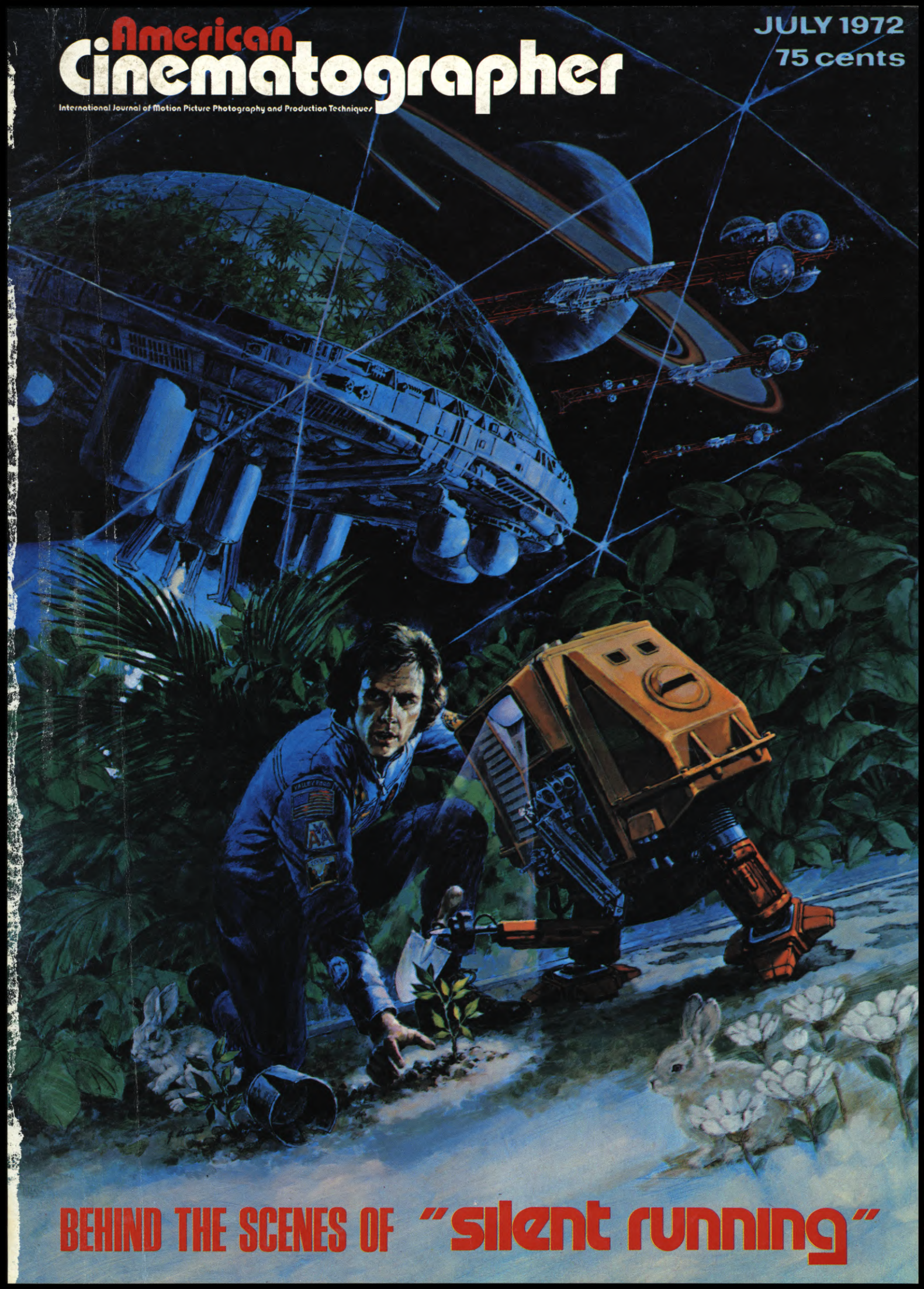


American Cinematographer

International Journal of Motion Picture Photography and Production Techniques

JULY 1972
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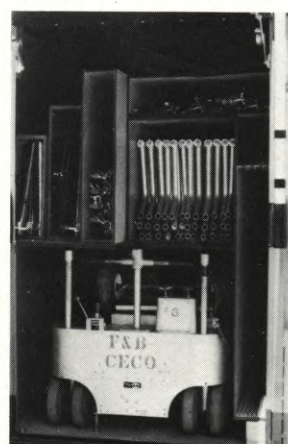
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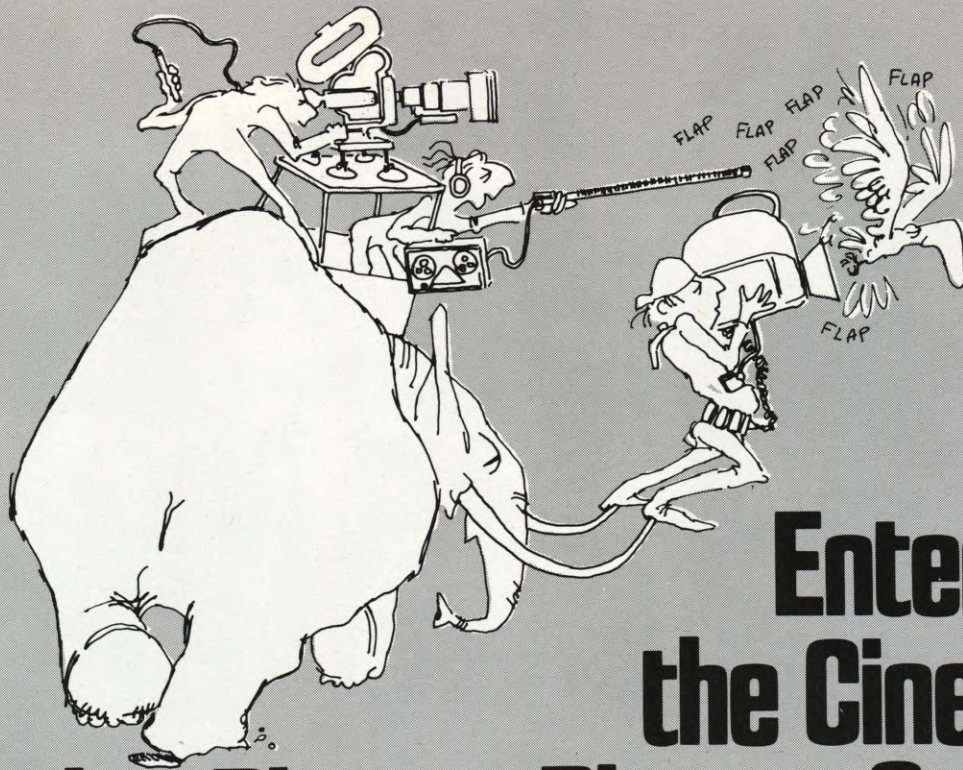


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Enter the Cine 60 Motion Picture Picture Contest.

**Whether you win or not,
you win!**

Every day, it seems, more motion picture people discover Cine 60 products. Often, because of a word from fellow-professionals. *But sometimes, because our equipment is the only practical way to do the job.*

Take our Power Belt, for instance. Available in voltages up to 35 and ampere-hour ratings up to 7½, it's been responsible for making many impossible shots possible. From sky divers in action to skiers schussing down the slopes to motorcycle racing.

The same goes for our Arri-35 Blimp. Our Vacu-Platform. Our Snap-lok. Zoom motors. In fact, just about

every item in the Cine 60 line fills a unique need.

What does all this have to do with a contest? Simple. Because people are so busy *doing things* with Cine 60 products, they don't have time to take pictures of how our equipment does the job. So we have few photos to help show others what they're missing.

Result: our contest

Any cinema professional or student is eligible. All you need is a photo you've taken of our products *in action on location*, along with a brief note describing the situation and production (name, location and name of people in the picture). For other rules, see below.

While you're at it, why not ask the people using our products what they think of Cine 60 equipment? You'll discover why many have become industry "standards"—for reasons like comfort and lack of restriction; compatibility with all types of cameras; unusual flexibility; and day-in, day-out reliability. In fact, you may even want to try some Cine 60 equipment yourself. (We'd like that!)

Now that we've made it more interesting than ever to find out how Cine 60 can help you make the most of your talent, we'd like to hear from you. At the very least, you'll discover why so many people think of Cine 60 when they think of camera accessories. Which will make you a winner by itself.

CONTEST RULES

1. Any cinema professional or cine student is eligible.
2. All contestants must submit an 8 x 10" glossy photograph, which they have taken showing the Cine 60 Power Belt in action, on location, *during an actual production.*
3. All photographs must be accompanied by a signed letter from the photographer, describing the situation, production (name and description), and names of all people recognizable in the photo.
4. All photos and letters entered become the property of Cine 60 Incorporated, and will not be returned.
5. Photographs will be judged on the basis of artistic and technical merit, uniqueness, and illustration of the Power Belt in action.
6. Prizes will be as follows:
First Prize: a Cine 60 Sun Gun Power Belt and Sylvania Sun Gun (value: \$418.50)
- Second Prize: a Cine 60 Power Belt for Arriflex, Eclair, or other equivalent camera (value: \$269.00)
- Third Prize: a Cine 60 electric zoom drive of the winner's choice, or comparably valued Cine 60 accessory (value: \$365.00)
7. In all cases, the decision of the judges is final.
8. Prizewinners' photographs may be used in Cine 60 advertising. In such a case, receipt of the prize will be considered compensation.
9. If other (non-winning) entries are used in advertising, suitable compensation will be arranged by mutual agreement between Cine 60 and the entrant.
10. Employees of Cine 60 Incorporated and its advertising agency are ineligible.
11. All entries must be postmarked no later than Sept. 30, 1972.

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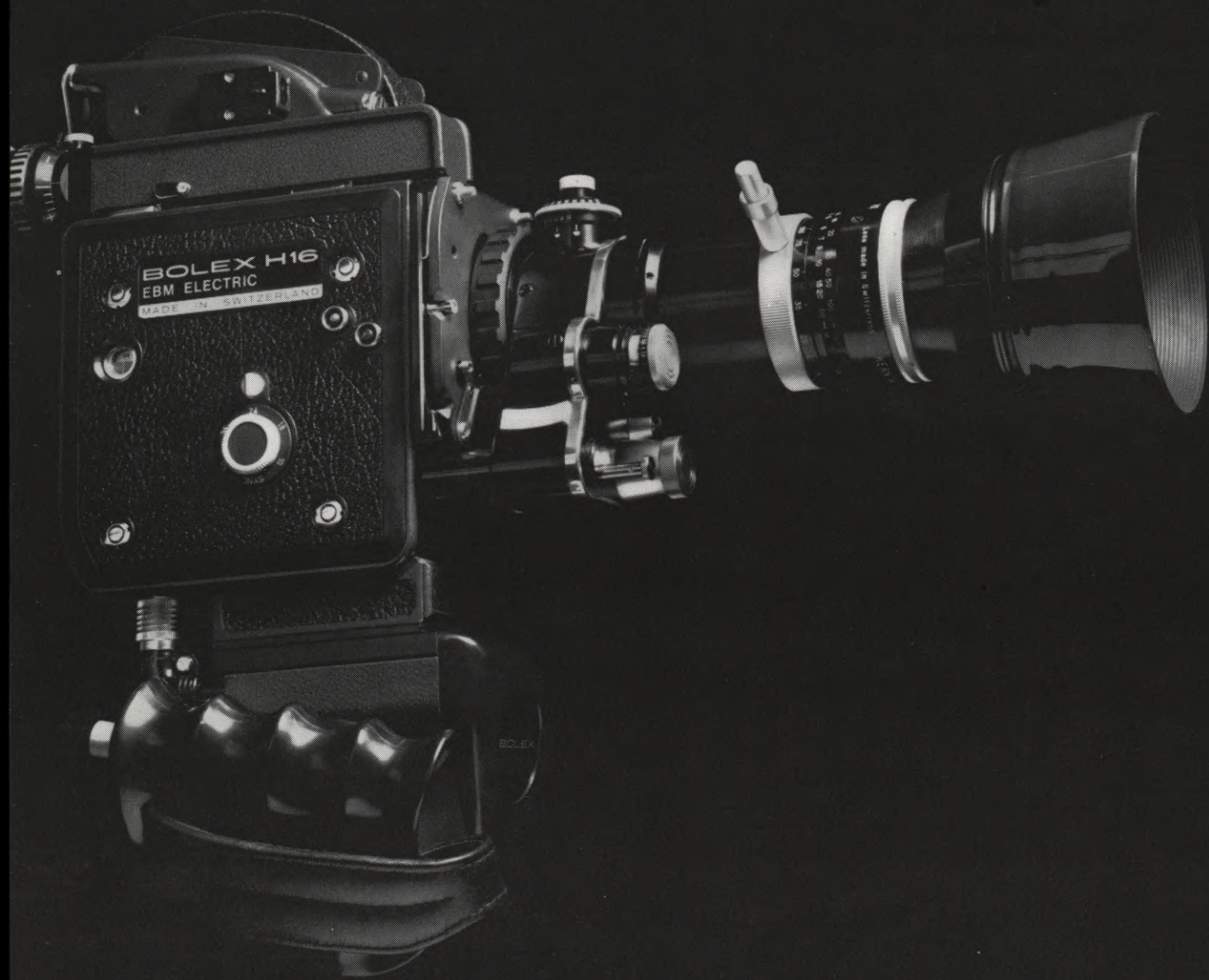
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ON THE COVER: Posterization of the dramatic elements featured in the space adventure epic, "SILENT RUNNING", a Trumbull-Gruskoff Films Production for Universal Pictures. Poster art courtesy of Universal Pictures.

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NOW THERE'S A PROFESSIONAL 16MM ELECTRIC AT THE PRICE OF A BOLEX.



Because it is a Bolex.

The new Bolex EBM Electric 16. With all the solid, dependable features you associate with Bolex. Plus built-in motor, and rechargeable 12-volt battery contained in the most comfortable grip you ever held in your hand. A compact, easy-to-handle, thoroughly professional 16mm camera. At a price that should put an end to rentals forever. \$1200 and it's yours to own.

The motor is electronically controlled for accurate, steady running at speeds of 10 to 50 frames per second, and 24 and 25 fps for synch sound. An easily attachable 400' film magazine is also available.

The EBM has flickerless ground glass reflex viewing and focusing with 14X magnification. Plus a handy behind the lens filter

slot arrangement. And the camera incorporates the famous Bolex registration claw that assures rock-steady images.

Equipped with the Vario-Switar 16-100mm zoom lens with electric-eye through-the-lens light metering and power zoom, the EBM becomes the most automated professional camera. (NASA chose Switar lenses for use in the Apollo flights.) A dozen other top quality fixed focus and zoom lenses are available, all incorporating the bayonet type lens mount for instant lens changing and locked ring security.

Accessories for the EBM include a small, lightweight synch pulse generator that rides in a pocket. And a pocket-sized crystal control unit for wireless synch sound filming.

The Bolex EBM has everything a professional could wish for in an electric 16. At a price that sounds like wishful thinking.

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Introducing Vari-flector II

We've made a good product even better!

More versatile than any other reflector. More rugged and easy to use than ever before.

The only reflector that rolls up into a compact case for storage and travel is also the only reflector on the market with a flood control: the Lowel Vari-flector. And now, we've improved it!

New ease of assembly

If you're familiar with the Vari-flector, you already know it unrolls like a roll-top desk, becoming rigid by attaching two side channels and a cross bar. But now, the side channels open wide, making the reflector a cinch to insert.



New ruggedness

The Vari-flector's channels now clamp shut like a vise. Which, with the added protection of a new cross bar locking lever, increases structural integrity... even in high winds.

As compact as ever

The large Vari-flector II (model 404) and stand fit into a 42 x 7" case. And the smaller unit without stand (model 202) fits into a case only 24 x 4½". Both units are compact enough to take to the most remote locations.

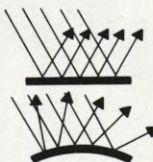
Superior stand-mounting

Rugged, lightweight Vari-flector stand (model VS) assures positive tilting, panning and height adjustment, providing horizontal, vertical and diagonal reflection and flooding. Center spike can be forced into soft ground for added wind stability. Extendable leg levels stand on uneven ground. (Incidentally, many gaffers have taken to using our VS stand for large lights, cutters, etc.)



Exclusive flood control

Vari-flector's brilliant, extremely even light pattern can be instantly softened and spread out (as much as 3:1) with its finger-operated cam lever.



You can continuously adjust the degree of flood to prevent "washing out" subjects as they approach the camera.

Works indoors, too

Vari-flector is an excellent studio or location "source", reflecting artificial or window light. And it's especially useful where space and/or power restrictions exist.

Cleans with soap and water

The aluminized surface resists stains and scratches; eliminates frequent, expensive resurfacing.

Choose from two sizes

Model 404, measuring 42 x 27" opened, and model 202, 24 x 18".

For more information

... visit your Lowel dealer, and try the Vari-flector II for yourself.

For his name, or further information, contact us.

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SONOREX 16/16 INTERLOCK PROJECTOR

The concept of the interlock projector was followed through to near perfection in the design of this remarkable machine. Its operating features make the SONOREX 16/16 one of the most versatile production tools ever built. Its capabilities in recording, transferring, mixing and playback, provide virtually unlimited applications. In all, this 16/16 Interlock provides the filmmaker with in-house, time-saving, money-saving advantages.

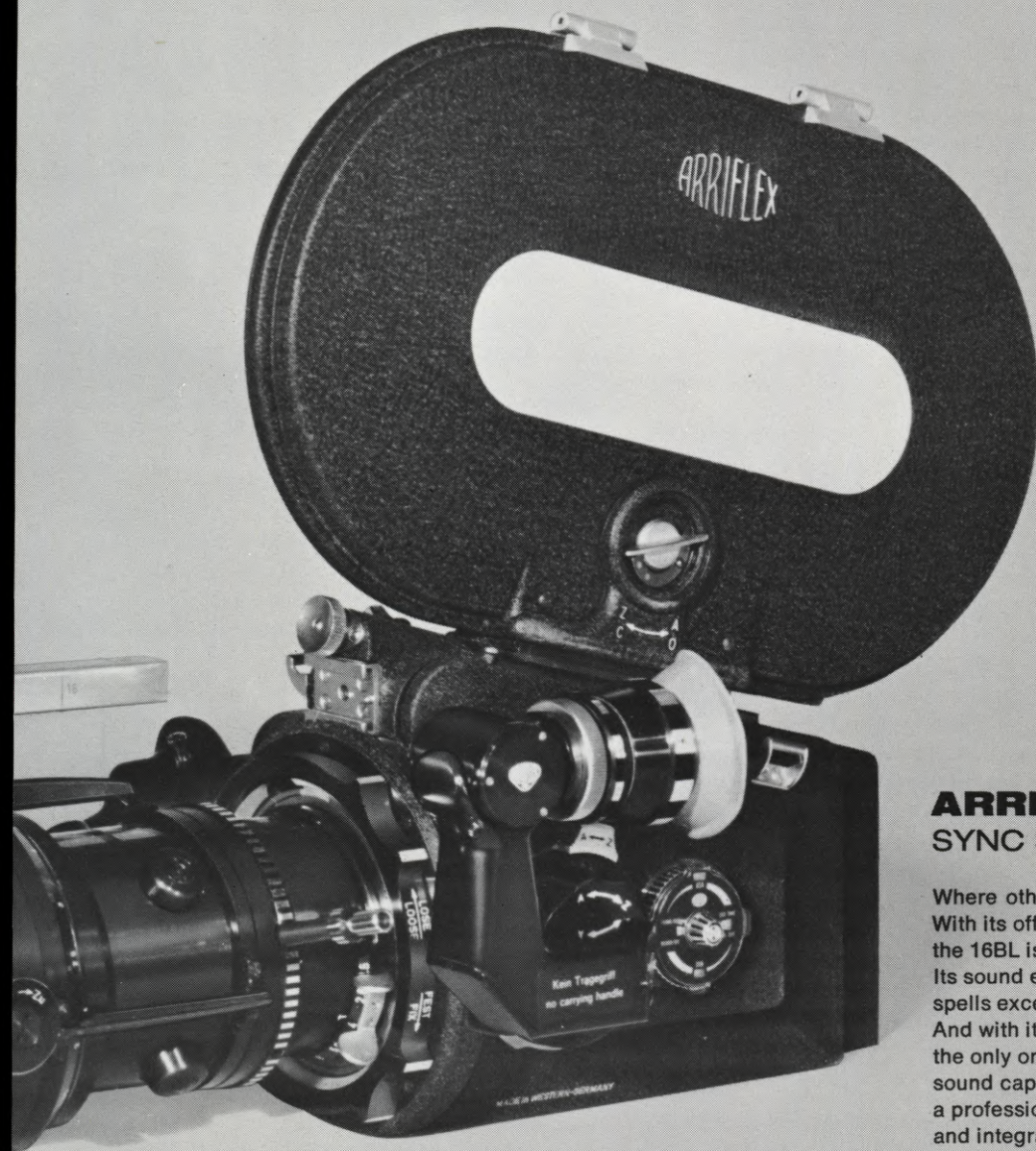
ARRIVOX-TANDBERG RECORDER

Here's the first true alternative in professional 1/4" sync sound recorders. In performance and features, it compares to the best, yet it's priced surprisingly low. It brings professional quality recording within the means of every filmmaker. Before you buy a 1/4" sync sound recorder, take a close look at the Arrivox-Tandberg and decide for yourself if you need any more.



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One complete family of professional motion picture products—from original picture and sync sound to sound transfers and more. Each one assuring you of ARRIFLEX excellence, versatility and performance on every level of operation.



ARRIFLEX 16BL SYNC SOUND CAMERA

Where others promise, the ARRIFLEX 16BL delivers. With its off-the-shelf, ready-to-go features, the 16BL is today's pacesetter.

Its sound engineering and rugged construction spells excellence in every phase of cinematography. And with its line of accessories, the 16BL is still the only one that offers single and double system sound capability; a 1200 foot magazine; a professional exposure control system; and integrated motorized zoom.

The ARRIFLEX 16BL delivers what others promise.

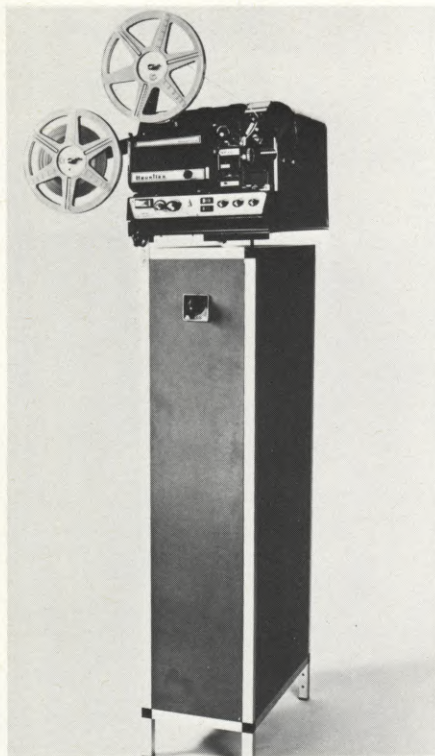
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WHAT'S NEW

IN PRODUCTS, SERVICES AND LITERATURE



HEURTIER ST 42 STEREO XENON SUPER-8 PROJECTOR AVAILABLE FROM HERVIC

Hervic Corporation/Cinema Beaulieu, exclusive United States distributors for the fine line of Heurtier Super-8 and Dual 8 Projectors, is proud to announce the availability of the Heurtier ST 42 Stereo XENON Super-8 Projector.

The Heurtier ST 42 Stereo XENON Super-8 Projector now makes it possible to project Super-8 footage in large theatres (up to 1000 seats), and the projection quality of the Super-8 footage is truly superb. Due to the weak light source of Super-8 projectors, projection of Super-8 footage to large audiences in theatres has not been possible up to now. However, the Heurtier ST 42 Stereo Xenon Super-8 Projector has been equipped with a Xenon lamp system in order to provide the required light intensity to project Super-8 films in theatre-sized areas.

The Heurtier ST 42 Stereo Xenon Super-8 Projector consists of two parts: (1) the Projector itself, with automatic lamp starter, blower, ammeter and hour counter; and (2) the pedestal with rectifier, 6-step switch and height adjustment for projector (with extra space for storage of the loudspeaker, microphones, earphones, film, etc.).

Other features on the Heurtier ST 42 Stereo Xenon Super-8 Projector include:

- ★ High quality Stereo sound
- ★ Transistorized Amplifier
- ★ Choice of Projection Speeds: 18 and 24 f.p.s.
- ★ Forward and reverse Projection (double claw system)
- ★ Automatic Film Threading (manual threading possible)

The Heurtier ST 42 Stereo XENON Super-8 Projector is supplied with a Schneider Xenevaron 12-30mm, f1.3 zoom lens. Available separately is a General Electric Xenon lamp, type XE 500 EAR (500 Watt).

The price of the Heurtier ST 42 Stereo XENON Super-8 Projector with General Electric Xenon lamp is \$5,123.20.

For further information, write Hervic Corporation/Cinema Beaulieu, 14225 Ventura Boulevard, Sherman Oaks, California 91403.

changed with the longer 7½" and 10" units on existing lenses. Of course, all of the popular zoom lenses, including the 9.5-57mm, 9.5-95mm, 12.5-75mm, 12-120mm and the 12-240mm now may be ordered with these new finders.

For further information contact Bern Levy, Angenieux Corp. of America, 440 Merrick Road, Oceanside, N.Y. 11572.



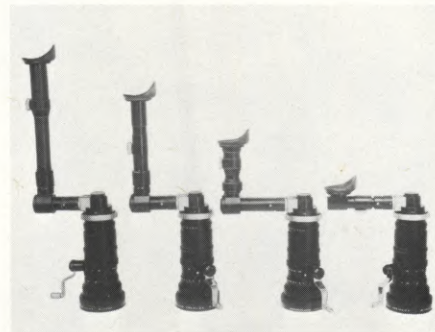
NEWLY DESIGNED, FULLY ADJUSTABLE SHOULDER POD

Peter-Lisand Machine Corporation of Edgewater, New Jersey has announced a newly designed shoulder pod that is simpler to use, uncomplicated in design and easier to maneuver. The camera pod offers unique construction advantages and features that will appeal to producers, cameramen in motion pictures and television, and operators of in-plant industrial communications centers.

An outstanding feature of the Peter-Lisand shoulder pod is the fact that it is fully adjustable. It adjusts five different ways: up, down, forward, backward, plus a shoulder adjustment to make it accommodate any camera angle or fit any cameraman. It has an adjustable camera slide, permitting the cameraman to slide the camera forward and backward with greater ease. The cameraman's hands are free at all times to zoom, iris or focus, no matter what make flat base camera is used.

The all-aluminum machined construction feature of the shoulder pod, as opposed to the more common casting construction, makes it exceptionally lightweight. The total weight of the camera pod is only 3½ pounds, making it extremely easy to handle.

"There is one feature we're particularly proud of," reports Mr. Guasti, Continued on Page 805



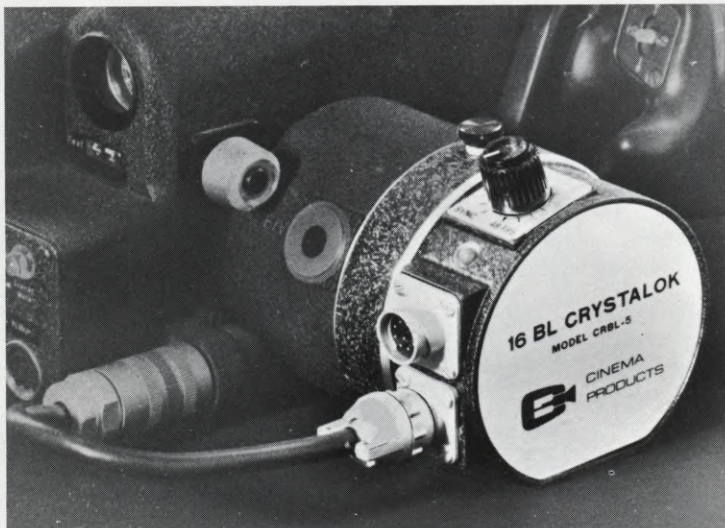
ANGENIEUX NOW OFFERS FOUR SIZES OF VIEWFINDERS

In addition to the 7½" and 10" viewfinders, Angenieux Corporation of America has introduced two new short viewfinders: the CVIII, a swivel-type 3½" and the V30, a fixed one inch.

Both of these compact finders were especially designed for the shoulder-held type cameras, which require the eyepiece to be located near the film plane in order to balance the camera properly on the shoulder. In addition, the CVIII and V30 configurations have the eyepiece offset from the axis of the lens by approximately 4½", permitting the eyepiece to be placed in a wider selection of positions than previously possible.

Both short viewfinders may be inter-

"Talk about Crystal Control!"



Everyone's talking about the new 16BL Crystalok, which makes crystal sync recording with your Arriflex 16BL a reality at a price you can afford. Designed and developed by the Academy Award-winning Cinema Products and available from AGE Inc., 16BL Crystalok requires no modification of your BL camera or battery. The small, compact 16BL Crystalok slips over the end of the Arri motor housing and is held in place by three thumb screws. Ready to operate in seconds. A switch on the 16BL Crystalok allows you to shoot 24 fps in crystal sync or variable speeds from 14 to 48 fps. The 16BL Crystalok offers the ultimate in quality and reliable operation, incorporating high efficiency, solid state integrated circuitry and high accuracy.

Price: \$775.00

16BL Crystalok unit,
complete with power cable and connector



No connecting cables necessary

FEATURES:

- Frame rate 24 fps forward only in crystal mode, ± 15 parts per million over temperature range of 0° to 140°F. (The 16BL Crystalok will drive cameras geared for 25 fps at 25 fps sync.)
- Frame rate in variable speed mode is 14 to 48 fps. Accuracy factor $\pm .05\%$.
- Power supply: standard Arriflex 12V battery. No changes required in camera or battery.
- Works compatibly with any Universal motor (i.e., type without forward/reverse switch.)
- Comes ready to operate with pigtail connector.
- Extremely compact. Projects only 1 1/2" beyond motor housing when installed.
- Lightweight — only 14 1/2 oz. complete with cable.

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Dick Borden, Borden Productions, Inc., uses the unique and highly versatile 1P in his patented "Camera Gun" to capture award-winning action wildlife sequences for such clients as ABC-TV, National Geographic, Walt Disney Productions, etc.



This new camera, Model 1PD, designed to meet the more sophisticated requirements of documentation and sports, is a direct by-product of Photo-Sonics' 36-year record of meeting and exceeding the most rigid specifications for cine and high-speed motion picture photography.

Outstanding features include . . .

- Rugged construction
- Movement: 2 pulldown, 2 register pins.
- Speeds, 16 to 200 fps, to 500 fps optional.
- Continuous reflex viewing; image always correct. 360° rotation perpendicular to film plane, 360° rotation around viewer centerline.
- Interchangeable ground glasses.
- Clear gate; no spring loading of pressure plate against film.
- 200', 400' and 1200' daylight load magazines

change in five seconds.

- Designed for use with Arri bayonet mount zoom lens.

Optional features:

- Speeds to 500 fps.
- Pistol grip/shoulder pad.
- Electrical switching between any 2 preset speeds.
- Time lapse.
- "Add-on" automatic exposure control.
- Variable shutter, 7½° to 160°.

*Write, wire or phone
for complete details.*



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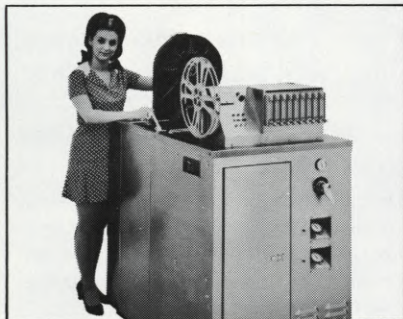
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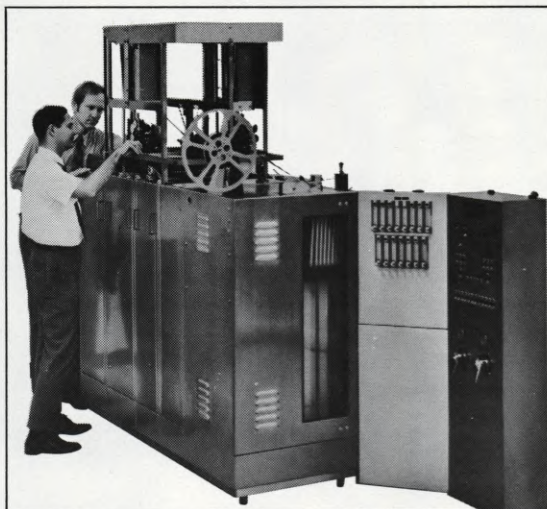
Jamieson Color Film Processors.

Basic features of all Jamieson color film processors that give you the ultimate in reliability, simplicity, and high quality output.

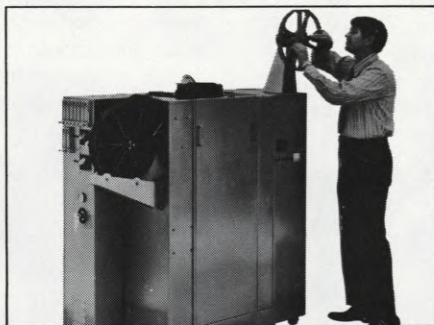
- Advanced design technology
- The industry's gentlest, most reliable film transport system
- Patented tube tanks of PVC
- Minimum chemistry requirements
- Precise temperature control
- High levels of induced turbulence
- Fully instrumented
- Automatically controlled
- Fast warm-up time
- Small sizes that save space
- Modular construction
- Stainless steel cabinets
- Color coded plumbing and wiring



Jamieson Compac 16/8. \$6,980. Conducts standard ME-4 at 20 f.p.m. Runs 16mm and 8mm interchangeably. Also available for 35mm/16mm. Other Compac models for B & W reversal and negative/positive.

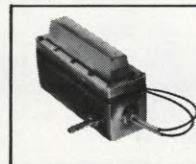


There's a Jamieson color film processor in the size you want, for the process you want to conduct. For complete technical data and specifications on the Mark IX series, Mark IV series, and Compac models, write for our catalog on Jamieson Color Film Processors.

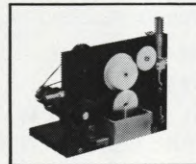


Jamieson Mark IV, Model A. \$11,565. Processes 16mm and 8mm Ektachrome at 30 f.p.m. Model B for ECO-3 and ME-4 with silver track. Other models for 35mm processes, including CRI.

Jamieson Mark IX, Model B. \$26,325. Conducts ECO-3 and ME-4 for all 16mm, 8mm Ektachrome camera and print films at 65 to 75 f.p.m. Other models in the Mark IX series for Eastman Color and other processes in 16mm and 35mm.



Jamieson Ultra-High Velocity Pre-Dryer. Utilizes capillary accelerators to produce high air velocity for surface moisture removal. Small size, easy mounting, small air volume, minimum heat input and low power consumption.



Jamieson's Vacuum Augmented Track Applicator*. Provides absolute film positioning, highest reliability through vacuum assisted contact at back-up roller. Gives maximum power for uniform film drive. Precision machined, micrometer adjustments, right- or left-hand operation.
*Patented

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JAMIESON FILM COMPANY

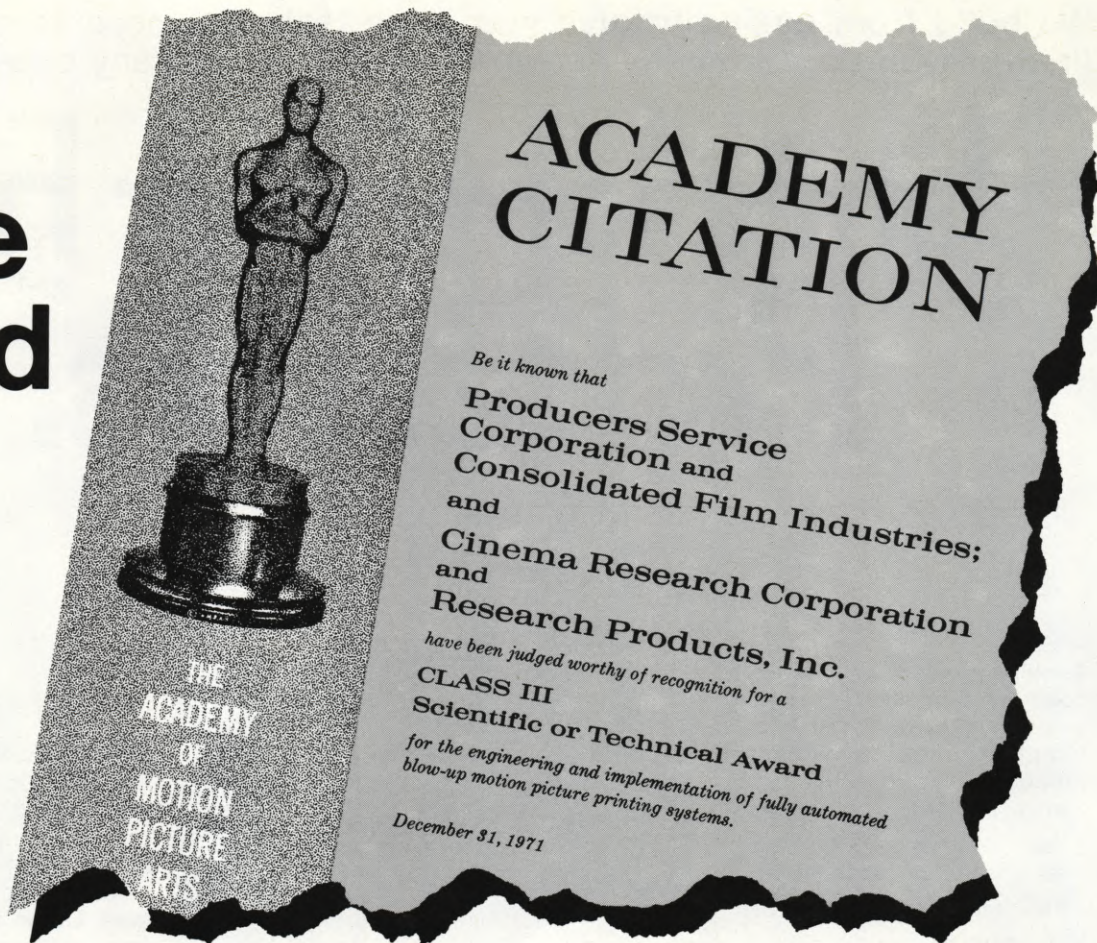


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We're proud



... that both Research Products, Inc. and Cinema Research Corp. (our optical printing service associate) received the Academy Citation for the engineering and implementation of a fully automated blow-up motion picture printing system.

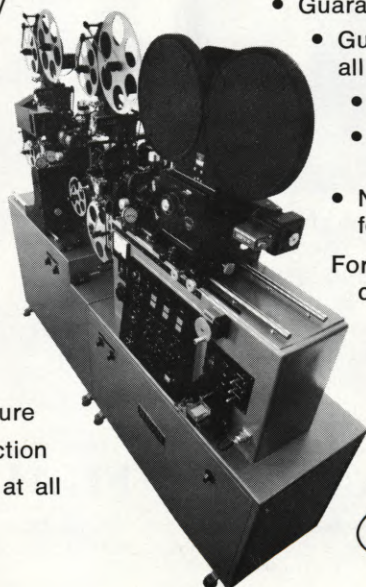
This system is noted for its liquid gate, high speed (40 feet per minute) operation, and utilizes the Bell & Howell Additive Color lamp house. Fully tape programmed, it will automatically make light changes from scene to scene and six lengths of fades or dissolves while doing the blow-up. This system has been in use for over three years and has made numerous quality blow-ups at the lowest possible costs.

But, Research Products engineering does not stop at this point.

Let's take a look at the newest Research Products optical printer, the Model 2101 (illustrated).

It was designed for 35mm, 16mm and reduction printing, and also for **creative blow-ups** that need

- Matted multiple panels (split screens)
- Optical wipes
- Enlarging, or reposition of picture
- Special scanning for 1:85 projection
- Skip or multiple frame printing at all speeds
- Hold frames
- Reverse action



- Spin or rocking effects
- Distortion effects
- Matted color titles combined during blow-up (one generation) ... and many other treatments

The 2101 is the most modern, lowest price, fully equipped combination 16mm/35mm optical printer available today. It features the new "PhotoTron" solid state electronic film drive that obsoletes cumbersome gears, shafts, pulleys, belts and stop-action clutches. It has many "plus" factors such as

- Guaranteed no flash frames even at top speeds.
- Guaranteed not to lose synchronization between all printing heads.
- Vibration-free lenses for sharper reproduction.
- Autofocuser that works smoothly and efficiently from 4X enlargement to 8X reduction.
- No gear shifts — all controls are on one panel for faster, easier operation.

For complete details on our complete line of optical printers and our custom engineering capabilities, contact Research Products, Inc., 6860 Lexington Avenue, Hollywood, Calif. 90038; Phone (213) 461-3733 or cable "Research."

Purchase or lease plans available.



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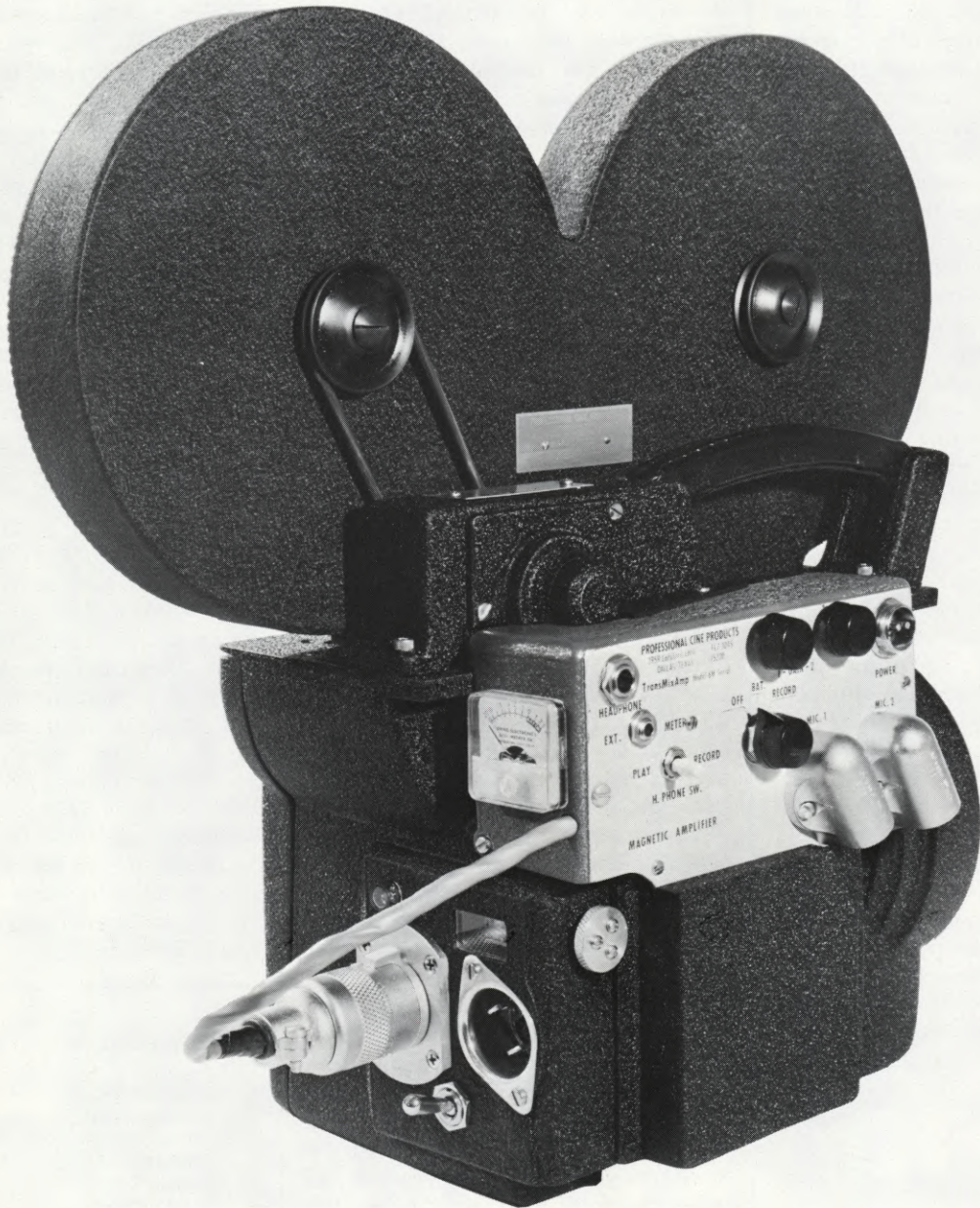
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CINEMA WORKSHOP



By ANTON WILSON

GRANULARITY

The final image on the film consists of minute masses of metallic silver. Usually called "grains", these little specks are the building blocks of what appears to be a continuous deposit. Much like the fine dots that make up a picture in a newspaper, this inhomogeneity of the silver image, or granularity, becomes increasingly apparent at greater magnifications. Every type of film will exhibit different granularity characteristics. However, the granularity of the emulsion is of importance only insofar as it produces a sensation of "graininess" for the viewer. In other words, the granularity of an emulsion can reach a point where the audience will perceive the inhomogeneity of the image they are viewing. It is obviously the desire of the cinematographer to minimize the apparent "graininess" in the final image and to produce a picture that appears smooth, continuous and homogeneous. It is to the cinematographer's advantage that he understands the granularity rating of a film stock, and the many additional factors that will affect the "graininess" of his final image.

Almost every film stock will exhibit in its data sheet a number for RMS granularity. The method for obtaining this value is very straightforward. A sample of the emulsion in question is uniformly exposed and developed. The developed film appears to have a solid uniform density. However, our old friend, the microdensitometer, will prove otherwise. Remember that the microdensitometer is essentially supermagnifying a minute portion of the image, as it scans through an aperture only 48μ in diameter. It will thus pick up and register the inhomogeneity of

the image. That is, instead of registering a smooth continuous line indicating a uniform density, the trace will fluctuate up and down as it passes over areas where several grains are grouped tightly and then areas that are sparse.

An emulsion that has a very fine grain structure will produce a trace similar to that in FIGURE 1A. Note that the deviations are small and of high frequency. On the other hand, the emulsion represented in FIGURE 1B has a much coarser grain structure as reflected by the larger deviations. The information in these traces is converted to a number known as the root mean square (RMS) granularity. A higher RMS granularity number will indicate a coarser grained film and thus a relatively greater sensation of graininess. FIGURE 2 is a chart listing some of the more popular film stocks and their respective RMS granularity ratings.

When the magnitude of graininess is great enough to be visible to the audience, a difference of about 6% in the effective value of RMS granularity will correspond to a "just noticeable difference" in the visual impression of graininess. For example, the difference in graininess between Ektachrome MS and Ektachrome EF would be "just noticeable". The difference between Dupont 931 and 933 would probably be imperceptible. On the other hand, the difference in graininess between Ektachrome Commercial 7252 and Ektachrome MS 7256 would be 8 times a "just noticeable difference".

In addition to the inherent characteristics of the emulsion as reflected in FIGURE 2, there are several other factors that affect granularity of the raw stock and the resulting print.

As the development is increased (pushed) the granularity of the emulsion will increase proportionately. Granularity also increases with the density of the negative. It is therefore important to avoid over-exposure with a negative and under-exposure with a reversal film stock. Processing conditions can also affect granularity. Appreciable differences among the temperatures of the various baths may increase graininess due to incipient reticulation of the gelatin.

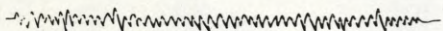
Obviously, the granularity of the final print is strongly determined by the graininess of the camera original. There are additional factors that enter into the picture.

The contrast of the print film is roughly proportional to an increase in granularity. That is, if an original of RMS 9 is printed on a print stock of contrast 2.0, the resulting print will have a granularity of approximately 18.

Graininess will also be more noticeable in large areas of uniform density, particularly for medium tones.

A positive made on reversal stock usually exhibits lower graininess than a print derived from a negative of similar sensitivity.

Lastly, the sensation of graininess is roughly proportional to image magnification. That is, if the size of the viewing screen is double, the sensation of graininess will be approximately doubled for a given distance from the screen. Likewise, for a given screen size, the sensation of graininess will increase as the viewer sits closer to the screen. These rules do not hold as closely for color stocks. This may be why Kodak does not publish a RMS granularity number for Eastman Color Negatives 7254-5254. They claim that Eastman color is more of a "system" than a raw stock and that a RMS number for the raw stock would not be very relevant. From personal evaluation, the granularity of Eastman 7254-5254 would be in the neighborhood of 14-16. This is relatively grainy for 16mm and that is why ECO 7252 is far more satisfactory for 16mm production than Eastman Color Neg 7254. ■

A 

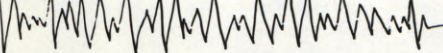
B 

FIGURE 1

INCREASING GRANULARITY ↓	FILM STOCK	RMS GRANULARITY	
		Ektachrome Commercial	7255
	Plus-X Reversal	7276	10
	Ektachrome MS	7256 - 5256	14
	Ektachrome EF	7242 - 5242	15
	Dupont 930		17
	Tri-X Reversal	7278	22
	Dupont 932		22
	4-X Reversal	7277	24
	Dupont 931		24
	Dupont 933		25
	Ektachrome R Print Film 5388-7388		8

FIGURE 2

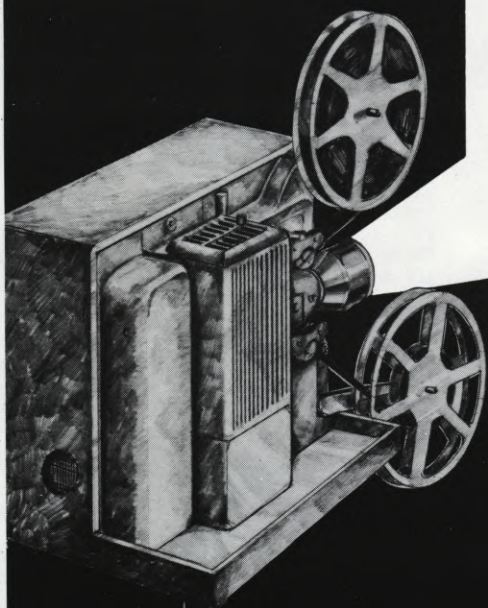
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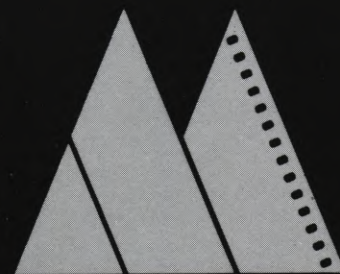
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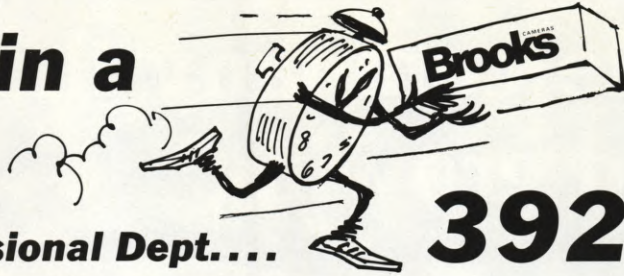


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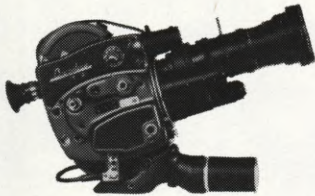
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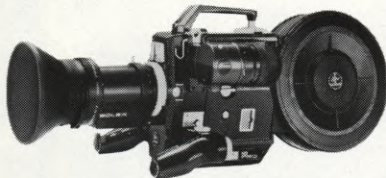
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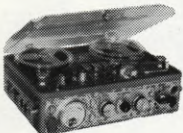
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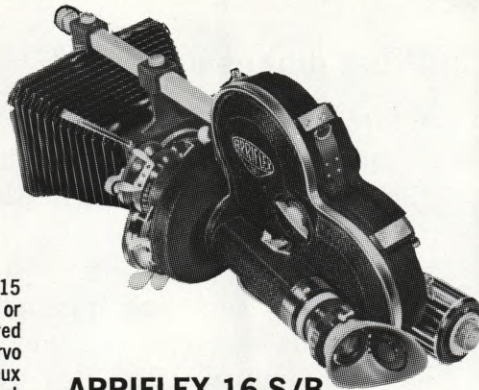
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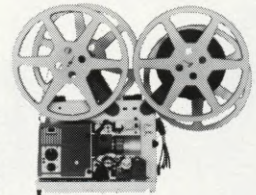
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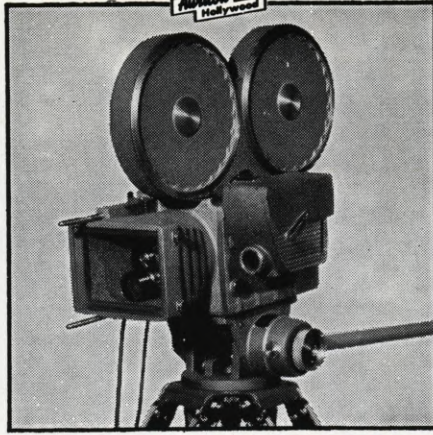


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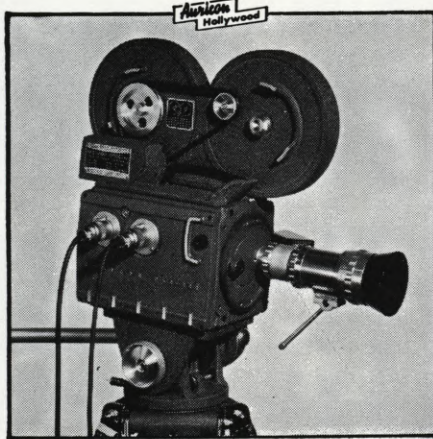
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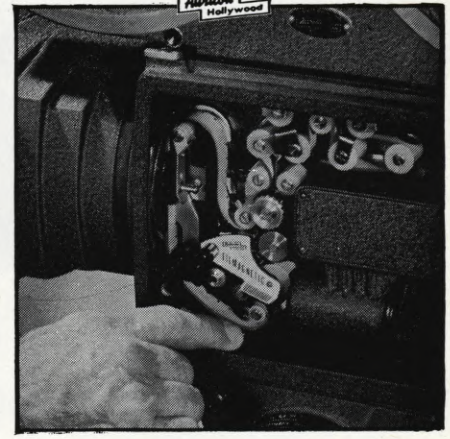
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THE BOOKSHELF

By GEORGE L. GEORGE

A comprehensive survey of the practices and procedures of domestic feature film production, *THE MOVIE BUSINESS* (Hastings House \$12.50) documents with thoroughness and expertise the economic considerations that made the U.S. movie industry number one in the world. This substantial volume, edited by A. William Bluem and Jason E. Squire, presents authoritative views by 43 top-drawer professionals. The scope of the study and its caliber add up to a uniquely informative work of unimpeachable authority.

* * *

A fascinating panorama of Soviet cinema in the turbulent 1917-28 period, Huntly Carter's book accurately forecasts in *THE NEW SPIRIT IN THE RUSSIAN THEATRE* (Arno Press \$12.) the movies' role in the development of performing arts in the USSR. His analysis of the structure, concepts and methods of the then fledgling Soviet film industry is a scholarly document of historic value and eminent readability.

* * *

Uniquely well-informed on the erstwhile "underground" film world—now the fully recognized New American Cinema—Jonas Mekas' *MOVIE JOURNAL* (Macmillan \$8.95) is a collection of his widely read chronicles in *The Village Voice*. Mekas' crusade on behalf of freedom from conventional film forms, notably in the field of cinematography, has demonstrably influenced U.S. commercial production and enhanced our cultural image abroad.

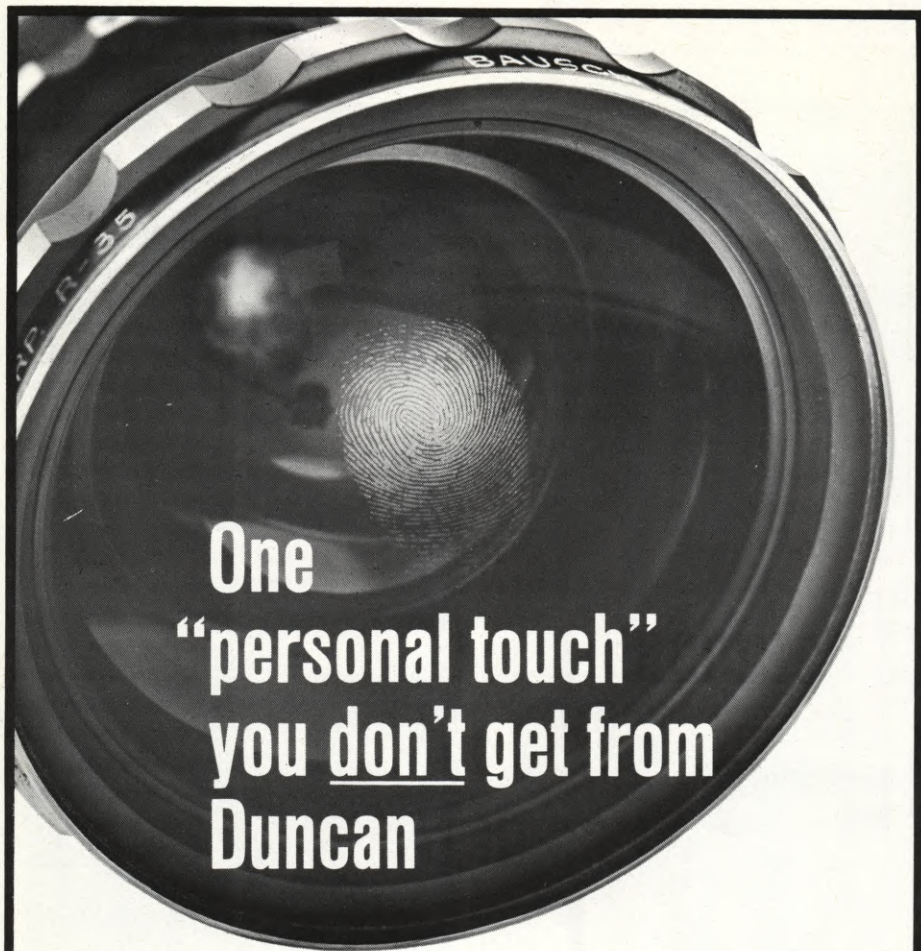
* * *

Hugh B. Churchill's *FILM EDITING HANDBOOK* (Wadsworth \$6.60) is a carefully planned and clearly written text to be used by students while working at the cutting bench. Each step is discussed in detail with the help of numerous diagrams, samples of charts and forms, and an illustrated list of standard equipment and tools.

* * *

Relating politics to movies is the purpose of *DOUBLE FEATURE* (Ouerbridge & Lazard \$5.95), an unusual "agit-prop" book by Michael Goodwin and Greil Marcus. Its method uses juxtaposition of an interview with French director Jean-Luc Godard, professing a "Maoist" approach to cinema, and the authors' script on the Marin County shootout. The result is revolutionary verbalizing, yet to be transmuted into convincing film.

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Paul Schrader's *TRANSCENDENTAL STYLE IN FILM* (U. of California Press \$10.) examines the work of directors Ozu, Bresson and Dreyer as examples of a universal film style determined by the nature of the medium and the film-maker's spiritual orientation, transcending differences in personality and cultural background. One main unifying element is the austerity of the camera work.

* * *

Said John Ford, "I never had an argument with a cameraman" in John Baxter's *THE CINEMA OF JOHN FORD* (Barnes \$2.95), as he discusses the camera work of Winton Hoch, ASC (*THE SEARCHERS*, *THE QUIET MAN*, *SHE WORE A YELLOW RIBBON*) and Joseph August, ASC (*THEY WERE EXPENDABLE*). Many mentions of pertinent technical details show the significance Ford attaches to visual effects and pictorial composition.

* * *

In Leo Braudy's study, *JEAN RENOIR: THE WORLD OF HIS FILMS* (Doubleday \$8.95), the emphasis is on the director's stylistic approach, but his concern for camera movement is repeatedly mentioned. Braudy's book is essentially a penetrating critique of Renoir's films, analyzing their structure, their visual content and their links to other creative fields.

* * *

C. G. Crisp's portrait of French director *FRANCOIS TRUFFAUT* (Praeger \$5.95/2.95) presents him as a politically aware and intellectually alert filmmaker, who works closely with his cameramen. Truffaut's latest film, *BED AND BOARD*, presented an interesting challenge to Nestor Almendra, whose "camera had to be completely self-effacing, for fear of attracting attention away from the actors."

* * *

A similar circumstance is described in Bruce Martin's brochure *ALLAN KING* (Canadian Film Institute \$1.), regarding *WARRENDALE*, the Canadian director's award-winning film about disturbed children. "There was no question of setting up the situation," said King who also used "spontaneous filming" for his dramatic feature *A MARRIED COUPLE*.

* * *

Strangely missing from *JEAN VIGO* (Praeger \$6.95/2.95), John M. Smith's study of the innovative French director of the 30's, is all mention of ASC member Boris Kaufman who shot the four films Vigo completed before his death. The book analyzes Vigo's original style and the impact it had on contemporary filmmakers.



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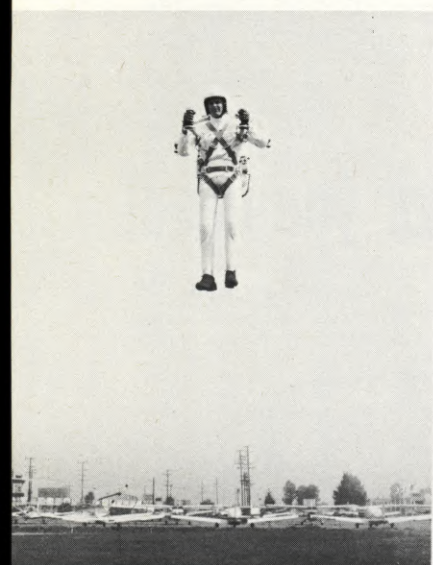
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PICTORIAL NEWS FROM HERE AND THERE



(LEFT) At the Century Plaza Hotel in Century City, Los Angeles, George A. Mitchell, designer of the world-famous camera that bears his name, gives a short speech of acceptance upon being elected to Honorary Membership in the Society of Motion Picture and Television Engineers. (CENTER) Mr. Mitchell celebrates with his friend, Victor Milner, Jr. (RIGHT) Guest of Honor Howard W. Koch addresses A.S.C. members at a recent dinner meeting of the Society. Koch began his career as a youth in a studio mailing room, worked his way up through key phases of production and eventually became production head of a major studio. He is now a top producer at Paramount Studios.

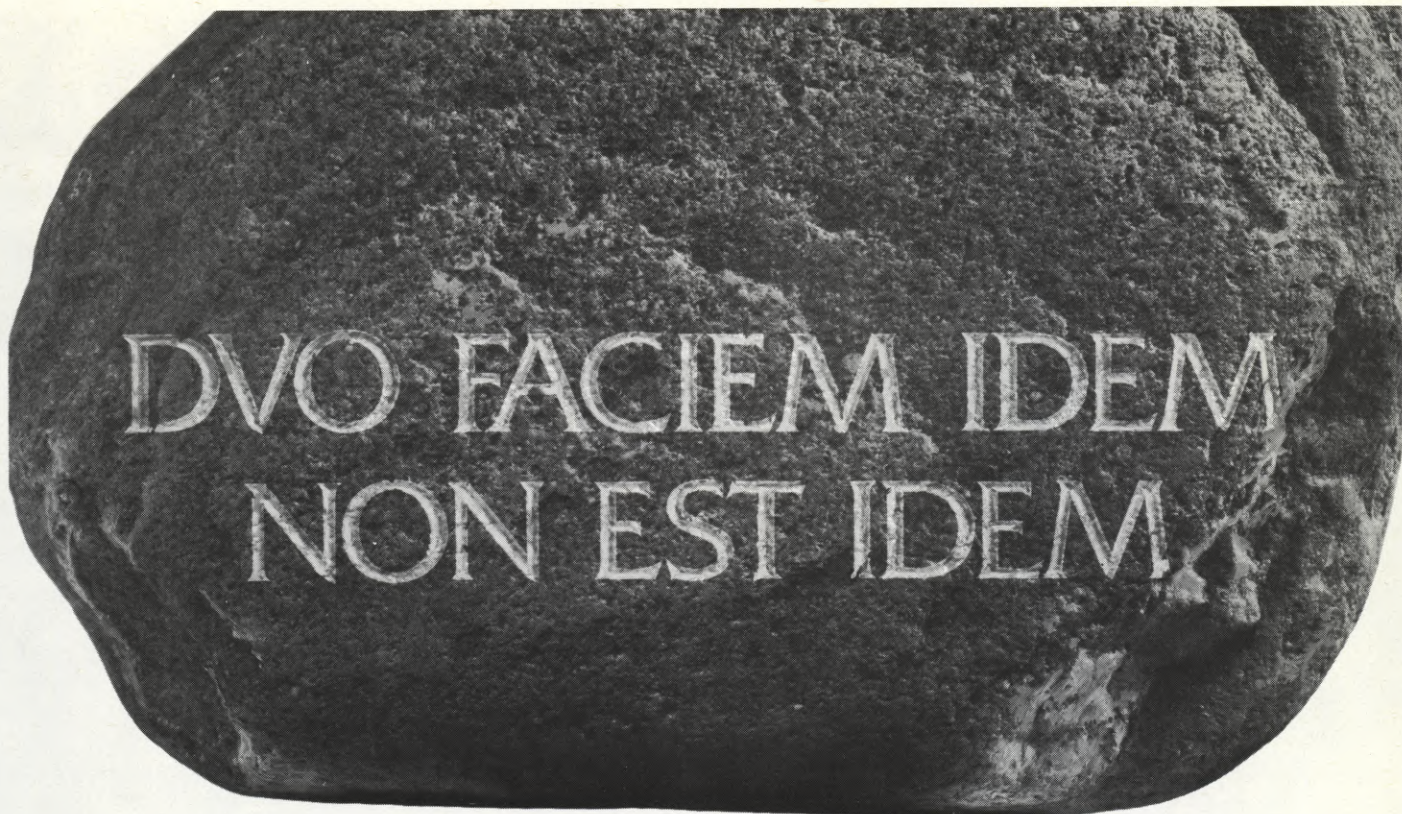


(LEFT) Shades of Buck Rogers! (or James Bond). Nelson Tyler, world-famous helicopter cameraman and designer of the Tyler Vibrationless Camera Mount, takes a flying leap for himself with the aid of a rocket belt. (CENTER) Down Under, at a special meeting of the Australian Cinematographers Society in Canberra, Eric Kenning, A.C.S. (Senior Cinematographer, TV Section, Australian Information Bureau), delivers his lecture on "Lighting for Color". (RIGHT) President of the Australian Capital Territory Branch of the A.C.S. Bob Hargreaves shows a 16mm Arriflex BL to some of the delegates who attended the recent "Color 70" seminar in Canberra.



(LEFT) Fouad Said, President of Cinemobile Systems, explains the sound department of one of his location vehicles to top-ranking members of the British Society of Cinematographers, who were among the 50 B.S.C. members invited as guests of Cinemobile Systems International at Pinewood Studios for a special preview of the "studios on wheels" just arrived in Britain for service in that country and Europe. (CENTER) Outgoing ASC President Sol Halprin accepts from George Folsey, ASC a gold money clip inscribed: "in recognition of his outstanding service to his fellow members." (RIGHT) Using a new and unique motion photography technique, Phillip Leonian's photograph of a sabre fencer shows nuances of movement a straight photograph would miss.





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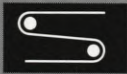
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QUESTIONS & ANSWERS

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

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



Q How can I produce a night effect in the daytime using color film?

A This is the question we most frequently receive and, though the answer has been given many times, still the key to the question is to underexpose two stops. Additional techniques which assist the illusion are to photograph the scene in back-light, using lights or reflectors as fill lights on the players. When such are not available, use front cross-light. By all means avoid any white sky in the scene. You may use a 85N6 filter, but disregard its factor. The N6 (Neutral density—6 transmission) portion of this filter will reduce the light transmitted by two stops. Therefore, you judge the exposure as if you were using the normal #85 filter for a day exposure; the N6 portion, cutting two stops, will produce the underexposure necessary for a night effect.

It will further the illusion if you can include in the scene some light source—such as lighted windows or street lamps. These must be boosted by using photo-flood lamps—using tracing paper or Bon Ami on the glass of the windows to diffuse the light from the naked globes.

Q I read that professional cinematographers normally light their sets at a predetermined foot-candle level. Why is this, and what is the difference between foot-candles and candles-per-square-foot?

A Motion picture sets are illuminated for a definite light level measured in foot-candles. The intensity of the light and the lens opening will vary with the speed of the film being used—and effect desired. The professional is only concerned with the incident light available—not with the reflective aspect of the players' clothing, backgrounds, etc., unless these are of a particularly light or dark tone—in which case exposure compensation may be required.

The term "foot-candle" is used in connection with the intensity of illumination at a given location. It is entirely dependent upon the intensity of the light source and its distance from the subject. Foot-candles are measured with

an incident light meter.

The term, "candles-per-square-foot" is used in connection with the brightness of an illuminated surface. It is dependent upon the intensity of illumination on the surface and the inherent diffuse reflectance of the surface. Many reflected-light meters read in candles-per-square-foot.

Q I would like my Main Title to appear over live action scenes—having the text appear in white letters over the scene. What is the simplest method for doing this?

A This is best accomplished by the process known as Bi-Pack printing in which the developed title film negative is placed in contact with the developed positive background scene. Both are printed together on duplicating negative film stock—by one pass through the printer. The same bi-pack idea may be employed directly in the camera by threading the negative title film in front of the negative color film stock. The background scene is then photographed—such as waves breaking on white sand. The actual fade-in and out footage frames having been measured from the title negative (with sufficient footage in front for threading), the camera is faded in and out at these same positions. In this last case, the text will appear in BLACK letters over the light background. It is best to photograph the titles on positive film for maximum contrast and clear film surrounding the lettering. ■

Q I wish to photograph some fish in tanks. How can I determine exposure and what is the best method of lighting?

A Use top and side lights from as far front as possible, but avoid direct front lamps that would reflect in the glass to the lens. If possible these lamps should be on a dimmer so that they may be brought up for photography, but dimmed for lining up. Fast film should be used so that the lens may be stopped down for maximum depth-of-field. Exposure can be determined by using a reflective type meter from the lens position. ■

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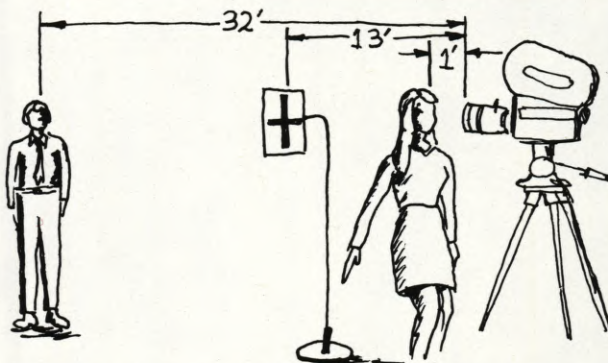
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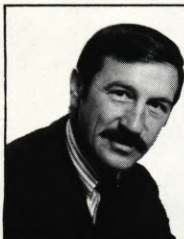
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A young man, his work, and his camera

MARK SHEPARD – Student Filmmaker and Cinematographer □ Speaker on Student Filmmaking in Los Angeles City High Schools and Member of the L.A. Film Teachers Association □ Student at California Institute of the Arts and Valley Junior College □ Producer/Cinematographer of “Mirrors” (a short subject, soon to be released theatrically) and “Spider-web” (a student-made feature length film)



“If I were to choose which is tougher: making a professional film or a student film – there is no doubt in my mind that I would choose the latter. This comes from ten years’ personal experience... from my Brownie to the Beaulieu. What can be more ulcer-producing than having no backing, no huge crew, no budget to speak of, time limitations, deadlines to meet, no sets, very little equipment, and dreams of an epic that might never see its way out of the can for lack of just about everything.

As a student filmmaker, I can honestly say I have been through everything a

cameraman can be through, even though I’m very young. After all, my career started at age 9! Any teenage filmmaker will acknowledge the fact that very little in motion picture equipment meets both our quality requirements and financial limitations. A happy medium is hard to find.

But one is around, the Beaulieu 16mm camera, which my film group discovered and began to rent regularly early last year. The Beaulieu has been a lifesaver



ever since. It suits all our needs... from the rental price to the design.

The Beaulieu R16B is one of the least expensive and very best auto-exposure 16mm reflex cameras you can rent from the professional camera supply houses –

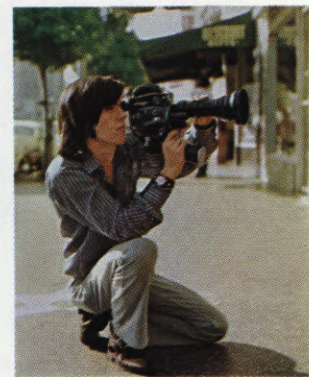


and it gives you the greatest results the first time around. This (and the fact that it is small and compact) meets the most important needs of the student filmmaker – who has one eye on a slim budget while the other is planning a shot.

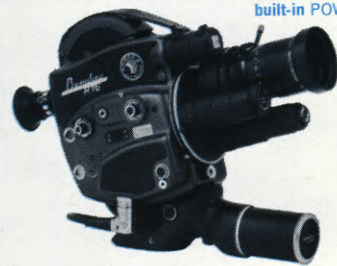
In my own style of filmmaking, I prefer to get the feel of the sequence once we get to our actual location. The Beaulieu 16mm camera lets me have total flexibility, as you can literally just grab it up and shoot away. It’s small, so I find it easy to strap it to a car or wheelchair for dolly shots... or for just lying on my back to get an ultra-low angle. It’s truly a personal camera. As far as I’m concerned, the Beaulieu R16B can do anything – but anything – you want it to, and in any style you want... from a scripted flick to cinema-verité.

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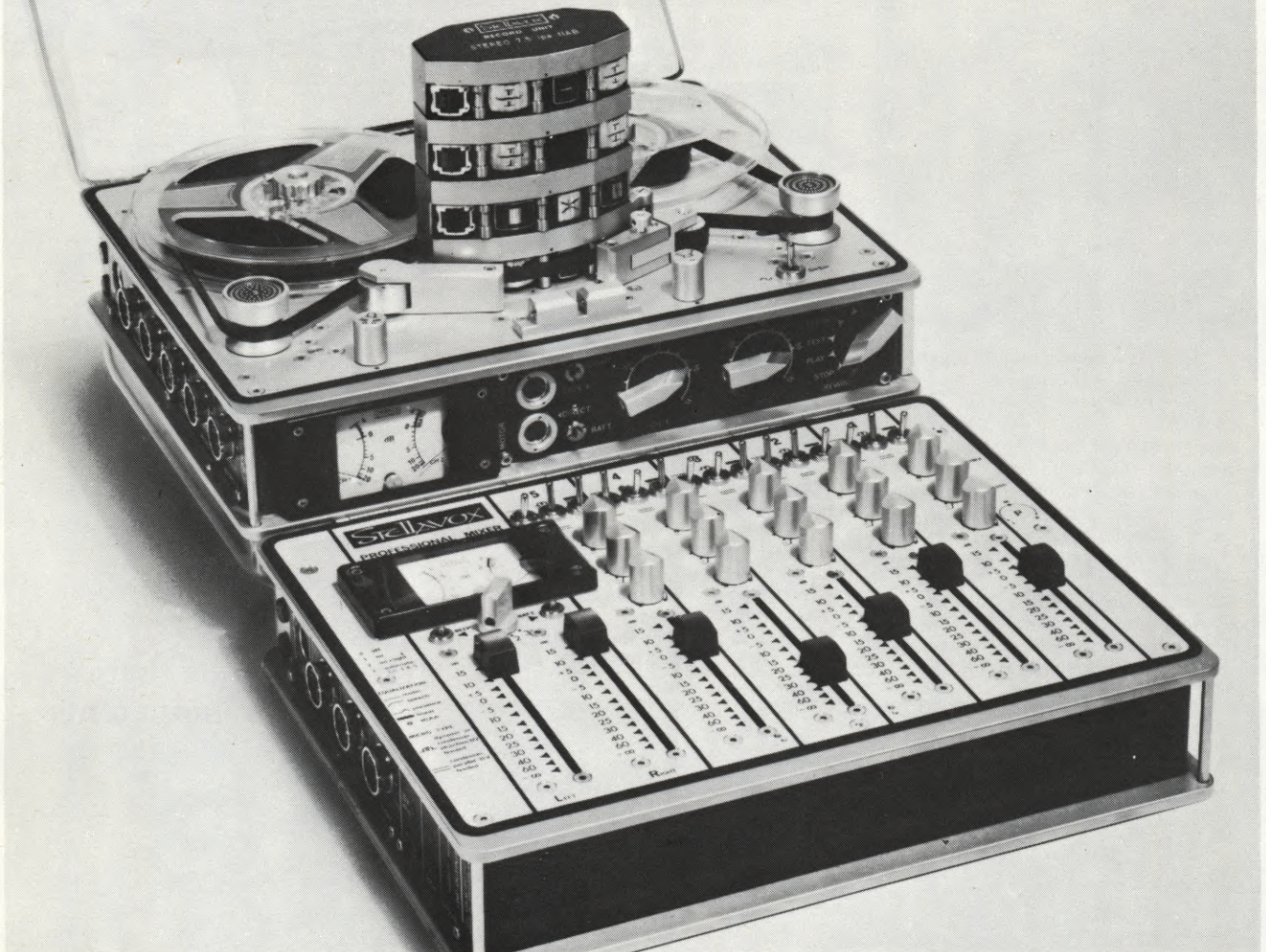
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BEHIND THE SCENES OF "SILENT RUNNING"

By WAYNE SMITH

Films such as "SILENT RUNNING" which place heavy emphasis on special effects are difficult and time-consuming operations requiring a great deal of cooperation among those involved. Brought in for a budget of \$1,350,000.00, the results were incredible—having the look of a much more expensive production.

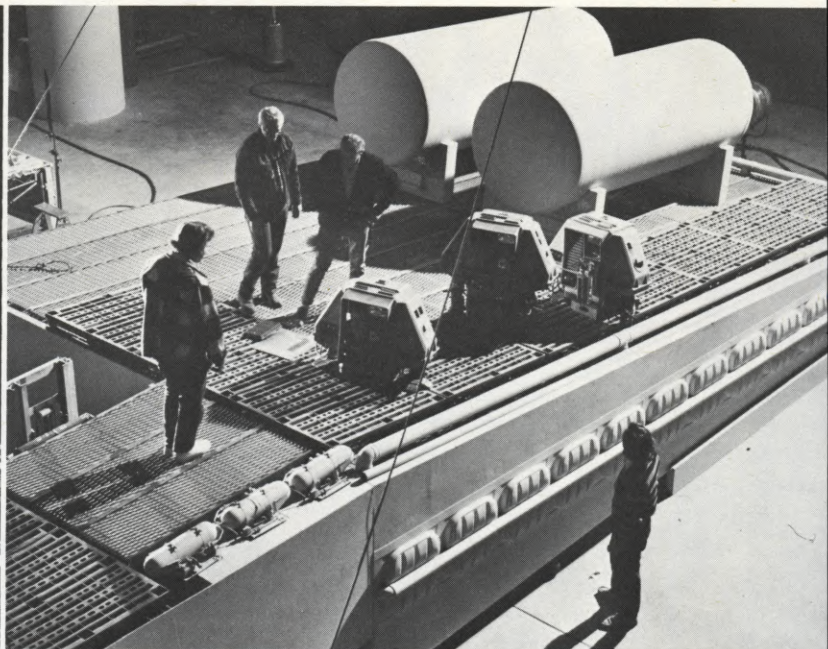
Science Fiction films that deal with the future have traditionally projected a very sleek and sterile environment. At the very start, we wanted to portray a very real and functional environment. Our budget did not allow for extensive set construction. Instead, various ways were explored and devised to cut costs, including the extensive use of an aircraft carrier, an airplane hangar and special front projection equipment. Also, new inventive photographic effects were utilized in the effects photography.

One of the most interesting aspects involved the acquisition and use of the U.S.S. Valley Forge, a decommissioned aircraft carrier scheduled for scrap at Long Beach, Calif., for use as the major set in "SILENT RUNNING". Early research showed a remarkable similarity between the N.A.S.A. manned space laboratory mock-ups and that of Naval ship interiors. For example, the pressure door hatches were nearly identical.

Continued overleaf







(LEFT) Director of Photography Charles Wheeler, ASC, stands on the deck of the space freighter *Valley Forge*. Deck section was built full-size to correspond to detail of 24-foot complete model built by artisans of Trumbull productions. While design of spaceship is original and wholly imaginary, it corresponds technically to authentic state-of-the-art serving as blueprint data for such vehicles of the future. (RIGHT) A rehearsal of the drones "walking" across the deck of the *Valley Forge*.

With Universal Studio's help, the Department of the Navy was contacted about the use of a ship in our film. Needless to say, it was difficult for the Navy to believe we wanted it for the interior of our space freighter, subsequently named the "*Valley Forge*" after the ship we used. After several months of continuous negotiations, the go-ahead was given for use of the ship on a rental basis by the Department of the Navy with further negotiations necessary with the Long Beach Naval Station to work out the requirements for pow-

er, water, etc. At one of these initial meetings, the aid of then-retiring Navy Chief Winfield Chitister was enlisted; he was to act as liaison between the Navy and Trumbull Productions, appreciably reducing the red tape.

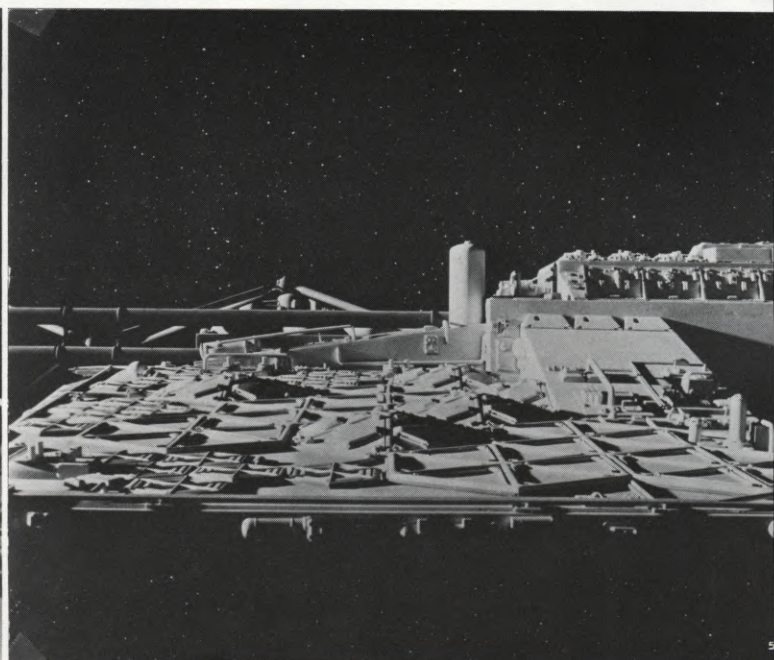
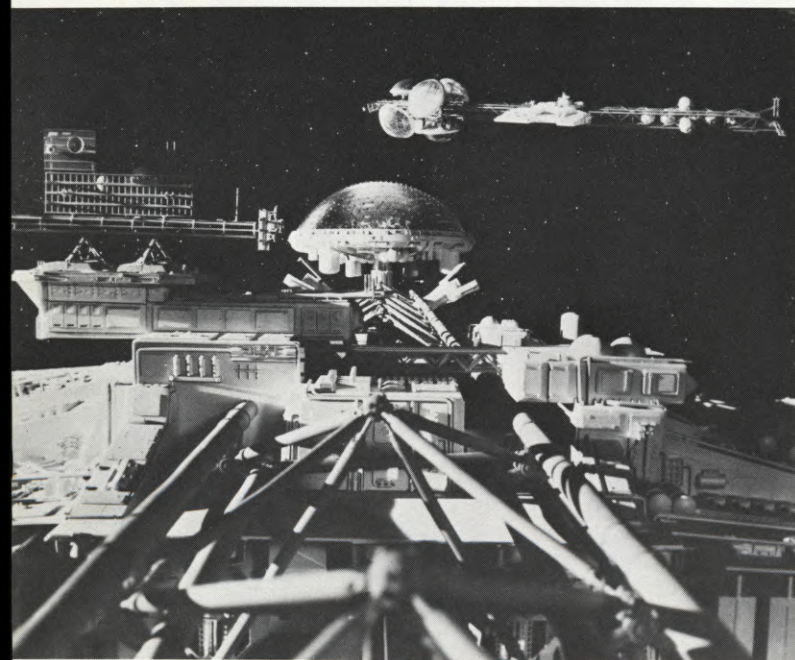
The script called for miles of passageways, a kitchen, surgery, main and auxiliary control rooms, recreation room and crew's quarters, plus the necessary production areas. With a minimum of change, the ship would provide the look we were after.

The location we chose, the C.I.C.

(Combat Information Center), the nerve center of the ship when operational, not only had the most to offer photographically but was also the most accessible. This became of prime importance for the actors (several were bilateral amputees) and crew alike. Located 500 ft. down the main hangar deck, 30 ft. above it and one deck below the main flight deck, the area was the best logistically, although it proved to be difficult at best. Two special chair elevators were installed for use by the amputees.

The ship in its present condition

(LEFT) Photograph of section of spaceship model which was custom-designed and assembled both from existing parts in toy model kits and epoxy resin parts formed in custom molds made from Dow Corning silicone rubber which reproduces the most intricate details of the original part design. (RIGHT) The command section of the *Valley Forge*, a gigantic space freighter orbiting the sun with all that remains of Earth's vegetation. Model was photographed from every possible angle to create front-projection plates for live foreground action.



lacked normal services. There was no water or drainage (these having been sealed up to prevent accidental flooding), no sanitation facilities aboard and power was supplied by a Navy generator, which was subject to an occasional failure, plunging the ship into total darkness. Power problems plagued us constantly during construction as fuses blew from overloads or were absent altogether, requiring a lengthy job of tracking down circuits. When live-action shooting began, an additional two generators were brought in with separate cables for the photographic lighting.

Our objective aboard the *Valley Forge* was to use the area selected as a "real set" that would allow a cameraman to follow the action from room to room without a cut. We wanted the actors to feel they were aboard a large

shapes of a repeatable nature were used extensively throughout the sets. This afforded us a fast transformation using a variety of shapes at a low cost. Vacuum-forming is the process of forming a hot piece of sheet plastic over a form by means of a vacuum for a desired shape.

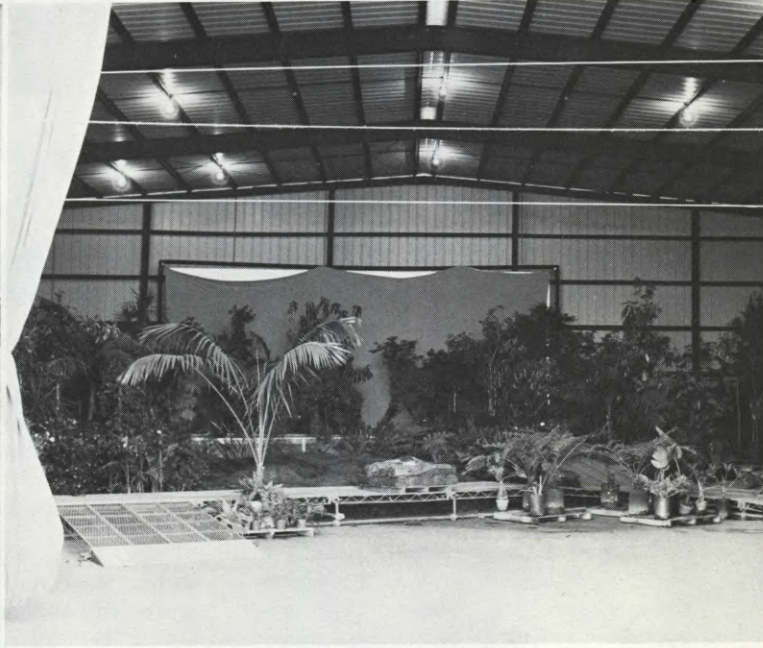
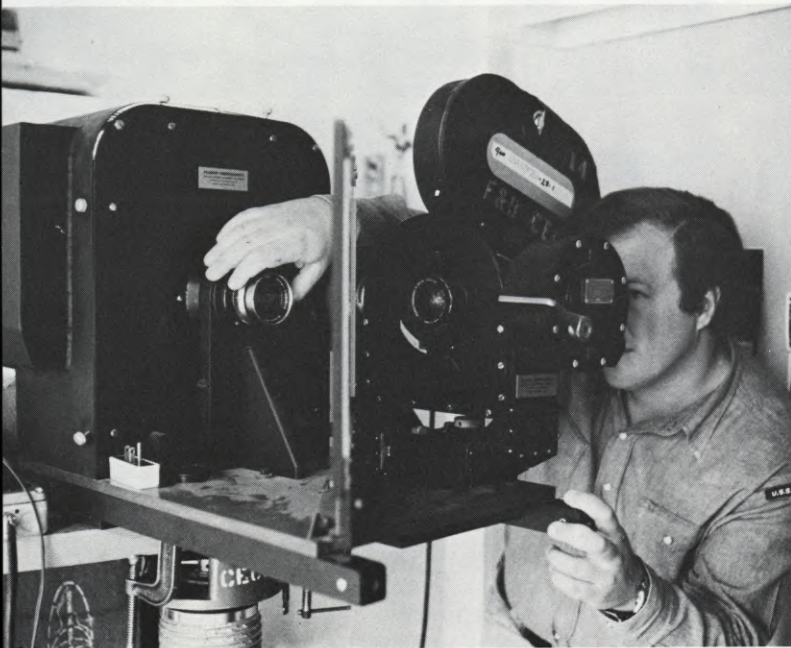
Contributions by major companies of materials helped substantially in keeping overall costs down. Dow Chemical gave us over \$60,000. in sheet plastics, rigid foams and epoxy resins in return for their logo display and credits. Over thirty companies participated in this manner.

The main control room was roughly 20' by 30' in size and filled to capacity with miscellaneous gear. Consoles, tables and light boxes were constructed and installed around existing gear along with fifty Concord closed-circuit video

turned to their brightest levels and the lights around were balanced to them. The average exposure was around F/4.5 using Eastman 5254 often pushed one stop.

The set was pre-lit as much as possible and all cables and plugs were laced throughout the overhead areas. No effort was made to hide lights or wires but only to blend them in with the ship's fittings.

In the recreation room, one entire wall of 30' by 7' was made into a "wall of light" with the use of fluorescent wall panels from Duro-test. The color classer series bulbs were installed along with 85 filter gels since they have the same color temperature as sunlight. The problem with fluorescents is that while operating on 110 volts, 60 cycles, they fall out of phase with the camera



(LEFT) Doug Trumbull lines up the front-projection unit, consisting of an Arriflex 35mm camera and a 5 x 7 still projector mounted at right angles to each other, with their respective lenses sharing exactly the same nodal point. A semi-translucent mirror mounted at a 45° angle between them reflects image of the projected background plate onto a screen, while the film camera shoots through the mirror to photograph live foreground action against the front-projected background. (RIGHT) The airplane hangar, partially "dressed" to represent botanical garden. In background can be seen the highly reflective front-projection screen.

space freighter and react to it.

Early construction began in November 1970 with the removal of unnecessary gear such as tables, chairs, and storage cabinets. The major change was the widening of all the doorways and the addition of new vacuum-formed plastic parts to dress the set. Torching out the unwanted metal was a very time-consuming operation, the average thickness of the steel being 5/8".

The enormity of the project, coupled with the industrial design backgrounds of myself and associates at Trumbull Productions, led us to find ways of using the same shapes for set construction and dressing when at all feasible. Styrene thermoplastic vacuum-formed

monitors run from eight tape machines. Only those monitors used in a particular scene would be turned on at a time. Monitors were placed so that every conceivable camera angle was covered. The video information on the set was recorded at Trumbull Productions where tests were made on light levels and how to deal with the raster bar. We decided to simply let the raster bars roll, since it added an extra effect on the video screens which audiences are used to in films today. Syncing the camera to fifty monitors would have been very costly and time consuming anyway. We, therefore, concentrated on light levels which were always low. When shooting around the video monitors they were

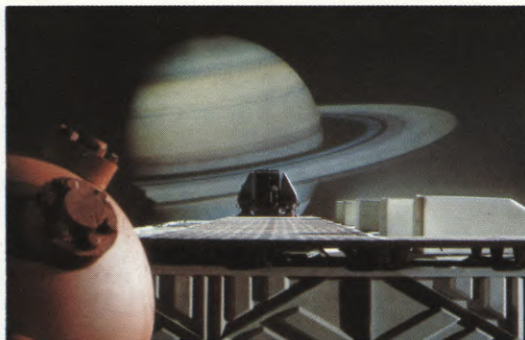
running at 24 f.p.s., resulting in a flicker effect. This was solved by using 220-volt, three-phase power and splitting it into three 110-volt legs, each of which was 90° out of phase from each of the other legs. The resulting overlapping of 2 of the 6 bulbs from each light panel gave us even and consistent light.

As shooting progressed in the various rooms and passageways, thirty feet below in the hangar deck carpenters were busy at the final assembly of 150, four-foot-high truncated tetrahedron cargo containers to be used as set dressing. The containers were assembled from various pie-shaped pieces of vacuum-formed styrene plastic sheeting pro-

Continued from Page 786



(TOP LEFT) Director of Photography Charles Wheeler, ASC, with ever-present pipe, during shooting of the Universal space epic, "SILENT RUNNING". (CENTER) Shooting front-projection scenes for botanical garden sequences inside hangar at Van Nuys Airport. (RIGHT) Bruce Dern, playing an ecology-minded astronaut, stands among his beloved plants in garden. Geodesic dome struts and star field were front-projected onto background. (BOTTOM LEFT) Set lighting in control room sequences had to be kept very low to balance with low-level readouts on television monitors. (CENTER) The planet Saturn front-projected behind section of spaceship deck. (RIGHT) Flashing colored lights accompanied wild trip through Saturn's rings.



HOW TO SHOOT A SPACE PICTURE ... IN NO SPACE

This far-out space feature called for some far-out photography—but how far can you pull back when working in tiny rooms deep in the bowels of an aircraft carrier?

By CHARLES F. WHEELER, ASC
Director of Photography

Creating a design for a picture like "SILENT RUNNING" was a tremendous achievement. The concept was staggering in itself: combining fantasy with the known facts of outer space and then developing a pictorial approach that would implement the story and create interest for the viewer. Because Doug Trumbull, the director of "SILENT RUNNING" is a recognized genius in several fields, such as mechanics

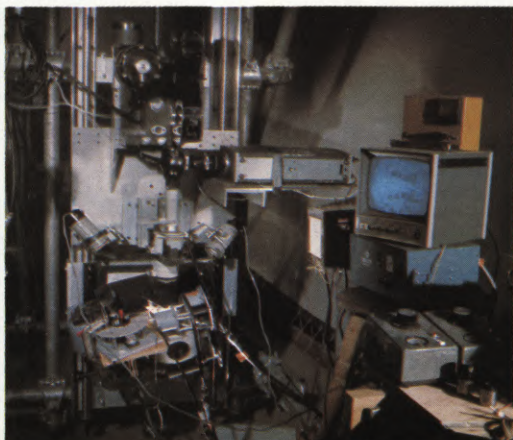
and electronics, and is a designer and inventor as well, I found myself intrigued with this project from our first meeting. He had been described to me as "a young man who looks like a teen-age hippie and talks like Albert Einstein." This was partly true, even though it was said jokingly. I found him to be the kind of guy who can talk to anybody, who listens equally well to criticism and/or contributions, and then

makes the best of both of them. At the end of a highly technical discussion he is likely to end with, "Hey, that's neat!"

WORKING TOGETHER

Doug's background was largely in photographic effects rather than working with large sets and a full company, so he relied on my experience in this area. We worked very well together, I think, and were able to complement one another. He left it to me to hire most of the crew and his comment at the conclusion of the picture as to their efficiency made me very happy. He generously stated, "You know, Chuck, I thought and thought and there wasn't a single guy I would have replaced in this company." He is a man of tremendous creativity and I was delighted that we were able to help carry out his ideas satisfactorily. One unique aspect of Doug's approach to "SILENT RUNNING" was that even though everything was filmed on location, a common enough procedure these days, we did not make a single exterior shot.

(LEFT) Director Douglas Trumbull sets up complex microscope rig to photograph what astronaut sees through his microscope. Set-up includes standard 35mm Mitchell camera, Sony TV camera, 5-to-1 Zeiss zoom microscope and special microscope stage with joystick control. (RIGHT) Originally developed for Trumbull's effects in "ANDROMEDA STRAIN", the rig has Sony video camera viewing through beam-splitter head.



LOCATION ON A CARRIER

We started shooting on the O-1 level of the old US Navy aircraft carrier, *USS Valley Forge*, which had been retired prior to being scrapped, and was tied up in the basin at Terminal Island. The O-1 level is immediately under the flight deck, sandwiched between it and the hangar deck, and on this class of carrier was the center of Command Operations, subject to the bridge. All of our equipment was carried up the gangway by hand, then moved across the hangar deck on hand trucks to amidships where it was lifted up the ladders to the O-1 level. My two assistant cameramen, Bill Bohny and Jim Hoover, saved us a tremendous amount of time, in spite of these distances, by keeping everything we needed close at hand.

On the O-1 level there were about thirty rooms of varying sizes. The maximum ceiling height was seven feet,

watertight integrity from compartment to compartment, which meant that the passageways had a regular door and a watertight door into each room which prohibited our use of rolling equipment. We had to remove one of these watertight doors with a blowtorch and as the passageways were only four feet wide to begin with, we had to measure tools, cameras, dollies, even drills, to be sure that they could be carried, sideways if necessary, through the narrow corridors into the sets.

LIGHTING

Harry Sundby, the gaffer, was an old friend of mine who, I am sorry to say, passed away this year. He did an absolutely fantastic job of intricate cable rigging in advance. The generators had to be left on the dock, so Harry color-coded the cables with color tapes to enable us to find the ones we wanted without tracing them back through

to us as we were able to position our lamps behind them. Most of the time, however, they were an extra problem because the lamps were not totally concealed due to the spaces between the pipes. To correct this, wherever it was possible, we inserted cardboard in front of the lights and painted it to match the background in color tone. We then lit this to the same density as the background by looking through the camera and adjusting the lights by eye until it disappeared.

Harry's crew was very well organized, accustomed to working together and complemented each other's efforts rather than duplicating them. Harry and I had known each other in Washington D.C. during World War II, when we were both in the Navy and we had done five pictures together since I became a first cameraman, as well as many more previous to that time. Harry was a person of great versatility and experience and al-



(LEFT) Director Trumbull, behind the camera, lines up a scene. Still in his twenties, the intrepid technician first won recognition for the spectacular special effects he created for Stanley Kubrick's "2001: A SPACE ODYSSEY". (CENTER) Trumbull gives direction to two of the robot drones featured in the film. Taking on almost human characteristics in an uncanny way, the lovable robots nearly succeed in "stealing" the picture. (RIGHT) The director explains scene to Bruce Dern, while cameraman crouches in foreground. Accustomed to working with complex equipment and special effects, Trumbull had to get used to directing live actors.

below which there was a maze of pipes, air ducts and electrical conduits. Doug and his competent crew had been remodeling the area prior to our arrival and they did a great job of painting, camouflaging and adapting. For instance, the former Air Combat Intelligence Headquarters, with its hundreds of pieces of machinery, became the main control room of the spaceship. Other sets were the spaceship recreation room, hospital, Bruce Dern's living quarters, drone repair shop and the food preparation center. Our backup facilities were installed in some of the rooms not used as sets, permitting storage, construction, painting and darkrooms to be as close as possible to our working areas. We had the same problems you find with limited access anywhere, complicated by the fact that a ship needs

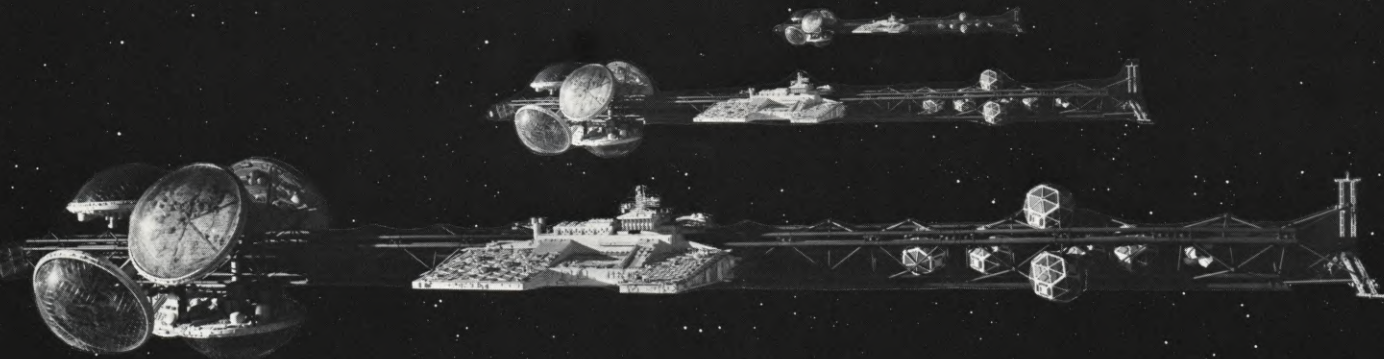
walls, passageways and decks. It was difficult to hide the cables in the passageways we used as sets, so we had to cut holes in the wall with a blowtorch and run them a hundred different ways.

The lighting was primarily difficult because of the cramped spaces and the director's need for fluidity with the camera, as well as with the actors. Because of the low ceilings we used a lot of low lamps, which gave a spooky effect suitable to many scenes. We used mostly incandescent lighting equipment: juniors, seniors, inky-dinks and a lot of gimmick lights. We also had to use quartz lights in some tight areas, although we preferred not to as they get very hot and it is harder to control their density. We had to light around the conduits and pipes in the ceiling and occasionally some of these were a help

ways was a tremendous help to me. After we set up our basic approach and decided on our light levels and general effects, I could depend on him to carry through completely on his own. We both found that our Naval photographic experience was a help since we were familiar with getting around on a ship, which is sometimes a problem in itself.

CAMERA CREW

Dick Johnson, my camera operator, was another old friend. We first became acquainted at Disney Studios working in the Animation Department. He has been associated with numerous Academy Award-winning pictures and is highly competent in all ways, and I always enjoy working with him. My wife has teased us for years and called us, "The Bobbsey Twins" because we are so



A fleet of handsome spaceships, each of which is supposedly a half-mile long, glides through the silent reaches of outer space. This scene was composited from separate photographs of the beautifully-articulated 24-foot model designed, constructed and photographed in workshops of Trumbull Productions over a period of many months. Parts from 850 Japanese model kits for German tanks were used to texture the surface of the spaceship miniature—all painstakingly hand-applied by a corps of model builders.

compatible in our working habits. Bill Bohny and Jim Hoover, the assistants whom I mentioned before, were very capable and were familiar with all of the different equipment we used, and both worked diligently.

Camera is mounted to the back of tiny car for over-shoulder shots prior to the filming of a wild "speed rally" sequence which the bored astronauts stage in the cargo hold.



CAMERA EQUIPMENT

Because we were working in very cramped quarters our original idea was to use small, lightweight equipment. We started with Arriflexes and a lightweight blimp but soon found that the blimp wasn't quiet enough and, because some of the scenes ran longer than originally planned, the 400-foot rolls of the Arriflex were not adequate, so we switched to a Mitchell BNC Reflex Camera. A large portion of the picture was shot with an Angenieux 20-120 zoom. This was used more as a vari-focal lens than a zoom because it permitted us to immediately obtain the correct lens focal length in tight situations where we couldn't adjust the picture size by physically moving the camera. Sometimes the camera was so close to the wall we had room for only a right eye or a left eye, much less a whole head, to check the viewer.

We did use some extremely wide-angle lenses on the Arriflex, but since they distort anything within three or four feet of the camera, we tried to use them where this distortion would serve a purpose in the story. Wide-angle lenses can be a trap working in a small room because they make it appear much larger than it is and this effect may not be desirable.

MOOD

We used Eastman 5254 Color Negative film. We tried to obtain a low-key feeling throughout the picture to heighten the feeling of boredom and depres-

sion of the astronauts. The opening scenes where they were eating, and those in the recreation room, were brought up to provide a contrast to this mood. Some liberties were taken with the darkness of outer space to provide a feeling of time change, but otherwise we attempted to remain faithful to the information reported by the astronauts and the many articles written in scientific books and journals. In a number of the interiors we used forced development to work down to the light levels of the practical lights in the sets such as the lighting fixtures, instrumentation panels and TV monitors. We had so many TV monitors constantly in the picture in some sets that it would have required an extraordinary amount of regulating equipment, time and money to eliminate the roll-over and static, so we stabilized as best we could and went with the results.

SOUND

The working arrangements with the sound equipment was one of the major problems we faced. We were surrounded by metal-encased walls with numbers of electronic devices operating simultaneously and both of these things caused all sorts of interference with the sound. Charlie Knight, the sound mixer, came up with one great solution by designing radio mikes for the actors. These were sewn into specially designed pockets in the astronauts' uniforms, which they wore throughout the picture. In ordinary clothing it would be most difficult

to conceal these mikes, particularly I might add in these days of limited covering and skin-flicks! Charlie is ingenious and very cooperative and this particular solution was of tremendous help to me as we were able to light the cramped sets with one less problem to consider, that of the ever-present boom mikes and their attendant shadows.

THE RACE

We moved to the hangar deck of the carrier to film the racing sequence. The set was a long tunnel leading into the mammoth storage area of the spaceship. There were two parts to this sequence and we tried to vary the mood between them. Three of the astronauts take off on a wild race at high speed in their transportation buggies, very much like a bunch of kids horsing around on motorcycles. Later, after the three are dead and Bruce is all alone, he retraces their ride and daydreams about them and all that has happened. We shot Bruce with a longer focal-length lens to accentuate his disturbed emotional state. We used numerous angles on the chase, including shooting straight down with a hand-held camera while hanging out of a freight hatch directly overhead, suspended from the strong hands of a couple of crew members. The chase was a means of relieving tedium for the bored astronauts in the story and I felt it was an important interlude for the audience as well, due to the limited amount of action in the picture.

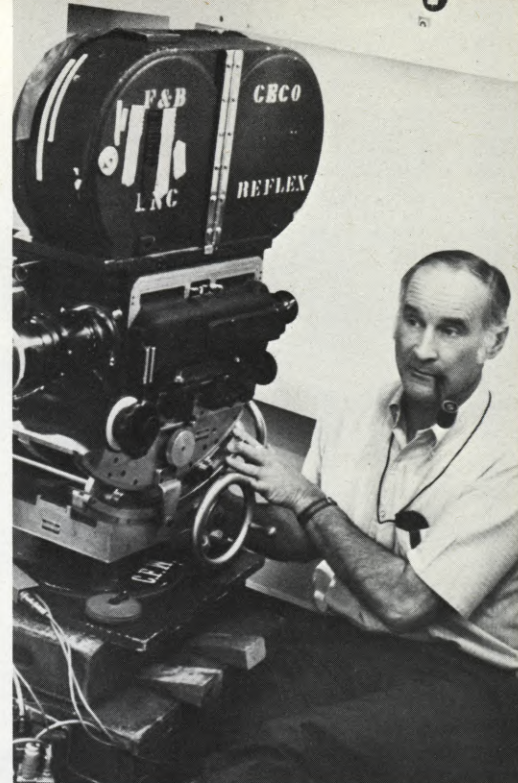
THE DRONES

I thought the drones were absolutely

marvelous. They were operated by a wonderful group of intelligent, cooperative athletes who were also bilateral amputees. They tried very hard to do everything Doug asked, but the drones themselves did not quite fulfill their promise mechanically. They were supposed to have electro-hydraulic arms that were controlled by both direct controls and radio controls. The radio controls never quite jelled so we had to rely on the direct controls and the exposed wiring limited our camera angles. I wish we could have developed the drones to a much greater extent because I thought they added a welcome softness, or tenderness, to the picture as well as comic relief. Even photographically we could have done much more with them had we not been limited by budget and time. We did try several interesting things that worked out well, such as placing some of the highly-reflective material of the front projection screen in such a way that when we opened and closed light on it the reflections made the drones shine.

SPECIAL EFFECTS

Special effects are used when not everything needed in a scene can be assembled in one place at one time, or when some components are imaginary. Doug was not only the director, but in charge of the special effects, which he had designed himself. Sometimes a director may not have the experience to make him knowledgeable about special effects and he has to rely on the recommendations of a separate special

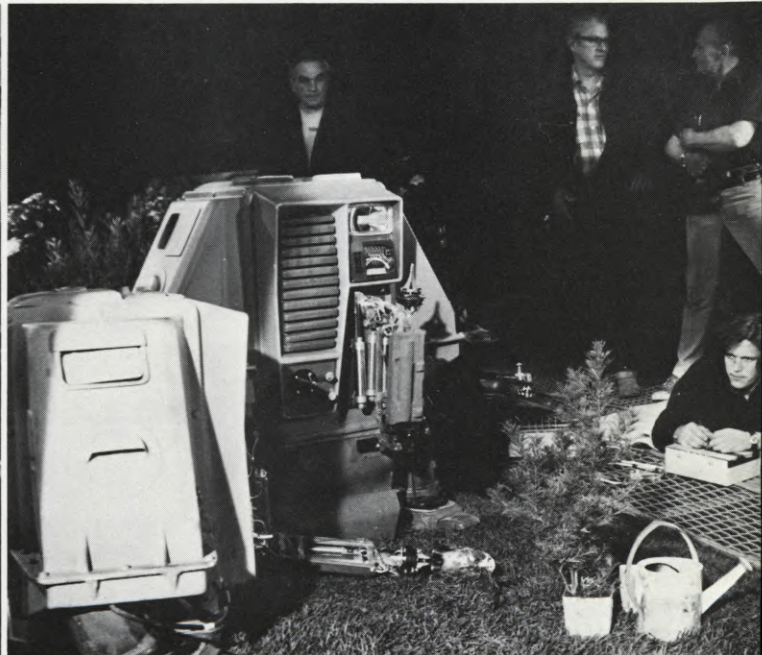


Cinematographer Wheeler sets the camera for a shot. The challenges of this film were quite different from his previous assignment, "TORA! TORA! TORA!"

effects department. His approach as to how the picture should be made may not coincide with theirs, as each individual sees things in a different way, and unless there is a meeting of the minds before production begins, difficulties can arise. Doug understood what we could accomplish with our time and equipment which allowed him to plan

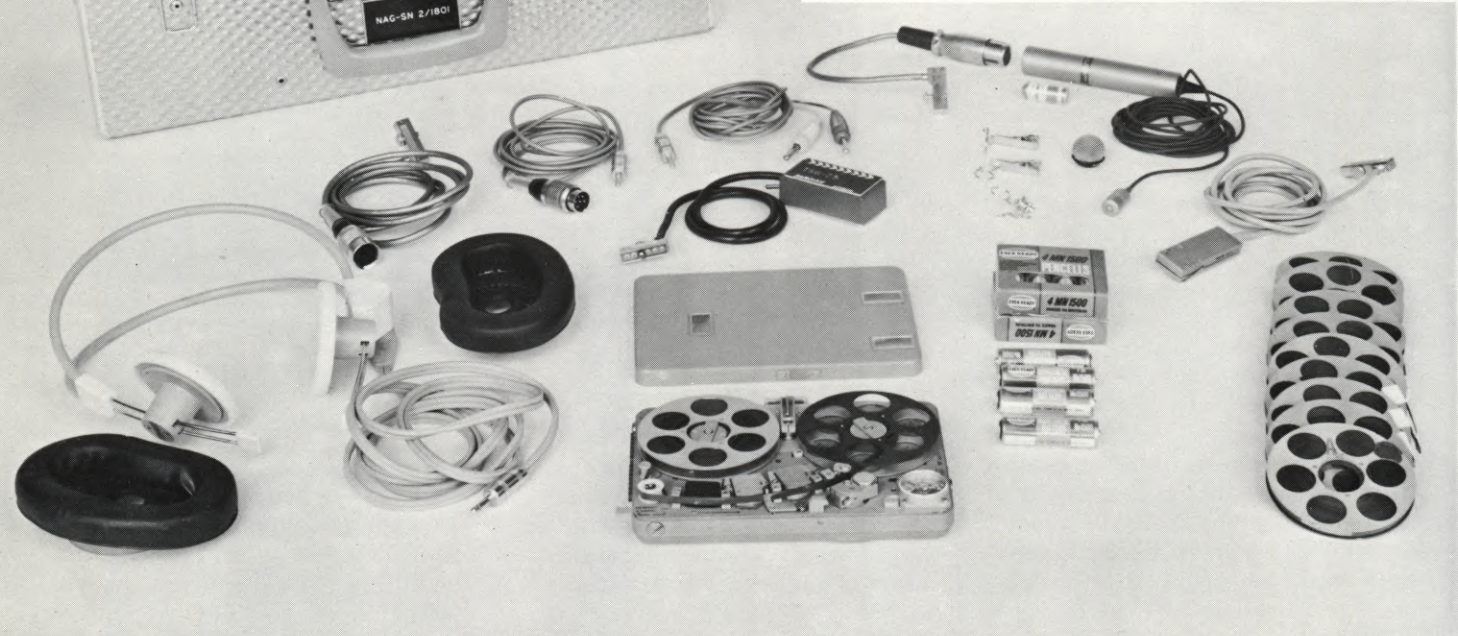
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(LEFT) Bruce Dern runs his lines, while Cheryl Sparks, inside drone robot case (with front plate removed) looks on. Drones were played by four young bilateral amputees who did a superb job of working inside the cumbersome cases and enjoying the whole experience immensely. (RIGHT) Mechanical manipulator arms of drones were operated by remote control by operator (shown lying down at right). Arms were very maneuverable, pneumatically-controlled and made of light-weight aluminum. Remote radio control device was similar to that used on radio-controlled airplanes.





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SPECIAL EFFECTS FOR "SILENT RUNNING"

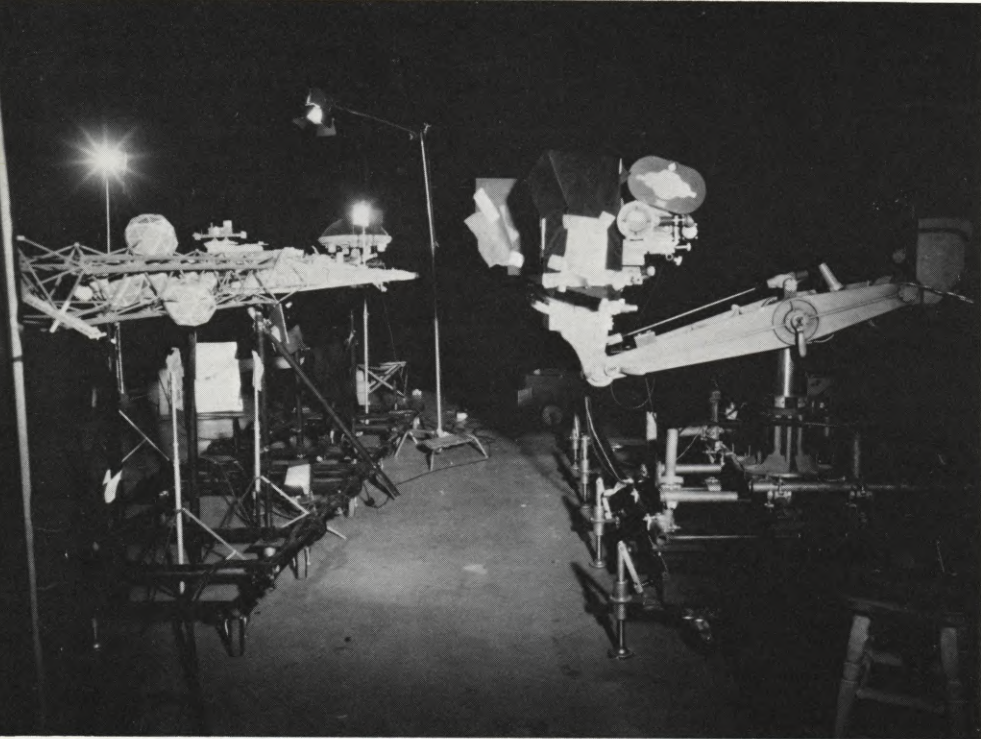
By JOHN DYKSTRA

One of the first problems we had in executing the special photographic effects of "SILENT RUNNING" was to overcome the shallow depth of field encountered in the model photography, due to the short "subject to lens" distance. The 4x5 transparencies to be used in front-projection had to make a 24-foot spaceship model look a half-mile long. This meant we had to hold depth of field from 8 inches to 24 feet—and all of it had to be sharp. Its projected image was to fill a 40' x 20' screen to be rephotographed during front-projection scenes.

In order to hold depth of field in the still plates to be projected, we used composite photos. When photographing the spaceship from the front, a position was selected which provided the composition for that particular plate. Next, three or more 4x5 color negatives were exposed from that position, each focused at a different point along the spaceship. These negatives were made into specially color-corrected and perspective-matched 16" x 20" or larger color prints. The area of sharp focus was cut out and laid down on another piece of board in correct perspective with the other prints made from that particular camera position. This composite was then touched up and rephotographed on 4 x 5 Ektachrome and mounted for projection between two pieces of 5" x 7" slide-mounting glass.

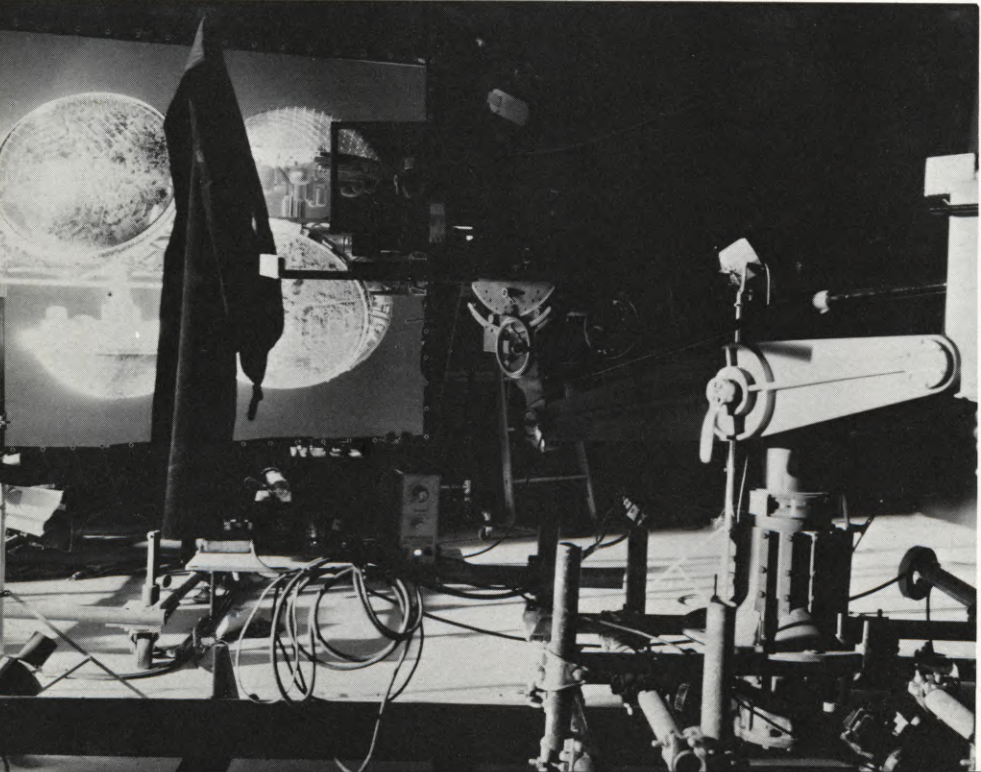
This same depth of field problem was encountered in the motion picture filming of the miniature, but in this case we could achieve the necessary depth of field at F/22 on 35mm film. Realism dictated that a single point source of light be used as a sun key. We used a single 10K for this purpose. Exposures at F/22 required a camera speed between 10 and 30 seconds per frame. Moving the model itself proved impractical, so the camera/front-projector unit was mounted on an articulated boom arm which was in turn mounted on a twelve-foot-long dolly track. Because the track speed had to relate to the camera speed, we used synchronous motors to dolly the camera smoothly past the model at speeds as slow as an inch a minute.

The six plexiglass domes on the



Set-up for filming the 24-foot model of spaceship *Valley Forge* to make it took a half-mile long. In order to gain maximum depth of field, lens of motion picture camera was stopped to F/22. Camera/front projector unit was mounted on an articulated boom arm (right) which was, in turn, mounted on a 12-foot-long dolly track. Synchronous motors controlled dollying past model at speeds as slow as an inch a minute.

The six plexiglass domes on the spaceship model presented many lighting problems. Their configuration and highly reflective surface provided a perfect fish-eye, reflecting every light source in the room, as well as camera, boom, etc. The solution was to paint the entire stage black, including walls, ceiling and floor.



model presented many lighting problems. Their configuration and highly reflective surface provided a perfect fish-eye reflector mirroring every light source in the room, as well as gobos, camera, dolly track, etc. They couldn't be dulled as their interiors had to be photographed and lit from outside. Our solution was to paint the entire stage black, including the ceiling, walls and floor. Our next concern was the lighting for the interiors of the domes. This was accomplished by spotting minis through the extreme sides of the plexiglass domes and then setting gobos so that each light source was not reflected in the surface.

Nearly all of the scenes involving the spaceship model used front-projection to provide the backgrounds of the stars, other ships, and Saturn. All the front projection shots in "SILENT RUNNING", including live action aboard the



Airplane hangar at Van Nuys Airport was used as "sound stage" for filming of forest sequences. The area was dressed with trees and plants, plus a pool. In the background can be seen the large front-projection screen composed of highly-reflective, ultra-directional 3M material, onto which was projected structure of the dome, star field and, at times, the planet Saturn.

tion to be matched to the foreground set, and the taking lens. The light source for this unit can be either a 1000-watt tungsten-halogen lamp or an 1800-watt xenon lamp. For all applications in "SILENT RUNNING" the 1000-watt quartz light was more than adequate. The beam-splitter on the unit reduced the effective light output of the projection unit by 1½ stops, and required that the taking lens on the camera be compensated 1½ stops over normal exposure for the scene. The color and exposure balance of the projected image could not be read with a meter and had to be balanced to the foreground set lighting by eye. A typical balance with our unit

was F/11 on the projector lens against F/4.5 on the taking lens. This was with a projection throw of approximately 40' to 60' covering a 20' x 40' front-projection screen.

The taking camera used on this unit was an Arriflex 35 with interchangeable high-speed and constant-speed motors. The camera itself was cradled in a special nodal-point mount which allowed the camera to be adjusted in three axes in order to accommodate lenses of varied focal lengths, and even zoom lenses. This nodal-point mount was made by splitting two O'Connor fluid heads and hanging a sling between
Continued on Page 808

Doug Trumbull works with front-projection unit, based on a plate-projector which projected a 4x5-inch format out of a 5x7 plate that could be moved during filming to produce a required background motion. Its axis of movement included pan, tilt and rotation. A 1000-watt tungsten-halogen light source was used in projector.

Bruce Dern in "forest", shown against front-projected background showing star field and struts of geodesic dome.

aircraft carrier, on the green set, and the model work used the same front-projection rig. This unit was specially built for Trumbull Productions to our specifications.

The unit is based on a plate-projector which projects a 4x5 format out of a 5x7 plate which can be moved during filming to produce a required background motion. Its axis of movement includes pan, tilt, and rotation. The projector has a complement of Schneider lenses from 105mm to 250mm, allowing the perspective of the projec-



THE NEW SHOWCHRON AMERICAN EXPANDABLE EDITING CONSOLE

A unique horizontal console of American manufacture, featuring a modular design concept that makes possible its use in a wide variety of configurations—even for mixing sound tracks

Reflecting a growing acceptance in this country of horizontal editing consoles, the new Showchron American Expandable Editing System sparked considerable interest at the recent SMPTE 111th Technical Conference and Equipment Exhibit held in New York.

The handsome equipment is light in weight, easily movable, and folds down for convenient storage. Showchron's most intriguing characteristic, however, is the almost infinite range of 16mm and 35mm, picture and sound editing configurations which its basic modular "systems" design makes possible.

EXPANDABLE SYSTEM:

Utilizing the "building block" principle the basic Showchron Console consisting of one picture and one sound is expandable to three pictures/one sound, and composite soundhead or with additional soundheads the editor can monitor one picture and three sound tracks. Each picture may also be equipped with digital or mechanical counter.

SHOWCHRON DESIGN CONCEPT

The design concept was reduced to modular hardware after a time and

motion study of editing techniques and practices peculiar to the component arrangement and functions of European editing tables.

It was determined that editing procedures have wide variations depending on the type of production. Such as: Does the editor follow a script or the cameraman? Single or multi camera? Is he the producer editing his own footage, or will a producer and director expect a variation of cuts from limited footage? Lip sync or post sync? Will the producer and client be watching over his shoulder?

Solution: Design and editing system versatile thru modular interchange, selective in arrangement and basic in structure, so that the system may be expanded for present and future requirements. Scaled for operational dexterity and small enough to be really portable.

CONVENIENCE DESIGN

Threading, marking, inching and all other functional steps to editing and monitoring have been simplified thru the "total design" approach. Each component was designed to meet its specific purpose and function. Picture and

soundhead location and their relationship to operational dexterity is an entirely new approach to "editorial productivity".

SINGLE SPROCKET DRIVE

Showchron's integrated "single" sprocket drive system is a departure from the usual belts and gears commonly used in carry-over designs. The integration of prism and sprocket provides a separate prism for each picture frame transmitted. Picture flicker is virtually eliminated. Correspondingly, the sound track reproduce head is inside the sprocket which is "interlocked" for "editorial sync" to the picture.

RAPID ADVANCE/RETARD OF SOUND TRACK:

With picture advancing at sound speed, sound track may be advanced or retarded variable to high speed. Sound track may also be rewound while picture is in motion.

FOOT PEDAL OPERATION:

A dual foot pedal provides instant start/stop or instant forward/reverse at sound speed. Tapping action on respective pedal will advance or retard film one or more frames.

INTERLOCK DRIVE:

Showchron's direct interlock drive system permits the coupling and decoupling of sound or "picture to picture" for selective composition and editing. Rapid advance or retard of multiple picture and multiple sound tracks simplifies and speeds program assembly.

INCHING OF PICTURE OR SOUND TRACKS:

Each sprocket has an "inching knob" for manual locating, marking and for precise threading of "start marks". Sprockets electrically couple and decouple during standstill or when film is moving. Editor may inch picture and sound interlocked by only turning the soundhead sprocket.

TORQUE MOTOR DIFFERENTIAL SYSTEM:

Each turntable has a torque motor and electro-magnetic brake assembly.

(LEFT) The Showchron Editing Console, Model P16-1S for one picture/one sound editing. (RIGHT) Addition of extra modules transforms equipment into Showchron Model P16-2S, for one picture/two sound editing. Below large viewing screen are read-out displays for feet/frames, minutes/seconds and advance/retard.



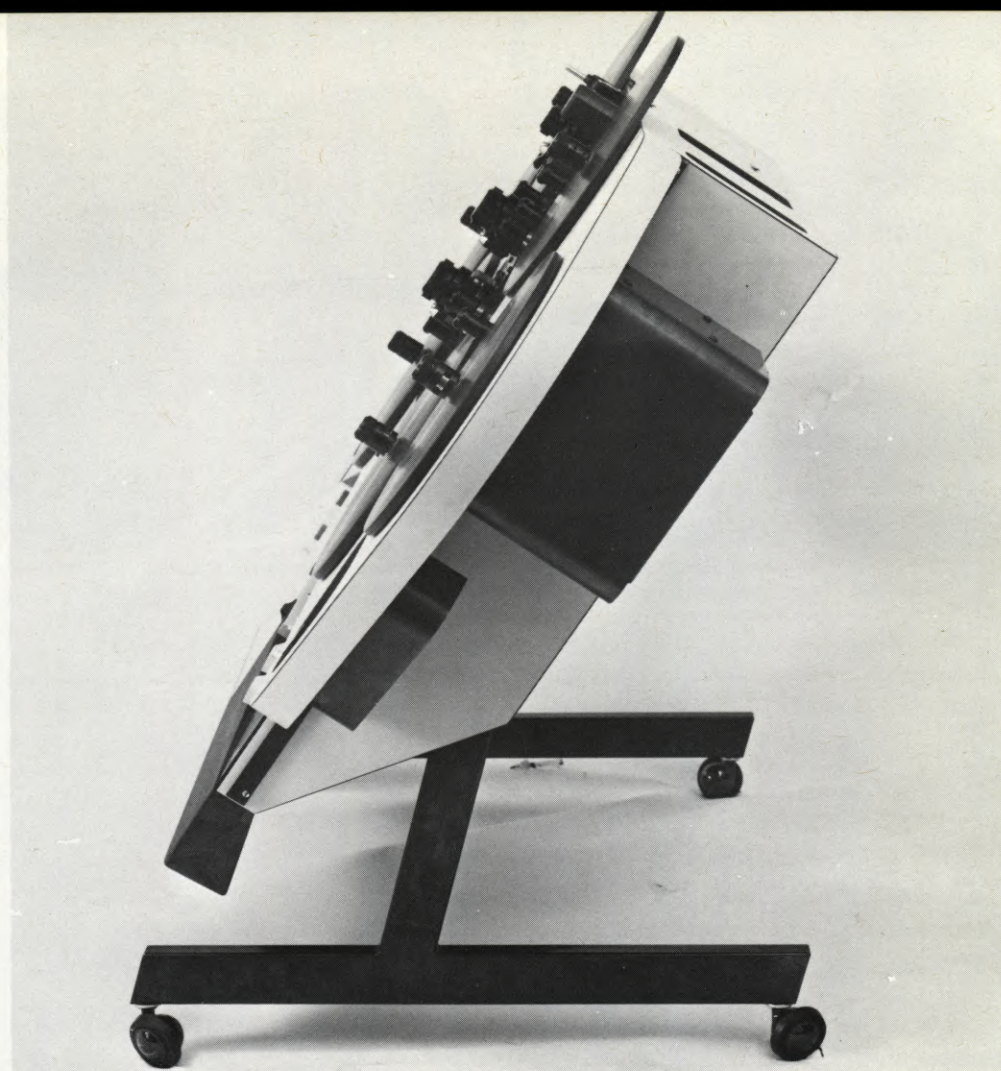
The differential system tight-winds the film during any mode of operation. The film rolls are wound "rock hard", thus eliminating spillage when film is removed and during subsequent handling. The logic circuit also controls the torque differential for selective rapid forward or reverse of picture and sound. Braking is instantaneous and safe at up to thirty times sound speed. Alternate braking stops turntable when roll is completely rewound.

SELECTIVE EDITING MULTIPLE PICTURE AND SOUND:

A two picture/two sound arrangement simplifies the assembly of good takes and out takes. Second picture may be rapidly advanced or retarded and re-coupled while picture and sound are running at 24 fps. Expanding to three picture heads to correspond with three camera shooting, editor can easily sync the program material to the dialogue track. Any one of the three picture heads can be coupled and decoupled for advance or retard.

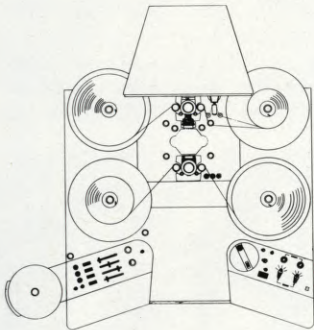
SHOWCHRON DIGITAL COUNTER DISPLAY:

The counter design and selection of components include led read-out displays for feet/frames, minutes/seconds and advance/retard. The advance/retard readout corresponds to the soundhead tachometer, thus displaying the number of frames out of sync. Each section of

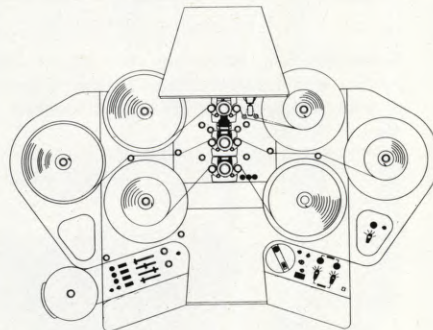


Unit shown with screen box removed and console tilted for easy movement from one area to another through a 28-inch doorway. Tubular steel legs are easily removed for transportation in station wagon. Also available is a special container for transporting equipment via air or surface transportation.

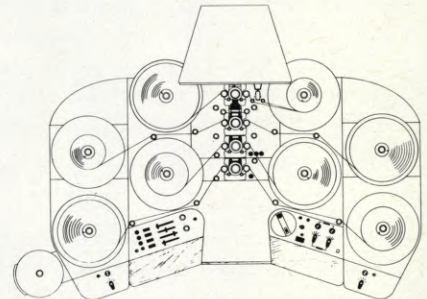
DIAGRAM SHOWING VARIOUS CONFIGURATIONS MADE POSSIBLE BY MODULAR DESIGN



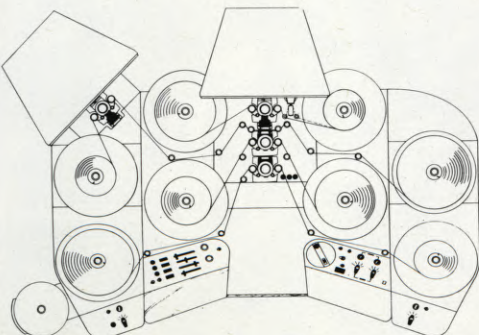
**ONE PICTURE ONE SOUND
MODEL P16-1S CONSOLE**



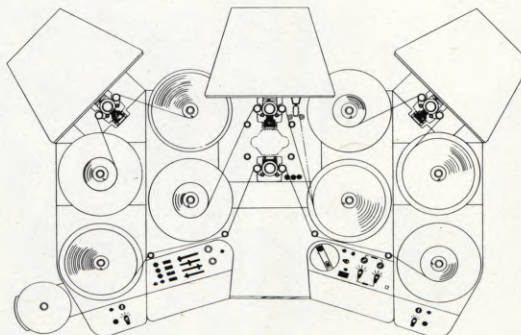
**ONE PICTURE TWO SOUND
MODEL P16-2S CONSOLE**



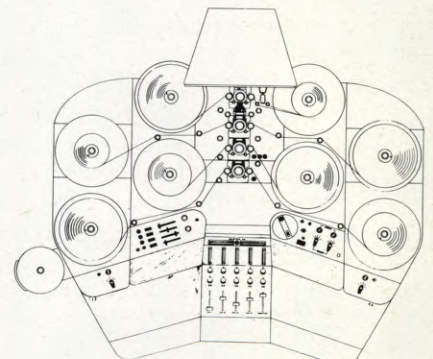
**ONE PICTURE THREE SOUND
MODEL P16-3S CONSOLE**



**TWO PICTURE TWO SOUND
MODEL P216-2S**



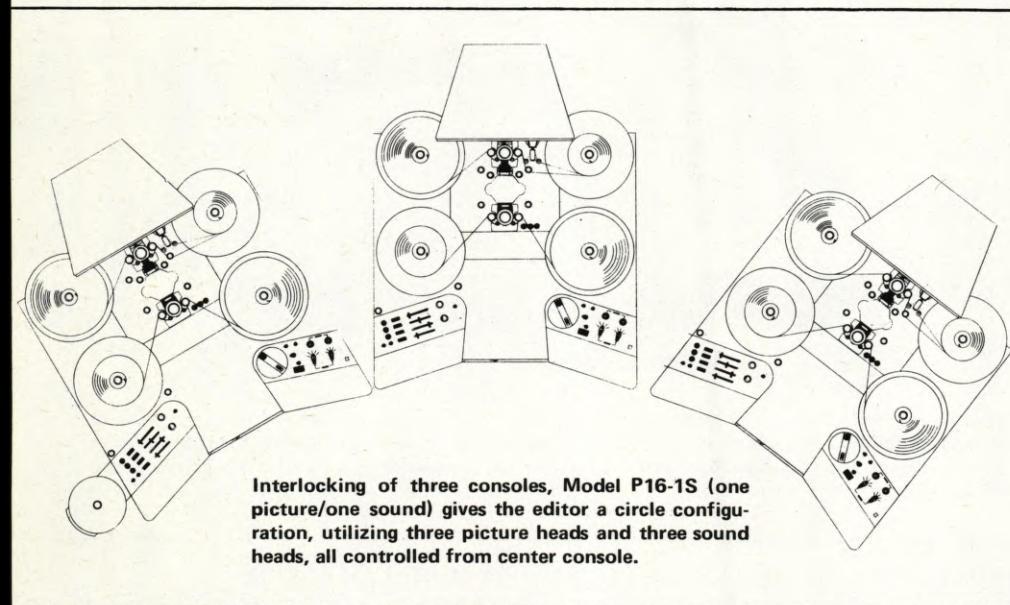
**THREE PICTURE ONE SOUND
MODEL P316-1S**



**MODEL P16-3S SHOWN WITH
SHOWCHRON MIXING CONSOLE
MODEL MC-4**



(LEFT) The control panel which is standard on all Showchron models. (RIGHT) The mixing control panel which is also standard on all Showchron models. Direct interlock drive system permits the coupling and decoupling of sound or "picture to picture" for selective composition and editing.



Interlocking of three consoles, Model P16-1S (one picture/one sound) gives the editor a circle configuration, utilizing three picture heads and three sound heads, all controlled from center console.

gain control, which corresponds to a single 600-ohm zero level output.

The unit also has a 15-watt monitor amplifier with speaker and headphone outputs. The operator can monitor his mix during a screening and, at the same time, transfer to 16mm mag.

The one-picture, three-sound model can be used for mixing and dubbing using an auxiliary 16mm magnetic recorder, or a record head attachment is available to convert one of the transports into a record/transfer unit. During this practice, the operator would first thread up his music and effects track and go through a mix into a composite transfer. Channels 1 and 2 would then be utilized to mix the dialogue track with the combined M & E Tracks.

The above procedures can be fol-
Continued on Page 816

the display has its own reset button; therefore, while the precise time of the picture is accumulating, the feet and frames readout is progressively utilized for editing and assembly.

SHOWCHRON MODEL MC-4 MIXING CONSOLE ATTACHMENT

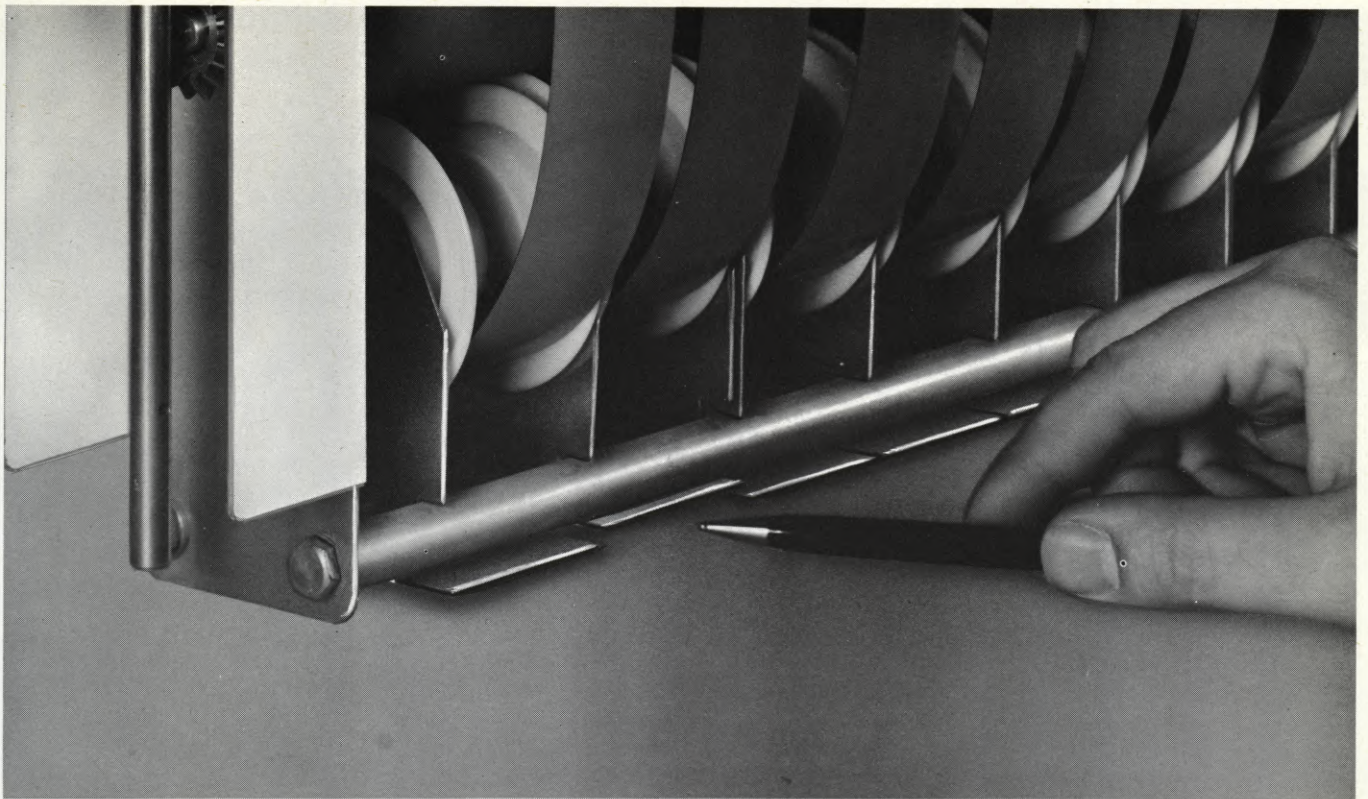
After having edited the picture, music, dialogue and effects tracks, a "scratch" mix can be made with each channel suitably balanced and equalized.

The output of each of the three channels is fed directly into the auxiliary mixing console, whereby the levels are set and adjusted for proper dialogue to music/effects balance. Additionally, each channel may be equalized for boost and attenuation of both high and low frequencies.

The console has four input channels, channel four designated as auxiliary, for narration, "wild sound", or background material, as may complement the overall mix. The fifth attenuator is the master

Single-sprocket threadings for Model P16-2S (one picture/two sound). Single-sprocket drive system is a departure from belts and gears commonly used in carry-over designs. Integration of picture and sprocket provides a separate prism for each picture frame transmitted, eliminating picture flicker.



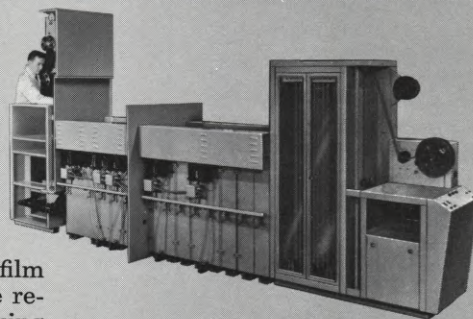


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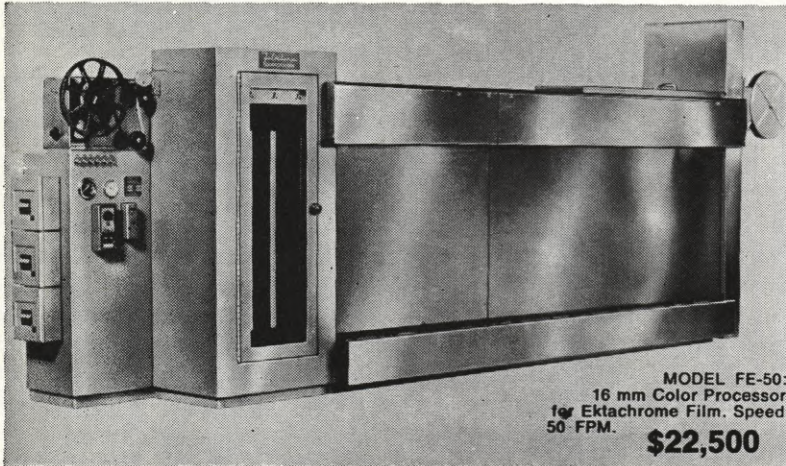
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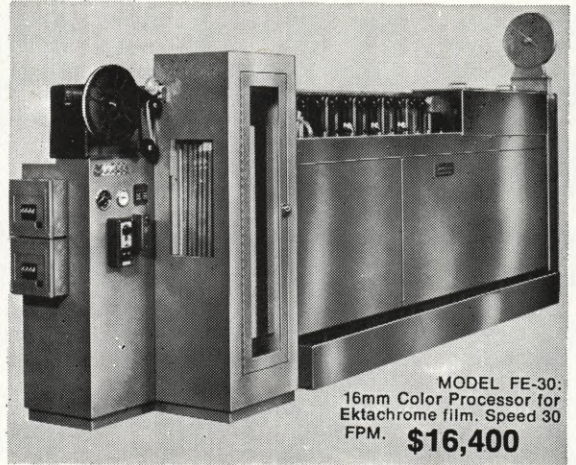
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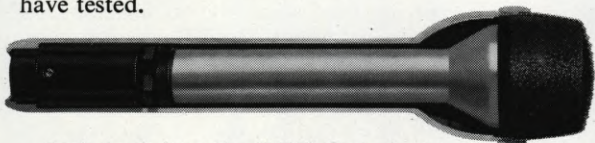
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Let's look into the RE50 first. A cutaway shows that inside each RE50 nestles the familiar 635A, case and all. It's shock-mounted at top and bottom to the outer case. Even the connector is isolated from the actual microphone. And the problems

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cept with the new RE85. Again, we have created a microphone within a microphone. But we've gone even farther. A special low-noise grille, for instance. And even the hard, smooth paint finish was chosen to reduce small rubbing noises.

The result is virtually noise-free operation even with inexperienced performers. And at no expense to sound quality. Like all E-V lavaliers, output of the RE85 is peak-free and natural. Each RE85 comes complete with neck cord, tie clip, and a belt clip to help control the cable. The RE50 is supplied with a Model 300 stand clamp.

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FILMING "LIGHT, STRONG AND BEAUTIFUL"

How a reluctant film-maker met the challenge of making an exciting picture about aluminum

By NEIL TARDIO

Francis Thompson, the noted film-maker (an "Oscar" for "TO BE ALIVE"), called me one day and said he had a film he would like me to do. I practically ran the 10 blocks from my office to his. I asked him the subject of the film three times between the front door and the short walk through his studio. We sat down. "What's this film about?", I pleaded for the fourth time. "Aluminum" he said. I was instantly depressed. The idea of doing an "industrial" made me ill. But Thompson was

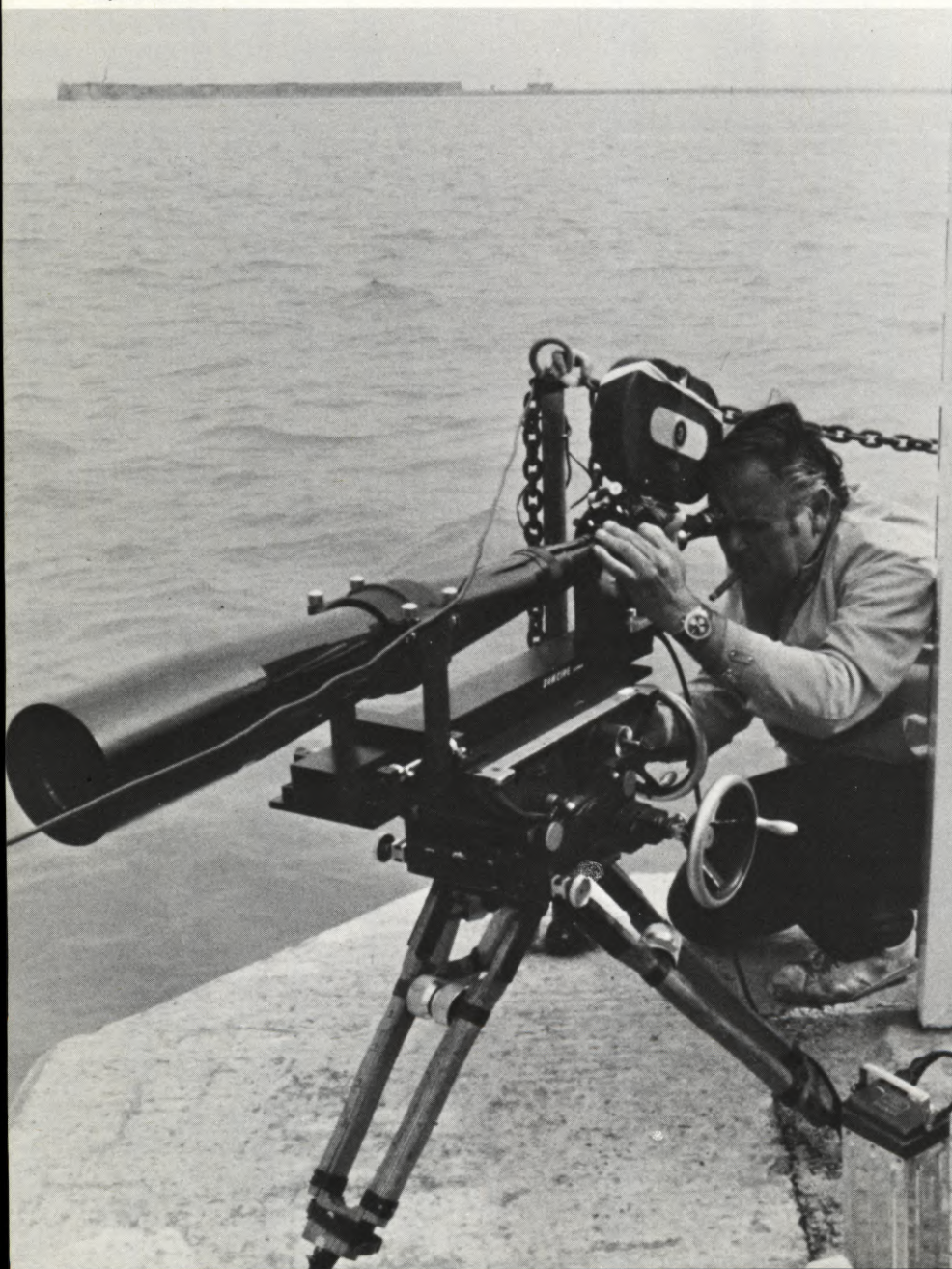
ready for me. Do you have a better film to do right now? No answer. "They (Kaiser Aluminum & Chemical Corporation) will give you total creative freedom. The budget is good. The film will be shot around the world—what's wrong with that?" "Aluminum" was my answer. "You think about it and call me in a couple of days." I called him four days later and said yes. During those four days, I screened aluminum films and industrials of all kinds. I did some reading and made some calls. There

were some fine films made in this area, but the chance to do something outstanding was, perhaps, greater here than any other place. I would try and learn a lot in the process.

I hired a writer named Dick Olmstead, a good friend, and ex-copywriter at Y&R, writer of a dozen film scripts, and currently writing a novel. We began writing the treatment in 1969. It was the most difficult kind of problem-solving. The "industrial" specter was omnipresent. We had to make a film that would actually excite people about aluminum. One that Kaiser salesmen could show to prospects, that would make employees of Kaiser, all over the world, feel proud to be in the business. One that would make anyone walk away from the screening think aluminum—and to do it differently, beautifully, excitingly. Not an easy task. On April 10th, 1970 we left for Australia and the first location. When we were working with Kaiser installations anywhere, it was obviously easy to operate, secure locations, cast people, move things, change things. But most of the film is concerned with the uses of the metal, and involved industrial scenes that had to be created from research, scouting and, at least half the time, designed and produced on the spot!

Aluminum is incredible stuff. (See, I'm brainwashed now) and we knew that there was impact in revealing a spectrum of interesting and varied uses. Our attitude was not to get trapped in the somewhat impressive weight of numbers—but in selected single uses that would transcend all others in that field. For example, automobiles use lots of aluminum—body parts, grills, trim, wiring and electronics, engine block, etc. But Pininfarina designs and hand-builds the most beautiful and style-setting cars in the world—completely out of aluminum. Paco Rabanne, in Paris, hand-makes one-of-a-kind exquisite fashions out of aluminum. But it was impossible to reach these people and others like them through any associations or contacts, no matter how influential or persistent, to convince them to even discuss the production of an aluminum film that would use their cars, boats, dresses, etc. For a feature . . . sure. An American TV special . . . sure. But not

The author trains his 1000mm lens on a Hovercraft, a huge aluminum half-plane-half-boat that races people across the English Channel in 35 minutes. Scene was shot for "LIGHT, STRONG AND BEAUTIFUL", spectacular award-winning film made for Kaiser Aluminum & Chemical Corporation.





Frame blow-ups from "LIGHT, STRONG AND BEAUTIFUL". (LEFT) Aluminum glider, photographed from Bell 47-T model helicopter with Tyler mount, flown by Bob Lockrow. All air-to-air shots were plotted on the ground in advance, using models. (CENTER) Experimental Fiat-Ferrari, built by Pinnin-Farina. Car was photographed on main runway at Turin Airport in Italy. Camera was an Arriflex chained to the floor of the Fiat (seats removed). (RIGHT) Dancing girl was filmed in Paris with a Mark II Mitchell camera at 120 fps. Scene was lighted with one 10,000-watt soft-light.



(LEFT) An "Asian" hut scene filmed up the Rio Grande River, near Port Ontario, Jamaica. (CENTER) Scene shows vacuuming of alumina from the hold of a ship. Scene was photographed by Allan Green, using a hand-held Arriflex equipped with a 9.8mm lens. (RIGHT) A bridge over the Seine River in Paris. Arriflex was on a tripod mounted on the roof of a river boat, which had a powerful engine and was about 60 feet long.



(LEFT) Hovercraft. 1000mm lens sand-bagged and mounted on wood frame on concrete pier. A Sun Gun held on ladder above camera directed Hovercraft pilot through fog as he crossed English channel toward camera. (CENTER) Scene filmed in Picadilly Circus. Camera was hidden under blanket over legs of cameraman riding in wheel chair for two reasons: 1) Police would not allow anyone to shoot there, and 2) Director wanted people under the fountain to be relatively unconcerned about filming. (RIGHT) Paris fashion designer Paco Rabanne "dressing" one of his models with one of his hand-made aluminum fabrics.

this. (You can't lie about what you're doing in order to get a foot in the door—unless you like to live that way.) But we made it happen. Mainly by personal contacts starting at the front door. I get pains thinking about it, but I wouldn't trade the experience for anything.

The Australian shooting, 20 days (prepared and shot), was exciting. I brought Alan Green and Pete Porter, cameraman and production manager, respectively, with me, and hired an assistant cameraman, sound and general assistant out of Sydney. They were among the finest workers and most

competent professionals I have ever known. Especially Ross Blake, the assistant who, I understand, is shooting now. The first 10 days of production were at Weipa, in the northern tip of Queensland, three or four hundred miles from New Guinea. Hot, rugged stuff. Because I wanted the viewer to see the production of aluminum, the way it was shown to me, we hand-held cameras and moved through all of it. Weipa has the largest deposit of bauxite in the world; it's a digging, loading, dumping, grading operation. Here, I selected only those elements that simply told the story—using people—always people, to report what

was there—to make it human and alive and international.

Jamaica was another story. We had two sequences to do there. The refining operation—turning bauxite (red clay) into a fine white powder which is aluminum oxide and called "alumina". The refinery in Jamaica was far from the places a tourist sees, and it looked like a mile-long still. Plumbing, tanks, furnaces, stacks, and furnace heat on top of 90° Jamaican sun. I hated the place.

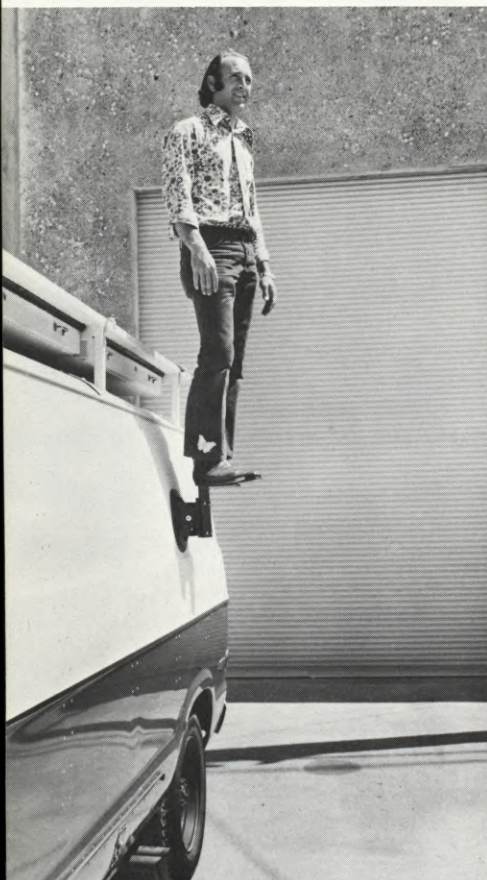
After a thorough tour of the facility, making notes and polaroiding faces and

Continued on Page 823

EVOLUTION OF THE "SUPER-GRIP"

A simple, small, versatile and super-strong device for mounting a film camera on any smooth surface

By KEN PHELPS



(LEFT) Designer of the Super-Grip, Ken Phelps, standing with confidence on one of his creations attached to the side of a truck. (RIGHT) A heavy five-light Molefay unit being used as a key light for a typical running shot. Note the simple extension plate used on the Super-Grip to raise the light.

How many times have you seen a closeup shot of someone driving a car and then realized that he really *isn't* driving? You are distracted by the fact that he is being towed, or perhaps he isn't moving at all—someone is rocking the car by hand, off-camera.

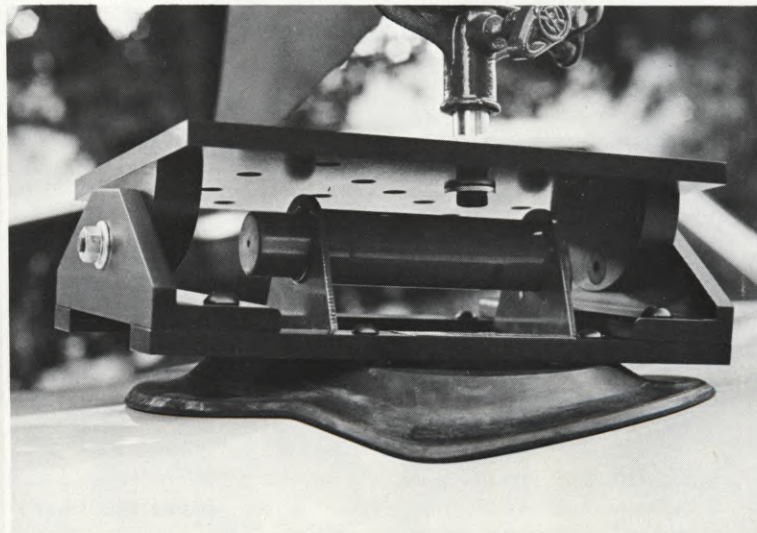
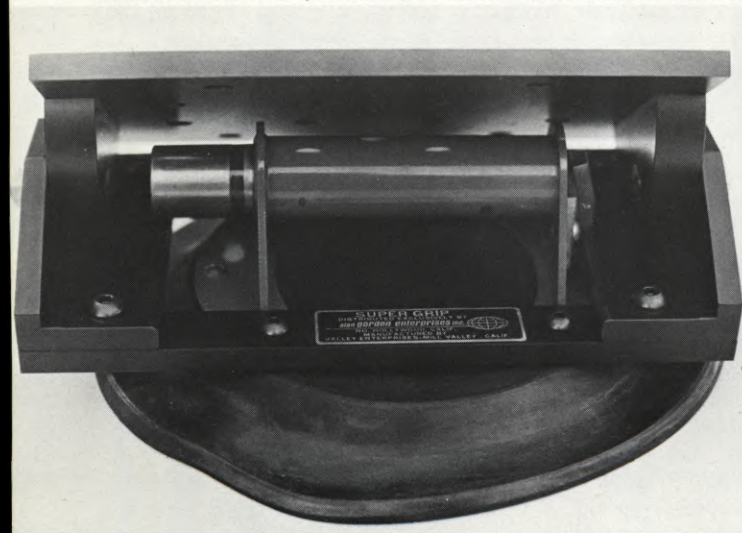
Chances are that the people who shot that particular scene knew all along that they were compromising, but matters of time, knowledge, and/or money prevented them from doing the real action.

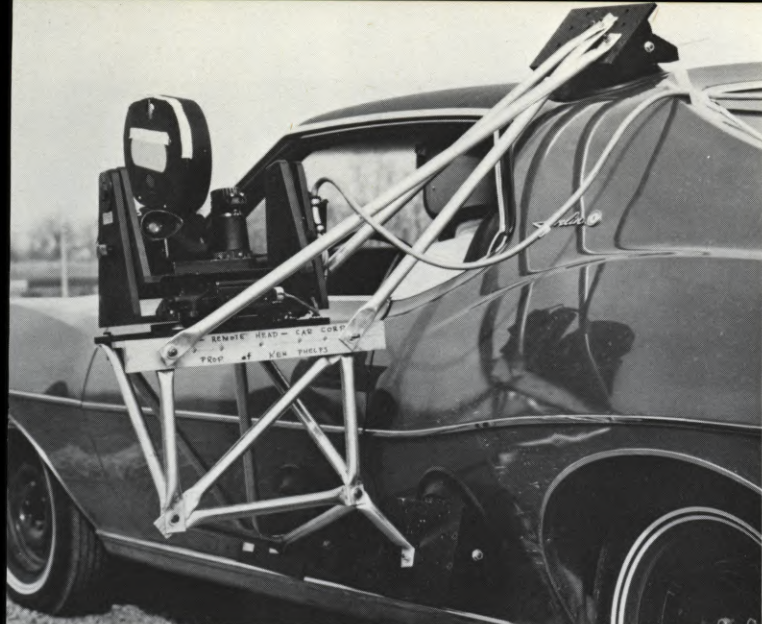
In a world where fast transportation is an overwhelming part of our lives, filming around cars, busses, planes, boats, trains, etc., is increasing steadily.

Working as a grip and rigger, I became aware of the many shots lost because of expediency. In many situations, if time was available, a grip truck with lumber, rope, etc. was not; or, if the necessary equipment was on hand, there was no time to set up the shot. Sometimes, if all the items were present—crew, equipment, *and* time to build some sort of support for a motion picture camera—I would hear: "Get that man and his electric drill away from my \$18,000 sports car!" Or, from an ad agency executive, "What are those guys doing to that handmade, prototype automobile?". I have also heard lines like "You aren't going to put all that stuff on *my* hydroplane!"

Perhaps none of these complaints is

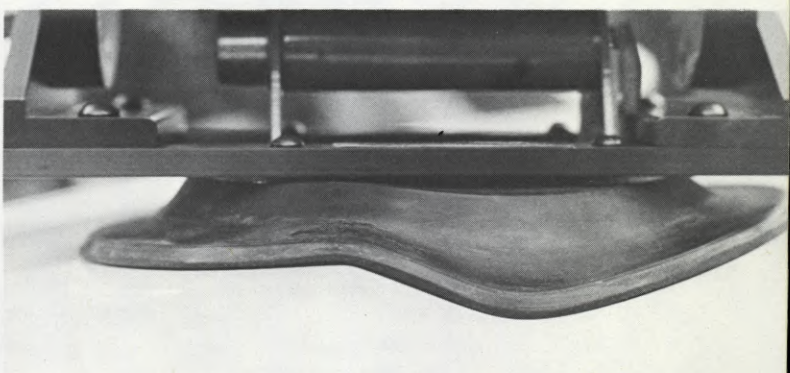
(LEFT) Detail of the pump assembly used in the Super-Grip. The attaching pressure indicator line is on the pump plunger on the left and the valve lever on the right end of the assembly is used to release the Super-Grip. (RIGHT) A Super-Grip used to mount a light on an automobile hood demonstrates the ability to adhere to uneven contours and conform to shapes that would prohibit the use of ordinary suction cups.





(LEFT) Three Super-Grips provide a strong support for a heavy remote pan/tilt head and 35mm Arriflex. This proved to be a rigid and reliable set-up on a coarse road at speeds in excess of 100 miles per hour. (RIGHT) A Super-Grip is used to mount a 16mm Arriflex to the bow of a speedboat for a wide-angle shot at Cypress Gardens, Florida.

(LEFT) Riding in comfort! Three Super-Grips provide safety and confidence for the camera operator, as he does some hand-held running shots. (RIGHT) Close up view clearly shows the amazing amount of flexibility and contour-forming ability of the Super-Grip. The unit is available from Alan Gordon Enterprises Inc., Hollywood.



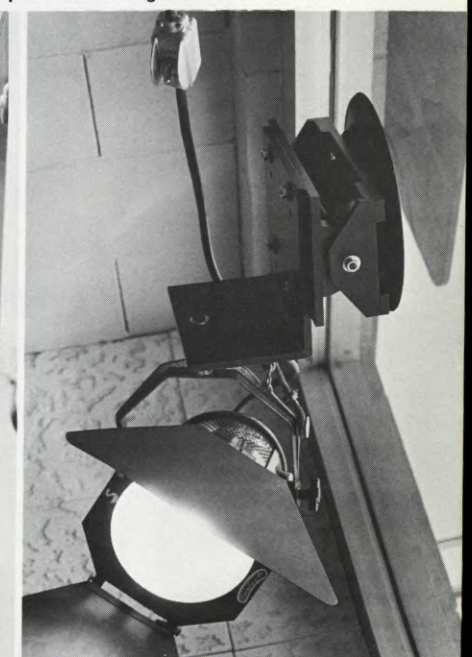
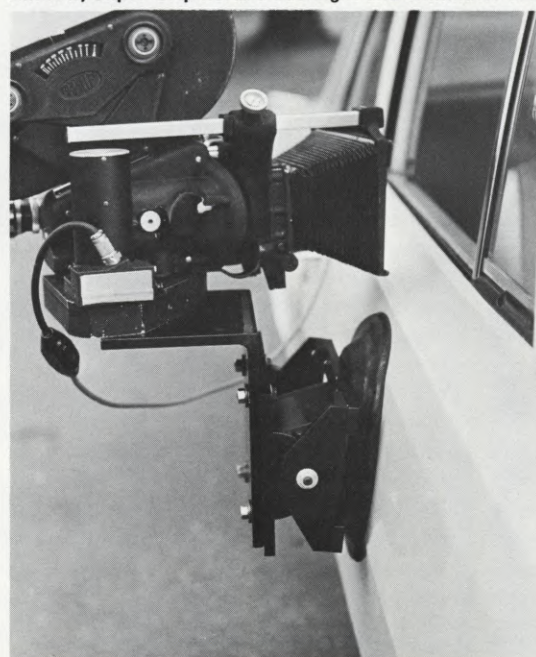
heard. Everything goes smoothly; the grips go to work; the camera is attached, braced off, and tied down solid. Then the Director says, "Can we move it just a little to the left and tilt up a bit?" Time to start all over.

Why not have an easy way to mount any camera to any vehicle? Instead of avoiding moving shots, they could be incorporated into a film easier and cheaper, thereby making the finished product more exciting and visually interesting.

There have been many solutions to this problem but each seemed to involve more men and equipment than the other. There were rigs for "through the front window"; there were other rigs for

(ABOUT THE AUTHOR: Ken Phelps is a member of I.A.T.S.E. Local #16, San Francisco. He works on TV commercials, features, and films of all kinds as a key grip. Specializing in camera rigs and special mechanical effects, he has worked on movie locations all over the world.)

(LEFT) A 35mm Arriflex mounted solidly on a car door for a moving shot of the driver (attached in about the time it takes to read this caption). (RIGHT) Mounted on an interior office window, Super-Grip holds a backlight and eliminates the problem of a light stand in the shot.





Two of the magnificent Mexican archaeological sites which are the "stars" of "SENTINELS OF SILENCE", stunning theatrical short produced by Producciones Concord and photographed by Jim Freeman. The film won two "Oscars" in recent 44th Annual Academy Awards Presentation for "Best Achievement in Short Subjects (Live Action)" and "Best Achievement in Documentary Production (Short Subject)". It is being released by Paramount Pictures.

"SENTINELS OF SILENCE" AND OTHER GROOVY MOVIES

An interview with Greg MacGillivray and Jim Freeman, the team of brilliant young film-makers, whose exuberant style and superb photographic techniques catch the joy of every motion picture subject which they approach

A partnership of only six years, the team of Greg MacGillivray and Jim Freeman has had a remarkably successful career, highlighted by the photographic credits on the multi-Academy Award-winning short, "SENTINELS OF SILENCE". Their trademark of beautiful, awe-inspiring photography is found in "SENTINELS" as well as in their own productions of "CATCH THE JOY", a dune buggy film, and their films on surfing, most notably "FIVE SUMMER STORIES" and the 35mm "SUNSHINE SEA".

Presently the team is producing a 40-minute film on the City of San Francisco which will be shown as a tourist attraction at Fisherman's Wharf, four ten-minute theatrical shorts for Chevrolet and United Artists, and is beginning a film documentary on George McGovern's campaign for the Presidency.

Although they are tremendously busy, their office in Laguna Beach is a relaxed place fitting patly into their barefoot style. The following is an interview conducted as they were getting ready to leave for San Francisco and Vermont shooting locations.

Q. In filming the Academy Award-winning "SENTINELS OF SILENCE", what was the general photographic idea?

A. The idea was to show the mysterious Mexican ruins of Teotihuacán, Palenque, Monte Albán, Tulum, Chichen Itzá and Uxmal as serene monuments, isolated and sacred in their existence. The helicopter camera was used to yield this viewpoint—to give an omniscient perspective, floating above these unbelievable monuments. The camera moves slowly, revealing angles and perspectives not normally seen, and in its movement, the stillness and permanence of the monuments are emphasized. Without humans in the scene, it is difficult for an audience to grasp the immense size of all the ruins when filming in this manner. But once the audience begins to relate to the size of the trees in the picture, the discovery of the majesty of the monuments is made—and made more powerfully than if there were human objects of reference. Such a discovery makes a memorable impression on an audience.

Q. I suppose that because the ruins are very far apart, these distances provided

a real challenge to the production?

A. The distance between ruins is vast and often difficult to surmount. Starting from Mexico City, the helicopter flew great distances over jungle and then landed at a small city to wait for the gasoline truck and the crew (trying to buy jet fuel outside Mexico City is almost impossible). Navigation to the ruins was also hazardous. The maps are often inaccurate. In the lower left hand corner of ours was a warning in Spanish. Translated, it read "Errors of 2000 ft. altitude and 60 miles in distance have been reported"—presumably, by survivors. Some mountains are only 2000 feet high! We adopted a unique navigational system: We would spot a local farmer, land and question him for directions. After the farmer recovered from the fright of the huge "mosquito," he would give us directions we barely understood. The giant mosquito was a Hughes 500 which is a great ship, but offers little room for camera movement—like filming from an ironing board. Closed. The Tyler B-1 35mm mount, a fantastic piece of equipment designed by our good friend Nelson Tyler, barely

fit into the four-passenger mosquito. We flew 176 hours, and we're still trying to unwrinkle! Other than pilot Larry Peterson, a 21-year-old Vietnam veteran who had never before flown for a cameraman, and ourselves, the crew was entirely Mexican. Manuel Arango, the producer, felt, and justly so, that the film should be made as much as possible by those who shared in part of the ruins' heritage. The international crew worked well, and Manuel must be congratulated for adhering to his philosophy.

Q. What was the most difficult shot to get?

A. At Chichen Itzá, we flew 50 feet below the lip of the sacrificial well, then cork-screwed the mosquito out, twinkling the sun on the water as we rose. As we gained height, the pyramid ruins were revealed in the background. The squeeze into the well was extremely tight, and Larry had to maneuver cautiously as he hovered out. The camera movement itself was also tricky, spiraling and then smoothly tilting up to show the ruins, perfectly framed. Larry was enthusiastic about the shot—it was a good thing, because we did it seven times before we had it perfectly coordinated. Once the shot was completed, we took a good breather to quiet our nerves.

Q. The film has an incredible rain sequence. Was this also dangerous?

A. Yes, extremely. Also, the camera, the lens and the pilot suffered from a case of pneumonia, and Jim had to pour

torrents of water from his tennis shoes when the shots were completed.

Q. Were there any other difficulties, specifically indigenous to filming in Mexico?

A. The main problem, besides gas, language and navigation, was the problem in electrically charging the batteries. The AC current is not constant, so we could not successfully charge the battery belts over night. Our alternative was utilizing auto batteries from several sources: the trucks we had for the crew, a couple of spare batteries, and several borrowed from passing tourists. One of the most beautiful shots in the film was taken with a '65 Olds battery borrowed from a family from Ohio.

Q. Your company is well-known for technical excellence, and the results of your "CATCH THE JOY" and "SUNSHINE SEA" 16-35mm blow-ups are remarkable. Why did you decide to shoot "SENTINELS OF SILENCE" in 35mm?

A. Although Cinema Research had done amazing things with our blow-ups in the past, we chose 35mm to allow ourselves greater speed, latitude and color rendition. To show the texture and remarkable beauty of the ruins as clearly as possible was our objective. We chose the rainy season (September and August) to get the variations in color and light, puffy, pillow-like clouds, soft green carpets of trees, clean washed air, and the wind conditions so necessary for unusual helicopter movements.

Q. Did filming "CATCH THE JOY", an award-winning picture in its own right about dune buggies, present significant shooting problems?

A. Yes. Sand is the most obvious: All the equipment had to be air-hosed after each filming session. One tiny grain of sand could have caused irreparable damage to the film emulsion. The second major difficulty was having the patience to wait for perfectly smooth, trackless sand conditions. We wanted the serenity of an untouched sand dune so we waited, filmed, and waited again for the dunes to "blow smooth." Understandably, the fifteen-minute movie took two months to film—and most of this time was spent waiting for smooth dunes and just the right, directional light we wanted.

Q. Among the many TV commercials and promotional films you have completed is an unbelievable commercial for Del Monte Salmon. How was this filmed?

A. Clem McCarthy of McCann-Erickson envisioned a 24-second shot of a salmon, perfectly lit and in perfect physical condition, soaring through the air and water, jumping a waterfall. After they called us, we spent one month scouting for the best salmon-jumping falls on the West Coast. The perfect location was found at the bottom of a 500-foot-deep gorge. After hiking the half mile to the gorge and down to the falls, we filmed, and filmed, and filmed. A salmon jumps only about once every four minutes when the sun is out, and

Continued on Page 791

(LEFT) Jim Freeman, half of the MacGillivray-Freeman filming crew, perches on the "hood" of a dune buggy, with one hand holding the Bolex, during filming of the exuberant, award-winning theatrical short feature, "CATCH THE JOY", which was released by United Artists. (RIGHT) Freeman, considered one of the top helicopter cameramen in the world, takes to the air to get some wild "follow shots" of the dune buggies.



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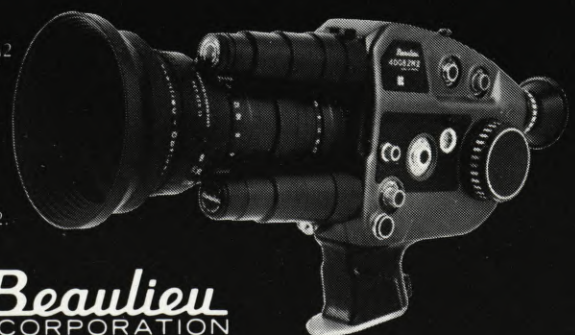
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FILMING "THE TRIAL OF THE CATONSVILLE NINE"

How a carefully thought-out systems approach to the technology of production made possible the filming of a high-quality feature motion picture on a very low budget

By MILTON FORMAN, *Consultant*

For the last several years, we have often been told that *LOW BUDGET FILMS MUST BE SHOT ON LOCATION; LOWER BUDGET FILMS SHOULD BE SHOT IN 16mm or SUPER-16; LOWEST-BUDGET FILMS OUGHT TO BE NON-UNION.*

Gregory Peck selected "THE TRIAL OF THE CATONSVILLE NINE" as the first film that he would produce. In doing so, he was faced with the most

difficult problems related to low budget filming.

"THE TRIAL OF THE CATONSVILLE NINE" was originally a successful play, produced on the New York Stage at the Phoenix Theater, and then later at the Mark Taper Forum in Los Angeles. It is the story of two Catholic priests, Daniel and Philip Berrigan, who with seven other Catholics broke into a Selective Service Office in Catonsville,

Maryland and burned all the draft records of men who had been classified 1-A, in order to prevent them from being drafted for the war in Vietnam. The entire play takes place on one set, a combined church/courtroom. It is a very forceful, moving exposition of what led nine religious Catholics to perform such a drastic, dramatic act in defiance of the laws of the United States.

The original play was directed by Gordon Davidson, Artistic Director of the Mark Taper Forum, recipient of a Special Award from the Los Angeles Drama Critics Circle, and of a Margo Jones Award for his outstanding contribution to American playwrights. Mr. Gordon Davidson made his debut as a film director with "THE TRIAL OF THE CATONSVILLE NINE".

As a powerful supplement to Mr. Davidson, Haskell Wexler, ASC, was the Director of Photography. Wexler is the recipient of an Academy Award as Director of Photography for "WHO'S AFRAID OF VIRGINIA WOOLF?" He also photographed, directed, or produced many other films, including "MEDIUM COOL", "IN THE HEAT OF THE NIGHT", etc.

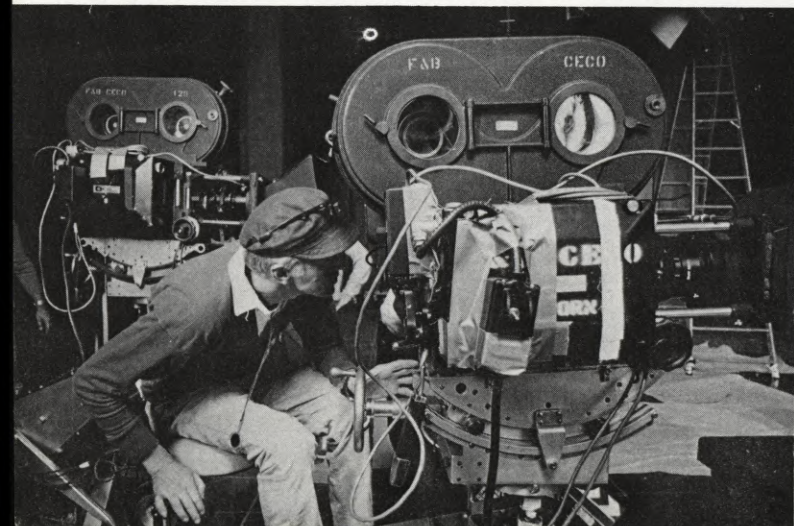
The cast for the film was exclusively drawn from the stage play, and it included Ed Flanders as Daniel Berrigan, Douglas Watson as Philip Berrigan, and William Schallert as the Judge.

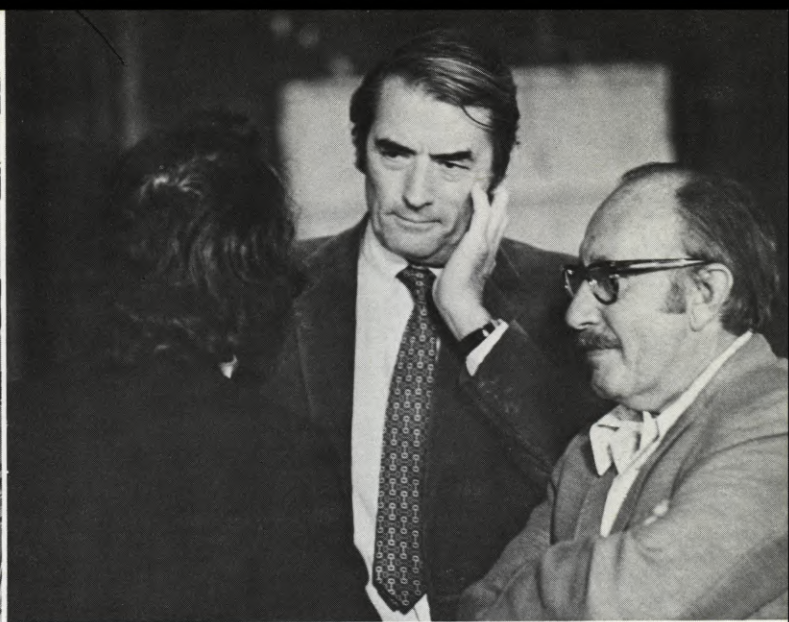
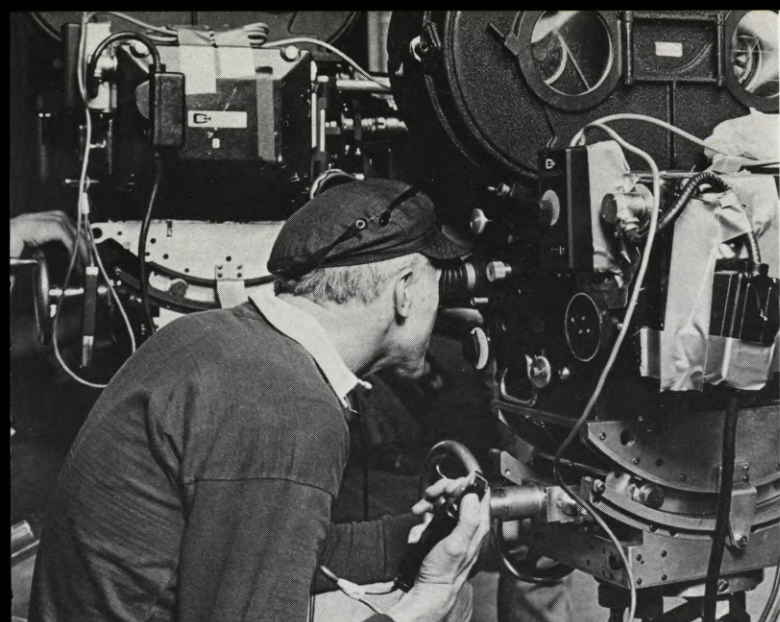
SPECIFICATIONS FOR THIS LOW BUDGET FILM

Since the subject matter of this

Overall view of the basic set for "THE TRIAL OF THE CATONSVILLE NINE". An artistic decision to expand the set made it necessary to use an exceptionally high sound stage, which resulted in considerably increased cost for rigging the lights and increased the number and size of lighting units which had to be used. (Photographs by Bob Willoughby.)

(LEFT) Director of Photography Haskell Wexler, ASC peers through lens of one of the two reflexed Mitchell BNC cameras supplied by F & B Ceco. Each camera was fitted with a Canon Macro-zoom lens. (RIGHT) Courtroom scene being filmed with the two reflexed BNC cameras. Note that floor is clear of cables, because of the use of crystal-control motors.





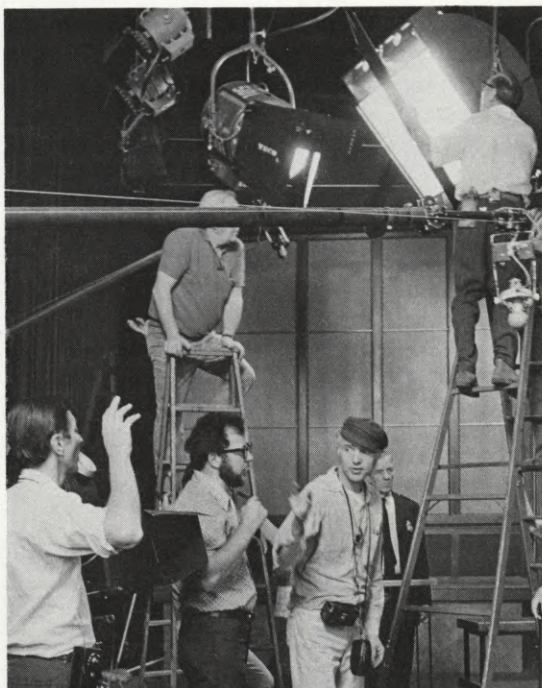
(LEFT) Wexler in the process of using the Cinema Products Co. joy-stick zoom control, with his right hand conveniently controlling it. Note that most of the technical innovations, such as the zoom controls and crystal motors, had to be taped to the cameras in order to up-date them. (RIGHT) Producer Gregory Peck discusses shooting of "CATONVILLE NINE" with Executive Producer Joel Glickman (left) and Technical Consultant Milton Forman (right).

feature film did not fit into the category of the normal "action" or "entertainment" picture, the budget had to conform to the special nature of the film. It was estimated that a subject which expressed an argument in politics and morality would have a more limited audience and, therefore, could justify only a very low budget. In fact, the total budget, excluding rights to the play and the screenplay, was \$200,000.00.

On the surface, it would seem that such a low budget called for the film to be shot on location, in 16mm, and with a non-union crew.

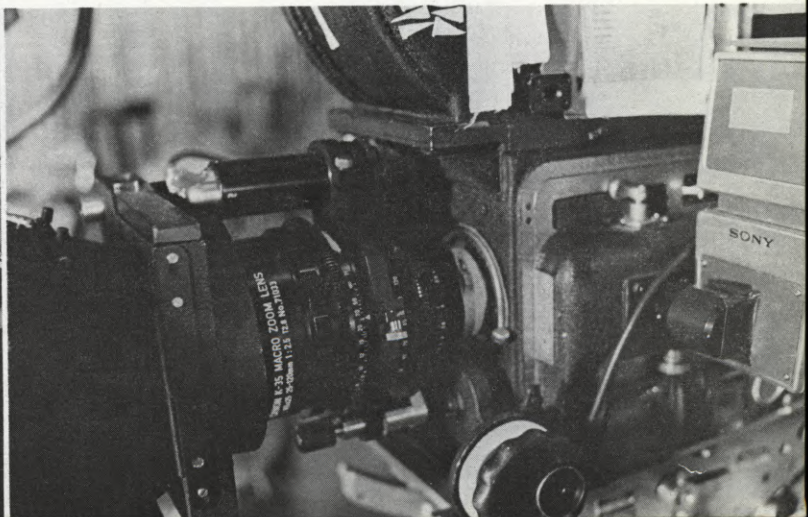
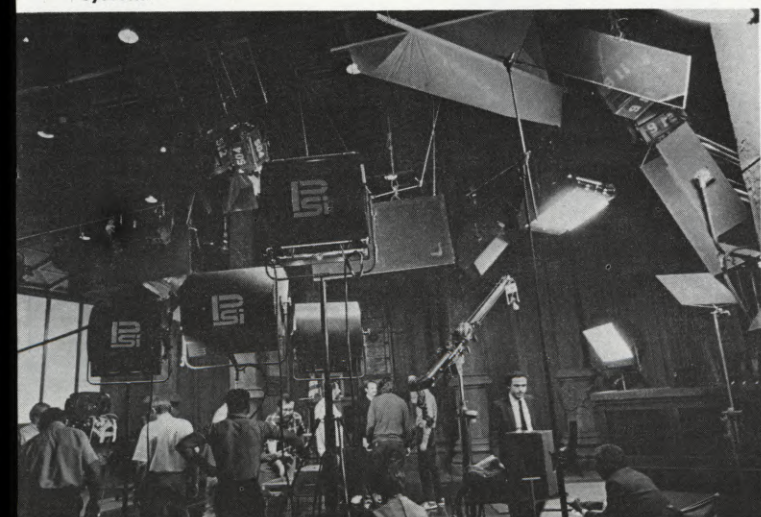
However, the very nature of the screenplay and the subject matter dictated that it had to be a feature film for cinema release and, therefore, it required very high image quality. In fact, because of the expository nature and the lack of "action" in the film, the quality of the cinematography had to be exceptionally high. This meant that present technology required that it be shot in 35mm color—1.85 format.

The same lack of "action" required



(LEFT) Cinematographer Wexler (with cap) and Gaffer Foster Denker (left) working on arrangement of the lights. (RIGHT) Interesting set-up of a FAY light attached to umbrella and reinforced with 10K, in order to develop a soft lighting effect on Douglas Watson, who played the role of Philip Berrigan.

(LEFT) Despite the large-scale use of soft lights, as shown here, the quality of the lighting was dramatic and not flat. (RIGHT) Detail photograph showing Canon Macro-zoom lens installed on BNC camera. The motor for the zoom is shown above the lens. Note, at the right, the Sony video-assist system.



that the sound also be of the highest quality in order that the ideas be given the best chance of reaching the audience.

LOCATION VERSUS SOUND STAGE

It is an undeniable fact that the overhead and fixed costs are much higher when shooting on a sound stage than when shooting on location. This also seems to be true whether local rental stages or major studio stages are used. Yet, these types of charges are only one part of the cost of filming. When a detailed study was made of "THE TRIAL OF THE CATONSVILLE NINE", it was evident that it made more sense to use a sound stage than a low-cost church. Let us examine these factors:

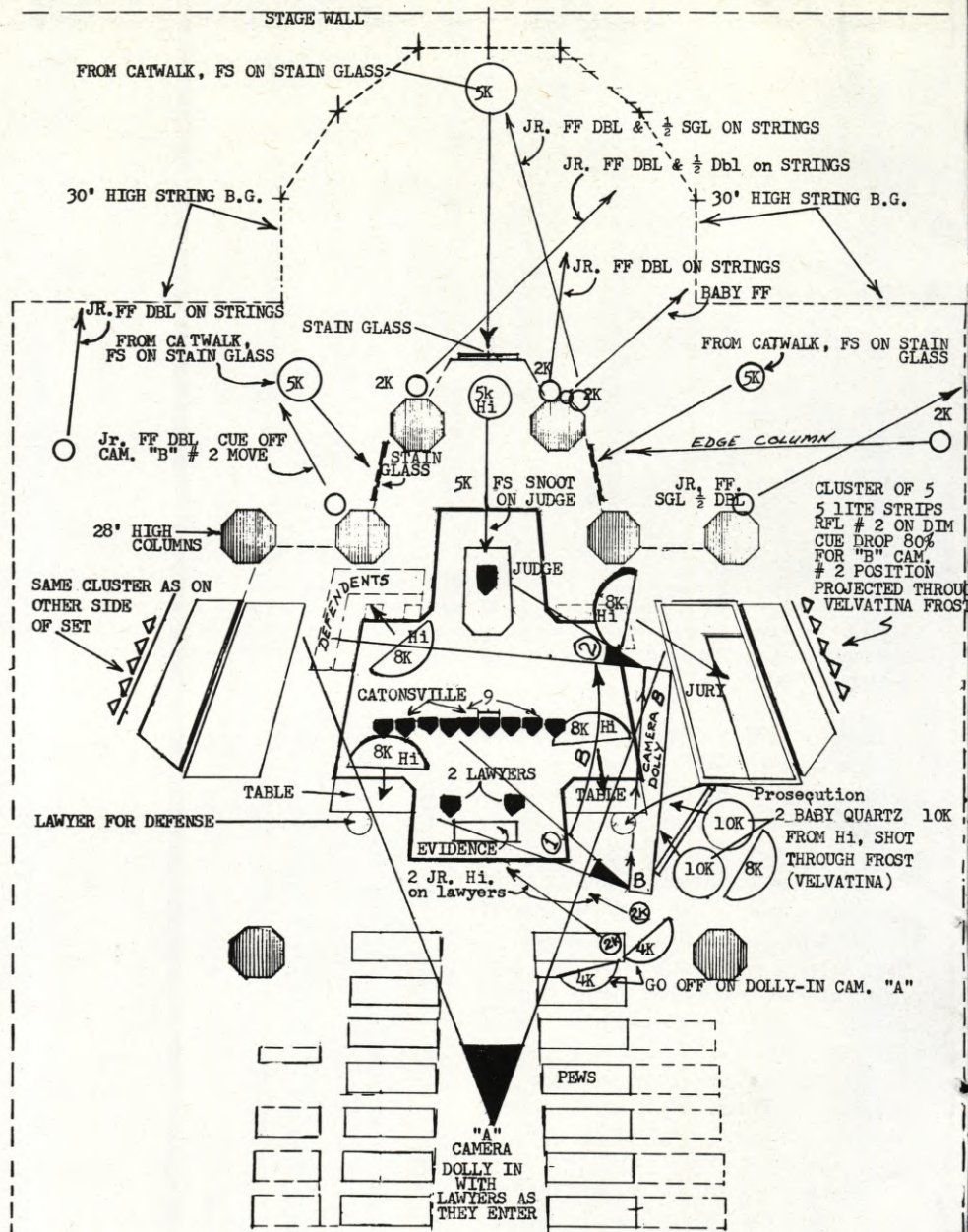
1) A location church would certainly not permit high quality sound to be recorded. Also, incidental street noises would certainly interfere with the shooting schedule.

2) The physical construction of a location church would certainly not permit easy rigging for lighting. It would require auxiliary generators and messy cable distribution. In addition, it would cause considerable loss of time, because lighting changes could not be executed quickly and efficiently.

3) The physical limitations of a church would not permit auxiliary equipment to be made available around the "set," particularly dressing rooms, props, lighting equipment, etc.

4) If it rained, in all likelihood, shooting would have to stop because of the noise which would penetrate onto the set. Under these conditions, it would be impossible to control the production schedule. An extension of the shooting time would tend to increase the budget, despite the fact that

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BASIC FLOOR LIGHTING PLAN FOR "CATONSVILLE"—SCENES 116-134

LIGHTING KEY:

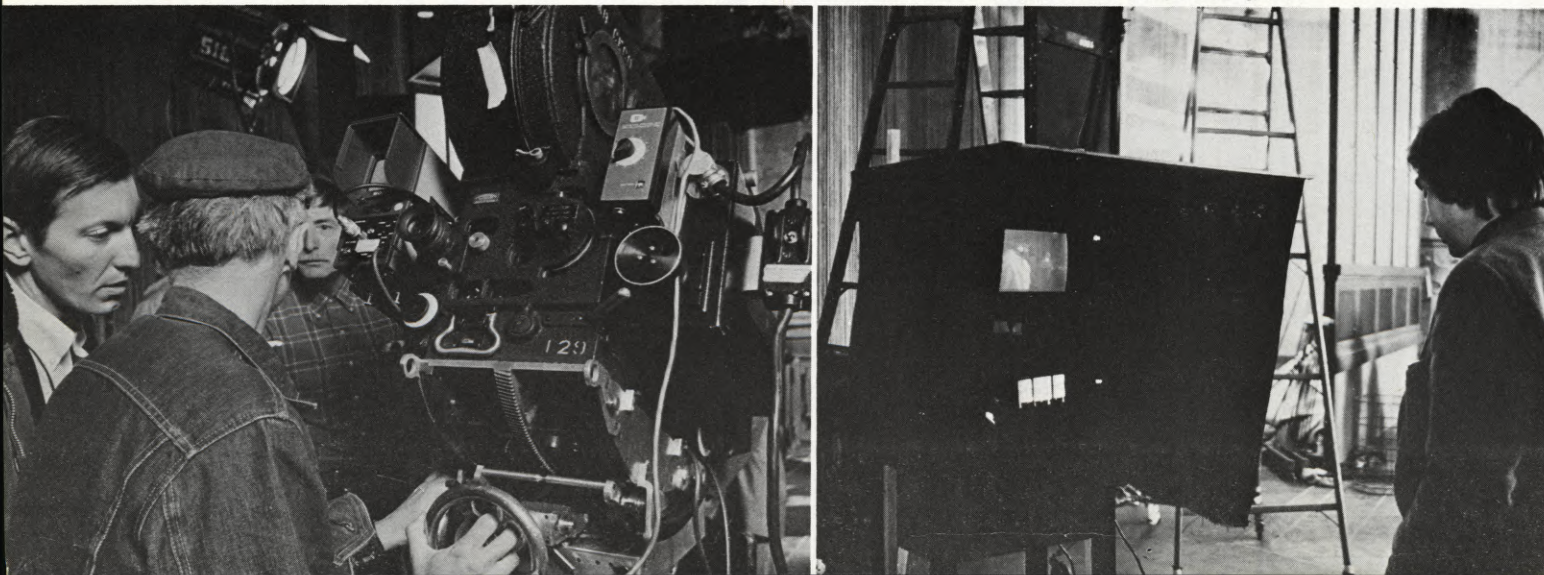
- 2K—JR. 2000 WATT SPOT
- 5K—SR. 5000 WATT SPOT
- 4K—4000 WATT SOFTLITE
- 8K—8000 WATT SOFTLITE
- 10K—10000 WATT SPOTLIGHT


FF—FULL FLOOD

- FS—FULL SPOT
- SGL—FULL SINGLE SCREEN DIFFUSION
- DBL—FULL DOUBLE SCREEN DIFFUSION
- 1/2—SGL or DBL SCREEN DIFFUSION
- HI—UNIT HUNG FROM ABOVE

(NOTE: Velvatina Frost was a soft plastic white material; 60% transmission; cooler in color temperature than other tested frost materials.)

(LEFT) View of the rear of the BNC reflexed camera, showing the Cinema Products control box (upper right corner) which pre-sets the maximum speed of the joy-stick zoom. On left side of camera is the Sony video-assist system. Haskell Wexler, ASC, behind the camera and Foster Denker at left. (RIGHT) "CATONSVILLE" Director Gordon Davidson viewing the two monitors which were part of the video-assist system.





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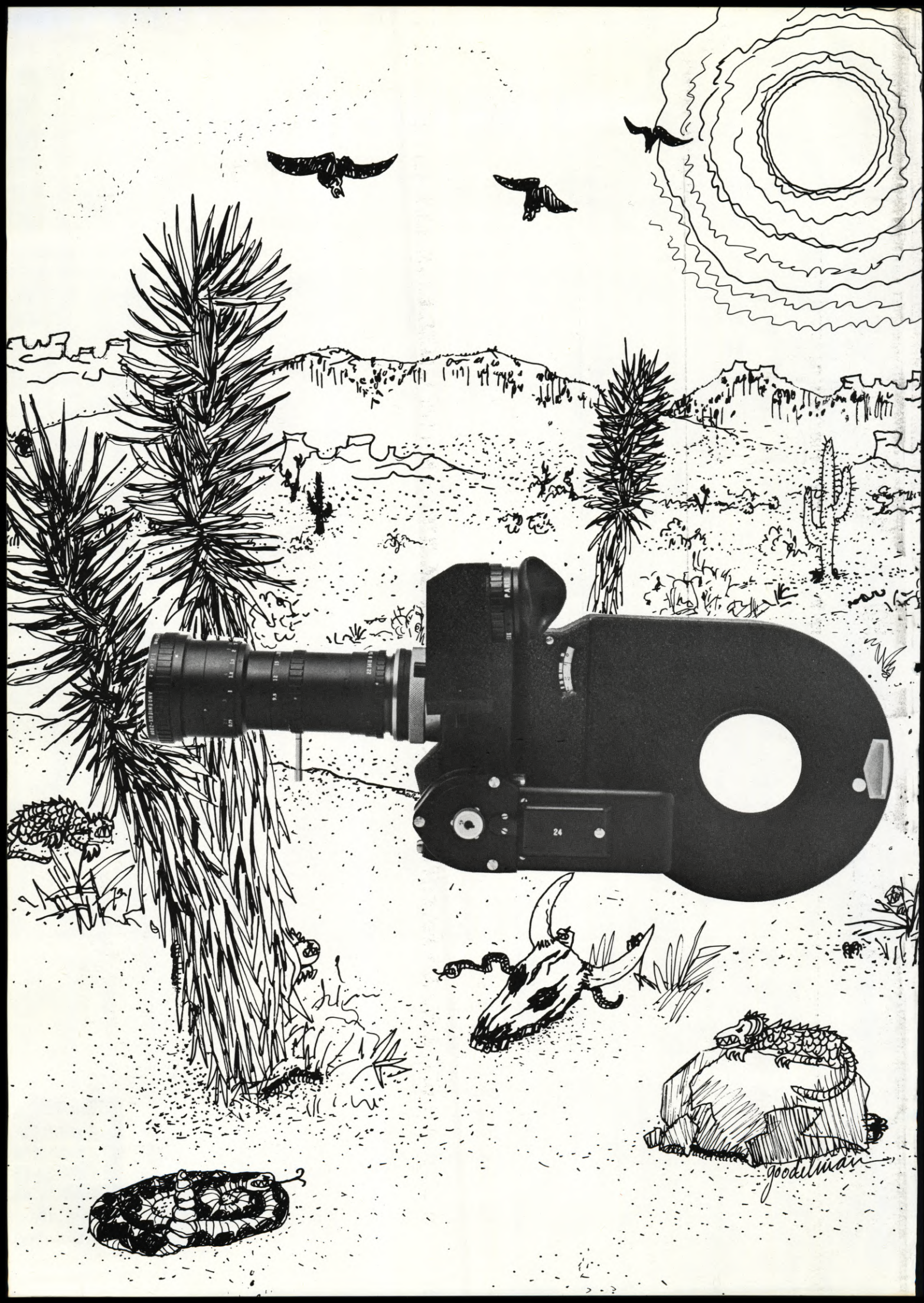
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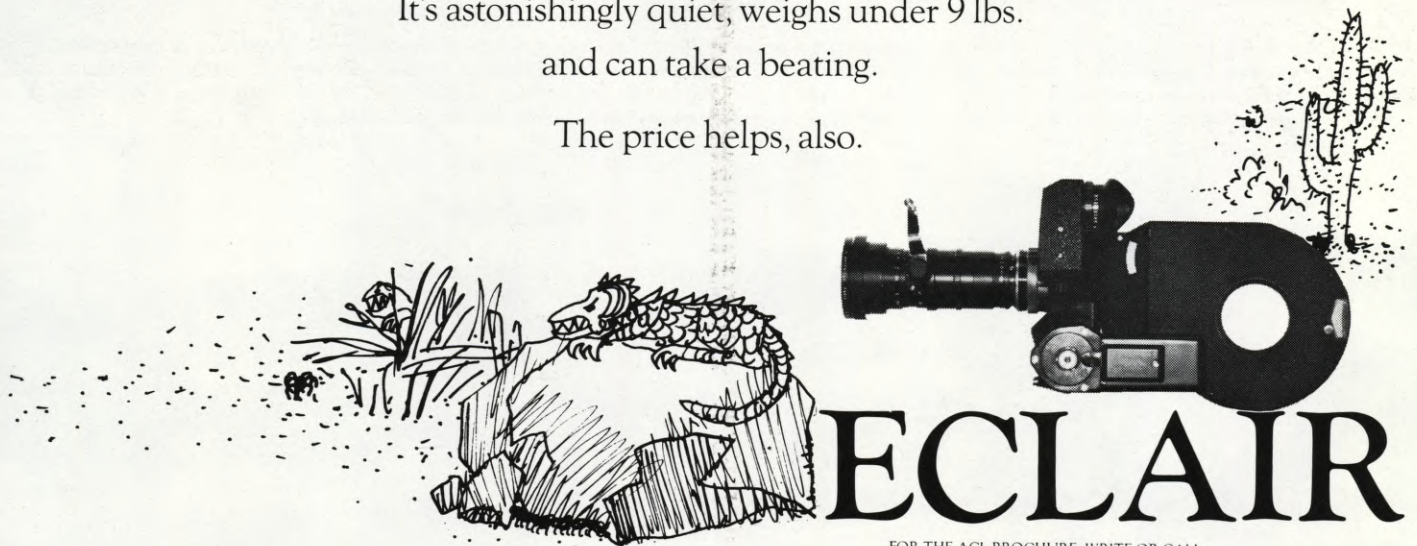
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THE ADVANTAGES OF ONE-LIGHT COLOR DAILIES

If one knows how to interpret them, and has good communications with the laboratory, one-light dailies can save considerable time and money

By RICHARD PATTERSON

One-light color dailies provide a cameraman with an excellent means of evaluating his work, provided that he knows how to interpret them and has good communications with the lab. In order to discuss the interpretation of one-light color dailies, it might be helpful to review briefly some aspects of the timing process involved in color printing.

When a color negative is printed, there are two ways it can be "corrected." The density of the print can be controlled by varying the intensity of the light used to expose it, and the color rendition can be controlled by adjusting the color make-up of the printing light. Most laboratories today use an additive printer in which these functions are both performed by three light-valves through which the light passes before it exposes the print stock.

In such a printer the light from the printer lamp is split up into its red, green, and blue components by a series of special dichroic reflectors. Each component passes through a light-valve in which a gap between blades is regulated to control the amount of light which passes through. Then the three components are recombined into the beam which exposes the print stock. In this way, the color, as well as the intensity of the light, can be controlled. If all three valves are changed by the same amount, the color of the light will stay the same while the intensity of the light is changed. Similarly, by increasing the gap in one valve and reducing another, it is possible to change the color of the light while maintaining the same intensity.

The most common type of additive printer is calibrated to have 50 "points", so that 8 to 10 points approximate one stop in the exposure of the camera negative. The printer is calibrated in increments of $.025 \log E$. This means that a

12-point increase would approximately double the intensity of the light exposing the print stock. ($12 \times .025 \log E = .3 \log E$, and the \log of 2 = $.3010$.)

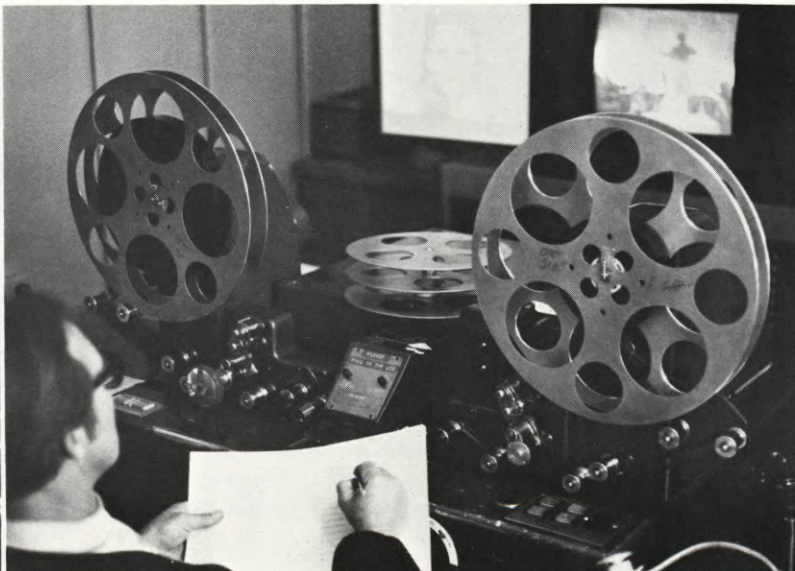
Since Eastman Color Negative is processed to a gamma of about $.65$, a one-stop increase in camera exposure would be the equivalent of an increase of about $.2$ in the density of the negative and, hence, in printing, a difference of $.2 \log E$ in the exposure of the print stock. This is the equivalent of eight printer points. ($8 \times .025 \log E = .2 \log E$) Theoretically, then, if a negative is one stop under-exposed (and therefore too thin), a decrease of eight points is required to compensate.

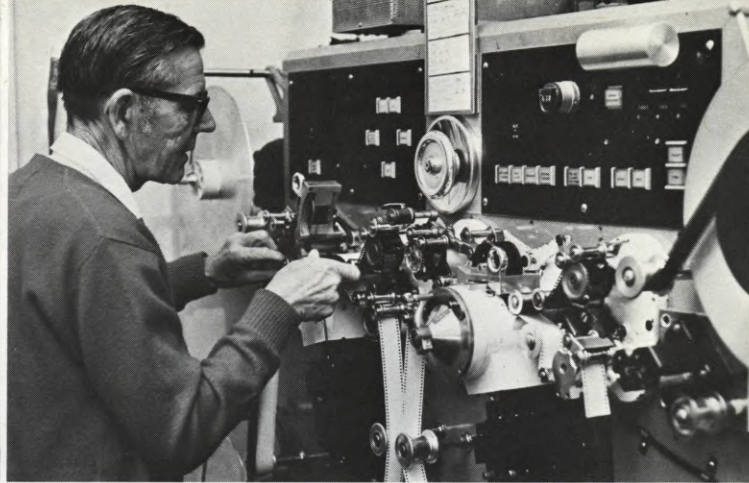
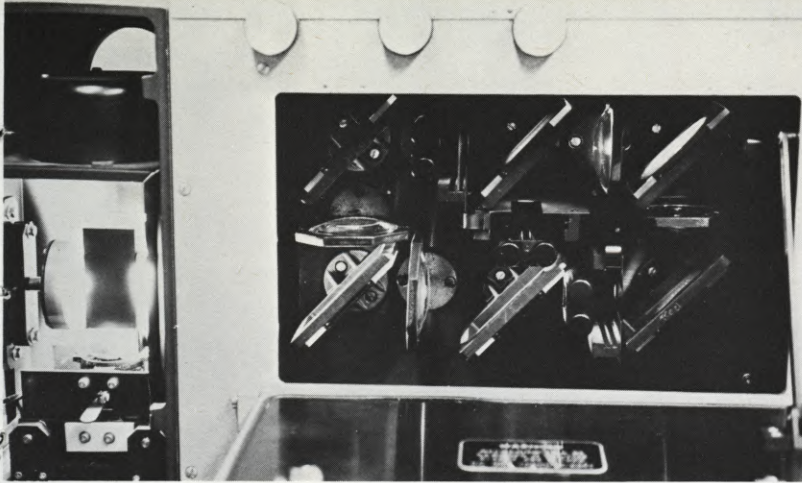
Practical experience reveals a number of variables which make it impossible to say that eight points on the printer scale always equal one stop in the exposure of the camera negative, and many labs regard 10 points on the printer scale as the equivalent of one stop in the exposure of the camera negative.

Since the valves can be adjusted separately for each color component, one must remember that a change in exposure without an alteration in the color balance requires that each light-valve be changed equally. This means that the value of each light-valve must be increased by 8 to 10 points to achieve the equivalent of a one-stop increase in camera exposure—or a total change of 24 to 30 in the three-printer-light setting represents about a stop of camera exposure. This rule of thumb applies only in the middle of the scale, since the response of the negative and the print stock will vary at the ends of the scale.

In recording the way a scene is printed, it is customary to list the Red, Green, and Blue values in that order by referring

(LEFT) Processing machines develop the film at a rate of 150 feet per minute. When a cameraman delivers his exposed negative to the laboratory at the end of the day, it is developed, printed and inspected in time for him to have a report some time the next morning. (RIGHT) An electronic color analyzer enables a timer to determine the best printer setting by viewing an electronic image of the scene. The negative image is converted to a positive image and separate controls for the red, green and blue components enable him to find the best color balance.





(LEFT) The light box on an additive printer. Light from the printer lamp (left) is split into three separate beams by special dichroic reflectors. Each beam passes through a light valve which regulates the amount of each color (red, green, blue) and then the three beams are recombined by another set of dichroic reflectors and transmitted to the printer aperture. (RIGHT) Threading up an additive printer. The card in the slot at the top of the printer contains information pertaining to the setting of the printer trims.

to the printer "points" (e.g. 27-25-20). It should be emphasized that these printer light settings do not refer to absolute values, but only to proportions relative to an arbitrary range of light values set for a given film stock at a given lab. The color and intensity of the printer light can also be regulated by adjusting the printer "trims" which are separate from the light valves. The printer trims are adjusted to compensate for different print stocks and variations in emulsion batches and processing, so that a given scene printed at a given light will always produce the same results.

Unfortunately, there are no industry-wide standards for setting printer trims and defining the range of printer values for a given print stock—which means that a scene printed at a given setting by one lab will not necessarily yield the same result if it is printed at the same setting by another lab. Theoretically, it should be possible to establish industry-wide standards using a standard negative to define the middle of the scale, but it is not economically feasible because it would necessitate, among other things, changing every light card for every negative in each lab. As it stands now, there may be a difference of as much as 10 points altogether in the way a scene prints at different labs. A scene printed at 26-26-26 at one lab might easily have to be printed at 31-26-21 at another in order to get the same result.

In printing color negative, the range of values for an additive printer is such that the higher the number, the more light passes through the valve and the denser the print will be. This means that the higher numbers produce darker images on the screen, and discussions of timing can become confusing to the layman because a scene is "printed up" by lowering the numbers. Similarly, for a given color, the higher the number, the more of that color strikes the print stock and the more of its *complement* will appear in the scene.

If a scene is too blue and the timer wants to take blue out to make it more yellow, he may raise the value of the blue light or lower the value of the red and green lights. A scene printed at 25-25-30 (R-G-B) will be more yellow (i.e. less blue) than the same scene printed at 25-25-25.

(Note: Exactly the opposite is true in printing a reversal original onto a reversal print stock. With reversal film, the more light striking the print stock, the brighter the image will be on the screen. Similarly the bluer the light, the bluer the scene will be. For the time being, however, our discussion will refer to making prints from color negatives.)

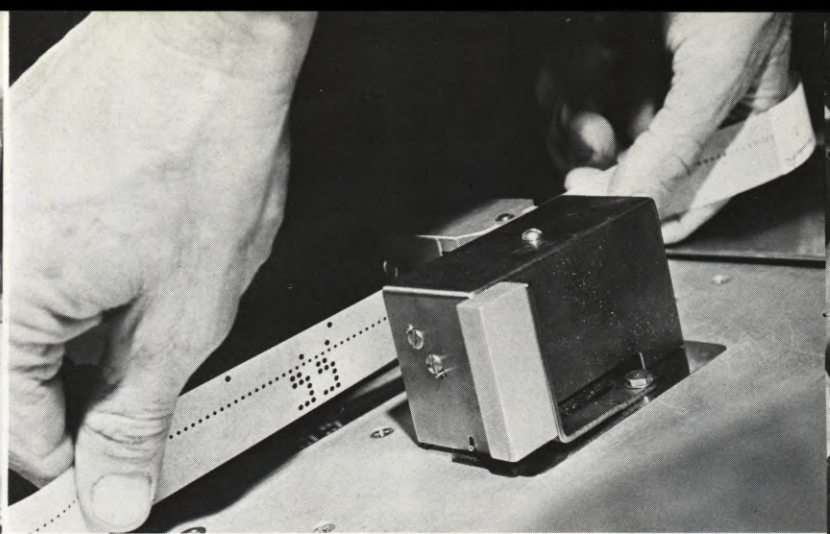
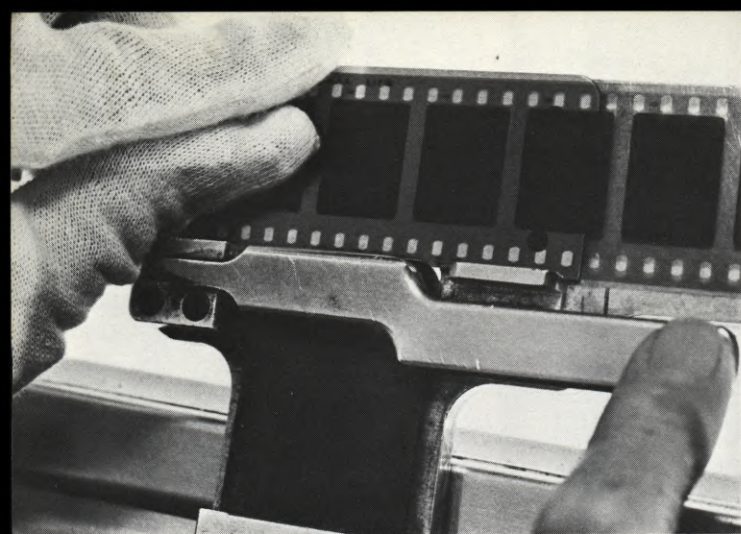
The range of printer values for an additive printer is established by defining the middle of the scale as the setting at which an ideally-exposed negative produces the best print. Over-exposure and under-exposure can then be expressed in terms of how far from the middle of the scale a particular

negative yields the best print. For a variety of reasons which need not concern us here, labs quite often consider something other than 25 or 26 to be the middle of the 50-point scale. For example Technicolor defines 24 as middle of the scale while Deluxe General and Consolidated Film Industries consider 27 the middle of the scale. Under ideal conditions, middle of the scale would mean that every light had the same value. If a standard negative were used to redefine the printer scale, the printer trims would presumably be set so that the scene prints best at 26-26-26. In actual practice, however, many labs are set up in such a way that one light may print at a consistently lower value than the others due to a variety of factors, including the way in which the emulsion of Eastman Color Negative type 5254 has changed since it was introduced.

Laboratory terminology is also not completely standardized, and discussions about timing can often be confusing, because many people still use the terminology derived from the use of subtractive printers. A subtractive printer controls the color and intensity of the light by means of filters, rather than light-valves, and is usually calibrated in terms of a 21 or 24-point scale, such that each point represents an increment of .05 or .04 log E and four or five points are the equivalent of one camera stop.

In adapting to the use of additive printers, many timers have continued to think in the terms to which they were accustomed so that a timer may refer to the Cyan, Magenta, and Yellow components rather than the Red, Green, and Blue. He may also specify timing adjustments in terms of "half steps" since, in round figures, the additive printer has twice as many points as a subtractive printer. Thus one timer may say "plus a half Y" where another timer would make the same adjustment by saying "minus one point of blue."

When color photography first began to be used in motion pictures, it was customary to correct every scene for color and density when daily prints were made. Even when producers ordered black and white dailies from their color negative in order to reduce costs, the daily prints were timed for density corrections. Sid Solow of Consolidated Film Industries is credited with introducing the concept of one-light color dailies in a conversation between him and Quinn Martin, producer of *THE F.B.I. STORY*, in 1965. Quinn Martin was then producing the first episode of the series and was distressed by having to look at black and white dailies. His budget was not sufficient to pay for timed color dailies, and he asked Sid Solow if there was anything that could be done. Solow suggested that they try printing all of the dailies on one light rather than making scene-to-scene corrections, and offered to provide one-light dailies at half



(LEFT) When a negative is timed for scene-to-scene corrections, it must be notched at every scene change. (RIGHT) A paper tape is punched in such a way as to record the light settings for each scene. The notch in the negative triggers the printer so that it "reads" the information on the tape and automatically adjusts the lights for each scene. (Photographs courtesy of Consolidated Film Industries.)

the cost of timed dailies. They tried it, and everyone agreed that it was a phenomenal success. In no time at all, one-light color dailies became an industry-wide standard.

The reason for the enthusiastic reception of one-light color dailies was twofold. First of all, color dailies are much better for the morale of the entire production company, and the reduced cost of one-light dailies made color dailies economically feasible. Secondly, cameramen and producers both realized that one-light dailies provided them with an excellent means of evaluating the camerawork on a production. Since everything for a particular production is printed at the same light, the variations in brightness and color rendition seen on the screen are indications of the consistency of the exposure of the camera negative.

It might seem that the simplest and best procedure for making one-light color dailies would simply be to print everything at the middle of the scale so that the cameraman could judge his work by evaluating what he sees on the screen. Most laboratories, however, do not automatically print dailies in the middle of the scale. In their effort to provide the best possible service, labs will try to find the best single printer setting at which to print a company's dailies. One-light dailies mean that all the scenes for a given production are printed on the same light, but this light may differ radically from the light used to print another production's dailies.

The reason for this is that, outside of an optical house, a cameraman is rarely, if ever, able to control his lighting and exposure so precisely that his negative will print best exactly at the middle of the scale. Usually there will be variables, such as the characteristics of his negative emulsion batch, film storage conditions, the condition of his lights, the coatings on his lenses, the make and quality of his filters, and even the environment in which he is shooting—all of which will affect the color rendition in his negative and perhaps the accuracy of his exposure. A difference in lens coatings may result in as much as four or five points of difference in the color balance. Film storage conditions may account for a difference of two to four points in the color balance. Since many of these variables will remain relatively constant throughout a given production, they can be compensated for in selecting the best light for the one-light dailies.

When the lab receives the first batch of negative for daily printing, it will examine the negative—usually by means of an electronic color analyzer such as the Hazeltine—in order to determine the best light at which to print the dailies. The first batch of dailies is discussed with the cameraman to see if he would prefer a different light. Quite often, because of

differences in projection facilities or simply as a matter of taste, a cameraman may prefer his dailies printed slightly lighter or darker than the lab would normally print them. Or the cameraman may prefer a warmer or colder skin tone than the one the lab considers best. At this point, it is essential that the cameraman be familiar with timing techniques so that he can discuss his preferences with a timer in terms of printer lights.

Once these matters have been discussed on the basis of the first day's dailies, a light is established which is then used to print all of the dailies for the production. If at some point during the production the conditions under which the cameraman is working change radically (as, for example, when a cameraman changes from location to studio work), he can request that the negative be examined and a new light be set for the remainder of the production. Most laboratories will, if requested, establish different lights for printing day exterior, night exterior, and interior scenes, provided that they are on different rolls or clearly indicated on the camera reports.

One-light dailies for a given production will often be printed on three, or even more, different lights which may differ substantially. A sampling of daily printer lights for typical television shows and theatrical features at Consolidated Film Industries yielded the following examples:

Production	Day Exterior	Night Exterior	Interior
#1	26-24-21	32-27-24	30-25-19
#2	23-20-17	32-26-24	30-24-22
#3	25-25-24	33-30-26	31-27-22

One show, shooting entirely in the studio and using three cameras, had a different light for each camera:

Camera A: 29-22-18

Camera B: 30-24-19

Camera C: 30-23-17

All of these lights indicate an excellent negative with ample latitude for balancing the final print.

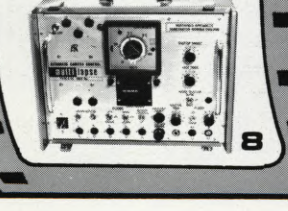
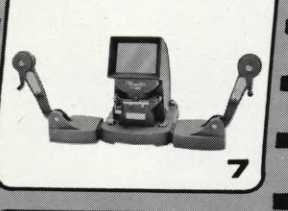
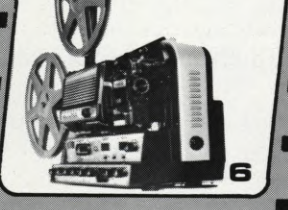
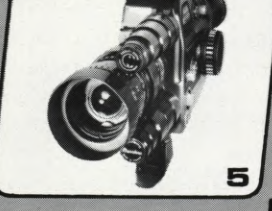
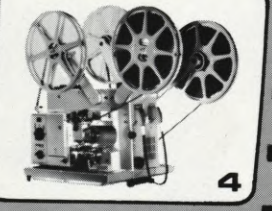
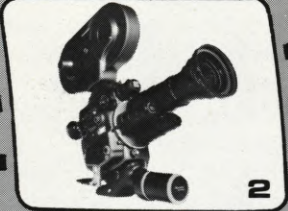
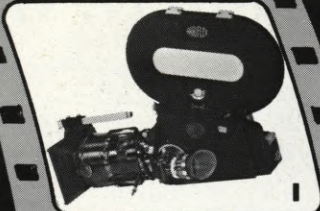
Some labs include a report indicating the printer light with the dailies when they are delivered. Normally, however, such a report is not included, and the lab contact will usually just give a brief verbal report to the production company indicating whether or not the density of the negative is well within the printable range. If the cameraman inquires about the printer lights, he will be told what they are; and it is often helpful for a cameraman to be able to interpret the way his dailies are printing. Generally speaking, if his dailies

Continued on Page 810

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BEL AIR CAMERA has long enjoyed an enviable reputation as an unequalled source of information and counsel on all subjects pertaining to professional and advanced 8 and 16 mm cinematography. BEL AIR'S thoroughly competent staff is constantly available to assist in any cinematographic problem. And every available Beaulieu, Arriflex, Sonorex, Hervic/Minette, Heurtier, and Uher product is instantly available from stock. Bel Air will be happy to send you literature on any of these superior cinema products. Please accept our invitation to visit us at any time to see our vast stocks of cinematographic equipment. Or drop us a card or phone if you prefer. You will enjoy your association with Bel Air Camera.

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2. The BEAULIEU R16B(PZ). One of the world's most advanced 16mm motion picture cameras. Has built-in power zoom with continuously variable zoom speed from 3 through 15 seconds and positive stop/start with manual override, coupled to the fine Angenieux 12-120 mm "auto" zoom lens. Mirrored shutter allows all the light to pass alternately to the brilliant reflex viewfinder and to the film. Fully automatic exposure control with manual override. Ultra-accurate speed control from 2 to 64 frames per second. Nickel cadmium battery screws into (and forms part of) camera handgrip — eliminating the need for battery pack hanging over the shoulder or battery belt attached around the waist. Ability to accept most standard "C" mount lenses, and (with the use of lens adapters) an extensive range of still camera lenses, is only a part of the outstanding features that make the Beaulieu R16B(PZ) the favorite choice of the TV-news film and documentary cameramen, and the "new cinema" producers. Available accessories include a 200 ft. magazine, 60 cycle sync generator, 500 mA and extra heavy duty 1000 mA ni-cad batteries, battery chargers, cases, etc. Inspect the BEAULIEU R16B(PZ) at Bel Air Camera where ALL your questions can be answered. Consider this fine instrument for your next sync/sound production.
3. The UHER 1000/N Neo Pilot ¼" Sync Tape Recorder, specifically designed for sound film synchronization is ideal for use with the Beaulieu, Arriflex, Eclair, and similar first line cameras. Its lightweight 7½ lbs., small and compact 11x9x3½ inch size, and the ready accessibility of its operating controls in the ever-ready shoulder case, make it the perfect unit for on-location sound filming. An assured frequency response of 20-20,000 Hz at a stroboscopically controlled speed of 7½ i.p.s. combined with a full-track recording, produces precisely synchronized sound without variation. Ruggedly built and fully climatized. Has interruptible automatic photo-electric level control, interruptible low frequency filter, sync signal test button, battery condition test button, off-the-tape monitoring, built-in monitoring speaker, and adjustable CCIR or NARTB record equalization. Mixer jacks, 600 ohm balanced, for adding sound sources. Operates on self-contained batteries, car battery, or 110/250 volt AC power. Complete with microphone, 5 Ni-Cad batteries, AC Power Supply/Charger, case, and camera connecting cable.
4. The SONOREX Double/16 Sound Projector offers sound capabilities that far exceed those of a conventional 16mm machine. It permits single system optical playback and magnetic record/playback; it provides double system record and playback in perfect sync, and has extensive facilities for transfer, mixing, recording, and re-recording. Picture steadiness is better than 1/1000th of picture height. The projector uses a 24 volt-250 watt Halogen lamp, a 1-6.9 ratio shutter, and a fast lens for a light output of approximately 500 lumens. A solid state amplifier with a power output of 20 watts continuous into 8 ohms has inputs for microphone, phono, and balanced +6db line. Outputs include built-in monitor, separate main speaker, balanced +6db line, and unbalanced adjustable line. Film-end and film-break safety switches are built in. Standard accessories permit multi-screen, multi-media, and similar special presentations, as well as multi-projector interlocks. Transfers from ¼" tapes to 200 mil sound tracks on 16mm magnetic film may be made on the Sonorex. This projector is a "must see" for all serious film makers.
5. The BEAULIEU 4008ZM2 Zoom Macro represents the ultimate in advanced Super-8 motion picture cameras. The 4008ZM2 has double system synchronous sound capability (with automatic tape recorder start/stop control), continuously variable power zoom from 2 through 12 seconds, motorized macro focusing as close as 1 millimeter from the front element of its Angenieux f:1.9 zoom lens (focal length 8 to 64 mm), without the need for added accessories. The 4008ZM2 accepts all standard C-mount lenses. And all 35mm still camera lenses as well (when used with suitable C-mount adaptor). The super-luminous 27X magnification viewfinder functions with a mirrored guillotine-type shutter (set at 45° angle), which alternately directs ALL the light on to the film or into the viewfinder. The viewfinder is equipped with a fine-grain ground glass focusing screen. The variable shutter allows fade-ins and fade-outs. Self-resetting footage counter and resettable frame counter (1-100). Continuously variable film speeds from 2 through 70 frames per second. Single frame and remote control filming is provided for. Self-contained 250 mA nickel-cadmium battery is readily recharged with a dual voltage 30 mA charger. Uses standard 50 ft. Super-8 cartridges. A Super-8 with which you can produce motion pictures of true professional quality.
6. HEURTIER Super-8 STEREO SOUND Projector. This all new Super-8 projector — an innovation in Super-8 sound projectors — features a unique and revolutionary STEREO SOUND system. The Heurtier ST 42 STEREO's integral magnetic sound system provides professional STEREO SOUND quality, and is supplied with dual speakers, two microphones, and a headphone set. Its "twin head" magnetic recorder (using the main track stripe and balance stripe for recording), can be used for simultaneous full stereo recording, or recording on either one of the two tracks separately — with complete "sound mixing" control. Among other features, the ST 42 STEREO projector offers sound superimposition, sound transfer, echo effects, a built-in public address system, an 18-frame sound/picture separation, and an INSTANT START heavy duty flywheel for the best possible sound recording and playback quality. The ST 42 STEREO sound projector is ruggedly constructed and attractively designed. It provides rock-steady, critically sharp pictures, with a choice of projection speeds at 18 and 24 f.p.s., forward and reverse. PLUS . . . 800' reel capacity; SOM Berthiot 17-28 mm zoom lens, f:1.3; and completely automatic film threading from reel-to-reel. Also available is the HEURTIER ST 42 MONO Super-8 sound projector, which is basically similar in design and construction features to the ST 42 STEREO sound projector model EXCEPT that it does not record STEREO sound. The ST 42 MONO's integral single magnetic track sound system provides Hi-Fi-quality monaural sound.
7. HERVIC/MINETTE 16 mm and Super-8 Viewer-Editors. Large, brilliant projected image (16 mm: 3.2"x4.2"; Super-8: 2.9"x3.8"). Four sided optical prism (instead of shutter) prevents flicker. Sturdy all-metal 16 mm body weighs 8 lbs., all-metal Super-8 weighs 5½ lbs. Uses 6 volt 10 watt projection bulb. Optional 16 mm rewinds (2000 ft. capacity, weight 5 lbs.) fold for storage. Super-8 has built-in folding rewinds, 400 ft. capacity. Hervic/Minette Viewer-Editors feature a film pressure plate which maintains picture sharpness whether film is in motion or stationary, plus a frame marker, focusing and framing controls, and dust-proof glass screen. Hervic/Minette 16 mm & Super-8 Viewer-Editors are precision made, smooth operating, of professional quality, and are built for many years of service. (Illustration shows 16 mm model).
8. MULTILAPSE — a remarkable instrument for time-lapse cinematography. Operates the camera, lights (flood or strobe flash), motors, background curtain, etc., at intervals from 4 frames per second to 1 frame every 45 hours! Entirely automatic, it may be left unattended for days, making time lapse exposures every 4½ minutes, or any other of many selected intervals. Has "shutter hold" to expose several frames at a time, exposure counter, shutter thrust adjustment, flash charge outlet for strobe batteries, fine adjustment for flash synchronization, and many more features not found in any other instrument designed for time-lapse operation. Fully portable, operates on regular 100/120v AC power source. Requires no accessory elements — operates with your normal equipment. Literature sent on request — but you really should come in to Bel Air Camera and see the MULTILAPSE for yourself.

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The 8th Annual TT&FL Symposium of the ILLUMINATING ENGINEERING SOCIETY

Conferees meet in Chicago to discuss problems and progress in respect to theatre, television and motion picture lighting

The Theater, Television and Film Lighting Committee of the Illuminating Engineering Society held its 8th Annual Symposium in Chicago from May 21st through May 24, 1972, at the Pick-Congress Hotel. This Symposium continued the tradition of annual meetings of this committee which has become the lighting committee of the SMPTE as well as of the USITT (United States Institute for Theater Technology).

There were several highlights to the meeting, which included more material of interest to film people than usual. The State-of-the-Art panel revealed that there was a need to give some immediate consideration to certain questions of safety. Mr. William Shearer of the CBC reported that they had sponsored a study whose preliminary results indicate that there is danger of Infra-Red eye damage to people who habitually look into bright sources. This has been a problem among TV lighting directors, some of whom aim fixtures by spotting themselves on the floor and looking directly into the fixture. It was the opinion of the medical people who conducted this study that the potential danger from infra-red exposure is substantially greater than the ultra-violet hazard. It is their opinion that the U-V damage is less likely to be permanent than the damage associated with the I-R (heating). Another member of the panel, Mr. Richard B. Glickman, Consulting Engineer, and ASC Associate Member, stressed the fact that it was of great and immediate importance that we begin to face certain safety problems in our industry. He pointed out that the new

Occupational Safety and Health Act of 1970 had implications for the film, TV and theater industries. The work done by the Motion Picture and Television Research Center in the recent situation relative to the safe handling of xenon lamps was used as an example of the type of cooperation possible between industry and governmental bodies where the industry takes a positive approach to the problems.

As a result of this discussion, incoming Chairman Sal Bonsignore of CBS, appointed an Ad Hoc Safety Committee with Stan Miller, President of Rosco Laboratories, as chairman. The committee will consist of William Shearer of CBC, Tom Lemons of TLA Associates, Jim Davis of Sylvania, Charles Clark of GE and Richard B. Glickman, Consultant. The committee will begin by defining some of the areas where it is felt that it can be effective in establishing standards.

An interesting paper was delivered on the subject of new materials for diffusion and color correction in both film and TV. The author, Stan Miller of Rosco Laboratories, did not read the text of the paper, but instead gave the audience a view of some of the materials he had written about, accompanied by an interesting, informal commentary. It was most refreshing not to have the paper (which all the registrants received) read back.

The past symposiums have featured lighting demonstrations of various types but a new wrinkle was introduced this year. A combined TV and film lighting demo was staged at the studios of

WGN-TV. A simple set and two models were used. The film demo was conducted by Mr. Jack Behrend, who had come in the day before, and photographed the models and set in the various situations which he wished to demonstrate. He was able, therefore, to begin the demonstration by showing the audience a film of the demo we were about to see. He then proceeded through the various lighting setups. A similar approach was used by Thaine Lyman in demonstrating some of the problems of TV lighting. The results of his efforts were shown to the audience on videotape.

The 1973 Symposium will be held on the West Coast, with the final arrangements to be determined by a committee of West Coast members of TTFL. The committee accepted an invitation proffered by the CBC representatives to have the 1974 Symposium in Montreal.

PROGRAM OF THE 8th ANNUAL TT&FL SYMPOSIUM

SUNDAY, May 21st PICK-CONGRESS

Noon—5 p.m. Registration
2 p.m.—4 p.m. Committee Meeting
5 p.m.—7 p.m. Cocktails—Joe Vito Trio
7 p.m.—9 p.m. Dinner
Guest Speaker—Red Blanchard

MONDAY, May 22nd PICK-CONGRESS

8:30 a.m.—9 a.m. Coffee—Registration
9 a.m.—9:15 a.m. Session Chairman—C. Schuyler Bramley
Welcome—Ken Ponte
9:15 a.m.—10:30 a.m. State of the Art Discussion
Discussion Chairman—Charles Neenan of L. K. Comstock and Co., Inc. plus Panel of Experts
10:30 a.m.—11:30 a.m. Paper Subject:

Continued on Page 799

(LEFT) At the Pick-Congress Hotel in Chicago a panel discussion takes place on the state-of-the-art in theatre, television and film lighting. (Left to Right) Richard Glickman, Thomas Lemons, Charles Neenan, Nathan Sonnenfeld, Salvatore Bonsignore and William Shearer. (RIGHT) Jack Behrend conducts a demonstration lecture on motion picture lighting.

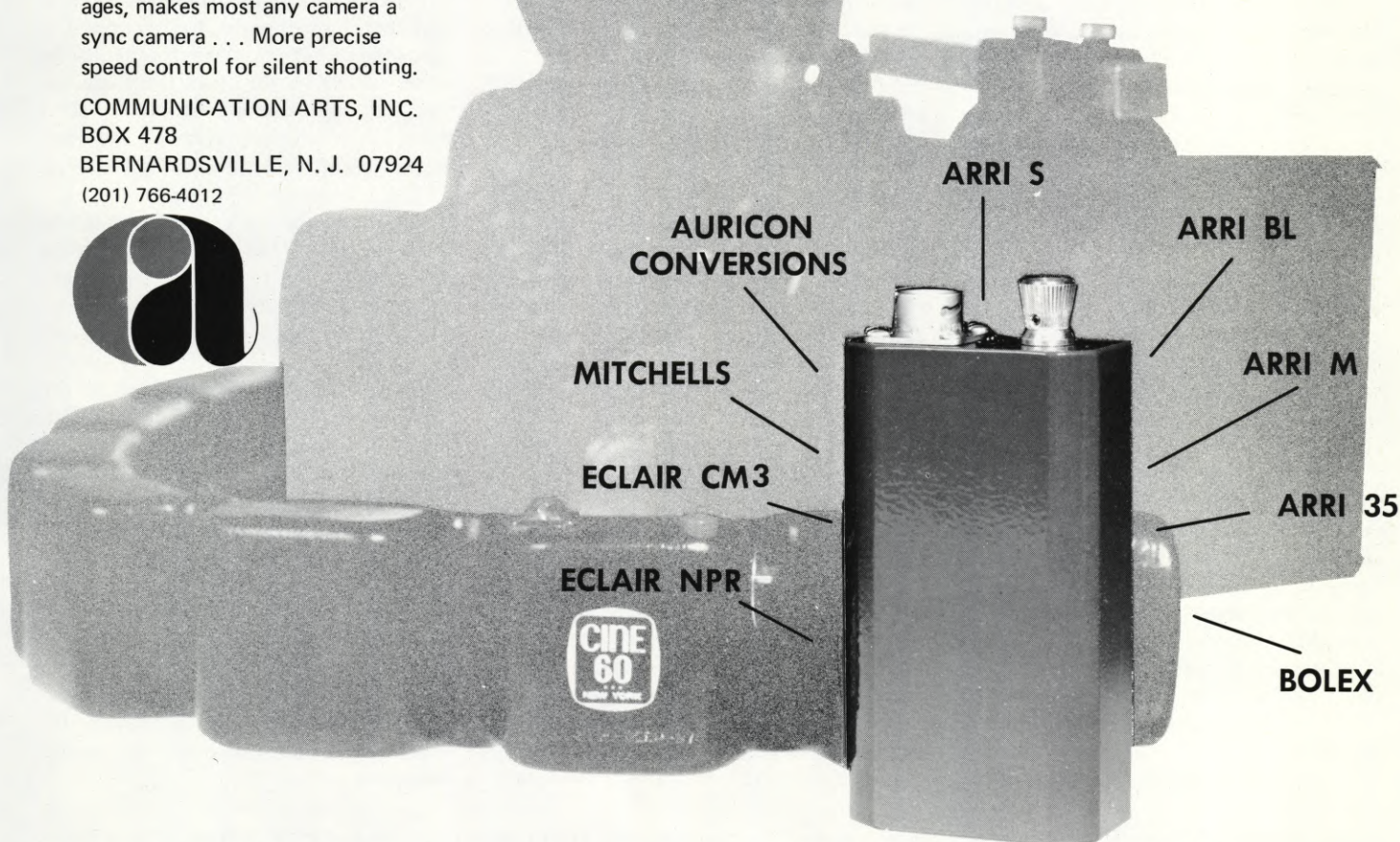


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BEHIND THE SCENES

Continued from Page 749

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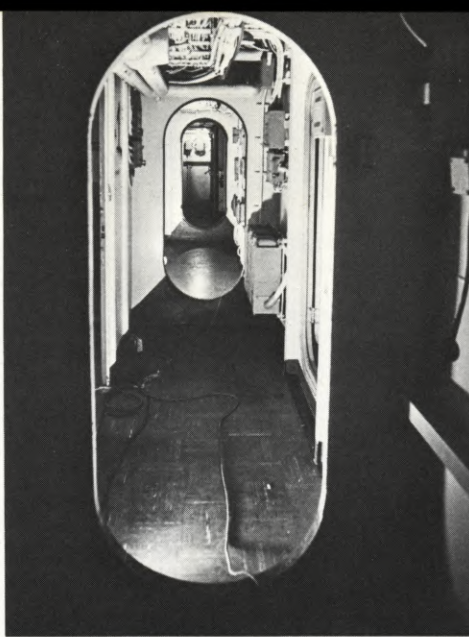
Four weeks prior to our scheduled shooting on the hangar deck, it was decided to design and construct three all-terrain vehicles for the film. We had prior experience in this area, having completed some preliminary design and engineering on an ATV idea several months before. Utilizing some of our ideas from that vehicle, we redesigned it with special characteristics for use on the steel floor of the carrier. This model had motorcycle handlebar controls and steering, in that a right turn was accomplished by leaning into it and pulling back on the right lever and forward on the left. The vehicle was very maneuverable, only four feet in length and three feet wide, and capable of doing full power spins, wheelies and other speed acrobatics. It was powered by a five horsepower gas engine and the body was 3/16" cyclac thermoplastic, vacuum-formed, trimmed and assembled over a steel and wooden frame.

Our very special stars were the drones, Huey, Dewey and Louie, whose job it was to perform maintenance tasks aboard the *Valley Forge* spacecraft and later, after reprogramming, to act as "human companions" to our lone space-man.

Six months went into the research, design and construction of the three drones. We wanted them to be machine-like in appearance, but not formidable; therefore it was important that they be small in stature, less than three feet high.

Research was started to see if it was possible to have a bilateral amputee walk on his hands with a suit of armor (or drone suit) on him. The initial tests were positive and our work proceeded.

We contacted Veteran's Hospitals, the UCLA Medical Center and Rancho Los Amigos Hospital and finally settled on a "crew" with capabilities to act as technical consultants and actors for the drone suits. Leland McLemore, 23, and George McCart, 24, who both lost their



(LEFT) Before the "SILENT RUNNING" crew began work on it to transform the interior of the U.S.S. *Valley Forge* into a spaceship interior, the main corridor of the aircraft carrier looked like this. (LEFT) In the film the doorways have been widened and brought down flush with floor level. Styron 470 high-impact polystyrene covers door jambs and wall surfaces to complete transformation.

legs in Viet Nam provided indispensable assistance in working out the complex technical problems involved in the fabrication of the drone outfits.

Each custom-fitted drone suit was made from A.B.S. plastic, vacuum-formed in pieces and assembled. A.B.S. is a heat-forming plastic able to take mistreatment without breaking. By vacuum-forming a number of parts, we were always ready with spares should the need arise. The weight of the suit was 20 lbs. including a manipulator arm attached to the front.

The manipulator arm gave the drone the dexterity to weed the garden, play cards or perform surgery. It was designed and constructed by Don Trumbull, Doug Trumbull's father, a prototype engineer-designer. The arm was small and light; a very maneuverable pneumatically-controlled aluminum device. Arm control for positioning was provided remotely by radio, through servo valves on the fine pneumatic cylinders with manual analog master arm 5-channel transmitter to 5-channel receiver. Each channel with servo to 4-way valve link had mechanical feedback to null the valve. This is similar to



that used on radio-controlled airplanes. The arm not only functioned extremely well, but looked good, too. One of the things we didn't count on, though, came about when the arm was taken aboard the ship. The remote control unit failed to function properly with all the steel around, resulting in an overnight manual control changeover.

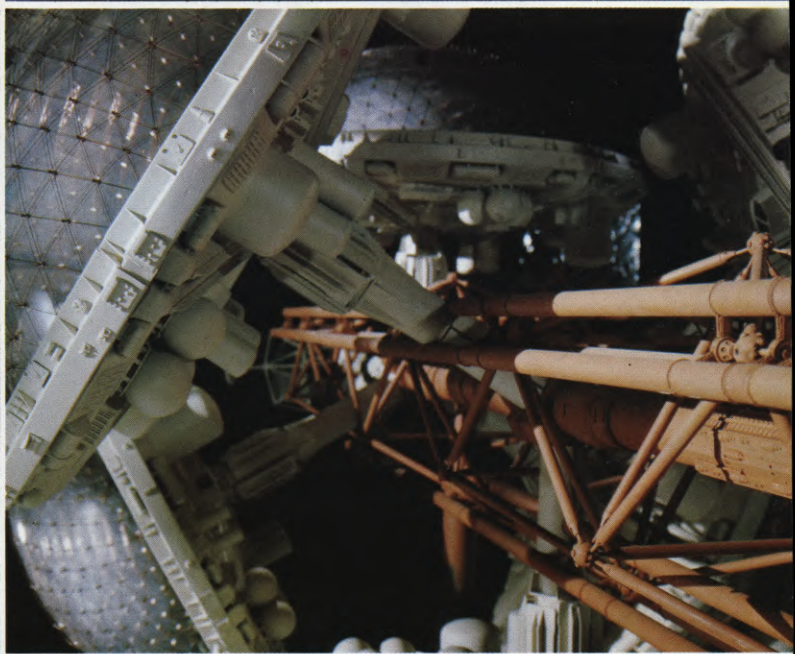
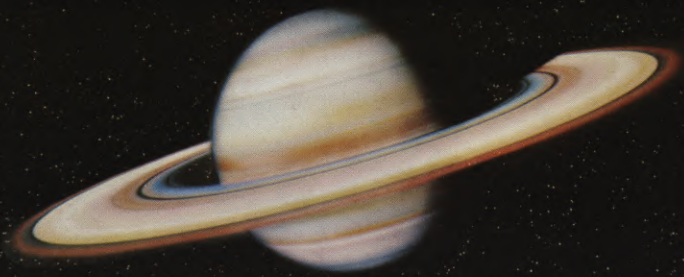
The model of the *Valley Forge Space Freighter* is one of the most detailed ever constructed for a film. Over twenty-five feet in length, its design and construction took more than eight months and involved over thirty people at one time or another. We wanted the space freighter to be modular in construction, open, and to incorporate six geodesic domes for housing the ecological systems or gardens. It needed a vast amount of detail to be believable, yet unlike any preconception people might have.

In September 1970, when we started "SILENT RUNNING", Doug and I visited Expo '70 in Osaka, Japan to see what new building techniques and materials people were experimenting with. The exhibit that most impressed us and

Continued on Page 797

(LEFT) Styrene thermoplastic, vacuum-formed flats of a repeatable nature are shown stacked on the hangar deck of the aircraft carrier to be used in assembling cargo containers for the spaceship. (CENTER) The flats are clamped together like children's toys to form the containers. (RIGHT) The result was hundreds of cargo containers in the shape of truncated tetrahedrons lining the cargo hold of the spaceship. Dow Corning Chemical Co. provided sheet plastics, rigid foams and epoxy resins used in set construction for the film.

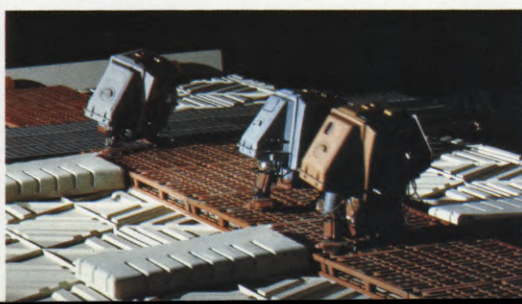




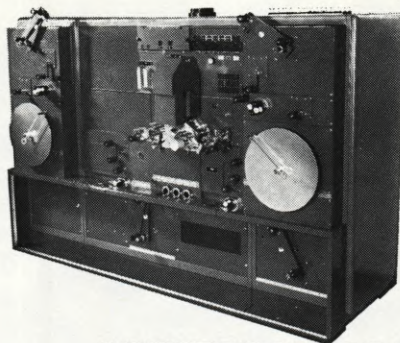
Several of the front-projection "plates" used to provide backgrounds for live-action filming in "SILENT RUNNING". Plate at UPPER LEFT was generated from multiple photographs of 24-foot spaceship model pasted up on star field background and rephotographed. Shot of Saturn was composited from two separate photographs (one of sphere, another of rings). Shots of the spaceship's superstructure were used to back up scenes photographed on "life size" segment of the deck.



(ABOVE LEFT) The decommissioned aircraft carrier U.S.S. Valley Forge, shown at "mothball" pier of Long Beach Naval Station, was used for interior shooting of spaceship scenes. (CENTER) Plastic modules, used to assemble cargo containers, on the huge hangar deck of the aircraft carrier. (RIGHT) The plastic modules line the hangar deck, as miniature car travels along their ranks. (BELOW LEFT) A "fisheye" view down the narrow passageways of the aircraft carrier converted into a spaceship. (CENTER) Robot drones march along the deck of the spaceship. (RIGHT) The "recreation room" of the spaceship. Entire wall at left was illuminated by means of fluorescent fixtures placed behind frosted plastic.



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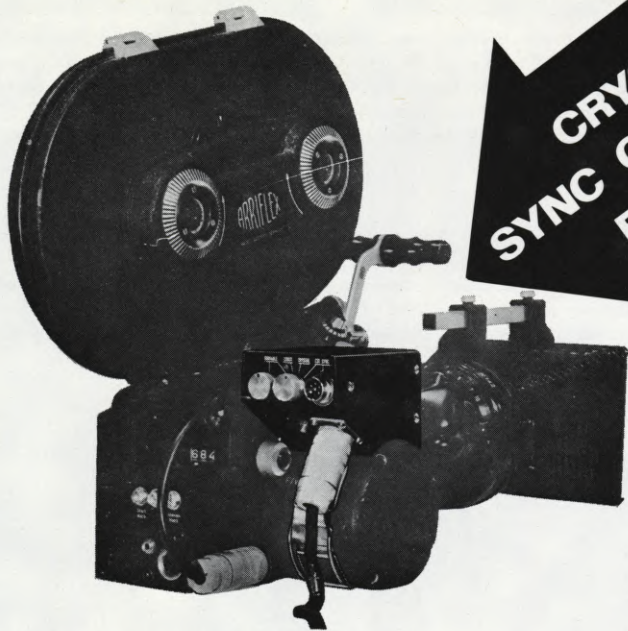
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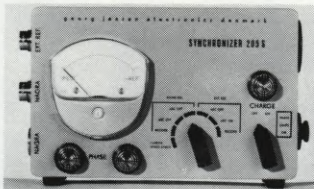
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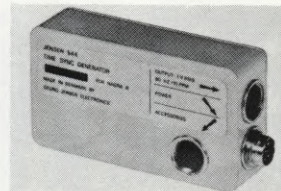
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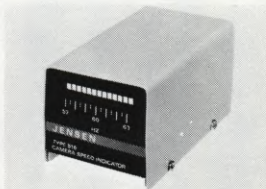


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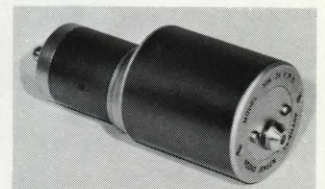
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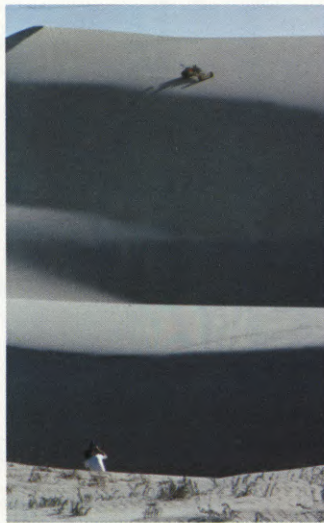
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Photographs taken on three of the breath-taking locations, during filming of "SENTINELS OF SILENCE": (LEFT) Uxmal (CENTER) Tulum (RIGHT) Palenque. Objective of the film was to show the mysterious and isolated monuments scattered throughout Mexico, silent evidences of once-flourishing civilizations. No humans appear in the film, but the exquisite photography by Jim Freeman, mostly shot from helicopters, captures fully the dramatic mystique of these majestic monuments.

(LEFT) Helicopter carrying Freeman to remote fishing site in the interior of Mexico touches down at primitive village to ask directions of the local farmers who were awed by the "giant mosquito", a sight which they had never seen before. (CENTER) Greg MacGillivray, Cindy Huston (Assistant) and Jim Freeman on location in Yosemite National Park. (RIGHT) Freeman sits in Hughes 500 helicopter which took him to far reaches of Mexico for filming of "SENTINELS OF SILENCE".



(ABOVE AND BELOW): Photographs taken during filming of "CATCH THE JOY" in the California desert. The theatrical short, a cinematic paean to the exciting sport of dune bugging, has won many awards and has been released for theatrical showing. It makes use of dramatic low angles and slow motion to "catch the joy" of the exhilarating sport. MacGillivray-Freeman Productions is headquartered in Laguna Beach, on the coast south of Los Angeles.



"SENTINELS OF SILENCE"

Continued from Page 771

once every two minutes when the sun goes behind the rocks. Moreover, the salmon do not jump in the same spot each time, and there is no way to predict exactly where or when one will jump. There was, however, a slight trend to multi-jumps. When one jumped, in one out of ten cases, another would jump within 3 seconds. So, our practice was to wait for a jump, then turn the camera on and wait. Using the Mitchell high-speed camera at 600 fps, EF film pushed one stop and an Angenieux 12-120 lens at about 70mm, wide open at F/2.2, we spent ten days and over 12,000 feet of film until we "caught" several salmon, one perfectly framed, lit and in the proper physical condition. Afterward, Cinema Research did an optical enlargement and scan following the fish across the frame. The resulting effect is fantastic! The salmon floats as if weightless, flapping its tail left and right, swimming through the air up the falls.

Q. You have recently released your final feature-length film on surfing. The film, "FIVE SUMMER STORIES" has met with tremendous critical acclaim and enthusiastic audiences. What are some new techniques used in the film?

A. Besides the beautiful color, shots taken as the cameraman surfs alongside the surfer, and our high-speed slow-motion photography, the two most innovative techniques used are the recording of sync sound surfing action and a

magnetic-sync-stereo 16mm sound track. For the actual, on-the-spot sound of what it sounds like to surf the Banzai Pipeline, we equipped champion surfer Corky Carroll with a Vega wireless microphone which we waterproofed with rubber material, surgical tubing, glue, resin and string. (The miniature Sony mike was covered with a play balloon leaving a slight air pocket above the sensor. The balloon was attached with glue and nylon string to a surgical tube covering the mike wire. The transmitter and antenna were covered in the same manner with rubber.) After several tries and alterations of the coverings, the waterproofing was perfected, and the equipment was harnessed and taped to Corky's chest and back, with the transmitter fitting into his altered swim trunk pocket. On shore, a receiver fed the sounds to a Nagra IV, used with an Arri, equipped with a telephoto lens. The effect is fascinating and very funny. For sound reproduction, we wanted stereo sound with magnetic quality that would really inspire rock-conscious filmgoers. At the time, the only reasonable method was to run double system. So we converted a Magnasync 16mm tape recorder to stereo, developed a common start mechanism for the constant speed projector and Magnasync, and ran the whole set-up through 400 watts of amplification and a matched pair of HUGE Vega high performance speakers. The sound quality and the total effect is truly worth the extra \$10,000 it cost to develop the machinery and to dub in stereo. Our deepest gratitude goes to Cinesound, Paul Martin, Bob Leonard, The Beach Boys, Honk, and all others who assisted with the sound reproduc-

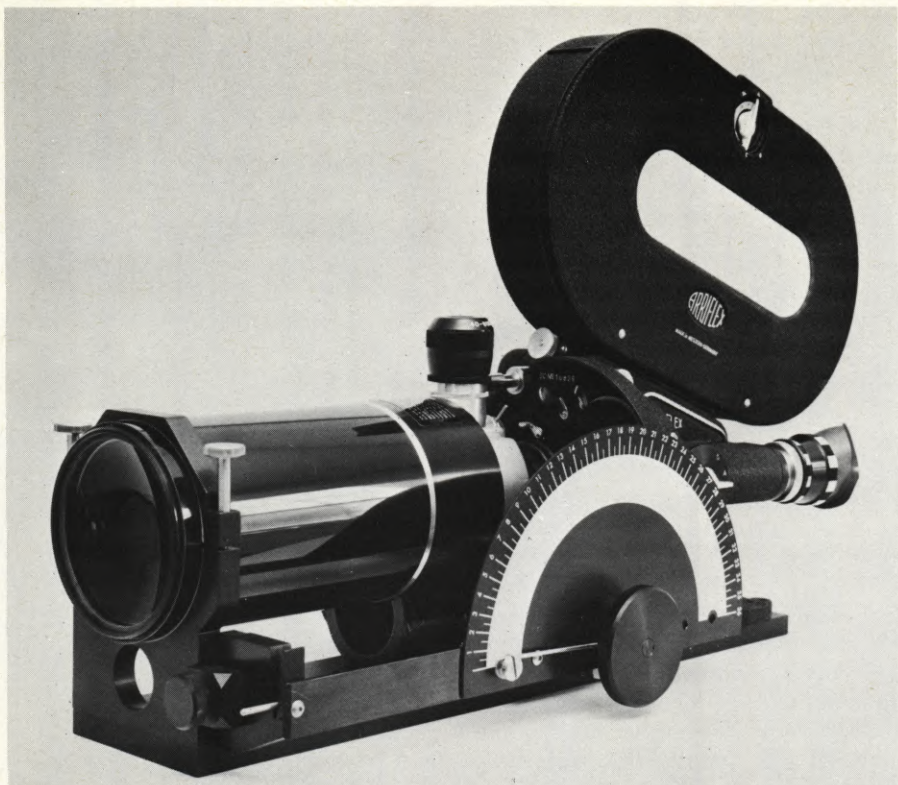


Jim Freeman and Greg MacGillivray in position for filming dramatic angle of buggy careening down a dune for "CATCH THE JOY".

tion. As with "SENTINELS OF SILENCE", where the helicopter was utilized to its greatest advantage, we attempt in all of our films to invent new techniques and improve on old ones to achieve the maximum artistic expression in a given situation. No photographic challenge is too great in order to capture the most beautiful, graphic and natural images which will intensify the message of any film. ■

(LEFT) Freeman sights sunset waves with a high-power telephoto lens in Hawaii during filming of "FIVE SUMMER STORIES", new surfing-adventure film now in release. (RIGHT) David Nuuhiwa, one of the stars of "STORIES", was raised in Hawaii and, though he is now a Californian, can still occasionally enjoy a warm, late-afternoon wave along the North Shore of Oahu.





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One of the most exciting things we have seen recently is a test film shot by David Quaid with our new Questar Cinema Model attached to the Arriflex 35. It begins with the motion of the moon drifting slowly across the field of view, follows a train along the bank of the Hudson river, three-quarters of a mile away, pans the New York skyline and climbs the Pan Am and Chrysler buildings three miles away, inspects the Statue of Liberty from five miles, observes a grazing cow with its accompanying cattle egret at two hundred yards, rises to a mocking bird singing on a branch at three hundred feet, follows a vapor trail until it catches up with its jet at ten miles, and watches a plane take off at Newark Airport and approach the camera, finally passing overhead. The sequence ends with the sun setting behind some fishermen in a boat three and a half miles at sea.

And all this with no lens change—just the Questar which, as David Quaid says, can focus from the eye of a fly to the craters of the moon . . . instantly!

Quaid's film was taken on 35 mm. Ektachrome 5254 ASA 64 rated ASA 125, with a #85 filter, and at 24 f.p.s. with the exception of the sun and moon shots which were intended as 'atmosphere' and purposely overexposed.

The Questar Cinema Model and its special accessories can be used not only with the Arri 35 but with other 35 mm. and 16 mm. reflex cameras as well. It gives the cinematographer something he has never had before—the ability to adjust his focus from an extreme telephoto situation to a macro-closeup within the same film take.

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SPACE FILM IN NO SPACE

Continued from Page 753

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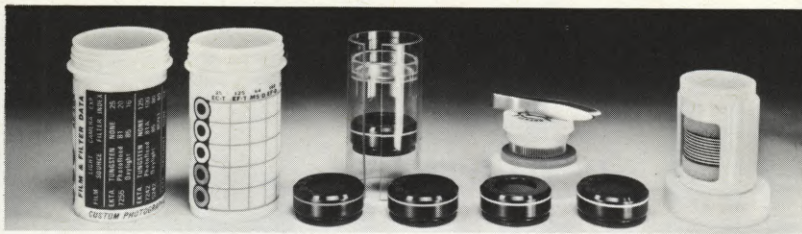
An animation background is a big help to any cameraman, in my opinion. It was very helpful to me in "SILENT RUNNING" because of the many imaginative effects involved, and because animation is basically an effect rather than the normal approach to shooting live action. If you have experience in animation techniques you are probably well-grounded in photographic effects and you are better able to understand what increments of film are needed and how they are assembled to create special effects.

Many of the scenes involving models of the spaceships were done in Doug's shop after our shooting schedule was completed and we had to be sure that he had the right pieces of film to work with and that the backgrounds we shot were related colorwise, tonewise and in density. For instance, we shot an interior front projection scene of Bruce Dern standing at the window of the food preparation center. While he is fixing his salad he opens the large automatic window shade and looks out at the stars in outer space. Then we reversed the shot, and filmed him from outside looking into the room through the same window. This second cut was later used by Doug as a portion of the extremely important "pull back" which sets up the whole production. It starts in the tight shot of Bruce in the window; expands to include the outside of the spaceship; grows wider to present the complete spaceship; and finally fills the screen with a breathtaking view of all of the spaceships gliding silently through space. It gave the audience the perspective of the enormous size of the ships and the magnitude of the undertaking, which had been concealed from them prior to that time in the picture.

FRONT-PROJECTION

Front-projection is a special effect procedure and it is expensive. Except for a couple of shots, the front-projection was used in the hangar in the San Fernando Valley where we had the "Dome Sets". The interiors of the domes were the forests growing in space. We never actually built the domes, they were all projected on background plates. In contrast to the much larger front projection equipment used

Continued on Page 795



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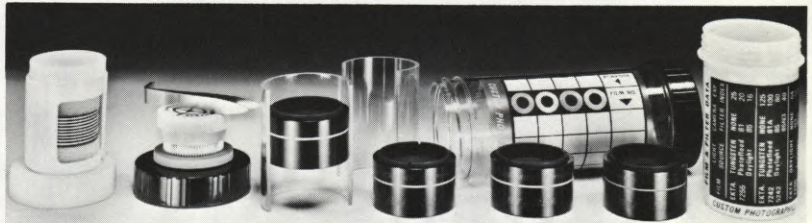
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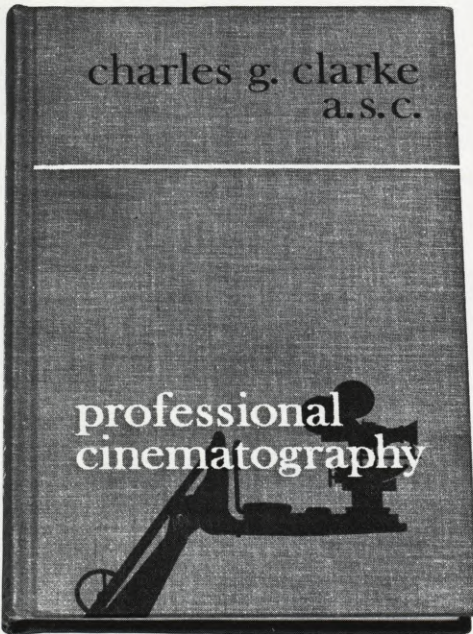
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ABOUT THE AUTHOR: Charles G. Clarke, ASC, a top Director of Photography at 20th Century-Fox for many years, and an ASC member, taught Advanced Cinematography at the University of California at Los Angeles, where he recognized a need for practical professional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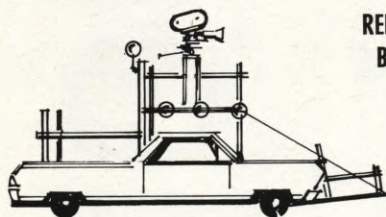
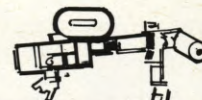
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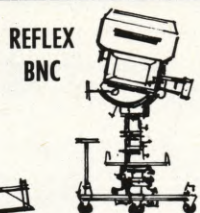
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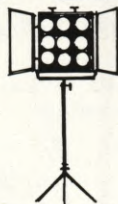
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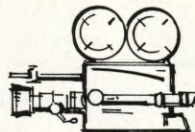
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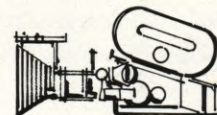


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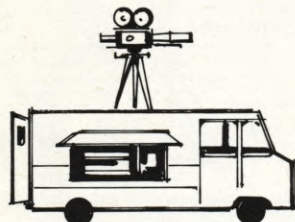
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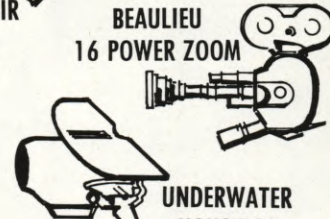
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SPACE FILM IN NO SPACE

Continued from Page 792

in "TORA! TORA! TORA!" which was essentially a camera and projector mounted on a lathe bed and placed on a large fork lift, and the equally sizeable equipment required by the eighty-foot screen used for the animation in "THE WAR BETWEEN MEN AND WOMEN", the front-projection equipment for "SILENT RUNNING" was small enough for two people to move.

The unit was designed to Doug's specifications and employed a still projector rather than a motion picture projector. The camera was an Arriflex that was mounted on a fluid head, specially modified to position the nodal point of the lens. The camera, projector and the 45-degree mirror were placed on a table where they were adjustable to coincide the axes of their respective lenses.

The still projector was incandescent, rather than an arc, so we had to work within the smaller range it was capable of producing. It had enough light to cover an eight-foot screen at F/1.8, but not at the light level we wished to maintain, which was F/2.8 to F4, for our depth of field. The amount of light you get on your screen depends, of course, on the speed of your projector lens, the amount of light you can pump through the negative in the projector, and the distance from the screen to the projector, as light falls off drastically depending on the length of the throw.

Doug had reasoned in his preparation that by careful planning we could adapt our shooting to a forty-foot screen and we used one which is owned by Universal. It is forty by twenty-five feet, mounted on a tubular aluminum frame, constructed to allow for a three-foot variance in height, and it is on wheels, enabling it to be moved anywhere on the set where you have provided enough space. It, too, required only two men to move.

The projector was capable of covering a 4x5 transparency, although the holder was large enough to accommodate a 5x7. We used both sizes at different times and they could be moved horizontally, vertically, or in combinations of both, resulting in a diagonal movement. Doug had worked out an electronic panel which could be programmed in advance to accomplish these movements at the speeds we wanted to fit the length of time in a scene. As an illustration, the same scene I described earlier where we shot Bruce looking out the window employed this method. The audience had the feeling



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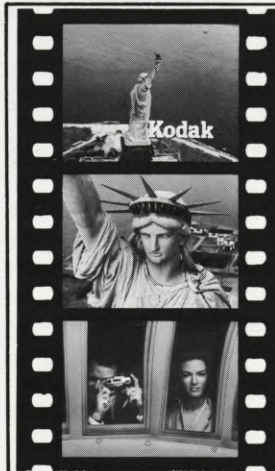
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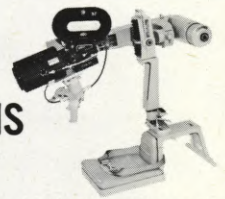
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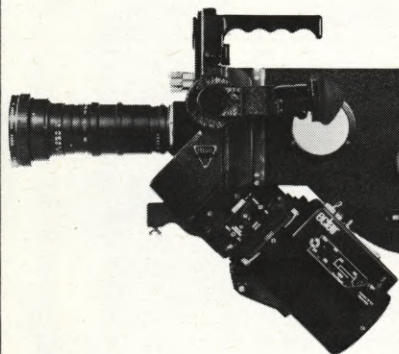
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that the spaceship was moving by the stars and planets going past the window, when in reality the background transparency was being moved on the front-projection screen. The electronic panel was moving the holder on the projector slowly from one side to the other, and perhaps downward as well, all with the touch of a switch. It was beautifully worked out. I found the still projector much easier to use than a motion picture projector since we were able to hold the transparency on the screen and analyze it for lighting as we went along compared to the difficulty of running the frames of film back and forth in the motion picture projector. This was the first time this particular rig had been assembled and as it had never been really tested we weren't sure of its limits and what we could get out of it. It is the only one of its kind, I believe, and was very interesting to work with.

LIGHTING FOR FRONT PROJECTION

Lighting for front-projection is a book in itself. Basically you try to light to a mood as you would any other scene. You naturally have to adjust either the foreground lighting or the background plate within the limits available. You may have a plate that is in such a low key that it is difficult to bring the foreground light down to it, or you may be able to bring the background up to a level that is more easily worked with in the foreground. It is a constant juggle and there are some traps.

The basis of front-projection is the power of the material of the screen to reflect a light thrown on it, up to 200 times the same intensity, at an exact angle from which the light originates. Foreground lights anywhere near the camera must be positioned so that they can be cut off from the screen. If you use a strong back light on a subject and there is a reflective material involved it can create a similar problem. For instance, a man in a space suit has a helmet. The helmet is highly reflective. If there is a light coming from a position near the screen and it hits the helmet, it may bounce back toward the screen and is now in the same angle as the camera and may create a halo around the helmet. This makes it necessary to light, not with stand-ins, but with the exact elements you are going to shoot in the scene, and to turn and move those elements to check their respective properties.

Leak light can hit the screen, if it is far around to the side, because, if a light comes from a 170° angle, it will be reflected off the screen at 200 times the

original intensity, but at a complementary angle to the 170 degrees—not to the angle of the camera.

EXPLOSIONS

One of the interesting things we worked out with the front-projection was during the sequence in which the domes on the other spaceships are being destroyed as per orders. Bruce is working in the garden of his dome and as these explosions occur, he reacts to them. We wanted to see and hear these explosions from Bruce's point of view and to convey the feeling that they came from different directions. For the tight shots we used our regular camera setup and lit the scene normally, adding extra lamps to overexpose it. We used the ground, set pieces, or the brush as our backgrounds, and then while shooting, we covered and uncovered the extra lamps with shutters or gobos, on a timed schedule to create light flashes. We could have put these extra lamps on dimmers but they tend to go extremely red or orange when you do and we were trying for a light fadeout and not a color change.

This system was fine for the closeups but, in order to be able to see the explosions outside the dome, we placed the front-projection screen behind the forest and used the projector, without a

transparency, as a light source. We set the light on the projector at the density we wanted on the screen and then at the point where an explosion occurred, we opened the iris from one to three seconds, which threw a bright, white light behind the forest and gave the effect of the sky, or space, lighting up.

AFTERTHOUGHTS

Considering the budget and shooting schedule on "SILENT RUNNING", we felt that we had provided a great deal of production on the screen, particularly compared to the enormous budgets of other space pictures, such as "2001: A SPACE ODYSSEY". I was delighted to be associated with the project and treasure an unusual little gift Doug gave me when we finished. It is a small section of the space module, mounted on a walnut base, with a kind inscription of thanks from Doug. On the back is a small printed sheet with a message that is indicative of the fun we had and what set this picture apart in my mind from any others I had done. It reads, "A design symbolic of the cargo modules used on the spaceship, 'Valley Forge' in the picture 'SILENT RUNNING', or A FAKO FOMO KLUGED WITH NURNIES."

A very inventive mind, as I said before. ■

BEHIND THE SCENES

Continued from Page 786

gave us our first idea as to what a space freighter might look like in the future was the Theme Building. The main tower, over 300 ft. tall, was a modular geodesic type of structure that was absolutely fascinating. Unlike anything ever constructed before, it suggested the feeling of openness and had the structural beauty we were looking for. We could envision it as a full-size space freighter.

From an initial half-dozen drawings that laid out the design elements such as structure, pod sections, and dome locations in a logical manner, construction began with the whole project being treated as a piece of sculpture. Shapes and parts were continually being rearranged in respect to camera angles.

The model work was started with the construction of a rolling pipe platform, four feet wide and twenty feet long, capable of being broken into three sections for future camera work. At the same time, parts for the structure were being fabricated. Metal, wood and plastic prototypes were constructed. Silicon rubber molds were made from these, with the final part cast in an epoxy resin. Hundreds of parts were custom-made in this manner with an additional

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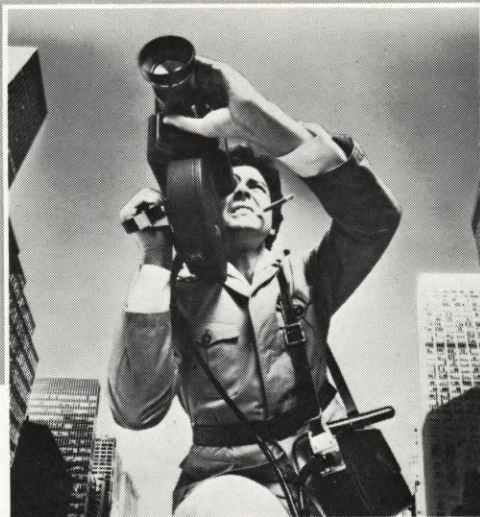


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amount cut from acrylic plastic stock tubes. All were inspected for flaws and painted prior to assembly. The wing section was constructed of wood and steel covered with 1/8-inch styrene plastic before the application of detail.

A model has to have a great amount of detail in order to be photographed close-up and still maintain its believability. This was accomplished with the purchase of 850 Japanese model kits of German tanks which had interestingly shaped parts. When grouped together they gave a surface texture that looked real. Hours of cutting and sanding preceded many more hours of gluing the thousands of detail parts to the basic structure with the results always being checked with 35mm test slides to see what the detail looked like when properly lit and on the screen.

The domes were two feet in diameter, made of blow-molded acrylic plastic. Holes were then drilled in a geodesic pattern and metal inserts installed. Three layers of a fine copper wire were then laced inside and out, the whole process taking more than 60 hours per dome. Not the slightest was forgotten. Smooth surfaces were scored in a grid pattern and painted in different values to break up the flat areas and give the whole ship an older character.

Some of the most remarkable photography was achieved at the airplane hangar in Van Nuys where we shot the garden interiors of the domes and full-size exterior of the space ship.

The garden set was 35 ft. in diameter centered in the 100' x 100' hangar and served as a tropical forest as well as a pine forest and desert. Front-projected backgrounds of the interior of the dome were projected on a 20' x 40' 3M front-projection screen moved around the set to cover different shots.

For the exterior of the space ship, a foreground set was built in perspective to 4 x 5 transparencies previously shot of the model at Trumbull Productions for the front-projected backgrounds. Set costs were kept at a minimum by the reuse of plastic parts, such as the cargo containers used on the *Valley Forge*. Sections of these were assembled on flat surfaces for detail on the set.

I think "SILENT RUNNING" is just the first in a series of spectacular visual productions which we can now produce at a fraction of the expected cost of such complex "hardware"-type films. We are using new techniques, new equipment, and new ideas to bring prohibitively expensive areas of the film medium back into line with today's fast, lightweight, and efficient live-action techniques. ■

TT & FL SYMPOSIUM

Continued from Page 784

"New materials to correct light and color in film and TV productions."

Stan Miller, President,
Roscoe Laboratories, Inc.

11:30 a.m.—1:30 p.m.
Lunch (Open)

WFLD-TV

1:30 p.m.—4 p.m.

TV/Film Lighting Demonstration
Thaine Lyman (TV) Columbia College,
WGN-TV.

Jack Behrend, President, Behrend's, Inc.
Question, Answer Session

4 p.m.—4:15 p.m.
Film "Glass"

4:15 p.m.—5 p.m. Paper

Subject:

"Glass Halogen Studio Lamps"

Charles N. Clark, General Electric Co.

5 p.m.
Open

TUESDAY, May 23rd PICK-CONGRESS

8:30 a.m.—9 a.m.

Coffee—Registration

9 a.m.—10:30 a.m.

Session Chairman—Stewart R. Martin

F&B CECO

Remote Lighting

Jack Behrend, President, Behrend's, Inc.

10:30 a.m.—11:30 a.m. Paper

Subject:

"Stage Lighting—its place in the
business world."

Thomas M. Lemons,

TLA—Lighting Consultants, Inc.

Charles J. Neenan,

L. K. Comstock & Co., Inc.

11:30 a.m.—1 p.m.

Lunch (Open)

GOODMAN THEATRE

1 p.m.—2 p.m.

Session Chairman—Paul Tyler,

Grand Stage Lighting Co.

Visit Goodman Theatre

Guest Speaker—Glenn Naselius,

Operations Manager

2 p.m.—2:15 p.m.

Bus to Arie Crown Theatre

ARIE CROWN THEATRE

2:15 p.m.—3:15 p.m.

Visit Arie Crown Theatre

Guest Speaker—William Taylor,

Theatre Manager

3:15 p.m.—3:30 p.m.

Bus to Auditorium Theatre

AUDITORIUM THEATRE

3:30 p.m.—4:15 p.m.

Visit Auditorium Theatre

Guest Speaker—Monty Fassnacht,

Managing Director

4:15—5 p.m.

Open

CANDLELIGHT THEATRE

5 p.m.—Midnight

Bus To and From "Candlelight Theatre"

For Discussion, Dinner and Play

"Fiddler On The Roof"

Guest Speaker—William Pulinsi,

Owner, Producer

WEDNESDAY, May 24th PICK-CONGRESS

8:30 a.m.—9 a.m.

Coffee

9 a.m.—10 a.m.

Session Chairman—Charles Neenan

Paper

Subject: "Application of theatre

lighting techniques

in Architecture and Education."

N. "Sonny" Sonnenfeld,

President, Sonnenfeld & Co., Inc.

10 a.m.—Noon

Session Chairman—Thomas M. Lemons,

TLA—Lighting Consultants, Inc.

Subject: "Sports Lighting"

Panel

Dave Frick, CBC

William Shearer, CBC

Robert Stebbins, WGN

Richard Davis—University of Illinois

Noon—1:30 p.m.

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A.S.C. PRESENTS VOICE TAPES OF FAMED CINEMATOGRAPHERS TO USC

Taped interviews with famous film makers, some of whom are no longer living, have been presented to the University of Southern California by the American Society of Cinematographers.

The valuable collection of 30 tapes will be housed in the library of the proposed USC School of Performing Arts. They were received on USC's behalf by Dr. Robert Knutson of Los Angeles (90025), head of the USC Library Special Collections Department, and Sol Lesser, Beverly Hills, distinguished producer, USC cinema professor and chairman of the USC Performing Arts Coordinating Council. The Council is dedicated to acquiring historical artifacts and documents from all the arts for future study in the Performing Arts Library. Representing ASC in the presentation were Hal Mohr, Beverly Hills, past-president, and Charles G. Clarke, Brentwood, treasurer.

Persons whose voices are recorded on the ASC tapes include cinematographers: John Arnold, Jacob A. Baderacco, Fred J. Balshofer, Spencer Bennet, Charles Clarke, William Daniels, Arthur Edeson, George Folsey, James Wong Howe, Reggie Lyons, Arthur C. Miller, Virgil Miller, Victor Milner, George Mitchell, Hal Mohr, Roy Overbaugh, Lewis Physioc, Ray Rennahan, Charles Rosher, Harold Rosson, Joseph Ruttenberg, John Seitz, Henry Sharp, Karl Struss, Philip Tannura, James Van Trees, Paul Vogel, Joe Walker, and Gilbert Warrenton.

On still another tape actor Gregory Peck, former President of the Academy of Motion Picture Arts and Sciences, expresses his ideas on contemporary cinema.

FIFTH ANNUAL ATLANTA INTERNATIONAL FILM FESTIVAL

Preparations are well underway for the Fifth Annual Atlanta International Film Festival, to be held August 11th-20th, 1972. As in the past, the Festival films will be shown in the beautiful Atlanta Memorial Arts Center, which has four screening facilities, seating from 150 to 2,000 people.

This major world film competition has grown into one of the world's largest film festivals, with more than

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ACTIVITIES

1,200 films from 32 nations entered in 1971. The Atlanta event is a member of the International Festivals Association.

The Atlanta International Film Festival is the most comprehensive film competition in the world, embracing the entire spectrum of motion picture production (58 separate categories), from features to TV commercials, in every format from 16mm to 70mm, plus filmstrips and broadcast-standard videotape.

Preliminary judging is accomplished by an international blue-ribbon committee of 100, who select the films to be presented during the 10-day festival. A final international jury makes the actual award selection.

Included in the festival are the competition screenings, seminars, symposiums, and production equipment exhibits. The new Festival theme, "TEN GREAT DAYS IN AUGUST", kicks off the fifth annual competition, one of the largest film festivals in existence. Major studio participation will continue this year. Last year, Columbia Pictures' "FOOLS' PARADE" with James Stewart and the Dalton Trumbo epic, "JOHNNY GOT HIS GUN", captured top honors.

In answer to the great need for serious recognition and competition in the field, a major television category has been created. This Silver Phoenix Award competition has several divisions including: TV specials, features made for TV, network and local news, TV series, public affairs, documentaries, and news film clips. The new competition is a result of suggestions on the part of the Board of Advisors of the Festival and top television and network officials.

All areas of competition in the festival have been re-structured for better presentation and competition. A new "Filmstrip" Gold Medal category has been added. In cooperation with the Ampex Corporation and WFAA-TV, the Festival will present a special three-day seminar on videotape creative and experimental techniques. WFAA Productions is nationally recognized as one of the nation's most innovative videotape centers.

In Atlanta WTCG-TV is the official station of the Festival and will present hours of specials from the Festival. WETV and the ETV network will carry major specials on the Festival, and will broadcast the final awards presentation live and in color from the Sheraton Biltmore Hotel.

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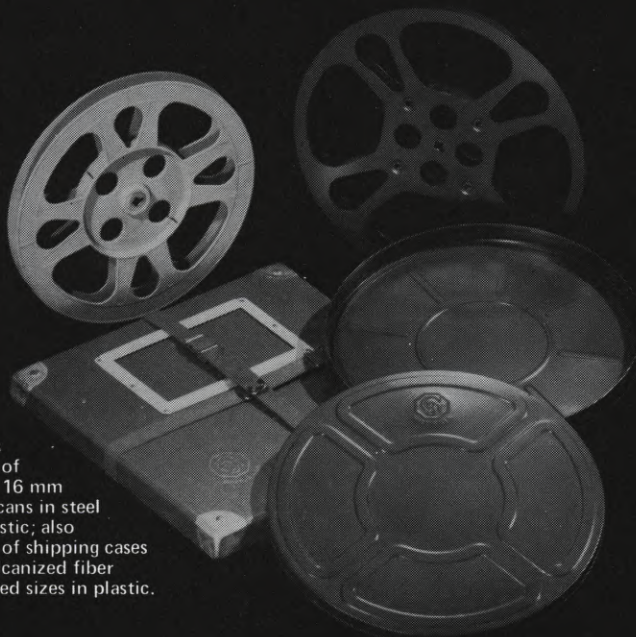
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Festival screenings will be held in the 2,000-seat Symphony Hall of the Atlanta Memorial Arts Center. Over 25,000 are expected to attend the ten-day event. For further information, contact: J. Hunter Todd, Director; Atlanta International Film Festival; 1584 Tullie Circle, N.E.; Atlanta, Georgia 30329 U.S.A.; (404) 633-4105

FESTIVAL OF HUY

For the twelfth time, The World Festival of amateur and independent cinema of Huy, will take place in October '72 in the premises of the "Maison de la Culture".

- The programme will be as follows:
- Friday 13th, Saturday 14th and Sunday 15th of October: Free of charge public quoting performances
 - Monday 16th of October: Jury deliberation
 - Saturday 21st of October: closing evening, party, results proclamation and prize-giving.

Furthermore we want to point out the fact that the 18th, 19th and 20th of October the most attractive films of the festival will be presented to students of primary (the 18th) and secondary schools (the 19th) and to old people (the 20th). As in the past, The Festival, sole manifestation of this kind in Belgium, is organised by the Lions Club and the Camera Club, within the activities of the "Maison de la Culture".

Information: Secretary J. BANK
 86, Chemin de la Sarte 5200 HUY (Belgium)

Regulations and entry forms: Mr. E. AMAY
 9, rue des Vergiers 5200 HUY (Belgium)

MOTOROLA EXPANDS CASSETTE TV BUSINESS

In Chicago, Elmer H. Wavering, Vice Chairman of the Board and Chief Operating Officer of Motorola, Inc. announced Motorola's intention to aggressively pursue its North American EVR cassette TV operations and to expand operations multi-nationally in the marketing of Motorola Teleplayers and programming.

"In the recent past," Wavering said, "we have been reevaluating our EVR posture following CBS's realignment of their worldwide EVR business. We have examined the excellent EVR Partnership manufacturing facilities in Basil-don, England. They have convinced us they are capable of serving the world

market with quality EVR color cassettes. We expect quantity deliveries to the Motorola Teleprogram Center and other North American customers before mid-year.

"In the meantime, CBS's Rockleigh, New Jersey plant continues to deliver both color and black and white cassettes to us and other customers. Our shipments of Motorola EVR Teleplayers continue to yield good quality reports from the field. We are in strong position to expand manufacture of Teleplayers for world markets.

"In meetings with the top management of the EVR partners, Ciba-Geigy A.G., Switzerland and Imperial Chemical Industries (I.C.I.), London, I was impressed with their dedication to the EVR format and have every assurance that in concert with Motorola and all the other licensees they will provide the management thrust and investment necessary to make EVR a leading world format.

"CBS will work with us on program distribution to the industrial/institutional markets. Titles from their educational divisions are already being distributed to Motorola Teleprogram Center markets such as police and hospitals."

Lloyd Singer, Vice President and Director of Education and Training Products, Motorola Systems Inc. stated that the marketing strategy would be to move ahead vigorously on two fronts. Our U.S. market will continue with already announced plans as well as the new American Bankers Association training and enrichment program for which Motorola recently received exclusive distribution rights.

Singer said, "International opportunities exist for our format and we will begin aggressive marketing of a Motorola PAL EVR Teleplayer in Europe in March. Shipments of the new PAL unit will begin in mid-year. We will be dealing through other EVR licensees as well as master distributors with service capabilities in multiple countries. We also expect to gain some excellent cross-marketing situations for the Motorola Teleprogram Center.

"The Motorola Teleprogram Center expects to be a major factor in the cassette TV business—in both hardware and software," according to Singer.

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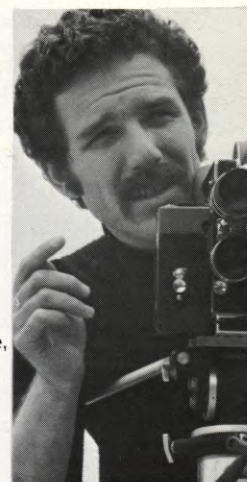


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Los Angeles streets or on city property was approved by unanimous vote of the City Council. Councilmen who spoke to warmly support establishment of the new office were: John Ferraro, Chairman of the Industry and Transportation Committee and a strong supporter of the plan; Joel Wachs, Robert Stevenson, Gilbert W. Lindsay, and Louis Nowell.

The new office, to be known as the Office of Motion Picture Coordination, will be located in Room 278, City Hall, and may be reached by calling 485-5328. It will be under the direction of the Department of Public Works, headed by Commissioner Howard W. Chappell, who is also chairman of the city's Motion Picture-Television-Communications Committee.

Jock Mahoney, active and well-known member of the film industry, has agreed to serve in an advisory capacity without pay in establishing the new office. He will be assisted by a staff including Jesse Wayne and Toni Kimmel, both with outstanding backgrounds in the film industry, who have been employed for the project through a Federal funding program which assists local governments.

"This is the first step in what we hope will develop into a major program to revitalize the Los Angeles area film industry and nearly 50,000 members of film unions who live in our area," the Mayor declared.

Previously, film companies using city facilities or property had to place separate calls to arrange with whatever individual department had direct control over the facility sought as a film location site. Now, however, a single call to the City Film Coordinator will be all that is required. The new one-stop office will then handle all the necessary coordination between departments, freeing film companies of red tape and much of the delay that has tended to slow down the approval for such requests.

"The Los Angeles area has it all," Mr. Mahoney said. "We can provide many types of locations production people think they have to travel a long way to obtain," he said.

"We will not only speed up permits, but we will go all out to help filmmakers find those difficult locations, close at hand, that many of them don't even realize we have right here in Los Angeles."

Members of the film industry throughout Los Angeles were asked by Mr. Mahoney to call or write his office with recommendations as to how the City of Los Angeles could augment the Movie Coordinator's Office services to help the local film industry further.

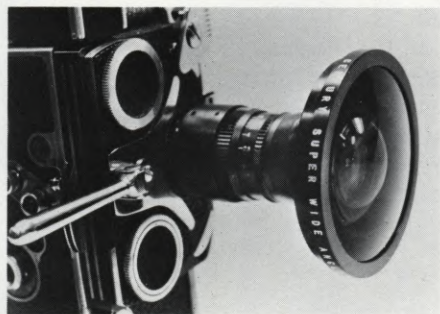
WHAT'S NEW

Continued from Page 726

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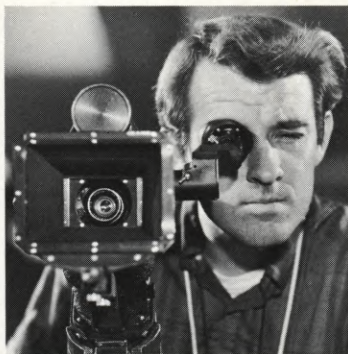
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The Leacock System, named for its developer, Professor Richard Leacock of M.I.T. Educational Research Center, is designed to provide a low-cost means of instruction in professional film-making at the University, High School, and even Elementary grade levels.

Designed for use in instructional curricula, The Leacock System's projected simplicity and low cost structure, makes it desirable for use by the media, and the amateur enthusiast as well. The under six-pound, sound-blipped, modified Braun camera, combines with a three-plus-pound recording unit, professional editing equipment, and 5-bladed projector to provide a light-weight system, unencumbered with camera-to-recorder umbilical cords, for about \$6,000. This figure, approximately 10% of that normally spent for professional equipment, and about 35% less on material cost compared to 16mm, makes it a revolutionary step in a field increasingly attractive to beginning students. The cost and size factors have been deterrents to meaningful programs in filming education in today's growing enrollment of young people in this pursuit.

Handling of the equipment is facilitated by the extremely light weights and simplified controls allowing creative thought to work, not to mechanical details. The professional broadcast microphone contains its own unique amplification system, controlled during recording. The recording unit and camera include a crystal-controlled oscillator, the key to later film/sound synchronization.

Once recorded, cassettes are transferred to full-width 8mm tape through the broadcast quality system in the transfer deck.

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Continued on Page 826



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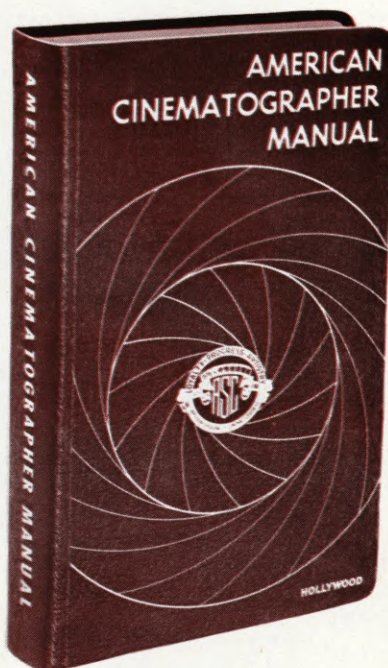
Munich, August 26—September 10, 1972



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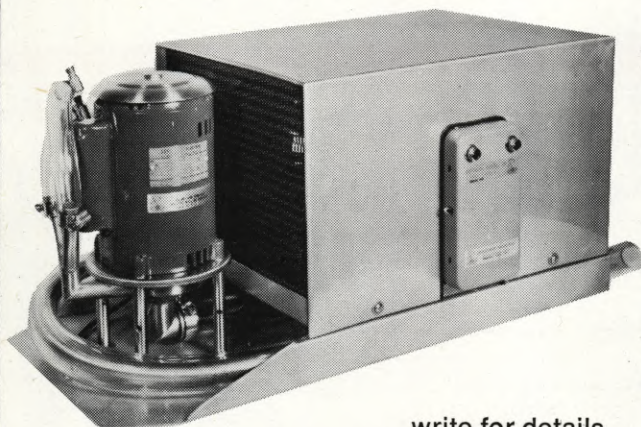
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"SILENT RUNNING" EFFECTS

Continued from Page 757

them for camera position. With this setup, the camera was free to zoom, pan or tilt within a 15° limit without background shift. The application of front-projection provided tremendous savings as compared to time-consuming and costly matte work.

Many of the front-projection plates for the forest scenes included views through the dome of Saturn against a star field. Saturn was first produced using a streak photography process which involved a large semi-circular illuminated surface which, when slowly rotated in a darkened room, would produce a spherical exposure, if rotated 180° while the camera shutter is open. A separate exposure was made of a flat panel which was also rotated in the same manner to produce Saturn's rings. The images of the planet and its rings were combined by pasting together color prints of each and then airbrush-retouching the composite, which would be rephotographed with painted stars onto Ektachrome 4x5 film.

Most of the front-projection plates used in the dome interior scenes had to include a dome structure, star backgrounds and, in some cases, Saturn. These plates were made using a six-foot-diameter miniature dome photographed against a black backdrop, which then would be removed, revealing a rear-projection screen. Without the dome lighting, the rear-projected star field and Saturn would then be exposed on the same plate, the silhouette of the unlit dome providing its own matte.

Streak photography, a la slit-scan, was used in the Saturn's rings penetration sequence. Here we projected random slides upon a rippled, highly reflective drum that rotated in sync to camera motion and bounced rippled cloudlike images onto a rear-projection screen. This rear-projection screen simply replaces the "slit" or pattern as used previously for effects in "2001". This sequence in the film took a week to photograph, and the average exposure was 90 seconds per frame. The image generated here was then optically combined over locked-off shots of the miniature with moving colored lights reflecting upon it. This combined footage was then set up in a process projector and rephotographed off a rear-projection screen in order to add camera shake.

Animation of flat art work was used at times in the exterior spaceship shots, for it was impossible to get long shots to include the side view in our limited working area. Flat art was simply stripped together using color prints of

the full-size-model and painted stars.

The high-speed work with the connector separation sequences was one of the most challenging and enjoyable aspects of the special effects. These shots were made with the camera on its back looking vertically up at the connectors. Some long shots include front-projection at 86 fps shot with the Arri 35. For tighter shots, a Mitchell/R35 was used at 128 fps. Many problems were encountered in these sequences with model articulation. There were six individual articulations of the one-foot-diameter model connector. These had to occur in two seconds and in sequence. For this we used electric motors, pneumatic controls, pneumatic cylinders, explosive squibs and very quick hands. High-speed filming was also used to provide material to be optically combined with other scenes involving explosions and flying debris.

With two or three exceptions, none of the special effects in "SILENT RUNNING" were shot in real time, and until the film was back from the lab, there was little or no way of telling exactly what it would look like at 24 fps other than by educated guess. It took a lot of very good "educated guesses" to make "SILENT RUNNING" on schedule and on budget, and we're delighted with the result. ■

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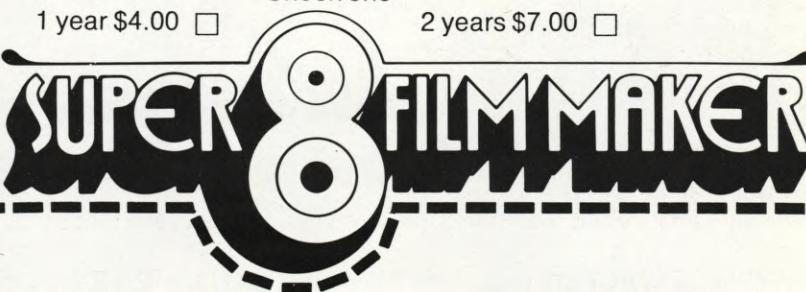
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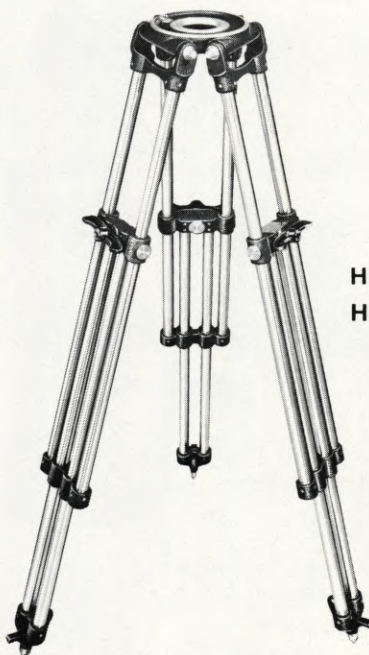
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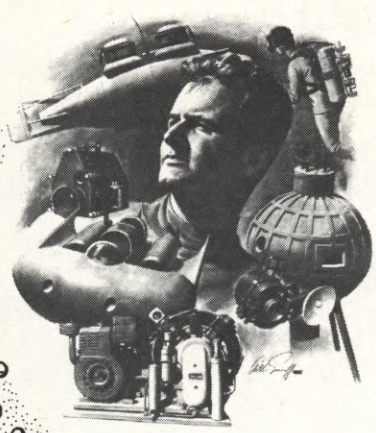
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ONE-LIGHT COLOR DAILIES

Continued from Page 782

are printing in the 20's or 30's, his negative is good. If his dailies are printed with all three lights below 20 or above 40, he should be concerned. Under-exposure is generally worse than over-exposure so that dailies printing below 20 are an indication that something is drastically wrong. (If a cameraman is shooting reversal original rather than negative, his exposure is much more critical; and his dailies should be printing somewhere between 25 and 35.)

Normally, a cameraman does not have to be concerned with the spread between the three lights, and some labs will simply report either the value for the Red light or an average of all three as an indication of the density of the negative. It is quite normal for there to be a spread of as much as 10 or 12 points among the lights, depending upon the way the lab sets its printer trims. If, however, a cameraman is striving for a color effect which he does not see in his first day's dailies, he may be interested in the spread of the three lights to see whether the color effect has been "corrected for" or can be heightened later on in the final print.

If a cameraman is trying to achieve a special effect in his photography, it is absolutely essential that he have good communication with his lab, so that his dailies can reflect his intentions. This is especially true if the lab is not familiar with his work or if he is striving for an unusual effect. The best thing to do is to shoot tests which can then be discussed with the lab in order to determine exactly how to achieve the effect. Only if the lab understands the effect he is trying to achieve can it determine the best light for printing his dailies. Normally the timer selecting the best light for printing a production's dailies will go by the faces of the people in the scenes. He will assume that the faces are fully exposed with light of the standard color temperature, and he will match the skin tone to a laboratory standard. If a cameraman is deliberately under-exposing his subject's faces or creating a special effect through the use of colored lights, he must tell the laboratory exactly what he is doing so they will not compensate for it in selecting the light for his first day's dailies.

Some cameramen request that their dailies be printed in the middle of the scale even though laboratories insist that there is no reason for specifying this.

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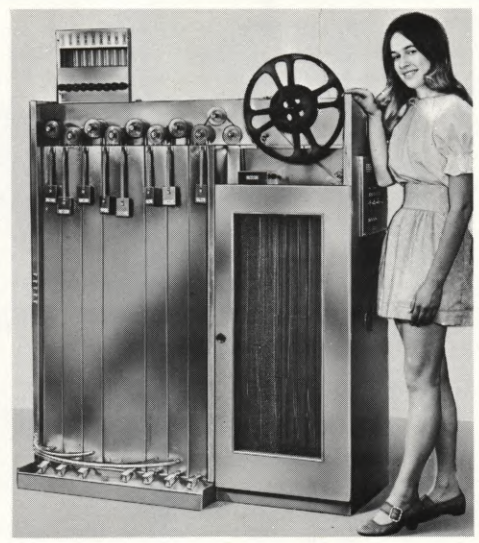
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First of all, "middle of the scale" can mean two things in color printing. It can mean simply mid-density with whatever corrections are necessary to achieve a proper color balance, or it can mean strictly printing at 26-26-26 with no effort to correct the color balance. The chances are that a cameraman requesting that his dailies be printed at the middle of the scale is cheating himself. So long as the lab understands the mood or effect he is striving to create in the photography, he is better off letting the lab select the best light for printing his dailies.

Laboratories differ in their approach to dailies. Technicolor, for instance, will say that ideally a cameraman should photograph a gray scale fully exposed with light of the proper color temperature at some point in each roll to provide the timer with the best possible means for interpreting the negative. C.F.I., on the other hand, insists that shooting a gray scale is only a waste of film and time because it is not the best means of determining the printer light and will be ignored by the timer setting the light for the dailies. In every case, what is important is communication between the cameraman and the lab, and every time a cameraman begins a production he should talk to the lab contact so that he knows what the lab prefers and the lab knows what he is trying to do.

Cameramen and producers must also understand the limitations of one-light color dailies. They must realize that the burden lies on them in explaining to the lab the effect they are striving for in the photography and, of course, they must not expect their one-light color dailies to be perfectly balanced from scene to scene. They must learn to recognize correctable variation in the color balance, just as they know scenes can be corrected for density. It is often disturbing to see changes in color balance in a workprint (especially when a leading lady's face seems to change color within a scene), but changes in color balance are correctable in the timing of the final print.

If a cameraman is working under particularly difficult conditions and the screening of the dailies is critical for some reason, he may want to order timed dailies. Only by ordering timed dailies can he expect his dailies to be completely balanced from scene to scene. Timed dailies, however, are, by normal standards, an unnecessary luxury, since most producers and cameramen should be accustomed to viewing one-light dailies. ■

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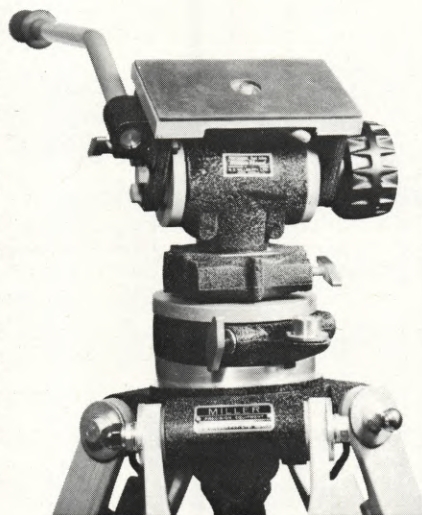
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EVOLUTION OF SUPER-GRIP

Continued from Page 769

"through the driver's window", etc. All seemed to come in big crates and were severely limited. The standard shots that they made possible never seemed to be quite right.

What about the cameraman who wants to be mobile and fast-moving? What about the director who doesn't want to be bogged down by trucks full of equipment and large crews? It would be ideal for a cameraman to take a camera, walk up to a car (or a boat, etc.), put it where he wants it, and—*presto*—walk away. Such fantasy has always been just that—a wild dream.

However, I wanted to find a "something" that would enable a cameraman to approach that fictional ability. He should be able to mount a camera on a car with no muss and no fuss. And he should be able to do it without the necessity of a large grip truck full of equipment.

I realized that a "gadget" like that would simplify my job immensely. In 1968 I set out to design a device that would save me some headaches and save the producers money at the same time. My criteria for development were:

1. small size
2. light weight
3. durability
4. simplicity
5. versatility

The possible solutions were:

1. suction cups
2. magnets
3. stickum
4. Elastic tie-downs

Suction cups were already in use, but they never fit the right place because of contours on the surface, and I had seen them fall off unexpectedly. Magnets were available that would hold several hundred pounds, but they also would only work on flat surfaces. They wouldn't attach to plastics or glass and they would scratch painted surfaces. In desperation I even thought about some sort of high-density adhesive in large globs, but there were too many obvious problems. Elastic materials were undependable and would not resist strong G-forces.

Back to the idea of a suction cup. How could I improve upon those in existence? How could I make one really safe and really strong? I decided I would have to do three things to end up with a worthwhile piece of equipment:

1. Incorporate a valve/pump system that would be self-metering so it would warn of loss of attaching pressure.

2. Manufacture a *flexible* suction cup that would adapt to contours, both concave and convex.
3. Develop a fool-proof mounting point that would enable the device to be used by any department—camera-men, electricians, grips, special effects, etc.

Without too much difficulty, an existing pump assembly was decided on after methods of its manufacture were improved. I wasn't so lucky in finding a rubber cup, however. After months of frustrating talks with manufacturers and rubber companies, a really flexible rubber pad, 10" in diameter and molded on a 12" radius, was produced. It had a metal ring inside the rubber for strength.

Preliminary tests showed that I had a truly unique device. A suction cup with over 700 pounds of attaching pressure, that would form itself over contours, and would warn the user if it was leaking air! Now was the time to see if it worked on the job.

The suction cup was tried on every application I could think of. It was used on car and tire commercials, race-car footage, films for the F.A.A., gasoline commercials, dune buggies in the desert, stunt planes—even on San Francisco cable cars. All types of cameras were used, 35mm Mitchells, 35mm and 16mm Arriflexes, 35mm and 16mm Eclairs, Bolex, etc.—all in production situations.

During the shooting of "THX 1138", a Warner Bros. release, a Lola race car that had been rebuilt to resemble a car of the future had to crash through several barricades at high speed and then into a wall. The camera, an Eclair CM3, was mounted on the top of the car with the suction cup. It stayed rock steady through all of the action and flying debris.

At this point I was convinced that I had succeeded in my search for a new device. I now had a camera mount that could be used by anyone. It could be used without worrying about scrapes or scratches in a car's paint job. Nor was it necessary to drill any holes. It was the only suction-type mount in existence that would conform to existing contours on a surface. Because of its unbelievable amount of attaching pressure, it would stay in place for hours, until someone *purposely* released it.

Different mounting hardware was tried—some rigid, some adjustable, some locking universal joints, etc. Through trials on location, I found that:

1. A low center of gravity was imperative, because most surfaces such as sheet metal or fiberglass are only

New Hahnel 16mm splicer. It's motorized.

Instead of hand-scraping (and the risks thereof), Hahnel's new battery-operated 16mm splicer uses a 6000-rpm sapphire-coated scraping wheel to produce a clean, wedge-shaped, jump-free, blip-free splice. In seconds. Consistently.

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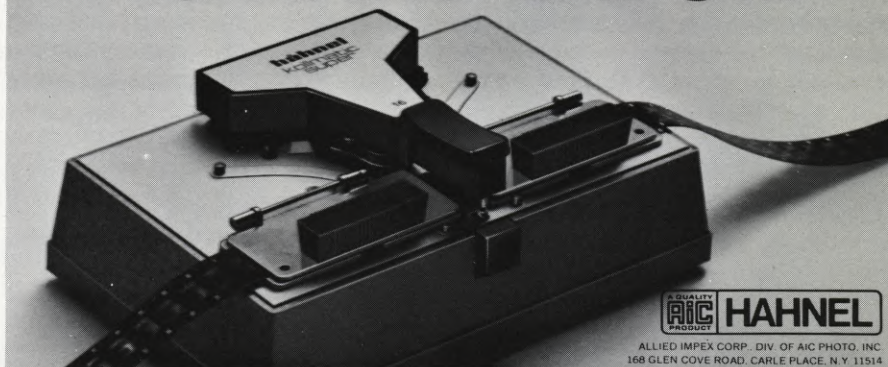
The Hahnel wedge-shaped splice is invisible on the screen.

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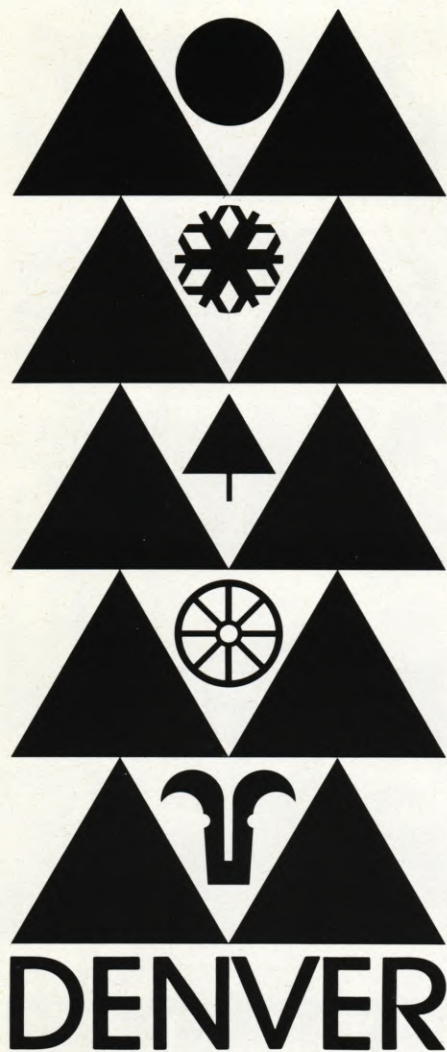
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2. A tilting plate with a positive lock was the most effective and adaptable mounting surface.

The device in this form saved me so much time and trouble and served such a multitude of tasks that the name "Super-Grip" evolved quite naturally.

In early 1970 I was using Super-Grips in basically their present form. It seemed that on every job a new use would present itself. One of the most interesting uses I found was discovered while filming TV commercials for Porsche/Audi. The cameraman wanted to do a hand-held shot from the hood of the Audi. How was I to prevent him from sliding off the hood the first time the car turned a corner? Three Super-Grips were the solution—one acted as a seat back, one for a foot brace or stirrup on the side of the car, and one to tie a safety rope to. Complete freedom to do a hand-held shot on the hood of a moving car, *in safety* in five minutes.

A Super-Grip proved indispensable during the filming of a Johnson Outboard Motor special for TV. A speedboat was to go over a jump in Cypress Gardens, Florida, with a camera on the bow. It was to be an extreme wide-angle shot looking back at the driver and some following boats. One Super-Grip held the camera with no excess weight, no holes in the boat and no rigging in the shot.

Besides unusual applications such as these, there were many instances when I was required to mount a camera on the door of a car, or mount a FAY light or Sun-Gun on a hood, etc. It was a relief for myself and the cameraman to know that the light or camera would not come off unexpectedly.

Although designed for exterior work, I have used the Super-Grip for interior filming. A shot called for backlighting the principal actor, who was sitting at a desk. There were large windows behind him and no ceiling structure to hang a light from. I put a Super-Grip on the window, up high, while a 2000-watt Mighty-Mole, with Dichroic filter, served as the backlight—and there was no light stand in the way of the shot.

In Australia, the storyboard called for a helicopter shot but a helicopter mount was not readily available. The camera was mounted on a wooden cradle and suspended on shock cord strung between a Super-Grip on the bubble and hooks on the floor of the cockpit. This eliminated any transmitted vibration, yet gave the operator freedom of movement.

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It seemed that everyone who had seen a Super-Grip in use wanted to buy one but I wasn't in the manufacturing business and it was not for sale. But I was eased from the position of being a key grip to that of manufacturer, as well. I set up production, and with the help of my good friend, Grant Loucks of Alan Gordon Enterprises in Hollywood, the Super-Grip is now distributed around the globe.

A device which I originally invented just to make my job easier has now become a unique commercial product in use in every form of motion picture production. ■

**FILM HISTORY PROGRAM
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The University of Southern California Division of Cinema will offer a new program in film history, criticism and aesthetics in the fall.

The announcement came from Dr. Bernard Kantor, Chairman of the Division of Cinema, who said that Prof. Arthur Knight, critic, historian and member of the USC faculty since 1960, will head the program.

John Russell Taylor, London Times film critic and author of "Cinema Eye—Cinema Ear," and Sylvia Fine (Mrs. Danny) Kaye, composer-writer, have been appointed to the USC faculty to teach in the new program.

Other participating members of the USC faculty will include: Dr. Edward Kaufman, drama critic; Prof. Leonard Spigelgass, writer; Prof. William Froug, producer-writer; Dr. Stephen Karpf, writer; and Dr. Allan Casebier, assistant professor of philosophy.

Students seeking a Bachelor of Arts or a Master of Arts in Cinema will have the option of focusing their studies on either film production or film history and criticism.

Students in the new program will be prepared to serve as film critics, historians and teachers. Says Prof. Knight, "With the ever-expanding interest in motion pictures, the need for skilled



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SHOWCHRON EDITING SYSTEM

Continued from Page 760

lowed without the use of the auxiliary mixer. However, the basic audio channels do not have individual equalizers. With the record head attachment and two reproduce channels, program material which needs equalization can be singularly re-recorded for gain balance and equalizing.

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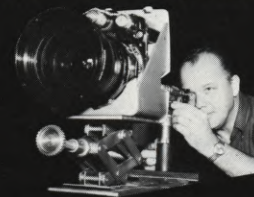
It is suggested that program material which does not involve critical music could very well be mixed and dubbed into a composite 16mm mag, or at least give the editor/producer a general preview of his final composite sound track.

Also available is an interlock motor attachment to the basic table, which can be operated in conjunction with an interlock synchronous project conversion, such as the Magnasync or the Omega units. This permits large-screen viewing with the preliminary composite sound mixed and reproduced "double system" from the editing console.

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"THE CATONSVILLE NINE"

Continued from Page 776

the daily rental for the church would be low.

Because of the tightness of the budget, it was necessary to eliminate every possible variable which *might* add to the cost of production. This was particularly important since, as we all know, unpredictable things tend to happen in the shooting of any film, and certainly the quantity and quality of these unpredictables increase when on location.

In the particular case of "TRIAL OF THE CATONSVILLE NINE", only one set was essentially required, and this made it even more economically feasible to control costs by shooting on a sound stage.

It might be interesting to comment here that exceptional care has to be used in the selection of a sound stage, since unseen costs can be generated very easily. For example, for "artistic" reasons, the Director and the Director of Production Design wanted to expand the set slightly. As a result, the stage was changed from one that was 60 x 80 and 22' high to one that was 90 x 130 and 40' high. The intention was to get greater floor area, but the increased height resulted in a substantial increase in the cost of rigging the lights. It is, therefore, necessary to select the proper stage when going to studio shooting. The issue is not merely sound stage versus location. Rather, it is careful and logical selection of the stage when it is preferred.

The decision to go location or to use a sound stage should be the result of a very careful analysis of cost effectiveness as it relates to the specifications of the film and the script itself.

EQUIPMENT FOR LOW COST FILMING

Since the conditions for shooting "Catonsville" were extremely severe because of the very tight schedule and the requirement for high image quality, the equipment had to be selected with extreme care. The equipment was selected in order to fulfil the overall objectives. The most advanced equipment was required in order to guarantee that the very tight schedule be met. This decision resulted from a cost analysis which showed that the rental cost for the best equipment was relatively small as compared to the cost which would be encountered in an extended shooting schedule. Behind all of this, of course, was the assumption that under no conditions must the quality of the film be sacrificed. Therefore, the lowest cost

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equipment was not justified in order to achieve the lowest cost of production.

CAMERAS:

In order to facilitate filming, two Mitchell BNC cameras were used simultaneously throughout most of the shooting. Both of these cameras were reflexed in order to make full use of the flexibility offered by high-quality zoom lenses. Since most of the shooting was done on a single set, these two cameras carried the burden of almost all of the shooting. A 16mm Eclair NPR was used for the small amount of "location" filming of the burning of the draft records.

LENSES:

Each reflexed 35mm camera was fitted with the new Canon Macro Vari-focal Zoom lens. These Canon lenses were developed under the specifications of the Motion Picture and Television Research Center of the Association of Motion Picture and Television Producers. They are very fast for zoom lenses, T/2.8, and their resolving power and general quality are such that for practical purposes they are equal to the best fixed focal length lenses. These varifocal lenses permit great reductions in shooting time when they are properly used. In addition, these Canon K5 x 25 lenses, which have a range of from 25mm to 125mm, have a built-in "MACRO CAPABILITY". This "macro" effect permits focusing within two inches of the front of the lens without distortion and permits the development of cinematographic effects not previously available to cinematographers. However, for the purpose of filming "CATONSVILLE", these high quality zoom lenses saved shooting time without sacrificing quality.

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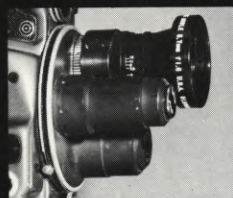
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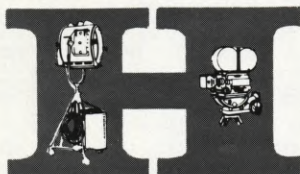
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ed. The operator or camera assistant who is controlling the zoom can now go from zero to the pre-set maximum speed by activating the joy-stick, either forward for zooming in or back for zooming out. By providing proportionate rate control, the joy-stick enables the operator to gradually "feather" on and off from the pre-set zoom speed. In this manner, "dolly" moves can be most accurately simulated, thereby making the zoom lens much more effective as a production tool on the sound stage.

CRYSTAL CONTROL MOTORS:

In order to make the cameras more mobile on the sound stage and thereby reduce shooting time, crystal control motors manufactured by Cinema Products Company, were installed on the BNC reflexed cameras. Each of the BNC cameras had a crystal control motor being driven from a battery pack that sat on the "dolly." The two cameras were, therefore, automatically in perfect synchronism with a recorder which also had a crystal oscillator built into it. No power cables from wall to camera and no sync pulse cables from camera to recorder were required. In multiple camera shooting, this degree of flexibility makes possible camera moves where one camera may pass in front of the other without the hindrance of cables on the floor.

SOUND

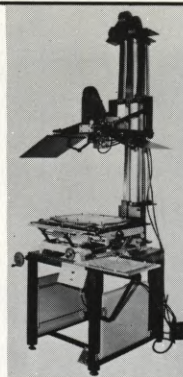
All recording of sound on the stage was done with Nagra Mark IV equipment.

VIDEO ASSIST

In order to facilitate communication between the Director, Gordon Davidson, and the Cinematographer, Haskell Wexler, ASC, and in order for Gordon Davidson to be able to "feel" and "see" everything that was being recorded, the cameras were supplied with video assists which permitted the image as recorded by the film to be seen on a monitor on the camera and on a remote monitor. The application of the video assists was rather interesting because it was used in some ways which were not predicted. The original intention in using the video assist was to give Gordon Davidson, the Director, full knowledge of what was being recorded on film. During shooting, it was used by Haskell Wexler to observe what was happening. In addition, it was used extensively by Aaron Stell, the Editor.

One of the interesting applications of the video assist was that it assisted the camera operators, Herb Pearl and Dick Wimpy, in guiding the dolly during

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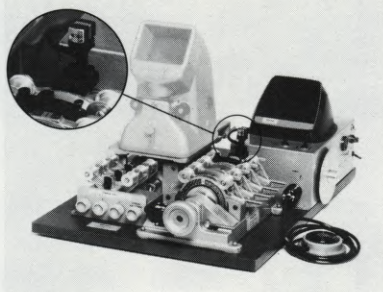
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blind difficult shots.

Despite its successful use, the video assist was not as effective as it could have been because of the relatively low quality of the image that was recorded with the particular equipment that was used. Since making this picture, a system has been developed which is of very high quality and overcomes the weaknesses of the system that was used on "CATONVILLE".

LIGHTING

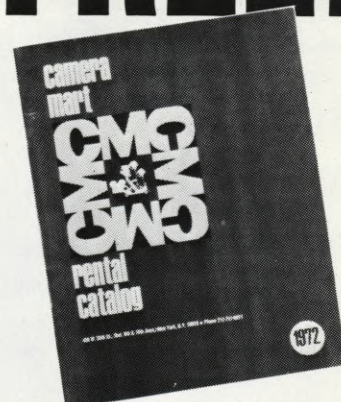
Because most of the film was shot in the courtroom, and in order to make the cinematography interesting, Haskell Wexler used innumerable camera angles. This required many lighting set-ups, and with the help of Foster Denker, the gaffer, he developed a system of mainly using soft lights in the most imaginative and interesting way. If it were not for the skillful use of these soft lights in combination with Fresnels, it would have been impossible to shoot this picture within the allotted time. In addition, remote control switching of lights and dimming equipment was used in order to get the proper cinematographic effects and in order to reduce lost time between shots. Under Wexler's instructions, Foster Denker was extremely successful in organizing his men and the equipment to fulfill the requirements efficiently.

One of the biggest problems in shooting a picture in a short time is the human one. Many crafts are brought together and there is almost no time to be lost in moulding them into a unified working crew. We all know the tendency of various crafts to respond to their own immediate problems before they work together as a team. With a schedule of 7 or 8 days of shooting, an extended "shake-down" period would be disastrous. In addition, the budget requirements made it mandatory to keep below-the-line costs under control.

Fortunately, Productions Systems Inc. (PSI) has developed a program which permits a producer to have security concerning a substantial part of his cost. A fixed price contract was negotiated with PSI for the total supply of equipment. The total negotiated price for equipment included almost all variables. There were to be no special extra charges for more equipment if it was required. There was to be no extra charge if the shooting extended for one or two days beyond the anticipated schedule. Burn-outs of lamps were included. Of course, this price was negotiated on the basis of an analysis of the set requirements.

In addition, in order to have full control over the crew, Foster Denker

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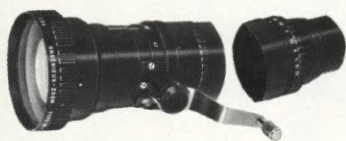


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was assigned as Technical Facilities Manager and this included supervision of all of the labor necessary for the film. There was, therefore a single boss in charge of all of the work, and he worked directly under the Director of Photography and the Director.

The above system worked very well and, despite the fact that the original scope of the shooting was extended, and despite the fact that the film was shot on a sound stage, and despite the fact that union labor was used exclusively, and that it was shot with the highest quality 35mm color film, and sound—the picture came in on budget.

GENERAL COMMENTS

In analyzing the experience of shooting this film, the following conclusions can be drawn:

1. Of course, the basic labor cost and rental cost of equipment profoundly affect the cost of production.
2. However, one of the most significant factors is the pre-planning and organization of the production.
3. That the many advances in the design of cameras, lenses, sound control can be very instrumental in reducing the cost of production.
4. The advances of technology in the design of the equipment not only tend to reduce costs, but expand the creative instruments at the hands of the film-maker. For example, the macro-zoom lenses and the crystal-control motors give the film-maker greater latitude.

SPECIAL OBSERVATIONS

Although it is correct to emphasize the below-the-line cost of production during shooting, equally important must be an examination of the post-production techniques. One of the areas which must be investigated for improvement is the process of editing. Although there have been some improvements in editing tables, it seems only logical that advanced computer or other techniques be made available to give the editor greater and more efficient control of the enormous amount of footage which he must master.

The experience of filming "CATONVILLE NINE" confirmed Gregory Peck's feeling that it is possible to produce high-quality cinematography with controlled budgets. ■

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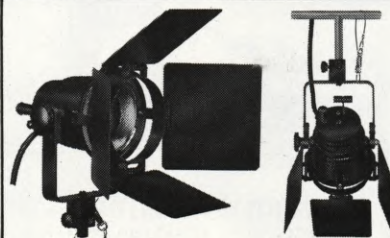


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Continued from Page 767

things as we went, I wandered off alone to talk to myself. First, to ask myself how I ever got involved in this film and, second, how to solve the problem of this refinery. The red clay goes into one end of the place and you literally don't see it again till it comes out in powder form. As a still photo for the cover of the American Society of Refining Engineers... maybe a Margaret Bourke-White Fortune cover, circa 1948—nice. But a scene for a film you are desperately trying to make different and compelling—it seemed impossible.

I decided to shoot the sequence at night. I used people doing their jobs, but not making believe the camera wasn't there. Some nice things. I wanted to counterpoint these fairly close human bits, with a continuously moving night shot of the entire plant. I tried shooting from a dust-covered Cessna 172, took the door off and seat out, and outrigged the camera. (The only available chopper, a Bell H-13, was Jamaican Air Force, and they said "no", emphatically. A Tyler mount and chopper out of Florida was too expensive.) After a couple of practice runs flying as close to the steel as we could, I began shooting, making concentric circles around the plant hoping to catch the same good piece each time and moving farther and farther away. Translation (vibration) through the air frame to the camera was not bad at all.

On the third or fourth pass we began to get instant and severe winds. I tried again and it was hopeless. We then did a series of static camera shots—starting close to the plant and slowly easing through the night lights at the "in" position of the 250 zoom lens. Then we took a position on a hilltop two miles away and did an overcranked (86 FPS) zoom out to smoothly ease back the scene. It worked.

Port Antonio is the most beautiful and friendly part of Jamaica, and if you go up the Rio Grande River, way up, it's a mountain-jungle rain forest that looks like Ceylon. Up here we shot the last eight minutes of the film. I wanted an oriental boy to end the film and we hauled a Chinese family (lots of Chinese in Jamaica) and the crew up there. We found a tiny banana farmer's hut, and doubled its size with bamboo and leaves. We gathered some chickens and goats and, shooting in and out of torrential rains, designed on the spot, rehearsed and rehearsed, and shot our little end scene. Then caravan-style, winding back down the goat-path road, we scouted and photographed the re-

maining bits of the sequence.

Then it was Africa. (Here, the most modern reduction plant in the world is "Reduction", that's melting the powder—actually freeing the pure metal from the oxide through electrolysis.) Ghana to be more specific. That's where you go if you're doing an aluminum film. Kenya, Nairobi, Tanzania, if you want to see Africa.

In Tema, just outside of Accra, is the aluminum reduction facility. Despite the fact it is a new facility in a developing country, the VALCO smelter is one of the most modern and efficient in the world. It currently has one of the highest rates of productivity of any in its major parent's system. Immense crucibles of red-hot metal swing through the air. We shot in this inferno for six days hand-holding, moving, selecting just those things to tell the story. Here, perhaps more than anywhere else, the people on camera tell the story. They are magnificent human beings. We cajoled the Ghana dance ensemble into a field, which looks like an African plain if you stand in the right place, and shot a dance sequence to work into the planned footage. Another counterpoint. (Against my better judgment I tried the dance footage in the rough cut—it worked better than I expected.)

The sequence that follows this in the film was a monster. We wanted to do a sequence to bridge the production and uses. A kind of pause to look closely at the newly-born metal in its various shapes and graphics. To do this we built a steel 12' x 12' platform, three feet high, on the corner floor of an empty plant wing at the Ravenswood, West Virginia, Kaiser Reduction & Fabrication plant. We covered the surface with sheets of 1/4" milk plastic. The contents of a railroad car that had gathered fittings, extrusions, forgings, castings, pipe, wire, nails, cable, cans, and a hundred other things, was dumped on the floor of the set. I selected the items one at a time, placed them on the platform and under it, then placed Lowel Quartz lights in nests under each partition depending on the object. I sometimes filled gently with white cards or soft-side foil. I intended to do moves on every piece and put the sequence together with long dissolves from one object to the other.

The camera was an Arri mounted on a big O'Connor head, on a Moviola dolly. The dolly rode on a 2"-thick solid steel platform about a foot high, as I remember, along one side of the platform. I used a motorized 10-1 zoom. Some of the items were small roofing nails. One was a 12' diameter culvert section.

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The sequence that follows is the "uses" sequence and it begins with the first of many surprises. Out of blackness comes an exquisite black girl, nude under a beautiful dress of aluminum discs hand-made by Paco Rabanne. We used a large sound stage in Paris and completely blacked it out—then hung a 10,000-watt soft-light high and to one side. We blasted an African rock music track in the studio and shot the girl at 120 FPS with a 40mm Cooke lens on a Mark II Mitchell, mounted on a heavy studio dolly.

After rehearsing all aspects of the shot, Alan Green did the shooting and I danced with the girl. The aluminum beads and discs were fastened on long strands and I wanted them to fly and whirl around her body, flicking in and out of the light. I danced just off the edge of the frame line, trying to keep her on line with the camera and keeping her "up" and excited and happy. We were both ready for the intensive care unit after that. It was an especially rewarding piece of film.

The "uses" sequence covered so many things. For example, a Grumman Hellcat downed in WWII brought up in amazingly good shape after 27 years on the ocean floor, 4,000 feet down. We shot the Hovercraft, a huge aluminum half-plane-half-boat that races people across the English Channel in 35 minutes. All the chalk talks, maps, radio gear and pre-planning didn't mean a thing except a Sun Gun aimed down the axis of a 1000mm lens which the pilot sighted on and came head on into our eyeballs on an overcast, foggy, typical channel day. We shot Roger Staub (1966 Olympic Gold Medal) skiing down the Vail slopes.

Nothing really says *aluminum* better than the Schweitzer 1-26 aluminum glider that opens the film. The little boy who quietly and nonchalantly walks up the hill, before the glider and music burst over the crest, is my son. He was five years old at the time. He's the only

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kid in his class with grey hair. We shot this sequence at Elmira, N.Y., home of Schweitzer Air Craft and the scene of international soaring events. When I told Paul Schweitzer that I wanted to use one of his racing-class gliders to open my film because it was the epitome of what aluminum is all about, he said all his gliders were painted and that it was impossible to make one unpainted unless I wanted to lay out \$10,000 to separate one from the production line and build it from scratch.

"Why don't we rub the paint off one?" I asked.

"Can't," he said, "too much patina. Scratches, wrinkles and nakedness wouldn't make our product look good."

I picked up a tail section of a new glider and asked him to remove the paint and polish the metal. If he didn't like the way it looked, I would pay for the labor and paint job and go away. (The beautiful silver glider is still there, it's Paul Schweitzer's show piece. It's also the one, they tell people, that was in the great aluminum film that nobody sees.) The glider sequence was shot in three ways. Pre-planned, helicopters and Tyler mount stuff. Hand-held glider-to-glider footage at high altitudes, and ground camera tripod, set up with the glider making passes, etc. Bernie Karras, glider pilot and chief pilot for Schweitzer, Bob Lockrow flying the chopper and Alan Green and I shooting.

The "Faces of Earth" sequence, which was designed to be a simple reverse cut from the glider flying directly at the lens to a subjective, straight-ahead, low-level flight over the raw formations of the earth's crust. To do this we rigged a Tyler Mini-mount in a Bell 476-3B1 high-performance chopper and aimed the camera straight ahead, shooting through the bubble. This Bell chopper is really a two-seater and is nowhere near as big as the 47J model or the Jet Ranger or Alouette. To reduce glare, we built a black "collar" off the lens barrel out to the N.E. S.W. limit movement of the mount, which was about eight inches in diameter. Since I prefer to back light, I had to position the chopper cutting the direct back light angle slightly to remove any trace of the bubble reflection. The pilot, Phil Stietenroth, from Denver, was fabulous. We flew in and out of the Tetons and the wild country out of Moab, Utah. We scouted location by light plane first, mapped them and noted sun, etc., then laid on the chopper without wasting time, fuel and money.

Those are some of the stories of "LIGHT, STRONG & BEAUTIFUL". Sorry it took so long, but I guess I loved every minute of it . . . after all. ■



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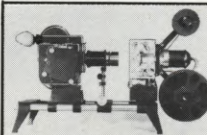
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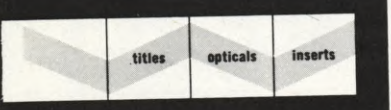
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WHAT'S NEW

Continued from Page 806

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For complete information on this unique new Leacock System, contact the manufacturer: Hamton Engineering Associates, Inc., 735 Providence Highway, Norwood, Massachusetts 02062.

35mm INSTRUMENTATION/ DOCUMENTATION CAMERA

The new Photo-Sonics 35mm-4M instrumentation/documentation camera featuring 200, 400 and 1000-foot daylight loading magazines that can be interchanged in a few seconds, is announced by Instrumentation Marketing Corporation, exclusive distributors, Burbank, California.

This quick-change magazine feature minimizes the loss of event documentation at time of film run-out and magazines may be loaded without disturbing the optical system. The camera with 1000-foot magazine mounted, measures only 12" x 14" x 7" making it the smallest 35mm camera with a 1000-foot load available on the market today. Camera speeds by selector switch of 16, 24, 48, 64, 96, 144 and 180 frames per second; has film run-out switch, intermittent with 4 pulldown pins and 2 register pins, 28 VDC (115 VAC version available), may be tripod, top or side-mounted. Lens mount is bayonet interrupted thread. Electronics are modular solid state. Shutter is variable rotary disc with openings of 9° to 144°. Accessories include boresight tool, automatic exposure control, etc. Literature on request. Price: 35mm-4M less magazine, \$3850.00.

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

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NEW AUDIO-VISUAL ART FORM

A new and controversial audio-visual art form was featured at the American Association of Museums Annual Meeting at the Camino Reale Hotel in Mexico City, on Wednesday, June 21, at 8:30 PM.

The viewer will see unusual effects derived from a continuously variable slide projector-programmer which gives the illusion of motion. This new sound and light programming is the result of two years of research and development by Bergen Expo Systems, Inc.

The program "Family of Earth" was produced, directed, and written by Harvey Lloyd for the United Nations, and features a 45,000 mile trip around Planet Earth with panoramas of all four continents.

This unique programming and projection system is called "Infinity II". Further information can be obtained by writing directly to Bergen Expo Systems, Inc., Route #46, Lodi, New Jersey, 201-472-1154.

NEW ECONOMY MODEL 16mm PROJECTOR

International Audio Visual, Inc., Seattle, has announced the addition of the International Model-TR to its line of 16mm projectors. The Model-TR is the economy model of their projector line. It has all the features of the popular International-ST/Royal, but with a 1.4

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lens and no still picture clutch or reverse. The International Model-TR is available in both manual and self-threading models, and is in stock now and ready for delivery.

Like all International 16mm projectors, the new International Model-TR is engineered with half as many moving parts as other projectors. It also utilizes International's exclusive modular construction which makes repairs easier and faster. The projector consists of four basic modules—the motor, the cam tank, the amplifier, and the gate assembly.

The International-TR is a quality projector with a small price tag; an ideal projector for schools and service groups.

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Recently announced by Treise Engineering is their new Minaflex Processor. According to the manufacturer, this versatile unit never becomes obsolete. No matter what process the user is interested in—whether it's black-and-white, color reversal, color negative, old chemistry or the latest creation—the firm says that the Minaflex can handle it. Just by making minor plumbing or component changes, the same basic unit can be used effectively for practically any process.

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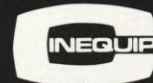
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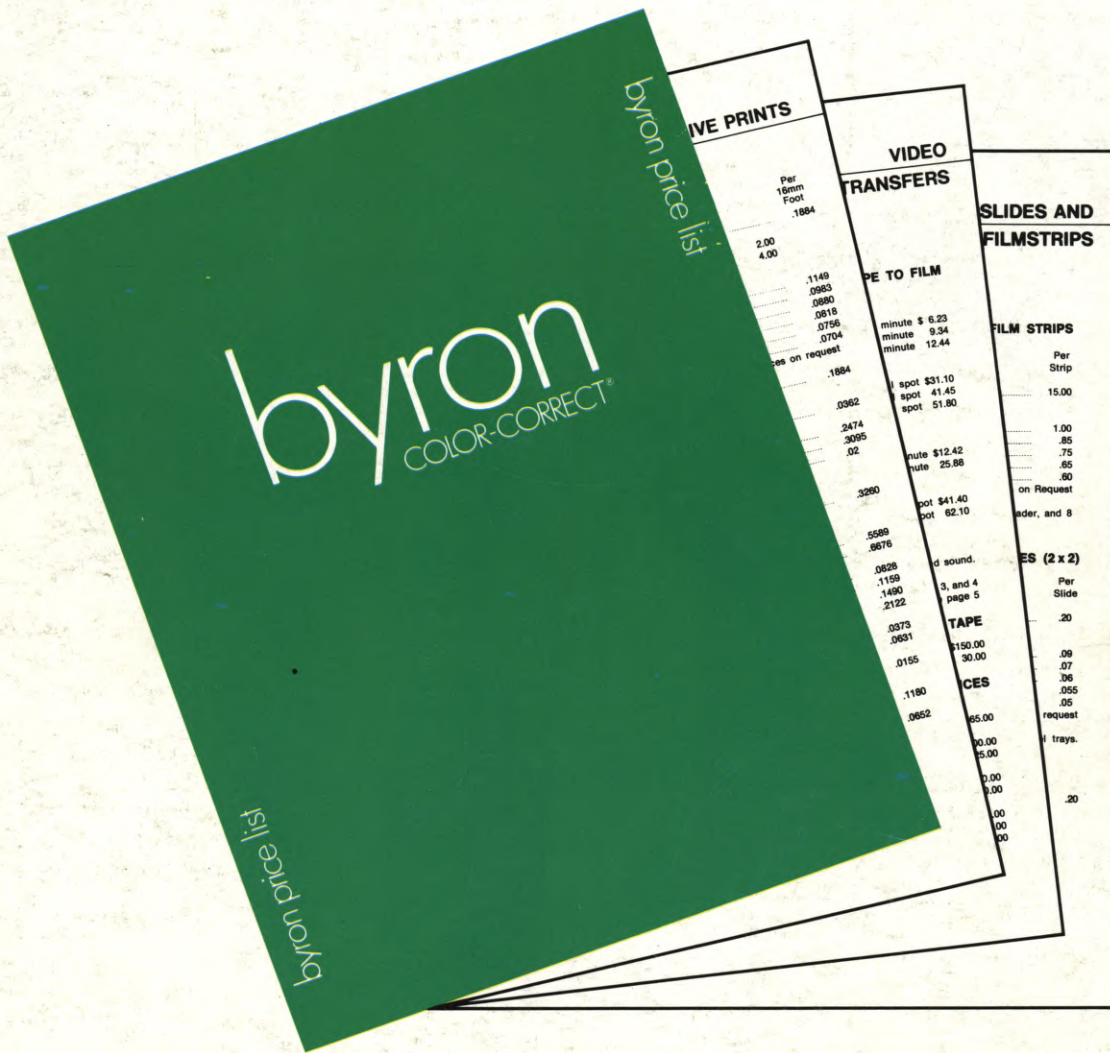
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