as to be invisible to the camera.



### 2.3.3. Mnemonic System

The applications of the SN to help the memory are very varied. The sound quality of the recordings obtained make it useful, for example, for music or theatre critics, or for documentary recording.

The fact of being able to identify the voice (virtually impossible with a dictating machine) can be valuable in certain cases.

The journalist can protect his interests by keeping a recording of a declaration which could later be denied. In this case, it is better to use the higher speed to obtain sufficient quality to render the identification incontestable.

### 2.3.4. Professional Training

A salesman, for example, can improve his technique by analysing the conversation held with customers. This can be applied more generally to anyone whose profession depends on human contact.

## 3. DESCRIPTION

### 3.1 Mechanical Section

#### 3.1.1. Box

The SN is of metallic construction. The bottom and the cover are drawn, whereas the central part (tape deck) is milled from solid metal. This technique allows the use of a very high performance alloy which is an essential condition for the dimensions and reliability.

#### 3.1.2. Tape Transport

The tape is driven as on the Nagras III and IV by an electronically speed-controlled motor. The capstan is an integral part of the motor. The speed stability obtained, without attaining that of the larger Nagras because of machining tolerances, nevertheless allows music to be recorded. In view of the fact that a tape recorder is only one link in the chain between the original sound and the listener, it is clear that the performance must be several times better than the perceptible limit, this being the case with the Nagra IV. The deformations produced by each link should be sufficiently small that the final sound is undistorted. With the SN, the sound is always of high quality, but the reserve of "Super-quality" is reduced.

The pinch wheel is operated by the "On/Off" switch. The tape tension is servo-controlled, this being an indispensable condition to a good tape speed stability and a reduced energy consumption.

The flat motor of the SN is derived from the motor type CR which was created by Kudelski several years ago to equip an instrumentation recorder in a military weapon, to control its trajectory. The SN profits from the experience thus gained.

#### 3.1.3. Blocking Brakes

These are incorporated in the SN to ensure that the risk of the tape unspooling and tangling, when subjected to large rotary acceleration, is minimized.

#### 3.1.4. Auxiliary Transmission and Rapid Rewind

The SN does not use transmission belts: all transmissions are effected by gears. The rewinding is manual. A crank is connected to the reel through a speed multiplier. In such a small device, an electrical rewind would be too slow, because of the reduced energy that the batteries can supply. During rewinding, the heads are automatically disengaged.

Continued on Page 1238

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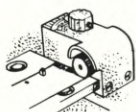
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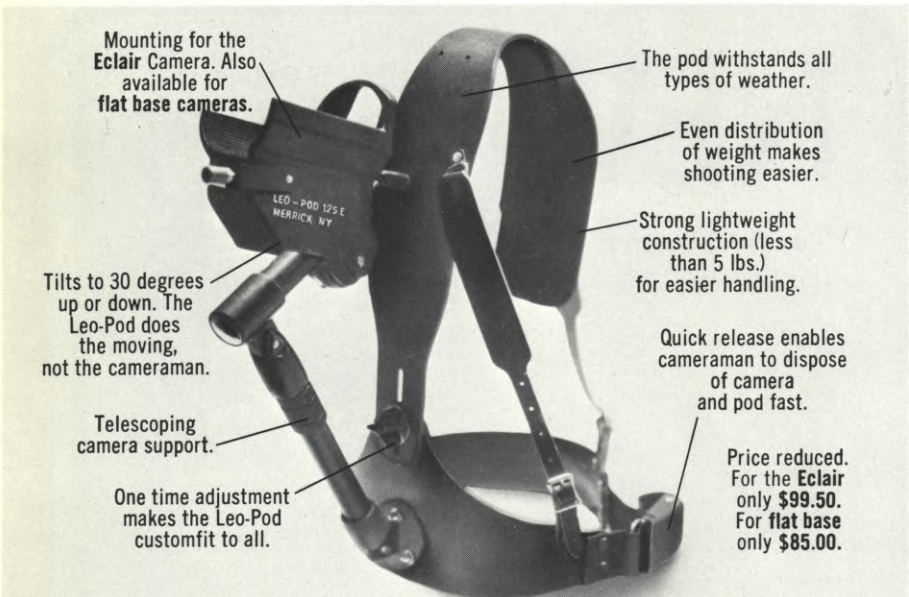
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## NAGRA SN TAPE RECORDER

Continued from Page 1235

### 3.1.5. Heads and Tape

The SN has 3 heads: the first erases, the second records and the third plays back. In common with all professional recorders, playback can be made during recording. This allows a check to be made, not only on what is being recorded, but also on that which has just been recorded. The heads being readily accessible make their inspection and cleaning easy. The tape used is 3.81 mm wide (as in cassettes), and the recording is full width, to obtain the most favorable signal-to-noise ratio possible.

### 3.1.6. Constructional Materials

The construction materials used are essentially light alloys and stainless steels. Cuprous metals and certain plastics have been used only where technically necessary.

### 3.2. Electronic Section

#### 3.2.1. Plug-in Circuits

The active circuits are essentially constituted by 7 plug-in boards with gold-plated contacts. This sub-division facilitates checking and servicing. At the same time, it allows the realization of special versions more easily, or the ulterior modernization of the Nagra.

#### 3.2.2. Input Circuits

The standard input circuit allows the SN to be used either with a classical dynamic microphone (200Ω 0.2 mV/μbar) or with the Nagrastatic® condenser microphone. The latter is very small and has been specially created for the SN.

The SN also has a line input which is of particular use with the SMR accessory, allowing a manual level control.

#### 3.2.3. Automatic Level Control

This device is similar to that of the Nagra IV. It is very sophisticated and gives excellent results.

#### 3.2.4. Manual Lever Control SMR

An automatic level control is not desirable under certain circumstances. In effect, no matter how good its quality, it cannot discriminate between the desired sounds and undesired sounds, and above all, know the operator's intention. This is why the SN can be connected to the SMR which comprises a high quality condenser microphone, a potentiometer and a modulometer. It is held in the hand, and is no larger than a conventional microphone. A device is incorporated enabling it to be switched back on to automatic level control as required. The automatic level control should, however, be used exclusively in the case of "discreet" recordings.

#### 3.2.5. Playback

The playback circuit feeds into a miniature jack which allows the recording to be heard in an earphone. If the microphone is not connected, the SN simply plays back the tape.

If it is connected, the SN passes automatically on to record. It erases the tape, records that which the microphone picks up and plays it back again immediately for checking.

The external accessory SLA plugs into the same jack and gives a symmetrical 600 Ω line output.

#### 3.2.6. Meter

The SN has a small measuring instrument

which normally indicates the degree of compression of the automatic level control. A warning device causes the meter to zero in the case of insufficient power voltage. A small push button switches the meter to measure the battery voltage.

### 3.2.7. Power Supply

The SN contains 2 AA manganese cells (easy to obtain since certain cameras use them). The use of accumulators may be of interest for intensive operation.

A specially invented circuit converts the battery voltage to 5 V, stabilized. The conversion ratio varies automatically to obtain optimum use of the available energy. It is, in part, due to this device that such a high performance with a good safety margin has been obtained.

### 3.2.8. Construction and Components

As far as possible, all the components are of "military" quality. All 63 transistors are in hermetically sealed cases. The electrolytic condensers are all tantalum, also sealed. The trimmers are cermet. When suitable components have not been available on the market, they have been specially manufactured. This is particularly so with plugs and sockets, except for the earphone jack.

## 4. QUALITY OF RECORDINGS ON THE SN

### 4.1. Speed Stability

The Nagra SN uses the same process which rendered the Nagras III and IV famous. However, as the dimensions are smaller, and the mechanical tolerances the same, the performance cannot equal that of the Nagra IV. Nevertheless, the performance of the SN is entirely acceptable, and this recorder can be used for music.

### 4.2. Pass Band

The Nagra SN records from 10 to 15,000 Hz. It is not desirable to go down as low as 10 Hz for speech, and for this reason, a high-pass active filter has been incorporated in the SN to eliminate frequencies below 80 Hz. This gives clear and agreeable speech whilst substantially attenuating very low frequency noise.

The overall frequency response depends on the microphone and the playback correction. The signal available on the earphone output is linear up to 10,000 to 12,000 Hz. With the external corrector amplifier SAC, 15,000 Hz can be obtained, when so desired. It is also possible to restrict the pass band to modify the response curve in order to have optimum subjective results. Any non-linearity during recording (e.g. sounds modified by the microphone being too close to the body) may thus be corrected.

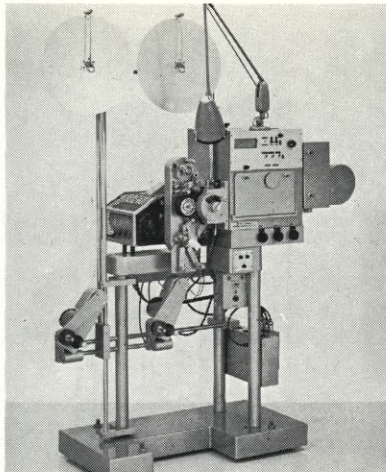
### 4.3. Signal-to-Noise Ratio

Measured with an ASA "A" weighting filter, the noise level is -60 db, compared with the level giving 2% third harmonic distortion at 400 Hz. It is this characteristic which shows the real progress compared with other miniature recorders.

### 4.4. Restrictions

Recording on the SN is somewhat analogous to miniature photography: remarkable results can be obtained, provided care is taken. The tape on the SN should be in perfect condition: any fold or tear will cause a much more serious disturbance than a studio machine running at 15"/sec. The heads should be clean and properly aligned.

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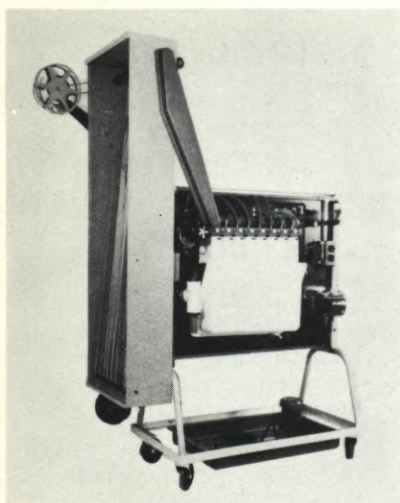
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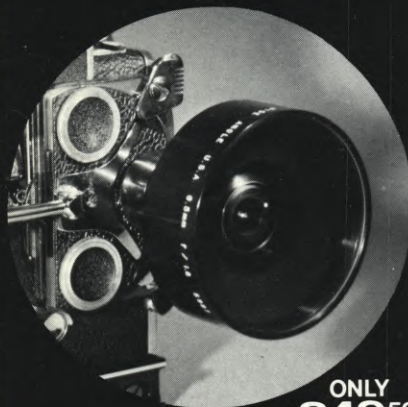
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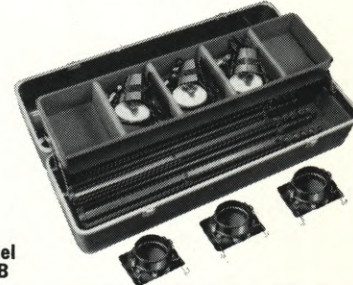
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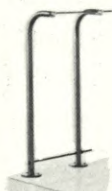


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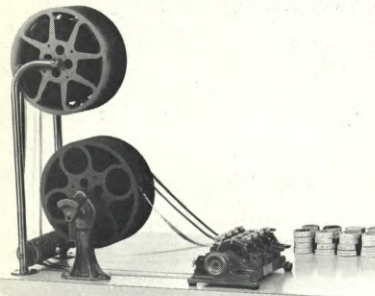
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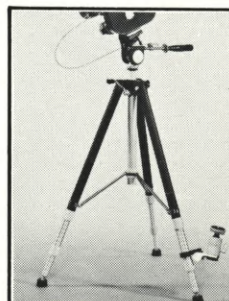
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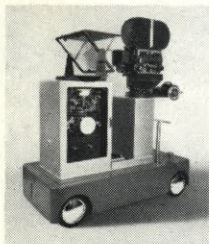
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## "FIDDLER ON THE ROOF"

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shot in sunny weather and what can be shot in dull weather or in the rain. I must say that this script calls for just about every conceivable weather condition—even snow.

"We have cover sets built inside that huge plastic bubble set up on the road that leads here. We've made tests in there and it will work just fine if we get weathered out and have to move inside—but it hasn't happened yet.

"The second big problem is the language barrier. I've worked abroad a tremendous amount, but I've never found the language barrier quite so formidable as it is in this country. There seems to be no link between the local tongue and any other known language. One has to do an awful lot by means of sign language. I would like to say, though, that I've found the Yugoslavs simply marvelous to work with—tremendously willing and very keen to help. I've got the most wonderful unit with me and you've no idea how much easier it makes my job when I know that everybody is backing me up."

The conversation gets around to the subject of distant locations—when and if they're necessary.

"I certainly think it was right for us to come to Yugoslavia to make this particular picture," says Ossie. "The basic sets could have been recreated elsewhere, but the general locale wouldn't have been as authentic—nor would the people. On a film of this scale the crowds do play an important part, and it would be very difficult to find faces like these anywhere else.

"Equally, though, I don't think distant locations are always necessary. I wonder myself at times, why people want to do this. I think it's because some directors feel that there is a style of photography created in major studios that is entirely different from that which you get on location, and that you can never blend the two together. I don't agree with that. I think that one can create exactly the same effect in shooting a studio interior as one gets on location. It's just a question of getting the Art Director to design the sets in an honest and real way. That forces the cameraman to light his interiors just as he would on location.

I had noticed, when exploring the interior of the picturesque synagogue set earlier in the day, that there were no "wild" walls and I ask him if it is because of the reason he has just mentioned.

"That's one of the reasons," he says.

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### Extracurricular Song

As the crew is setting up in the new location, a lusty chorus of voices raised in song is heard coming from inside one of the buildings.

I am told that this is the villagers (the real ones who actually live here) celebrating the signing of a contract to sell all of their pigs for the year.

Later, between set-ups, Ossie Morris tells me that he has dispensed completely with arcs as fill light for daylight shooting on this picture.

"I know that some of my colleagues have already been doing this," he says, "but it's the first time for me. I've felt for a long time that there was a need for something less cumbersome than the Brute for daylight work—so, on my last couple of pictures, I've gradually filtered the ColorTran Min-Brutes into my lighting equipment. However, this is the first time that I've used them exclusively for day-to-day work in bright sunlight—and it's paid off handsomely."

"I'm dropping the conventional 10K's, 5K's and 2K's quite a lot. I find that the modern quartz lamps are smaller and I can tuck them into corners on location, whereas I could never get the bigger lamps into some of those rooms. I definitely have a tendency to experiment with new methods and styles of photography."

I remark that he has built a unique reputation because of his willingness to experiment in search of new and different photographic approaches.

"I've found, during my years of photographing films, that it's important to learn what one can, for want of a better phrase, *get away with*," he tells me. "When I first started in photography, I was terrified of every little problem, of every possible error that might occur in lighting or composition. But I've grown to understand, over the years, which things are important and which are not. It's because I know now that I'm within the realm of credibility with what I'm doing that I can experiment and do the more unusual things—whereas, when I first started, I would have been terrified to experiment."

It strikes me, as I watch him work with such sure professional skill through the chill Yugoslav night, that he doesn't seem terrified at all.

Not even a little bit . . . ■

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## REPORT FROM THE 1970 PHOTOKINA

Continued from Page 1175

these delectable goodies, while, at the same time, telling the drooling prospective customers that said delights would not be available for a year or more.

In all fairness, the various manufacturers are to be commended for their caution in (1) holding back mass production of their items until all of the bugs had been worked out, and (2) refusing to accept orders which could not honestly be filled within a reasonable length of time. Also, one got the distinct impression that several were awaiting feedback from *Photokina* visitors, regarding possible adverse comment or suggestions for improvement, before "freezing" their designs for mass production. All of this is understandable, but does little to soothe the aching hearts of those who would like to have these spectacular items of equipment available for use right now.

Selecting items of equipment to be highlighted in the biennial *Photokina* issue of *American Cinematographer* is always difficult—and it is, especially so this year because there was a greater number of worthy items than usual on display. We have attempted to direct the emphasis of coverage toward those pieces of equipment which, in the opinion of the editors, constitute the most significant innovations in the technology of motion picture production, as well as toward those which were actually introduced at *Photokina* and are, therefore, completely new to the trade.

Inevitably, certain worthy pieces of equipment will be omitted or given sparse treatment, considering their importance, but this may well be due to one or more of the following reasons: (1) The item is so new that there was not sufficient technical data concerning it available at this writing, (2) The item was reviewed in depth in a recent issue of this journal, (3) The item is scheduled for in-depth treatment in an upcoming issue of *American Cinematographer*.

The latter reason is particularly true of certain items of sound recording equipment, which are mentioned only sparsely here because they will be exhaustively reviewed in a special "Sound For Motion Pictures" issue of this journal, soon to be published.

For now, and in the pages of the current issue, we present as highlights of *Photokina 1970*, reviews of those items which we feel may be of most direct interest to our readers. ■

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with Line Converter Module. Camera heater power attachment available.

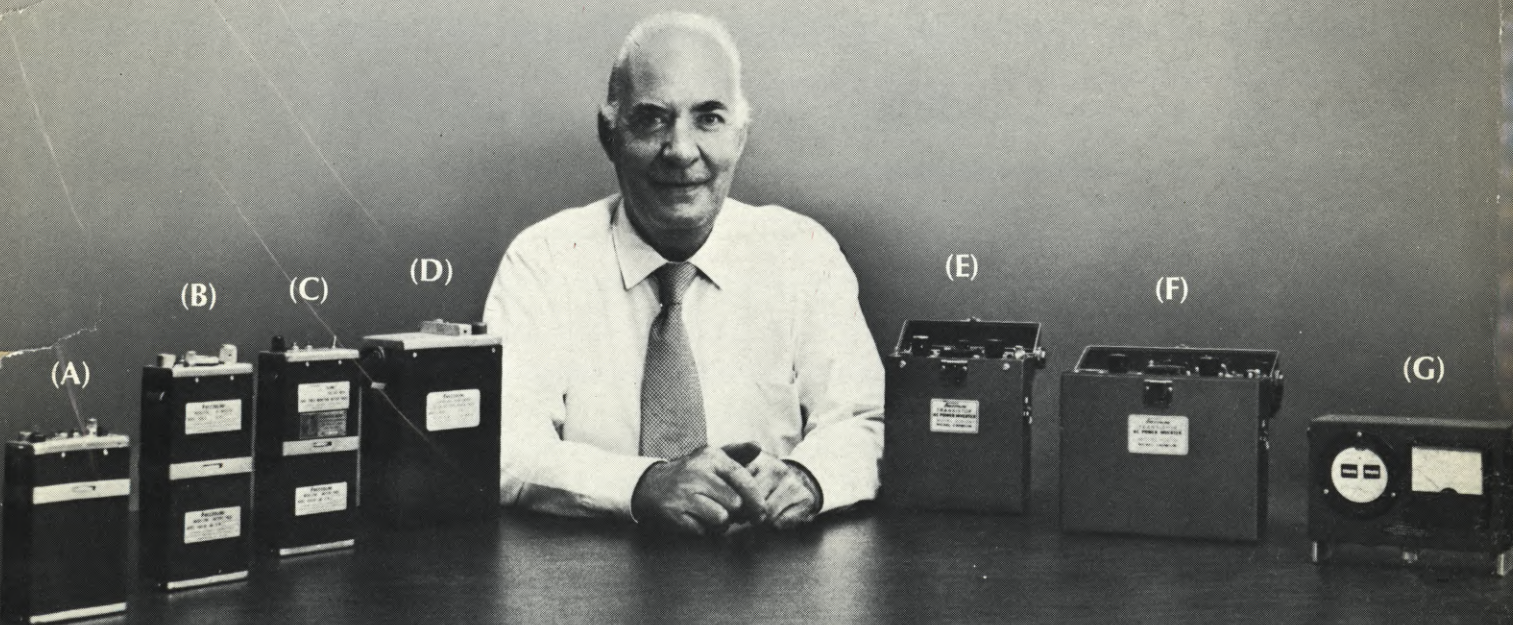
(F) **Power to run them all! Model 100-DX** is the standard of portable power for AC camera motors. Supplies up to 100 watts continuous output from internal batteries.

(G) **Portable Test Set** checks AC line and AC Inverter frequency and voltage, from any AC line or AC Inverter. Simulated camera load test is built in.

All Frezzolini AC Inverters can be supplied with a 50 or 60 hz. transistor-controlled module for single-system cameras or a precision crystal-controlled module for "double-system" camera operation. A matching built-in crystal-controlled module is available for pilotone Nagra® recorders.

Jim Frezzolini produces other professional motion picture equipment too. For more information about all his products see your professional motion picture supply dealer, or call or write James J. Crawford, Vice-President, Engineering.

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