

# AMERICAN Cinematographer

International Journal of Motion Picture Photography and Production Techniques



behind the scenes of **"HELLO, DOLLY!"**

# HOW DID WE MAKE THE "QUIETEST, BEST PERFORMING, MOST PROFESSIONAL REFLEX BNC CONVERSION" EVEN BETTER?

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You might say we've improved on perfection. You just can't top a reflex camera for tight shots, zooms and dollies. For swish pans, quick tilts and long shots, however, the addition of the finder offers the last word in comfortable viewing. The power-packed advantages of a synchronized-to-lens finder, plus reflex viewing, provides you with an unbeatable combination. And, it's all yours with the CSC Reflex BNC Conversion.

It's very much worth your while to send for further details TODAY!

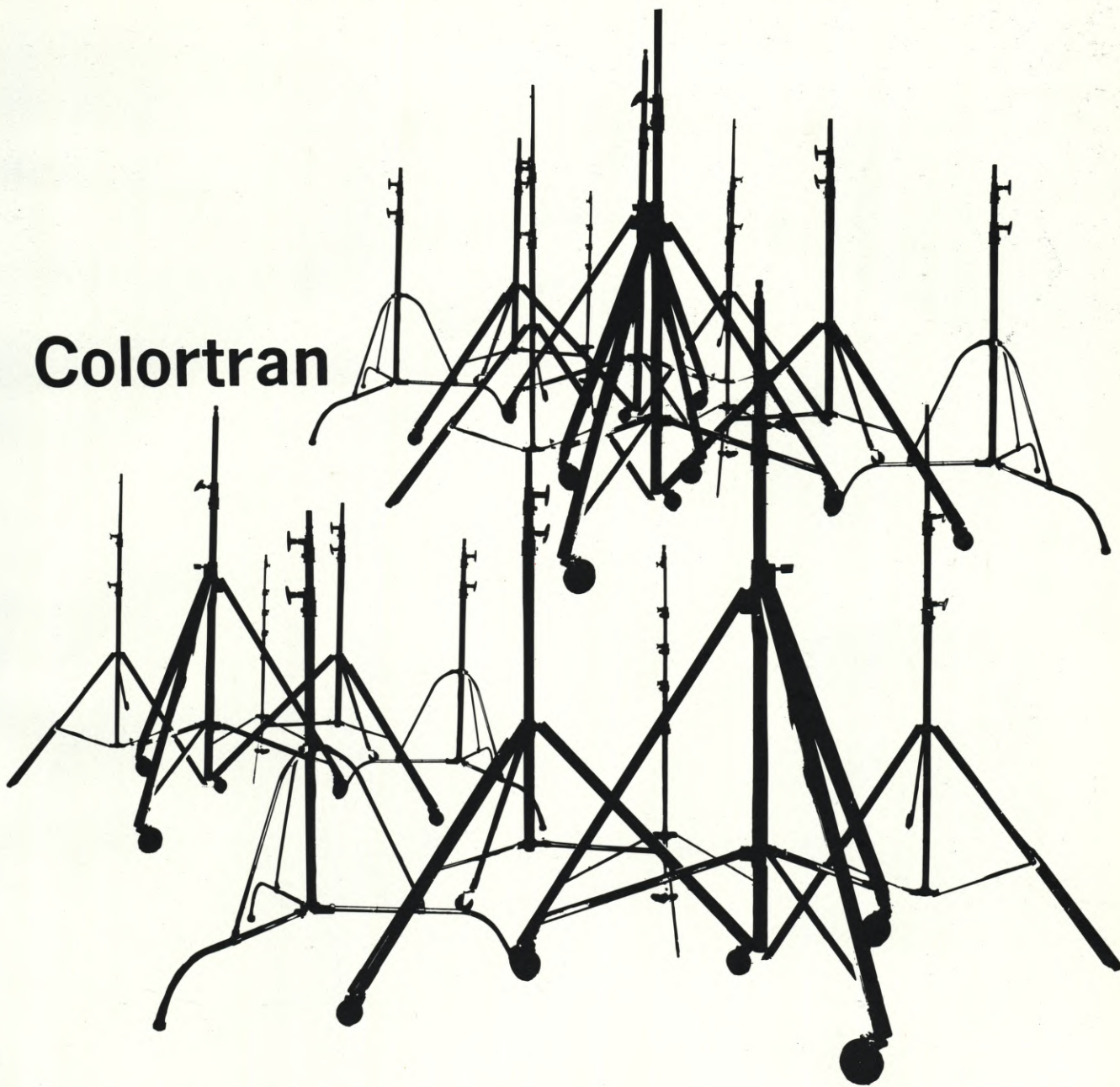


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**GENERAL CAMERA CORP.**  
321 WEST 44th STREET, NEW YORK, N.Y. 10036

# AMERICAN Cinematographer

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ON THE COVER: A colorful look behind the scenes of what may well be the last of the multi-million-dollar super-musicals, the magnificent 20th Century-Fox production of "HELLO, DOLLY!" Cover design by Don Record.

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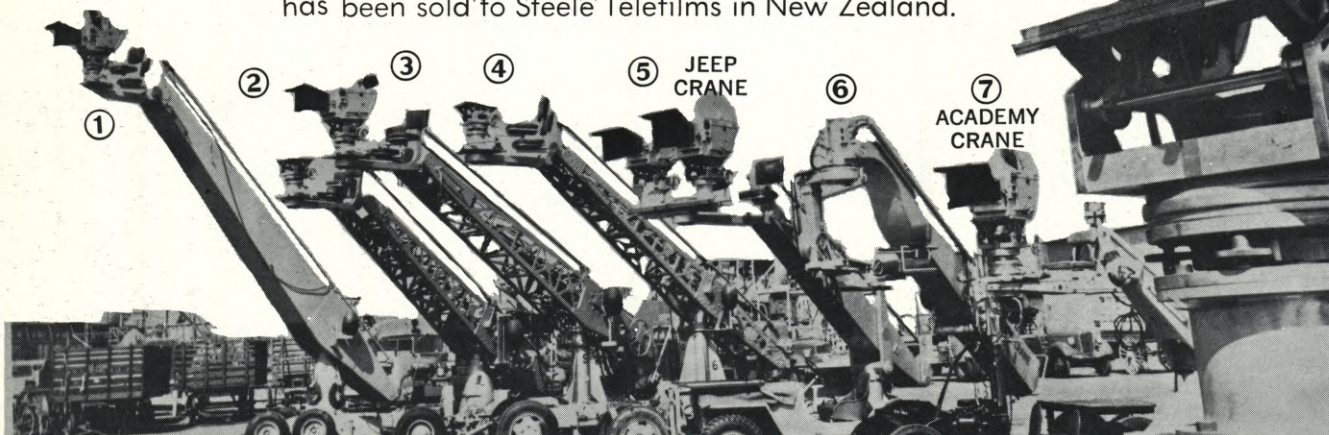
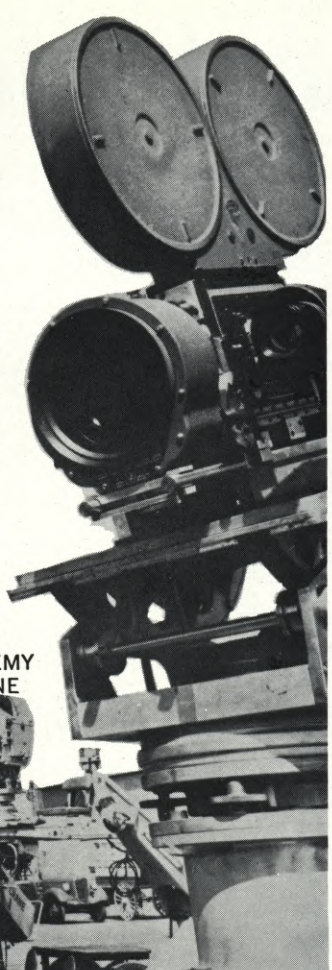
**BIRNS & SAWYER**

# STUDIO EQUIPMENT SALE

## ***Birns & Sawyer Brings You M.G.M. Studio Cranes at Realistic Prices!***

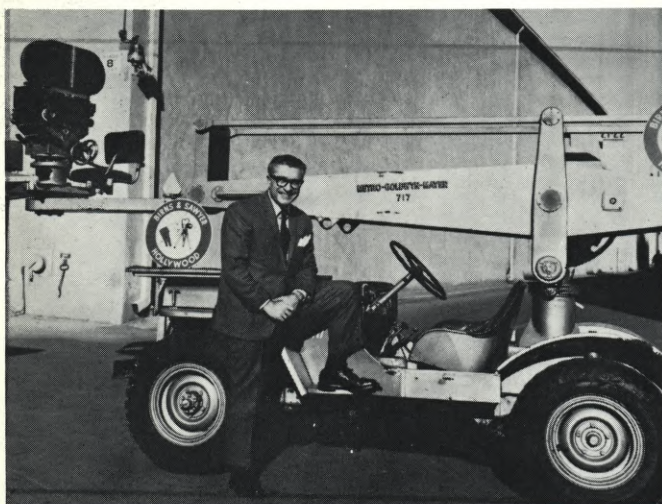
In the past, we have brought you serviceable and usable studio equipment from Columbia, Warners, Republic, ZIV, Universal, and other major studios. Now, once again, B & S offers the best available — this time from M-G-M, eight valuable studio cranes, electrically operated, reaching as high as 34 feet! From \$1,995 to \$4,995.

Note: The jeep crane is at B & S (Aust.), the Academy crane has been sold to Steele Telefilms in New Zealand.

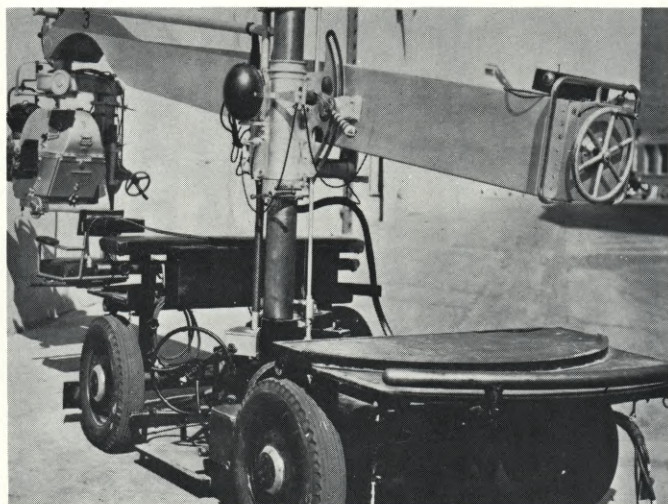


These cranes helped shoot \$2,000,000,000 worth of classic and memorable film productions, over a quarter of a century of world-wide entertainment.

Write for spec sheet keyed to equipment numbers. Offered at a fraction of replacement value.



Jack Birns, President of Birns & Sawyer, Inc., shown with M-G-M jeep-crane which has been shipped to Birns & Sawyer (Australia) in Sydney, where, as part of permanent rental stock, it has worked in a dozen features.



M-G-M designed and built these R-O (Reverse Oscillator) cranes as Hollywood's most versatile. Lens will operate to six-inches of ground level and boom arm can be operated into hole below ground level.



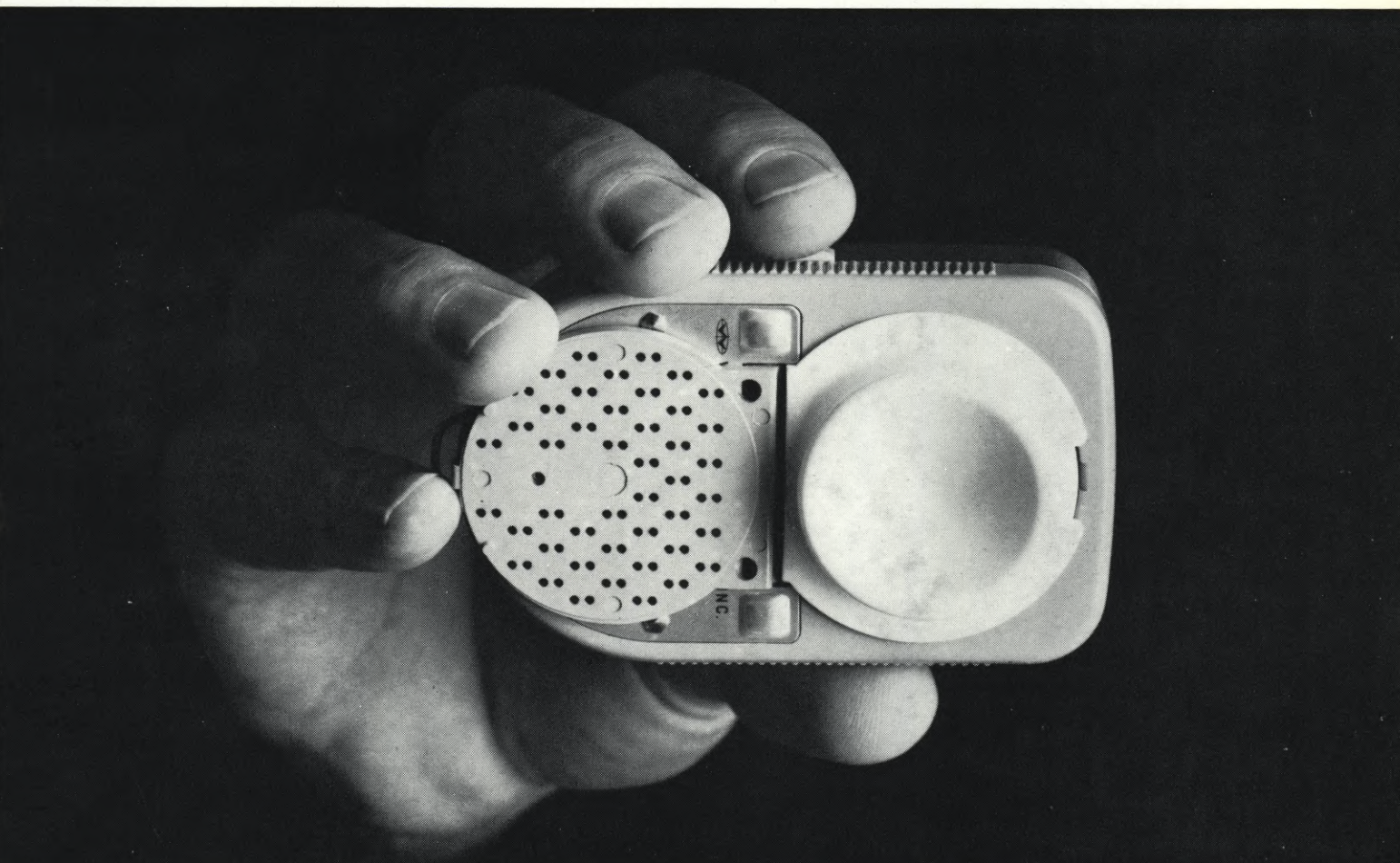
## **BIRNS & SAWYER, INC.**

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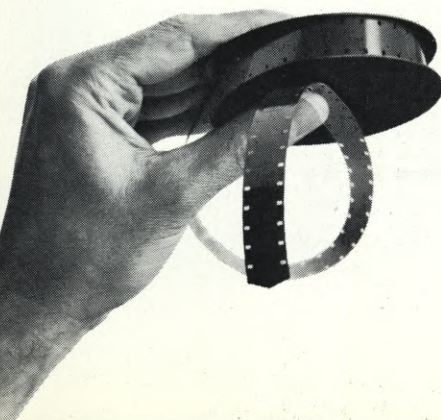
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OVERSEAS BRANCHES: Birns & Sawyer (England), Dene Lodge, Eaton Park Rd., Cobham, Surrey, England; Birns & Sawyer (Aust.) Pty. Ltd., 19-21 Cleg St., St. Leonards, Sydney, N.S.W., Australia 2065; Birns & Sawyer - Hong Kong, 17th Floor, Union House, Hong Kong, B.C.C.

# When available light is all you have, Gafpan® film is all you need.



*Gafpan® Type 2962 the fastest B&W reversal film available in Super "8" and double Super "8" formats—none faster in 16mm. Test a roll next weekend.*



GAF has it. In Super "8" and in 16mm formats.

A super high speed reversal film with a moderately fine granularity.

It's Gafpan® Type 2962 B&W reversal film—designed specially for filming at very low light levels.

This pan sensitive, super high speed film (E.I. 500) is probably the most useful, adaptable film you'll ever work with.

Even at this very high speed, Gafpan film delivers excellent pictorial quality.

Each frame is sharp, has high resolution and excellent tonal gradation. And it has wide latitude to help compensate for uneven light.

Gafpan Type 2962 film is well suited to industrial, instrumentation, scien-

tific, surveillance, sports and news photography. It's available in Super "8" in 50', double Super "8" in 100', or 16mm, in all the standard roll sizes and perforations.

So, if you're filming at night, or in poorly lighted interiors—in short, if you think there may not be enough light for your present film—try Gafpan film.

It's all the film you may ever need.

For technical information on Gafpan Type 2962 film, just mail in the coupon.



206-0100

**GAF Corporation**  
Professional Photo Products / Dept. XXX-XXX  
140 West 51 Street, New York, N.Y. 10020  
Gentlemen:

- Please send technical data on Gafpan® Type 2962 film.
- Please send data on other Super "8", 16 and 35 mm motion picture films available from GAF.

Name \_\_\_\_\_ Title \_\_\_\_\_  
 Company \_\_\_\_\_  
 Address \_\_\_\_\_  
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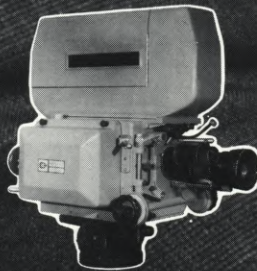


Our exclusive Silent Pellicle Reflex Conversion System won the coveted Academy Award in 1968 (the only Reflex BNC to be so honored). Positive proof of superiority and excellence.

Used BNC's sold for \$12,000 to \$15,000 a year ago. Your BNC is worth as much as \$8,000 more today, thanks to our SPR. Reflexed, your BNC is probably worth over \$30,000.

You're money ahead with our conversion.

We're No. 1. Over 35 of our SPR's are in use: 16 already at Paramount, a like number in work for Universal; in Chicago, Detroit, New York, London and Paris. Several Panavision features have already been shot with our SPR cameras. You'll get your camera back with no increase in operating noise, maybe less... no shroud required. SPR's are easy on the operator, easy to clean. Loosen two thumb screws and the optical block slides out. No fuss, no mess, no bother. With its newly engineered, large, bright, flicker-free viewing system and handsomely restyled low profile magazine and motor housing your converted BNC will be better than new...



*Ed Di Giulio says*

**"I'll reflex your BNC  
for \$6,000  
or buy it, sight unseen,  
for \$20,000"**

**"THEY JUST DON'T MAKE 'EM LIKE THEY USED TO!"**

*Call, Write or Wire*



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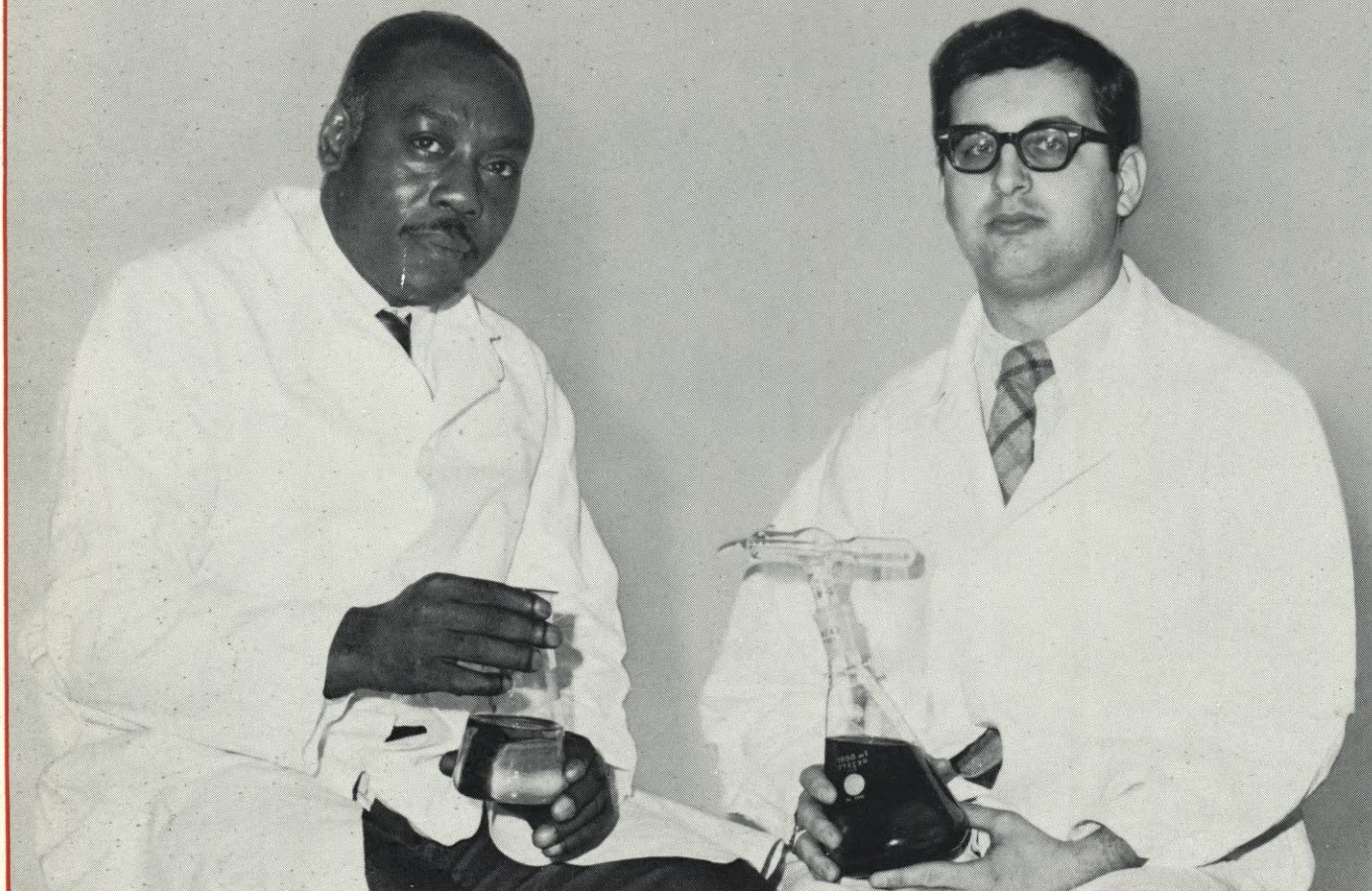
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I'm an ME-4 Chemist.

I'm an ME-4 Chemist.



## Now there are two of us.

We're proud and pleased as punch—to join that other company in supplying your ME-4 processing chemical needs, and, we've gone a few steps further...

### FOR THE LITTLE GUY!

- A new 12-gallon size unit (packaged four 3-gallon sets per case).
- Consists mainly of liquid concentrates.
- Savings on labor when mixing.
- Eliminates expensive chemical waste.

### FOR THE BIG GUY!

- We have the conventional 100 liter size in handy, easy-to-mix packages, competitively priced.

Quality ME-4 chemistry is manufactured by FR under license from the Eastman Kodak Company.

All chemicals meet the specifications of the American Standards Association for photo-grade chemicals.

For further information about FR's ME-4 EKTACHROME processing chemistry, mail the coupon now. Users in L.A. and N.Y.C. ask about our Ready-to-Use Solution Service Program.

### THE FR CORPORATION

A SUBSIDIARY OF TECHNOLOGY INCORPORATED

951 BROOK AVENUE / 3031 FIERRO ST.  
BRONX, N. Y. 10451 / LOS ANGELES, CALIF. 90065



### FOR ALL GUYS!

- Service back-up.
- Free process manual with initial purchase of chemistry.
- PH Adjuster Kit for maintaining chemical tolerances.
- Eliminates the need of expensive laboratory reagents.
- Simplifies PH Adjusting procedure.
- Packaged in Ready-to-Use form.

#### THE FR CORPORATION

951 Brook Avenue      3031 Fierro St.  
Bronx, New York 10451      Los Angeles, Calif. 90065

Gentlemen:

- Order Enclosed. Please send free PH Adjuster Kit.
- I am interested in knowing more about your new, simplified ME-4 chemistry.

NAME \_\_\_\_\_

TITLE \_\_\_\_\_

FIRM \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_

ZIP \_\_\_\_\_

# **SBR** *drive!*

new "break-thru"  
REVOLUTIONIZES  
processor  
performance!

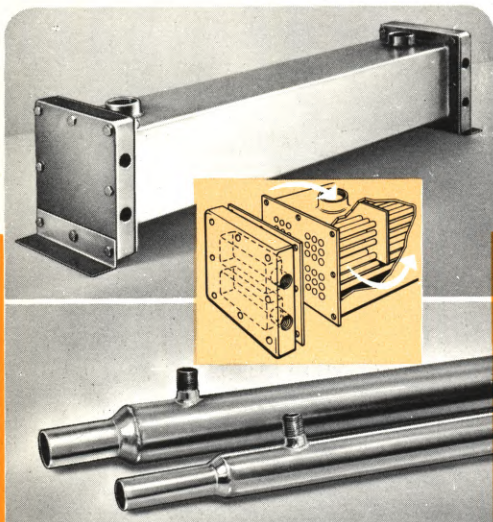
Looking for smooth all-format capability, constant processor speed, and full utilization of chemical solutions? Join the leaders who are already benefiting from this significant new modification in processor design. Write today for complete details!

**T**REISE ENGINEERING, INC.

1941 FIRST STREET • SAN FERNANDO, CALIF. 91340

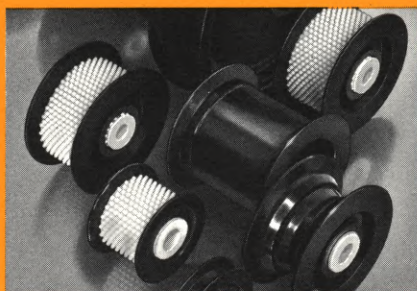
# Look to **TREISE!**

for finest quality **PROCESSOR  
ACCESSORIES & REPLACEMENT PARTS**



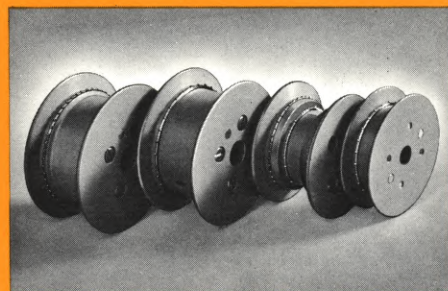
## HEAT EXCHANGERS

Shell and tube type heat exchangers are designed specifically for temperature control of processing solutions. May be used for single control or dual control systems. Single-pass heat exchanger offers the greatest amount of heat transfer area in the least space. Design permits in-line installation. Both models come in lengths from 10" to 60" and are available in heliarc welded Type 316 stainless steel or Hastelloy Type C.



## FILM ROLLERS

Special ball-bearing design provides a remarkable free-rolling characteristic that eliminates drag and promotes smooth processor operation. Available in 16, 8/16, 35, 16/35, and 70mm. For shaft diam. 1/2", 5/8" (also 3/4" - 35mm only). Choice of stainless steel, pyrex, or nylon ball bearings.



## FILM SPROCKETS

Made primarily for lab processors and engineered to sprocket tolerances found only in finest quality motion picture cameras. Available for all film sizes and all types of perforations. Choice of a wide range of diameters and shaft sizes.



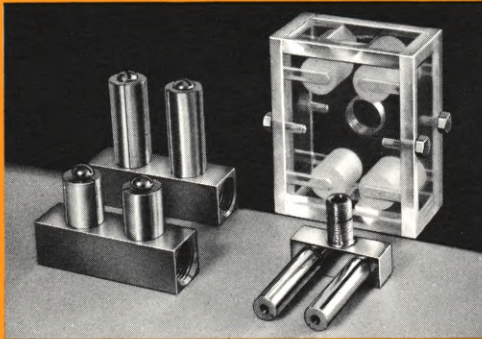
## WATER MIX VALVE

Designed to mix hot and cold water in a pneumatically operated proportional temperature control system.



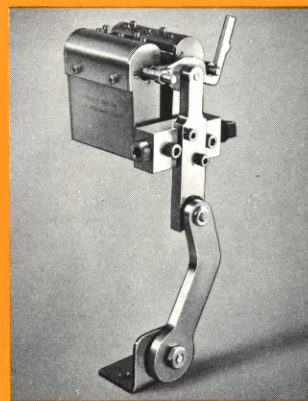
## BACKING BUFFER

for removal of all antihalation backings requiring mechanical scrubbing. Employs water jets and air squeegee in combination with power-driven buffing wheel.



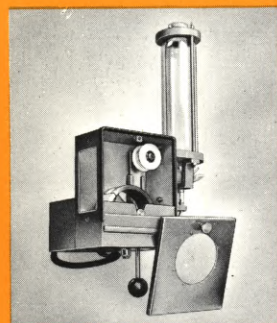
## SQUEEGEES

Illus. are knife squeegees for prevention of carry-over of both chemicals and water, and high efficiency box-type squeegees for final squeegeeing before drying. Both types are available in 16mm and 35mm sizes.



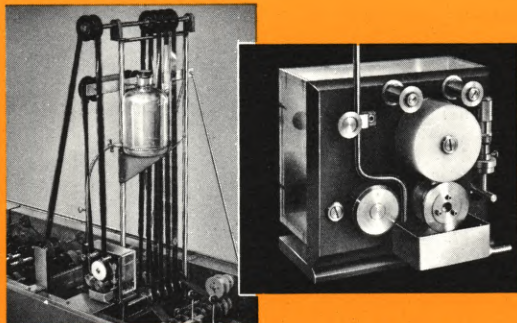
## OTT SQUEEGEE

High efficiency air squeegee is principally designed to remove all surface moisture before sound track application or where complete removal of surface moisture is critical before drying.



## WAXER

Full-width wax applicator for use at take-up end of processor. Completely self-contained, self-powered unit with automatic fluid level control. 16mm and 35mm sizes.



## SOUND TRACK APPLICATOR

for 35mm, 16mm, and 35-35/32mm combinations. Concentricity of backing wheel to applicator wheel is held to within .0005". Applicator wheel is micrometer-controlled to insure precision adjustment and repeatable settings.

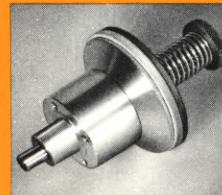
## DRIVE CLUTCH ASSEMBLY.

An adjustable friction-type clutch for use on tendency-drive processors or as a take-up clutch on chain-drive processors.



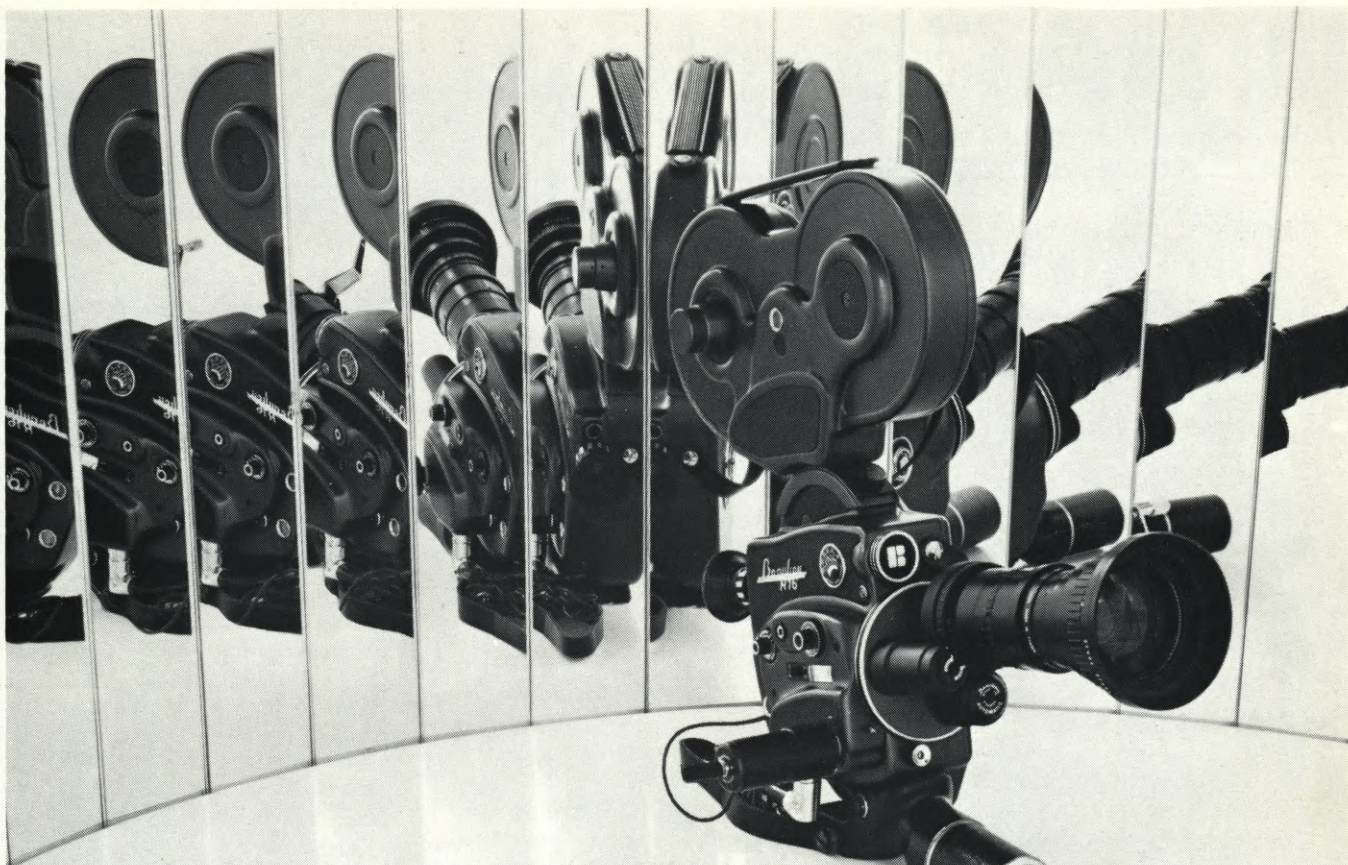
## HOLD-BACK CLUTCH ASSEMBLY.

An adjustable hold-back unit for maintaining tension on the feed spindles of the processor loading end. May be supplied with various types of output shafts.



# TREISE ENGINEERING, INC.

1941 FIRST STREET • SAN FERNANDO, CALIF. 91340 • (213) 365-3124



**The Beaulieu R16B "Automatic"  
isn't the only 16mm reflex camera  
with a mirrored shutter.**

**But the other ones cost at least twice as much.**

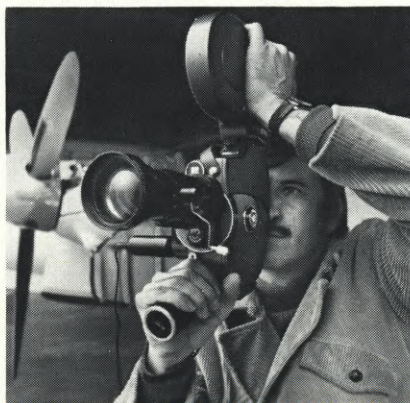
The mirrored shutter is one of the most critical differences between ordinary cameras and precision cameras. The Beaulieu's mirrored shutter is the guillotine type, angled at 45°. When it's open, all the light passes directly onto the film through the finest 12-120mm zoom lens made, the Angenieux. And there's no prism interfering between the lens and the film to cut down light intensity. When the shutter is closed, it's bouncing all the light through the reflex viewfinder. So your eye is getting the same brilliant, sharp image the film is. There are no parallax problems. There's no guesswork.

Monitoring the light is the finest automatic exposure control system ever built. The heart of it is a Gossen light meter, located behind the lens and linked electronically to a miniaturized servomotor that rotates the Angenieux's iris diaphragm ring. This system keeps the lens aperture constantly at the correct exposure setting, no matter how rapidly the light is changing.

Another advantage of the R16B "Automatic" is its weight, or lack of it. The

100 ft.-load camera body (less lens) weighs a remarkably light 4¼ lbs. And even when you load it up with a 200 ft. magazine, a sync pulse generator, and the Angenieux 12-120mm zoom lens, it still weighs only 10½ lbs., *including the battery!*

It's a nickel cadmium battery, and it's built right into the camera handgrip. Powerful? Beaulieu's 1000mA battery will roll 1600 ft. of film on a single charge. And you can replace it with a fully charged spare in seconds.



Not having to wear a battery strapped around your waist or swinging over your shoulder can make quite a difference when filming. Particularly when you want to hook up your Beaulieu with a professional recorder, like Nagra or Uher, for sync sound filming.

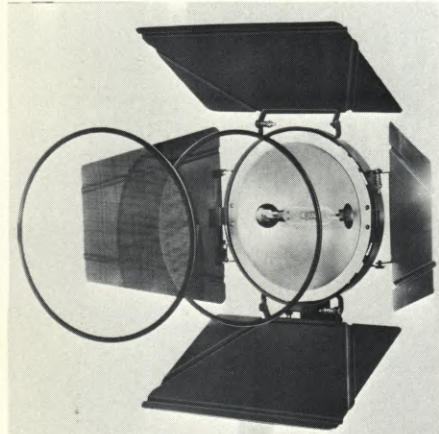
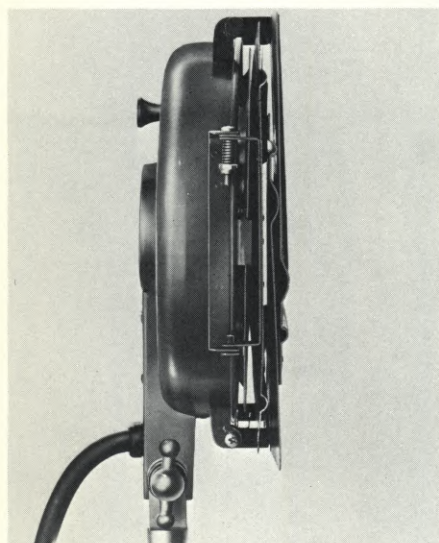
Wondering about the price? Then add up all the features of the camera—light weight, rock steady pictures, automatic exposure control, an electronically regulated motor, and a mirrored shutter. Then add to those features some rather important optional equipment—a 200 ft. daylight-load magazine, a sync pulse generator, an Angenieux automatic 12-120mm zoom lens, and a rechargeable nickel cadmium battery. The whole package comes to a little over \$2,650—at least half the cost of any other precision camera with a mirrored shutter.

**CINEMA**  **Beaulieu**  
A DIVISION OF HERVIC CORPORATION

To receive literature on the Beaulieu 16mm camera, visit your finest camera store or write Cinema Beaulieu, General Office: 14225 Ventura Blvd., Sherman Oaks, California 91403.

# WHAT'S NEW

IN PRODUCTS, SERVICES AND LITERATURE



## UNIQUE "SLIMLINE" LAMPS INTRODUCED

Bardwell & McAlister Inc. announces the availability of its new "SLIMLINE" 2000-watt tungsten-halogen "Quartz" light.

### DESCRIPTION:

The versatile "SLIMLINE II" is a high-intensity, continuous duty light source designed for TV and motion picture studios. The tungsten-halogen "quartz" lamps operate directly on 120 volts, AC or DC. A rugged new housing design allows "flo-thru" convection cooling. Reduces heat-load and increases unit life.

The 4-leaf style barndoors are unique in that each barndoor has its own spring-loaded hinge. Barndoors can be adjusted individually for positive lighting control and sharp edge cut-off.

Model is also available without barndoors.

Adjustable, heat-resistant knob and "thrust-bearing" between lamp housing

and yoke provide easy rotational control. Proper "tension" prevents undesirable movement; new one piece reflector design increases light output without "peaking"; provides a smooth, even light pattern.

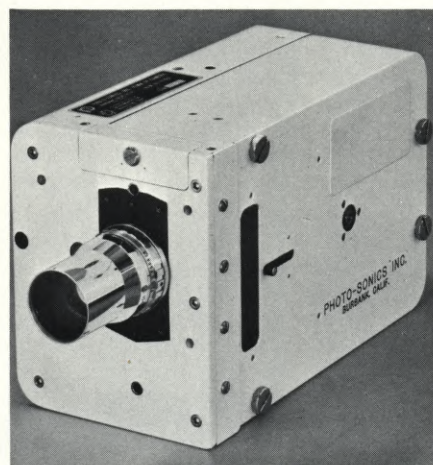
### APPLICATIONS:

These light-weight, portable units, designed for broad fill and flood lighting applications, can be used in TV, motion picture studios and by professional "still" photographers. Extreme care has been taken to design a unit that has flat, even pattern of light over a wide area.

Because of its small size and portability, the "SLIMLINE II" is ideal for field use. When the barndoors are closed, several of the units can be packed together easily into a small amount of space.

The "SLIMLINE II" is available with a wide range of lamps in different wattages, color temperatures and intensities.

Further information about the "SLIMLINE" light may be obtained from: Bardwell & McAlister Inc., 6757 Santa Monica Boulevard, Hollywood, California 90038.



## 16mm INSTRUMENTATION DOCUMENTATION CAMERA

The new Photo-Sonics 16mm-1P instrumentation/documentation camera featuring 200, 400 and 1200-foot daylight loading magazines that can be interchanged in several seconds with one hand, is announced by Instrumentation Marketing Corporation, Burbank, California.

This quick-change magazine feature

minimizes the loss of event documentation at time of film run-out and magazines may be loaded without disturbing optical system. Camera speeds by selector switch of 16, 24, 50, 100, 200, 300 and 400 frames per second; has film run-out switch, is dual intermittent pull-down and dual pin-registered, 28 VDC (115 VAC version available), may be tripod, top or side-mounted. Accepts any "C"-mount lens. Electronics are modular solid state. Accessories and compatible equipment include add-on automatic exposure control, variable shutter from 7.5° to 160°, pulse motor kit, pulse generators, photo-digital recorders, film readers/viewers, etc. Literature on request.

Price: 16mm-1P with 200' magazine, \$2925.00.

For further information contact: Richard Freeborg, President; Instrumentation Marketing Corp.; 820 South Mariposa Street, Burbank, California 91506 (213) 849-6251



## PORTABLE TRANSISTORIZED A.C. POWER SUPPLY

A new crystal-controlled A.C. Power Supply has been announced by Kamtron Systems Inc. 8331 De Celis Place, Unit B, Sepulveda, Calif. 91343.

The unit, Model PPS-1, will power any load up to 100 watts.

It features precision crystal-controlled oscillator. Integrated circuits, automatic charger, output monitor, easily replaceable battery pack.

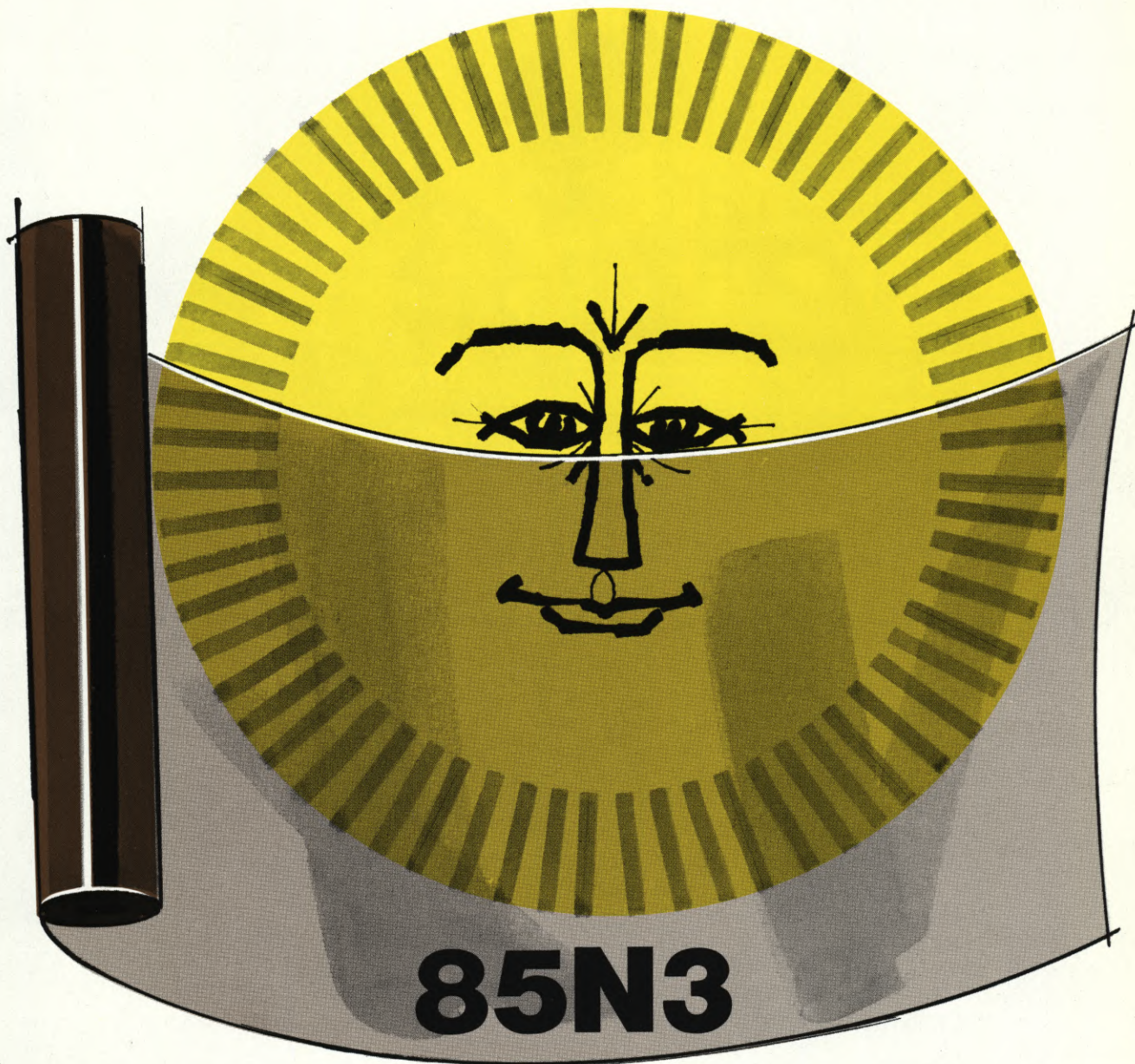
The supply weighs 7 lb., it can also be powered from external 12 VDC source or double as a 12 VDC source.

Unit is supplied with cables and shoulder strap.

Options available: 115 and 230V charge capability, 50 and, or 60 Hz output frequency, sync-pulse output, panel in Spanish, German, French.

The PPS-1 is priced at \$ 792.

to warm up the sun  
and dim it down...



You're shooting indoors. The cold, bright sunlight is streaming through the window. Rosco Cinegel 85N3 is the fast easy solution. It combines the correction of an 85 filter with 30% neutral density.

Also available are 85N6 and 85N9, with 60% and 90% neutral density respectively.

The material, called Roscovin, comes in 54" rolls to eliminate most seams. It's flexible and adheres to glass without taping or framing. Minutes later, roll camera!

Cinegel is the name of Rosco's complete line of specialized cinematic color media designed to make light behave. It in-

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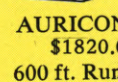
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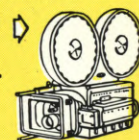
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The man in this photograph is Haskell Wexler; and that's his CM3.

**Director of Photography  
Haskell Wexler, A.S.C.,  
won an Academy Award  
for his cinematography  
of "Who's Afraid Of  
Virginia Woolf." He also  
shot "In The Heat Of  
The Night," which won six  
Academy Awards.**



## **In both films he used two cameras: a Mitchell BNC and an Eclair CM3.**

In the days before the Mitchell offered reflex viewing, Mr. Wexler used to shoot with the CM3, (which has extremely clear and accurate reflex viewing), when framing or depth of field were critical. The Mitchell's 1,000 foot load made it his choice for most studio sequences, even though the CM3's pre-threaded 400 foot magazine can be changed in literally five seconds. He used the CM3 for about 50% of "Virginia Woolf." But on his own feature production "Medium Cool," Mr. Wexler used a specially made 1,000 foot magazine on his CM3, as well as the standard 400 footer; and he shot the whole picture with the CM3.

Because of his extensive experience in shooting documentaries, Mr. Wexler's photographic style has a strong feel for realistic treatment. He approaches the lighting of a studio interior set as though it were a real room on location, with four walls and available light

sources. The living room set in "Virginia Woolf" was realistically cluttered and cramped for space. The CM3's small size and light weight enabled Mr. Wexler to use this to advantage, instead of having to fight it. He could put the camera in among the clutter, and get the lens close to objects on the bookshelf or whatever. No need for a bulky crab dolly.

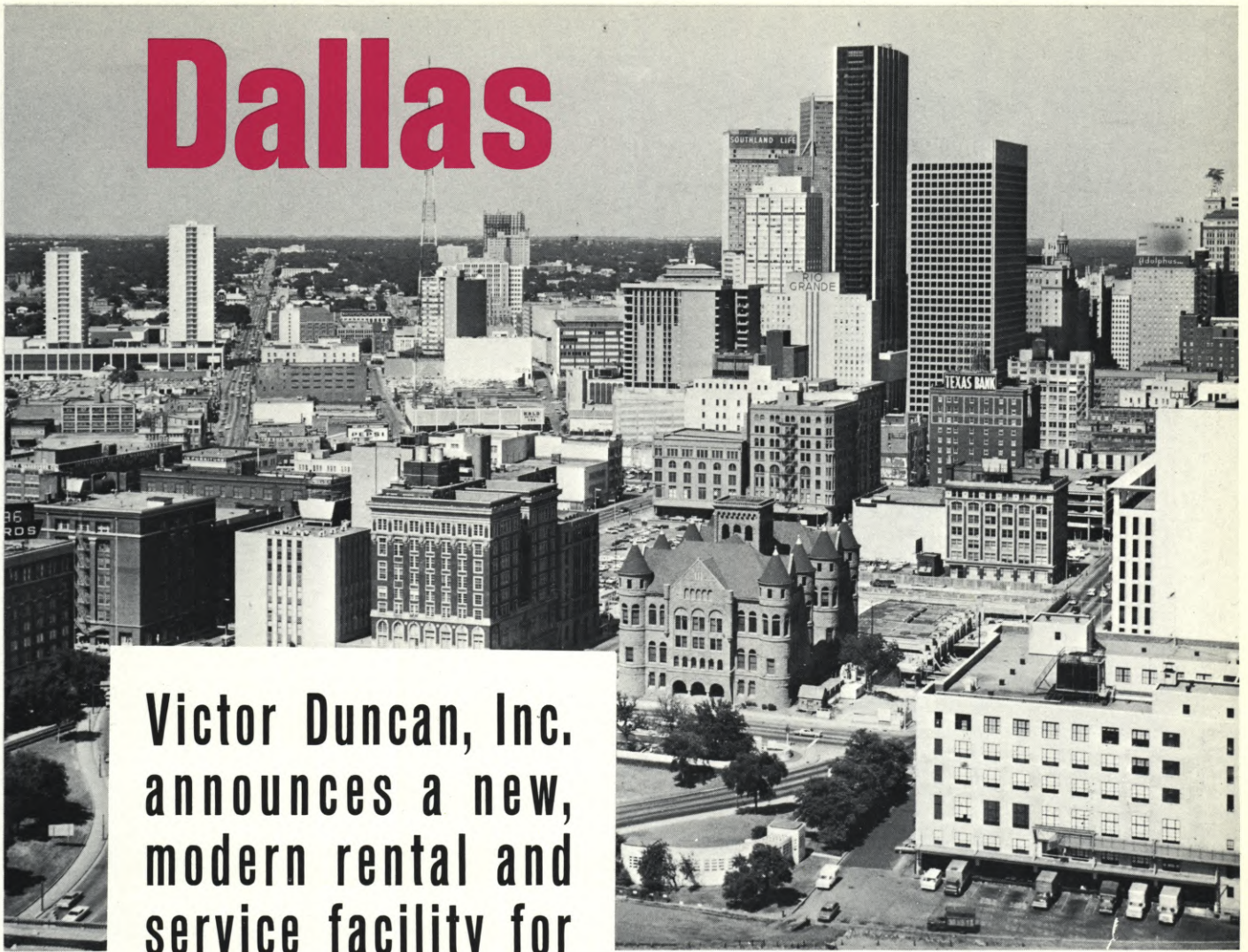
On location, the fact that the CM3 can be mounted on a light-weight wooden-leg tripod makes moving a few feet over to a better angle quick and easy. With a 300 pound rig, says Mr. Wexler, you're tempted to stay where you are. Shooting "The Thomas Crown Affair," he also mounted his CM3 on a dune buggy, in a helicopter, on a home-made "skateboard," and, of course, on his own shoulder. Because the CM3's magazine is mounted on the rear, says Mr. Wexler: "No other 35mm camera balances so well on your shoulder."

When Mr. Wexler shoots a scene inside a moving car, it's a real moving car, not a car set with a process screen background. For various reasons, many of the Tennessee location shots for "Heat Of The Night" had to be made fast, without elaborate rigs or setups; but the script called for a lot of car interiors. The CM3's rear-mounted magazine gives the camera a low profile, which enabled Mr. Wexler to sit inside the car with the actors, and shoot at normal eye-level with the CM3 on his shoulder. No other 35mm reflex camera would have fitted under the car's roof. And no process shot would have looked as genuine. Even an external camera rig would not have looked as real, says Mr. Wexler, because of the rigid camera position and fixed image size. CM3 versatility helps.

For more CM3 information, contact Eclair at 7262 Melrose Ave., Los Angeles 90046.

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“The footage we got in the rural areas,” writes John Gunselman, Avco Director of Cinematography, “was as successful as it was, often because of the austere magnificence of the settings themselves. In those forests and mountains a cameraman just turns on, because everywhere you look is something you want to shoot. I could go on about our challenges and conquests there, but the biggest challenges faced us when we shot in the city. After all this true to life footage we’d gotten in the country, we found that the crowds that gathered when they saw us filming in the city absolutely demolished the spontaneity of the scene. We tried several times, but the stilted, self-conscious attitudes of the city people just didn’t work.”

Mr. Gunselman’s solution was to take his camera off the tripod, and mount it on a body brace. “By doing this, we became more mobile and much less conspicuous. On the streets, in a bar, a church, I was suddenly just there—if people noticed me at all, they paid no attention.”

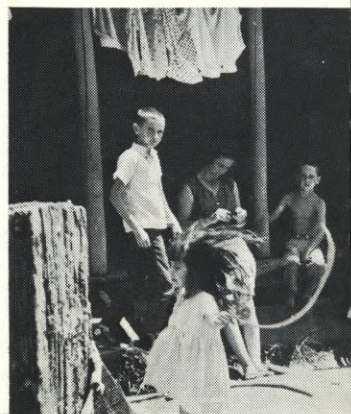
Good thing, then, that Mr. Gunselman had chosen an Arriflex 16BL for the entire production. 1200-ft. magazines were used in a great deal of the hand-held shooting, to help cover the long takes made necessary by the unpredictable, unrehearsed action. No other 16mm camera could have handled 1200 footers without a tripod.

That Mr. Gunselman was successful in this and other resourceful applications of his Arriflex equipment is demonstrated by the string of awards already garnered by “Appalachian Heritage.” These include the first-place award of the National Association of Television Programming Executives, a regional Emmy, and the N.P.P.A. award for Best Cinematography in 1968.

“Having been a personal Arriflex owner for a number of years,” concludes Mr. Gunselman, “I was totally familiar with Arriflex quality, and when Avco decided to buy a new production camera, I immediately insisted upon the Arriflex BL. My faith was borne out. In “Appalachian Heritage”, I exposed 32,000 feet of 7255 without as much as a magazine jam.”

To many award-winning cinematographers, this kind of reliability might be called Arriflex Heritage.

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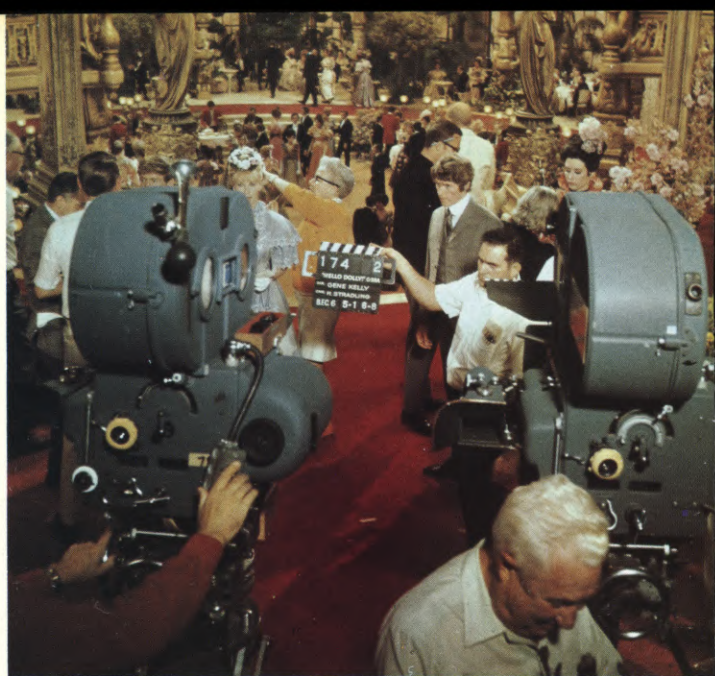
Soundman Don Regensburger and Director of Cinematography John Gunselman at work shooting a scene for "Appalachian Heritage."



The suffering of the region falls hardest on the children.

This old man belongs to a past which no longer exists.

# BEHIND THE SCENES OF



Assistant cameraman slates two TODD-AO camera in preparation for shooting one of the lush production numbers for the 20th Century-Fox film version of "HELLO, DOLLY!"

Superbly photographed, and radiating technical brilliance in every aspect of production, a fabled stage hit musical becomes a many-times-better motion picture

By HERB A. LIGHTMAN

As the opening "still-life" panorama of "HELLO, DOLLY!" faded in on the screen, and the 1890 New York street scene which it depicted rippled into motion, I thought back to a certain hot summer's day more than a year and a half ago when I stood on that very street watching the filming of the parade sequence for this screen version of David Merrick's fabled Broadway stage hit. ■ Production Designer John DeCuir's incredible set stretched seemingly for miles into the distance and even though I had traversed this street hundreds of times to enter the 20th Century Fox Studios the illusion was so nearly perfect that I had to keep reminding myself it was only a movie set, and that beneath those rococo turn-of-the-century facades there were hulking sound stages and the no-nonsense architecture of the 20th-Fox Administration Building. ■ Thousands of extras in period costume lined the curbs of the cobble-stoned thoroughfare that day, watching colorful bands and floats

(LEFT) TODD-AO camera on boom arm trucks ahead of dancers gamboling down cobble-stoned street on location at Garrison, N.Y., which doubled for 1890 Yonkers. (RIGHT) Chapman "Titan" boom moves into position for filming of wedding sequence on a Hudson River bluff near West Point. Final scene was actually a zoom shot made from high camera platform.







(LEFT) Couples whirl in spirited dance routine about the circular floor of Production Designer John De Cuir's magnificently lush Harmonia Gardens set. (RIGHT) Participants form a stylized American flag as they march full length of vast Manhattan Street set in the spectacular parade sequence. Thousands of extras in period costume were involved.

march in snappy cadence toward the anachronistic off-screen traffic snarls of Pico Boulevard. Director of Photography Harry Stradling, Sr., ASC, threw me a pantomimed hello as he went rolling by on a giant camera crane. He had a handkerchief tied around his head to ward off the noonday sun and seemed to be hugely enjoying the challenge of photographing such enormously complicated action. I remember telling myself that this had to be the most spectacular sequence filmed in Hollywood since D.W. Griffith's "INTOLERANCE".

Superlatives come easily to mind in describing the lush screen version of "HELLO, DOLLY!" because (unlike several other recent super-expensive extravaganzas) every cent of its \$20,000,000 budget shows up on the screen. It pretends to be no more than it is—a joyous, rollicking, giant-size candy-box of sheer entertainment.

Considered from the standpoint of technical excellence, however, it is far more than that. "HELLO, DOLLY!" is a stunning example of the quality which can be achieved when a team of top-notch, dedicated artists and technicians aim their combined talents toward the goal of perfection. At a



(ABOVE RIGHT) 1840 structures of Garrison depot had to be "modernized" for film. (LEFT) Actual period buildings on location were refurbished to represent Horace Vandergelder's hay and grain emporium, a key setting of the film. (RIGHT) Interiors of same set, with stars Walter Matthau and Barbra Streisand, were filmed 3,000 miles away on 20th-Fox sound stage.





Photo series showing the progression of a helicopter shot made by Nelson Tyler, using the vibrationless camera mount which he designed. (LEFT) Helicopter on flat car is pushed along the railroad tracks by grips to achieve a "soft" start. (CENTER) The craft lifts off of the flat car, continuing the backward motion as it rises. (RIGHT) The helicopter soars above the train as it moves out of the station, and follows its journey along the riverbank.

time when somewhat-less-than-adequate technique is frequently lauded as "Art" on the screen, such a *tour de force* of technical precision is reassuring.

#### A Few Pertinent Logistics

20th Century-Fox purchased film rights to "HELLO, DOLLY!" on March 9, 1965 and pre-production work on the project began exactly one year later.

Construction of the huge New York street set began October 23, 1967. On January 2, 1968, choreographer Michael Kidd began developing routines with the nucleus of his chorus.

The stars and featured players began rehearsals with director Gene Kelly and Kidd on February 19.

"HELLO, DOLLY!" went before the TODD-AO and DeLuxe Color cameras on April 15 for a scheduled 89 days of shooting.

The production was completed in 90 working days on Aug. 23, a feat regarded as extraordinary in view of the size of the project and the fact that about 65 percent of the film was made out of doors subject to the vagaries of weather. The company was caught only once with a large crowd of extras (350) and so committed that it couldn't retreat

Four-time Academy Award-winning Cinematographer Joseph Ruttenberg, ASC, chats with old friend, "HELLO, DOLLY!" Director of Photography, Harry Stradling, Sr., ASC, between set-ups.



indoors to a "cover" set. This was on the New York location.

All the 1890 period interiors and the Manhattan exteriors were shot at 20th Century-Fox Studio, while the Yonkers exteriors were made at Garrison and Cold Springs, N.Y., with the big finale number against a sweep of the Hudson River.

#### The Man Behind the Camera

"HELLO, DOLLY!" owes much of its superior style and quality to the fact that its key technicians were selected with meticulous care—and so it is not surprising that the photography was entrusted to veteran cameraman Harry Stradling, Sr., ASC, winner of Academy Awards in Cinematography for "THE PICTURE OF DORIAN GRAY" and "MY FAIR LADY".

Stradling himself admits quite frankly that he was given the assignment primarily because Barbra Streisand requested him. He had photographed the lady in her Academy Award-winning debut as the star of "FUNNY GIRL" and there developed between them a very special professional rapport which carried over through "DOLLY" and two subsequent films, "ON A CLEAR DAY YOU CAN SEE FOREVER" and "THE OWL AND THE PUSSYCAT"—both unreleased.

Of Miss Streisand, Stradling, a man noted for his candor, says: "She's one of the greatest talents I've ever worked with. She knows photographic quality—what's good and what's not good. She knows what height the camera should be and just where it should be placed for her closeups—and she's learned all this during the short time she has been in pictures. She even does her own makeup because, as she says, she knows her own face better than anybody else does. I find her as easy to photograph as any of the hundreds of stars I've worked with since I've been in this industry. The contours of her face give her a rare beauty. She's just a very wonderful, really brilliant, woman."

Apropos of adopting a definite photographic style for "DOLLY", Stradling comments, "I had seen the show on the stage in Las Vegas and it seemed to me that the film version should be a happy-looking picture—bright and airy. A heavy dramatic style of photography just wouldn't fit."

Having decided upon a crisp high-key style, Stradling shot a negative of normal density. Later Producer Ernest Lehman would decide that the bright and airy aura could be enhanced further by making the prints two printing lights brighter than normal.

## Manhattan Street Exterior Set

The New York street was originally planned for the 20th Century-Fox ranch, about 35 miles distant, but this idea was abandoned when it was discovered that transportation charges would be so huge that practically nothing would be left for the set itself. There appeared to be no space for the 15-acre complex on the studio lot until production designer DeCuir came up with a plan whereby it could be built around existing buildings without interfering with their utility. Thus 11 existing buildings were enclosed by the set, including the Administration Building, the lot's nerve center.

The set, itself, is the largest and most expensive—more than \$2,000,000—ever attempted for a 20th Century-Fox picture, and perhaps for any other film. At this writing it still stands—a source of wonder to passing tourists.

It is a complex of 60 buildings involving reproductions of intersections of Manhattan's Fifth Avenue, Broadway and Mulberry street, with subsections for Madison Square Park, 14th Street and the Bowery. Involved are re-creations of Tony Pastor's theatre, the Hoffman House, Fifth Avenue hotel, the Waldorf Astoria and old Grand Central Station. The original plan was to faithfully reproduce the areas named, but when the set has to be tailored to available space this could not be done and so it is exact in every tiny detail, but inexact geographically.

If laid out in a straight line the set would have stretched about three-fifths of a mile. Through it runs a six hundred foot reconstruction of the Sixth Avenue elevated railway with a working steam engine and three cars operated by retired Union Pacific engineer Herbert Hoopes. In some places the set rises to a height of 130 feet, or about eleven stories, and is supported by 183 pine, extra length, telephone-type poles and by 8.9 miles of steel tubing. All supporting material was embedded eight feet deep in concrete against wind stresses.

If a multi-skilled worker started on the job in 1968, he would finish 119 years later! However, it took a scant six months to do the job of turning the studio streets and facades of the sound stages and the administrative building into the New York street, circa 1890.

Enough paint was used on the exterior sets alone to cover every house in a 5,000 population town, more than 10 tons of nails were used at the last count and the end wasn't in sight; 858,000 board feet of lumber were cut and fabricated. Just for the record, 858,000 board feet of lumber translates into 117 miles!

More than 330,000 square feet of plywood were used,—enough to build all the houses in that 5,000 mythical



The camera, mounted on a Chapman crane, soars high in the air as it follows a marching band down the Manhattan Street for the famous parade sequence.

population town mentioned above.

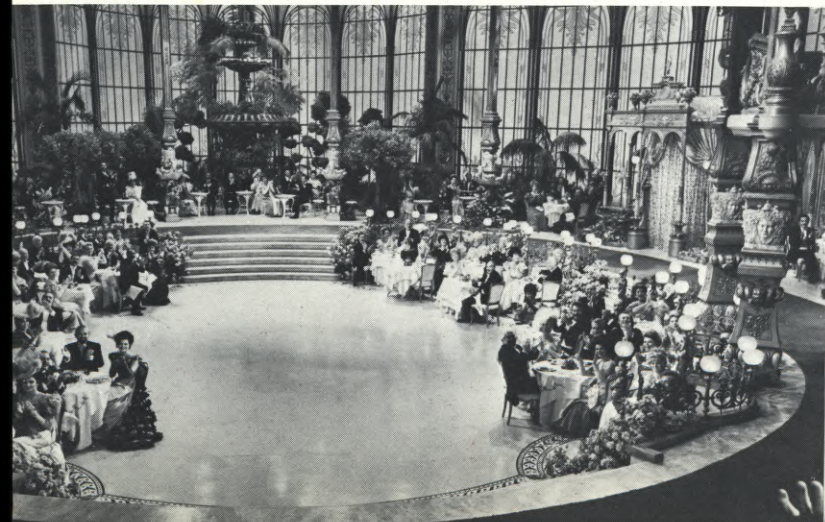
The 183 telephone poles required more than 22 miles of wire simulating telephone cables.

For the elevated railroad, more than 220 tons of steel had to be specially fabricated; more than 30,000 lineal feet of steel frames for cutouts had to be made; 528,000 square feet of high impact Styrene for plastic brick and rock exteriors had to be used; 575 cubic feet of concrete had to be poured for the foundations and sidewalks; 186,000 square feet of asphalt were used for the block paving and parking areas; gandy dancers drilled and drove spikes for more than five miles of track; more than 50,000 plastic leaves and blossoms were hand tied to the life-like plaster trees in the park, whose roots, if they had roots, were imbedded in the imitation soil and plastic grass on which they rested.

The elevated train was supplied by Lindley F. Bothwell, of Woodland Hills, Calif., a collector who is also supplying four of the five horse-cars in the film. Twentieth Century-Fox already had one of these vehicles. However, nowhere in the country could be found a horse-drawn double-decked omnibus. One was located in Paris, but the expense and time

Continued on Page 130

(LEFT) The lush Harmonia Gardens set, with its circular dance floor, as it appears in the film. Approximately 25% of the picture's action was shot in this spectacular setting. (RIGHT) Behind the scenes at Harmonia Gardens, two Todd-AO cameras are trained on the action of intricately choreographed "Waiters' Gallop" dance number. A great deal of precise camera movement was needed to follow this action in a 360-degree sweep around the floor, as well as up and down several levels of the stunning set.



# TESTING FOR UNUSUAL MOOD

Veteran cinematographer experiments with nets, filters and several other things, seeking very special images for an off-beat dramatic film

By MORRIS HARTZBAND, ASC  
with GEORGE WALLACH

In January of 1969 Gil Cates contacted me and said that he would like to have me as his Director of Photography on his first feature film production. This was to be a picture adapted from the successful stage play "I Never Sang for My Father" by Robert Anderson and bought for the screen by Columbia Pictures. Cates who, in addition to directing the production, was serving as Co-Producer with Everett Rosenthal, sent me a copy of the script to read. The story is a highly dramatic and bitter presentation of the relationships between parents and children. The dialogue is strong, realistic and, at times, sad and depressing.

As I was reading the script it occurred to me that this story could not be filmed in the usual, straightforward

manner. Something would have to be done to offset the depressing dialogue and soften the visual images. I approached the producers and requested time to make some photographic tests. They agreed and set up at the Biograph studio for the first of many preproduction tests.

Using a production assistant as our subject we proceeded to make the first series of tests on Eastman Kodak 5254, the same stock which we would use during production. First we shot through several colored nets (red, blue, white, pink, black, and brown), lighting first from behind the nets to bring out the color. Everything was shot with the aperture wide-open and the same face was used for all of these and the ensuing tests.

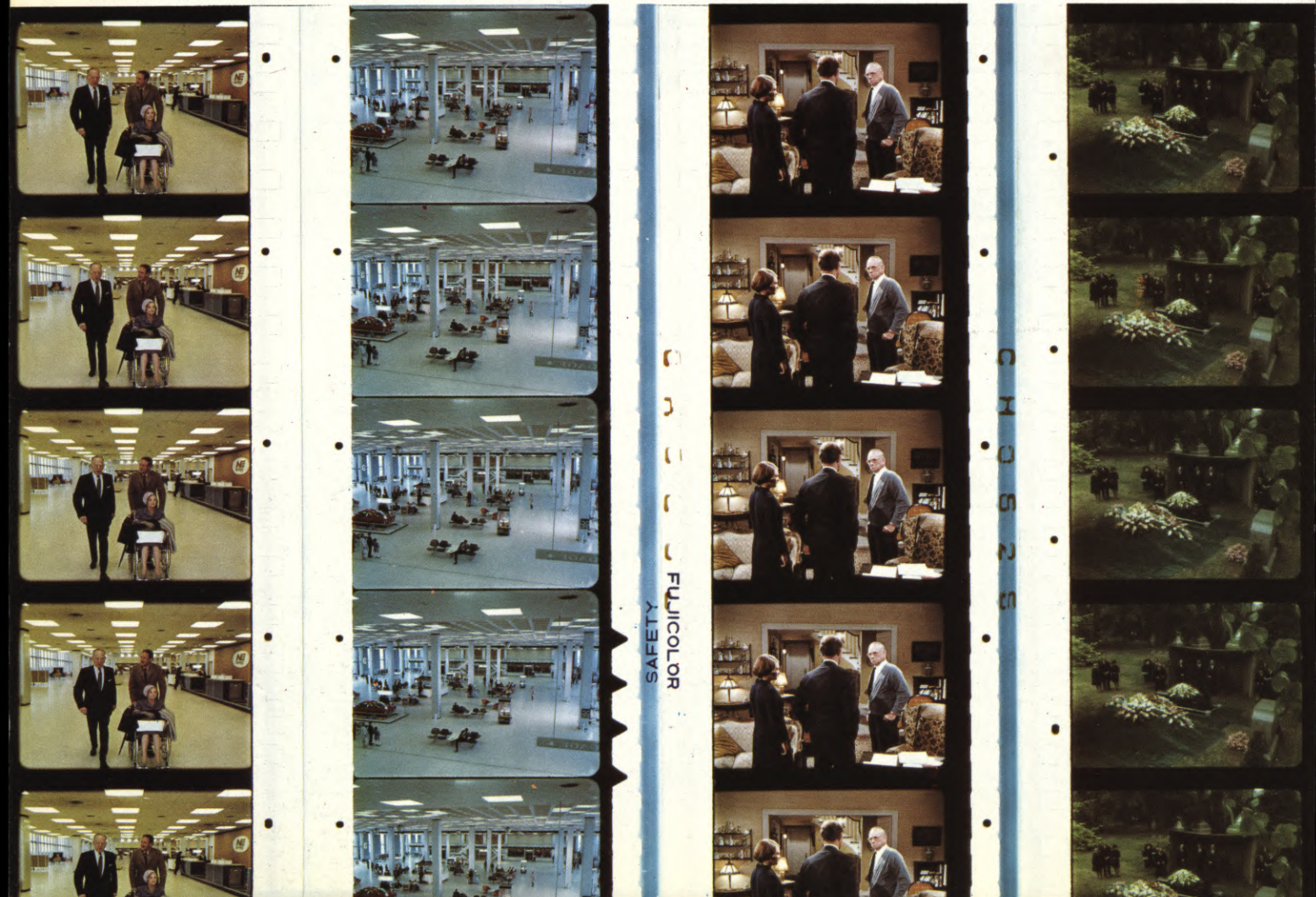
With the white net I had to vary the intensity of light from bright to very dim, since white is not a color, but the absence of color. The bright light on the net almost washed out the image on the film whereas the dimmest light used was just enough to create a slightly fogged effect as with a fog filter.

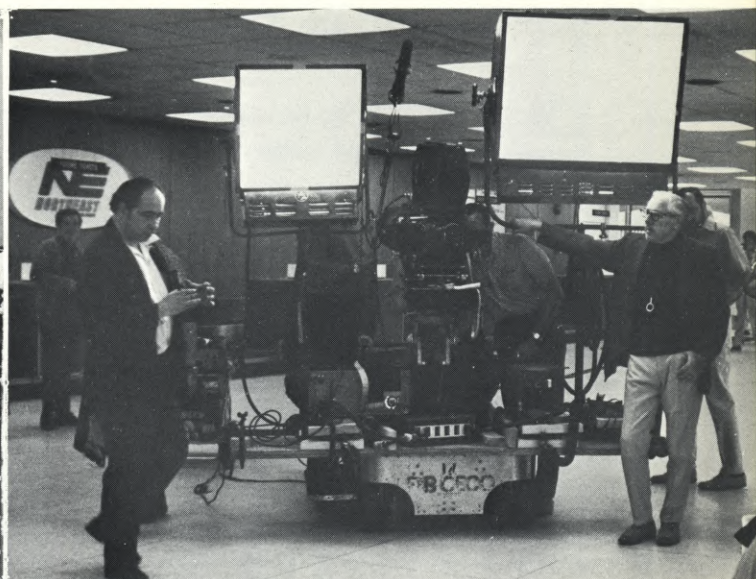
The next group of tests was shot through Harrison fog filters from #1 through #5 and through Scheibe fog filters 1/8th through 2.

The third series was a combination of the colored diffusion nets and the fog filters. In all the series of tests the distance to the subject varied from three feet to ten feet.

During all the tests we were in constant touch with John Kowalak, a color expert and consultant for Movie-

Uncorrected film strips of scenes from "I NEVER SANG FOR MY FATHER". (LEFT TO RIGHT) 1—A scene inside Kennedy Airport terminal, pushed two stops in development. 2—A scene inside Kennedy Airport terminal, pushed one stop in development. 3—Dramatic interior sequence, shot and developed normally. 4—Cemetery sequence, photographed for maximum mood through gauze net, fog filter and 90% neutral density filter.





(LEFT) Lining up a low-angle shot for cemetery sequence in the Columbia Pictures production, "I NEVER SANG FOR MY FATHER". In order to achieve the desired somber mood, Eastman 5254 color negative was shot with a fog filter, a net and a 90% neutral density filter in front of the lens and developed at 200 feet per minute. (RIGHT) Shooting inside the terminal at Kennedy International Airport, mainly with available light, required that the negative be pushed two stops in development for some sequences.

lab. John had each test printed on both Eastman Kodak and Japanese Fuji stock for comparison and evaluation.

At this point we repeated all the tests up to now with one difference. I underexposed each take first one and then two stops and requested the lab to push the development of the film first one and then two stops. This was done for two reasons. First, because several of the locations were in areas where the only available light would give me 10 to 20 foot-candles and I needed a minimum of 35 foot-candles to get an F.2 stop. We were planning on using existing light at these locations with the exception of one fill light. The second reason was to determine if the small amount of grain we would get as a result of pushing the development of the film would give us a softer, more pleasant-looking visual image to balance the sadness and harshness of the dialogue and acting.

The next step was to repeat all of the tests shot in the studio at the different exterior locations indicated in the script. We repeated the tests using the same nets and filters in various combinations with one difference. I added neutral density filters to the #85 filter to be able to shoot at the widest lens opening.

The tests were screened in a normal projection room and, then, John Kowalak arranged for a second screening on high speed projectors with the Eastman Kodak print on one projector and the Fuji print on another and, both, run simultaneously. The projectors are set up at a special screening room at Movie-lab in New York City.

With this type of screening we were able to make immediate comparisons to

determine any differences between the two stocks. The Eastman Kodak print looked crisp and the color separation excellent. However, what I wanted was a softer image with more of a pastel tint.

The next step was handled by John Kowalak at Movie-lab. For normal development, the developing machine developed the film through at 175 feet per minute. John made tests at 185, then 195 and, finally, at 200 feet per minute which is the maximum speed of the developing machine.

At the termination of the tests, I decided to go with, on exteriors, the Harrison fog filter #2, the 85 filter and 30%, 60%, or 90% Neutral Density filter depending on the time of day and the intensity of light. For the cemetery sequence I added a net, (the color of the net was unimportant because I was not hitting the net from behind with light). On exteriors I used Mitchell diffusion glass from A to D. On long shots I used Mitchell diffusion glass A or B, and on close-ups C or D, and again if the scene called for it, I used a net in addition to the glass diffusion. Of course, with the fog filters and nets I had to take into consideration the F-stop factor which varied from  $\frac{1}{4}$  to  $\frac{1}{2}$  stop.

Now, we put everything together. Eastman Kodak 5254 negative shot through a fog filter. For scenes like the cemetery sequence I added a net with the aperture wide open (to get this I had to use a 90% neutral density filter), and developed at 200 feet per minute. In sequences where we did not have enough existing light as in one sequence at Kennedy Airport I pushed the film

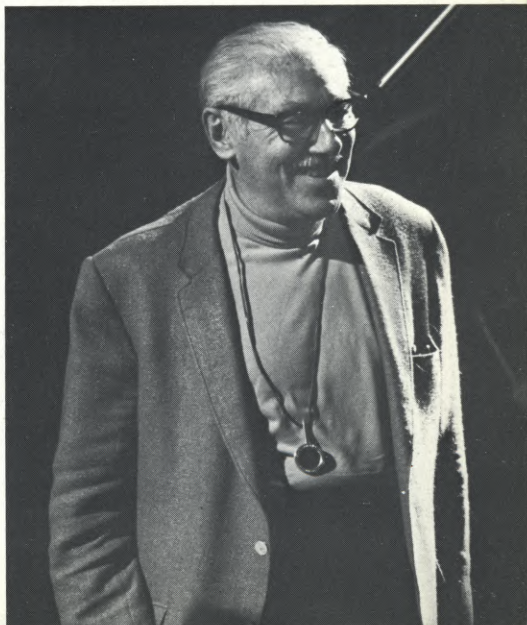
two stops over normal development. All release prints will be made on Fuji stock.

The Columbia representative, the Director, Producer and Co-Producer all approved the final tests and we were ready to shoot "Strangers".

This story is superbly acted by Melvyn Douglas, Gene Hackman, Estelle Parsons and Dorothy Stickney.

I have always been of the opinion that photography should add to the mood, but, at the same time, be unobtrusive and not detract in any way from the story and performance on the screen. I believe that John Kowalak and I have succeeded in doing this in "I NEVER SANG FOR MY FATHER". ■

The author, Director of Photography Morris Hartzband, ASC, experimented toward developing unusual photographic approaches to complement the moods of an off-beat dramatic screenplay.



# THE NEW "CLIPSTRIP" SPEEDLIGHTING SYSTEM

A unique innovation in motion picture lighting which features diminutive lamps of extremely high efficiency that can be set up fast to light wide areas of background on location

On display at the Bardwell & McAlister booth during the recent IFPA Convention was an item which literally "stopped traffic". Crowds of people attending the affair (including representatives of some of the other exhibitors) clustered around the booth to see demonstrations of a unique new concept in light-weight portable lighting equipment, the Clipstrip Speedlighting System.

At first glance the hardware involved looked anything but impressive. It consisted, basically, of a 20-foot length of metal moulding onto which could be instantly snapped as many as ten tiny sections of angle-aluminum, each of which was fitted out with a quartz lamp and a single barndoor.

However, when the current was turned on, these diminutive reflectors kicked out an incredible amount of light in a flat pattern over a very wide area. It became immediately apparent that the Clipstrip could prove to be an extremely valuable new tool for cinematographers faced with the problem of lighting up vast areas of background on location.

The Clipstrip is a newly developed system of motion picture set lighting that lends itself to extremely rapid set-ups. It consists of two basic elements and a small group of accessories. The basic elements are: the Clipstrip, which comes in 5 and 10-foot sections. The Clipstrip carries the current through bus bars that are insulated from, and encased in, a steel sheet. The Clipstrip serves to supply the power to the lighting unit, called the Strip-clip, and also acts as its mechanical support. The Strip-clip is a lighting unit that snaps on to the Clipstrip and draws its power from it. It consists basically of a Quartz Halogen type bulb of various wattages ranging from 500 to 1000 watts. It's a 90-degree reflecting surface of extremely high reflectivity. The light pattern is very even over a large central area with gradual fall-off at the sides. It has one barndoor mounted at the bottom. This barndoor is used both to cut off and control the light and also to protect the bulb and reflector surface in the course of shipment. The presently-available accessories consist of:

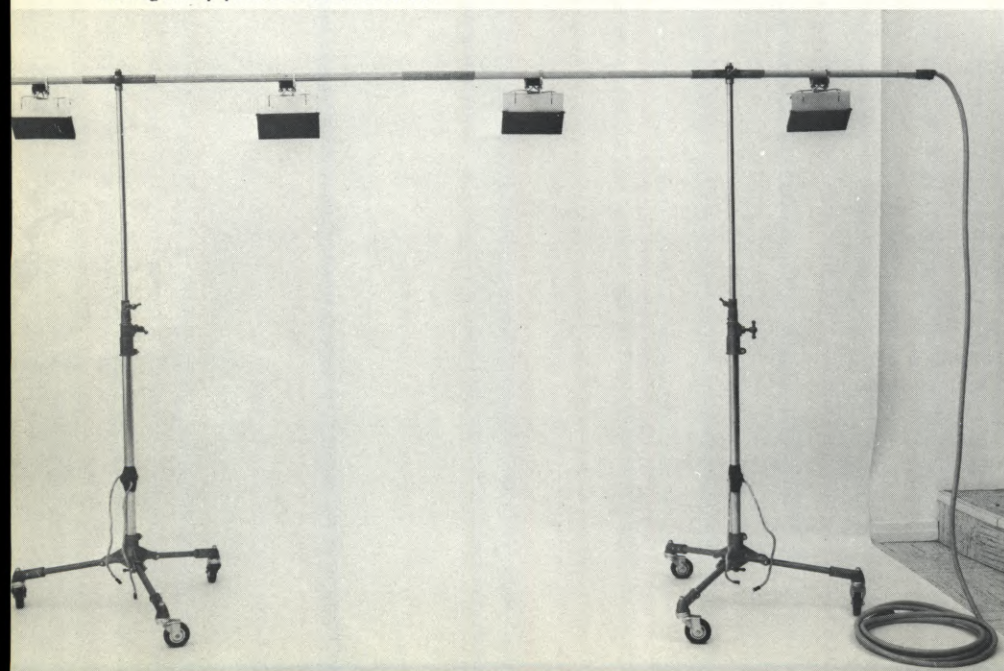
- 1) A messenger cable hanger. This is a slip-on fitting for the Clipstrip. It enables the user to hang it either on sash cord or steel wire, stretched taut, about four inches above the desired Clipstrip position. This hanger has a messenger cable to be hung first and then the clipstrip is hooked on to it.
- 2) Nailing surface hanger that allows one to place the Clipstrip snug on any surface that can be nailed to.
- 3) 5/8" adapter that allows for overhead gantry arrangement on currently standard Baby Keglite stands. This can then move with the camera for rapid and varied lighting set-ups. The same adapter lends itself to banking these lights on regularly available century stands.

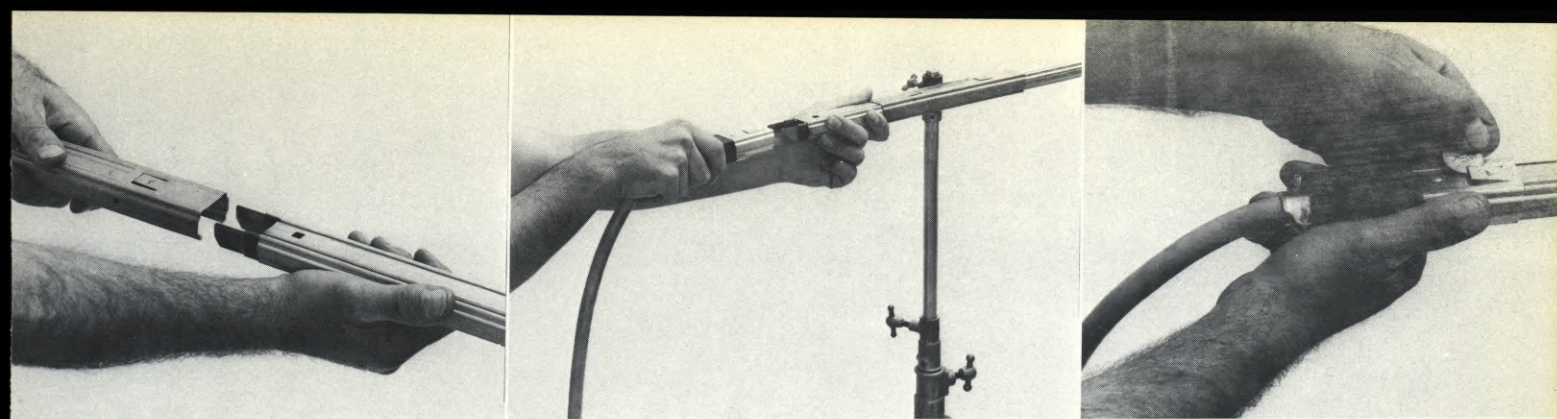
The Clipstrip is a modular and extremely light and portable system of set lighting. The foundation of the system is the Strip-clip kit. This is a carrying case 6" x 72" x 8½" and contains four 5' clipstrips, 3 couplings enabling the user to assemble them to either two 10' units, one 15' and one 5' unit, four 5' units, or one 20' unit. There are two 5/8" stand adapters that enable the user to hang a strip of up to 20' between two rolling Baby Keg stands. The feeder cable is then plugged into one end: then the Clipstrips, as many as 10 of them, can be clipped onto the track. This provides a 20' gantry arrangement that can be moved around with the camera set-up.

The same case contains 10 Clipstrips, each capable of accepting up to a 1000-watt Quartz Halogen bulb. These bulbs are also available in 500 and 750 watts. Other accessories included in the kit are eight messenger cable hangers. These clips slide onto the Clipstrip and make it possible to suspend as large an assembly as required, often over 100' on rope, sash cord, wire, etc.

In order to safely ground the entire system of the Clipstrip—the lights on them, all the accessories, (make them safe to handle)—it's only necessary to

A 10-foot section of Clipstrip mounted, by means of 5/8" adaptors, onto two Baby Keglite stands and fitted with four Strip-clip lamp units. Extremely light-weight and compact, the system effectively replaces large bulky lights conventionally used to do the same lighting job. Clipstrip was designed by veteran New York gaffer Charles Intrator to solve problems he had encountered during many years of location work.





(LEFT) Separate lengths of Clipstrip bar are quickly joined together by means of a coupling connector. (CENTER) The power cable shown being connected to the assembled Clipstrip track. (RIGHT) The power cable is locked to the Clipstrip by flipping metal tab. A coin may be used for this simple operation if tool is not available. All elements of system are fully insulated and can be simply grounded for safe handling.

ground one end of the supporting wire and messenger cable. This creates a very good metal-to-metal contact through the hangers to the Clipstrip and then to the lighting unit itself extending through the barndoor. The barndoor hanging down the furthest is the part most often handled by personnel. It makes the entire system very safe and precludes the need for using a third wire for grounding purposes.

Another method of supporting the Clipstrip is the nailing clip. This unit also slides over the clipstrip and enables the user to hang any length of Clipstrip with nails to any surface that can be nailed to. This method is especially useful when erecting a bank of lights of the type used for lighting large transparencies in the studio or perhaps a bank of lights to simulate a north sky feeling in the studio or on location.

There are certain very challenging areas of motion picture production in which the Clipstrip proves to be especially valuable. These include, for example, location interiors with ceilings so low as to preclude the use of larger lighting units. The total ceiling height lost by using the Clipstrip can be as little as 5 inches and never more than 6 to 8 inches.

The Clipstrip is also a boon to cinematographers shooting in 16mm with its slower film stocks and conse-

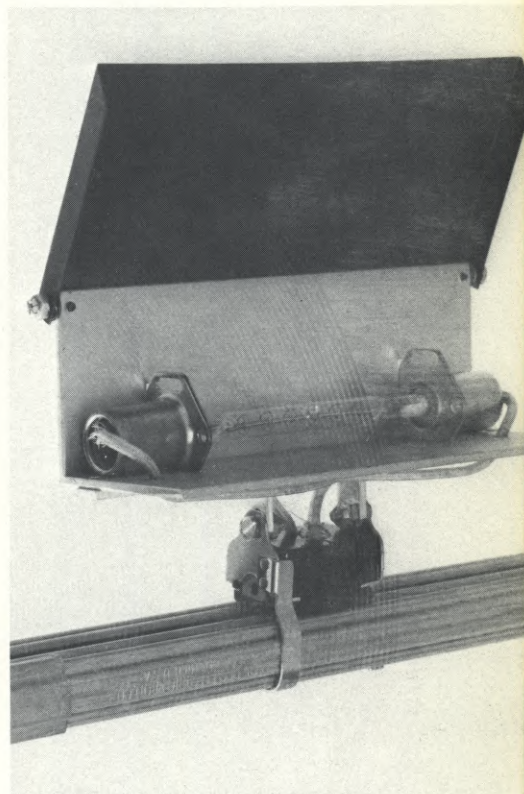
quent need for a higher light level.

The light can always be used in its ideal position, that is, with the light source being overhead under these circumstances rather than at eye height and very often, in some industrial areas, even below eye height, which makes for a very poor picture.

As many as twelve kits of Clipstrip can be carried in an ordinary station wagon with room left for passengers, a lot of other equipment, and a coffee urn. Ten kits translated into wattages amounts to 100,000 watts of light and 200 feet of track.

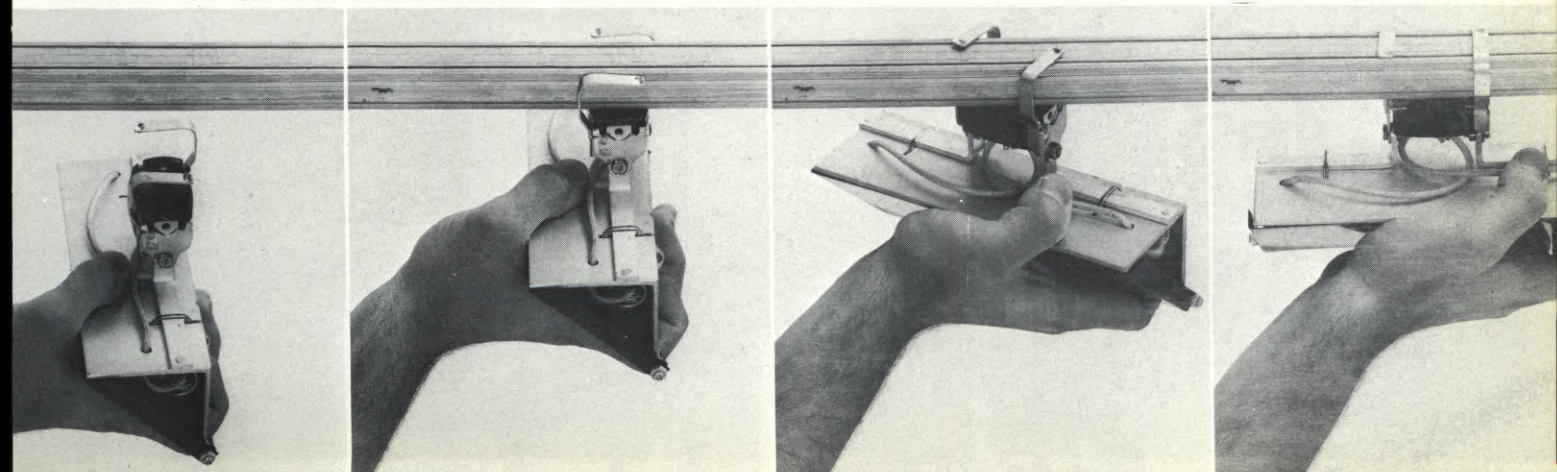
Such an array of equipment can be used to light up a vast area, proving invaluable especially to industrial and in-plant film units which are often faced with having to illuminate great expanses of very dark area inside factories, etc., while not interfering with the normal activity going on in those areas. In addition, there are fewer cables on the floor than are required with conventional lights and the Clipstrip units can be hung overhead so that there are no stands at all on the floor to interfere with traffic and normal production. Mounted above eye-level in this way, they eliminate safety hazards while providing a light level sufficient for filming with even the slowest color emulsions now on the market.

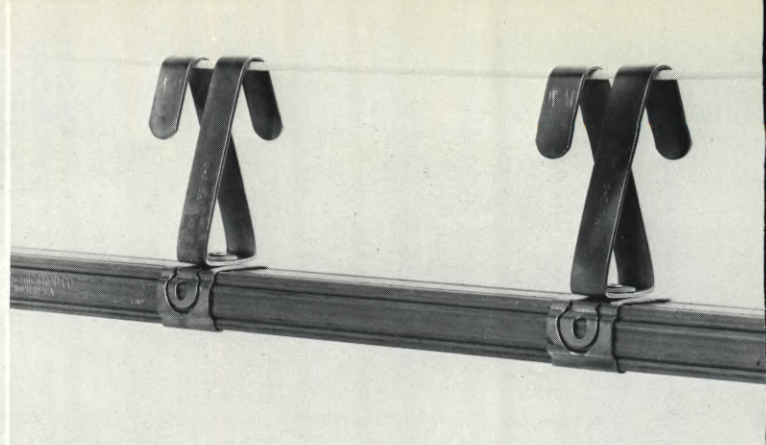
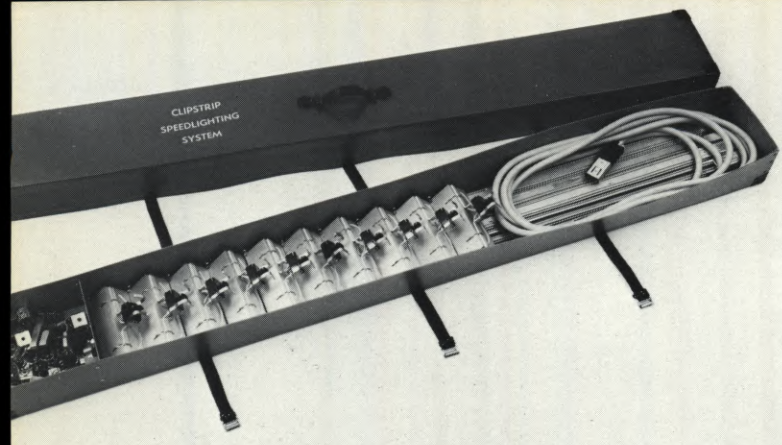
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Heart of the system is this diminutive, deceptively simple 90-degree reflecting surface of extremely high reflectivity. Fitted with tungsten-halogen lamps ranging from 500 watts to 1000 watts, these tiny reflectors kick out an amazing amount of light over a wide area. The single barndoor serves both to control the light and protect the lamp when folded down.

A series of photographs showing how—with literally a “twist of the wrist”—the individual reflectors are securely snapped onto the Clipstrip bar. Speed with which the lights can be set up is often an important consideration when shooting on location. Extreme light weight of Clipstrip elements means that as long an assembly as required (often more than 100 feet) can be suspended on rope, sash cord, wire, etc.





(LEFT) The basic Bardwell & McAlister kit consists of four 5-foot sections of Clipstrip bar, 10 Strip-clip reflectors, plus necessary feeder cables, plugs, hangers and adaptors—all of which fit neatly into a sturdy telescopic carrying case measuring 6" x 8½" x 72". (RIGHT) Slip-on messenger cable hangers, provided in kit, make it possible to hang Clipstrip bars from wire or cord stretched taut about four inches above desired Clipstrip position.

#### FEATURES:

- Designed for shooting in small areas
- Simplest and easiest method of background and cyclorama lighting
- All equipment "up-and-out-of-the-way"—occupies a very small amount of floor space
- Each kit is a complete self-contained lighting system unto itself
- Installation Costs/Time/Labor—cut by as much as 50%
- Each "Clipstrip" can accommodate as many as 10 separate lighting units
- Completely flexible and extremely versatile

Nailing surface hangers are provided to attach Clipstrip bars securely to any flat surface that can be nailed onto.



- Provides a smooth, even, "broad" light pattern that overlaps without a bar or shadow

#### APPLICATIONS:

The "Clipstrip" system of Speedlighting was designed to solve the problems that exist when shooting in limited or confined areas where ceiling height and floor space are restricted. Presently available conventional units are often either too large (reducing effective shooting areas) or lacking in adequate control (resulting in the compromise of lighting standards and overall quality of reproduction).

Because the entire system has been designed in the modular concept each kit, which is totally portable, is a completely self-contained lighting system. It sets up quickly and easily, requiring a bare minimum of personnel, and will accommodate as many as 10 separate short or long-throw lighting units.

The "Clipstrip" is available with 500 and 1000-Watt lamps and a complete line of individually-engineered accessories.

#### DESCRIPTION:

Ideal for motion picture, TV, still and industrial photography purposes, the "Clipstrip" System of Speedlighting is extremely versatile and flexible, solving a myriad of lighting problems when shooting in areas of limited space. The system, utilizing up to 10 500-Watt and 1000-Watt tungsten-halogen "Quartz" lights on each track, provides a background and cyclorama lighting with a pattern that is smooth, even, and broad—the lights overlap without a bar or shadow being cast.

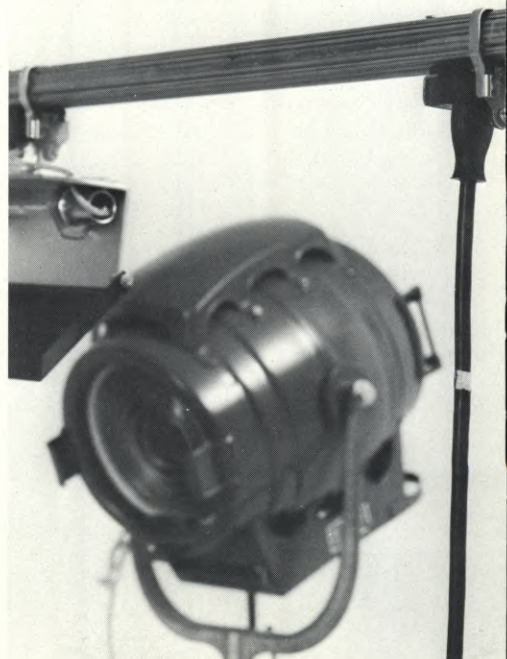
By placing the "Clipstrip" System up and out of the way, a minimum of floor space is utilized, creating a more effective shooting area and allowing the lighting director the ideal flexibility of placing his key lights with considerably more versatility. Barndoors allow ab-

solute control of cutoff. Installation costs, shooting time consumed and extent of manpower required can be reduced as much as 50%, since the new system replaces the bulky lights now available to achieve the same effect. One out-of-the-way cable is required for each "Clipstrip" System, (20 feet, accommodating up to 10 separate lights)—any number of strips may be employed to achieve the desired effect.

The "Clipstrip" System of Speedlighting is available with a wide range of accessories to fit exact needs and specifications.

Further information about the Clipstrip Speedlighting System can be obtained from the exclusive distributor, Bardwell & McAlister Inc., 6757 Santa Monica Boulevard, Hollywood, California 90038. ■

A simple adapter permits Clipstrip to be used as power source conductor for conventional studio light units in unusual situations.





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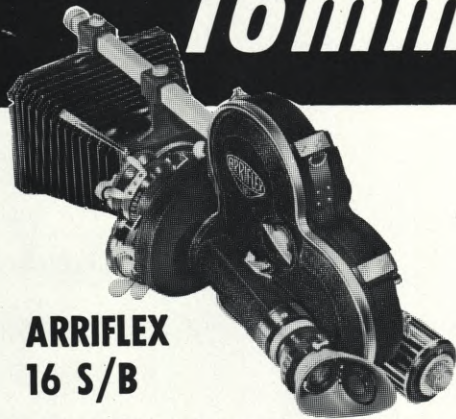
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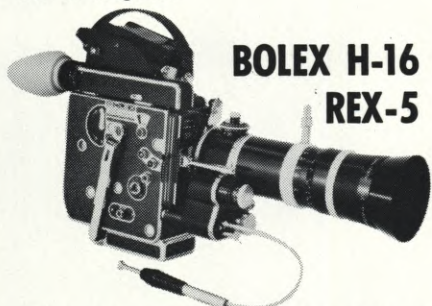
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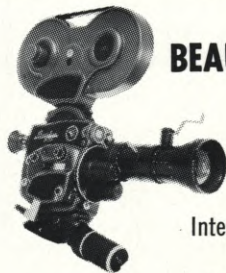
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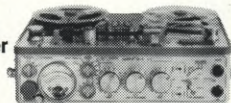


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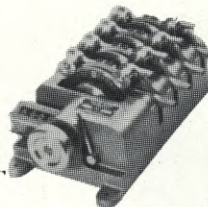
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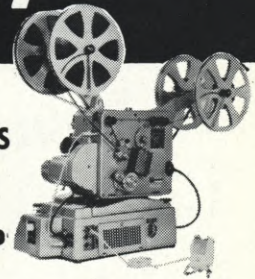
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Sports films are big movie business nowadays—and the only business of Sports Films & Talents, Inc. of Minneapolis. The firm has produced films in all the major amateur and professional sports, and their long experience has taught them the secret of the exciting, successful sports film: to put the viewers on the field, where they not only follow the game, but actually share the individual challenges and achievements of the players themselves.

The basic techniques are familiar enough—tight close-ups and slow-motion footage. Used separately or together, they keep the viewer in intimate contact with the players, and let the audience participate in the thrill of the game. But the audience is rarely aware of the difficulty in capturing such spontaneous action. Explains a crew member: "The job of most athletes, whether playing individually or as part of a team, is to deceive and evade the opponent—to fool him into thinking that one thing is happening while something else is taking place. With a little bit of luck, he'll also fool the cameraman who's photographing him. So when you're framing as tight as we do, you need a sixth sense to guide your camera to the spot the player will be in half a second from now."

The cameraman must provide his own "sixth sense"—but Arriflex has provided the three cameras that help keep his "sixth" on target.

The Arriflex 16S, a bantamweight handful, lets the cameraman keep on the action as easily as turning his head; the 16M positioned at a high elevation for selected coverage, capitalizes on quick-change magazines for continuity and the maneuverable 16BL, tripod or shoulder-mounted, is used for all lip-sync interviews with players, coaches and other VIP's.

The strengthened heavy-duty steel lens mount, now part of all Arriflex cameras, has been instrumental in situations where bulk and weight would hinder effectiveness. "We can use longer focal length lenses for all important close-ups—capturing the emotional facial expressions of the players", continues our correspondent, "without additional lens support. This minimizing of camera weight and bulkiness, enables maximum close-up coverage of the action."

The 16S and 16M cameras were successfully used in the slow motion filming. "Even at the speed ranges of 32, 48 and 64 fps, Arri's precise registration pin system keeps the film 'rock-steady' ". Characteristics such as these may explain the firm's great success in filming productions like the 1969 Kodak College Football Bowl Reports; 1969 Wheaties-College Coaches All America Basketball Team announcements; Minnesota Twins Highlights, 1969 New York Yankees Highlights, Minnesota North Stars Hockey Highlights; the 1969 Pepsi-Cola NCAA Basketball Championship Highlights, Prestone New York Jets Previews, and others.

While many production companies find their requirements adequately filled by just one of the Arriflex models, it is not unusual to find all three under the same roof; each having its own capabilities, makes each best suited for a specific job or aspect of a job. Being able to select exactly the right camera has always kept the Arriflex user on top of the "game".

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Richard Polister, Director of Motion Pictures

Robert Farrell, Sound Engineer



(LEFT) Appearing to extend for miles, incredible 15-acre Manhattan Street set was built along main entry to 20th Century-Fox lot. Rococo facades cover sound stages and Administration Bldg. Tall structure in background conceals adjacent Century City skyscraper. (RIGHT) Costumes and horse-drawn vehicles of the period make the set come to life.



## BEHIND THE SCENES OF "HELLO, DOLLY!"

Continued from Page 119

needed to bring it to Hollywood was excessive and the studio found it more expeditious to build its own. Numerous cabs, trucks, fire engines—all powered by horses—were involved, but the studio was well equipped with these with rentals filling any gaps.

Among other things, all this formed a background for the most stupendous effort ever attempted by a film company in America—the parade sequence. Sixteen units, comprised of 675 persons, were in the parade, passing through 3108 extras. Nearest comparable statistics in 20th Century-Fox history was the funeral of Queen Victoria sequence in "CAVALCADE," which involved a total of 3,000 persons.

Perhaps the best idea of the size of the operation can be gained from the logistics that were behind it: Two soundstages and three circus-style tents were staffed with 122 specialists, dedicated to makeup and wardrobe for the crowd. There were 15 special assistant directors, most of them costumed and radio equipped so they could function within

(ABOVE LEFT) Giant camera crane paces marchers in parade sequence. Elevated railway can be seen in background. (LEFT) Night-for-night lighting lends the set a frosty magic. (RIGHT) Ace Hollywood helicopter cameraman Nelson Tyler hovers in chopper above Garrison depot waiting for signal to start filming departure of the ornate train.





(LEFT) Barbra Streisand waits at top of Harmonia Gardens stairway as camera lines up to shoot famous title song number. (RIGHT) In mellow amber "gaslight" glow, the star sings a wistful ballad. Of the fabulous Barbra, all four of whose pictures he has photographed, Cinematographer Stradling says, "She has a rare beauty, distinctively her own."

view of the four TODD-AO cameras. Thirty-five uniformed policemen directed traffic and provided crowd control and five costumed detectives mingled with it. The 146 horses involved, some of them pulling vehicles, were trained not to be panicked by the music of "Before The Parade Passes By" as was the pig carried by actress Judy Knaiz on the Meat Packers Float. Schedules of three television series were changed so that they would not be shooting on the lot that week, and all regular employees not involved were urged to take their vacations then. Sixty watering stations, 17 special toilet facilities and five first aid stations were set up.

#### A Collaboration on Visuals

• In reference to the extraordinary sets which he had to photograph in "DOLLY", Stradling comments: "Shortly after I was given the assignment, and somewhat before shooting began, I met and began to work with a wonderful Production Designer, one of the greatest—John DeCuir. I had many weeks of working with him during which I could test various things out, the colors and so forth. This opportunity for pre-preparation was a great advantage to me and helped

Continued on Page 166

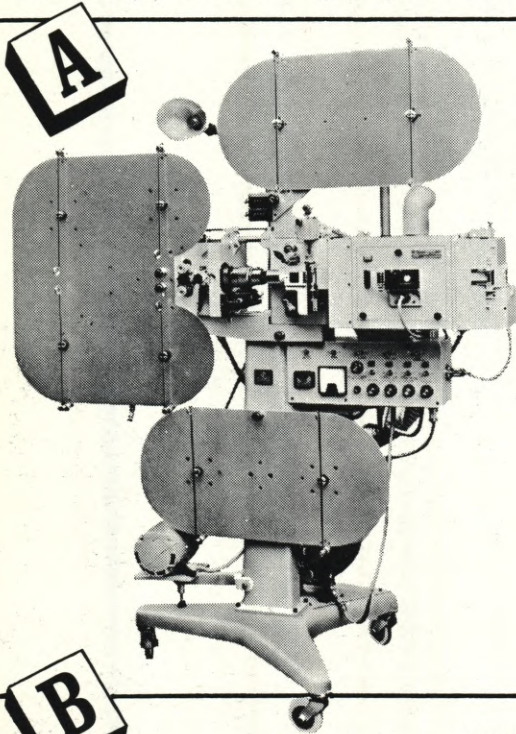


(ABOVE RIGHT) Intricate camera movement was required to shoot frenzied acrobatics of "Waiters' Gallop" number. (LEFT) Millinery shop interior set, built on sound stage, was partially duplicated for reverse angles in store front opening to park exterior. (RIGHT) "Cover" set was constructed inside gymnasium-turned-soundstage on New York location.



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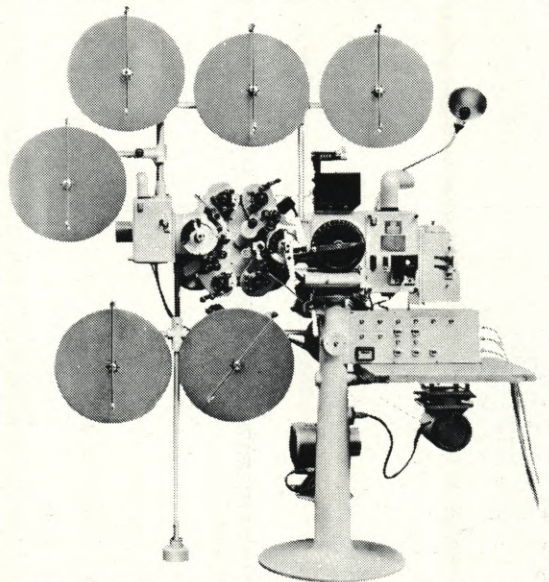
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**B**



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# CINEMA VERITÉ FILM MADE FOR THE AMERICAN STOCK EXCHANGE

Off-the-cuff realism combines with historical re-enactment to create an interesting film

The American Stock Exchange recently premiered "The Investor and the Marketplace," a new motion picture that traces the story of the Amex from the colorful spectacle of the old Outdoor Curb, to the streamlined dynamism of the modern securities marketplace.

The 22-minute color film, produced by Audio Productions, depicts the Exchange's informal birth on the streets of Manhattan, and the subsequent growth of the Amex—where today more than 1,300 security issues valued at \$55 billion are traded.

Exchange President Ralph S. Saul said, "'The Investor and the Marketplace' is intended to increase public understanding of the Exchange's function in today's society. It is a response to the needs of educators for new audio-visual tools to explain the role of securities markets in a free economy. The film will be distributed to shareholder groups and to business, civic, and fraternal organizations, as well as schools."

## CINEMA VERITÉ

Using *cinema verité* techniques, the film takes the viewer directly onto the Exchange Trading Floor, where he is engulfed in the sights and sounds of the marketplace. Rather than professional actors, the performers are brokers executing investor's orders; Floor Officials supervising trading; Amex executives meeting self-regulatory responsibilities; and personnel manning sophisticated communications and automation equipment.

## UNIQUE MARKET SEQUENCES

For the first time, special film techniques are used to portray little-understood phases of market operations.

In one sequence, animation is used to illustrate how all investor interest in a particular security—all buy and sell orders, all bids and offers—is focused at a single spot on the Trading Floor, creating the auction market that determines stock prices. Here, the role of the specialist in maintaining a fair and orderly market is defined.

Another sequence shows step-by-step the execution of an investor's order. For clarity, this scene was shot with the 21,000-square-foot Trading Floor cleared of everyone except the half-dozen people involved directly in handling and reporting the transaction.

## COLORFUL HISTORY

Historical scenes in "The Investor and the Marketplace" depict the beginning—around 1849—of the Outdoor Curb Market, predecessor of today's American Stock Exchange. Early brokers trade their shares in the heat, rain and snow of the open air market.

Garbed in colorful hats and other flamboyant attire for easy identification, the Curb traders develop a unique system of hand signals to communicate with their clerks, perched precariously in the windows of nearby buildings.

Patents for a host of 19th century inventions seem to pop out of the screen. The film explains that these products, spawned by the Industrial Revolution, created the need for a central market to trade corporate shares.

## SELF-REGULATED MARKET

Moving toward the present, the film describes the move of the Curb Market indoors in 1921, so it could establish a stock ticker and provide better supervision. Later, the camera peers over the shoulders of present-day Floor Officials overseeing the market, Stock Watch personnel monitoring trading, and Amex computer technicians at work.

The picture will be distributed nationally by United World Films of New York City. It will be available in 16mm on a no-charge basis for school, college and club groups.

"The Investor and the Marketplace" was produced by Audio Productions, a division of Novo Corporation of New York City. It was directed by Hans E. Mandell, written by Stanford Sobel and narrated by Philip Tonken.

## TELEVISION VERSION

A special 13-minute version of the film has been prepared for use by television stations. "The Investor and the Marketplace" also will be utilized by the Exchange and its member organizations in personnel training and orientation programs and in investment seminars for shareowners.

Bookings for public showings of "The Investor and the Marketplace" may be arranged through United World Films at 221 Park Ave. South, New York, N.Y. 10003, any of the company's offices in 43 cities throughout the country, or the Information Services Division, American Stock Exchange, 86 Trinity Place, New York, New York 10006. ■

(LEFT) In historical re-enactment showing activity of the old Outdoor Curb market, customers drive up in carriage as curbside "broker" approaches to take their order. (CENTER) Telephone clerks lean out of upstairs windows to relay orders from the brokers doing business on the sidewalk below. (RIGHT) A view of the busy trading floor of today's American Stock Exchange. All photos depict scenes from "The Investor and the Marketplace", *cinema verité* informational film produced by Audio Productions.



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**He uses an Eclair  
GV16. NFL Films Inc.  
owns 10 of them.**



Dave Marx is the Director of Photography at NFL Films Inc. Each week during the season, NFL Films shoots eight National Football League games. From this footage, two half-hour TV shows are assembled; and they are then aired by syndicated TV stations nationwide as "NFL Game Of The Week" and "NFL Highlights."

At every game there's a GV16 on a tripod, up in the press box. There's also an Eclair NPR. Both cameras are covering the action at normal speed and using different focal lengths on their zoom lenses to give the editors both close-ups and long shots of the same action. What all the editors constantly demand, however, is super slow motion footage. So during crucial plays, the GV16 cameraman shoots at 200 frames per second.

Both cameramen have to know the game in order to anticipate the plays. It's easy to run out of film in the middle of *any* unrehearsed ac-

tion, of course—and at 200 frames per second, you get only 80 seconds shooting from 400 feet of 16mm film! But that's not a problem for NFL Films. Why? Because both the NPR and the GV16 have 400 foot magazines that you can change in less than five seconds. And they accept both core wound film and daylight loading spools.

Dave Marx himself used to be a college football player. He covers a game each week from the sidelines, with a hand-held GV16 shooting mostly at 200 frames per second. Tripods aren't allowed down there, of course; and if they were, he wouldn't use one. As the play moves, so does he—at a run.

When a player throws the ball, Mr. Marx swish-pans to the receiver to see him faking the defense before the ball arrives. Then he

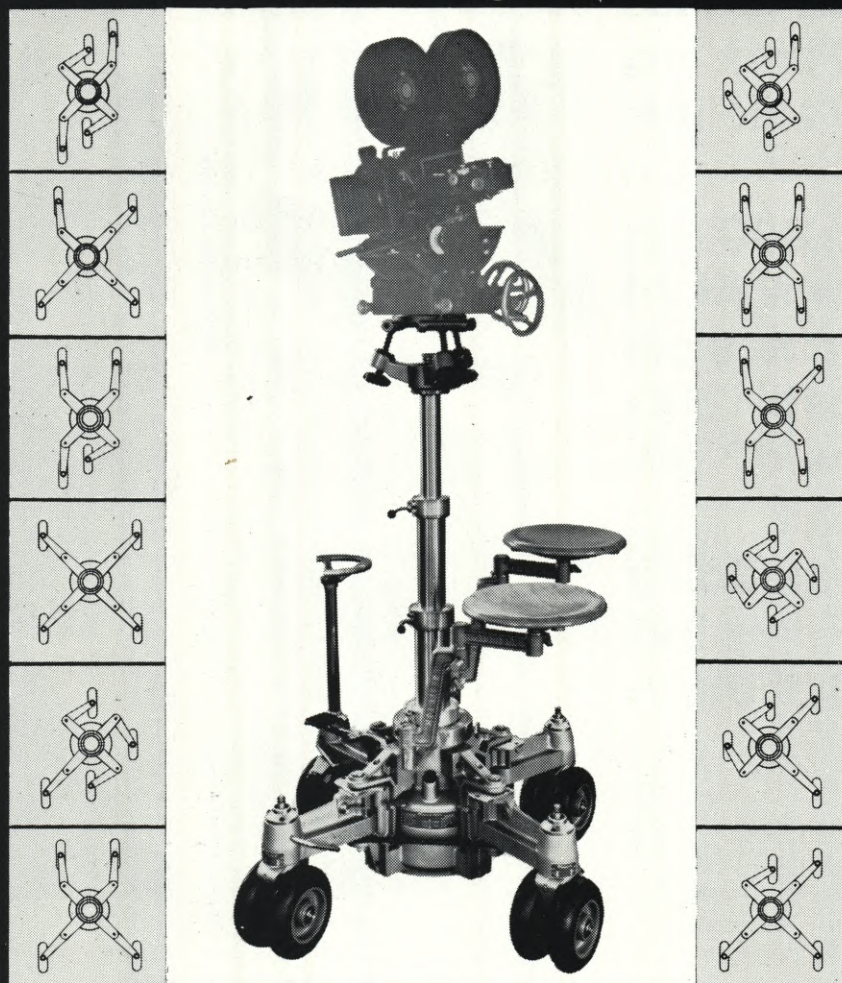
switches from 200 to 24 frames per second for cutaway reaction shots of the players on the bench. Tripod heads just aren't that flexible; but you couldn't cover a whole game hand-held if the camera were either bulky or heavy. The GV16's body and motor weigh six pounds, and can be rested on your shoulder. The lens mounts on the front, the magazine on the back. Balanced. Overall, it's a pretty athletic camera.

For more information, write Eclair at 7262 Melrose Avenue, Los Angeles, Calif. 90046.

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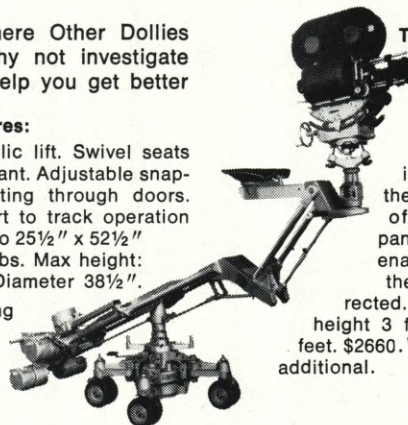
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# THE UNIQUE VIDEO WEST INSTANT REPLAY SYSTEM

A new high resolution video monitoring method for instant replaying of filmed scenes, and painless looping on location

By CHARLES LORING

The concept of "marrying" an electronic camera to a motion picture camera so that scenes can be monitored and played back as they are filmed is not at all new. Almost since the birth of television there have been attempts to combine the two systems. However, Jerry Lewis is generally conceded to have been the first to use such a combination on a wide scale. Several years ago, when he first began directing himself in feature films, he had a small vidicon camera mounted next to the motion picture camera lens so that he could check his performance on several monitors hidden about the set, while the scene was being shot.

There followed a rash of similar systems, including some quite sophisticated versions (such as Mitchell System 35 and Molec) which can monitor three or four cameras simultaneously.

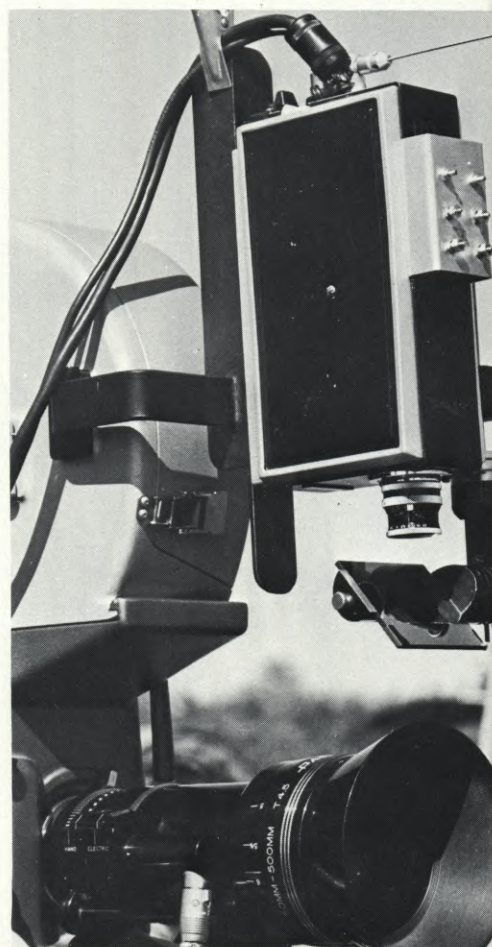
The generally limiting factor to all such systems developed in the past has been the inherently poor image quality of the pictures recorded by the vidicon electronic cameras which, because of their small size, it has been necessary to use. The effect has often been that of viewing a picture through a bowl of jello—hardly an aid to precision in filming. On the other hand, the image orthicon cameras of the type used in television studios, which record an excellent quality of image, are much too large and bulky for use in tandem with motion picture cameras.

It is necessary to keep these facts in mind when one considers the introduction of yet another such system, the Video West Instant Replay System, developed during the past year.

What sets the Video West system apart from the others is the vastly superior picture which it places on the monitors—a picture so sharp, clear and rich in tonal values that it appears to be a projected film image rather than one produced by electronic means. Like the other available systems, the Video West combination employs a vidicon camera as its electronic component, but the vidicon has been subjected to a myriad of modifications in order to make possible recording of its extremely high quality image.

It all began rather indirectly a couple of years ago when director Blake Edwards was preparing to make a picture called "THE PARTY", starring Peter Sellers.

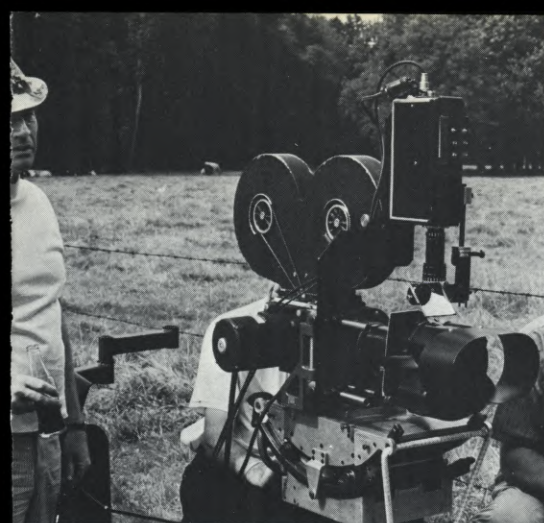
"Because the film was to be mostly ad lib, I really felt that we would need some means of being able to document what we did, so that we could take a look at it and know where we were going to go from there," Edwards recalls. "With that in mind, I contracted to use one of the electronic monitoring systems then available. I thought of it strictly as a device to give me a kind of reference—not as a creative instrument. But I found as I worked with it that Peter Sellers and I were both beginning



Heart of the Video West system is a thoroughly modified vidicon camera mounted directly above the film camera lens, with a 45-degree mirror picking up the same composition. Vertical parallax is negligible.

(LEFT) The Video West system in operation on the set of the Ralph Nelson production, "... TICK ... TICK ... TICK ...", showing camera and monitor. (RIGHT) At the end of the day's shooting cast and crew members gather around monitor to view "instant rushes" of their work. Certain technicians, initially wary of system, become boosters after having used it.





(LEFT) Director Blake Edwards, who sparked idea for development of system stands next to camera equipped with it. (CENTER) Rock Hudson and Julie Andrews, stars of Edwards' production, "DARLING LILI" are photographed with Video West-equipped boom camera on location in Europe. (RIGHT) "LILI" Director of Photography Russell Harlan, ASC, sits beside camera with vidicon pickup mounted above lens.

to depend more and more upon it as a creative tool. We could work out the action in rehearsal and then, when we felt we had it right, put it on tape and take a look at it—something like instant rushes.

"Too many times before I had gone in to screen rushes, viewed what I had printed, and wished to God I could go back and do it again. Sometimes I have—but it's costly. I found that while the tape does not rule out judgment error completely, it can confirm many things right there on the spot. It can help enormously in maintaining consistent pace and emotional attitude from one scene to another, for example. Sometimes you do a scene and reach a high emotional pitch. Then you break to move in for a closeup, and it's very hard to pick it up at exactly the same height of emotion—because you have no point of reference. But how great it is to be able to look at a tape of the last scene and really see where you were emotionally. I found that this was one of the greatest, most important contributions such a system can make—at least, for me."

Having thus become sold on the concept of an electronic monitoring system, Edwards was, nevertheless, far from satisfied with the minimal quality of image such systems afforded. He talked the problem over with his production associate, Ken Wales (who has a solid technical background) and with electronics engineer Jim Songer, both of whom felt that there must be ways to modify vidicon equipment to produce a picture with quality comparable to that of film.

They formed a company, Video West, to pursue that problem as well as others pertinent to the communications industry. The first result was the Video West Instant Replay System, consisting of a thoroughly modified vidicon camera to be mounted vertically above the

motion picture camera lens, with a 45-degree mirror reflecting almost exactly the same picture that the film was recording—but very sharp and clear.

Blake Edwards tried it out on his next picture, the multi-million-dollar Paramount release, "DARLING LILI", and found it to be an enormous aid to production. It was especially valuable in verifying scenes which involved hundreds of extras.

Recently, in shooting "THE MOONSHINE WAR" on location in Stockton, California, director Richard Quine had the following to say about his first experience in using the Video West Instant Replay System: "I'm absolutely intrigued with it. As far as I'm concerned, it's a fantastic 'security blanket' in the sense that I can check out what I'm getting right now, without waiting to see it on the screen. Then, too, I'm used to doing something that resembles a jungle ballet, trying to get through all the lamps and gobos and people to see what's going on in the scene. With this I



(LEFT) Console of the Video West system serves as control center and contains an Ampex 660 2-inch helical-scan video tape recorder and a small monitor. (RIGHT) Floor monitor for use on the set.

"... TICK... TICK... TICK..." director Ralph Nelson discusses details of replayed scene with Director of Photography Loyal Griggs, ASC, while stars George Kennedy and Jim Brown watch themselves emote. High quality of monitored image is evident even in this photograph.





(LEFT) Playback of close shot of Frederic March is used to clue George Kennedy in his matching close shot. (CENTER) Director Nelson replays a scene for verification on location, while Ken Wales, co-developer of system (white sweater) looks on. (RIGHT) Key members of crew find the system valuable for checking many details right on the spot, instead of having to wait for dailies.

can get a perfect view of it from anywhere on the stage. With the immediate playback facility you can check all manner of things. It's great for the script girl in matching action. The wardrobe and prop people find it valuable for checking details of their work, as do the gaffer and cameraman for seeing how the lighting is coming through. I know it's a real time-saver. I just think it's fabulous."

Richard H. Kline, ASC, Director of Photography on the same film, commented: "I would like to be where the camera operator is and see exactly what he sees and, unfortunately, I can't be—because my theory is that if you stand even a few inches to the right or left of the lens you don't see exactly what the camera is getting, nor does the lighting look the same. But with the Video West System I can look at the monitor and see exactly what the camera is picking up. If we are shooting out of continuity and we shoot a part of the scene one day and the rest a week later, I can re-run what we've shot and match the lighting much more accurately than if I

just depended upon my own memory for placing the lights. I find it a tremendous aid and I depend more and more on it each day. It's a great plus for so many people, not just myself. This is the first film I've done with it, but, I hope, not my last."

A very recent refinement of the system has the vidicon unit built right into the door of the Panavision camera for through-the-lens viewing, thus eliminating all parallax and making possible the accurate monitoring of zoom shots.

Also in the last stages of development is a color version of the camera that is only slightly larger than the black and white unit. It is said to record an amazingly faithful color rendition of the scene. ■

#### TECHNICAL FEATURES OF THE VIDEO WEST INSTANT REPLAY SYSTEM

By KEN WALES

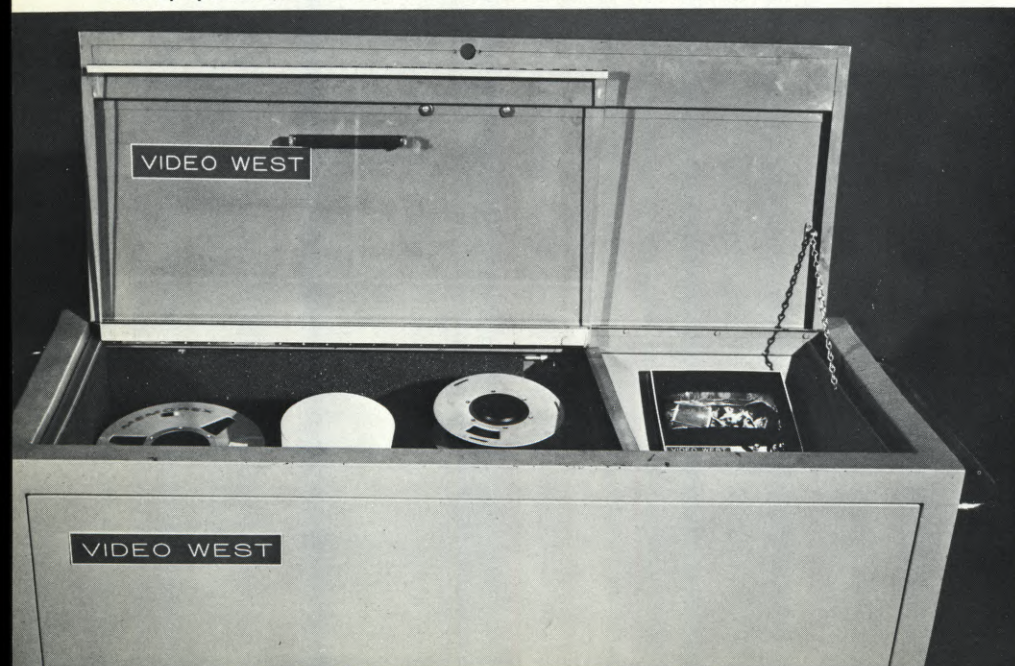
#### CONCEPT:

Concept of the development and use of the Video West Instant Replay Sys-



Julie Andrews watches replay of scene on a miniature, wireless remote monitor, while on location for "DARLING LILI".

Video West console features Ampex 660 recorder, a versatile, high-quality/solid-state unit selected for use because of its 2-inch tape format. Small monitor at right, with picture showing, is used by operators, who are located some distance from the shooting area.



tem is to provide the director with the facility of being able to record on video tape the motion picture scene which he is filming at the moment. This system also enables the director to view the scene "live" on a video monitor, or any number of monitors, while the scene is taking place.

It is basically intended that the system be of greatest assistance to the director in verifying a "print" take. Since the beginning of film-making, an oft-heard plea of the director has been "If I could only see what I have." Now, through the use of video tape recording, it is possible for the director to immediately review the scene he has just completed and to evaluate immediately

Continued on Page 156



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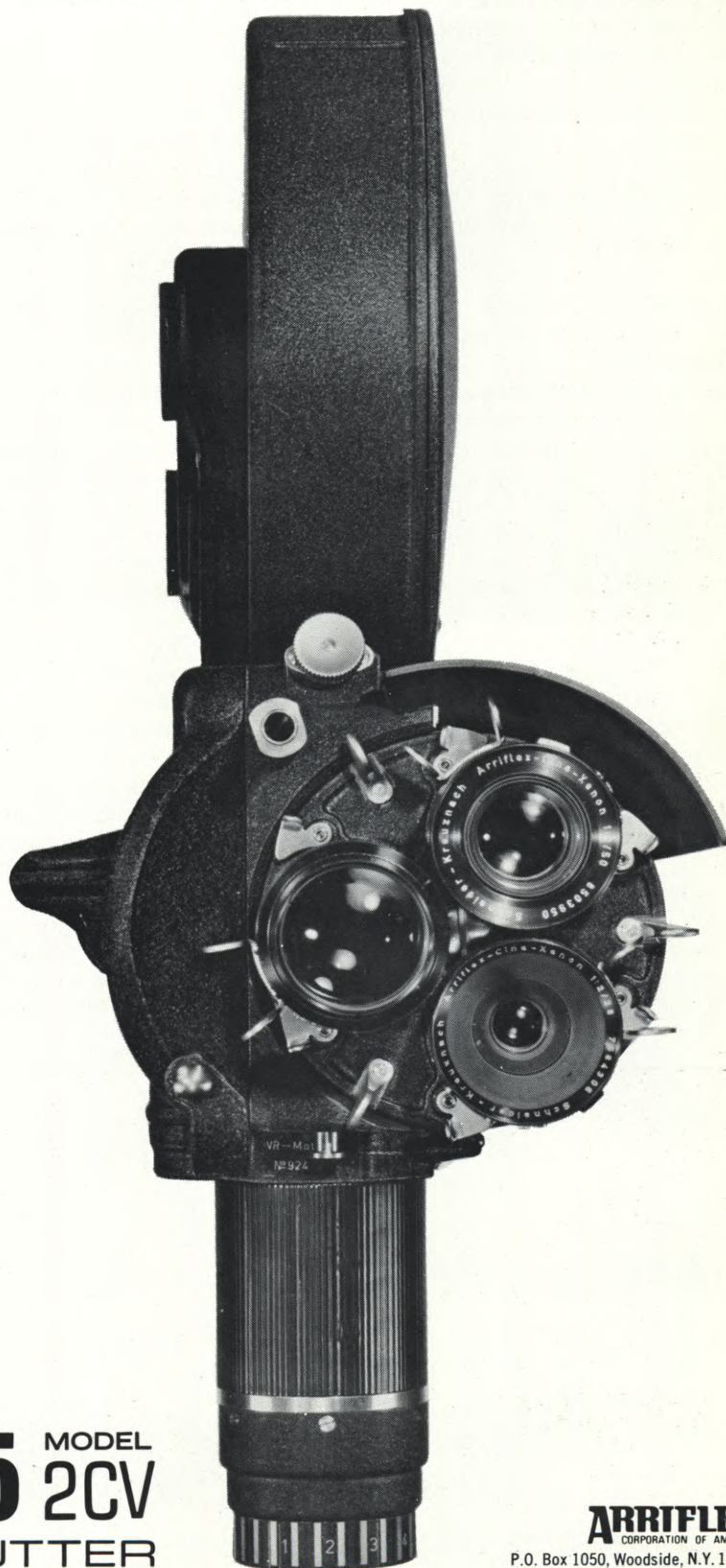
Lenses give their finest images at certain apertures. Maintain these apertures by adjusting exposure with the variable shutter instead of the diaphragm. The variable shutter can also eliminate the need for ND filters and the optical deterioration they create.

## more depth-of-field control

A 'busy' background can ruin an otherwise good shot. Wash it out—close down the shutter and open the lens to reduce depth-of-field—the background stays in its place: the background.

## more sharpness control

Fast-moving subjects may speed by too quickly to register at the wide-open shutter speed of 1/48 sec. So close down the shutter—just enough to 'freeze' the action in each frame and get sharper pictures on the screen.



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# "FLASHING" EKTACHROME EF

An accidentally-discovered technique makes it possible to reduce contrast of high-speed 16mm emulsion for smooth intercutting with ECO

By DAVID BOWEN

Speed and more speed! Even though we've come a long way since color films were rated at an exposure index of 10, cameramen and directors still cry for faster emulsions—to cut costs, to increase production flexibility, to get that otherwise impossible shot.

Presently 16mm lags well behind 35mm, with Commercial Ektachrome rated at ASA 25 against Color Negative's ASA 100. Of course, there's always Ektachrome EF, at ASA 125—but many feel this emulsion is too grainy, too contrasty to use except in emergencies.

This article will describe a technique for flashing EF that minimizes these objections, and its emphasis will properly be on the how-to-do-it mechanics. But it should be borne in mind that no technique is an end in itself; at best it is a *tool*, a way to help the creative film-maker enhance the scope and visual effectiveness of his productions.

In simplest terms, it consists of flashing (or fogging) Ektachrome EFB film, type 7242, to make its printing contrast compatible with Commercial Ektachrome, type 7255.

Useful ideas sometimes grow from casual observations. For me it started in 1955, before EF was even a gleam in Mr. Eastman's corporate eye. I was then working as an editor and sometimes cameraman. One slow day, while readying some original for the lab, I found myself bemused by half a dozen

frames at the end of one roll. They had picked up a faint fog during unloading, yet looked far *better* than the "properly" exposed footage ahead of them—pastel colors, excellent shadow detail, natural contrast despite somewhat harsh lighting. One thought led to another: perhaps this effect could be reproduced under controlled conditions and put to practical use.

A series of tests with both Commercial and Type "A" Kodachrome proved promising, but when improved printing stocks appeared early in 1956, I dropped the project for other things.

In late 1966, now on staff at Parthenon Pictures, I was assigned to direct a sponsored film in photoplay form—really a 40-minute dramatic story. We decided to shoot it the way more and more pictures are being made today: on location, in actual settings, mixing professional actors with people from the street.

We'd already used EF on several short sequences and on one 8-minute picture I directed in New York, and were quite pleased with the results, so we plunged in with both feet and planned to do the entire show with that emulsion. But it was still relatively new, so we followed approved practice and ran a short test on our production emulsion.

We watched the print the morning before we started shooting. That afternoon we replaced the EF with ECO. As a direct result of unscheduled

time for lighting, we went almost two days over schedule and had to pass up innumerable visual opportunities that would have enhanced the picture.

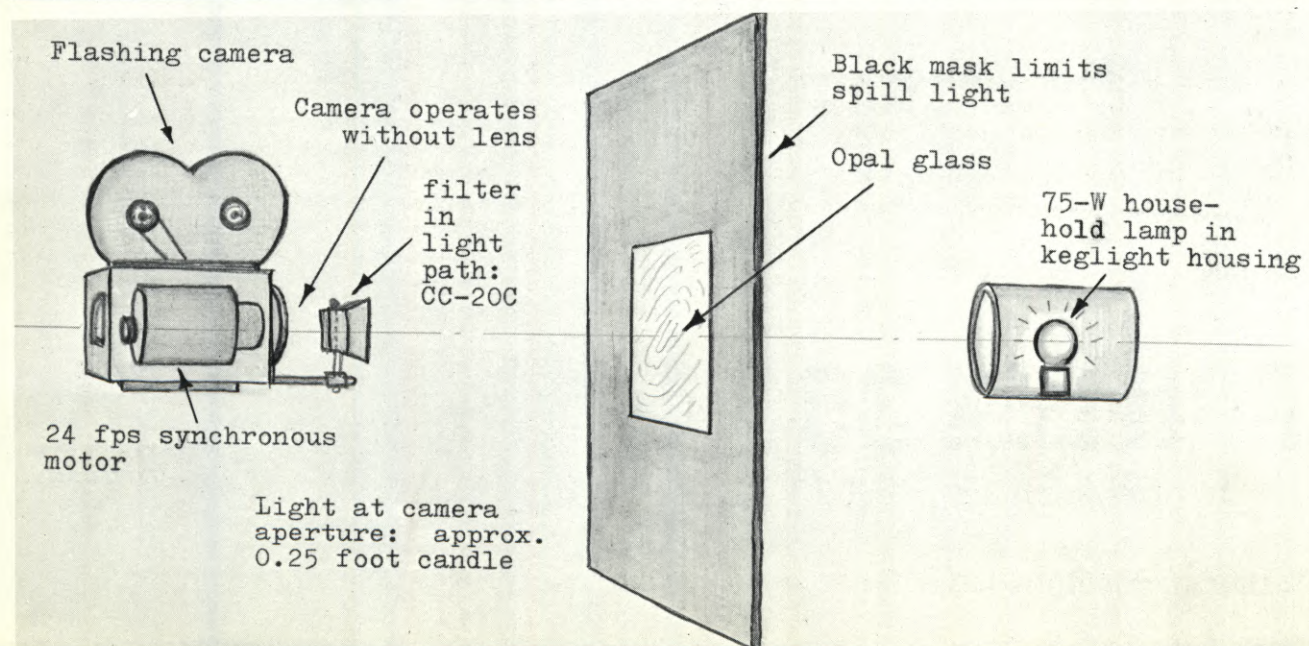
The problem, as those familiar with EF know all too well, is that the original looks fine—but the increase in contrast that accompanies printing results in an image with blotchy blacks, washed-out highlights, and a generally unpleasant, grainy, home-movie look. So when things quieted down, I started wondering whether EF might benefit from that same flashing technique started over ten years ago.

In simplest terms, flashing consists of subjecting the film, either before or after principal exposure, to just enough neutral illumination to produce a slight fogging or "greying-out" of the image. Projected, flashed original looks pale and masked with a slight veil; printed, the contrast increase cancels out the fog and the resultant image appears normal.

Our initial tests at Parthenon used a camera as the flashing device—in our case, an old Maurer—and since this is how the experimenter is most likely to start out, the setup will be described in detail.

FIGURE 1 shows the principal components. The light source is an ordinary 75-watt household bulb (it's hard to find a 3200° K source of low enough intensity!). The bulb is enclosed in an old keglight housing to control spill light.

FIGURE 1—Arrangement of equipment needed to "flash" Ektachrome EF



Between lamp and camera is an 8x10 pane of opal glass, which furnishes a diffuse fogging source for the film. The glass, plus a CC-20C (cyan) filter, corrects the lamp's color temperature close to 3200° K. The black frame around the opal glass helps keep any spill light from contaminating the fogging exposure.

The camera is driven by a synchronous motor at constant speed. The lens is removed completely, so that the light from the glass falls directly on the emulsion as it passes the aperture. Coarse exposure control is achieved by adjusting the distance between lamp and glass; fine control by adjusting the camera's variable shutter. Light is measured at the camera with a CdS meter, to insure repeatability.

We began by making a series of 3-foot exposures at various shutter settings. The film was processed and the base density of each exposure visually compared to processed but unexposed ECO.

Once we found an exposure that looked close, we chose this as a center point and flashed 50-foot bursts at this setting, as well as at several others both above and below it. Then we rewound the film and exposed 10-foot bursts of a "typical" scene over each flashed segment in each series, using ASA indices of 100, 125, 160, 200, and 250. A timed color-corrected print then indicated which combination of flash and scene exposure yielded the most natural effect.

For the setup described, we arrived at the following:

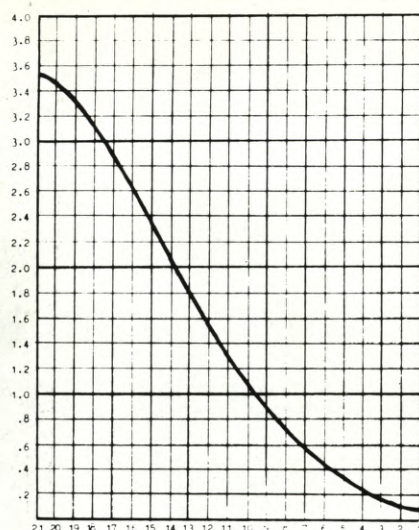
Light at camera: Approx. 0.25 foot-candles (this is a calculated value, since our meter was not calibrated directly in foot-candles);

Camera speed: 24 frames per second;  
Shutter setting for flash exposure: 90°;

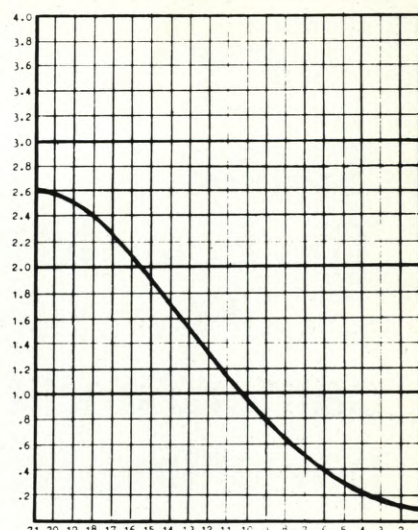
Exposure index for primary (scene) exposure: ASA 125.

We had expected flashing to raise the film's exposure index slightly, much like the once-popular "latensification"; but

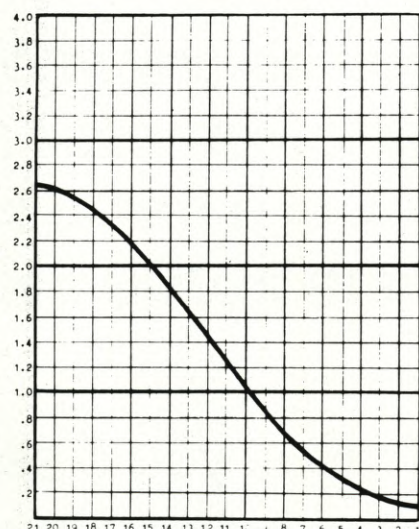
*(ABOUT THE AUTHOR: Since graduation from UCLA in 1950, David Bowen has been continuously employed in professional motion picture production—first with several "in-plant" industrial motion picture units, and since 1958 as Associate Producer with Parthenon Pictures in Hollywood. When schedules permit he occasionally does work for other producers. Although the last ten years have been devoted primarily to writing and directing, he still retains an active interest in the technical aspects of film-making, especially where they expand the scope of the medium.)*



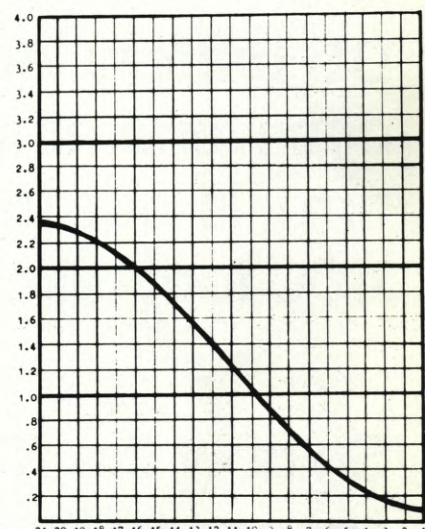
CURVE 2-A UNFLASHED 7242



CURVE 2-B-ECO, TYPE 7255



CURVE 2-C-FLASHED 7242



CURVE 2-D-FLASHED 7242

in practice, best results were obtained at the normal ASA 125. This gives a light (though not washed-out) original which, when printed, tends to minimize apparent grain. We obtained satisfactory images with ASA settings up to 200—but with a denser original, grain becomes more noticeable. Still, it's comforting to know that a 2/3 stop underexposure will still furnish a usable scene without forced processing.

A diffuse flashing source (in our case, the opal glass) is also important in minimizing grain. With a specular light source, grain structure always became more pronounced. Possibly this is caused by one layer of the film's structure "shadowing" those below it, at such low levels.

Again contrary to expectations, we found it made absolutely no difference whether the film was flashed before or after principal exposure. However, if the film is pre-flashed, the very weak ex-

posure tends to decay with storage. Ideally, pre-flashed film should be exposed and processed within three or four days. Post-flashing is not as critical, but of course it is always good practice to process as soon after exposure as possible.

Both pre-flashing and post-flashing have advantages. If anything should go wrong during pre-flashing, all you've lost is a roll of film—not perhaps irreplaceable original photography. Post-flashing, on the other hand, is better for location work, where exposed film can't always be sent promptly to the lab. And of course, you need flash only the film you actually use.

Unless both production and flashing cameras have very accurate movements, the film should be rewound after exposure and flashed heads out, to avoid coming out with two different frame lines. If registration permits, film may

Continued on Page 160

# CORDLESS SYNC SOUND

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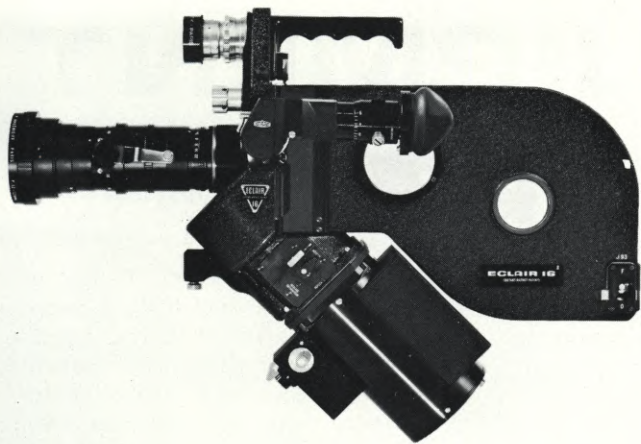
## **How Eclair Crystal Control works.**

With the regular-sync-pulse generator and sync cord system, tape speed is made to conform to the camera's speed when the track is transferred to 16mm magnetic film. With the Eclair NPR camera's Crystal Control system, the camera motor's speed is regulated by a built-in quartz crystal frequency signal generator; and an identical crystal generator at the tape recorder puts a pulse signal on the recording tape, which is used as a speed reference at the transfer to 16mm.

These generators are completely independent of each other; but because the pulses they generate are truly identical, sync is maintained. And since each crystal is independent, any number of crystal-controlled cameras and tape recorders can be used together, without any connection between them and at any distance from each other.

## **Accuracy is as great as AC power.**

Obviously, the whole thing depends on the crystal signals being exactly identical. Although several cordless systems have been in use for ten years or more, none has approached the accuracy



of synchronous motors running on direct AC power. For short or normal length takes and for recording speech (not music) on location, they have certainly been good enough. But they have all to some extent sacrificed accuracy for mobility. The Eclair Quartz Crystal, however, provides the first cordless sync signal that is unequivocally as accurate as the 60Hz pulse of AC electric power. Specifications are: sync error less than  $\frac{1}{4}$  of a frame in one continuous 400 foot take. That's  $\frac{1}{4}$  frame in 16,000 frames; and that's running the camera continuously for one eleven-minute scene. On shorter takes, of course, sync accuracy is even greater than that.

### Proven in use in Europe and U.S.A.

And the Eclair system really *works*. It has been in regular use in Europe since 1966, and in the U.S.A. since 1968. ABC TV's World Of Sports are using it; so are Paramount Studios Special Projects Division; and many network TV Specials are being shot with Eclair Crystal Control. In fact, nearly half of all new NPRs are being bought with the Crystal Control motor. Names of satisfied users are available on request from Eclair, at the address below. Nagra and Perfectone tape recorders can be purchased with the Eclair crystal generator built in, or can be quickly and simply modified for Crystal Control operation. After modification, the same recorders can also be used with regular sync-pulse and sync cord systems.

### Universal Crystal Control Motor.

Heart of the Eclair NPR Crystal Control system is this DC phase comparison motor whose

speed is regulated by a quartz crystal time base reference signal generator that attaches to the battery. It combines the portability and efficiency of DC battery operation with the accuracy and reliability of a synchronous motor. It's called a Universal Motor because it can be used with any number of crystal controlled cameras and recorders, or with AC powered cameras or sprocketed recorders using sync motors. It can also be made to keep in sync with a tape recorder playing back a pre-recorded track; which means that you can shoot cordless lip-sync Playback, even with music, even on location. The Universal Motor also functions as a crystal-controlled variable-speed motor, with tachometer. And its built-in sync pulse lets you use it with a sync cord, too.

### Camera and Sound. Two one-man units, instead of one two-man unit.

A few of cordless sync's advantages: Shooting unrehearsed action, the soundman can stay where the sound is best, while the cameraman can move spontaneously as the action changes. In crowded places, no sync cord to trip people up. For unsuspected candid shots, the soundman can move close in with his recorder and microphone disguised, while the cameraman stays back out of sight and uses a long lens. Multiple cameras and recorders can cover non-repeating action from different angles, all in sync and all with complete freedom to move around.

The only disadvantage: No start mark. One way around this is for the soundman to visibly tap his microphone at the head or tail of a scene. Various strobe-light buzzer combinations are also available. And, of course, if automatic start marks are more important than complete mobility on a certain job, the Universal Motor can be used with a sync cord, which lets the camera's built-in clapper automatically establish sync when you switch on. Eclair NPR: one camera that really *helps* you get the job done.

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

# eclair

# NEW LIFE FOR OLD SOUND EQUIPMENT

Here's a simple, low-cost way to upgrade the battery system of your old, but good sound gear lying idle

By STEPHEN A. KALLIS, JR.

Many film units have at least one piece of audio equipment that's just gathering dust on the shelf. It's usually gear that's used only occasionally, such as an optical recording amplifier or a portable sound mixer, but it cost a pretty penny when new. And often the reason that it's not used at all is not because it isn't ever needed, nor because it's broken, but simply because it's

battery-operated, and the batteries are hard to come by or are no longer made!

After one very painful experience of my own (I had a tight schedule, bought a "brand new" battery for my Auricon amplifier, traveled immediately to keep an appointment almost two states away, set up my gear for a single-system interview and discovered that my "new" battery was stone, cold dead—it had sat

on the shelf of the store I bought it from for its entire shelf life!), I determined that there had to be a less frustrating way of getting single-system optical sound short of scrapping my old amplifier in favor of brand new gear. (Frankly, the most frustrating thing I can think of is inoperative equipment that *almost* works.)

The answer I came up with is really

The equivalent of three old batteries connected to a recording amplifier. In addition to the two 6-volt battery substitutes (left), there is a substitute for the 1½-volt filament battery (right), composed of eight flashlight cells connected in parallel. The wood "margin" around the electrical tie-points of the connectors helps shield them from accidental short circuits, but does not make them too much more bulky than the batteries being replaced. Both assemblies fit neatly into the case with room left over.



rather simple: replace the old batteries with new batteries that are not likely to become obsolete. For low-voltage batteries in particular, the ideal replacement batteries would be ones that would *never* go out of style. The most obvious battery to use under these circumstances is the flashlight battery—flashlights have used the same type of battery for years, and there is no indication that they are likely to change in the foreseeable future. An added advantage of using flashlight batteries is that they are very easy to find. Besides radio stores where you can (sometimes) find the older batteries, you can obtain flashlight batteries in dime stores, hardware stores, and drug stores. This means that if for some reason new batteries are needed in a hurry, there's a better chance of getting them.

Naturally, it would be impractical to use flashlight batteries for high-voltage equipment. At this point, however, it is still possible to get high-voltage batteries needed for most equipment. If your old sound gear has completely obsolete high-voltage batteries, these can also be replaced by the techniques I will describe; however, in general, it's the low-voltage batteries that become obsolete first. Because of this, I will concentrate on the low-voltage batteries initially—then discuss techniques relating to the other kind.

In replacing one battery with another, it is necessary to keep two things in mind: the battery that is replacing the original must be able to do at least the same amount of work as the battery it replaces, yet the replacement must not take up so much additional space that it cannot be stored where the original was. When I am required to discuss specific batteries, for purposes of my discussion, I will use as examples the batteries I replaced in my Auricon amplifier; the techniques used can be adapted to a variety of similar batteries.

The principle of replacing batteries is actually very simple if one keeps in mind certain fundamentals of electricity. Cells connected in parallel do not increase in total voltage, but they can put out more current; cells connected in series add the individual voltages, but the amount of current that can be put out remains constant. Using these two rules, battery-switching becomes simply a matter of mechanics.

Most "low voltage" old-time radio batteries are actually made up of cells very similar to those used in flashlights. For example, one of the batteries used in my Auricon NR-24-VA amplifier is the Eveready No. 744 (or its electrical equivalent), a 6-volt battery. Break it



A relatively hard-to-find battery like this 6-volt specimen, when disassembled, is found to be made up of four cells very similar to flashlight cells, except for their length. If taken apart very carefully, the top can be salvaged for use as a connector.

open carefully with a pair of tin snips and you will discover that it contains four cells, connected in series, that are shaped very much like D-size flashlight batteries, except that they are about half again as long.

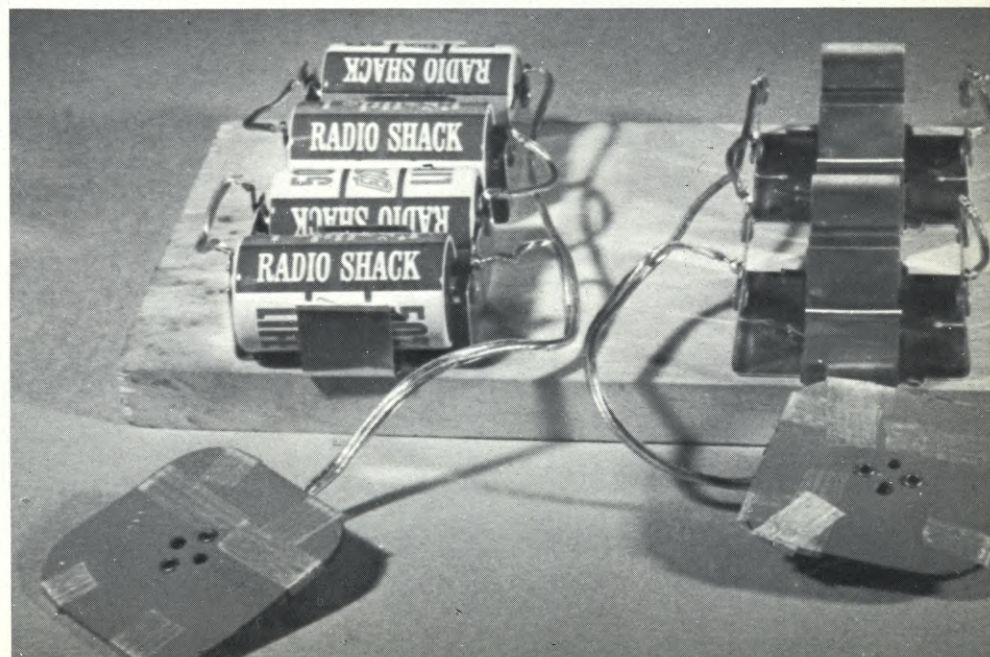
For ease of changing batteries, it is a good idea to let the amplifier retain its battery plugs (it also helps ensure against making a wiring mistake). Therefore, in order to connect anything to the amplifier, you should salvage the top from a discarded battery to act as a mating connector. This should be done by carefully cutting the metal jacket of the battery and spreading it so that the top can be lifted out (usually in such batteries there is no wiring connection between the top and the internal cells).

Since the maximum amount of current may be required for some jobs, it is most practical to use the larger D-size flashlight cells. Since these are only 2/3 as large as the cells in a typical 6-volt battery, they may have to be changed somewhat more frequently. However, for most normal jobs, they will stand up quite well (in fact, this can be compensated for in part by using the newer heavy-duty alkaline flashlight cells that have a longer duty life than the old carbon-zinc cells). Further, replacement is easy and convenient.

To facilitate replacement of cells, they must be installed in receptacles that will allow them to be changed with a minimum of effort. Such receptacles

Continued on Page 158

Two six-volt battery substitutes mounted on a single board. The batteries have not been inserted in the right-hand assembly to permit the battery holders to be detailed. Each unit is connected to a salvaged battery top that will act as a mating connector to the amplifier.

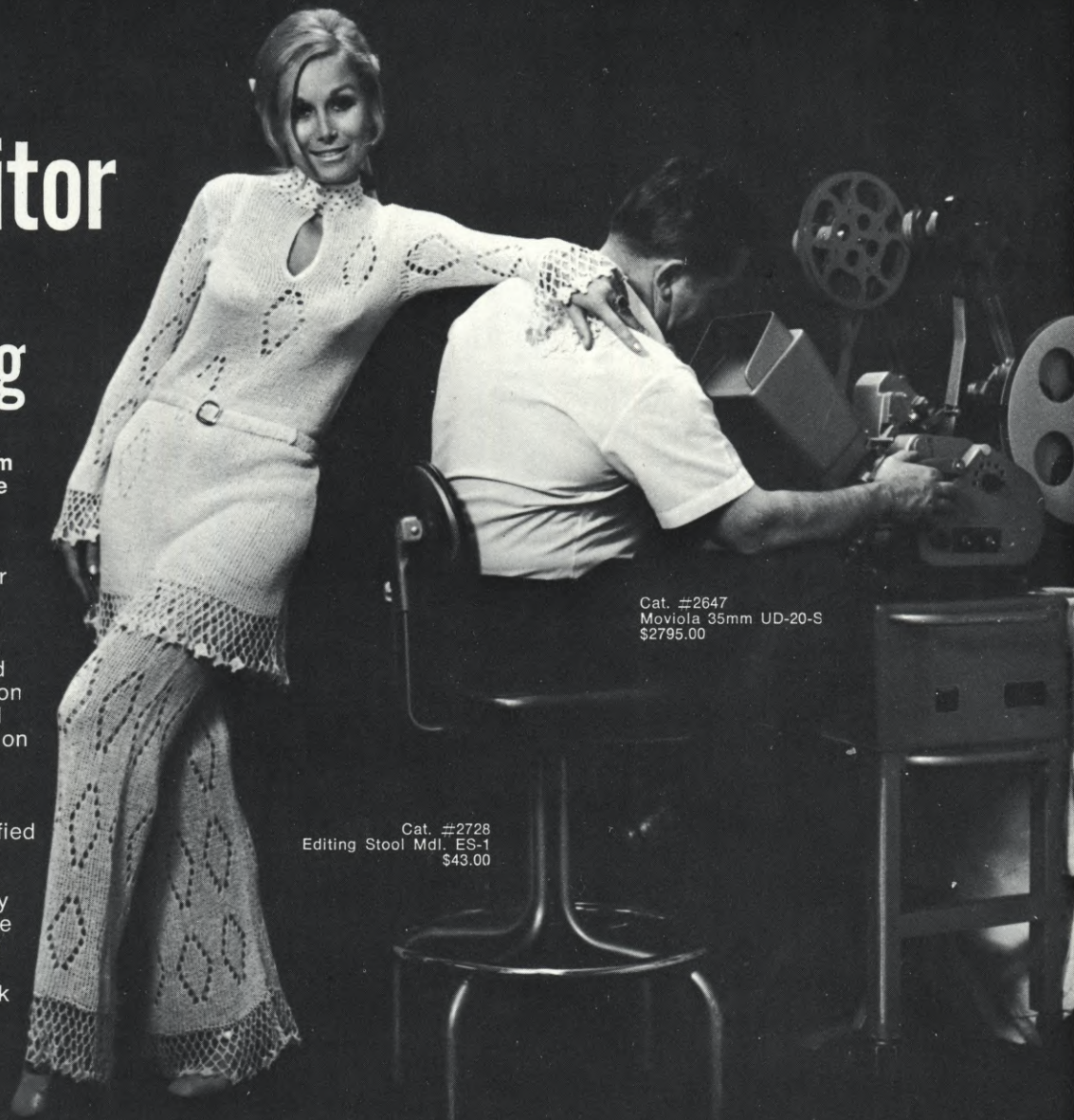


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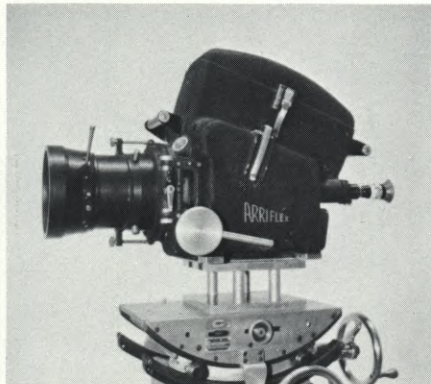
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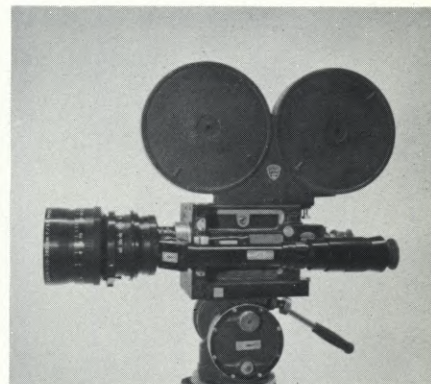
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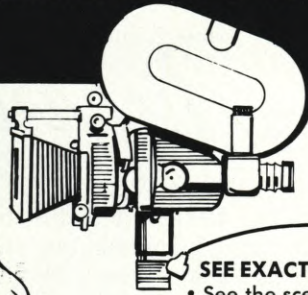
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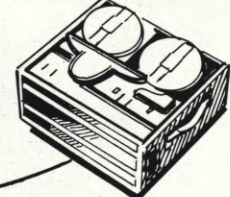
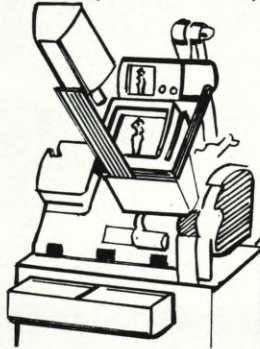
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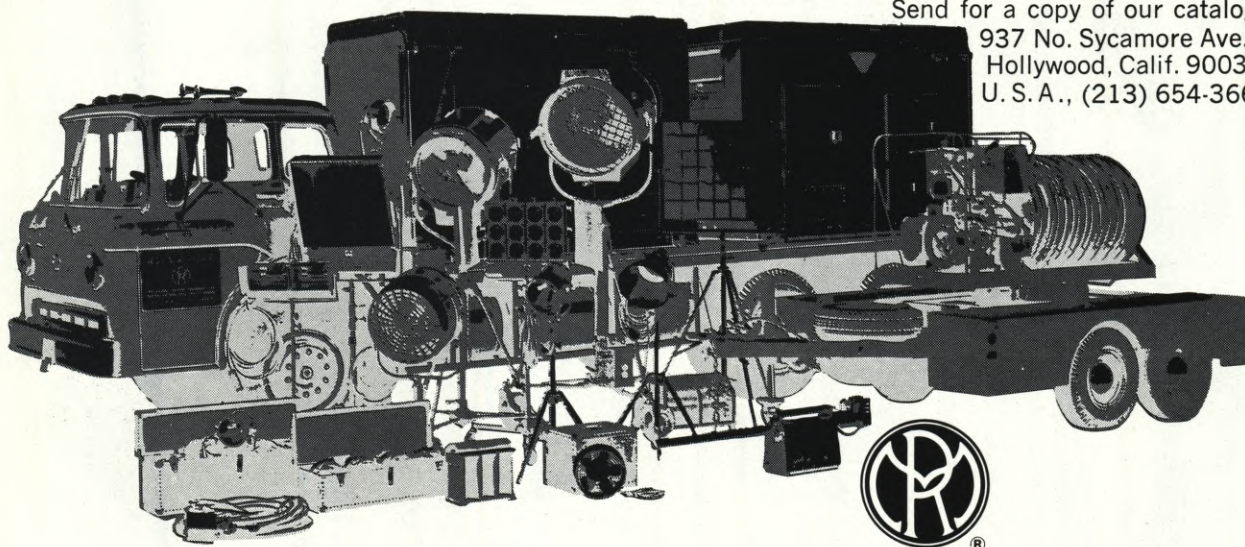
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Two years ago Bob Soluk, of Sol-lux Cinema in Hollywood, introduced to the industry a unique conversion of the Auricon Cine-Voice camera. It was dubbed the "NOMAG 400" because it required no external magazine. It was designed, instead, to fully enclose a 400-foot daylight-loading spool of 16mm film, plus takeup spool, within the sound-proofed body of the camera.

The NOMAG 400 has enjoyed a certain popularity among TV newsreel cameramen who appreciate its substantial film capacity and the elongated camera body which permits it to rest securely on the cameraman's shoulder, without the need for a harness or chest-pod. On the minus side is the fact that the camera is rather bulky and heavy for constant use, weighing about 17 pounds with zoom lens and full film load. Also, like most professional hand-held 16mm cameras, it requires an external portable power supply.

Now Soluk has come up with a redesigned, considerably smaller version of his camera, the NOMAG 200, which not only eliminates the negatives of its "big brother", but also incorporates several completely new and highly sophisticated features.

The NOMAG 200, like its predecessor, utilizes the Auricon Cine-Voice movement and encloses its 200-foot daylight-loading spool of 16mm film within an elongated self-blimped body

balanced to ride comfortably on the shoulder.

However, a new and unique feature is its small, highly-efficient, constant-speed DC motor which runs the camera with full film load on only 500 milliamperes of current per hour. The power source is a single small rechargeable nickel-cadmium battery which is fully contained within the chassis of the camera. The battery can be recharged right in the camera by means of a built-in charger. These features make the camera extremely portable, freeing it of the conventional heavy external power supply, dangling cords and burdensome accessories.

The NOMAG 200 has the capability to record either single-system or double-system sound. For double-system recording, the camera is equipped with

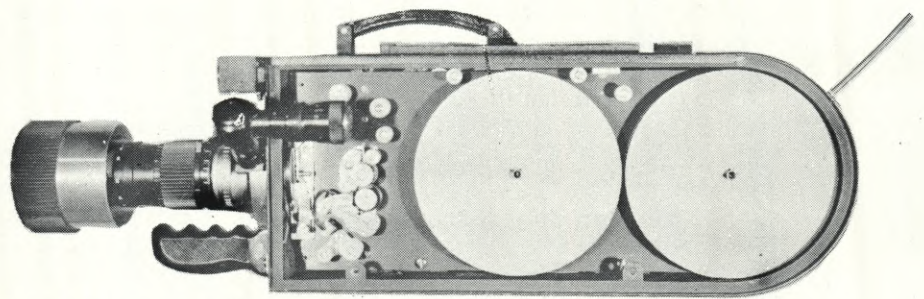
either a 50 or 60-cycle sync-pulse generator, a beep-slate and a remote control for tape recorders.

Optically, the NOMAG 200 is equipped with an Angenieux 12mm-to-120mm zoom lens and a three-inch, short viewfinder.

Soluk describes his new model as "the only silent hand-held professional camera in the world which has all of the necessary apparatus incorporated into a single unit for sound-on-film photography."

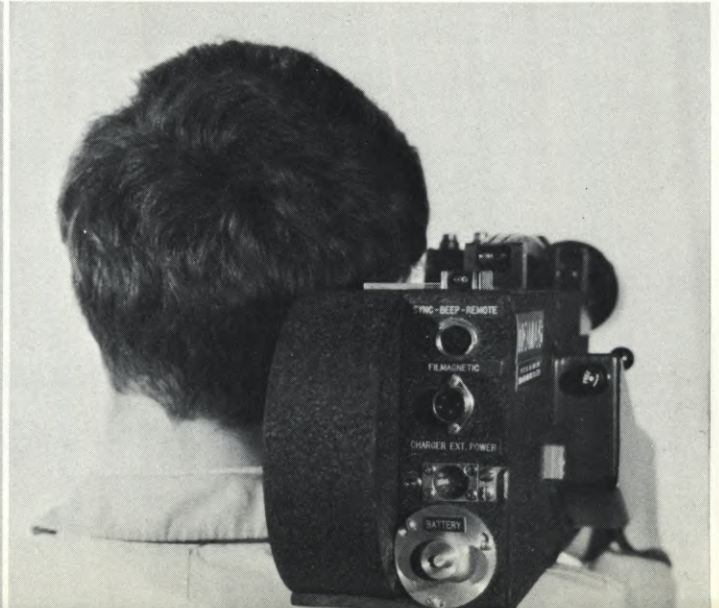
Somewhat amazing is the fact that this self-contained unit, complete with zoom lens and a full film load, weighs only 11 pounds.

Further information about the NOMAG 200 camera can be obtained from Sol-Lux Cinema, 6510 Santa Monica Blvd., Hollywood, California 90038.



Earlier "NOMAG 400" model of Cine-Voice conversion by Sol-Lux, shown with door removed, accommodated 400-foot daylight-loading spool of 16mm film inside camera body. "NOMAG 200" appears similar, but is smaller and electronically more sophisticated.

(LEFT) Long body of "NOMAG 200" camera balances comfortably on shoulder. 100-watt quartz light is optional and requires external power. (RIGHT) Rear plate of camera accommodates single and double-system modes, charger, external power, sync-beep and battery check. A single nickel-cadmium battery provides internal power supply for camera operation.





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## VIDEO WEST

Continued from Page 140

the performance of his actors, determine if the scene does what he wants it to do and to provide a reference for him to decide if he needs to "cover" the scene from an additional angle or possibly to eliminate a certain setup, since he might not need it in the cutting stage.

## CONSOLE

The console of the Video West Instant Replay System is its heart and control center. The console contains an Ampex 660 2" helical-scan video tape recorder. This recorder is a versatile and high quality solid-state unit and was selected for this use because of its 2" tape format and history of extremely reliable operation in many other applications. This is most important due to the hard use which the equipment receives while on location or shooting on a sound stage.

The 2" tape was selected over 1" or 1/2" tape in order to utilize maximum frequency response. While the outside appearance of the Ampex 660 is relatively unchanged, over 200 modifications have been incorporated by Video West engineers within the recorder circuitry. These design changes are an important factor in obtaining a superior quality video picture.

## MONITORS

The video monitors used in the system are basically standard video monitors designed to accept a 75 ohm direct video input. A video distribution amplifier enables any number of monitors to be used at the same time.

A standard arrangement includes a large 23" Conrac monitor mounted on a 5-foot pedestal stand with large casters for mobility. This monitor is placed on the side in a position so that the picture on the monitor screen can easily be seen by the director. It is usually placed so that it can be seen by a number of people including the cameraman, gaffer, script supervisor, property men and many other members of the crew who use video picture to "check" a particular setup of the scene.

The second monitor, of course, is situated in the control console and enables the video tape operator to have constant viewing of any picture whether live or playback.

All of the monitors used are modified to accept the compressed picture signal that presents the Panavision or wide-screen format. This feature can be

Continued on Page 167

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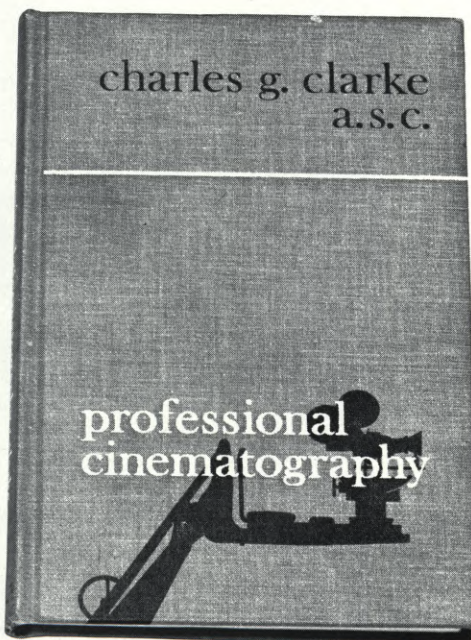


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ABOUT THE AUTHOR: Charles G. Clarke, ASC, a top Director of Photography at 20th Century-Fox for many years, and an ASC member, taught Advanced Cinematography at the University of California at Los Angeles, where he recognized a need for practical professional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

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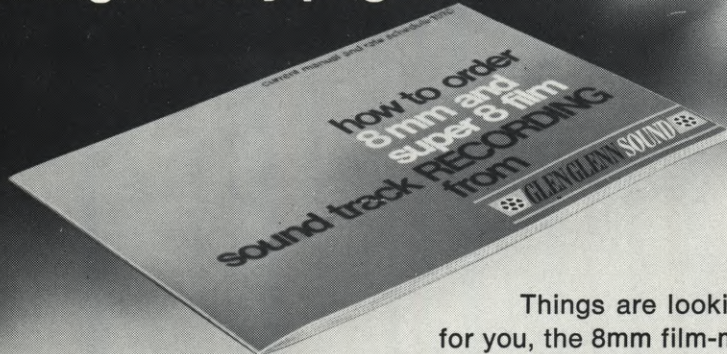
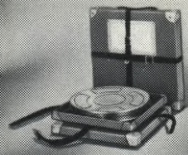
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## OLD SOUND GEAR

Continued from Page 147

are available at most radio parts stores or wholesalers (such as Lafayette Radio, Allied Radio, or Burstein-Applebee), and they are called simply "battery holders." They usually are available in one- and two-cell configurations, and occasionally they are available in three-four- or multi-cell configurations (though usually only by special order). It is very important to make sure that the holders you buy are not "pre-wired" for you, as some holders are sold that way. The exact wiring of each set of holders will depend upon the battery configuration for which you want to substitute.

Since batteries connected in series add their voltages, the number of cells required for each battery substitute will depend upon the voltage of the battery to be replaced. That is, two cells connected in series would give you 3 volts, three cells in series would give you 4½ volts, four cells would give 6 volts, and so forth.

To facilitate the initial wiring, and to assist you in actual use, the battery holders should be fastened to some sort of stiff backing. I have found that a small piece of wood, ½ to ¾ of an inch thick, is very useful for this purpose. In the case of a 6-volt battery, the optimum method would be to mount 2 two-cell battery holders on a single such block of wood, leaving sufficient "margin" around the holders to act as some protection.

After the battery holders have been mounted, their ends should be connected by wire to form the proper connection. Still considering a 6-volt battery replacement, the two 2-cell holders should be connected so that all their elements are in series. A reasonably thick wire, such as half a lamp cord, is preferred. Each connecting bridge should be a little longer than the distance between the connecting points, plus about 3/8 of an inch on each side to be stripped of insulation and soldered to the appropriate connecting point. Two longer wires will be used as leads to the connector.

When soldering connections, a few precautions should be taken. First, be sure *always* to use *rosin core solder* to make the connections, and use no supplementary flux. (Often in hardware stores you can find acid-core solder; this may be good for fixing drainpipes that leak, but acid-core solder is terrible for electrical work.) If your connecting wire

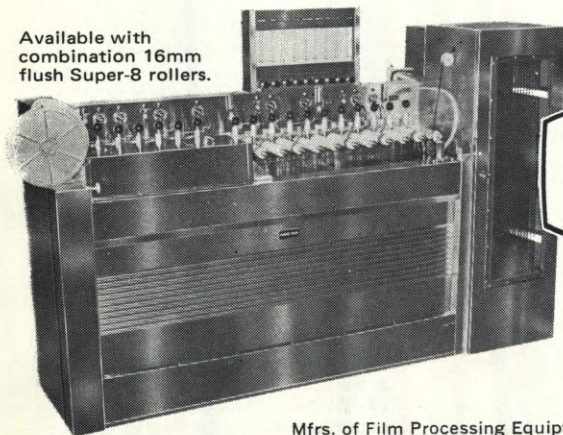
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is multi-stranded, such as lamp cord, twist the exposed ends before inserting them through the connecting point. Also, use your solder sparingly. Too much solder or a stray strand of wire can bridge the insulation of the electrical connection point and cause your battery to short-circuit itself. (All soldering should be performed, however, before installing any batteries.) Wire between points should retain its insulation.

For ease of remembering which wire to connect to which "pole" of the connector, I used a special clear-insulation lamp cord with a copper and a silvery wire running parallel to each other rather than using standard lamp cord. This special twinlead is usually available at high-fidelity salons, or it can be purchased from radio supply houses. The batteries can be inserted to conform to the "polarization"; the center post of the standard D-cell is positive and the bottom is negative.

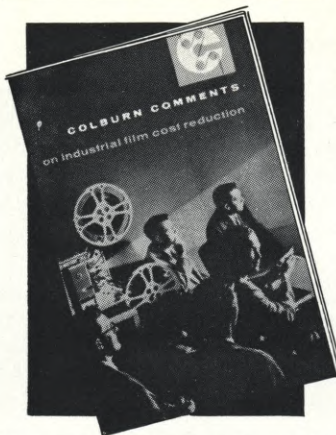
The salvaged battery top used as the connector should be soldered with the same care as the connecting points to the battery holder. Since the battery top does not have tie-down points (that is, the electrical connection points with holes in them) as the holders do, you will have to solder directly to the metal strip contacts that the internal cells used to connect to. For best results, wrap the wire around the contact strips and solder carefully (as with all soldering, heat the objects to be joined, not the solder, for the best results).

Once the solder has cooled, flashlight batteries may be inserted and the unit checked—either with a voltmeter, or by placing the unit into the equipment, connecting it, and checking it with the test circuit of the equipment, if it has one.

If your gear employs a 1½-volt battery, it was probably used to supply current to the tube filaments. To make a replacement for such a battery, it is necessary to connect a number of flashlight cells in parallel. Although the flashlight battery has the same voltage as the larger battery it could replace, the current drain would be too great for a single cell to handle. Again, using the Auricon amplifier as an example, the Burgess 8F battery (or its electrical equivalent) is such a 1½-volt battery; to replace it, I connected 8 D-cells in parallel. As with the series-connected cells, I mounted the battery holders on an appropriate wooden backing.

With higher-voltage batteries, parallel- or series-arrangements of smaller batteries will also work. Here, though,

Continued on Page 164



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**"FLASHING" EKTACHROME**

Continued from Page 143

be run through the flashing camera tails out to avoid rewinding. Needless to say, each pass through the camera entails some risk; the flashing equipment should be kept in good condition and cleaned scrupulously before and after each roll.

Once feasibility was proved, the next step was to reduce the process to measurement. Here, Eastman Kodak's Hollywood branch was most helpful, placing sensitometric exposures on our flashed footage and plotting the results.

Curve 2-A is typical of *unflashed* EF—note the steep slope and the base density approaching 3.5. Curve 2-B is characteristic of ECO, type 7255—a more gentle slope, denoting lower contrast and a base density around 2.6.

Now examine curve 2-C—EF, flashed as described. The base density of all three color layers averages around 2.6. This curve and that of ECO track astonishingly well, verifying what we have found to be empirically true—that the two emulsions can be intercut, scene by scene, with no significant change in contrast.

Curve 2-D shows EF flashed to a base density of approximately 2.35, achieved by a shutter setting of 127° on the flashing camera. Subjectively—and I must emphasize this is a purely personal opinion—I find this curve more pleasing than the one that tracks with ECO. Colors are more natural, more pastel, and final image contrast very closely approximates what the eye sees during filming, without the aid of viewing glasses or other devices. It's possible to flash to even lower densities, but below about 2.25 the image takes on a greyed-out look suitable only for special effects.

For the purist, I should mention that these curves represent an average of the response of all three color layers; all layers were plotted and track about as would be expected.

At this point the reader might speculate that flashing opens the door to a sort of selective contrast control. By shooting sequences on separate rolls, the subsequent flash exposure can be varied for different conditions. One might elect to flash very lightly a sequence shot on a grey, overcast day; or conversely, flash heavily a sequence in a foundry with harsh, contrasting areas. But such manipulation should be approached with discretion and humility. Standardization has its rewards, and the cameraman who establishes constant values for exposure and flashing—and

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sticks to them—will not overcorrect himself into trouble.

Any transport mechanism that can produce a uniform, controllable, repeatable exposure may be used in place of a camera. One simple, safe, and rapid flashing method is to use a standard continuous printer, and a number of commercial labs are offering this service. It is only necessary to set up a filter pack to cut down and diffuse the light and correct its color characteristics, and film can be flashed at several times camera speed with little danger of scratching and none of emulsion pile-up in the aperture.

Any labs that wish to experiment may find the following specifications helpful. They are courtesy of Walter Rice and Ross Wiley, of Movielab's Hollywood plant:

Using a Bell & Howell Model C printer operating at 180 feet per minute:

Lamp Voltage: 90 v.

Trimmers: Blue—19 + .10 N.D. in light path  
Green—16 + .10 N.D. in light path  
Red—19 + no N.D. in light path

Main beam: 2B filter + 7.10 N.D.

Printer tape punched for: 17 Red

17 Green

39 Blue

The printer key number exposure lamp should be turned off. EF is of course far more sensitive than printing emulsions, and darkroom safelights should be adjusted accordingly.

Flashing level can be measured most accurately with a densitometer, and the curves of FIGURE 2 suggest some guidelines. Here the lab again has the advantage of accurate control. Even if the user wishes to flash his own footage, he can best check his results by having the lab where he does his work measure his film's base density.

Many cameras don't have adjustable shutters, and many cameramen will not care to set aside space or equipment for flashing. An alternate method is to flash with the camera aimed at a neutral card, controlling flash exposure by adjusting the light on the card and the lens aperture. The card must be very evenly lit and should be thrown completely out of focus (to approximate the diffuse light source), which means using a relatively wide aperture. One might instinctively select a white card, but a neutral grey or even black one will work every bit as well, once proper light level and aperture settings are established (a white card with no light on it is black; a black card shot in sunlight at F/1.4 is white).

We have done no work with flashing EF and having it forced-processed. Our objective has always been to obtain the best possible image consistent with reasonable speed, and the degradation

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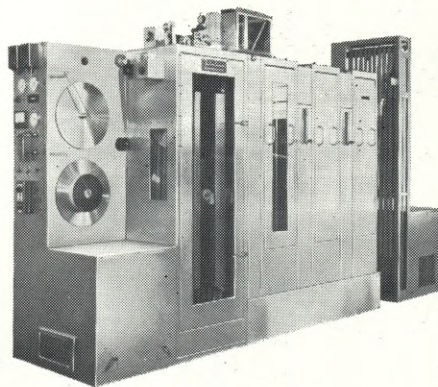
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that accompanies forced processing goes one stage beyond any compromise we care to make. In some applications, getting the shot may take precedence over quality, and here the reader is encouraged to experiment.

How does flashed EF look on the screen? Its contrast quite closely parallels ECO. Colors tend to be slightly less saturated, more pastel. Ruddy faces will tend to grow ruddier; we've found it wise to carry a neutral theatrical powder base and "dust down" talent before photography, even if other make-up is not used. This only takes a few seconds and simplifies color correction later in printing.

EF's grain is undeniably more pronounced than ECO's, but the lower contrast and a full exposure tend to reduce its apparent size. From a normal viewing distance it is not easy to tell ECO and EF apart. Of course, close to the screen the difference is at once obvious. The user must decide for himself how acceptable the grain may be for his particular subject and application.

With the film flashed to the 2.35 density, the image comes very close to what the eye sees during photography. Generally, highlights should be controlled—scrimmed off or toned down, lest they wash out. Shadows and dark areas, always a headache in 16mm, tend to take care of themselves, and a lot of the supplementary lighting normally used to fill them in can be ignored. If the scene is lit hard, it will come out hard; if it's lit normally, it will look normal, without all sorts of manipulation to achieve a "normal" effect. And if it's lit soft, it will come out soft, and I don't know any other way to achieve *this* on 16mm.

The image might be described as having a more "documentary" look than ECO. It's less painted-looking, less saturated—an image that says, by implication, "This is the way it was". For certain subjects, this is desirable—a dramatic film on location, say, or a documentary in a police station or a hospital or a Synanon or on the streets. For others—glamor product shots, maybe, or a slick high-key comedy—it's not appropriate.

Maybe this is the best guideline: If you are portraying *reality*, it works. If you are trying to glamorize, stylize, or suggest artificiality, stick to ECO.

The real significance of the process becomes evident when you start considering what can be done using it.

The economies are obvious. A producer can work in areas with high ambient illumination without bringing

in lights, or he may cover with three or four units the same scope that with ECO would call for a station wagon full of equipment. But I feel very strongly that the process's main application should not be merely to save money, but to broaden the visual scope and interest of production.

Flashed EF permits shots that would otherwise be difficult or even impossible. Once, for example, we had to pick up tiny red indicator lights on a training panel. ECO light levels would have washed them out; EF recorded them perfectly. Part of this same training system used projected motion pictures, and we were able to shoot the actual image on the screen right along with the foreground class responding—with some shutter flicker, true, but the result was far more believable than any matte shot.

Another film dealt with contact lenses. ECO light levels for the extreme closeups of the lens transferring to our model's eye would have half blinded the poor girl by lunch time. As it was, we maintained very comfortable levels at all times, even with long lenses and her eye filling the frame.

In more general applications, talent—no longer ringed by lights—can be given greater flexibility of movement, neither burning up when they move close nor going black when they move away. The same conditions widen the scope of camera movement. Single sources of illumination need no longer be painstakingly simulated; instead of four lights eight feet away, one can use a single unit 20 feet back. Multiple shadows are reduced. Weaker diffuse light carries further—in fact, can be used exclusively if the subject warrants it, spots no longer being required to build up a working exposure. If necessary, areas can be lit by bouncing light off ceilings or walls (we did this once in an elevator, where there simply wasn't any place to put a direct light).

Shooting night-for-night becomes feasible. Ability to handle shadow detail opens up what has always been difficult in 16mm—effective low-key lighting. A director no longer need move his action close to a wall, or angle his shot to avoid large background areas that add scope to a film. Light-reducing dichroics become less trouble.

Depth of field at smaller apertures, though not stylish today, can be achieved without pouring intolerable amounts of light on the people. Zoom lenses, stopped down, become sharper. Candid photography becomes easier, with a few strategic units placed and turned on well in advance so people

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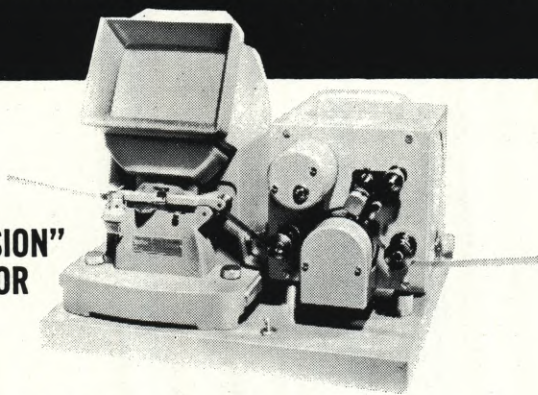
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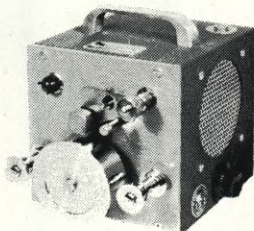


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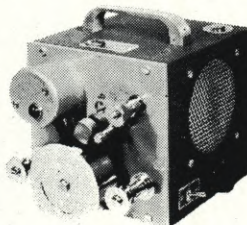
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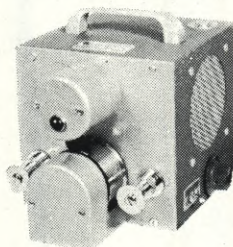
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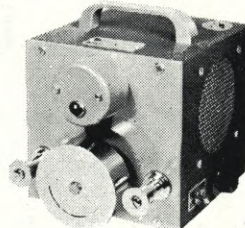


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## OLD SOUND GEAR

Continued from Page 159

rather than battery holders you would require battery clips that you would string together. The rules are the same, however: a 45-volt battery could be created by stringing five 9-volt batteries in series, etc. So far, however, I have had no trouble locating the high-voltage batteries, so I have not needed to take this step. If and when this becomes necessary, I will make sure that the replacement batteries will be large enough to carry the load, yet still fit within the confines of my battery case (note to worriers—an Auricon case is pretty roomy).

When using battery substitutes, there are two things that you must look out for. First, make certain that when a cell is replaced, the new cell is always put in facing the right way. If a cell is put in backwards in a series chain, it's bad enough; in a parallel arrangement, it means ruining all the batteries without even turning the equipment on! Red enamel (or some of your wife's nail polish) at each positive pole on the holder might help to remind you. Better than that, it's an electrical standard, so if someone else is loading your batteries for you, it may guide him.

The other item to be careful about is to make sure that all exposed metal surfaces are protected against short circuits. The "margin" afforded by each wooden mounting board should help, but if you cannot be sure, cover the exposed surface with insulating tape.

Replacing your obsolete batteries this way has a side benefit. Since there are many rechargeable batteries (such as nickel-cadmium cells) that fit standard flashlight holders, the upgrading of your equipment can be very economical. If you acquire a battery charger and rechargeable batteries, the availability of batteries on short notice becomes almost academic. Yet if something does happen, you can still go back to the carbon flashlight cells.

When replacing flashlight batteries, however, it is wise to replace them all at once from any given battery-substitute assembly. Otherwise, you may end up with batteries composed of cells with different degrees of strength, and your system will not work at its highest efficiency.

In any case, for less than \$10.00 worth of parts and a little labor, you can save a piece of gear that may be worth several hundred dollars from oblivion. And if that isn't economy, I don't know what is. ■



become used to them. Instead of lugging heavy cable and clip-ons or a generator, the gaffer pulls his power from wall outlets.

Outdoors with an 85 filter, flashed EF has an ASA rating of 80. An 85N3 cuts this to 40; an 85N6, to 20. The cameraman can literally pick his film speed and work at a reasonably constant aperture—or far later in the day.

Applications in high-speed and instrumentation photography lie outside my own range of interests, but those who work in these fields will undoubtedly think of many ways flashing might be put to good use, particularly if the material they generate ultimately finds its way into films for public showing.

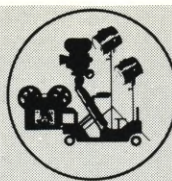
In conclusion, speculate on the lighting problems (and opportunities) associated with the following scene, drawn from my own experience:

Night. Camera in the back seat of a cab, beside the passenger, looking toward the driver. Driver finishes a line, turns front as we round a corner, and over his shoulder we see a pharmacy (a pivotal location) a block away. As the cab pulls up, pan to hold the building, bringing the passenger into profile. He gets out and the driver leans toward the right window, making a two-shot. Conversation. A brief reverse on the driver; when we return to the first angle it looks the same, but the camera has now moved outside the cab and shoots through the window. Then the cab pulls off—and we follow the passenger right into the pharmacy, past two long aisles, and finally to a reunion with his father at the back of the store.

Sure, you could do it like we had to—in a series of cuts. But played *continuously*, you gain a sense of *reality* no cutting can duplicate. You know you're in a real cab, on a real street, that it's a real store—and the next thing you know, you start to believe the *people*—which is the name of the game.

This shot, with ECO, would eat up half the lights in Hollywood. With flashed EF it wouldn't be simple—wouldn't be the kind of thing you'd do on a shoestring—but it would be completely feasible. This flexibility, I think, is worth a little grain.

The results of this work were presented to the Society of Motion Picture and Television Engineers in November of 1967. Despite this—and doubtless the work of others who have independently explored the same avenues—surprisingly few people seem to be conversant with the process. It's not patentable, anybody can use it who's interested. Hopefully, this article will be useful to them. ■



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## BEHIND THE SCENES OF "HELLO, DOLLY!"

Continued from Page 131

save considerable time during production. In the course of those six or seven weeks before shooting began we made many trips out into the Manhattan street set to check every spot for good camera angles. We had it so well lined out by the time shooting began that we knew exactly where to go to shoot every scene. There was no time lost with the entire crew standing around while someone decided where the next set-up should be."

Stradling cites Alfred Hitchcock, with whom he worked both in England and in Hollywood, as a prime example of the film technician who makes exhaustive pre-planning pay off: "He has the shooting of an entire picture plotted out four or five months before shooting begins—and he knows exactly what he wants. He never has to look through the camera viewfinder. He simply gives the cameraman a little sketch he's drawn of what he'd like to see on the screen. Hitchcock is a master technician—probably the best in the business."

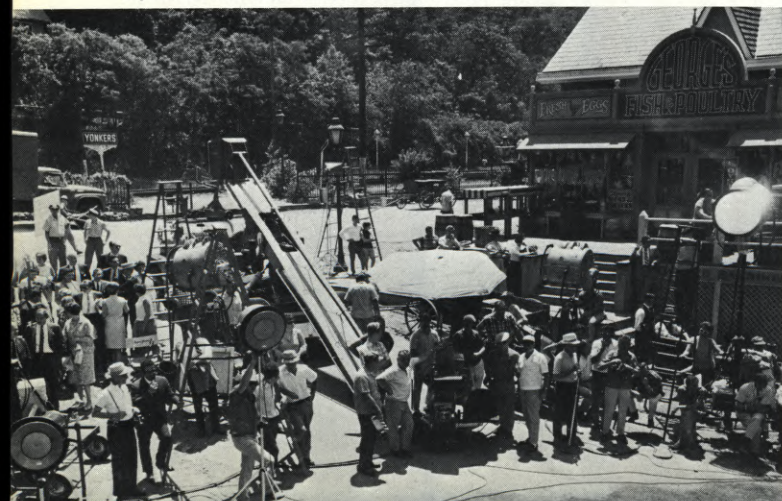
The Manhattan street set, which Stradling calls "the biggest thing I've ever had to photograph," presented some

(RIGHT) Director of Photography Stradling discusses an upcoming set-up with Director Gene Kelly on the set. Having photographed "FUNNY GIRL" and the Academy Award-winning "MY FAIR LADY," Stradling might easily be thought of as a specialist in high-key glamour photography. However, his complete versatility and command of the craft become obvious when one remembers that he also was responsible for the starkly realistic photography of such dramas as "A STREETCAR NAMED DESIRE".



(LEFT) A night scene in the Manhattan Street set outside the Harmonia Gardens. Lush lighting creates an aura of nostalgia for turn-of-the-century New York. (CENTER) Sequence taking place in the cellar of Horace Vandergelder's emporium was filmed in an actual cellar on location in Garrison, N.Y. Low ceiling made it difficult to place even small lighting units. (RIGHT) A night scene in the park, another area of the 15-acre Manhattan Street set built on studio property.

Production crew for "HELLO, DOLLY!" on location in Garrison, N.Y. Existing buildings in this historic town were temporarily vacated by tenants so that they could be "modernized" to authentically represent the 1890 period of the production.



understandable problems when the entire length of it had to be lighted to film night-for-night long shots.

"The fast 5254 color negative had just been introduced, but it was almost impossible to get any of it," Stradling recalls. "I talked to Sol Halprin, head of the Camera Department, and he was somehow able to order me about 100,000 feet of the new emulsion. That saved the situation, because using that film made it possible for me to cut the amount of lighting needed right in half. I was able to shoot with 100 foot-candles at about F/4, without forcing the development."

A tricky bit of lighting balance was required during shooting of the sequence inside the millinery shop. This set was built as an interior on the sound stage, but a portion of it was also duplicated inside the exterior store front, so that reverse angles from inside the shop would show the Manhattan street and park as visible through the plate glass windows. Ordinarily those windows would have been covered with a

Continued on Page 170

## VIDEO WEST

Continued from Page 156

switched out of the circuit quickly in order to obtain any other format desired such as 1.85:1, or a standard 4.3 television format. This 4.3 ratio has been used on commercials including those done by Stan Freberg. Mr. Freberg finds the immediate viewing and instant replay features of this system so necessary to the production of his commercials that he does not wish to film them without it.

If the director so desires, a monitor can be placed in his office on the set so that he may view his work in private or discuss it with his actors or production staff. However, it has become apparent that once the director has become familiar with using the video tape system, after one or two days, he generally views the monitor on the set where other crew personnel can also see it.

## VIDEO CAMERA

The Video Camera is a solid-state unit designed and built by Jim Songer. It is basically similar to many closed-circuit Vidicon cameras. At that point, the similarity ends. Special circuitry makes it possible to electronically and optically adjust the camera to match the Vidicon picture with the image seen in the photographic camera viewfinder.

The camera is about the size of a cigar box and weighs approximately 6 lbs. It has its own self-contained power supply and the only cables attached to it are a 110-volt AC supply cord, and the RG 59U-75 Ohm coaxial cable for the video output.

Standard 16mm C-mount lenses are used in the optical portion and the proper selection of different focal length lenses together with the desired adjustment of the electronic components make it possible to achieve any desired frame format such as 1.85:1, or Panavision 2.33:1.

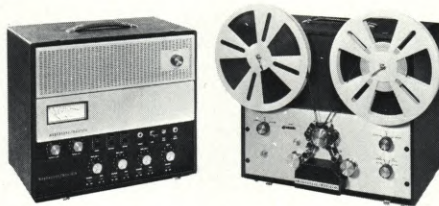
The unique feature that is most noticeable about the entire system is that the Panavision wide screen ratio is *not* obtained in the usual manner as in other systems where the Video monitor is simply masked top and bottom to obtain the Panavision format. In the Video West system, a specially protected circuit design compresses the picture into half the vertical area and yet maintains vertical linearity. In other words, a circle does not become an oval but retains its original shape. This, in effect, gives approximately twice the resolution and adds greatly to the picture quality.

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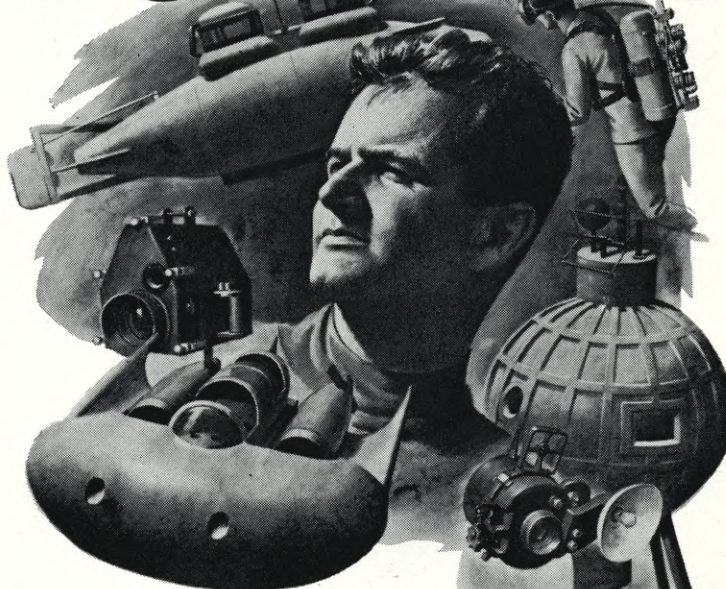
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The video camera is mounted on the front of the motion picture camera directly above the camera lens and facing down toward the floor. A 45° angle mirror is attached by a special bracket to the video camera which reflects a reversed image to the face of the vidicon due to the use of the mirror. This reversed image is converted back to a "correct" picture in the camera electronics.

Previous similar replay systems placed the video camera at the left of the film camera, either in place of or next to the optical viewfinder. This, of course, optimized horizontal parallax and was misleading. Vertical parallax is much less critical than horizontal parallax.

Horizontal parallax is reduced to zero since the video and photographic lenses' center-lines are on the same vertical axis. The video camera is mounted on an adjustable bracket that is quickly and easily detachable from the film magazine housing.

## LOOPING

A unique feature of the Video West system provides for instant looping, immediately following the scene or delayed until desired by the director. This feature is especially important for location work where it is of great advantage to the director to record the dialogue of the actor that was not obtained during the actual scene. By recording or "looping" his line at the spot where the scene was filmed, the same "room tone" is obtained and the "box-like" quality so often heard in studio-looped scenes is avoided.

The process for the looping is simple. The desired scene to be looped is selected and the actor sits or stands in front of the monitor. Dialogue from the original scene is recorded on audio track one of the Ampex 660 video tape recorder which has two audio tracks with separate level controls. The signal from the audio track one with the original dialogue is fed into the left side or both sides of a pair of binaural earphones.

In order to provide a visual start cue for the actor, a magnetically scribed line is placed on the video tape and appears on the video monitor as a gray line moving from the bottom of the frame to the top. (Film looping start cues generally move across the screen from left to right.) The actor simply begins to speak his line when the looping start cue line reaches the top of the frame. Now that we have the setup ready for looping, the recording procedure is as follows:

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- 1-The video tape recorder is placed into video playback mode.
- 2-Audio track one, with original dialogue of scene, is placed in playback mode with its signal going to ear-phone for actors' audio cue.
- 3-Audio track two of the video tape recorder is in record mode. The "new dialogue" of the actor is picked up in a standard way by the same microphone used on the set. The signal from the microphone is fed by cable to the recording mixer on the set and from the recording mixer to the audio track to input on the video tape recorder.
- 4-The actor begins speaking his "new lines" when the visual cue line reaches the top of the frame.
- 5-When the actor has completed the loop, the video tape recorder is stopped and the tape rewound to its start mark for the scene.
- 6-Both audio track one and audio track two are placed in playback mode.
- 7-The recorder is placed in playback mode, and the audio signal from track one is fed to the left side of the binaural earphones, and the signal from audio track two with the new dialogue is fed to the right side of the earphones. This enables the director to instantly determine if the new dialogue is in sync with the original dialogue and if the new dialogue is a satisfactory performance.

By listening to the new dialogue and watching the scene on the video monitor, the director can instantly determine if the lip sync is correct and if the voice matches the action. While the above process has been broken down as indicated, the actual time for the looping operation is very brief, in fact, much shorter than is possible in studio looping.

Recording the loops on location also eliminates the necessity of bringing local actors from the location to the studio for any recording. It is obvious that much expense can be eliminated by using this method. For example, on the Ralph Nelson production "... tick ... tick ... tick ..." a budget allotment of more than \$5000 was saved by using the video system of looping.

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(LEFT) A classic colonial chapel under construction on a bluff overlooking the Hudson River, part of the setting for the final (Wedding) sequence of "HELLO, DOLLY!". (RIGHT) Hundreds of extras and crew members swarm about the area for shooting of the wedding sequence, while anachronistic freighters move down the river. A giant "Titan" crane was brought along, but the film's final breath-taking scene was actually a slow zoom shot made with the camera tied down atop a high parallel.

## BEHIND THE SCENES OF "HELLO, DOLLY!"

Continued from Page 166

combination of 85 and neutral density filter materials to balance the color temperature and intensity of the exterior light with that of the incandescent lamps being used inside.

What prevented that approach from being practical in this case was the fact that characters had to be able to make entrances through the doorway opening onto the park. As a result, the lights inside the shop were rigged for a daylight balance and the scenes were shot with an 85 filter over the lens. The artistic judgments involved included deciding how high the interior light level should be built up in relation to the exterior light. Of this Stradling says, "In balancing an interior-exterior situation like this, I feel that a good normal ratio would have the outside light reading about two full stops brighter than the inside. That means that if the inside light was F/4, the outside light should be F/8—or you could let it go to F/11 if you wanted a more extreme effect."

### The Harmonia Gardens Interior Set

The Harmonia Gardens, a combination bar, restaurant and nightclub of the type popular in the '90's, is an extraordinary example of rococo interior decoration. Its decor was suggested by Castle Gardens, Maxim's in Paris and by London's Crystal Palace. Built on four different levels, it is filled with

fountains, candelabra, chandeliers, statues and greenery: marble, gold and crystal; carpeting, upholstery and curtains, in mutations from basic red to salmon. The walls are translucent plastic and the sound stage was draped with 10,000 yards of white muslin from which an overall general lighting was "bounced" onto the set. This spectacular construction, which Production Designer DeCuir considers "different but proximate" to the most lavish sets he created for "CLEOPATRA", serves as a locale for approximately 25% of the film's action. It is here that Barbra Streisand makes her grand entrance singing the title number and makes a 360-degree tour of the elegant salon, accompanied by the energetically capering singing waiters.

The antic "Waiters Gallop" number, which quite possibly may set new standards of inventiveness in musical slapstick, was staged here. Choreographer Michael Kidd had to have stairs for falling down; fountains for falling into and all kinds of different devices to assist his routines. One movement in this number consists of a diner and his lady waving away bowls of live trout and lobster. The waiter brings a large covered cart and suggests wild duck. The cart is opened and out fly real ducks which the waiter shoots. All this is done in time to music.

In order to enhance the mellow quality of the gold painted walls of this set, Stradling illuminated them with amber light. The walls were lined with gaslight fixtures, but

(LEFT) Production Designer John DeCuir's magnificent Manhattan Street set populated by day with strolling New Yorkers and horse-drawn vehicles authentic to the 1890 period. (RIGHT) At night the same set takes on a mellow glow, representing a momentous accomplishment of the motion picture lighting art. Problem was eased by nick-of-time introduction of fast 5254 Eastman color negative which made possible shooting of such scenes at an average stop of F/4, with a 100 foot-candle light level. Stradling calls this set "the biggest thing I ever had to photograph."



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actual gaslight proved to be too faint to show up against the set lighting. As an alternative, bulbs having a flame-like flicker were acquired and the glass was dyed amber to simulate a realistic effect.

In other interior sequences throughout the picture, Stradling used #54 light straw-colored filters in front of the lights to cast a warm glow over the scenes suggesting lamplight.

**The Yonkers Exterior (Garrison, N.Y.)**

Garrison, N.Y., 60 miles up the Hudson from New York City and directly opposite West Point, was chosen for the Yonkers exterior setting for reasons both artistic and practical. Yonkers, itself, was out of the question because almost nothing remains of the 1890 period.

The buildings in Garrison had been erected about 1840 and production designer DeCuir had to "modernize" many by adding gingerbread touches characteristic of the '90's.

Garrison was on a railroad—the main line of the Penn-Central—and this was essential to several story points, most notably the "Put On Your Sunday Clothes" number which ends with Miss Streisand, Michael Crawford and other members of the cast boarding a period train enroute to New York City. The station is architecturally admirable and once was the pride of the old New York Central Railway, which was undoubtedly inspired by the fact that J. P. Morgan, Hamilton Fish and other financial titans had their great estates in the back country there.

Garrison is one of the most beautiful spots in the entire Hudson River Valley and nearby the company found a meadow on which a church setting was built for the "Finale Number", in which Miss Streisand and Walter Matthau are married.

Garrison, despite its illustrious past as the railhead for West Point which involved such names as George Washington, Abraham Lincoln, Robert E. Lee, the Prince of Wales and Queen Marie of Romania, had run down and local residents of the area formed two associations to restore it. These groups owned the railway station, park and marina, having bought them from the New York Central Railroad.

Since director Gene Kelly and his troupe wanted to beautify the place in accordance with the essentially idyllic character of the period, agreement was soon reached. There are 16 structures in the village, including what was formerly a small hotel, an ancient ferry house and

Continued on Page 176



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# INDUSTRY

## FILM FESTIVAL DATES ANNOUNCED FOR MAY 8-10 BY FOOTHILL COLLEGE

Dates for the ninth annual Independent Film-Makers Festival at Foothill College, Los Altos Hills, Calif., are announced as May 8, 9, and 10, 1970, by the college's Associated Students, sponsors of this internationally known film event. Again this year, prize money will total \$1,200 in cash awards.

Competing films must have been completed between January, 1969, and April, 1970, and must be received by the college film committee no later than April 25, 1970. Independent film-makers may contact the college for entry information and entry forms.

An innovation of the ninth annual festival will be judging by categories. Judges, still to be announced, will be free to distribute prize money as they see fit among seven listed categories or, where the film-maker prefers, a category will be assigned by the pre-screening committee.

Categories of competition include cartoon and animation, documentary, abstract and fiction and/or fantasy, nature/process, about children, protest and criticism, and syncategormatic.

According to Denos P. Marvin, executive producer, and Bill Meese, director of the festival, purposes of the festival are to encourage individual expression and experimentation in the visual, technical, and esthetic aspects of film-making and to provide Foothill College's students and the community with an opportunity to see and discuss the best in recent experimental and independent film-making. The term "independent," according to the sponsors, connotes a quality of mind, rather than the financial state of the film-maker.

The 1969 festival attracted the cream of 170 new films, judged by Jimmy Murakami, partner in Murakami-Wolf Films, Hollywood, and one of the first independent film-makers to receive an award from the American Film Institute; Sheldon Renan, author of the definitive book, "Introduction to the American Underground Film," published by E. P. Dutton in 1968; and Claire Clouzot, Paris native and established European and U.S. film critic whose book, "A Decade of French Cinema: 1960-70" is in preparation.



# ACTIVITIES

Of the 1969 prize money, judges gave a top award of \$400 to David Lourie for "Untitled Project One;" second prizes of \$150 each to Michael Stewart for "Free Form," James A. Hill for "Numbers," D.B. Jones and J.K. Jennings for "Campus Christi," and Tom De Witt for "The Leap;" \$100 to Charles Braverman and David Adams for "World of '68;" and \$50 each to James Douglas for "Speedqueen" and to the Yellow Ball Workshop for "Rainbow Reel," a collection of animated films by 11-16 year olds.

Capacity audiences attended the festival's six weekend programs shown on May 24 and 25, 1969.

Judges pronounced: "The overall impression of the judges was a constant feeling of excitement. Foothill has become a vital festival which is the only one of its kind on the West Coast, if not in the whole of America."

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## "1970 FILM FESTIVAL" CALL FOR FILMS

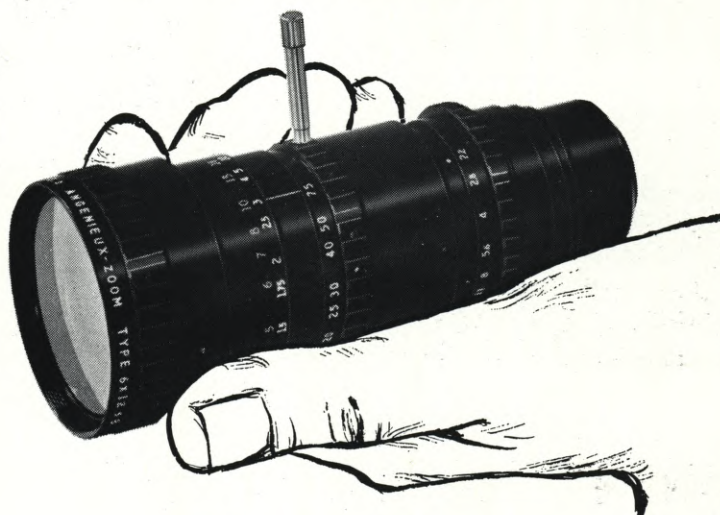
This call invites the nomination of motion pictures to be included in the 1970 ASZD Film Festival which will be part of the program of the 1970 American Society for Zero Defects Third Annual National Symposium in Anaheim, California, April 6, 7 and 8, 1970.

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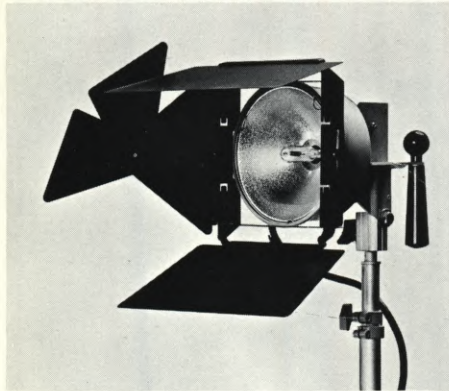
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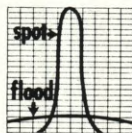


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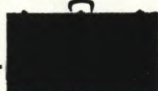
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Companies, universities, government agencies, and other organizations are invited to nominate films produced and released since January 1, 1969. The exception to this are those films which were submitted to the Second Annual Film Review held in May of 1969. These films are not acceptable.

Although there is no restriction, because of the desire to present a wide range of information to the diversified audience, it is preferred that the films not exceed twenty-five minutes in length. Short, concise, message-type films are encouraged.

### OFFICIAL RULES 1970 FILM COMPETITION

1. All films submitted must have been completed or declassified for general release within the period Jan. 1, 1969 through Dec. 31, 1969. Films submitted to 1969 ASZD Film Review are not eligible.
2. All films submitted must be 16mm prints with optical sound tracks.
3. There is no limit to the number of films which can be submitted by an organization or individual.
4. Films may be entered by members and non-members of ASZD.
5. Entry fees are:  
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6. ASZD membership—\$12.00 per year—can be obtained by qualified applicants from any local chapter, or from the National Office, 790 Broad St., Newark, N.J. 07102.
7. All fees shall be submitted by check and made payable to: American Society for Zero Defects Film Competition.
8. All entry forms and fees should be submitted immediately, but in no case postmarked later than Feb. 1, 1970. Films *may* accompany entry forms and fees, or may be sent subsequent to entry. But in no case will films be accepted later than March 2, 1970.
9. Entry forms, fees and films should be submitted to:

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10. No refunds will be made after March 2, 1970.
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**UFA ANNOUNCES STUDENT  
FILM COMPETITION**

The University Film Association has announced the beginning of competition for SEVEN SCHOLARSHIPS IN FILM to be awarded to students in American universities and colleges.

Although film has been one of the fastest-growing academic disciplines in recent years, the amount of financial aid available to students has not kept pace. Therefore, the University Film Association, a professional organization of more than six hundred individuals, institutions, and companies has embarked upon a program to increase the number of scholarships available to students of the art.

The Association is especially interested in encouraging minority students to consider careers in film.

Any graduate or undergraduate student is eligible to apply for these scholarships, which will be awarded principally on the basis of the student's past work in film production, scholarship, or criticism. Competition will close February 14, 1970.

The awards currently available are: Two McGraw-Hill Book Company Scholarships of \$1,000 and \$500; the University Film Association Minority Scholarship of \$500, donated by UFA member Rose Blyth Kemp; The University Film Foundation Scholarship of \$500; the Ken Edwards Scholarship of \$500, donated by UFA member John Flory; the University Film Association Scholarship of \$500; and the White House News Photographers Association Scholarship of \$1,000.

Information on the organization's scholarship program can be obtained from Professor Howard Suber, Scholarship Chairman, University Film Association, in care of the UCLA Motion Picture Division, Los Angeles 90024. ■

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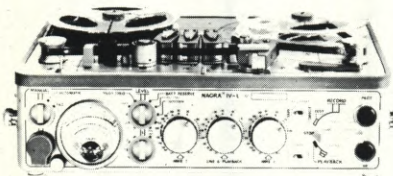
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## "HELLO DOLLY"

Continued from Page 171

a store. Seven families lived there, of whom two moved to outlying houses and one left the area. This was necessary to provide offices and dressing rooms for the movie-makers. Those who remained in the center of things may have regretted it. Particularly on Sunday when the set was open to the public and thousands visited it, people strolled into living rooms and kitchens in the mistaken belief that the whole area was a set.

There was a good deal of new construction, including a \$30,000 period barn erected to conceal the modern automobiles of 80 commuters who regularly used the railroad station. This was important to a helicopter shot of the entire village thronged with people as Barbra Streisand, on the observation platform of the train, sings "Put On Your Sunday Clothes". All the commuters cooperated except one, who insisted on parking where he had always parked. There were a number of suggestions on coping with this problem, including building a portable outhouse, complete with peaked roof and a half moon in the door, to cover the vehicle. Ultimately it was noticed that the commuter didn't work on Saturday—the film company did—and so the helicopter shot was made then.

An interesting aspect of the Garrison location was provided by the steam engine and three cars, which came from a railroad built in 1832 and which has been in continuous operation. It is the only scheduled, steam-powered, standard gauge passenger train running in the U.S. today. Its normal operation is on "The Road to Paradise", (Paradise, Penn.) a nine-mile trip through the Amish country in the vicinity of East Strasburg, Pa. The road's long life was about to end ten years ago when a group of railroad buffs took it over and preserved it, starting the Strasburg Railway Museum.

There was a division of opinion among the people of Garrison as to whether to keep the set intact after the "HELLO, DOLLY!" troupe departed. Ultimately it was decided by producer Lehman that everything should come down except a little bandstand in the park and the park itself.

### In Case of a Break in the Weather

Since the best planned location shooting schedules often go sour due to spells of bad weather, several cover sets were built inside a local gymnasium-turned-soundstage while the company was shooting in Garrison. However, the

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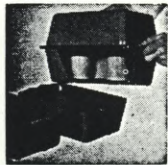
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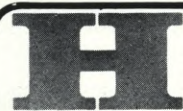
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contingency never materialized, because the sun continued to beam brightly during the entire location period. Since the cover sets had already been built, the company utilized them, moving indoors to shoot while perfect weather prevailed outdoors.

The ultra-smooth helicopter shots filmed on location were photographed by ace aerial cameraman Nelson Tyler, utilizing the famed vibrationless camera mount which he designed. Of Tyler, Stradling says: "This man is just great—the best in the business—and I'd like to give him a lot of credit for the work he did on the three pictures I've made with Barbra Streisand."

Besides "DOLLY" these include "FUNNY GIRL" (the unforgettable tugboat sequence) and "ON A CLEAR DAY YOU CAN SEE FOREVER".

The opening railroad station sequence, during which Dolly boards the train for her trip to Yonkers, was filmed in the picturesque glass-roofed terminal at Poughkeepsie, N.Y. The harsh summer sunlight streaming down through the glass from directly overhead had to be softened by means of intricately rigging many yards of diffusion material above the shooting area.

The breath-taking wedding sequence at the end of the picture, which looks like a Currier & Ives print come to life, was filmed on a magnificent bluff overlooking the Hudson River near West Point. A giant Chapman Titan boom was moved into the location and some scenes were filmed using it. However, the actual fadeout scene was photographed with the camera tied down atop a high platform, utilizing a 10-to-1 zoom lens. The scene begins with the lens racked out to its 500mm telephoto extreme to show the happy pair as they are about to enter the little white colonial chapel built for the picture. As they move forward, the lens slowly racks back to its 50mm extreme, tilting up simultaneously to end on a panorama of spectacular scope.

Of the use of zoom lenses, Stradling comments: "Personally, I think zoom shots can be good if there is a need for them on the picture, but, in general, I don't care too much for them. I have the feeling that they are being overused in a lot of pictures. People zoom in and out for no logical reason, and I think this is very distracting. The zoom lens can be used once in a while very effectively, but I think that in future films we will be getting away from so much use of the zoom—because it's too much of a mechanical device and it usually shows up like what it is."

Continued on following page

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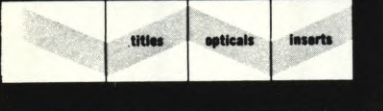


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In relation to the 70mm TODD-AO format used to photograph "HELLO, DOLLY!", Stradling considers that he has, in a sense, come full circle—because he was one of the first cameramen to experiment with the equipment when it was first developed. He spent ten weeks in Europe with Mike Todd shooting tests in the then-new format before it was ever used on a feature production.

"At the time the TODD-AO system used a lens called the 'bug-eye', with which you could practically see around corners," he recalls, "but that lens was done away with because there was just too much distortion. Now the TODD-AO people have lenses that compare favorably with the very best anywhere. I was very delighted that I had such good lenses to use in shooting this picture."

The huge scope of the sets and action in "DOLLY" often called for the use of a wide-angle lens. Having run tests on all of the lenses in advance, he discovered that the 35mm had a bit of distortion, so he used the 40mm when a wide-angle was called for. However, the bulk of the footage was shot using the 50mm, 75mm and 100mm focal lengths.

In order to keep pace with Michael Kidd's free-swinging choreography, designed with wide patterns to match the scope of the film version, a great deal of camera movement was necessarily called for, much of it employing giant camera cranes. However, it is so skillfully executed as to be quite unobtrusive.

"Sometimes on the stage you have a very difficult series of movements within a shot, where the camera goes here, there, up and down—and it seems very complicated during the shooting," Stradling comments, "but then, when you see it on the screen, it doesn't look complicated at all. That simply means that it has been very well executed by the camera operator, who plays a very key role in getting the movements and compositions to look well. I'd like to give special praise and credit to the crew that worked so conscientiously with me on 'HELLO, DOLLY!'—my operator, Richard Johnson; my assistant, Elmer Faubion and also my key grip, Richard Boland.

"After all—as the old saying goes—you're only as good as your crew." ■

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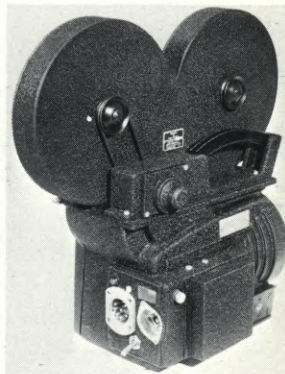
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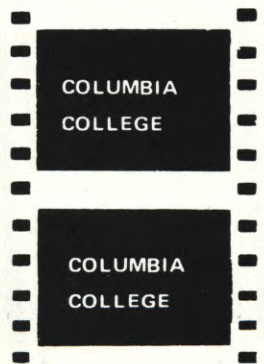
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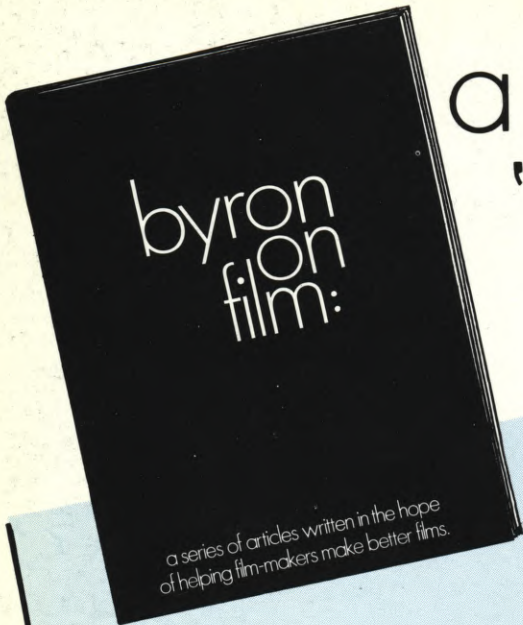
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# a pat on the back for "Byron on Film"

NORTHERN FILMS  
BOX 98 - MAIN OFFICE STATION SEATTLE 11, WASH.

1 December 1969

Mr. Byron Roudabush, President  
Byron Motion Pictures, Inc.  
65 K St. N. E.  
Washington, D. C. 20002

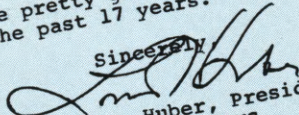
Dear Byron:

I want to thank you for the exceptionally lucid and valuable compendium of articles ("Byron on Film") which you sent us recently.

It is difficult for a producer to know some things he should know. You of course are in a splendid position to discover important knowledge much earlier than others. Your thoughtfulness in making this knowledge available is very much appreciated in this quarter (and, I suspect, everywhere else).

Your examination and conclusions on the 8mm market were especially pertinent to us. We had suspected that it was not the great utopia so many people had been saying it was. One can make bad mistakes by following the wrong leaders . . .

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