

OCTOBER 1970

75 cents

AMERICAN  
**Cinematographer**

International Journal of Motion Picture Photography and Production Techniques



the film happening at

**"woodstock"**

# they said it - we didn't!

Read what the pros say  
about the CSC Reflex BNC.

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

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

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the Pussycat.

"I've shot four feature films  
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The only one, in my opinion, that  
functions reliably from day to day,  
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It's excellent!"

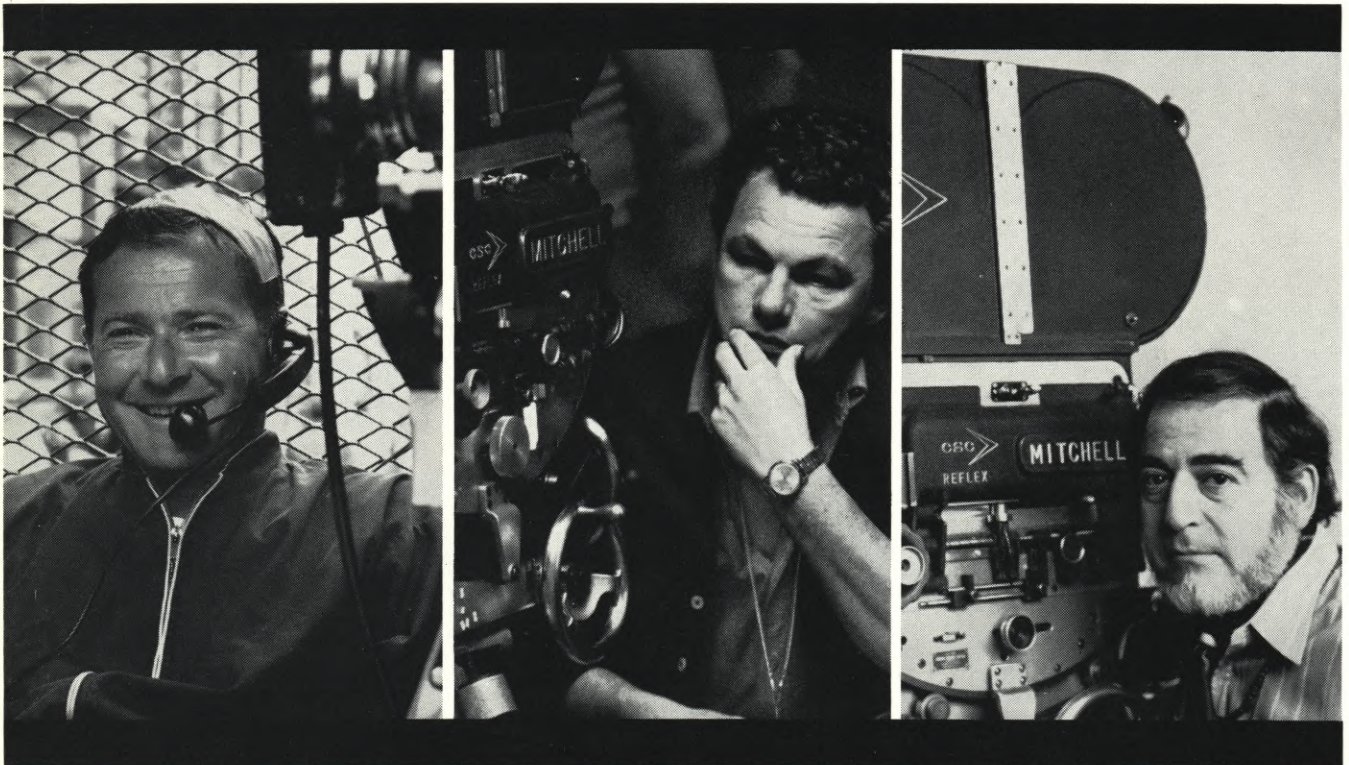
**Gordon Willis**

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

"My last three films were  
photographed with the CSC Reflex  
BNC... it's a really fine camera...  
I even took it halfway around the  
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**Gerald Hirschfeld, A.S.C.**

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



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swamps and jungles of Vietnam.

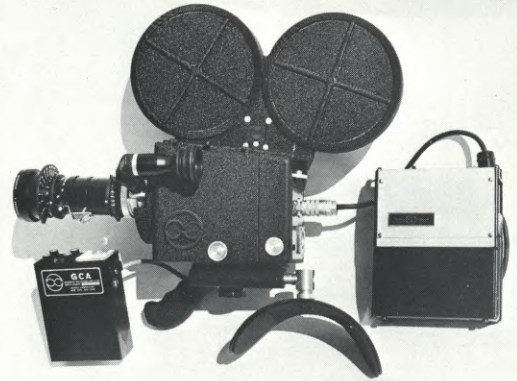
Wherever it goes, it does the job. Without doing a job on the cameraman's back. Our Peter Waldeck can give you prices and specifications.

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

**General Camera Corporation**  
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**(212) 581-1060**



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



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



# AMERICAN Cinematographer

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OCTOBER, 1970

VOL. 51, No. 10

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## • FEATURE ARTICLES

- 968 The Film Happening at "WOODSTOCK"**  
A crew of expertly trained young film technicians copes with three days of 'round-the-clock rock, a trio of rainstorms and wall-to-wall people, in order to film a spectacular documentary of the Woodstock Music Festival
- 972 The "Take One" Challenge of Filming "WOODSTOCK"**  
The director tells it like it was in creating the all-time biggest documentary, where you had to get it right the first time because there was no "Take Two"
- 978 "WOODSTOCK": The Acid Test**  
Three exhaustive days of shooting under the worst possible conditions could have defeated them, but it's all on the film—and great!
- 984 Getting It All Together For "WOODSTOCK"**  
It added up to a king-size exercise in logistics, diplomacy and just plain "gut" determination—something like building a pyramid
- 992 CINEMA VERITÉ—What It's All About**  
A former professor-turned-soundman gives a scholarly analysis of a much-misunderstood documentary film form, with a character all its own
- 998 The Netherlands Pavilion at EXPO '70**  
A last long look at Japan's magnificent World Fair, with special tribute to a stunning multiple-screen film presentation
- 1002 The New Arriflex Built-in Exposure Control System**  
An ingenious solution to an old problem gives the cinematographer continuous "eyeball control" of exposure, through the viewfinder
- 1006 PrismaLite**  
A revolutionary new motion picture screen-surfacing material makes possible an image with 300% more brilliance, plus improved contrast and color saturation

## • DEPARTMENTS

- 946 What's New**  
**954 Cinema Workshop**

ON THE COVER: A symbolic stylization of the spirit underlying the Woodstock Music Festival: Music, people and the dove of peace. Cover design by Don Record. Color graphics conceived by Herb A. Lightman.

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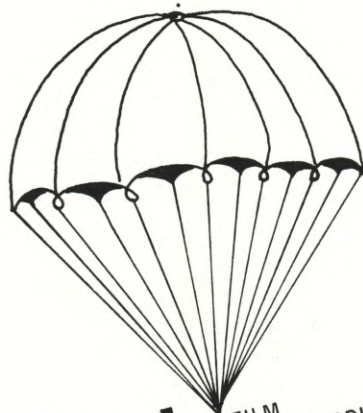
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# The new Birns & Sawyer FILMOVAN rolls neatly into a world of tight budgets!



The new B & S Filmovan is 4,000 pounds lighter than its competition — easier and cheaper to fly-away to location. A 10' x 7' topside shooting platform is an integral feature. And when the unit is used with a motor-home, as illustrated below, the producer has all his equipment, plus dressing room, bath, air conditioning, conference room, etc., and still needs only one driver. The new Filmovan is a custom-fitted unit —

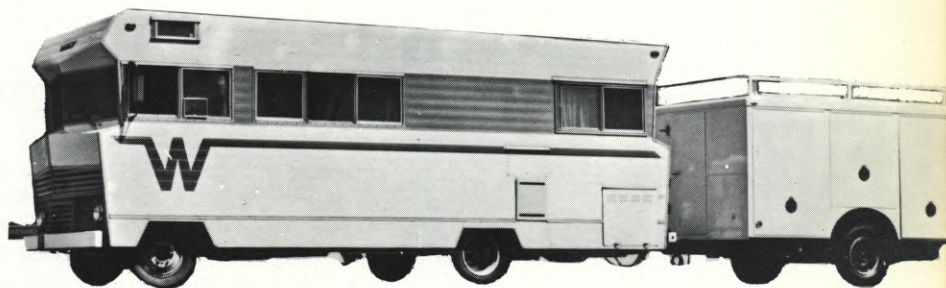
each piece of equipment has its own rack, hanger or drawer. Easy to set-up, easy to work, easy to wrap at the end of shooting. Door and interior lights make night work easy. Large, insulated, countersprung doors (fifty square feet on each side) swing upward to shield against sun and rain; they also give clear access to both sides of unit.

Hollywood's newest location filming vehicle is a saucy, white and red trailer, called the FILMOVAN.

Except for saving money and effort in huge quantities, the pioneer Hollywood equipment firm of Birns & Sawyer makes no radical claims. The money angle is new — rent only the equipment you need and Birns & Sawyer throws in the FILMOVAN free!

Birns & Sawyer designed and built the FILMOVAN as an on-set unit—to serve with a minimum of steps and effort—camera, grip and electrical crews. Doors open to neat compartments (35 cubic feet of intelligently designed space to *hold everything you need*)—the most sophisticated lightweight equipment: cameras, sound, electrical and grip, dollies, tracks, tripods, lights, ladders and lenses. Easily deployable to move without fuss from setup to setup.

The FILMOVAN has its own brakes, hooks on to any heavy-duty pulling vehicle. No engine, transmission or rear-end to wear out, fail or cause other trouble to hold up assignments. Try it. It's different. It's also free.\*



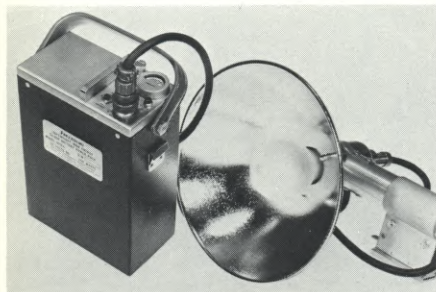
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*\*If you wish to buy or rent empty units, you may, of course.*

# WHAT'S NEW

IN PRODUCTS, SERVICES AND LITERATURE



## FREZZOLINI INTRODUCES NEW LIGHTWEIGHT BATTERY PACK

The "New Frezzi T.M." Model 800LL lightweight (7 pounds, 14 ounces) high-energy silver-powered portable (size 5 5/8" x 8 3/4" x 3") Battery Pack supplies 250 watts of power at 30 volts DC output for 30 minutes. Model 800LL can be used with all portable battery-operated professional motion picture light heads or 28-volts DC professional motion picture camera motors.

"Frezzi T.M." Model 800LL Battery Pack has fully-automatic built-in solid-state charger. Battery is fully protected during charge or discharge. Accurate color-coded DC voltmeter continuously monitors output during filming. Indicator lights show "Operation" or "Charge" status.

Model 800LL is shown (photo) powering a "Frezzi T.M." nine-inch professional motion picture light head, the "old standard" for lighting TV hard-news and for documentary motion picture filming. (The nine-inch "Frezzi T.M." light head is still manufactured by Jim Frezzolini to order.

The "New Frezzi T.M." Model 800LL, as well as other Frezzolini products, are available from professional motion picture supply dealers. For detailed information see your dealer or write direct to J.J. Crawford (Vice-President, Engineering) at General Research Laboratories division of Frezzolini Electronics Inc., 7 Valley Street, Hawthorne, New Jersey 07506, or call him at (201) 427-1160.

## NEW CAMERA MOTOR FOR NPR

Eclair-Debie (UK) Ltd. offers a revolutionary new Camera Motor designed for the 16mm Eclair NPR Camera. The multi-duty, 12 volt Motor is crystal-

controlled and has a variety of operations previously not available in one unit. The unusual features built into the camera eliminate the need for any external accessories.

The Beala is unique:

Automatic reflex mirror positioning, eliminating inching; crystal sync control, (cordless sync with appropriately equipped tape recorders); sync-pulse generator, with 50Hz, 60Hz, or 100Hz facility (synchronous operation with cable between motor and recorder); speed of motor can be controlled by frequency from an external source, e.g. a sound recorder (play back function) or other motor of a second camera; variable speed (4 to 40 f.p.s.), tachometer and variable speed control included in basic motor; single frame operation socket, for separate attachment; automatic clapper light and tape blooming; built in crystal-control camera speed, both 24 & 25 fps; double automatic safety alarm system.

A full range of Eclair and Debie equipment is available from the newly formed Sales and Manufacturing Company Eclair-Debie (UK) Ltd. For further information please contact:

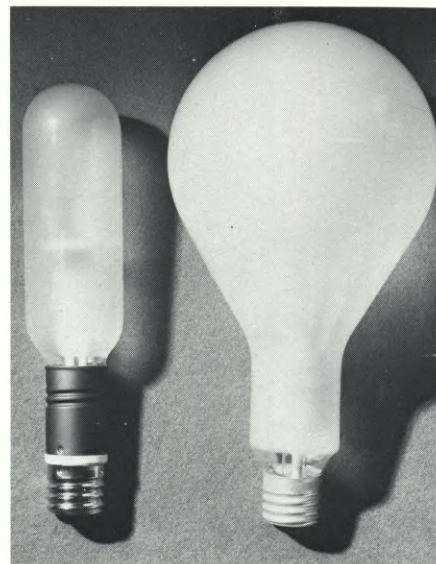
Jill Rodwell, Eclair-Debie Organisation; Orion Works, Northfield Avenue, Ealing, London, W.13. TEL: 01.579-3831.

## MOTION ANALYSIS PROJECTOR BROCHURE NOW AVAILABLE

A brochure on the new second generation model of the C-S MARK III 16mm Motion Analysis Projector is now available. The addition of a new cooling system, an aspheric element in the condenser system, and a heavy duty drive mechanism, provides increased stability in single frame hold, better illumination, and even greater reliability. It is designed for qualitative examination of films taken by high speed, time-lapse, memo-motion, instrumentation and/or normal cine motion picture cameras. Applications include motion study in scientific and medical research, industry, education, and athletics.

Featuring flicker-free projection rates of single frame hold or automatic 2, 4, 8, and 16 frames per second (24 fps if preferred) in forward or reverse, the machine can be controlled either at the

console or remotely. The unit is operated by relays, electromagnetic clutches, and solid state switching circuits for reliability. These are designed and furnished as plug-in modules for ease in maintenance. A quartz-iodine lamp, separate film gate motor blower, and an efficient dichroic heat filter protect the film at all times. Irondequoit Industries, P.O. Box 7637, Rochester, New York 14622.



## SYLVANIA DEVELOPS 1500-WATT HALOGEN STUDIO BULB WITH FINE DIFFUSE CHARACTERISTICS

Development of a 1500-watt halogen bulb with fine diffuse characteristics, designed for studio and motion picture uses where PS52 types are currently used, has been announced by Sylvania Electric Products Inc.

The initial light characteristics of the bulb are maintained throughout its 250-hour life by the halogen cycle which redeposits tungsten molecules on the filament rather than on the bulb walls. It is designed to provide 41,000 lumens of light at a 3200°K. temperature and operates in a base-up position to 45° to either side.

The diffusion characteristics of the new bulb minimize glare and harsh shadows which makes it an ideal source for studio lighting. Its halogen gas fill ensures that it will return up to 98 percent of its initial light output at the end of its useful life.

Nickel plated brass bases on the bulb minimize any tendency to become fixed in the socket.

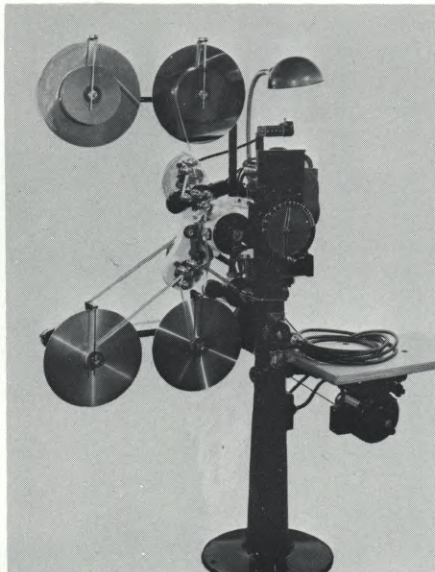
The bulb's light output may be reduced by any type of dimmer. It is virtually noise-free when operated with solid-state dimmers.

The bulb is 12 inches long and 2½ inches in diameter.



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## LAB EQUIPMENT AT NEVER BEFORE LOW PRICES



### BELL AND HOWELL CINE PRINTERS

Models D and J

These are the most widely used printers in the industry. Features include 22 exposure positions controlled by magnetic clutch, variable aperture, high-intensity lamp house, 1200-ft. capacity, motor-driven cooling fan, friction-type flange hubs and many more.

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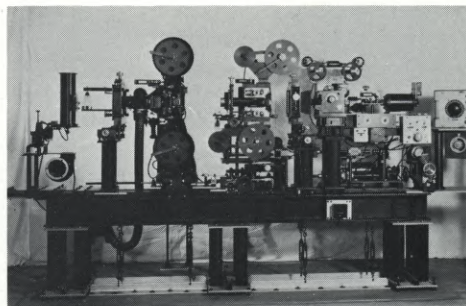
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Super 8.**

### CINEX EXPOSURE TESTING MACHINE

Capacity, 10-20 negative scene tests per minute. Single control, 11 step wedge. The standard of the industry for years.

Model 1049, used in good condition... **SALE PRICE: \$995.00**



### 35mm OPTICAL PRINTER

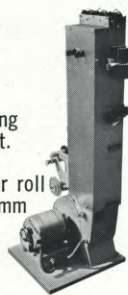
Equipped with standard Acme 35mm camera with reflex viewing prism and variable fade from 8 frames to 12 feet. Projector is set up for bi-pack and has aerial lens which works with a third projector that slides in and out of place or with title board that takes front or back lighted titles. Camera and projector have motors with variable speeds from 2 f.p.m. to 4 f.p.m. Stop motion works at 20 feet per minute. Available for viewing in our Hollywood show-room. Original cost \$90,000.00.

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### C-2 FILM DRYER ... 16/35mm

Automatic continuous drying of 16mm and 35mm 200-ft. black and white negative, positive, reversal and color roll film. Dries 100 feet of 35mm film in only 6-12 minutes.

**SALE PRICE:  
\$235.00**



### DEPUE LIGHT CONTROL BOARDS

Separate unit with provision for electrical connection to motion picture printing machines. Provides 22 standardized degrees of picture printing light intensity in any predetermined order or sequence. Also can be used with microfilm printers and optical picture reduction printers. Original cost more than \$1500.00.

**SALE PRICE, Model 152: \$685.00**



### 35mm COLOR ADDITIVE PRINTER

High intensity lamp, 120 f.p.m. printing speed, integral fader, separate sound head printing assembly. Original Cost, \$20,800.00.

As is, needs repair ..... **\$6500.00**

### HERRNFELD SCENE TESTER

Takes the place of a Cinex machine in making 35mm color prints. Primary function is to make it possible for the timer to select the proper color correction filters and printing densities for a given color original or dupe.

Model 1508, 35mm:  
**SALE PRICE \$1295.00**

### OPTICAL SOUND PRINTING HEADS

For attaching to all Peterson and Bell & Howell printers. Sound head comes complete with extra feed and take-up levers. 16mm for B&H Models J, C... Original Cost \$3450.00.

**SALE PRICE: \$1895.00**

35mm for B&H Models D, C... Original Cost \$3450.00.

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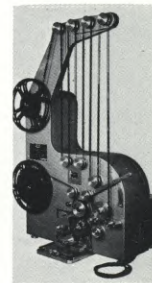
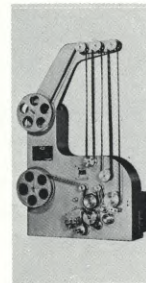
### OTHER PRINTERS AVAILABLE

Arriflex 35mm Step Printer, with punch tape control ..... **\$1495.00**

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### EDGE NUMBERING MACHINES

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(All equipment used unless otherwise specified.)

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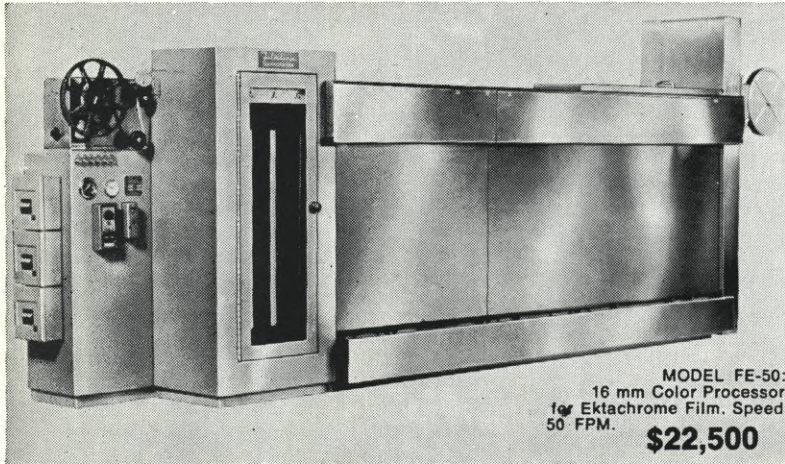
# The Money-Makers

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

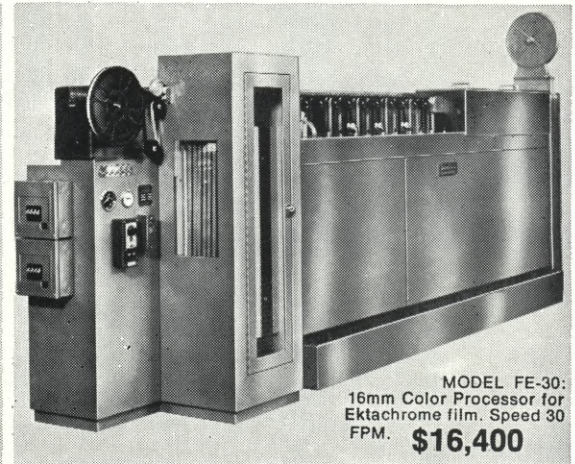
The Filmline Models FE-30 and FE-50 are fast, foolproof, troublefree and long-lasting. They turn out consistently superior work. The design is backed by Filmline's reputation as the world's leading manufacturer of film processors for the motion picture laboratory industry.

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

Check the exclusive Filmline features below:



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



MODEL FE-30:  
16mm Color Processor for  
Ektachrome film. Speed 30  
FPM. **\$16,400**

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

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

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

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

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

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

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

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

Partial listing of Filmline Color Installations: — NBC- New York, NBC- Washington, NBC- Cleveland, NBC- Chicago, CBS & ABC Networks, Eastman Kodak, Rochester.

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

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



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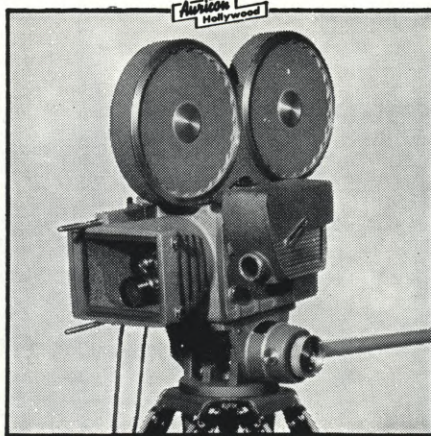
**"When you buy quality Filmline Costs Less"**

# AURICON 16mm Sound-On-Film for Professional Results!



ALL AURICON EQUIPMENT IS SOLD WITH A 30 DAY MONEY-BACK GUARANTEE.

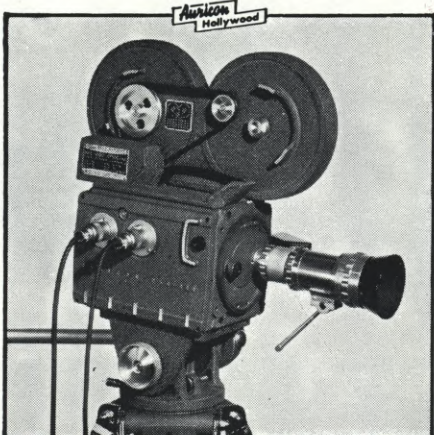
**"CINE-VOICE II" 16mm Optical Sound-On-Film Camera.**  
 ★ 100 ft. film capacity for 2¾ minutes of recording; 6-Volt DC Converter or 115-Volt AC operation. ★\$1180.00 (and up).



**"AURICON PRO-600" 16mm Optical Sound-On-Film Camera.**  
 ★ 600 ft. film capacity for 16½ minutes of recording. ★ \$1820.00 (and up) with 30 day money-back guarantee.



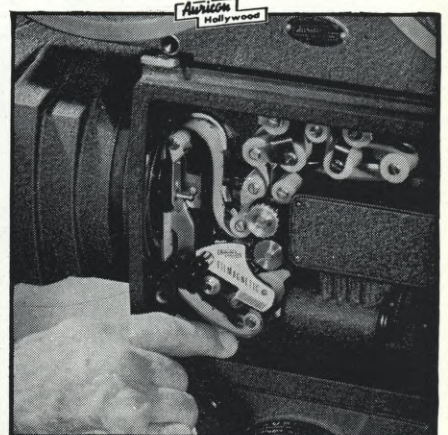
**"SUPER 1200" 16mm Optical Sound-On-Film Camera.**  
 ★ 1200 ft. film capacity for 33 minutes of recording. ★ \$6425.00 (and up) complete for "High-Fidelity" Talking Pictures.



**"PRO-600 SPECIAL" 16mm Light-Weight Camera.**  
 ★ 400 ft. film capacity for 11 minutes of recording. ★ \$1620.00 (and up).



**PORTABLE POWER SUPPLY UNIT — Model PS-21..** Silent in operation, furnishes 115-Volt AC power to drive "Single System" or "Double System" Auricon Equipment from 12 Volt Storage Battery, for remote "location" filming. ★\$337.00



**FILMAGNETIC**—Finger points to Magnetic pre-stripe on unexposed film for recording lip-synchronized magnetic sound with your picture. Can be used with all Auricon Cameras. ★\$1325.00 (and up).



**TRIPOD—Models FT-10 and FT-10S12...**  
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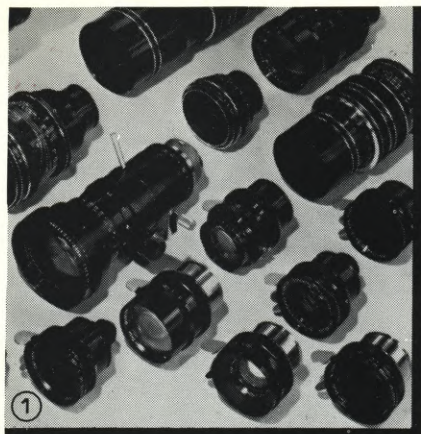
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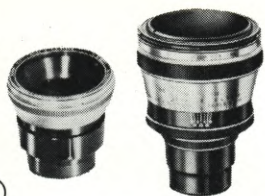
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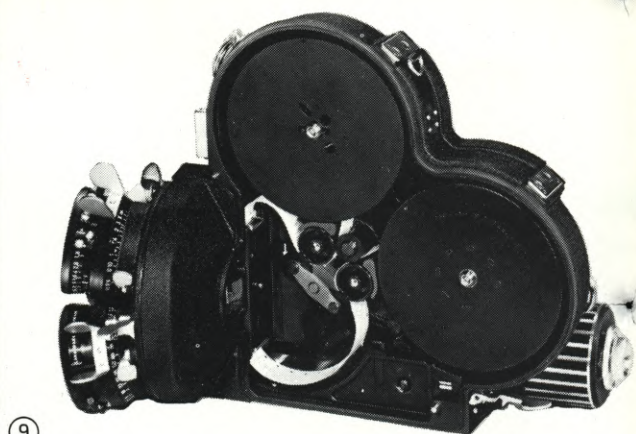
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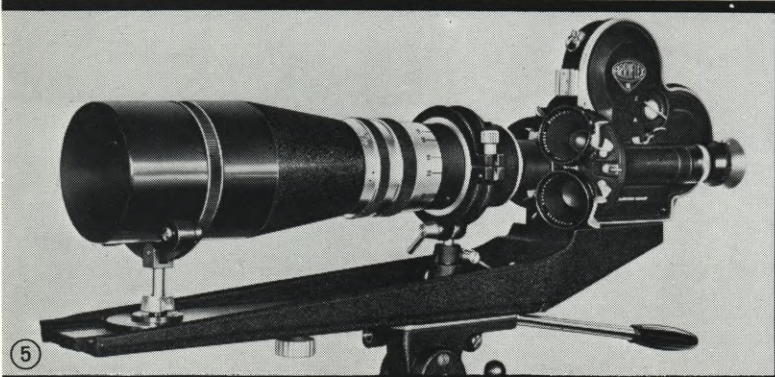
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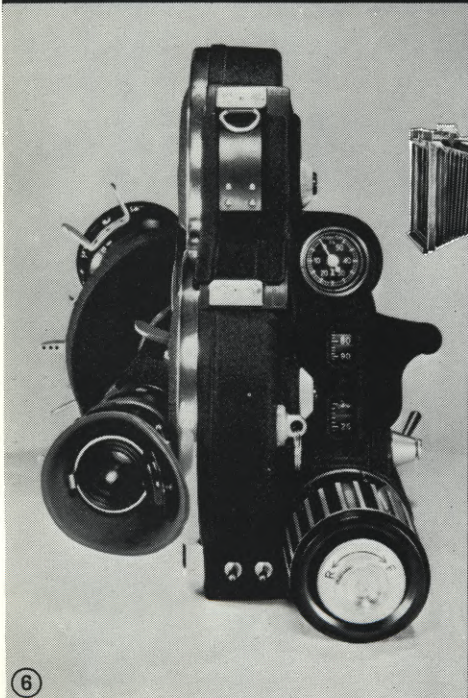
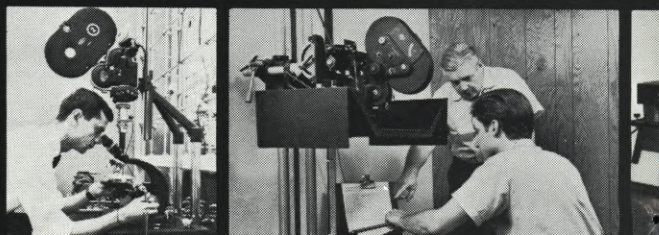
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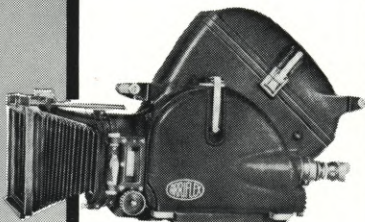
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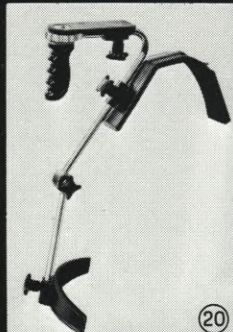
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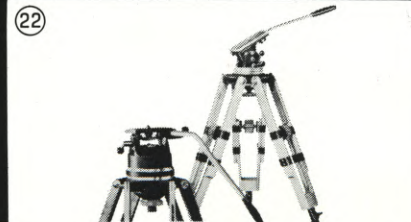
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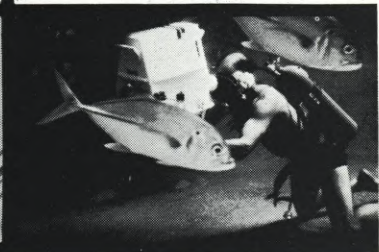
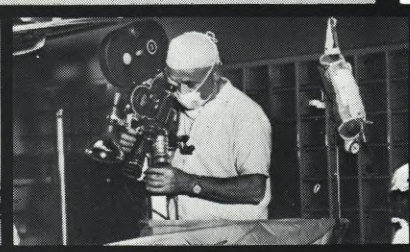
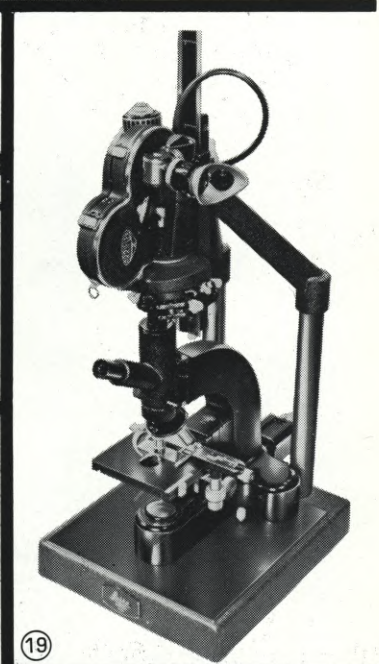
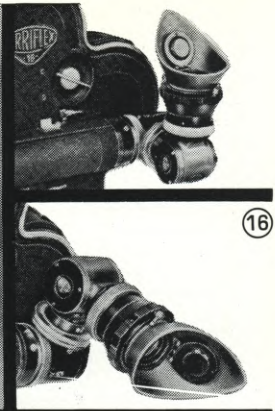
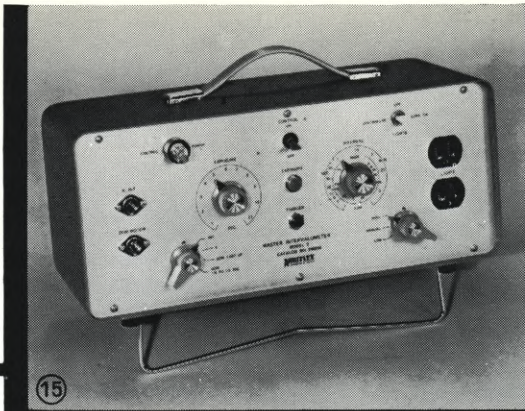
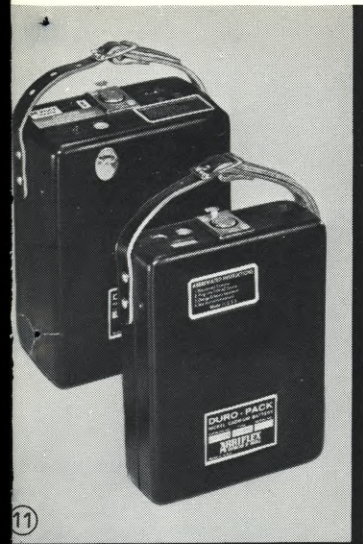
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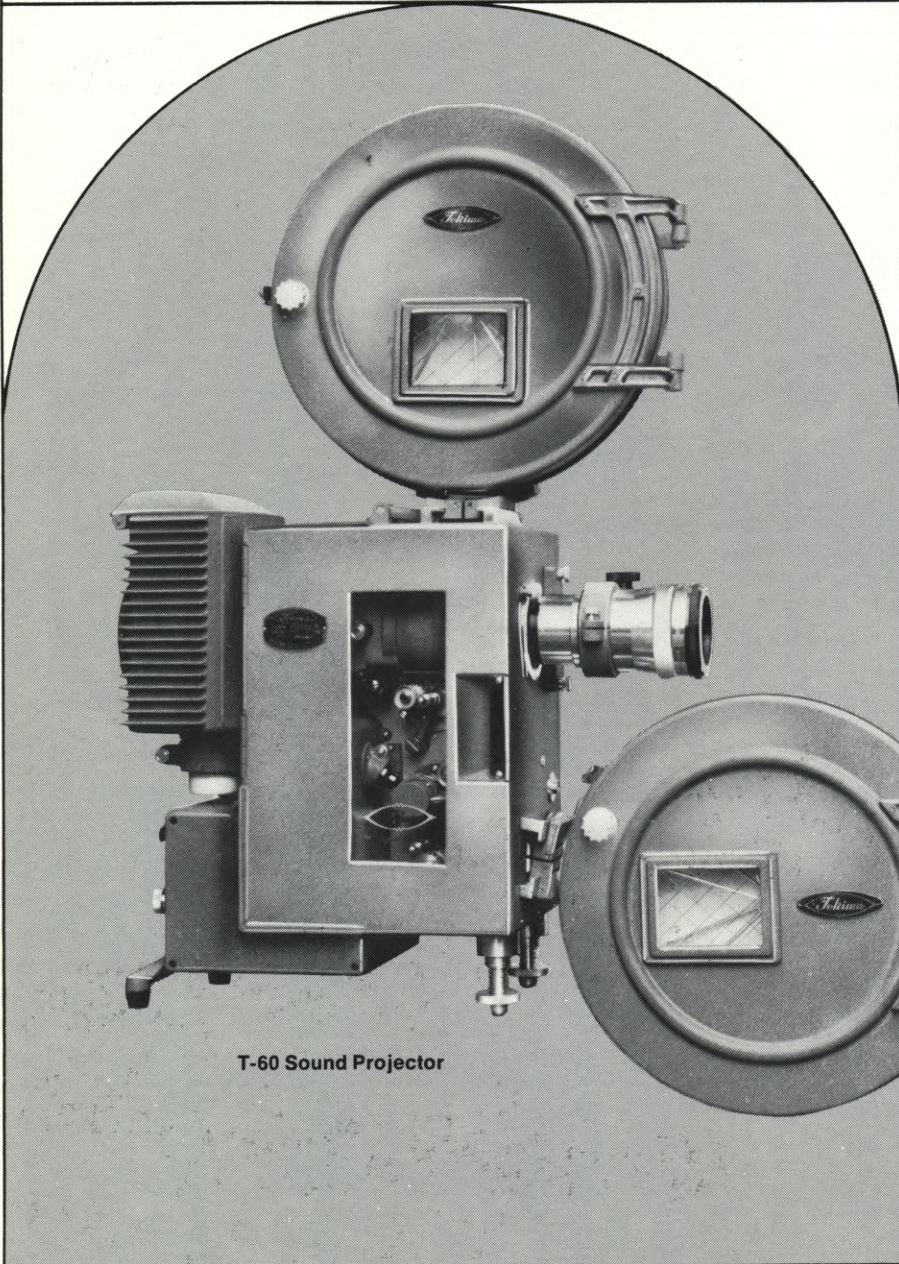
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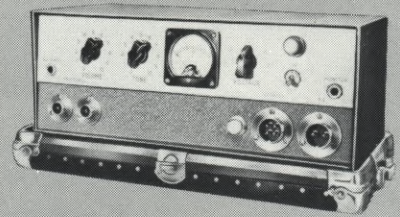
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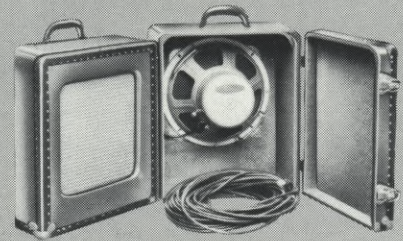
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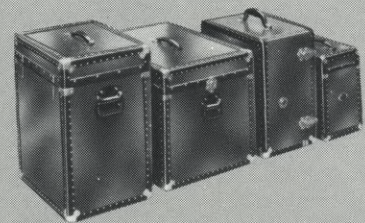
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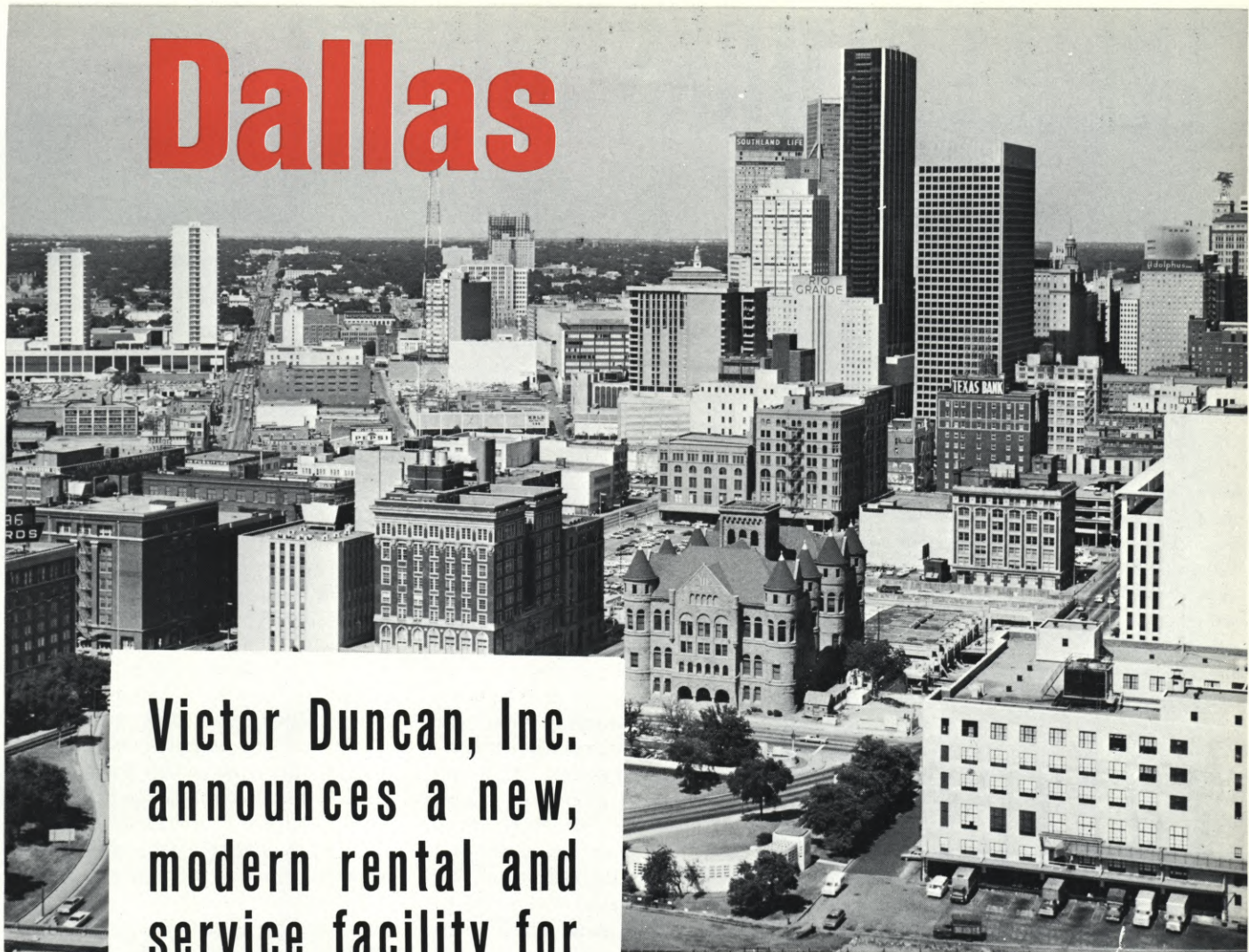
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# CINEMA WORKSHOP



By ANTON WILSON

Motion pictures are the most technical of contemporary arts and it is imperative that cinematographers technically understand this medium before they can fully exploit its communicative potential. The purpose of this feature is to help the cinematographer achieve a closer rapport with his medium by each month exploring a different technical aspect of the motion picture art.

Light is the basic element in every phase of photography. Of all the wavelengths shown on the scale (FIGURE 1), our eyes are only sensitive to a very narrow region which is called the visible spectrum.

A closer look at this region reveals that the human eye can perceive wavelengths from about 400 to 700  $m\mu$ , and can distinguish different wave-

lengths as colors. (FIGURE 2)

If more than one wavelength is present, the eye and mind will mix the two wavelengths and come up with an intermediate color. For example, blue and green will be perceived as cyan, red and green as yellow, and red and blue as magenta. If all wavelengths are present, white light is perceived. Objects appear colored by absorbing certain wavelengths and reflecting others. If white light falls on an object that absorbs blues and greens but reflects red, the eye will see a red object. This may seem elementary, but the cinematographer should be aware that the only way the red object can appear red is if red light is included in the original light source.

As an extreme example, take the same red object and illuminate it with bluish-green light (no red). Neighboring objects that are blue or green will appear normal, but the red object will appear black, because there is no red to reflect. A normally yellow object under the same light source will appear pure green because we perceive yellow as a combination of reflected green and red. However, in this case there is no red to reflect, so green is all that will be seen. Thus, the color balance of the light source will determine, to a large extent, the color of the objects on the film.

Although the foregoing is an extreme example, this same effect plagues many cinematographers because the light sources we call "white" really vary greatly in their "spectral energy distribution" or, more plainly, all colors are present, but the relative amount of each color may be different. This problem is compounded by the fact that the human eye will automatically compensate for even the most gross deviations in the color balance of a light source, thus a source may appear white to the eye, but the results on film could be disastrous, if not bizarre.

Thus, describing a light source as being white is not enough, and the color temperature scale was created as a method of rating so-called "white" light as to its spectral energy distribution (the

relative amount of each color).

Most light sources we encounter are incandescent; the light results from heating an object until it glows. Color temperature of a light source refers to the balance of color that is radiated by a non-reflective body heated to a specific temperature. If a piece of steel or a tungsten filament in a bulb (which can be considered a non-reflective body) is heated to about 2500°K\*, it will glow reddish. It is actually radiating all colors (white) but the amount of red energy is far greater than that of blues and green. At 3200°K the glow will take on an orange hue due to the increased green energy. (Red plus some green yields orange.) If the tungsten is heated to 5500°K, the glow will appear colorless. This is because the amounts of red, greens and blues are about equal. At 7000°K, the radiation will appear bluish because at the higher temperatures there is more blue energy in the radiation than reds or greens. The graph (FIGURE 3) should help clarify the concept of color temperature. It should be noted that in every case all colors are present and the lines are continuous and smooth. This is indicative of what is known as a "continuous spectrum" light source.

It is interesting to note that the eye will perceive light from about 2800°K

Continued on Page 1010

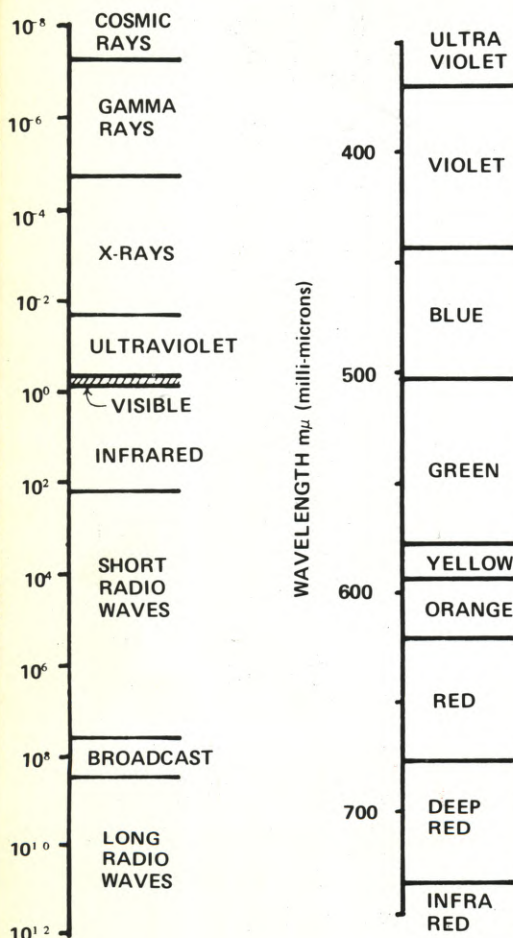


FIGURE 1

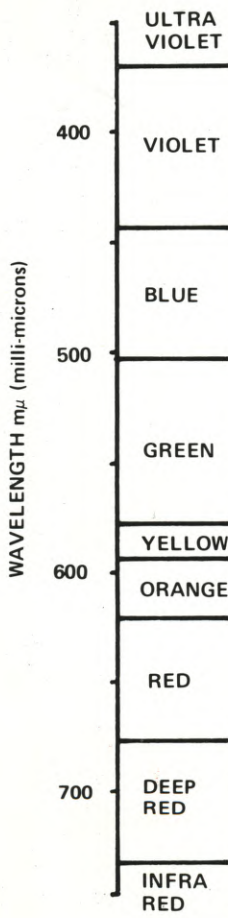


FIGURE 2

\*Degrees Kelvin or Absolute Temperature. Equal to Centigrade plus 273°

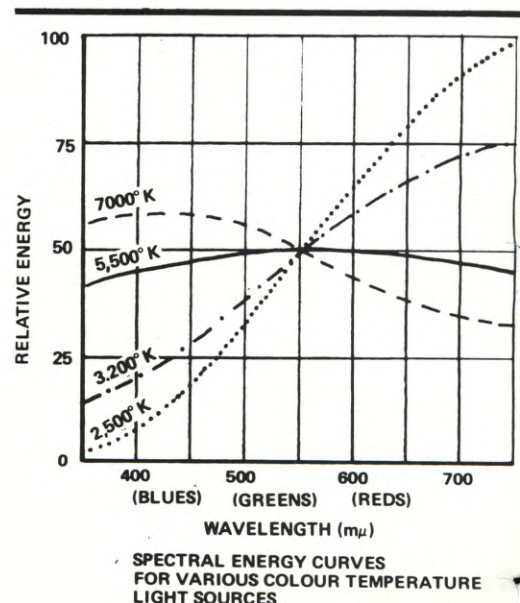


FIGURE 3



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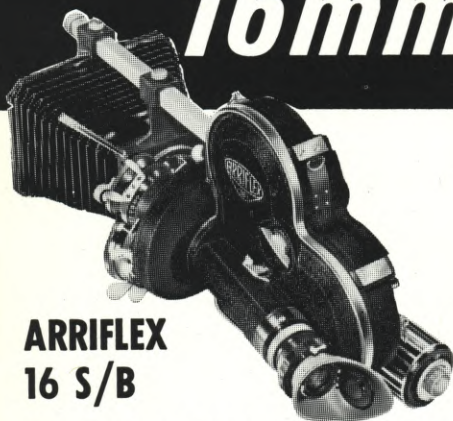
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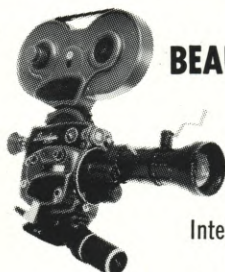
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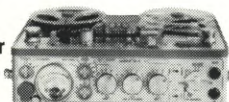
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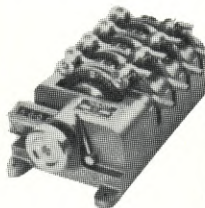
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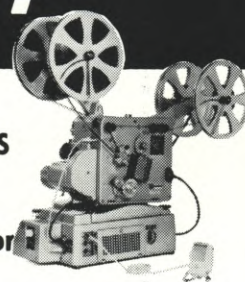
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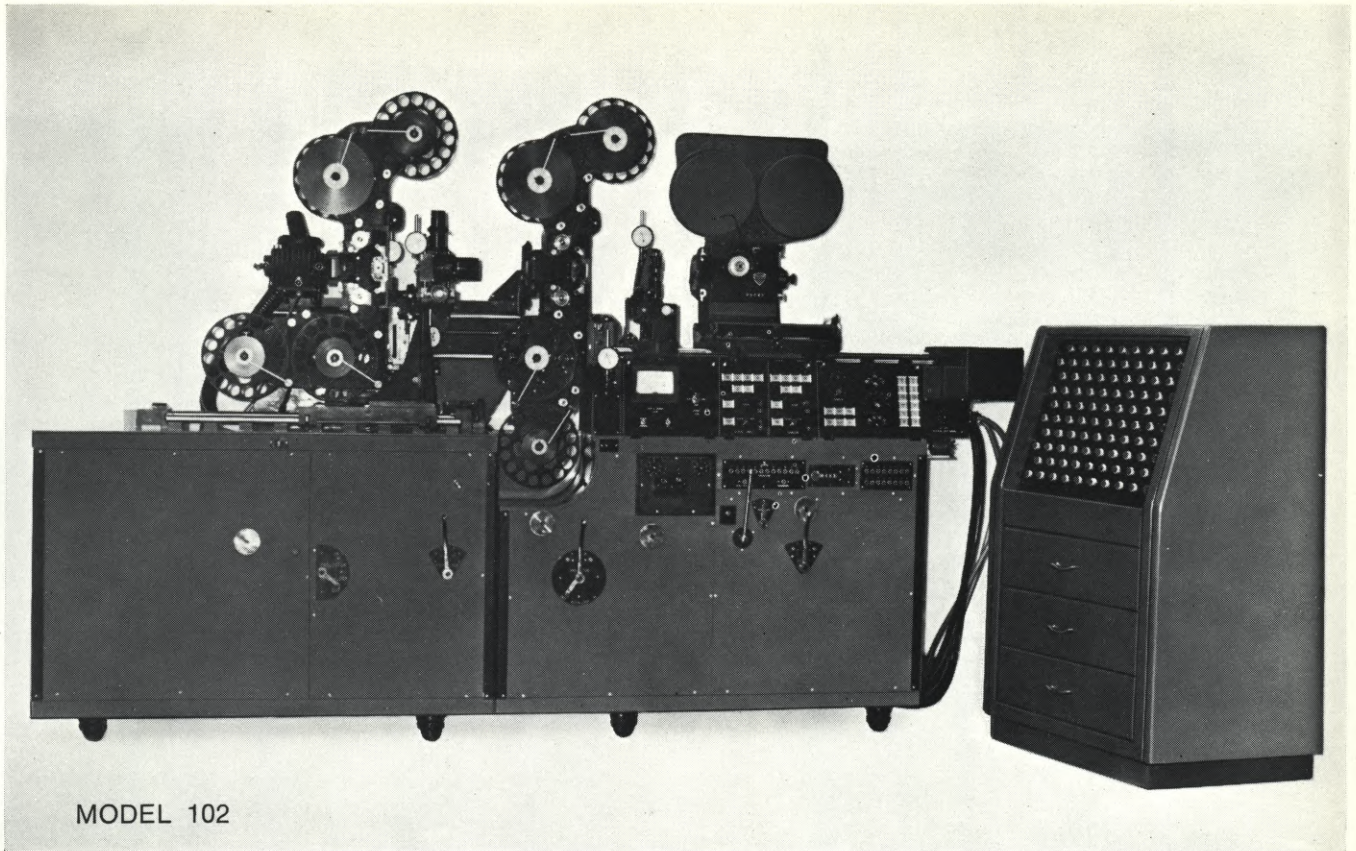
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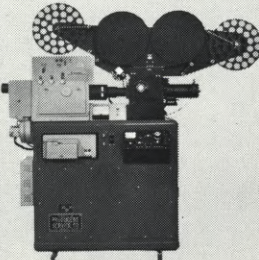
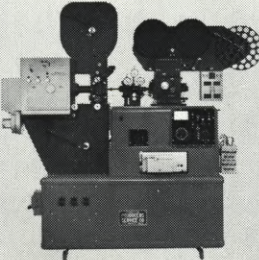
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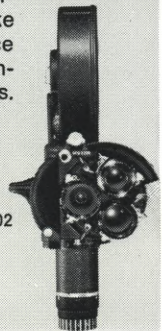
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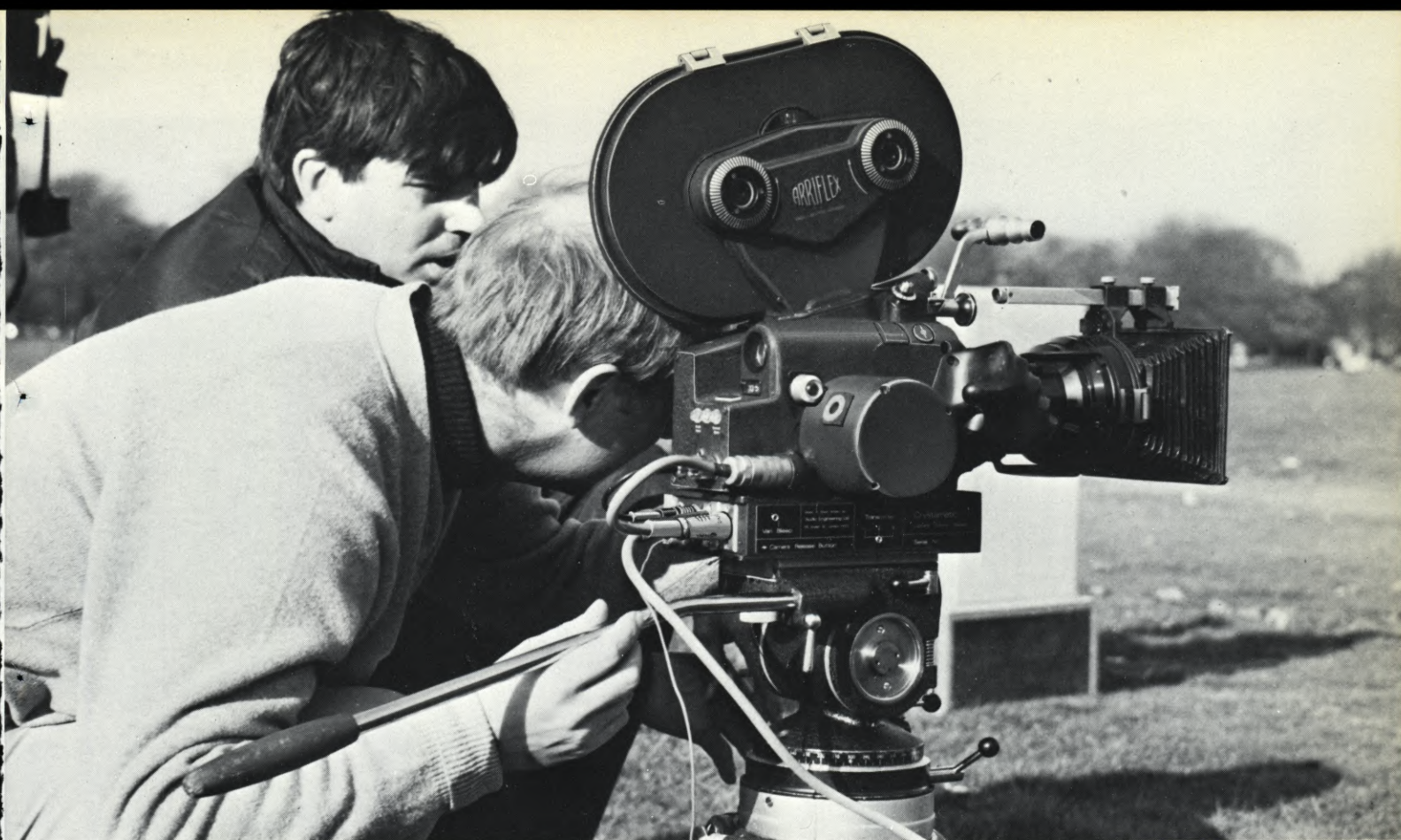
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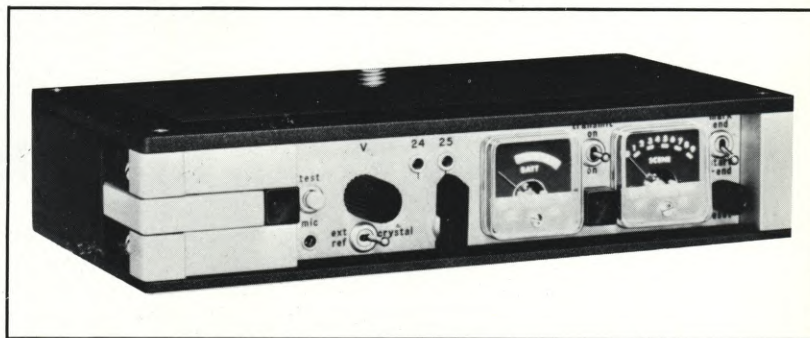
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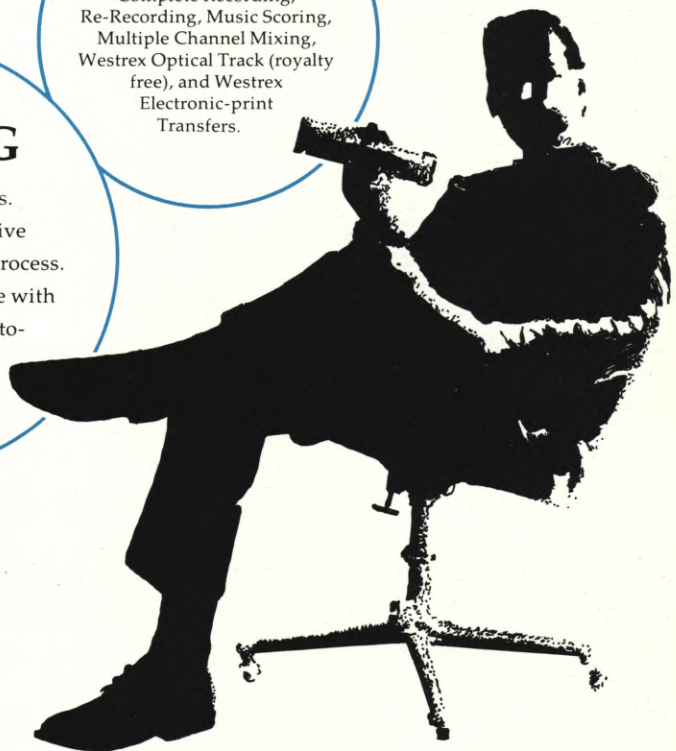
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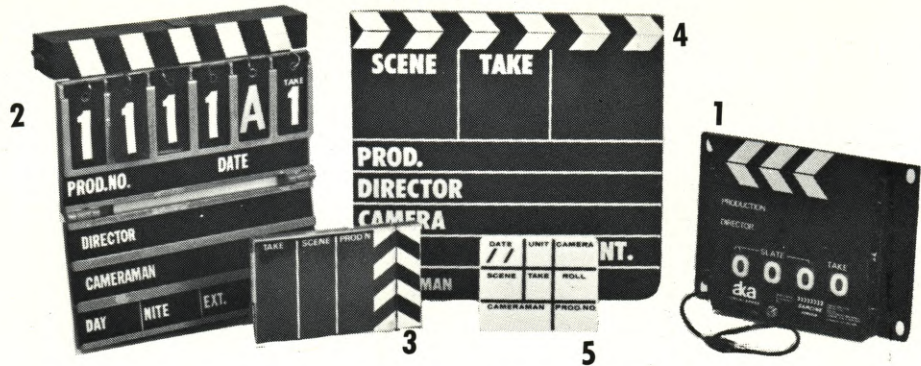


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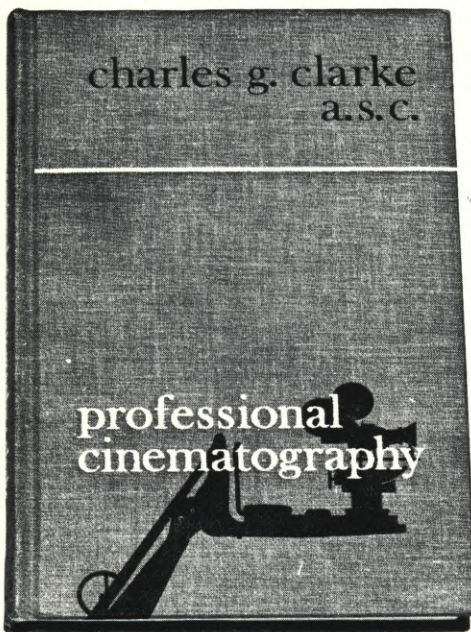
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ABOUT THE AUTHOR: Charles G. Clarke, ASC, a top Director of Photography at 20th Century-Fox for many years, and an ASC member, taught Advanced Cinematography at the University of California at Los Angeles, where he recognized a need for practical professional 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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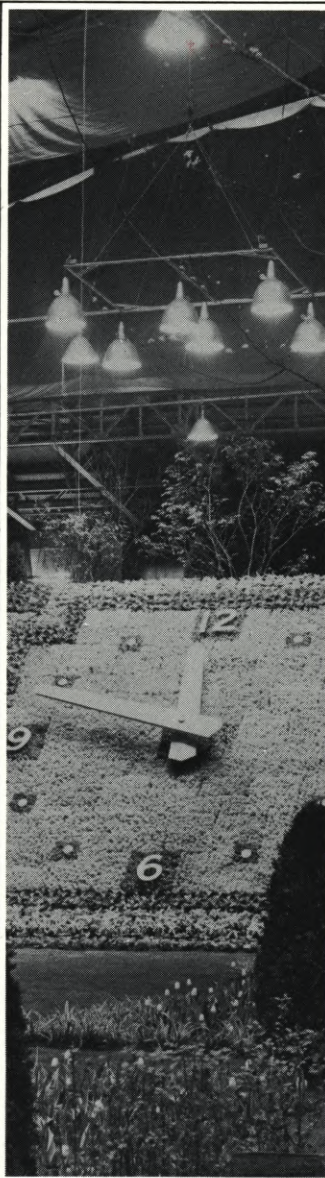
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# the film happening at "woodstock"

Dedicated camera crews endure three days of 'round-the-clock rock, mud and wall-to-wall people to film a stunning *cinema verité* documentary

By HERB A. LIGHTMAN

There will be those, I am sure, who will feel that the wild color graphics featured in this issue of *American Cinematographer* are a bit too far-out for a technical journal.

Everything else aside, I cannot accept the premise that simply because a publication is technical in content, it must necessarily be dull in its design—especially when the journal in question is one devoted to something as visually exciting as the motion picture medium.

But if it turns out that these worthies are right and that we have, indeed, gone too far this time, then I must personally accept full blame.

It was not my intention to indulge "Art for Art's sake" in conceiving these graphics, nor merely to put to use my 38 college credits in Design. Rather, it was my intent to try to capture in graphic form some hint of the visual excitement that pervades the motion picture called "WOODSTOCK".

When I first explained to our offset camera expert, Milt Darnell, what it was that I had in mind, he told me, quite frankly, that my ideas "frightened" him. But since he has worked in close collabora-

Continued on Page 970







Wall-to-wall people, variously estimated as numbering between 400,000 and 500,000, constituted the largest crowd ever assembled anywhere to view a public performance. Despite several rainstorms and many discomforts, they coexisted for three days and nights without a single hostile incident.

tion with me on this publication for the past two years (which is, in itself, a kind of "baptism of fire") he went ahead with a certain blind faith and applied his considerable technical skill to the execution of my "weird" concepts. Along the way, he pulled off a few accomplish-

Wadleigh readies his Eclair camera for on-stage shooting. Five expert cameramen, using 10-to-1 zoom lenses exclusively, filmed all of the performance action.



ments that were theoretically impossible in terms of the current state of the art.

At any rate, the images now appear in these pages exactly as I conceived them in my myopic mind's eye. The wives, sweethearts, consorts and concubines of some of our staff members have pronounced them "outta sight!" and are making plans to frame some of them.

But even if *they* are right, we shall in a sense, have failed—simply because it is impossible to capture in any *static* medium the specifically fluid stimulus that ebbs and flows throughout the three hours of "WOODSTOCK". The film's stunning effect is the result of camera movement, action of the subjects and the juxtaposition of adjacent images in the course of the editing process—all elements that are unique to the cinematic medium.

Some may ask why we consider "WOODSTOCK" a sufficiently important film to devote a bulk of this issue of *American Cinematographer* to its logistics and techniques.

We might answer, in terms they can surely understand, that "WOODSTOCK" has scored a triumphant international success and is attracting a phenomenal flow of paying customers to the box-office wherever it plays. But then, again, so is "BEYOND THE VALLEY OF THE DOLLS"—easily the worst picture ever made—so that's no valid criterion.

We might point out that it is *the* definitive example of that much misunderstood and misinterpreted *genre* of film-making known as *cinema verité* (for more on that, see Page 992). "WOODSTOCK" dotes on *truth*, which is the *sine qua non* of the form—but not in the literal reportage terms of a newsreel. It differs, also, from the conventional documentary in that it is completely free of off-screen narration, which is usually put in to "cover" what is lacking on the screen, or to tell the audiences how they should be interpreting the images they are seeing (very often reflecting the biases of those who backed the film).

"WOODSTOCK" does indeed make a commentary—in fact, several rather strong ones—but it does so strictly through the selection and arrangement of the scenes that have been included in the final cut, and not by superimposing a narrator's voice (and opinions) over those scenes.

We might also present, as a valid reason for singling out "WOODSTOCK", the argument that it records and preserves for all time an active record of the attitudes and life-style of a certain segment of American youth at a particularly chaotic period in our nation's history and is, therefore, an important sociological document.

All of these lofty reasons are valid enough and might well serve as justifica-



tion for the attention paid this picture. But the real and sole reason why we have seen fit to devote so many pages to "WOODSTOCK" is simply that, from the technical standpoint, it happens to be one helluva fine job of film-making—and *American Cinematographer* is, after all (despite its wild graphics this time) a technical journal devoted to the methods and techniques of the motion picture industry.

First of all, the key figures involved in the production had, through no fault of their own, only three weeks to get it all together—to secure financing, rent equipment, hire personnel, purchase supplies and take care of the thousand-and-one details inherent in such an enormous undertaking.

Secondly, the film was made by a group of highly experienced, extremely talented, thoroughly *professional* young technicians who know their craft—not by a coterie of arty would-be "filmmakers" who try to substitute talk for technical background.

Thirdly, it indulges in none of that phony cop-out to the effect that, in order to be "real", a documentary must be characterized by fuzzy photography, grain like billiard balls, poor exposure, hand-held scenes that look as if they were filmed from a pogo-stick, miserable sound, and spastic editing.

Even though "WOODSTOCK" was filmed under the worst possible weather conditions, its photography (more than 80% hand-held) is sharp and clear, rock-steady, precisely framed and exposed, and refreshingly free of self-conscious mannerisms. Its intricately-recorded stereophonic sound track, despite the necessity of recording under far less than ideal circumstances, is magnificent in clarity and quality.

This overall perfectionism extended through months of around-the-clock post-production devoted to precise and imaginative editing, the creation of superlatively well-executed multiple-image opticals, and the building of crystal-clear, aesthetically powerful 4-channel stereophonic sound tracks in the re-recording studios.

After the 120 hours of film had been processed, scores of willing workers labored for weeks on 24-hour triple shifts just to get it all into sync. After that had been accomplished, 30 key technicians were moved out to Hollywood and lodged in three rented houses, so that they could continue working on the more precise operations of post-production—the fine-cutting, optical printing, and mixing of the final tracks.

Possibly no film in history was subjected to more devoted manicuring and

polishing in order to bring it to the highest peak of perfection for release. And yet, the ecstatic critics, lauding the film in many languages around the world, have almost unanimously singled out the wonderful "spontaneity" of "WOODSTOCK" as being its most powerful element of impact. That is, indeed, a compliment.

In order to understand how this film came to be made at all—and why it is as good as it is—one must focus in on a single individual: Michael Wadleigh.

I first met Wadleigh two years ago at the *Photokina* in Cologne. I had been busily bird-dogging some *fraulein* down an aisle of the exhibition hall, when J.P. Carson, of the Eclair Corporation, grabbed me by the forelock and dragged me toward his booth. He had corralled over there, he kept telling me, a brilliant young cameraman-director whom I simply *had* to meet, a bloke who had just come back from having hiked 300 miles and climbed a 21,000-foot mountain in the Hindu Kush (wherever that was), and who had, moreover, filmed the whole glorious adventure in sync-sound, using (strictly by coincidence, of course) an Eclair camera.

"Why did he climb it?" I asked.

"Because it was there," said "J.P."

The brilliant young cameraman-director, of course, turned out to be Michael Wadleigh. He was 26 years old, quiet, intense and, garbed in his faded blue jeans, completely natural. I liked the way he hung loose in the midst of all those uptight types in their correct business suits.

We talked for roughly an hour about his recent filming excursion to the summit of the 21,000-foot peak (which



"T" Schoonmaker checks out a shipment of developed film. An elaborate logging system, worked out with Wadleigh, kept accurate track of the 120 hours of film exposed.

turned out to be in Afghanistan). He still seemed a bit weary from the experience, but enthused about the footage he had managed to shoot under some incredibly harsh conditions.

I told him I was sure the readers of *American Cinematographer* would be interested in knowing more about the technical challenges of that unusual assignment and how he had managed to meet them. He promised to write us an article on the subject, and eventually did. It appeared in the June, 1969 issue

Continued on Page 1011

Producer Bob Maurice and Director Michael Wadleigh, hard at work on pre-planning for the highly complex filming of "WOODSTOCK". Wadleigh wears his favorite head-gear, a 10-inch-high Navajo hat. Maurice coped with the enormous fiscal and logistical problems attendant to the production.





THE "TAKE ONE" CHALLENGE OF FILMING

"woodstock"

"woodstock"

"woodstock"

By MICHAEL WADLEIGH

These days people often ask how it came about that I happened to make a full-length *cinema verité* documentary about the Woodstock Music Festival. In other words, they want to know what were the professional steps that led up to this final product—the three hours of film known as "WOODSTOCK".

Actually, my background is pretty simple. When I got out of college—which was about four and a half years ago—I went to work almost directly for National Educational Television, the big organization in New York that supplies 140 affiliates.

My partner, John Binder, and I worked as a *cinema verité* team. I





In order to shoot some of the most striking scenes in the film, Wadleigh used a 5.9mm ultra-wide-angle lens, which forced him to work very close to the performers. Here he is shown filming literally only inches away from Bob "Bear" Hite, of the "Canned Heat" group.

functioned as cameraman-director, and he operated sound and shared the direction. For the better part of these last four and a half years we've been making films for "NET Journal" and "At Issue", which are their two hour-long film surveys. We went all over the country, shooting films, mostly at colleges like Berkeley and Columbia, in the ghettos of Watts and Harlem, and so on.

During this period there was another type of film production that, somehow, I got into quite accidentally and which, as it later turned out, added up to some good basic training for "WOOD-

STOCK". We started making musical films for television—small "specials" for Westinghouse and Metromedia, which featured such artists as James Brown, Joan Baez and Aretha Franklin. The special characteristic of these films is that we shot them all on location.

I had never liked the "studio" kind of TV musical program—the kind that's shot on a stage with the performer standing on a piece of transparent plastic against a bunch of things floating in the air. The artist is all made up and corseted into a sequined dress and it takes 500 hours to light her and work

The only stage lighting available to the cameramen for night shooting came from arcs on towers 200 feet away. Drops in line voltage, plus short-circuits caused by three rainstorms plagued the camera crews and added seriously to their exposure problems.



up the camera angles. Then they rehearse and rehearse until what you finally get is a dull, plastic performance—almost a play-back kind of thing.

The musical specials we shot were completely different from that. For example, we filmed Aretha Franklin, the First Lady of Soul, at a concert in Providence, Rhode Island, in front of 10,000 black people who were there simply because they loved to see her. She wore no girdle, no wig and very little makeup. She was just up there letting it all hang out.

We didn't tell her to do a thing. We just took along four cameras and hooked them up and shot the performance. She was incredible. You could watch the whole thing developing. The cameramen got turned on, the audience got turned on and it was all very emotional. Since we didn't have to stage it or light it or anything, we could put all our emphasis on her performance and the audience reaction. She ended up crying at the piano and the audience was crying too. It was incredibly moving.

What we learned from filming those musical specials was that you've got to shoot them without telling anybody anything. You've got to get rid of the light show and all those cute props, and you can't say: "Uh, wait just a minute . . . could you do that again?" It just won't work. In other words, you've got to shoot it as you would shoot a first-class *cinema verité* documentary.

Of course, I shot too much footage in filming those musicals. I usually do that because I love to shoot—but also because I don't think you can compromise on that. The first place where you can't compromise is in how much you pay your cameraman, because if you don't get good cameramen you're wiped out. The second place is in how much footage you shoot.

### Getting It All Together

During the six months prior to the Woodstock Music Festival, there had been suggestions that we make a film of it. Discussions were held with the Woodstock promoters and some preliminary proposals were made, but there was nothing definite. This entire phase was handled by Bob Maurice, with whom I had been working for some time, and who became Producer of "WOODSTOCK" when the project was finally solidified.

In the meantime, I took off for Wyoming to make a mountain-climbing film, an NBC special called "30 DAYS TO SURVIVAL". I came back down from the mountain and returned to New

York in July, literally just three weeks before the Woodstock Festival was scheduled to happen. It was only then that negotiations reached a point where it was definite that we would make the film.

This meant shifting into instant high gear, because there was a tremendous amount of preliminary work to be done and very little time left in which to do it.

Dale Bell, an Associate Producer for NET, was appointed Associate Producer for our film and he handled the logistical end of the production—getting the crews together, ordering supplies, etc. Bob Maurice maintained constant contact with the Woodstock people and, later, with the Warner Bros. representatives.

### EF or ECO?—That Is the Question

When we were getting our supplies and equipment together for the Woodstock filming, we were well aware that, because of the almost around-the-clock nature of the festival, there would be a considerable amount of night shooting and that we would have to make do with whatever lighting had been installed to illuminate the performers for the benefit of the audience. In other words, we wouldn't be able to set up any of our own auxiliary lighting just for the photography.

With this in mind, and to be on the safe side, we took along a quantity of EF (7242) film stock, together with the huge amount of ECO (7255) which we had ordered.

When it came to the actual shooting, however, we ended up by shooting only one of the musical groups (*The Who*) with the EF emulsion. All the rest of the night sequences were filmed with the ECO, pushed two stops in development (to ASA 100) by the Eastman Laboratories in New Jersey.

Even though we could have gotten a bit more speed (ASA 125) out of the EF emulsion, there were a couple of very good reasons why we stuck to the ECO.

First of all, we made some tests beforehand and discovered that when you blow EF up to 35mm, as we were planning to do, the blacks tend to go greenish. Since we were going to be shooting so much at night, with no light show background or anything, we knew we were going to have a lot of black—and I don't happen to like the look of it with a green tint.

Another thing we discovered is that even when the ECO is pushed two full stops in development, the grain doesn't



Wadleigh revues production plans with his two key assistants, Martin Scorsese and Thelma Schoonmaker, both of whom functioned in dual capacities as Assistant Directors and Supervising Editors. The ever-popular W.C. Fields adds his dry comment from the background.

break up. It doesn't really become more noticeable at all.

These were the factors that convinced us to stay with the ECO whenever possible.

My objective was to hire the very best cameramen/directors that I could, give them a nice free hand, and just coordinate the whole thing. We hired people who are expert at hand-held filming—big, solid guys who can really hold a camera steady. I'm not one of those people who believe everything should be hand-held—that's nonsense. But in a concert situation, with all that rock movement going on and the amount of shooting that has to be done right in the midst of crowds, you can't very well set up a tripod. You find that you're always in the wrong place, or someone gets in front of the camera, or trips over the tripod. You're left with no choice but to hand-hold most of it—and that's what we did.

As soon as we got the "go" signal, three weeks before the start of the festival, we sent two crews up to the area to start filming immediately. They shot all of the pastoral scenes and shots of the building of the stage, as well as scenes of the in-gathering of the crowd, as people began to move into the area.

We had decided in advance that approximately half of the film would be devoted to musical numbers and half to documentary coverage of the people at the festival, the human element that was such an important part of a happening

like this. The ten camera crews were divided up and assigned accordingly. During the three and a half days of actual performing, I was constantly on the stage with four other cameramen, shooting the musical numbers in sync-sound.

The five of us used Eclair cameras

Bettina Kugel Hirsch performs a cutting stint at console of one of several Amandus Keller editing machines, which proved most valuable in getting it all together.





exclusively and they were all equipped with Angenieux 9.5mm-to-95mm zoom lenses. We used no prime lenses at all—only the zooms. The only exception to that was the super-wide-angle Angenieux 5.9mm, F/2 lens that I would use at times to shoot a specific group or get an unusual effect. In order to get a close shot with this lens I had to literally get within two inches of the performers' hands and faces. I was the only cameraman who got that close to them onstage in order to really get involved with their music and with them as people.

That 5.9mm lens is fantastic. I used it for the shots of Richie Havens where you see closeups of his foot banging and the way he frets with his thumb. It was used to shoot several other groups, including Sly and the Family Stone.

Working in that close to the performer wasn't easy and sometimes it got pretty comical. For example, I had a camera cable running from my camera, and every one of the musicians was plugged into something. They had cables coming off of them all over the place and I found that I had to dance

my way through these cables to get my shots. Occasionally we'd end up a number where the electric guitars and myself were completely entangled with each other, and I'd spend the interim break trying to unwind and get out.

Each of the cameramen shooting on-stage had assigned to him a person who assisted him in several different ways. That person carried a notebook, pen, fresh magazine and, usually, a stopwatch. His job included keeping the cameraman supplied with loaded magazines, jotting down all the pertinent data about scenes shot, and keeping the cable straight so that the cameraman could move around freely. Occasionally he might also follow focus. Just having that one assistant taking care of those few details made this much easier for the cameramen.

All five cameramen were on headsets and were in communication with what we called our "loading pit", which was an area directly under the stage. We had a huge table down there around which everybody could work, with a lot of changing bags and about 80 Eclair magazines that they kept unloading and re-loading constantly. If the cameramen upstairs needed magazines or anything else, they could communicate directly with the loading pit.

On-stage, together with the cameramen and their assistants, were our two Assistant Directors and Supervising Editors, Martin Scorsese and Thelma Schoonmaker. They were right with the action all the time and were helpful in many ways.

Because rock people like to stand right at the front edge of the stage when they work, we built a shooting platform about four feet lower than they were. It was very narrow—only about two feet wide—but it ran the full length of the stage. It was built specifically so that we could get nice tight front shots without getting in the performer's way or the audience's way.

### The Sound of Music

In order to describe our sound system and the method used for keeping the five on-stage Eclair cameras in sync with the master track, let's start with the basic equipment.

We had brought up two 8-track Scully stereo sound recorders, so that all of the sound directly associated with the performances would be recorded on 8-track. These recorders were set up in a truck behind the stage, with recording engineer Lee Osborne in charge.

Out in the audience on a tiny little platform was the sound mixer, Ed Kramer. He had a pair of binoculars so



that he could check the numbers on the various microphones. He also monitored the P.A. and that sort of thing.

Usually the recording equipment and the P.A. system are separate—and they often have the two microphones taped together. We took charge of the P.A. system and used one set of microphones, with nothing else in the way.

Each of the tracks from the various microphones was laid down separately, unequalized and uncompressed. Six of the tracks were for the music, one was for audience reaction, and the eighth was reserved for the 60-cycle sync-pulse signal generated to synchronize the five on-stage cameras with the recorder.

All of the cameras were operated off line current. We used no crystal-sync at all on stage. The decision to go in this direction was based on all of the multiple-camera jobs that I've done. I'm not a believer in crystal for this kind of shooting situation. When you're shooting 120 hours of footage, you're no longer in the crystal ballpark. There's just too many feet of film involved, too many batteries, too much weight and too much everything else.

The line current was fed to the AC motors on our cameras by means of the tiniest zip cord I've ever seen—one narrow cable with four connectors for each camera.

We used a Nagra recorder for the on-stage shooting to record an extra mono track that was a sort of catch-all for pertinent information. One of our people would talk right over the music, putting down data about what day it was, the time, names of the numbers being played, special lighting information, what numbers of magazines were being used by which cameramen—plus anything else that might be helpful in putting the film together later on. It included a rather muddy version of the music, just for identification.

Sync marking wasn't too big of a problem, since we weren't turning the cameras on and off during musical numbers, but were running them all the way through. However, we did do quite a bit of syncing by setting off a flash unit where all five cameras could see it and use the flash as a sync mark.

#### **Directing—The Hard Way**

Initially we had planned our shooting very neatly according to the order in which the performers were scheduled to appear—but that schedule soon went right out the window. The performers couldn't drive into the area, because nobody could drive anywhere. They had to be flown in by helicopter and they



# "Woodstock"

## THE ACID TEST

With only a few weeks in which to get it done, a mammoth, precisely-organized filming effort was planned and launched

By LARRY JOHNSON

Assistant to the Director/Documentary Soundman

It survived three great rainstorms, tons of mud, 70 hours of almost constant use, 315,000 feet of film, 81 hours of sound recording, 500,000 people, and four beautiful days. It survived contact highs, The Who, blue

and green acid, The Merry Pranksters, Abbie Hoffman, and all the way through Hendrix and Monday. A half-million dollars' worth of equipment that Wadleigh-Maurice Productions brought up survived.

Cameraman Sam Warnow mans an Arriflex S, one of the very few tripod-mounted cameras at Woodstock, mounted high up on a steel tower. With him is comely assistant, who also happens to be his wife, Kathy. Filming of "WOODSTOCK" was very much a "family affair."

Technology is only beginning to realize itself in the design functions of motion picture equipment. Only semi-self-analyzing systems like Kudelski's Nagra recorders are sure technical bets. It is difficult enough having to keep the aesthetics of a project together without having to worry about scratching gates, drifting sync, jamming, mags, and inadequate power supplies. Michael Wadleigh went into Woodstock with the best of crews and the equipment he feels he can trust.

The technical arrangements were made a few days before the festival by Michael and Dale Bell, our Production Exec. They could figure only on what Mike wanted to do and what he would need in order to do it. Any problems would have to be solved by his crew's technical dexterity and inventiveness right at the festival site. Much easier said than done, we found out. By Friday morning you couldn't exactly zip over to Camera Mart for a sync cable.

Supply became an immediate problem. One half of the film we needed was in Chicago on Thursday, the day before the festival was to begin. Detailed plans and supply routes were mapped out only to be ripped up after a series of typical airline blunders. Chicago to JFK to LaGuardia—misrouted to Rochester to Liberty, where Producer Bob Maurice picked it up by helicopter and flew it to the site on Saturday.

At the festival site the order of business was to start shooting the masses of people coming, so documentary crews were assigned. The rule from Michael was: *Shoot what you want, how you want.* In other words, once away from our area behind the stage, documentary crews had to fend for themselves. They had to be self-functioning units able to work self-supplied.

Four sync-sound units and four to

Continued on Page 980









seven roving cameramen were organized. The general system worked out for the *cinema verité* crews was as usual—however, without the direct convenience of a supply car. The only sure method of transportation was by foot, maybe by motorcycle. Each documentary unit would carry: 1 camera, 2 spare magazines, a changing bag, light meters, 10 rolls of 7255, 4 rolls of 7242, a Nagra, an 804 mike, a 404 mike, 15 rolls of 3M 131 ¼" tape, raincoats, a filter, lens tissue, and a repair kit. The cameraman carried his camera, the soundman his recorder, and the assistant all the other gear. Under the heavy shooting situation, they could stay away three or four hours at a time.

Their biggest problems were the rain, mud, and helicopter noise, and then the mounting fatigue. They carried no lights—shooting was done during the daylight hours and by firelight at night. The areas covered were the Hog Farm, John Sinclair Pavilion, the lake, the Performers Pavilion across the road behind the stage, and all roads to the site. A bridge connected the stage with the performers' area and we were able to shoot the performers out of the helicopters to food, drink, etc., and onto the stage.

When a moment of mild security was felt over the documentary systems, the

more difficult Performance section systems were begun. We had located ourselves with a semi van and three tents behind and to the right of the stage. The tents served as offices, inside the van was equipment, and under the van, away from the rain, was the sleeping area.

We had reserved rooms and cabins about three miles away from the site at the famed Silver Spur dude ranch, but once the performance began on Friday there was little chance to make it back there and even less of a chance to get any great amount of sleep. In preparation for fatigue the crew was given Vitamin B shots, supplied by the medical tent.

The stage was still going up on Friday morning and we worked along with it, first building a shooting ramp four feet below the entire 100-foot front of the stage. The electronics were then put in. Martin Andrews, our chief engineer/electrician, wired placement for six cameras on the stage. Fifty feet of power line to drive the AC Eclair motors were taped, along with head-set communication set-up wires. All of this led to a maze of power lines, 4-way plugs, jumper boxes, camera cables, head-set jacks, all made neat with miles of gaffer tape.

For the camera positions, Wadleigh

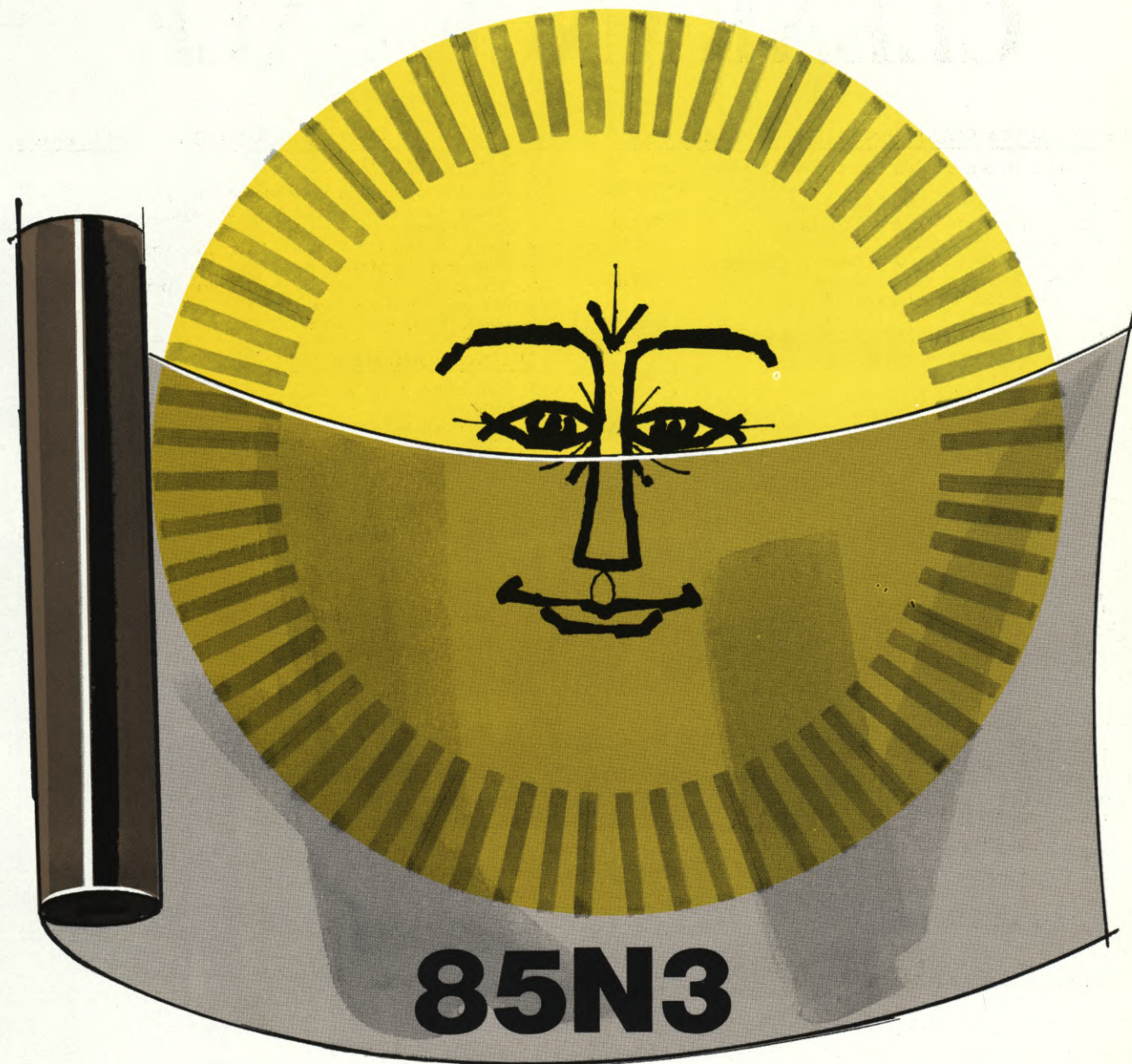
was front and center, with the other five stage front and on-stage left and right—positions filled by cameramen Dick Chew, Ted Churchill, Don Lenzer, Chuck Levy, Ed Lynch, and Dick Pearce. Two hundred yards out in the field, on the lighting scaffolds, we placed several Arri S cameras with long lenses. The power for these units was provided by battery systems. There were roving cameras in the audience and an occasional Arri with the 300mm Kilfit on stage, and we brought it all back home.

Under the center stage front, was a large table used for changing magazines and stashing extra lenses, cold water thermos, light meters, repair kits—in short, the essentials. Four people changed the magazines which were dispatched to both ends of the platform so that each cameraman had two spare magazines at all times. The magazines were carried or tended by the female camera assistants who also tended to the cables and the general health and welfare of their respective cameramen (a perfect job for a chick).

The concert sounds were laid down by Hanley Sound, who brought you the Fillmore East and other power houses. They were responsible for the PA systems (4500 watts of McIntosh

Continued on Page 1005

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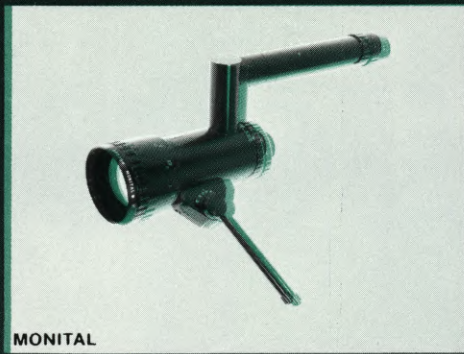
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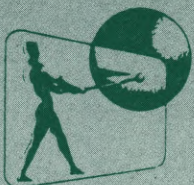


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# GETTING IT ALL TOGETHER FOR "woodstock"

A thousand and one details, meticulously handled before, during and after, account for the general excellence of "WOODSTOCK"

By ERIC BLACKSTEAD

A series of random and strictly coincidental events led up to my functioning as Performance Sound Co-ordinator during the filming of "WOODSTOCK".

A friend of mine had just opened a public relations office in New York and he had some clients connected with the recording industry. Because of my musi-

cal background and some writing I had done, he asked me to help him out for about a month in this area. One of his clients was the ebullient Bob Maurice, later to become Producer of the Woodstock film—but none of us had an inkling of it then.

Through Bob I met Mike Wadleigh

and we had some interesting rap sessions about what could be done with music in relationship to film—which is where my interest in the motion picture medium lies.

We talked about the technological innovations that had come about in the recording of music, primarily due to the



English explosion in the rock and roll field. People like the Beatles and Jimi Hendrix had developed recording techniques that had never been used before, and they certainly hadn't been applied to film. "Panning" sound with a performer is one example of what I mean. Up until "WOODSTOCK", I had never seen a musical film in which, for example, the sound of the bass instrument would follow the bass player as he moved from one side of the screen to the other.

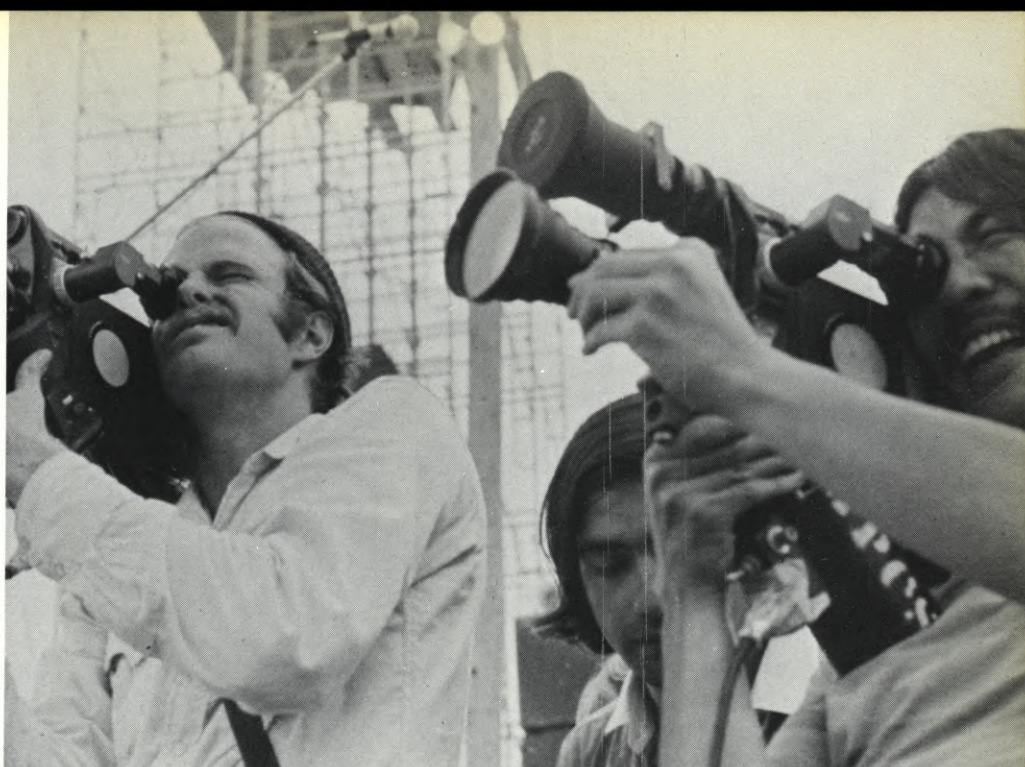
Mike Wadleigh told me about the film he had shot of Aretha Franklin and how he had experimented with a triple-screen effect. I feel that the multiple-image technique has many advantages in filming musical numbers. If you have a multiple perspective you can do things which, as a member of the audience, you could never do. You can get closer to the performer, move around with him and listen to his sounds from several vantage points. I discussed all this with Mike and gave him some of my ideas as to how these effects could be heightened through the use of simple stereo, with special effects added—a sound "zoom", for instance.

We both got so excited about the possibilities that we began to plan a kind of rock revival to be held on-stage at one of the theatres, a re-staging of the Golden Days of rock which would allow us to use some of these unusual sound techniques. We were pretty well into the planning when "WOODSTOCK" came along.

One of the first things I did when I went to work for Mike—actually on a salary-less basis, at that point—was to acquaint some of the people in the music business with the production techniques Mike had honed while making the Aretha film. This was before the film had definitely been assigned and at a time when several production companies were interested in doing it. The Aretha footage convinced a lot of people that, aesthetically, we were the ones to make the picture.

However, the whole thing was up in the air because the Woodstock Ventures people were extremely unrealistic in their demands upon the company that would make the film. They wanted a good deal of front money and a pick-up on some pretty hefty expenses. Also, they had negotiated several rather impossible contracts with the performing artists.

My first job, once we were definitely assigned to make the film, was to get with their attorney and straighten all of those contracts out. Some of the performers wouldn't sign over film rights,



Richard Pearce and David Cheu, two of the ten ace cameramen assigned to photograph "WOODSTOCK", train zoom lenses on the stage action. Though more than 80% of the photography was hand-held, it is rock-steady, with precise camera moves and compositions throughout.

or wouldn't allow us to shoot them at all, or laid down a series of conditions under which it would have been impossible to shoot. This meant that I had to get in touch with all of their managers, one by one, and persuade them to at least allow us to shoot. There were 36 groups involved in the festival and they all finally agreed—except for Richie Havens. Mike had insisted that he wanted Richie to lead off the performance segment of the film, but it wasn't until seven months after we had filmed his performance that we got his permission to include it in the picture.

My first big pre-production chore was to familiarize the cameramen with the groups that would be in the festival, their individual members, a breakdown of their songs, what their instrumentation layout would be on stage, which songs they would do and in what order. In all of this I had the assistance of three of my friends who are musicians and were familiar with the various groups.

Then I sat down with Michael and we selected, for filming, those songs which we felt would give an exciting, yet well-rounded presentation of each group's act. Following that, we drew up a schematic shooting plan for each number. These were based on information brought back by the people working with me. They would attempt to get from each group, or its road manager, a complete breakdown on each number—such data as: "Two verses vocal, guitar solo for two verses, back to vocal for one verse, drum solo . . ." That sort of thing. We would use that information to

design our camera layouts, so that the cameramen would be prepared for what was going to happen on stage. We held meetings with them to decide who was going to handle what, so that we would be assured of complete and proper coverage.

In order to cut down the margin for error even further, we called up all of the record companies, gained their sympathy and persuaded them to furnish us with records of the various groups. By playing these recordings and studying them, we were able to verify where the focal point of the music would be at any given time in a number.

Cameramen tend to be attracted to the most colorful personality in a group and concentrate the bulk of their shooting on that one person. We had to impress upon the cameramen the fact that these groups regard themselves as "families". They recognize no "stars" in their midst—so it would be necessary to give full coverage to all of the members of the group.

While I was in charge of recording at the festival, the actual handling of the equipment was done by Bill Hanley of Boston and his staff engineer, Lee Osborne, who subsequently worked with us all the way through to completion of the film—even to the point of checking the sound at the opening run theatres to see if it could be improved.

We also hired Ed Kramer, a well-known English recording engineer who does very exciting studio work. Poor Ed kept calling me up and asking things like, "Eric, do you have accommoda-

Continued on Page 1008

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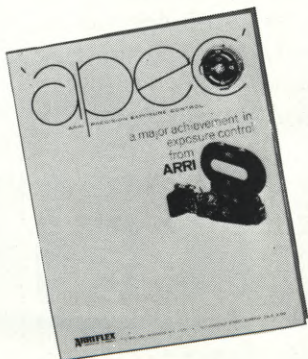
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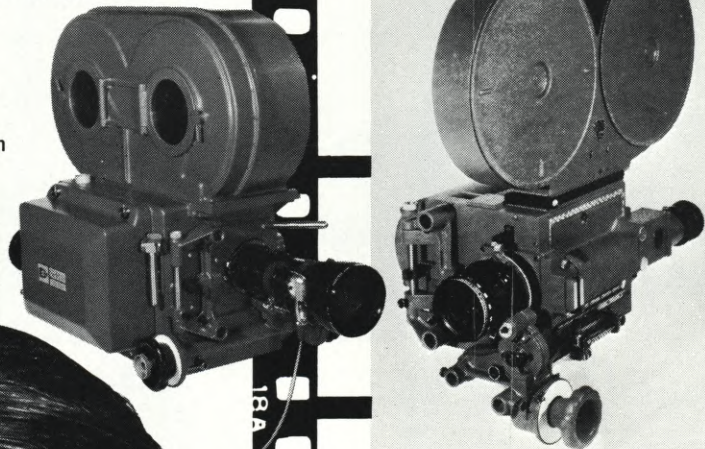
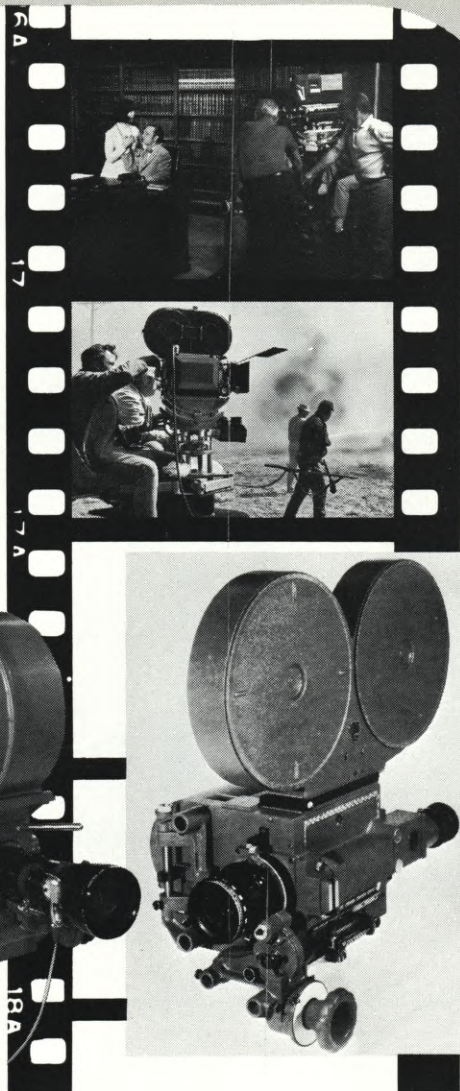
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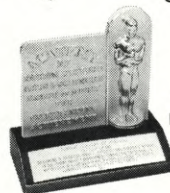
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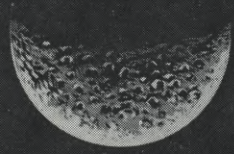
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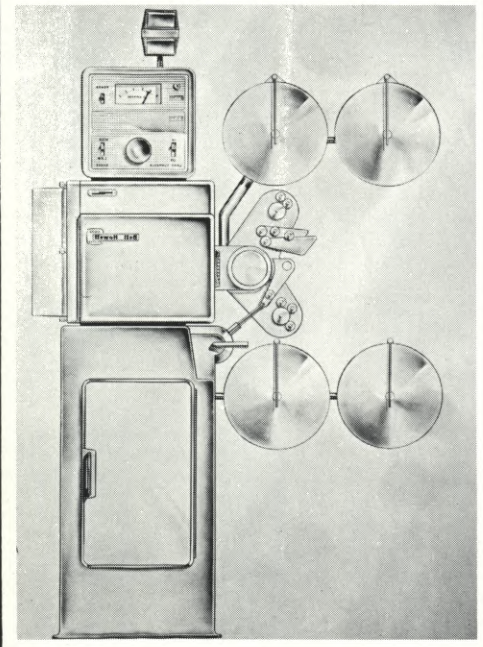
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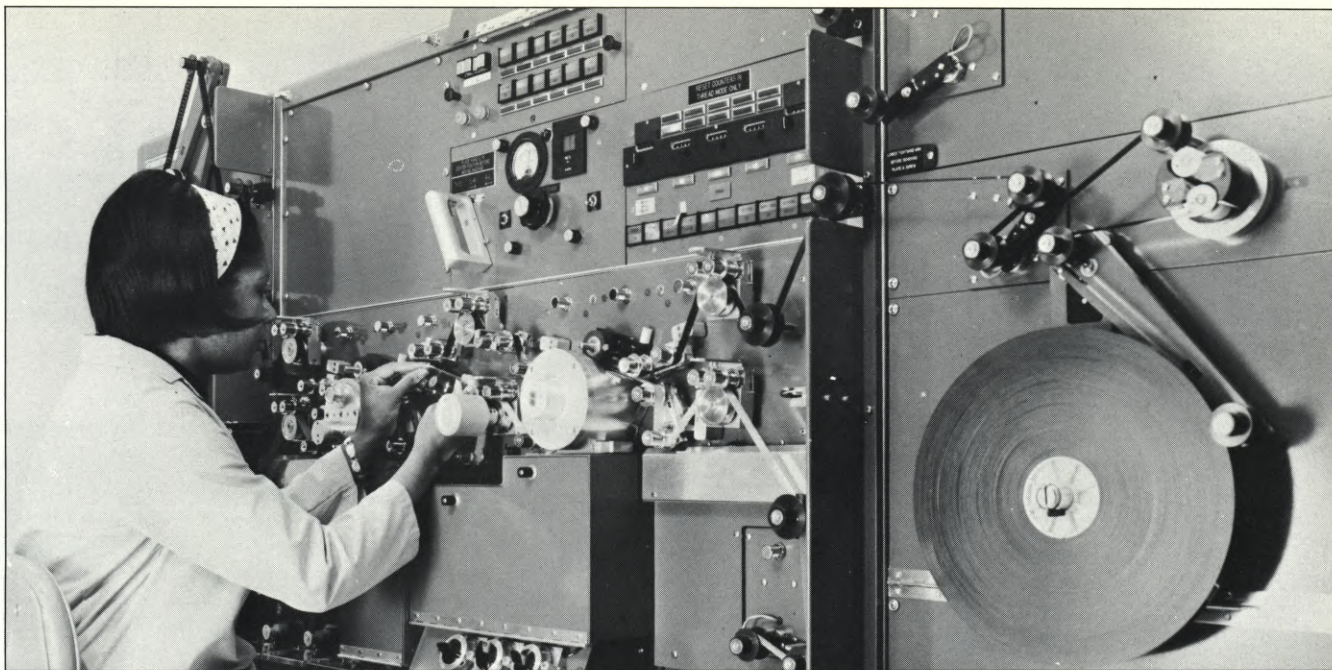
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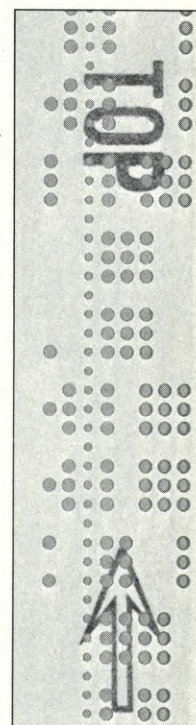
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# CINEMA VERITÉ

## WHAT IT'S ALL ABOUT

A former professor-turned-soundman, who worked with Wadleigh on "WOODSTOCK" and other projects, gives a scholarly analysis of the term that means "truth" in the documentary

By CHARLES GROESBEEK

### Prologue

Traditional credits give a strange impression of the dynamics of film-making. Consider the small team employed on a so-called *CINEMA VERITÉ* assignment. According to the conventional pattern, the first cameraman is respected for his proven standard of excellence, may have more experience than the others, receives the greater financial remuneration, and usually carries the major responsibility and authority. He concentrates on the primary action and characters.

The sound man is often considered little more than a glorified "grip" and/or the cameraman's alter-ego, running frantically after the umbilical sync-cable.

The second cameraman is there "to do his thing" and bring back material to enhance, explain and intensify the primary subject matter.

Pick-up crews are hired according to this format. And, if knowledge of film making is acquired academically, it generally concurs with the above outline.

The seamy side of the Woodstock scene, with a tender moment transpiring amidst a "disaster area" of mud and litter—all part of the "truth" aspect that establishes *cinema verité* as a special breed of documentary filming. "WOODSTOCK" may be regarded as a definitive example of the technique.

The following will examine and analyze this pattern, concluding that other alternatives have greater efficacy toward superior filming.

First, this author's point of view will be defined; secondly, he will give an exposition of *CINEMA VERITÉ* technique which will speak of its validity as an art form, the creation of an authentic statement about human nature and activity. Thirdly, there will be an inquiry into the role of the team as the conceiver, enabler and builder of the content and form; fourthly, this will be extended into a judgment concerning the potential power of each member to act in corporate directorship. The basic subject for illustration will be action/adventure films.

### I. Author's Point of View

This author, Groesbeek, came to film-making by virtue of being a dropout from a professorship in philosophy and, also, a professional alpinist. He was hired as guide and sound-man to work with Michael Wadleigh on a TV special on mountaineering. Together, they

made the first sync-sound film of a climb to the summit of a major peak more than 21,000 feet high. (See *AMERICAN CINEMATOGRAPHER*, June, 1969.) Groesbeek had done some writing, but his background in film had been limited to that of urban viewer. The polytechnics of film are not his *forte*; people, their psychology, personal philosophies and mythologies, however, are. He sees film not as an excuse for visual artistry alone, but as an opportunity to portray insight into human beings. In this publication it is superfluous to convince the convinced: film is the art form of this age. It is becoming to our age as the novel was to the world of Henry James, or the poetry of our age was to the work of Yeats. Perhaps it can also achieve the rank of essay corresponding to that of Albert Camus.

### II. An Exposition of Technique

What is *CINEMA VERITÉ*? First, it is a hackneyed *cliche* excusing a great deal of adolescent posturing and lack of creative discipline. Nevertheless, it is not an inherently negative term. Second, it refers to a viable heritage conjuring up the monumental power of Robert Flaherty. The logic of the term has become muddled, confusing two directions, Documentary and Reportage.

A documentary approaches its subject matter with a preconceived purpose; i.e., it arranges its material to conform to an *a priori* treatment. In practical terms, one's sense of ethics and values either serves that treatment and the sponsor's wishes, or is discarded. The worst example is propaganda.

Reportage filming, on the other hand, can be epitomized by the work of sensitive, scholarly newsmen. Here morals over-ride aesthetics. They film it straight, as it happens, and claim never to enter into, alter, or in any way attempt to affect the subject matter. Of course, the editing process does involve certain value judgments. There is, however, an effort not to allow the editing to unduly colour the reporting of the original event.

What room has been left for *CINE-*



*MA VERITÉ?* (Would that it were a better term.) One likes to feel he has some relation to, some participation in *truth*. Despite the queasiness of "truths" today there is some comfort in the term, even though only a fool would ever use a capital "T". What has truth become today? A truth is a statement which is coherent to the existing worldview or myth. It needs also to be pragmatically operable, carry some actual efficacy. Further discussion of the philosophic or scientific requirements will not be as meaningful as the statement: *Scientists and philosophers see the achievement of knowledge as an art*. The physicist understands that he and the poet are engaged in like quests. Film-makers share that endeavour.

Hence, *CINEMA VERITÉ* is an approach to film-making which accepts truth as a contribution from creative enterprise; the purpose is communication. The process of this cinematic style is subtle and complex. It is too simplistic to say, merely, that its medium is film and its accoutrements. The subject matter, the characters and action are also the malleable raw material of the art. Film-maker and equipment interact with the subjects and the situation. This is most obvious in the problem of selection, since the total reality can never be recreated. More acutely, the film-maker performs as does the non-directive counselor or psychiatrist in therapy. This is a rigorous requirement for the film-maker; he must be more powerful, deft, and sensitive than the conventional director who deals with professional actors.

In short, this film style is not passive recording, but active *creation*. Situation filming of "non-actors" provides a validity often unavailable, unbelievable, or dishonest in the typical "movie-house-drammer."

(ABOUT THE AUTHOR: Charles Holmes Groesbeek is a professional mountain guide-turned-soundman who accompanied Michael Wadleigh on the Hindu Kush filming expedition which resulted in the *SPORTS ILLUSTRATED*/G.E. television special, "ONCE BEFORE I DIE"—an account of which appeared in the June, 1969 issue of *AMERICAN CINEMATOGRAPHER*. Shortly prior to accepting that assignment, he had resigned a philosophy professorship in order to devote full time to mountain-guiding, writing and filming. His recent film projects have included "30 DAYS TO SURVIVAL", a *LIFE/ALCOA* TV special, government and promotional films, and "WOODSTOCK". His publication work has encompassed scholarly, philosophical and (most recently) mountaineering articles. He is presently at work on an historical approach to American mountaineering, for J.P. Lippincott & Co. In his film work he is associated alternately with Michael Wadleigh and Summit Films, of Denver.)



The author (left) holds a recording microphone in one hand and a mountaineer's pick in the other, while Michael Wadleigh mans the camera at 21,000 feet, during filming of the spectacular television special, "ONCE BEFORE I DIE". Groesbeek also worked with Wadleigh on "30 DAYS TO SURVIVAL" and "WOODSTOCK".

### III. The Film Team As A Corporate Directorship

The 1930's Documentary style, still evident in industrial films and too often in educational films, is dependent upon mocking-up scenes, handing out speeches and all the other gimmicks which insure the message of the underwriters. *CINEMA VERITÉ* goes at its subject matter with a trust and respect that that person or situation has an inherent validity which can, through the exercise of skill, be captured. The difference is akin to that between rape and seduction!

Let us consider the basic three-man filming team. Imagine them on a hypothetical assignment. Objective: to bring back footage for a film which the treatment has called "EXPLORATION—HORIZONTAL/VERTICAL." The situation is this: a dual-purpose team, four sailors and four alpinists, set off on a 75-foot yawl to sail to a remote island (the Horizontal). Once there, they climb virgin peaks (the Vertical). Backers of the film have an interest in ecology and conservation. They want a "message" for the polluted megalopolae. Secondarily, it is to be an adventure story about two so-called "ultimate" sports.

Prior to leaving, the backers came up with the idea that a proven director should accompany the expedition. The film crew objected, insisting they were professionals at their business; once the last line was cast off they would become part of the full team: sailors, climbers, and film men. The best film would come from them experiencing as sailor and climbers, just as the others would,

in part, experience filming. The relationships would be tough enough to handle without adding an overseeing director or "boss" for the film crew. More was said; it remained unresolved: the boat sailed.

Although the members of the film team had never worked together before they had confidence in their mutual competence. This was gained partially through their reputations; more realistically it resulted from their having sailed and climbed together (picking up skills they lacked) in preparation for the expedition.

During filming of "WOODSTOCK", Wadleigh often became so absorbed in capturing the "truth" of a performance that he ended up entangled in amplifier cords.



As they lived together, how to do the film became the topic of conversation. They learned to know they were, indeed, three sets of senses and intellects sharpened and oriented to what film can do. Lines of communication were established. They were in it together. The only reasonable solution to direction lay in each of them keeping notes—mentally, written or on tape—to be reviewed each night in preparation for the next day. Direction and management responsibilities flowed into place, more or less by the law of comparative advantage. The second Cameraman was ecstatic about doing visual essays and was a great Mr. Fix-it. The Soundman reveled in plot-building and didn't mind handling logistics. The first Cameraman really dug nature, was the quintessence of visual orientation and picked up accounting details.

What premise governed the creation of the film? All of their *CINEMA VERITÉ* background. The film team knew that in spite of the treatment which said much about conservation in nature, the natural world was only valuable because men valued it. Therefore, the best way to fulfill the sponsor's wishes was to make a film about men who express and demonstrate genuine appreciation of nature and who, quite incidentally, do exciting things like climbing and ocean sailing.

They were confident that their subjects, the dual crew, would provide a full spectrum of reaction to environment and events. They also realized, not without a little anxiety, that some things occur only once with authenticity; equipment must be ever-ready. More than that, they had to be aware, to *anticipate* developments and catch them from the beginning. If a sail tears loose, it is too late once it's in the water; nor can you ever recreate an accident in the mountains.

The film team knows what they want. Early in the sail or land travel they collect a reservoir of establishing shots, cutaways, action scenes. A record of the expedition is compiled. Wild life

and natural forces are photographed as they occur. The human plot of life together is recorded. All this is in preparation for some event of sufficient strength to make the climax: a crippling storm at sea, failure or success on a peak, encounter with natives, intimacy between man and nature—whatever.

Having experienced some success with this kind of film, this author is inclined to say it can *only* be accomplished by a basic film team that lives with the film subjects, does what they do, shares their anxieties and satisfactions, and carries absolute responsibility for direction. If that seems too strong a statement, consider this: if the basic team of three did have a fourth to whom they must look for direction, there is an inclination to establish a schedule; now we are working, now we aren't. An established pattern of being directed may leave responsibility to that fourth person. If "direction" is his only justification for being there he may do his best to help this process along. Situation filming does not permit the luxury of a non-shooting director. For instance, if a frayed line starts to unravel resulting in a broken boom or mast, a delay for the director's decision may mean that the action is lost to the film.

Relate that incident to filming as creation through manipulation of subject matter. Suppose camera and sound men (they should never be parted) are sitting on deck with their equipment. Back and forth, back and forth, a line starts to disintegrate. Film it: good detail shot. Then it becomes apparent it is going to let go. A decision must be made: give the alarm or wait till the crew on Watch discovers it? Tough one! Either way, they are there to film and affect the real circumstances.

Or, an argument arises whether to climb this or that peak, they are there to affect the decision or to incite a show-down between two antagonists. Communication with a director is impossible when you're in that tight; equipment is rolling (there is all that to

worry about) and you are influencing the scene by presence, words or something.

Or, high on a mountain the first assault team is being filmed and it is coming off to nothing worthwhile. So, by adroit group-work that ascent is scuttled. Bivouac on the peak. And the next day the full climbing team comes up and does the peak. Everything is just great. Situation filming of extreme action/adventure subject matter requires that the responsibility for direction come from the basic team involved in the activity being filmed.

#### IV. Individual Responsibility For Direction

How is the dilemma of all chiefs and no Indians overcome? First, there is the common dedication to the film itself. Second, each man has a specific job more or less dictated by the piece of equipment he carries. Third, there is the law of comparative advantage. Fourth, someone usually carries a greater weight of responsibility due to it being his company that hired the others, initial contact with backers, conception of the idea, etc. Something establishes a valid distinction of responsibility and authority. It seems little to the point of this article to devote space to the issue of who will be chairman of the corporate directorship. The alternatives are too multifarious: realistically a crew seldom leaves the underwriter's office without the finger being put on one man, "If this fails, it is your fault." Would that success were that simple: it is not.

The opening caricature of the basic unit of three is just that, a queer cartoon. Instead of a prima donna first cameraman being served by a lackey, while being partially dependant upon the caprice of the second camera for useful footage, we find instead three peers of separate, but complementary professions. Two of them, of necessity, act as one, most of the time. The sync team builds the main content. They must be skillful at getting into the

Continued on Page 1033

(LEFT) Groesbeek, a professional mountain guide, also holds a Harvard doctorate in Philosophy. He was taught by Wadleigh to handle the sound equipment for filming of "ONCE BEFORE I DIE" and, in return, taught him the basics of climbing. (CENTER) The climber eyes his goal, the 21,000-foot summit of the mountain. Packs, including filming equipment, averaged 50 to 60 pounds in weight. (RIGHT) Wadleigh reloads his camera, while a mountain goat appraises him with an amorous eye.





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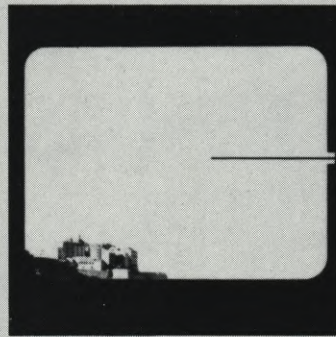
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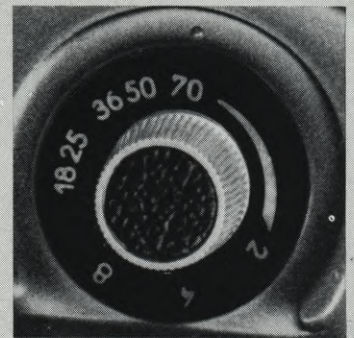
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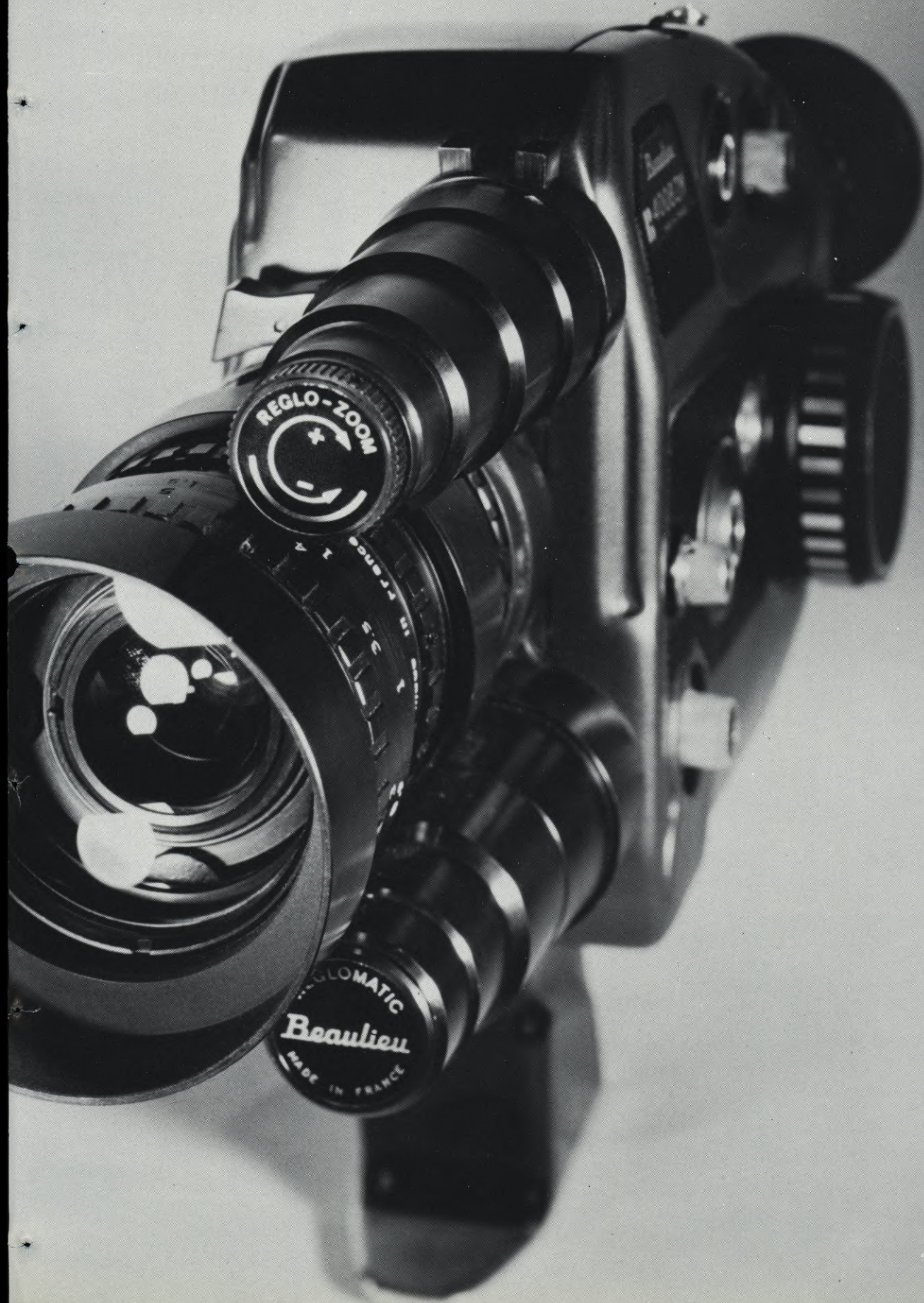
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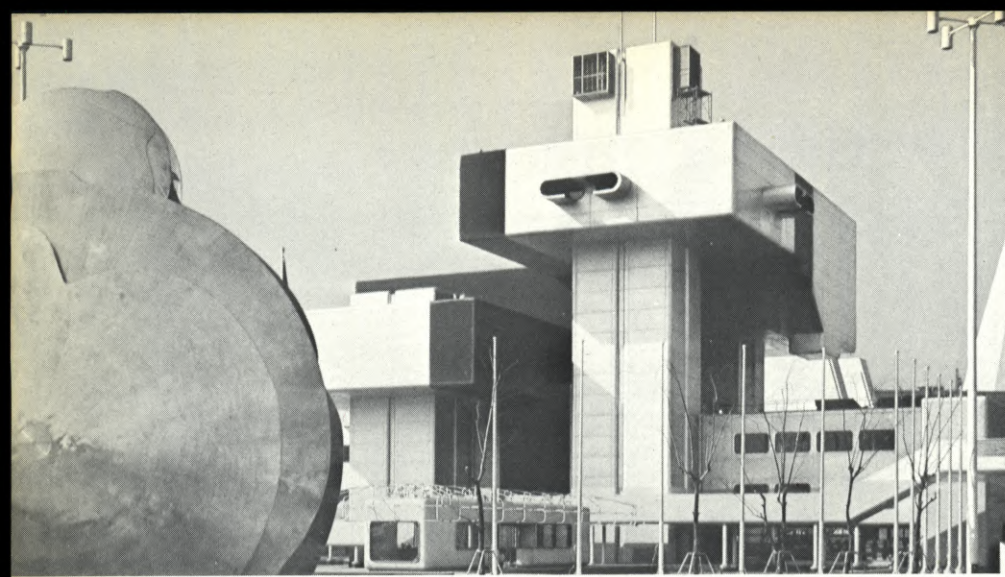
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**A last look back at Japan's wonderful World Fair, in order to pay tribute to a stunning, multi-image film presentation**

# THE NETHERLANDS PAVILION AT EXPO '70

It was inevitable (and unavoidable) that, because of deadlines and space limitations, one or two of the more striking film presentations at EXPO '70 would be omitted from the special (July, 1970) issue of *AMERICAN CINEMATOGRAPHER*, which was devoted to "FILM AT EXPO '70".

A case in point is the Netherlands Pavilion, which prompted French writer Hugues Vehenne to exclaim in *Le Soir* that the Dutch exhibit was "without any doubt, the most beautiful, intelligent, dynamic and open of anything built in Osaka." Commenting on the stunning and complex visual presentation that is an integral and dominant part of the spectacle, he went on to report: "Screens are everywhere—on the walls, on the ceilings . . . Visitors have nothing to do but absorb images of an

incredible beauty and vitality . . ."

His opinion was reinforced by that of several other enthusiastic critics and by the public itself, which flocked to the Netherlands Pavilion in such numbers that it jumped to fourth place on the popularity poll among exhibits within a short time after EXPO opened.

Creator of this multi-vision "happening" on 25 screens was Dutch film producer Jan Vrijman, who learned from Montreal's EXPO '67, HEMIS-FAIR '68 and several other such ventures about the development of the idea of multiple-screen.

In his 1968 proposal to the Dutch governmental EXPO committee, he said: "We will involve the audiences in an atmosphere of images, below them, and around them, through which they will move transported by escalators, in a

space a thousand feet wide and a thousand feet high . . . Twenty five projectors will give, by means of continuous and synchronous projection, in ten minutes, an idea of Dutch traditions, dreams and reality."

When the basic scenario was agreed upon, Vrijman chose two outstanding young Dutchmen, international award-winning film director Frans Weisz and Massimo Götz, the most advanced and able art director in Dutch television, to write and draw up a shooting script. Together they compiled a 100-page book. Each page contained drawings of the fifteen different screens which formed the base of the resultant multi-image system of the Dutch Pavilion.

Bert Van Munster, 28, was chosen as Director of Photography. Van Munster is widely known for his unique style and

(LEFT) Imaginative young Director of Photography, Bert Van Munster, sits behind the central camera of a three-camera configuration used to film some of the most spectacular scenes of the Dutch film presentation. (RIGHT) Three cameras, mounted on a special bracket, rest on a mattress placed in helicopter for filming sweeps over Holland's lovely countryside.



creative achievements in the documentary and commercial film industry.

In shooting the images Vrijman and Weisz followed the film techniques of "cinema verité"; every piece of reality as seen by the camera, was "touched" by the director's hand, whether it be people on the beach or scenes in a nuclear energy station.

A great deal of technical skill was required, during this period on the part of Bert Van Munster and his assistants. He had to know the philosophy and structure of the shooting script and the mechanics of the multiple-image system.

Vrijman and Weisz were not to make the mistake, earlier made by multi-image filmmakers, of obtaining images which in themselves had the right color and the right style, but differed from each other when placed side by side and created a feeling of being formless.



A segment of the Netherlands Pavilion interior, showing a few of the 25 screens utilized to portray, within an interval of 10 minutes, "an idea of Dutch traditions, dreams and reality."

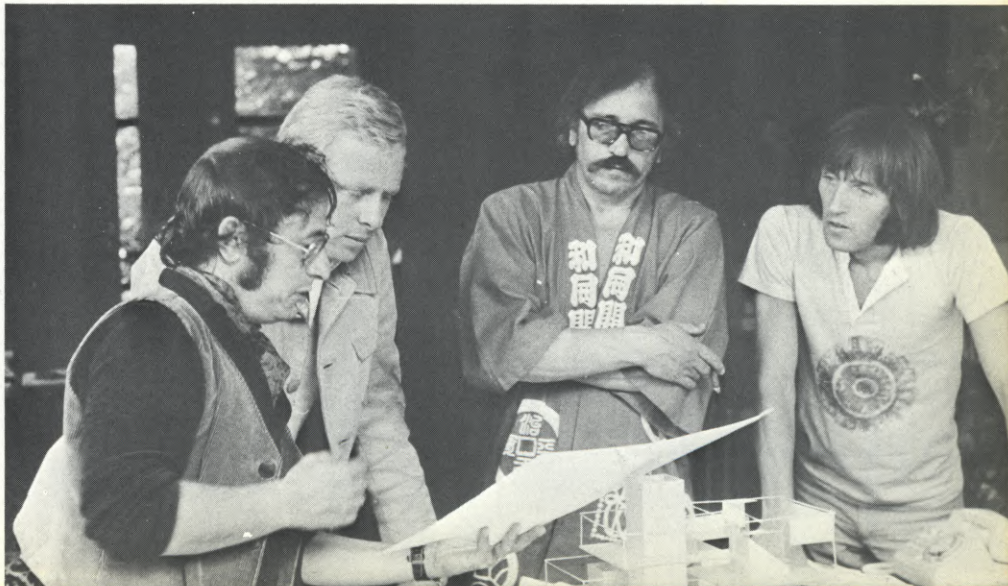
the "CinemaScope" or anamorphic aspect ratio (1:2.35), with the possibility of projecting a combined image, and two screens were designed vertically, which meant that one wide screen and one anamorphic screen were to be placed in the pavilion running lengthwise from top to bottom. In order to photograph scenes for these last two screens, again, a special bracket was developed, which made it possible to turn the camera 90 degrees.

Shooting was done with Arriflex cameras on Eastmancolor negative, the new type 5254, and the processing was done at Technicolor's London laboratory. The Technicolor staff, fascinated by the project, recommended the use of their dye-transfer system which, of all

printing systems, assures the most consistent print quality. For the aspect ratio of 1:2.35, the Techniscope system was used which worked out remarkably well. The shooting of the 4,500 meters of final footage needed (actually 60,000 meters were shot) was planned for 6 months and was completed on schedule. Thanks to the skill and care evidenced by the camera crew and laboratory, there was no negative damage at all.

Editing started while the shooting was still going on. The most intriguing question had to do with whether the film could be edited as was indicated in the shooting script. From the start Vrijman had realized that he would be confronted with quite a different philosophy of editing from that usually

The key technicians responsible for creation of the Dutch multi-image film spectacular at EXPO '70. (Left to right:) Frans Weisz (Director), Bert Van Munster (Director of Photography), Jan Vrijman (Producer), and Paul Roof (Editor).



One of 15 modified FP-20 Phillips projectors with continuous loop system capable of accommodating 1,000 feet of 35mm film.

The producer and director wanted to have the possibility of three synchronized cameras shooting one scene at the same time. A special bracket was developed on which three cameras were lined up and linked together by means of a sync device. Some of the Pavilion screens, of which three had to present a combined image, accommodated an aspect ratio of 1:1.65; three others were wide screens with an aspect ratio of 1:1.85; three screens were designed for



(LEFT) Triple-camera rig on low platform shoots a slate in preparation for filming of a scene, while interested cow looks on. (RIGHT) Editor at work cutting one of the sequences shot with the three-camera configuration. (BELOW) Two views showing areas of the Netherlands Pavilion interior, with multiple slide and motion picture images presented on a variety of screens, including one which accommodates a vertical anamorphic film format. Audience moved leisurely through four stories of exhibits including a total of 25 slide and motion picture screens.

employed in conventional filmmaking, where editing follows a vertical continuity: from scene to scene. In this case the editing should be primarily horizontal, i.e., with a continuity of the images which would be seen side by side.

Vertical continuity could no longer be dealt with in terms of a single reel at a time, but had to be considered as a complex of the fifteen reels, taken as a whole.

Perhaps the most interesting consideration was the discovery that the editing was no longer an arbitrary process that imposed its will upon the spectator. The audience, in actual fact, became the ultimate editor, with viewers making cuts by shifting their eyes from one image to another.

In this sense, the editor of the multiple-screen project became more than ever a "composer" of images, and for this purpose a special editing table, with three Cinette viewers, combined in sync, was built. For the job Vrijman chose a young Dutch editor, Paul



#### THE EXPO '70 NETHERLANDS PAVILION MULTIPLE-SCREEN PRESENTATION

##### CREDITS

Idea, scenario and producer  
General Director  
Contributing Directors

Art Director  
Director of Photography  
Editor  
Composer and musical Supervisor  
Slide Photographer  
Laboratories  
Multi-image film production company

##### TECHNICAL DATA

Shooting  
Negative:  
Cameras:  
Aspect Ratios:

Eastmancolor 5254  
6 Arriflex cameras with Angenieux zoom (10-to-1) lenses  
1:1.65; 1:1.86; 1:2.35; 1.86:1; 2.35:1.

Jan Vrijman  
Frans Weisz  
Anton Kothuys  
Juan Goudsmit  
Massimo Gotz  
Bert van Munster  
Paul Roof  
Louis Andriessen  
Eddy Posthuma de Boer  
Technicolor, London  
CINEPRODUCTIE N.V., Amsterdam.

Roof, who started to cut the film by following the shooting script precisely, only to discover that this didn't work! In a tryout using a series of sync projectors in combination, the results were rather chaotic, the ideas and meanings of the script becoming obscured. Visually it appeared necessary to bring more harmony, order and system to the editing, especially in terms of the rhythm of the scene changes.

In the weeks that followed, and in the course of many try-outs, the definite composition of the film was found. Time was running out, as the opening of EXPO '70 would be on March 14, but fortunately, a year earlier, tight planning had been done with the Techni-

Continued on Page 1022

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<b>CAMERAS:</b> Arriflex, Auricon, Bolex, Eclair, Mitchell, etc.	<b>EDITING FACILITIES:</b> Cutting Rooms, Productions Offices, Music & Effects Libraries, Mobile Cutting Room & Viewing Theatre.
<b>LENSES:</b> Wide Aperture, Wide Angle, Normal, Telephoto and Zoom.	<b>DUBBING:</b> Westrex 16mm. Reversible.
<b>PANAVISION:</b> Anamorphic lenses, 35 and 65mm. cameras, etc.	<b>VIEWING:</b> 16 and 35mm. Single or Double Head.
<b>DOLLIES:</b> Colortran, Elemack & Moviola.	<b>PORTABLE PROJECTION:</b> 16 or 35mm. Single or Double Head.
<b>CRANES:</b> Up to 28ft. lens height.	<b>STILL CAMERAS:</b> Pentax, Polaroid.
<b>TRIPOD HEADS:</b> Cartoni, Miller, Moy, O'Connor, Vinten & Worrall.	<b>CLOSED CIRCUIT T.V.:</b> Plumbicon & Vidicon, T.V. Viewfinders for Film Cameras, VTR.
<b>HELICOPTER MOUNTS:</b> Tyler Major & Mini.	<b>CAMERA CARS:</b> With front, roof & rear platforms, Casper Camera Cars.
<b>LIGHTING EQUIPMENT:</b> Colortran, Lowell, Mole Richardson, Battery portable, etc.	<b>PRODUCTION FACILITIES:</b> Full technical crews as required.
<b>RECORDERS:</b> Nagra, Westrex, etc., mono or stereo.	<b>TECHNICIANS:</b> All grades.
<b>SOUND ACCESSORIES:</b> Fisher Booms, all types of microphones.	<b>FREIGHT AND PASSENGER HANDLING:</b> Our own Offices at London & Amsterdam Airports.
<b>TELECOMMUNICATIONS:</b> Walkie talkies, Transmitter/receivers up to 25 watts output, Loudhailers, etc.	
<b>SOUND TRANSFER:</b> ¼in., 8, 16, 17.5 and 35mm., by Westrex.	
<b>EDITING EQUIPMENT:</b> Moviola & Steenbeck Editing Machines, Joiners, Synchronisers, Moy Numbering Machines, etc.	

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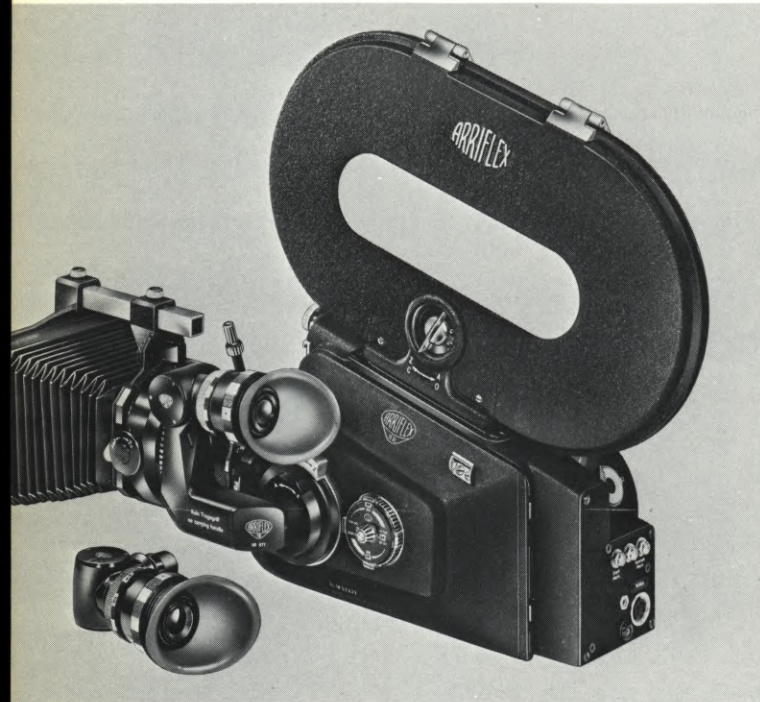
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# THE NEW ARRIFLEX BUILT-IN EXPOSURE CONTROL SYSTEM

A new approach to an old problem—that of extending the positive "eyeball control" concept to include continuous exposure information in the viewfinder



(ABOVE) Arriflex 16BL, shown with built-in Arri Precision Exposure Control. Off-set viewfinder is mounted, with standard viewfinder in foreground. (BELOW) Data on film speed and frame rate are fed into exposure control system through dial on door of camera. System has a range of ASA 16 to 500, and 24 to 50 frames per second.



Whether filming a hard-news story, shooting a documentary about an urgent contemporary problem, or making a feature film, the newsreel/documentary cinematographer must constantly be where the action is, searching and probing for new insights and angles to satisfy his sophisticated and curious audience. This requires a high degree of mobility, versatility and imagination on his part; and as the demands on his creativity increase, so do his demands on the equipment he uses.

In the Motion Picture Industry, throughout its history, technique and technology have alternately been leading and lagging. For instance, in the very early stages of motion pictures, technique was ahead of technology for a considerable time. However, at a later point in history, technology surged ahead, with the introduction of the first mirror-reflex motion picture camera. With it, for the first time, the cameraman had true "eyeball control" in his viewfinder over focus and follow-focus, depth and composition as well as parallax-free critical framing. This picture information, continuously before him, gave him the means of developing more imaginative and more effective motion picture photography.

Industry scientists have been aware of the desire by cameramen to extend this positive "eyeball control" concept to include continuous exposure information in the camera viewfinder. Now, for the first time, this has been accomplished in a strictly professional Motion Picture Camera.

For some time now, built-in light meters with automatic iris controls have been in use in amateur or semi-professional film cameras. These units however, could not meet professional standards. A truly professional exposure control system must be based on design considerations such as the following:

- A. The exposure measurement should be made behind the taking lens, in this way taking into account all exposure-determining factors such as filters, different lens transmission, extension tubes, etc.
- B. The measuring area must be in favorable proportions to the camera aperture. It must be large enough to allow for a meaningful integrated measurement of the important center-area of the frame, yet small enough to preclude vignetting effects when using a large variety of lenses having different focal lengths.
- C. The measurement must be equally accurate under daylight or tungsten illumination.
- D. The Exposure Control System must maintain its accuracy over the full range of varying temperatures normally encountered in cinematographic applications.
- E. The measuring result should be displayed in the camera viewfinder on an expanded scale for highest indicating accuracy.
- F. The measurement must be absolutely constant, whether the camera is running or standing still.



The overall accuracy of the system depends on how well all these individual requirements can be accomplished. Arnold & Richter K.G., of Munich, West Germany, the same company which, decades ago, introduced the first mirror-reflex motion picture camera, has built such an exposure control system into the Arriflex 16BL, a lightweight, silent 16mm Camera.

One of the marked advantages of the Mirror Reflex System is the unobstructed path between taking lens and film emulsion. Beam-splitters, prisms, or other optical devices in this path could scatter light and deteriorate the image quality. To avoid such a compromise with image quality, yet to get a true behind-the-lens measurement, Arri engineers have ingeniously built the entire Exposure Control System into the door of the camera, taking the light to be measured out of the viewfinder path by means of a spectrally selective beam-splitter. This sample of light to be measured, though not great enough to impair the brilliance of the viewfinder, is transmitted to the CdS photo cell through a multi-element relay-lens system dimensioned so that the light falls on the cell in conformity with the relative aperture of the taking lens.

No exposure system can be more accurate than the data fed into it concerning film sensitivity (ASA) and exposure time (camera speed). On conventional exposure meters, these variables are put into the system electronically. With the Arriflex method, the entire, irregular characteristic curve of the CdS photo cell is used for measurements which, even with the most sophisticated electronics, cannot be compensated for.

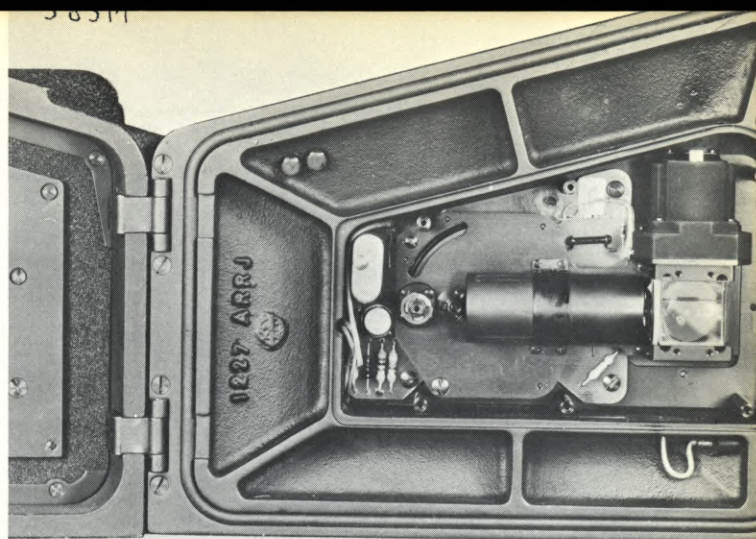
In the Arri Exposure Control System, all of these problems were ingeniously solved with an optical data input for film sensitivity and exposure time in the form of two counter-rotating circular neutral density wedges in front of the photo-cell. By aligning these wedges in accordance with film sensitivity and shutter time, and zeroing the indicator needle with the diaphragm of the lens, a constant illumination level for the photo-cell is obtained and with one ingenious stroke, the need to compensate for complicated photo-cell response characteristics is eliminated. The resulting advantages in terms of accuracy, repeatability and reliability are significant.

The development of these N.D. wedges is truly a story of perseverance and ingenuity. Early experiments showed that photographically manufactured wedges would not render acceptable accuracy. Additionally, their variations, due to aging and ambient changes, made them unsuitable.

Consideration was also given to wedges with graduated surface coatings; i.e., partially reflectant mirrors. This had to be discarded because the reflections would return through the relay lens system and deteriorate the ground glass image.

After many months of agonizing research and experimenting, Mr. Erich Kaestner, Chief Engineer at Arnold & Richter, developed a process by means of which stepless, circular neutral density wedges with almost perfect characteristics can be manufactured. These wedges are produced under aero-space type white-room conditions to assure continuously highest quality results. One of the essentials, which was extremely difficult to achieve, is the absolute neutral gray rendition of these wedges, since even a relatively small deviation from neutrality would result in a significant change of spectral response with increased density. Using a highly constant light source of diffused light, these N.D. wedges are measured and logged individually, corresponding to their entire range of 16 to 500 ASA.

An example of the accuracy of the gray wedges are random tests, conducted by the "West German Institute for

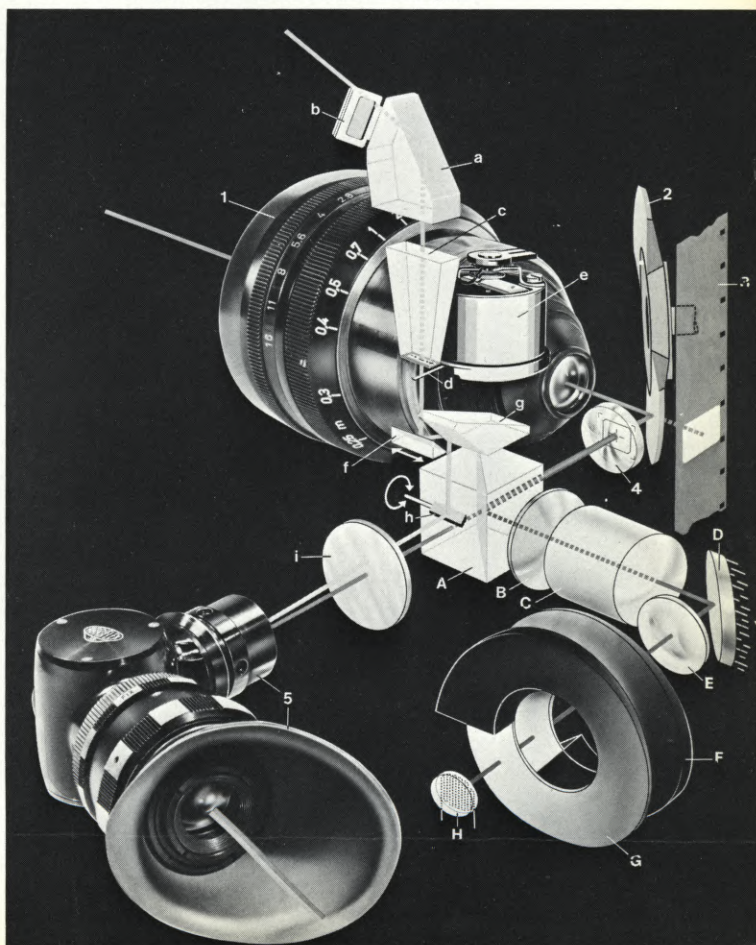


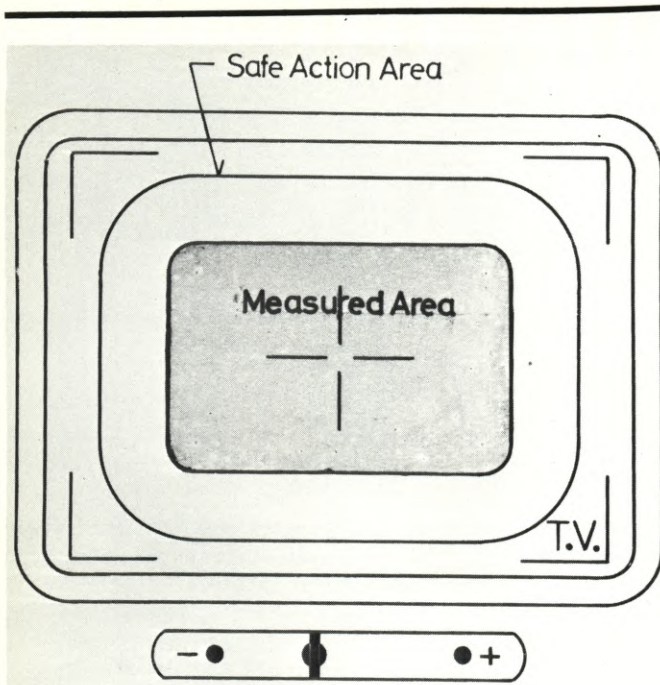
The entire Arriflex Exposure Control System is contained inside the camera door—shown here with protective cover removed.

Radio and Television," measuring the light attenuation right in the camera aperture. Their tests show that if we consider ASA 16 as a calculated value of 100, the actual measured values come out in almost perfect agreement with the calculated values, as shown in the following table. The wedges are by far better than the allowable deviations according to norm.

RATING	MEASURED VALUES	CALCULATED VALUES
13 DIN (16 ASA)	100	100
16 DIN (32 ASA)	49.2	50
19 DIN (64 ASA)	24.8	25
22 DIN (125 ASA)	12.5	12.5
25 DIN (250 ASA)	6.21	6.25
28 DIN (500 ASA)	3.14	3.12

Schematic rendering of the new 16BL Arri Exposure Control system. (1) Taking Lens; (2) Mirror Shutter; (3) Film; (4) Ground Glass; (5) Viewfinder. (A) Prism in viewfinder system; (B-C-E) Lenses in optical relay system; (D) Cold Mirror; (F & G) Circular, Neutral Density Wedges for inputs representing shutter speed and film speed; (H) CdS photoresistor. (a) Prism; (b) Matte with slot for filter; (c) Light Guide with meter scale; (d) Meter Pointer; (e) Galvanometer instrument; (f g & h) Reflecting mirrors; (i) protective cover glass.



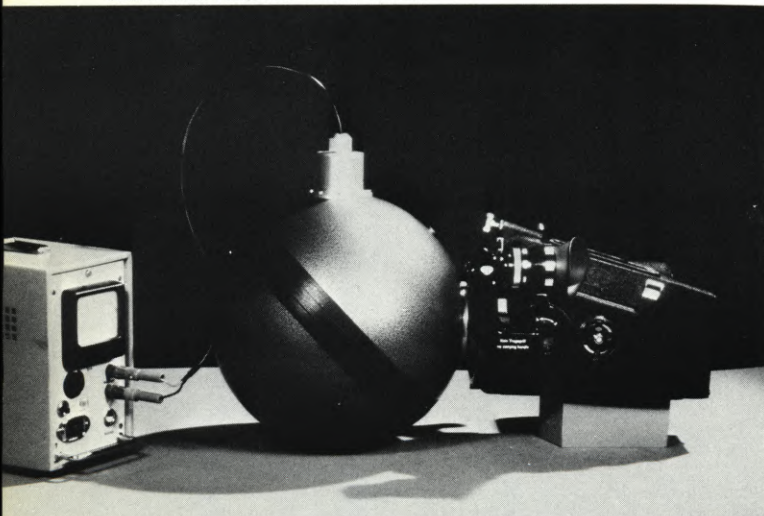


Viewfinder shows usual field, plus exposure information directly under ground-glass. Normally correct exposure is obtained by stopping down to align pointer with large central dot. Marks for one stop under and one stop over are shown to left and right respectively.

The fixed operation point on the cell also facilitates an efficient, straightforward temperature compensation. A CdS photo cell responds quite sensitively to infra-red, the percentage portion of which differs greatly between daylight and tungsten illumination. To insure an accurate measurement, regardless of the light source, all infra-red above 6800 Angstrom is taken out by a specially coated "cold mirror" in the relay lens system. With both ends of the spectrum controlled and using a conversion filter in front of the lens, where appropriate, the light is balanced for the film and matched to the spectral response of the CdS cell in a way that produces correct exposure under either daylight or tungsten illumination.

Considerable research preceded the selection of the area

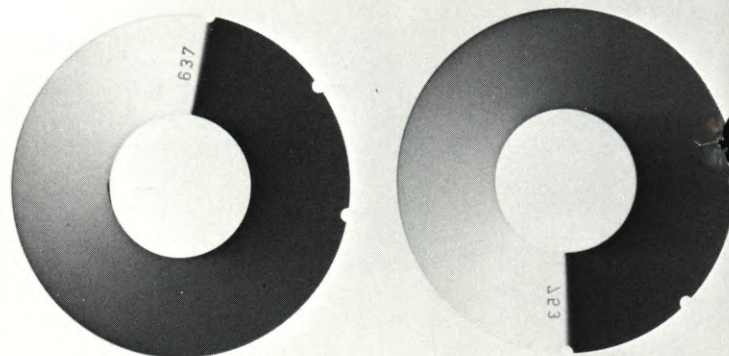
Specially designed test instruments for calibrating and servicing new Arri Exposure Control System include integrating sphere, special light source and stabilizer shown below.



of the frame to be measured by the photo-cell. It was found that a heavily center-weighted area of 6mm x 4mm, or 1/3 of the frame area, would provide a reliable integrated reading of the important center portion without the danger of vignetting errors when using a large variety of different focal-length lenses. Although the Exposure Control gives an integrated reading when using a zoom lens at its long focal-length setting, important object detail or highlights can be measured separately and accurately. For example, at a focal-length setting of 120mm, a spot reading with a horizontal coverage of 3° can be obtained.

The expanded scale of the meter is reflected into the viewfinder area just below the ground glass. The scale is illuminated by means of light from the scene directed through a prism in the camera door. The exposure scale shows normally correct exposure as indicated by a large dot in the center. To the left and right are markings to show one step under normal exposure and one step over, respectively. Correct exposure indication in the viewfinder, together with the other vital picture information on the ground glass, affords the operator "total picture control" at all times.

The amount of electrical power necessary for the operation of the Exposure Control System is very slight and is taken directly from the camera circuit. First stabilized to exclude problems caused by voltage fluctuation, it operates



Circular neutral density wedges used in the APEC system are high-precision products with a closely controlled density gradient, designed and manufactured by Arriflex. One wedge represents inputs for film speed, the other for camera shutter speed.

the standstill/run compensation relay and the wheatstone bridge circuit which contains the indicator meter. As a result, the Exposure Control is operational as soon as the power cable is connected to the camera, with no need for extra batteries or switches.

The Arriflex exposure control system is a sophisticated, new tool for the professional film-maker and its introduction is a significant advancement in motion picture technology.

Arriflex 16BL Cameras with built-in Exposure Control Systems are now available for delivery. Cameras already in the field from serial No. 50701 on can also be fitted with an Arriflex Exposure Control System.

For further information, contact The Arriflex Corporation of America in Woodside, New York, or in Burbank, California.

## THE ACID TEST

Continued from Page 980

power) and for recording an 8-track clean, clear master of every second of performance. They set up two 8-track Scully 1" tape recorders into a 16-pot mixer. They used 6 tracks for music, one for audience response, and the eighth was the 60-cycle sync-pulse donated by Con-Ed—the same 60 cycles that drove 6 cameras and enabled us to maintain constant perfect sync.

Microphone placement was accomplished with planning between the stage Technical Director, Chip Monck; Stage Manager, Steve Cohen; sound technical engineer, Lee Osborne; and the recording engineer, Eddie Kramer. The technical setup with each group was so different and complex that the first numbers were usually rough. Channel locations, balance and mike placement had to be adjusted. We covered both sync and mike signals with two Nagras recording through the PA systems and this gave us a fairly good mix-down to use in editing. We rolled 53 hours of music alone.

The lighting of the performance was handled entirely by Chip Monck and his crew. They used six Super-Trooper spots set atop two towers, three on each. We simply told him the F-stops we needed and he chose balance and color. We shot wide open, pushing 7255 one stop and 7242 as much as three stops.

The shooting procedure on stage was well directed and organized, both among the cameramen with their two-way head-set communicators and with the performers. Martin Scorsese

Wadleigh sits on the edge of the stage, ready to film the next group. At lower left is the author, Larry Johnson, who was Wadleigh's assistant and doubled as soundman.



## WOODSTOCK PRODUCTION CREDITS

**DIRECTOR** ..... Michael Wadleigh  
**PRODUCER** ..... Bob Maurice  
**ASSISTANT DIRECTORS** ..... Martin Scorsese, Thelma Schoonmaker  
**SUPERVISING EDITORS** .. Michael Wadleigh, Thelma Schoonmaker, Martin Scorsese  
**EXEC. IN CHARGE OF PRODUCTION** ..... Dale Bell  
**PRODUCTION SECRETARY** ..... Sonya Polonsky  
**PRINCIPAL PHOTOGRAPHY** .. Michael Wadleigh, David Meyers, Richard Pearce, Don Lenzer, Al Wertheimer  
**ADDITIONAL PHOTOGRAPHY I** .. Michael Margetts, Ed Lynch, Richard Cheu, Charles Levey, Ted Churchill  
**ADDITIONAL PHOTOGRAPHY II** .. Fred Underhill, Robert Danneman, Stan Warnow  
**ASSISTANT TO THE DIRECTOR** ..... Larry Johnson  
**DOCUMENTARY UNIT CO-ORDINATOR** ..... John Binder  
**PERFORMANCE LOCATION SOUND** ..... Bill Hanley  
**PERFORMANCE SOUND CO-ORDINATOR** ..... Eric Blackstead  
**PERFORMANCE SOUND MIXER** ..... Ed Kramer  
**PERFORMANCE SOUND ENGINEER** ..... Lee Osborne  
**ASSISTANT SOUND ENGINEER** ..... Dan Turbeville  
**DOCUMENTARY SOUNDMEN** .. Larry Johnson, Charles Groesbeck, Malcolm Hart, Joe Louw, Bruce Perlman, Charles Pitts  
**ELECTRICIAN** ..... Martin Andrews  
**CAMERA ASSISTANTS** ... Harold Smith, Peter Barton, Ric Berger, Steve Kraft, Suzy Berger  
**LOCATION LIAISON** ..... Bill Hilliker  
**EDITORS** .. Robert Alvarez, Yeu Bun-Yee, Bettina Kugel Hirsch, Jere Huggins, Muffie Meyer, Stan Warnow  
**EDITING SYNCHRONIZATION** ..... Mirra Bank, Ed Cariati, Ted Duffield, Barney Edmonds, Lana Jokel, Bill Lipsky, Janet Loratano, Susan Steinberg, Anita Thatcher, Winston Tucker  
**EDITING ASSISTANTS** .... Jim Stark, Angela Kirby, Miriam Eger, Phyllis Altenhaus  
**SOUND ASSISTANTS** ..... Charles Cirigliano, Ed George, Al Zayat  
**PRODUCTION LIAISON** ..... Alice Marks  
**LOCATION PRODUCTION ASSISTANT** ..... Fern McBride  
**LOCATION ASSISTANTS** .... Anne Bell, Sharon Binder, Alex Brooks, Jeanne Field, Valerie Perlman, Maggie Koven, Karen Levey, Felicity Lynch, Ellen Orsen, Robert Solomon, Judy Underhill, Renee Wadleigh, Noni Walters  
**UNIT PUBLICIST** ..... Rhona Kane  
**STILL PHOTOGRAPHER** ..... Larry Johnson

and Thelma Schoonmaker were responsible for coordinating the cameramen for complete coverage of a group, the audience, and the surprise once-in-a-lifetime shots. Eric Blackstead maintained contact with the groups and their managers so that we knew the order of songs and the groups' suggestions in advance of their appearance.

The convenience of sync slating was sacrificed in the performance shooting. It would have been a pain in the tail for the cameramen and a distraction for everyone. The system involved slating camera-to-camera by setting off a colored flashbulb and using these exposed frames to match the cameras. We finessed the slating, knowing that with the help of the great Amandus Keller editing machines (we've got five of them), good labeling by assistants, and careful lab order, we would have few problems. We began the shooting with written cardboard slates but both the cameramen and their assistants were soon too busy to worry about any such formality.

From the beginning there was the problem of crowds of people, on the stage, the shooting platform, and in the press area. Our essential personnel of directors, cameramen, assistants, and runners numbered about 25. This increased or decreased depending on the weather, fatigue, the performer, and the group exhilaration of the moment.

When Saturday's concert began, we were ready for anything. We had established our methods, the cameramen shot together, talked softly over their head-sets about the next moves and even worked out a four-camera hand-held "dolly" shot called the "hully-gully".

Our first substantial difficulty arose during Sunday evening's shooting with The Band. High humidity caused jamming of our 7242 stock. The thicker-emulsion film gave Dick Pearce nine out of nine jams. Dig the frustration that caused. The solution was obvious. Magazine covers were put on by the loaders and removed by the cameraman just prior to use. We were covered.

We were stoned on our own energy and enthusiasm and we were going to make it. We knew what the Woodstock Festival was doing to the country and to the world. A lot of people were feeling the vibrations from hundreds of miles away and we got the whole scene on film. Editing it all proved to be an equally beautiful experience. We've kept alive the spirit and life-style of the Woodstock Festival—no sleep, a few hassles, lots of excitement, and lots of love. We had complete control of the film and made it as adventurous, dynamic, simple, and beautiful as Woodstock itself was. "WOODSTOCK", "THE SOUND OF MUSIC" of the New Karma, is a great film. What can we say? ■

# PRISMALITE

**A revolutionary new surfacing material increases drive-in theatre screen brightness up to 300%, plus improving picture contrast and color saturation**

The Cinematographer is painfully aware that no matter how perfectly he may have captured a scene on film, his work must still pass over the hurdles of laboratories and finally (and most important), projection onto a screen.

This last step is really "where it's at" or is the "happening" as far as the photographer is concerned. Poor projection in the theatre can substantially reduce the artistic impact which the Director of Photography so carefully, and with infinite patience, attempted to capture on film. United Artists Theatre Circuit has long been concerned with this problem, particularly as it relates to the drive-in theatre.

Drive-in screens are considerably larger than screens in hardtop theatres, and the drive-in projection throw is usually greater. Unfortunately, these factors combine to reduce the quality of the projected image, no matter how brilliantly it was photographed. Large drive-in screens ordinarily consist of a matte-white painted surface with less than a unity gain (or reflectance of "1"). The end result is a low density, low contrast, "washed-out" picture on the screen. The problem is simply that more light is needed. This problem has been attacked from just about every possible angle with little apparent success. To the

uninitiated it would seem plausible to increase the light at the source—the lamphouse itself.

But a major part of that problem is the relatively small size of the projector aperture (715"x.839" maximum) which restricts the amount or "flow" of light passing through the aperture. The solution is not simply a matter of raising power to increase light output. Beyond a prescribed limit, merely increasing the power approaches a point of diminishing returns. The substantial increase in power necessary to effectively raise reflected light measurements would be disproportionate to the result achieved. And, there is the very real problem of introducing too much heat at the aperture, causing film buckling, warping and in some cases even scorching the print. Attempts to solve the problem with "thin" prints have added little to the brightness of the overall presentation, and have not proven to be an effective solution.

Research among lamp manufacturers has examined the problem of low levels of drive-in screen illumination without arriving at a workable solution. Obviously the next point to consider is the screen itself. The most inexpensive type of drive-in screen is a tower faced with plywood, painted matte white with a

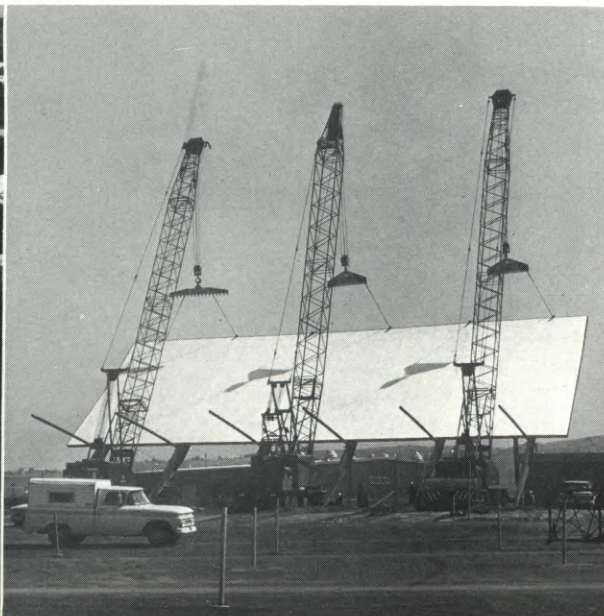
unity (or lower) gain factor: As a point of reference, hardtop theatres utilize screens ranging in gain from .8 to 1.5, the gain above "1" representing an advantage drive-in theatres do not enjoy.

The PrismaLite development was undertaken to increase the gain and thus



**Dr. Richard Vetter, inventor of PrismaLite, holds a panel of the remarkable new drive-in screen material which triples screen brightness and amplifies picture contrast and color saturation.**

**(LEFT)** Workmen begin installing PrismaLite facing on first PrismaLite drive-in screen at Hayward, California. **(RIGHT)** Giant cranes raise the surfaced screen into position. The exceptional brightness efficiency of this screen is a function of its second-surface cylindrical mirror reflectors and first-surface refractors.



the picture brilliance of drive-in theatre screens. Past attempts at improving drive-in screen surfaces have usually consisted of experimentation with first surface reflectance. Various forms of metallic surfaces, including all-metal screens have been utilized, often with the same result. When this type of screen is placed in service, the weather extremes may attack the first surface, lowering the gain factor to (and in some

instances even below) that of an ordinary painted surface.

It was at this point in the imperfect art of drive-in screen technology that Dr. Richard Vetter, Vice President of United Artists Theatre Circuit, Inc., and Director of the Circuit's Research and Development undertook a program aimed at solving the problem.

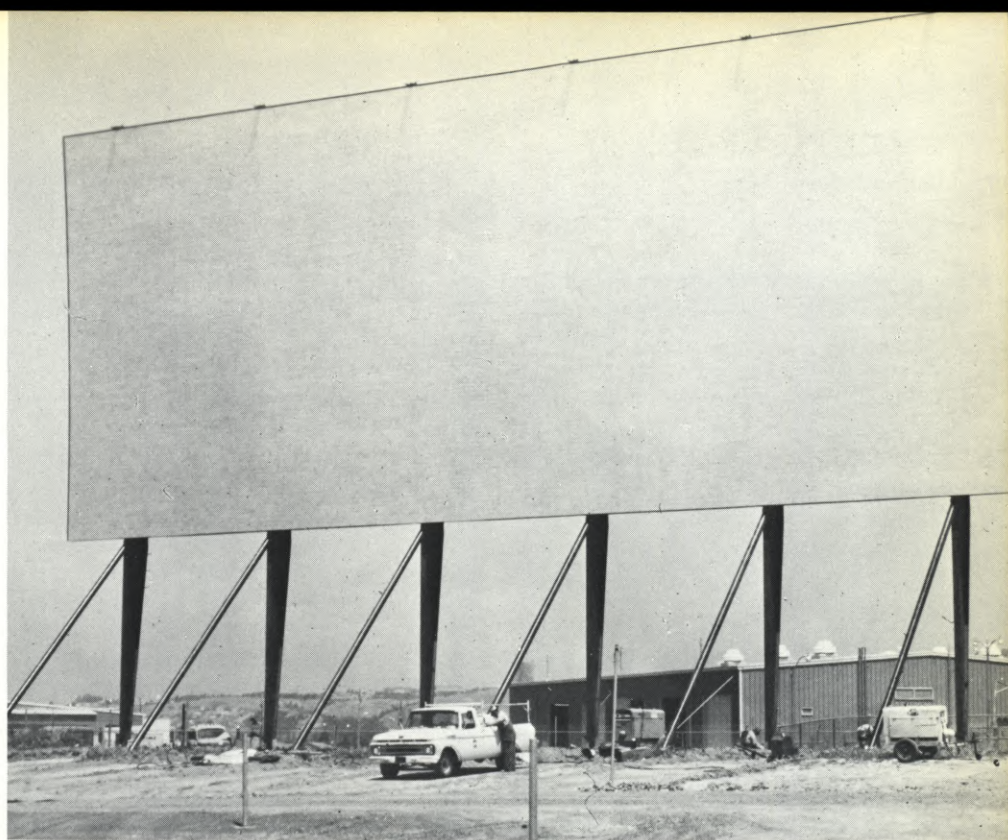
That was five years ago. Recently Dr. Vetter unveiled the results of his five years of research and exhaustive investigation at the opening of the new Hayward Twin Auto Drive-In in Hayward, California. This new theatre has two 120-foot-wide screens: one a normal painted screen; and the other surfaced with the new PrismaLite drive-in screen material. Typically, drive-in screen brightness measures three to four foot-lamberts of reflected light. The painted 120-foot-wide screen at the new Hayward Auto Drive-In reads four foot-lamberts. The 120-foot PrismaLite Twin screen, however, has a reflectance of 12 foot-lamberts, a screen brightness more nearly comparable to hardtop theatres. The projection throw to the PrismaLite screen is more than 800 feet, whereas the throw to the painted screen is approximately 550 feet. Both screens are illuminated by Christie 6.5 KW Xenon Lamps.

PrismaLite can increase screen brightness by up to 300% over that of conventional painted drive-in theatre screens. It not only triples screen brightness but equally important, it amplifies picture contrast and color saturation. PrismaLite is really a mirror. An average size drive-in screen faced with this product comprises approximately 12 million refracting mirror elements. Its exceptional brightness efficiency is a function of the second-surface cylindrical mirror reflectors and first-surface refractors which are offset to focus light downward to the viewing field while at the same time discarding ambient light upward. Lateral dispersion of light is  $120^\circ$  without fall-off from center to edges of the field.

The mirror concept combined with optical-grade plastic refractors makes possible the most efficient high-grade reflective projection screen surface yet developed for drive-in theatre application.

PrismaLite's mirror finish is laminated to the back (second surface) of the plastic and is protected from atmospheric attack with a time-tested sealant developed for the aircraft industry. Visual clarity of the optical-grade plastic is warranted by the supplier for a minimum of 15 years.

One of the advantages of this revolu-



The first PrismaLite drive-in screen at Hayward, California measures 50 feet by 120 feet and is comprised of 12,824,000 refracting mirror elements which increase picture brightness by about 300%. Visual clarity of the optical-grade plastic is warranted by the supplier for a minimum of 15 years.

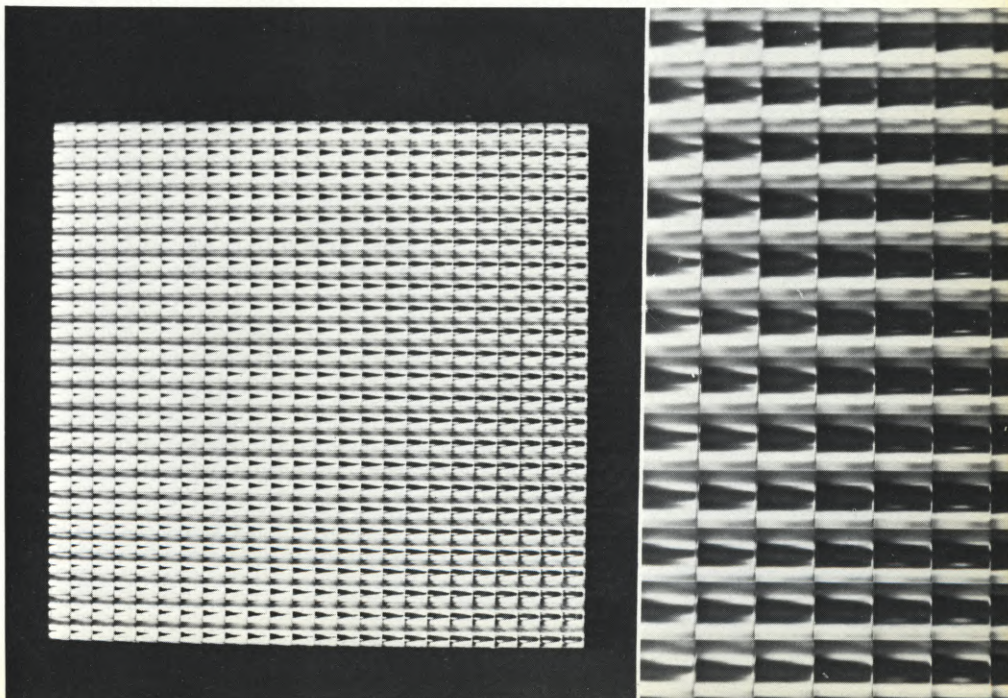
tionary new drive-in screen is that in many instances the theatre will be able to open somewhat earlier than would normally be the case with a painted screen. PrismaLite screens will enable audiences to enjoy far brighter pictures with greatly enhanced contrast and color.

The impact of this new product on the approximately 5,000 drive-in theatres in the U.S. should be tremendous. However, additional areas of significant application of PrismaLite include the

industrial, military, advertising and educational markets.

The long-suffering Director of Photography who spent countless hours photographing his latest artistic achievement need no longer despair when his talents are presented on this new generation of drive-in screens. PrismaLite represents the first technological breakthrough in drive-in theatre operation since the first shadowy, barely-discernible image flickered across the huge white outdoor screen. ■

(LEFT) Each PrismaLite panel is an optical-grade plastic unit 6 inches square, surfaced with 576 separate precision-molded lens elements. (RIGHT) Individual cylindrical mirror reflectors are offset to focus light downward to the viewing field, while discarding ambient light upward.



## GETTING IT TOGETHER

Continued from Page 985

tions for me?" He was rather concerned about the elegance of the arrangements. I guess he really thought we would have swank hotel accommodations, with room service and all that. Instead, he ended up sleeping under the truck one night and in a station wagon the next.

We took over one 8 x 12-foot "office" in Chip Monck's truck and converted it into a sound studio. Into that tiny space we crammed two 8-track stereo recorders, our two engineers, all of the 8-track tape, all of the 1/4-inch tape for the Nagras and a home-made board built by Bill Hanley. This board had a built-in echo facility and about 16 in-puts. They also had two Altec 604's as monitors.

One piece of equipment that proved invaluable was the copying machine we brought up there. On Friday, before any of the performers went on, we arranged with the stage managers to borrow the schematics of each group's equipment layout and, while these diagrams didn't necessarily indicate where each member of the crew would stand, it was quite obvious from the amplifier layout where they would be. We made copies of these schematics and passed them out to the on-stage cameramen—just one more visual aid to help them in preparing their camera layouts.

As a general rule, we would shoot each group's first number, as well as their last or encore. One of the things that is necessary for efficient recording is for the engineer who is doing the mixing to have ready access to the stage, so that he can check out the miking of the individual instruments. He should

know where every microphone is placed and what channel it is feeding into. They had originally set up a video monitor so that the engineers could see what was happening on-stage—like who was singing or what instrument was taking a solo. The monitor hook-up lasted about 15 minutes, and then it broke down—which meant that the engineers were flying blind. They had no idea of what was transpiring on stage or whether they would be covering everything properly with the mikes.

The sound truck was about 20 yards behind the stage and the stage was two stories above the ground. The only way up to it was by way of a freight elevator used to raise the heavy electronic equipment the groups were using. Very often our people couldn't even get up there to check the microphone placement because over-eager guards would turn them back.

This meant that frequently a group's first number would be excellent, but the recording would be messed up until the engineers were able to "feel out" where all the mikes were and set their basic levels.

Our Nagras pulled us out of the fire in a couple of cases when this happened. The Nagras were being used to bridge the P.A. system amplifiers and we weren't doing any mixing with them. The idea was to keep them going throughout the entire festival in order to catch all of the announcements and ambient sound from the audience.

In Arlo Guthrie's sequence, the first song he sang on stage was "Flying Into L.A.", but because of the problem I've been discussing, the engineers on the 8-track recorders couldn't get the instruments together until about halfway through the song. The Nagra, however, had picked up the whole song on a monaural track. We used that for the first part of the sequence which showed documentary footage of Arlo arriving by helicopter and giving a roadside interview to some newsmen. That portion of the song, recorded by the Nagra as a sort of pre-mixed P.A. tape, wasn't of stereo quality but was very suitable for off-screen over the documentary footage. By the time we cut to Arlo on stage, the engineers had gotten the 8-track recorder zeroed in and the sound sort of opens up into full stereo. It's actually very effective in the final cut version of the picture.

There were many more problems, some of which would have wiped out an ordinary crew. But these weren't ordinary people. They were very special and, because of them, we were able to "get it all together."

## NEW POLICY LAUNCHED AT MUSEUM OF MODERN ART

Because of the rapid changes on the American and international scene, The Museum of Modern Art has decided to embark on a new policy that it hopes will make a contribution to public understanding of critical issues affecting our daily lives.

WHAT'S HAPPENING?, the program it plans to launch, was conceived by Willard Van Dyke, Director of the Department of Film. It will bring documented coverage of the political and social scene on every conceivable subject: pollution, inflation, campus unrest, the war, racism, politics, the sexual revolution and women's liberation.

The program is scheduled for every Thursday at noon.

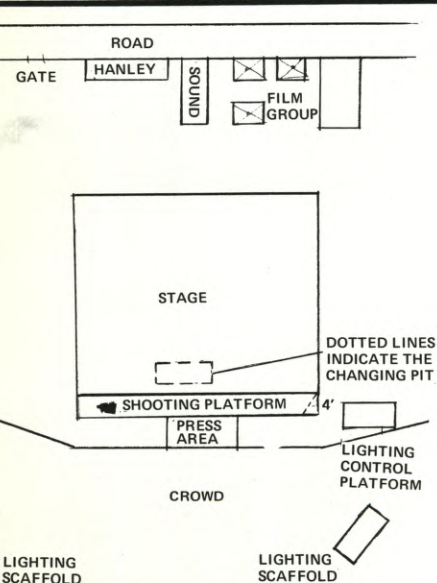
The idea, according to Mr. Van Dyke, is to stimulate public reaction through what is considered by sociologists, historians, and psychologists the most potent medium—the film. The visual image, being as direct as it is, can only help to illuminate many issues confronting the public. That image is unencumbered and carries its own message; each individual is free to come to his own conclusions.

Until now, new film-makers were inclined to explore their personal lives, take creative license, turn away from the past, and move forward into formal, experimental areas. Lately, it appears, a whole new group, as well as some seasoned film-makers, has awakened to the growing need for film to play the same significant role it had when documentaries began in the depression and during the war years.

These film-makers will continue to apply their creative imaginations but, recognizing an area of priority that demands their attention, they will render in filmic terms actual problems confronting Americans today.

WHAT'S HAPPENING? will not only provide relevant information for the public that normally would not have access to it, it will also give a forum to film-makers whose films are not shown theatrically, films that may be too editorial for a large television network, but which may nonetheless be of interest to audiences that want to keep informed. The revival of documentary reportage was encouraging, said Mr. Van Dyke, himself a documentary film-maker, who was cameraman on *THE RIVER*, and who filmed *THE CITY* and *VALLEY TOWN* and other films of social importance.

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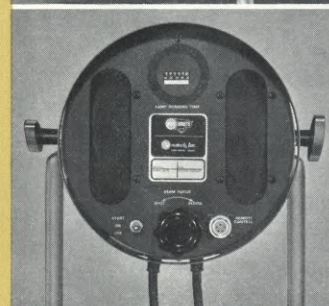
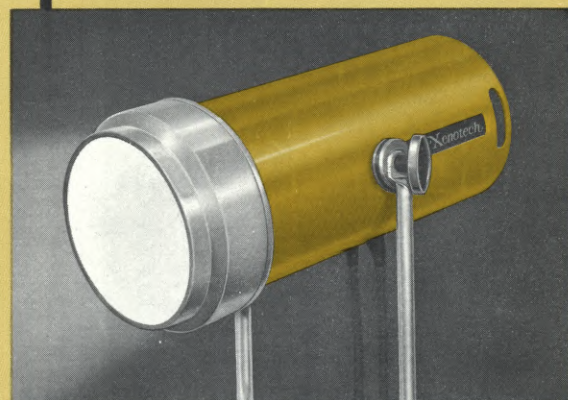
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**CINEMA WORKSHOP**

Continued from Page 954

to over 10,000°K as "white" light. If a 2800°K light source were placed alongside a 10,000°K source, the former would definitely appear orange and the latter blue. However, if either of the light sources were present alone, it would appear "white."

Color films are designed to give normal color rendition when the light source is a specific color temperature. Thus a film "balanced" for 3200°K will produce normal color only from a light source of 3200°K. If a film of this type is used with a light source of higher color temperature you can see from the graph that more blue and less red will be present and thus the picture will appear strongly blue with washed out reds.

Daylight color films are balanced for a condition known as "photographic daylight" (6000°K) which is a combination of sunlight (reddish) and skylight (bluish). This condition occurs on a clear sunny day from about 9 A.M. to 3 P.M. Near sunrise or sunset, where the sunlight predominates, color temperature drops and an orange hue will appear. On the other hand, on hazy, overcast days or in shadows, skylight will predominate with color temperatures in the 7000-8000°K range. Light from a clear blue sky could reach color temperatures as high as 30,000°K! Thus on hazy, overcast days or in shadows, the film will take on a definite blue characteristic. Under such conditions, which deviate from those for which the film was balanced, compensating filters must be employed to prevent undesirable results, a complete subject in itself.

With a basic understanding of the concept of color temperature and its relation to proper color rendition on film, the next area to explore is the many light sources commonly encountered in motion picture production. ■

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**THE FILM HAPPENING**

Continued from Page 971

of this journal. The film itself, a stunning documentary called "ONCE BEFORE I DIE", was aired recently on the television networks under the sponsorship of *Time-Life/Sports Illustrated*.

During that first brief encounter with Wadleigh, I managed to zero in on his wave-length with no sweat—film, as usual, being our common denominator—and arrived at some first impressions which, as it turned out, hold up rather well: A man of keen intelligence and a fantastic reserve of inner energy. Imbued with a fierce, almost physical love of film, and totally dedicated to his Mission—that of telling it like it is in a world which, while confused and imperfect, is also cinematically fascinating. Lean, almost to the point of being gaunt, soft-spoken and sensitive, you *know* he's just got to be put together with steel cables and that he has a character and integrity of a tensile strength to match.

I made a mental note: *Someday—and that day not far off—this quiet powerhouse would become the author of an extraordinary film.*

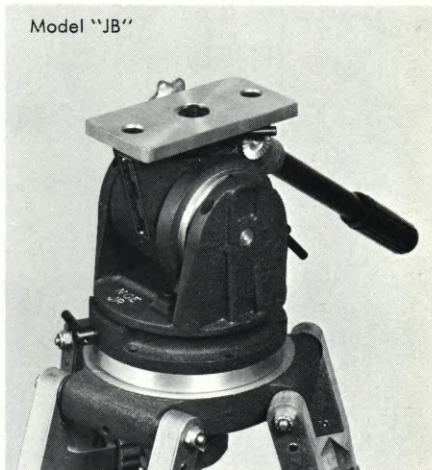
That extraordinary film is, of course, "WOODSTOCK". The credits read: "A Film by Michael Wadleigh"—and if ever there were an *auteur* motion picture, this is it. Wadleigh himself puts down this idea, insisting forcefully and frequently that "WOODSTOCK" was a *group* effort, the result of tireless devotion to the cause by a large contingent of dedicated film-makers.

All of which is true—but the large contingent of dedicated film-makers are the first to agree that it is essentially Wadleigh's baby. His stamp is evident on every frame of the film—and he paid his dues to have it that way.

During the chaotic weeks of negotiation which preceded the actual filming, Producer Bob Maurice kept telling the Woodstock promoters and the Warner Bros. people: "Look, what Mike really wants is total artistic control of the content of the film—with no completion deadline. You guys can make all the money."

And that's the way it actually went. Wadleigh put his money where his mouth was. He and Maurice emptied their personal bank accounts (about \$80,000) and went into hock for a like amount by mortgaging their business and personal holdings, in order to get up the money to finance the actual filming of the Festival—including costs of renting the equipment, hiring the crew and

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Wadleigh got what he wanted: complete freedom to select whatever musical groups he wished to appear in the film, the right to include in the picture anything he chose, plus agreement that the finished production could be of any length and could be completed in 1984, if it took that long to do it right.

In exchange for this artistic freedom, he and Maurice agreed to forfeit all rights to the multi-millions to be made from world-distribution of "WOODSTOCK"—except for a paltry 5% of the *net* profits, which they won't see until 1972. It is doubtful that they will see very much even then, after Warner Bros. deducts its healthy percentage for distribution (said to be 35%), plus an additional 25% for "studio overhead" (even though not a frame of the picture was shot in the studio), plus the huge percentage that is due the Woodstock Music Festival entrepreneurs.

Wadleigh, however, is satisfied. "I think I made the right decision, since, as it turned out, I *did* get full artistic control of the film," he told me recently.

What manner of man is it that will give up the big buck in favor of his principles, plus the right to do his thing his way, without outside interference?

Wadleigh's background seems conventional enough. A native of Akron, Ohio, he received two degrees from Ohio State University—a B.A. in English and a B.S. in physics and chemistry—and then went on to two more years at the Columbia University College of Physicians and Surgeons. With only slightly more than two more years to go for his M.D. degree, he decided to take a 12-month sabbatical leave from medical school in order to study and teach cinematography at New York University. It was during this period that he decided to make film his life work.

Explaining this seemingly strange switch of careers, he says: "I discovered I could do more to improve the human condition through the medium of film than I could within the limited practice of a doctor."

He studied everything that he could get his hands on that might help him learn to become a motion picture cameraman-director. "I hunted down all the back issues of *American Cinematographer* I could find—and sometimes they were very hard to come by—and read them from cover to cover," he said recently, with absolutely no coaching from me. "It's the only journal around that deals with the practical things you really have to know in order to function in this field. It's just incalculably valu-

able to anyone who seriously wants to become a cameraman or director, because it deals with techniques on a sophisticated rather than grade-school level, and there are so few publications around that do that."

Shortly thereafter, Wadleigh and his associate, John Binder, approached the N.E.T. educational television organization for a job as a *cinema verité* filming team. Wadleigh admits that they stretched veracity a hair in describing their respective backgrounds in the field.

"But we only did that because we were absolutely sure we could come through on the job," he explains. "We also made a vow that if it turned out we couldn't, we'd give them back all the money they had paid us in salary."

That they pulled it off brilliantly without having to refund any salary is now a matter of record. Wadleigh made his professional directorial debut with "THE VANISHING AMERICAN NEWSPAPER", then went on to make 11 more two-hour documentary films for N.E.T., several of which won important awards.

Recently, Wadleigh came back into town to spend a day and a half between 'round-the-world trips. He called me and suggested that we get together, so I met with him at the posh offices of Wadleigh-Maurice Productions in Hollywood. He was still wearing the faded blue jeans, but there were ten-thousand-dollar editing machines in the cutting rooms—a tangible reminder of his love for the very best equipment.

He seemed much more relaxed than he was at our last meeting, and clearly exhilarated by the universal success of "WOODSTOCK", though he stood to share in little or none of its astounding profits.

He led off by emphasizing how important his long-time associate, Producer Bob Maurice, had been to the venture. He flatly stated, in fact, that if it hadn't been for the last-minute efforts of Maurice, there probably wouldn't have been a Woodstock film.

"I felt that we *had* to do this picture, not only because it was going to be a great festival, but because this was the type of film that we really know how to do," said Wadleigh. "However, we had reached a stalemate because the Woodstock people wanted us to put up an incredible amount of money just for the privilege of doing it. I finally said, 'See you around,' and went off to shoot another mountain-climbing picture. Bob stayed in there pitching simply because he knew how much it meant to me. I'm a very poor negotiator, but Bob is

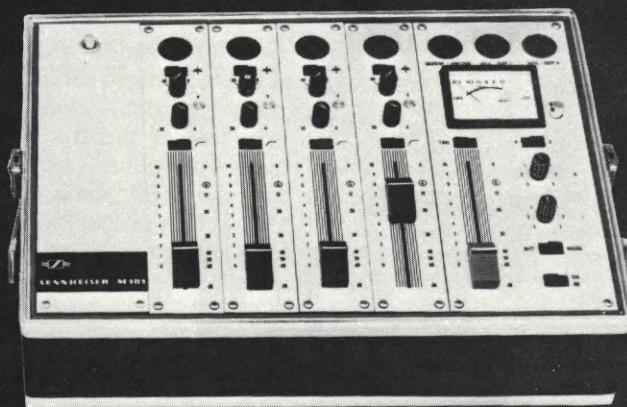
unbelievably skilled at it. He's the perfect one to negotiate with something like a big Hollywood studio, because he can't be intimidated. In fact, he can be intimidating as hell himself when someone comes on like that. He worked his way through college as a steel construction foreman on New York skyscrapers, and he's got that kind of negotiating philosophy—if they won't listen to reason, you drop a keg of nails on their head."

Funny—I hadn't gotten that impression of Maurice at all. From my slight acquaintanceship with him, I'd had him

pegged as soft-spoken, gentle and even *scholarly*—which wasn't too far off, considering that the 32-year-old C.C.N.Y. alumnus had devoted four post-graduate years to extensive study of the historical and philosophical background of science, linguistics, anthropology and comparative religion.

At any rate, it seems that Maurice had been the one who had broken the stalemate by cobbling together a mutually satisfactory working agreement with the Woodstock entrepreneurs, thus clearing the way for the making of the film.

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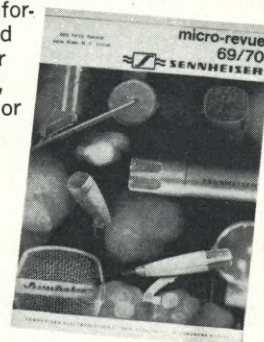
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The documentary sequences included in the final cut of "WOODSTOCK" cut across the entire spectrum of commentary and include every shade of opinion—which reflects Wadleigh's insistence upon integrity.

There are interviews with local adults who think the kids are all bad, and those who think they're all good. There is the sincere statement by a beardless youth who speaks affectionately of the generation gap that exists between himself and his immigrant father. There is a very funny and quite touching interview with a cheerful cleaner of latrines who says he's glad to do this for the kids, because he's got one boy in the crowd and another in Vietnam. The hard-working documentary camera crews, lugging their heavy equipment on foot through the mud, managed to capture on film some real gems of human interest.

Wadleigh feels strongly about the responsibility of film-makers—especially those engaged in the documentary form—to use technique, not for its own sake, but to better communicate the true content of the film.

"The principle I like best about *cinema verité* is the idea that you're getting to the essence of someone—the truth about a person, whether he is a performer or the man who cleans the latrines," he comments. "You have the ethical obligation to photograph and edit that person so as to get *his* values across, not your own. I feel very critical of certain directors who try to impose their own cute little values onto such a scene. We really tried very hard not to mess up a musical statement or a documentary statement with a lot of flashy technique. In 'WOODSTOCK' you don't see any zooming in and out to the beat of the music, as you do in other rock films—or a lot of changes of angle for no reason at all. The camerawork is amazingly conservative, and a lot of it is very long takes. That's very deliberate, because I really believe that my role as a director is not to destroy the performers or people being interviewed with distracting technique, but to give them an attractive package within which to communicate what they really want to say. Then too, of course, it has to be entertainment for the audience. It better be, or nobody is going to come and see it."

I asked him how all of this applied to the use of multiple-image techniques in certain sequences of "WOODSTOCK", and he answered, "We really spent a lot of time in questioning their validity before we decided to use them. We had

to be sure the multiple-images would enhance the performance, not destroy it. We found that, with careful use, the technique could create an excitement of its own without diluting the impact of what was happening on-stage. It was a matter of starting with one image and then ending up with as many as four, if it would heighten the effect—not the other way around."

Since the sweeping success of "WOODSTOCK", Wadleigh has become much in demand as a speaker before groups of cinema students. He has talked to quite a number of them and, while he hardly regards himself as a spokesman for fledgling film-makers, he does have a word of criticism about some attitudes he has encountered: "I must say that I really resent the idea some of them have that you can pick up a camera and just start shooting it. None of the cameramen who have worked for me are like that at all. Just as I do, they spend a lot of hours reading and practicing and thinking about the theory behind the function of the camera. Cinematography is not a mechanical process that you learn by rote. Even though there are currently more people interested in film-making than ever before, it is, in my opinion, becoming more and more difficult to find really good cameramen—well-educated, professional technicians who are also bright, perceptive people. This is because camerawork is so peculiarly all-encompassing. For example, you've got to be very 'German' about meticulousness and cleanliness in caring for your equipment. At the same time, you've got to be quite 'Italian' about such things as flair and style—very free, very open. And, just in general, you've got to be very, very sharp."

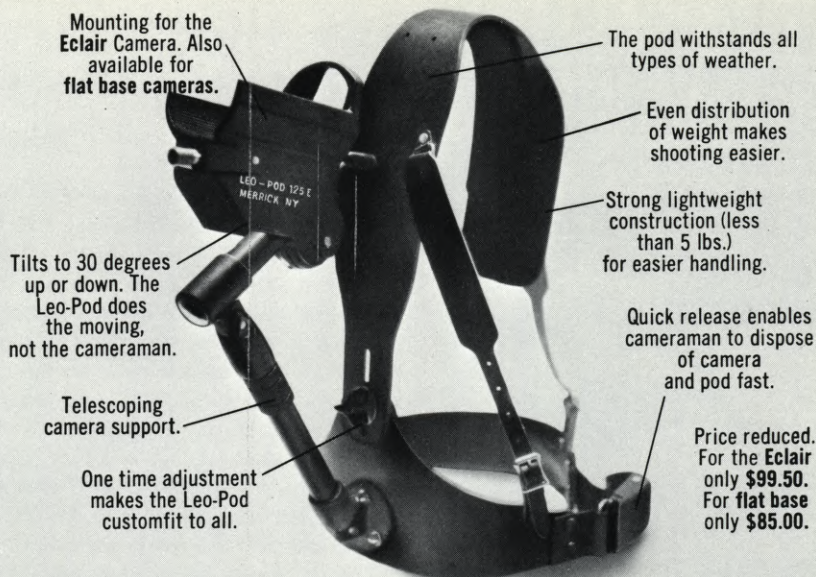
Wadleigh feels that the new breed of film-maker must, of necessity, be a combination cameraman-director. But he is aware of the fact that some of the top cinematographers, longing to be directors, are turning away from camerawork in favor of direction. Asked if he might be tempted to follow suit, the director of "WOODSTOCK" shook his head.

"No," said he, "I would never give up camerawork. I love it. I really *do*. It puts you directly in touch with the film."

#### MOVING?

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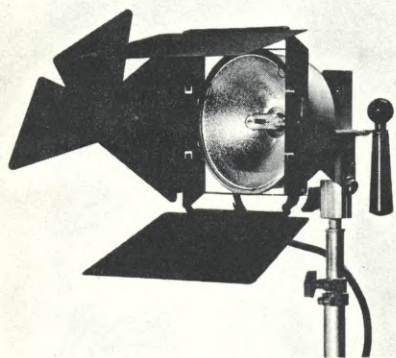
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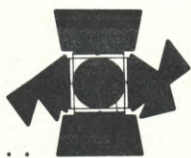
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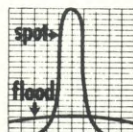


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## "TAKE ONE" CHALLENGE

Continued from Page 977

went on whenever they arrived. There was no way of finding out who was on next, let alone the order of the songs they were going to perform.

The only thing that saved the situation was the pre-planning we had done. For days previous to the shooting I had talked with the groups to find out how they worked. Then I'd held meetings with the onstage cameramen to discuss the characteristics of each group and what each musician did. We drew a separate diagram for each group, so that the cameramen could organize themselves accordingly. Most of these men had worked with me before, and I tried to hire people who really knew rock, so that they would have a feel for which way the emphasis of the music was going to go at various points—in terms of solo spots and breaks, for example.

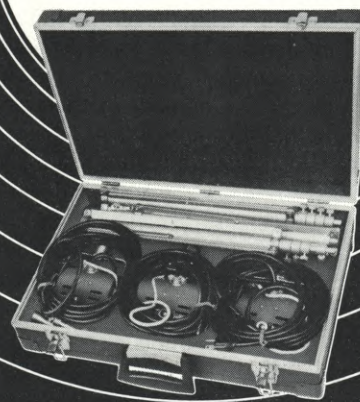
The way I worked at directing them onstage was that as soon as we found out what group was going on next, we would go into a huddle while they were setting up and review our previous "battle plan" for that group, check the diagram and exchange any last-minute ideas. Then the cameramen would move to their pre-planned positions.

We would start shooting at the beginning of virtually every number, because I didn't want to miss the head-end. Then, about 30 seconds into the number, I would make the decision whether we should continue and scream at the cameramen to either cut or go ahead. If it was "go", they would shoot the number straight on through to the end, come hell or high water. We never shot just sections of numbers to be intercut with something else.

I would try to set a style for each number. Like, maybe we'd shoot one with everybody using long lenses. Or if one man in the group was really the "hero" of a certain number, we'd all just concentrate on him and work him over with a whole lot of images. I'd scream into somebody's ear: "All right, on *three*, everybody roar into so-and-so!" You'd see all of the cameramen dive onto one performer. Then I'd scream at somebody to swing off and get the audience, or one of the singers. It was very straight, simple direction. And the cameramen all knew that if they were doing something more important, if they were into something really good, they should just ignore the directions and go right on doing it.

I had to scream my directions at them because the sound on stage was so incredibly loud that they couldn't have

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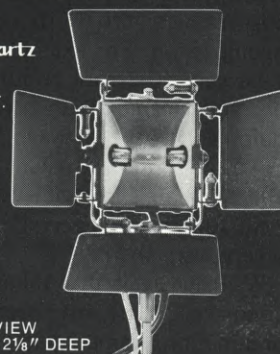


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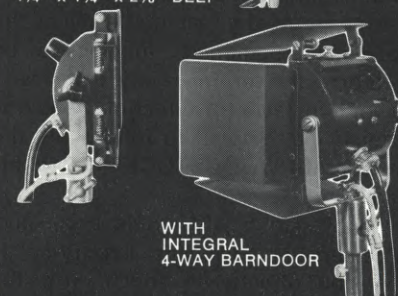
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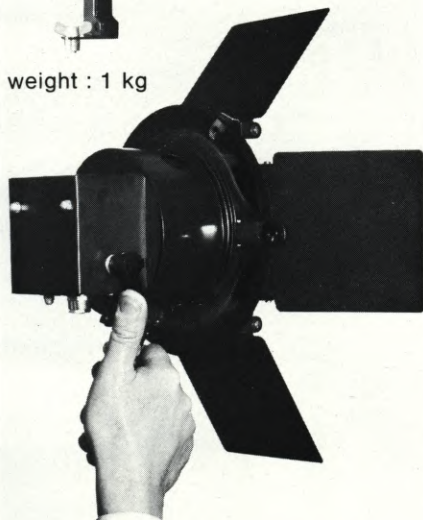
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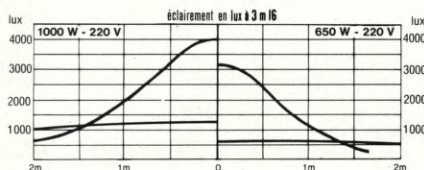
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held... .. by hand  
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### 3 uses

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- on stand
- on 16 mm camera



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heard me otherwise. The amplified music is so loud that you can't hear the vocals at all. You have to lip-read in order to figure out what a vocalist is singing about.

### The Rains Came

We had some incredible mechanical and electrical problems, due mainly to the rain. The rain was unbelievable—and it didn't rain just once, but three times. We didn't want to show rain all the way through the picture, so we cut all that footage into one sequence of the most dramatic storm.

But the rain did some terrible things to us. In the first place, it short-circuited some of our electrical connections and blew out a lot of our AC motors. These motors were running very hot to begin with, because of the huge bulk of footage we were grinding through, and because they're really not designed to take that kind of a load.

Secondly, all that rain and humidity caused the film emulsion to swell and we had constant jamming problems. We couldn't take any equipment out to have it repaired because all of the helicopters had been commandeered to fly in performers and medical supplies. So, our only recourse was to turn the area under the stage into what was literally a camera repair shop. I can't really knock the seven years I spent in college—devoted mostly to Physics and Biochemistry—because I learned to figure out why things work and how to jury-rig something imaginatively (like a motion picture camera) in order to keep it running.

Our equipment failures, however, were not the worst of it. The real horror was experienced by the five cameramen shooting on stage in sopping wet clothing while the rain poured down. All of a sudden there would be a short circuit to one of the cameras and you'd see a cameraman just sort of go crazy for a while, as 110 volts of electricity went jolting through his body. Later we were able to see the zig-zag patterns on the film caused by the electrical discharge coming right through the camera.

Added to this was another hideous experience caused by short circuits to our audio gear. We'd be shooting along like crazy, when all at once about two hundred decibels of sound would come shrieking through every single head-set. You'd see five cameras suddenly go berserk as we tried frantically to rip our head-sets off. We had extra-load head-sets for communication to begin with, because we had to be able to hear above the sound of the rock music, which is so loud that it's just damaging. We needed

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the head-sets in order to co-ordinate our camera movements, but that sudden extra load of sound caused by the short circuit was like some horrible form of torture. You'd just live in fear that suddenly you'd hear that incredibly loud shriek come tearing through your head. I'll never forget it.

The rain seriously affected the stage lighting, also. Short circuits and the drop in line voltage cut the intensity of the light considerably, adding to our exposure problems. At one point our communications to the people running the arcs went dead and we were flying blind as far as knowing how much light we were going to have was concerned.

We had one technician on stage who kept taking light readings with a Minolta spot meter. Based on his readings I would calculate the exposure I thought we should be using and shout the F-stop to the rest of the cameramen. We had gone to the trouble of ordering all of our film with the same emulsion number for the sake of consistency, and we wanted all of the cameramen to keep their exposures consistent, as well, so that we wouldn't have to make extreme corrections in timing later on.

The constant rain and the incredible crowds at the festival were tremendously costly to us. We just couldn't get around and get the kind of coverage we'd planned to get. I don't think I'm rationalizing when I say that we would have come through with an infinitely better picture if we hadn't had to cope with these enormous problems.

#### The Heart of the Film

In terms of sheer footage, the bulk of the film we ended up with—about 80%, I'd say—was shot by the five on-stage camera crews and was devoted to the musical numbers.

But the other 20%, the footage shot by our five documentary crews, is what gives the picture its substance and heart and provides the true *cinema verité* content.

Each documentary crew was composed of a cameraman-director, a soundman, and an assistant who was actually a carrier of equipment. We took mountain-climbing packs up there to use in hauling equipment. This decision was based on my experiences in shooting mountain films and it proved to be fortunate, because, as it turned out, these crews were not able to drive anywhere. They had to walk all the way into town carrying their Eclairs and Nagras and everything else in order to film their interviews. No vehicles could move on the highways. The mountain

Continued on Page 1020

**new**

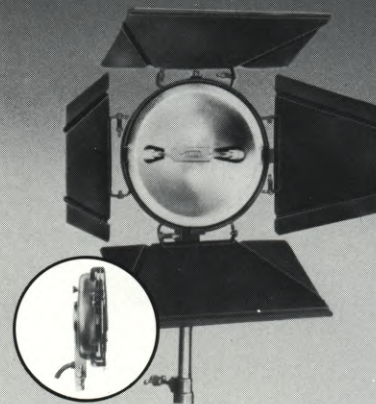
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## "TAKE ONE" CHALLENGE

Continued from Page 1018

packs were a godsend, because it would have been impossible to haul all of that equipment manually in suitcases.

The cameramen did their own interviewing, so they were really the directors of what they shot. The one thing I told them was that this was not going to be a picture made up of a lot of fragmentary inter-cut scenes. They were to bring back complete sequences of everything they filmed. I said, "Whatever you decide to shoot, get enough footage and the kind of coverage so that you can really edit the thing within an integrity."

I didn't want to cop-out by inter-cutting isolated scenes. That sort of thing doesn't move anyone. It doesn't give the audience enough chance to really get into anything.

The documentary crews used the Eclair-Nagra combinations, some with crystal-sync and others with cable hook-ups. They used Sennheiser 804 microphones almost exclusively—usually with wind-screens. They relied on battery-belts for power and had enormous problems because they couldn't get them fully charged, due to the low line-current up there. They had trouble keeping them dry in the rain, too, because the connectors weren't that good.

With all of their horrible problems and despite the incredible physical effort it took to slog through the mud for miles carrying heavy equipment, these documentary crews went out and brought back the bacon. They shot some really wonderful, marvelously human sequences. They had to work their tails off to get what they got—lugging every magazine, every roll of film, and nobody wanted to go with them.

A lot has been said about the fact that we used such a young crew in filming "WOODSTOCK", and that's generally quite true, but I'd like to point out that the bulk of the documentary interviews were shot by a couple of cameramen in their middle fifties, David Meyers and Al Wertheimer. They're both fantastic guys, and they did a tremendous job.

### The Real Work Begins

When the Festival was over and all the shooting finished, we came back to New York and slept for a week. And then the huge job of editing began.

Almost everybody who worked on the editing had functioned in some way

during the filming of the festival—either recording sound or carrying magazines or whatever—so that they were really in touch with the event.

The first thing we did, of course, was sync everything up. We did this with the aid of the three big Amandus Keller editing machines that we have. Supervising this phase of the editing was Thelma Schoonmaker. She is in her late twenties, an Honors graduate from Cornell University in Russian and Political Science. She also has this incredible technical ability—and I don't know where she gets that from.

She and I have made several films together with her doing the sound, and she really knows the various skills of shooting. But when it comes to editing, it's a joy just to see her handle film. She's developed her own techniques for using the Kellers and she's unbelievably fast.

Like myself, she has been oriented toward the sciences, toward more pragmatic things—so, between the two of us, we went in for film logging systems the likes of which have almost never been seen before.

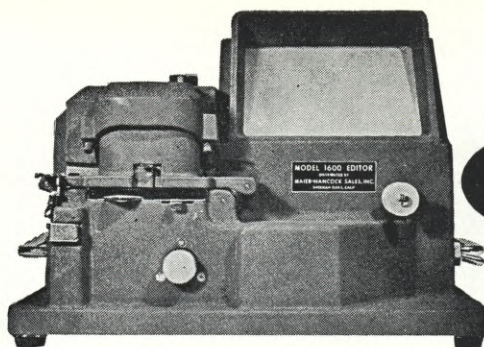
We had known from the beginning that we were going to go the multiple-image route, so we worked out a method of identifying and cross-indexing that established how, when, why and by whom each frame of film had been shot.

When it had all been put into sync, we had everything edge-numbered with codes, so that everything that had been shot at a certain point in time—let's say, 12:38 p.m. on Saturday—had a common reference point on paper. We ended up with two huge filing cabinets filled with nothing but logs of our 120 hours of film. This took a lot of time, but it was certainly worthwhile. It proved to be a terrific aid to us in locating scenes and making decisions during the actual cutting.

"T" Schoonmaker supervised the syncing and logging operations, and others did it. We tried to work around the clock to get these operations done, and pretty much did. Finally, we were squared away to the point where we could begin to think about the actual editing.

In the preliminary stages, with 120 hours of film on our hands, we reverted to the use of our six inter-locked Graflex projectors. I really can't praise these machines too highly. They work fantastically well. All you do is adjust the pressure plate according to whether the film is spliced or not and then turn them loose, knowing that they will

Continued on Page 1026



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## NETHERLANDS PAVILION

Continued from Page 1000

color staff to assure that the prints would be in Japan in time. One day before the planned day, on January 6, 1970, the fifteen 1000-foot reels of edited work-print arrived at the negative cutting department of Technicolor. Slashprints were made so that the activities of the composer and the sound effects editor would not be delayed.

A new, although *expected*, problem was the timing of the answer prints. As in the editing process, this timing had to be done, not only vertically, from scene to scene, but also horizontally, so that several screens placed beside each other showed exactly the same color grade. For more than one month the film crew and Technicolor people sat together in this process, which ended up close to perfection.

At the end of February the last prints were ready and they went to Holland for protective striping, a process developed in Holland which had already been tried out at Montreal's EXPO '67 in the Dutch and Czechoslovakian pavilions. Four tracks of polyester stripe, comparable to the conventional magnetic stripe, were put onto the film in order to prevent heavy damage that could occur due to the endless looping system; the fifteen reels of the Dutch multi-image show, each 10 minutes in running time, were to run continuously without any stop from 9:30 a.m. til 9:30 p.m., 12 hours a day, for six months.

This unique looping system, originating from the sound dubbing studio, was developed by Philips in collaboration with (and following the technical ideas of) Mr. P. van der Kleut, the technical adviser and director of the Dutch pavilion. It was Mr. van der Kleut who was the leading technician behind the complicated mechanical, optical and electronic devices which made the multi-image show possible. Van der Kleut, experienced during the EXPOs in Brussels (1958) and Montreal (1967), plus many other audio-visual experimental shows and exhibitions, had become an expert on all problems related to this type of presentation. He not only contributed to the development of the looping system, but also designed the multi-image editing table and the special slide projectors which were key elements of the multi-image show at the Dutch pavilion. Ten slide projectors, each with reels of 80 slides measuring 40 x 40mm, were synchronized with the 15 film projectors.

The results of all this combined

effort did not fall short of the dreams of its creators. The millions of visitors to the Netherlands Pavilion at EXPO '70 rose on a series of escalators through walls of film and sound occupying six stories. Though several segments of film were being shown simultaneously throughout the structure, the spectator was exposed to a selected few at a time, thus being enabled to absorb a many-sided and vivid impression of life in the Netherlands.

As it turned out, this straightforward, restrained approach to multi-projection was much more impressive to most visitors than the flood of images and sounds which inundated them simultaneously in many of the other pavilions.

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**SLIDE PROJECTION:** 10 slide projectors based on the principle of a stop-motion film projector containing slide filmstrips of 55mm, printed on




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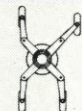
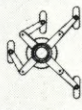
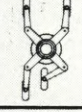



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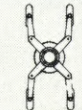
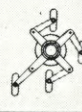
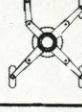


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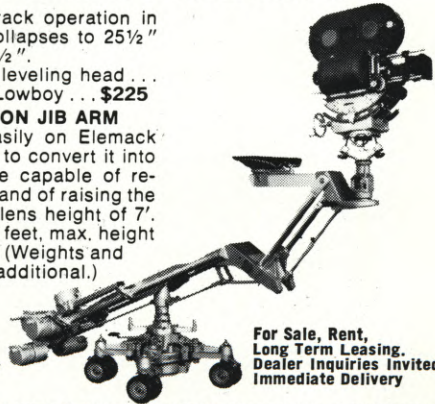
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specially manufactured positive color film by Gevaert Belgium. The compact-intermittent unit transports the slide in less than 1/25 of a second. Light source: per-projector, one 0.5KW Xenon lamp operating with special heat filters. The sound tapes each give one synchronization pulse every 10 minutes to obtain complete synchronization with the film-system.

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## "TAKE ONE" CHALLENGE

Continued from Page 1021

never tear up your film.

At any rate, we threaded the "WOODSTOCK" work-print into the Graflexes and, for almost a month, we did nothing but look at the 120 hours of film over and over again. We didn't edit anything. We just looked and looked and talked about the footage. It was a sort of family affair. We invited everybody in who had worked on the film and we talked about it among ourselves, trying to get a line on what it really represented. We felt that we had to be completely truthful about it, because we really couldn't make something that was contrary to the character of the event. We waded through all of that footage and looked at it many times over until we got a very clear sense of what the 120 hours of film really meant.

**16mm to 35 mm—But Which Way to Go?**

All of the footage for "WOODSTOCK" was, of course shot in 16 mm. I would have loved to have been able to use a 35mm camera for a certain few things, such as the aerials and scenes like that, but we didn't have the budget for it.

We knew from the start that we were going to use multiple-images in certain sequences and that we wanted the film to end up in the so-called "Cinemascope" format—that is, a 2.35 aspect ratio. The question was: how to get all those opticals into it and blow it up to 35mm with the least loss of quality?

We eventually made tests at several optical houses, but the first one we went to was Pacific Title. There's a very bright guy who works there named Dick Bond and he came up with an excellent suggestion as to the way to go. We had originally assumed that we would go from the ECO original directly to a 35mm anamorphic negative, which meant that we would have had to use anamorphic lenses in positioning and printing our opticals—putting the squeeze in at that point, while selecting the sizes and positions of the various images. It was just too much.

Bond came up with the suggestion that we go from our ECO original directly to a Techniscope negative, with the opticals put in, flat-to-flat, all in one generation. That would mean that the only thing standing in the way of the release prints would be the 35mm anamorphic matrices that Technicolor would make in the course of their

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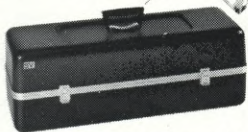


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standard Techniscope printing process. They would put the squeeze in at that point and there would be no additional generations involved—no inter-negatives or inter-positives to dilute the quality. I might add that Technicolor has, far and away, some of the best anamorphic lenses in the country.

At any rate, that's the way we elected to go—and it was a good decision.

### Multiple-images... and How They Grew

The decision to use a multiple-image treatment for certain sequences of "WOODSTOCK" developed as the result of something that happened quite naively two years ago, just after we had shot the Aretha Franklin special and were about to start editing the footage. At that time, I had never been to a World Fair and had not seen any of the great multiple-image documentaries—not even those made by Francis Thompson.

Anyway, we had all these miles of footage of the Aretha Franklin concert, and I was searching for some way of viewing the rushes so that I could see, simultaneously, what all of the cameramen had been shooting on a particular sequence. This was so that I wouldn't have to run one cameraman's work all the way through and try to remember what he had done while I ran the next one.

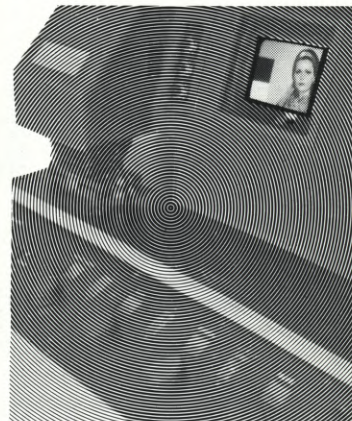
I had done a little work in television and I loved the idea of being able to see everything at one time—a selection of images, each on its individual monitor. So I got six Graflex projectors, installed sync motors in them myself, and set them in a row so that we could project up to six images side-by-side on the screen simultaneously.

I remember that we set up one scene on the multiple projectors, in which three of the cameramen, quite by accident, had started with closeups of identical size on Aretha Franklin's head. One was shooting from the front and the other two from opposite sides. It was like looking at three sides of a cube. Then, suddenly, one of the cameramen peeled off to a shot of the bandleader, another peeled off to the girl side singers, and the third peeled off to an audience reaction shot. The effect was incredible—like a three-ring circus. We were stunned by what we saw.

We went ahead and edited the film in a single strip for television, but it was that incident that convinced us that we would have to use the multiple-image treatment, if and when a legitimate vehicle for its use came our way. That

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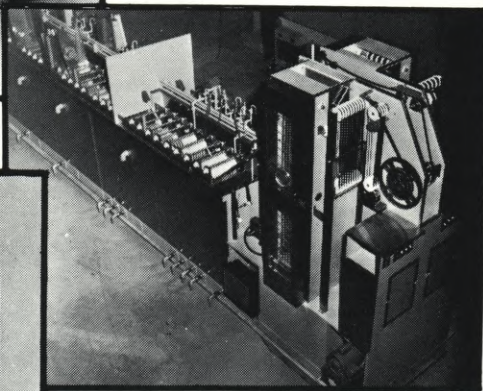
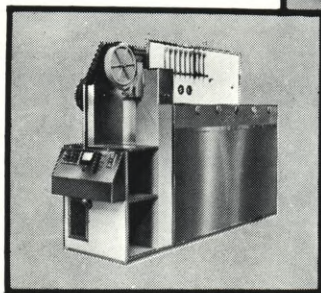
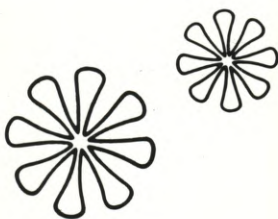
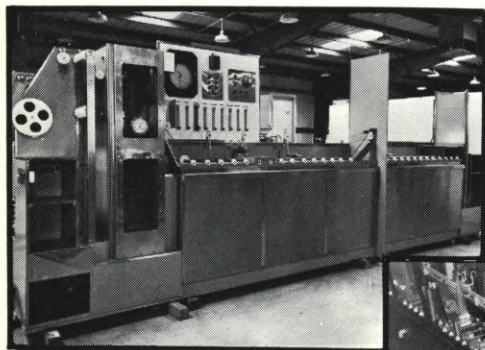
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vehicle, as it finally turned out, was "WOODSTOCK".

In the meantime, we had imported the first Amandus Keller editing machines into America. This was two years ago, when we were still based in New York City—and for a whole year no one in this country had them but us. These machines were to prove invaluable during the fine-cutting stages of "WOODSTOCK".

120 hours of film is a lot of footage, no matter how you cut it. I know there have been feature pictures on which they've shot that much, but in such cases, the great bulk of the film was used up on repeat takes of the scenes.

All of our film, by way of contrast, was "Take One" footage, and it was a huge chore to cut it down to screenable length for the theatres. We had filmed 36 different groups of entertainers, and we eventually whittled that down to a total of 14. The choice was made on the basis of two criteria: what their music had to say, and how good they were as performers.

Our first cut ran seven and a half hours in length, including finished opticals for the multiple images. We chipped away at it, dropping certain groups entirely and complete musical numbers, until we got it down to four hours. The hardest part was to get that last hour out of it, in order to end up with the three-hour version now playing in the theatres.

I have to give credit to Cinema Research for the beautiful job of optical printing they did on the multiple-image sequences. The difference between their liquid-gate work and that of some other opticals houses is like night and day.

Many of these opticals had to be done over six or seven times because, since we didn't want to go more than one generation beyond the original, each of the several images had to end up with perfect timing and color balance on the same strip of film. For example, if the last image of a four-image scene was off in timing, it meant that all four had to be printed over again from scratch. The technicians were going out of their minds with all of the scenes that had to be re-done, but they kept at it until it was right.

The handling of the separate shots that went to make up the multiple-image sequences began with a review of the work-print in its regular 16mm format. Our first step was to project the scenes side-by-side in a rough arrangement of how we thought they should go. However, it became evident that we would want to use only partial areas of certain scenes. Decisions as to the sizes,

shapes and placements in the wide-screen frame for the various images were worked out on the Keller screens, using standard masking charts which accommodated the plotting of 12 different configurations in terms of an East-west, North-south grid system.

Thelma Schoonmaker and I sat in front of the screens and plotted out the fields for the shapes, sizes and numbers of images to be used simultaneously. If a single image were selected, that didn't mean that it would necessarily be printed as a standard composition. It might be cropped top and bottom to fill the whole width of the screen, or part of the screen, or become a square, or whatever. We used two code designations—one for the size and shape of the image, and another to indicate its placement within the wide-screen frame.

It took a lot of tedious work to plot all of that out, but we couldn't leave it to someone else. It was a basic operation that we had to do ourselves.

#### Getting the Sounds Just Right

The home-stretch operation—and the critical one for a film like "WOOD-STOCK"—was the building and mixing of the final stereophonic sound tracks for release projection.

The monophonic sound recorded on the Nagras for the documentary sequences was handled in standard fashion, but the 8-track stereo recordings of the musical numbers required a lot of very careful handling. When you're recording in the field as we were, any number of things can go wrong—buzzing sounds on the tracks and everything else.

Our first step was to take the whole thing into the recording studio and make an 8-track to 8-track transfer, with equalization, pre-compressing, filtering, and you-name-it. We doubled up on audience tracks and did everything we could think of to improve the sound in that one transfer. We also employed the Dolby system, which is a method of repressing tape noise from generation to generation by holding down the signal-to-noise ratio.

We then built any number of applause tracks, effects tracks, and audience reaction tracks to solve our various problems. Next, we transferred everything to 35mm magnetic film and took it all into the Warner Bros. re-recording studios for the mixing sessions. We were to end up with 4-channel stereophonic sound—a left, center and right channel, plus a surround channel.

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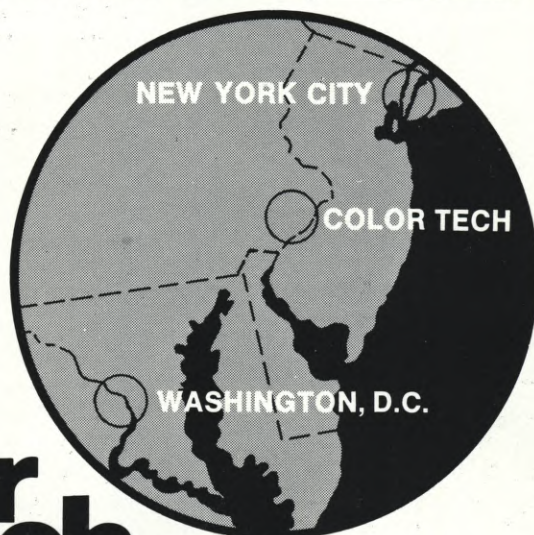
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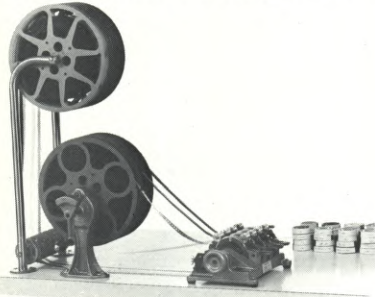
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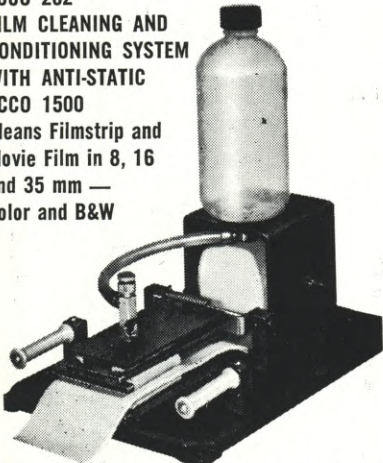
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screen by surrounding them with the reactions of other people. For example, at Woodstock, Country Joe yells at the audience for a response and you hear 400,000 people screaming back at him. When that happens in the theatres people start participating, because it sounds like there are other people behind them who are participating.

We did some other interesting things with that surround channel, also. When Joan Baez does her hauntingly beautiful *a cappella* rendition of "Swing Low, Sweet Chariot", we put an echo transfer of her voice into the surround channel, so that it sounds like it's rolling off the hills—a rather striking effect.

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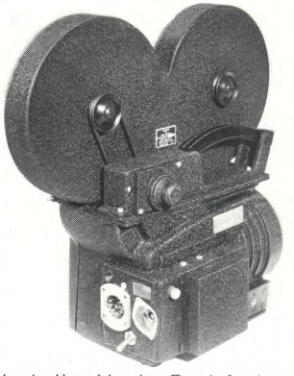
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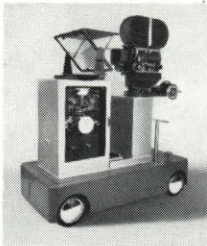
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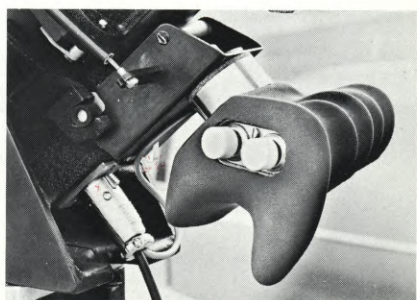
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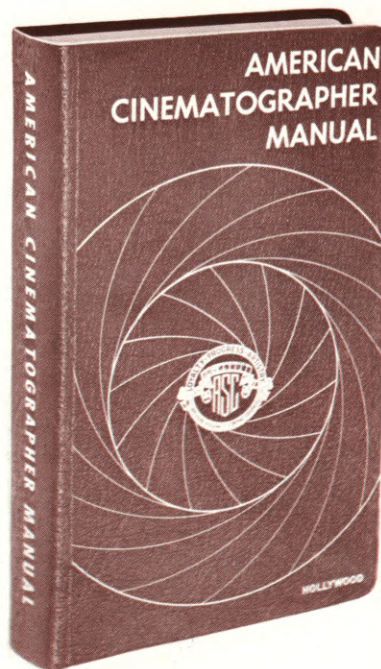
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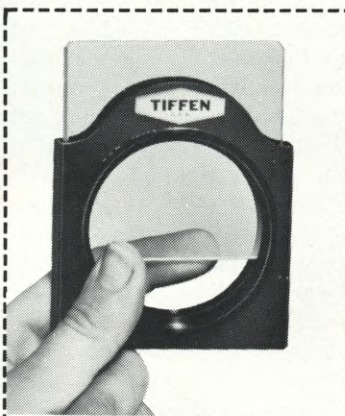
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## CINEMA VERITE

Continued from Page 994

individuals and action. If they are nervous about their equipment, the subjects will reflect their feelings much as pets often mimic their masters. If equipment is simply an unobtrusive outgrowth of warm and competent personality, fear and camera-staging will not be a problem.

For such work, the Eclair NPR camera is ideal because it loads in seconds by switching magazines with no fuss, and there are 400 feet of film in each. The universal eye-piece allows the Eclair to be put into action while it seems to be resting innocently on one's lap. It is silent, etc. If, at first, its size is intimidating, that same size also looks "professional," thus eliciting respect. Almost everyone becomes used to, almost oblivious to a well-wielded camera.

Likewise the Nagra IV. This can be helped along by discarding earphones (everyone shuns the man from Mars); if monitoring is required, a single hearing-aid earpiece suffices. A small cue pole provides a tight microphone with a minimum of physical intrusion. Of course a selection of microphones is useful: realistically, fast-moving action usually requires one to be the work horse. Yes, equipment enhances performance. In the final analysis, however, the essential piece of equipment is the man himself.

Requirements for the first cameraman seem to fall into two categories: technical acumen and a refined creative sense with film and men. Fascination with the possibilities of the first cannot obscure the second. Human beings are where it's at. He uses his camera to capture and to construct scenes which will become a coherent, revealing record. In one sense he makes a deliberate effort not to interfere or to impose a priori judgments.

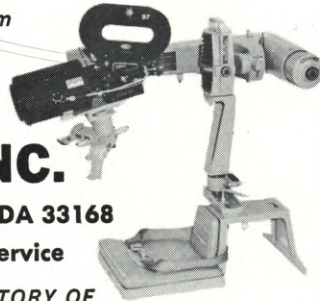
One of the values of *CINEMA VERITE* is the knack of responding to the mercurial expressions and introspections of men. Credence must be given to the desire to show things as they really are. However, were this laboriously done, the footage would be an exercise in tedium. Take that hypothetical sailing/climbing film for example, 99 and 44/100ths percent of the time is consumed with repetitious activity, the daily chores of life. These are more alluded to than recorded literally. What is needed is a series of sequences.

Film-making is taking a huge lake, siphoning off a portion, then distilling that sample into an infinitesimal fraction, thus giving the viewer insight into

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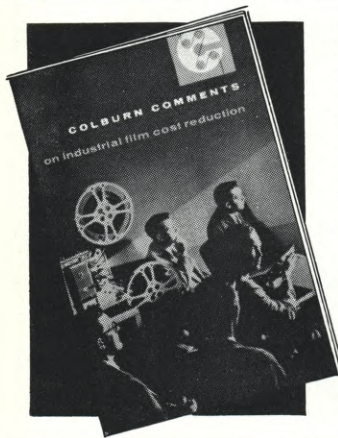
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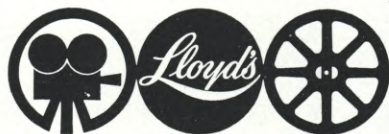
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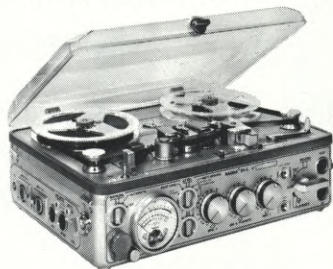
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the whole. The product is like a statement in twenty-five words or less about life, man and his world. A concrete example: a team consisting of Michael Wadleigh, Groesbeek, and Fred Underhill spent *six weeks* in the Wind River Mountains of Wyoming filming Paul Petzoldt's National Outdoor Leadership School. They returned to New York with upwards of 24 hours of film. The result was a *one hour* TV special for LIFE/ALCOA.

The above proportions tend to let the film-makers relax. An hour from six weeks! Surely there will always be enough material. In reality, the opposite is the case. From a film-maker's point of view, such an educational expedition into the wilderness can be a trial of boredom and frustration. It snowed for the first twenty-three days! In a well-run school/expedition too little happens to rely upon the doctrine: begin shooting a pregnant-appearing scene and abort if it doesn't develop. That is too passive; that standard of what is interesting is too nebulous. A more aggressive approach is the only solution; one must get on top of the action. A "Rat Patrol" of ten was chosen from a student group of over a hundred. The ten later were sifted down to just five. Artists mould their medium, the subject matter. Living with the "Rat Patrol," the film-makers came to know their subjects, gained their confidence, and were able, in part, to nudge them into doing worthwhile things for the film.

The practical consideration of finances is never very far away in such an expensive endeavour as film. The first cameraman and his work is the most expensive unit. He is the core and balance-wheel. But the financial weight, so heavy on that member of the team, has a releasing effect upon the soundman. Tape is cheap. Thus the soundman has more freedom, a freedom which is pregnant with power. His ideal is to gather enough tape beyond sync footage that an authentic audio track can be used throughout, precluding the need for a narration. He has to record several times the total footage of both cameramen.

When the sun goes down the cameramen are all but out of business on an expedition which precludes the use of artificial light. Part of the soundman's work is just beginning. With the day's activity over, people become less defensive (equipment is less obvious in the dark).

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up scenes. Suppose the situation is a mountain climb. Before rolling up in his sleeping bag, the soundman tours the other tents. Plans are being laid, there is debriefing on the previous day. One climber says that he will succeed or fail the next day, and says it well. Voice-over for part of tomorrow's footage is collected. More than that, instant replay for the benefit of the two cameramen gives them advance warning who to watch, what to watch for.

In filming sync sequences less concentration on the technical process is required of the soundman. His eyes are free, one or both ears are free, and he has greater freedom of movement.

"Presence" is a prime justification for situation filming. It compels the viewer's vicarious participation. Sight without sound fails to do this, Henry Mancini scores notwithstanding. Location sound and/or voice establish presence. The viewer's empathy is captured because "his mind's eye is transported by his ears." The Americans-on-Everest film failed because it was a misalliance of two arts: silent footage which portrayed largely low-key effort, and a narration by James Ramsey Ullman which spoke of the grandeur, excitement and achievement. It would seem Ullman should not be faulted, perhaps he felt motivated to tell more of the real story than the film did.

Had the advice of the Everesters: "Don't bother with sound, there's nothing but panting and grunting—not worth it—impossible" been taken, Wadleigh and Groesbeek's film of a climb of over 21,000 feet in the Hindu Kush might not have received the acclaim it did. For the first time on film the viewer not only saw but *heard* the agony of men at high altitudes. Of what impact is a picture of a man slumped in pain if you cannot hear that compulsive heaving, gasping for breath? Of what use the dance of glee at the summit if you cannot hear the trite, "We made it!"

As the cameraman forms the visual impact, so the sound man "writes" the script. That process of "writing" should be examined; it is not done by putting pen to paper. It is constructed by awareness, non-directive counseling, recording skill, and the ability to retain and contain weeks of sound and voice in relation to pictures. The plot is in the subject matter, the individuals and situations. He must see it, improve it, select it. It is in voice, sounds of activity and of the natural forces.

He can also compose the musical score. For example, in the Hindu Kush porters formed an orchestra and danced, children sang, etc. An account of the

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children demonstrates how one's instincts must devour opportunity. The indigenous population was extremely modest; Groesbeek in shorts became the object of ridicule. It was hot! A group of children taunted with a chant. Kids are neat: Groesbeek clowned back at them and recorded their singing response. It was played back; immediately they saw the game and performed. On the National Outdoor Leadership School job a student stood by a campfire and improvised cool jazz, another played his bagpipes at the top of a steep mountain pass. No more appropriate musical scores could be conceived. Once they are established on film, such sounds intensify visual authenticity.

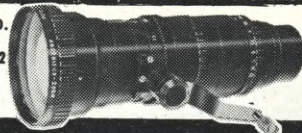
At Woodstock, music was so much the primary scene that very little of it could be used effectively to cover shots of action occurring off-stage—the mass, the environment, itinerant people, etc. What sounds were there? Popping through mud, farm noises, wind and insects in the grass, the mystical incantations, voices, wild and sync—so much noise that it was difficult to hear anything. At Woodstock, if you were interested in film as essay, there was the whole magnificent sociological event. Concern for that kind of literary content provided one hour of the three-hour phantasmagoria, "WOODSTOCK".

The second cameraman's work varies according to the particular need and characteristics of the film. Regardless of his personal shooting rhythm, style and technique, his responsibility is to establish context, provide detail studies, and shoot various photographic essays and montages which will be used to explain an experience or provide stimuli for the viewer's imagination. His relation to the primary film work can run from aloof indifference, to a still photographer who happens to be shooting with an Arri-S and waiting for orders, to an aspiring feature man always challenging to get a piece of the action. You name it. The ideal may be one of two alternatives. First, a film-maker of proven success in purely visual creation. He would then have a strong, well-disciplined point of view and style. This should include a penetrating insight into using film and related technology, with moody sensitivity or in spectacular display—hopefully both.

The ski and nature films of Summit Films, Denver, are an outstanding example of this combination. (see *AMERICAN CINEMATOGRAPHER*, April, 1970.) One of their men, Bob Fulton of Aspen, composes in the camera and

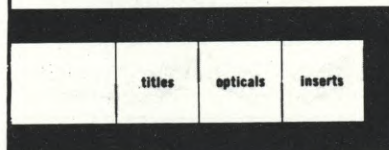
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shoots very close to a 1-to-1 ratio in his films. He remarks: "You learn to speak 1-to-1; why not film 1-to-1?" Now he is into a one-man sync-sound show. As a second cameraman on, say, a TV special, you would turn him loose "to do his thing" and sit back and smile at the editor's ecstatic reaction.

The second type of "alternative" technician would be a competent cameraman well aware of the intricacies of plot and broadly experienced with film in general. He would become integrally involved in the main operation and complement it step by step. Fred Underhill did this for the previously mentioned LIFE/ALCOA special. He was in his glory at Woodstock with a fantastic array of monster lenses, shooting either from the sound-light towers or poking about near the stage. Either way, such a man enjoys his assignments. As for the corporate directorship, much has already been said. It would be inadequate without his zealous participation.

### Conclusion

This article began with the observation that credits are a queer mutation of the realities of filming. Actually it was motivated less by resentment and criticism than one would suppose. Film is a complex industry, sometimes art. If you are aggressive about the *doing* of the thing, you may never even see the final product, because something else has become more fascinating or you are on location in Kenya or Spitzbergen.

Many young film-makers feel that such an attitude is aesthetically irresponsible. They want to do and be the whole project. In some respects that is admirable. It also has its hazards.

One, it limits growth and experience because each film takes so long and a small company tends toward professional incest.

Two, it is difficult to be excellent in all things. There are a limited number of geniuses in the population; surely they are all not in film.

Three (this is an aesthetic judgment concerning discipline), if you know you have full control of everything you may be inclined to think inadequacies on location can be made up for later, or you start editing as you shoot. An unfortunate practice to which there are exceptions. It tightens discipline if you know a sophisticated, successful editor will be the first to assess quality. The quicker one's work is subject to impartial, professional judgment, the better.

The excitement of film is where the action is; the validity of *CINEMA VERITE* is in its being a statement about reality.

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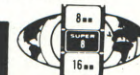
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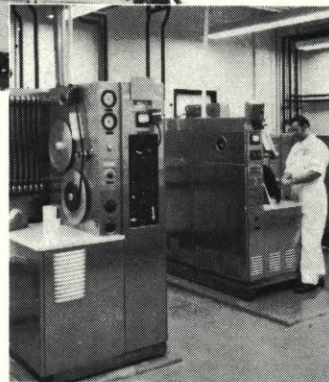
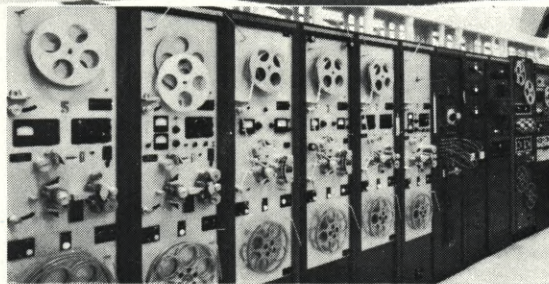
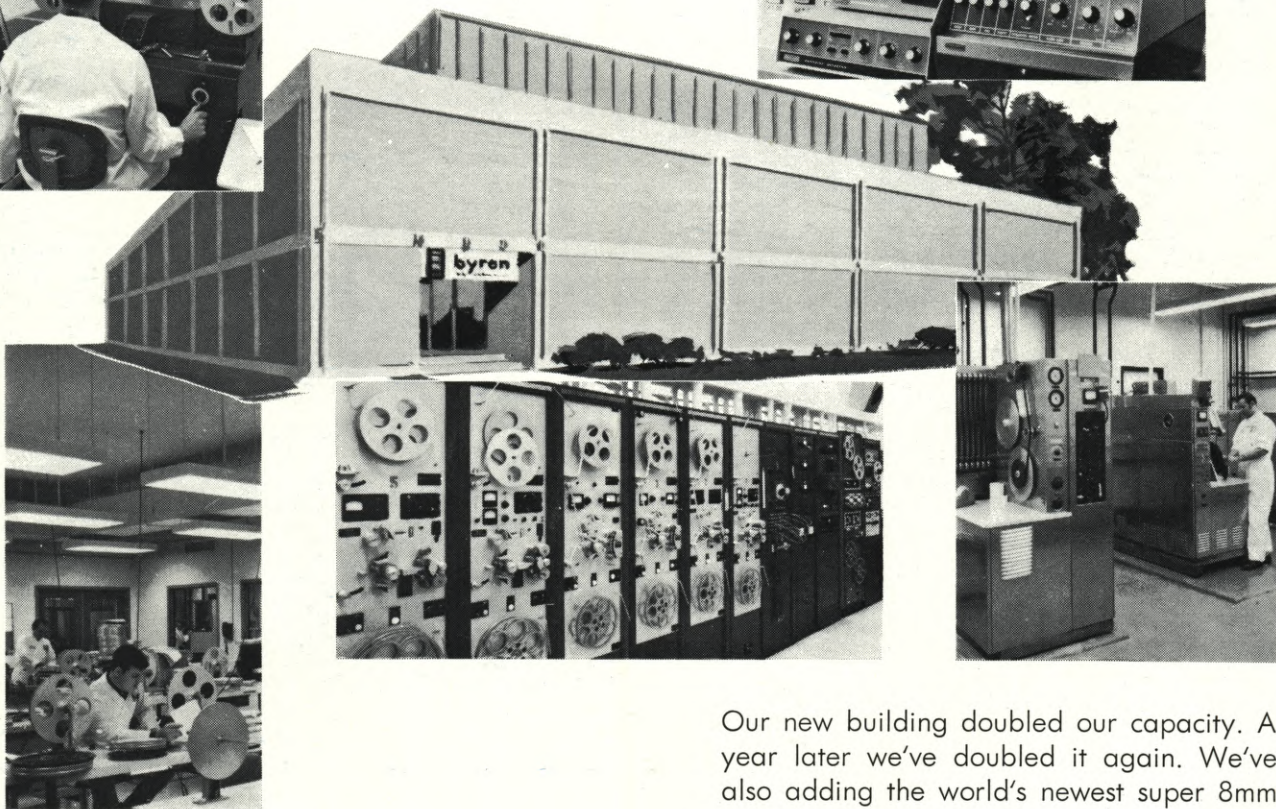
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