

# American Cinematographer

International Journal of Motion Picture Photography and Production Techniques

DECEMBER 1976 / ONE DOLLAR

~~ALW~~

EMM

ADB *PTK*

EJB

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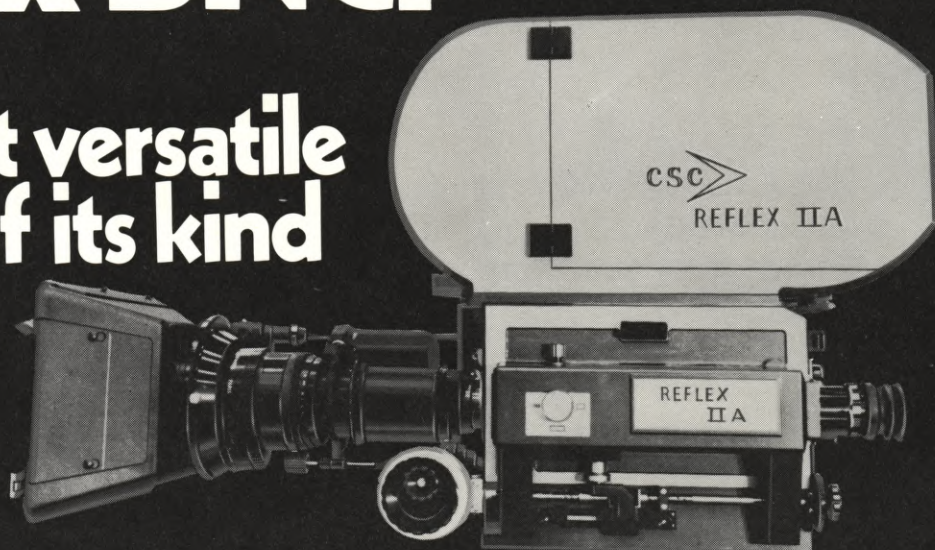
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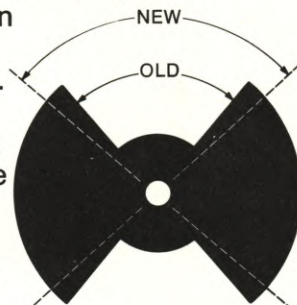
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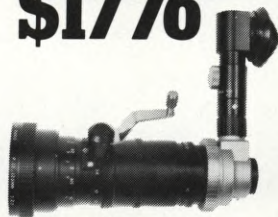
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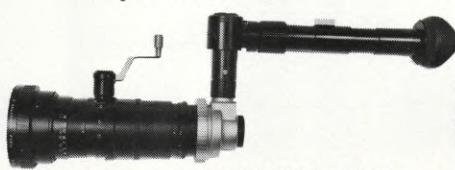
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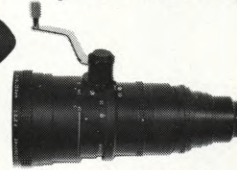
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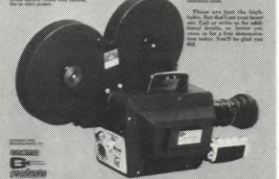
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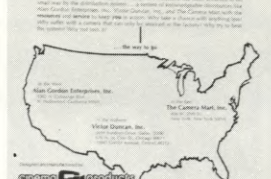
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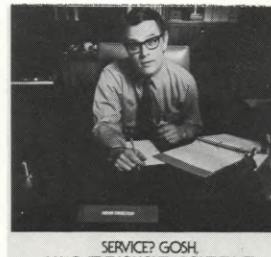
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# American Cinematographer

International Journal of Motion Picture Photography and Production Techniques

The American Society of Cinematographers is not a labor union or a guild, but is an educational, cultural and professional organization. Membership is by invitation to those who are actively engaged as Directors of Photography and have demonstrated outstanding ability. Not all cinematographers can place the initials A.S.C. after their names. A.S.C. membership has become one of the highest honors that can be bestowed upon a professional cinematographer, a mark of prestige and distinction.

DECEMBER 1976

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ON THE COVER: A fanciful representation of the famous Cologne Cathedral, which has become an unofficial symbol for *Photokina*, the massive "World Fair of Photography" held every two years in this city on the Rhine. Cover design and photograph by HERB A. LIGHTMAN. Posterization by WARNER COLOR.

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# PAUL ROTH



"We've come a long way in a short time. The first motion picture theatre was opened about seventy years ago. The first movie with a plot was made about sixty years ago; and sound is less than fifty years old.

"Today there are more than 15,000 theatres in the United States, representing an investment of more than five billion dollars. Last year we had a gross of almost two billion dollars.

"Theatre operators have one foot in the world of business and the other in the middle of the most powerful communications and art form ever devised. Exhibitors know and understand the 'art' of film and love it. They also know that if the art is to prosper, so must the business.

"We have a whole new generation of movie-makers and movie-goers. They've grown up with television, hi-fi, 8-track stereo, and every conceivable audio-visual technique. They've shot super 8 films, in color, with sound and a variety of sophisticated effects. Each year thousands study film at every educational level. They know what they should be able to see and hear. They simply won't settle for grainy, out-of-focus prints and distorted sound.

"Eastman Kodak Company concerns itself with release prints as well as production stocks. Dedicated exhibitors are interested in the entire process of creating, financing, merchandising, showing, and enjoying films. They try to enhance every film with the finest sound and projection, and by adding those important intangibles of comfort, convenience and courtesy for their patrons.

"The National Association of Theatre Owners (NATO) is the trade organization of motion-picture exhibitors. As large and important as NATO has become, it is still essentially a volunteer organization, manned by thousands of people for whom film is as much a way of life as it is a way to make a living. It has been my privilege to serve two years as NATO's President and currently as Chairman of the Board.

"NATO is involved in more areas than we have time and space to mention. Like Eastman Kodak Company, we are concerned with every aspect of the art and the business. Our new 'containment screen' is only one example of our dedication to the development of new and better sound and projection systems and other technical improvements.

"We spend a great deal of time and energy on Capitol Hill, in State Legislatures, and at the local Courthouses. We're involved in everything from freedom of expression to taxation, building codes, energy conservation, and tax incentives for film production.

"NATO is extremely interested in the American Film Institute because of its dedication to preserving the past and promoting the present and future of film. The Chairman of AFI's Executive Committee and three other Trustees are exhibitors. And AFI is only one of the many similar areas in which we work.

"Yes, we've come a long way in a short time; but the best is yet to be. This is a young and vital industry. Like the showman said, 'You ain't seen nothing yet, folks!'"

*Eastman Kodak Company shares the concern of Paul Roth and his dedicated NATO associates for the quality and fidelity of release prints. That's why major research and development programs are devoted to the continuing improvement of quality release prints.*

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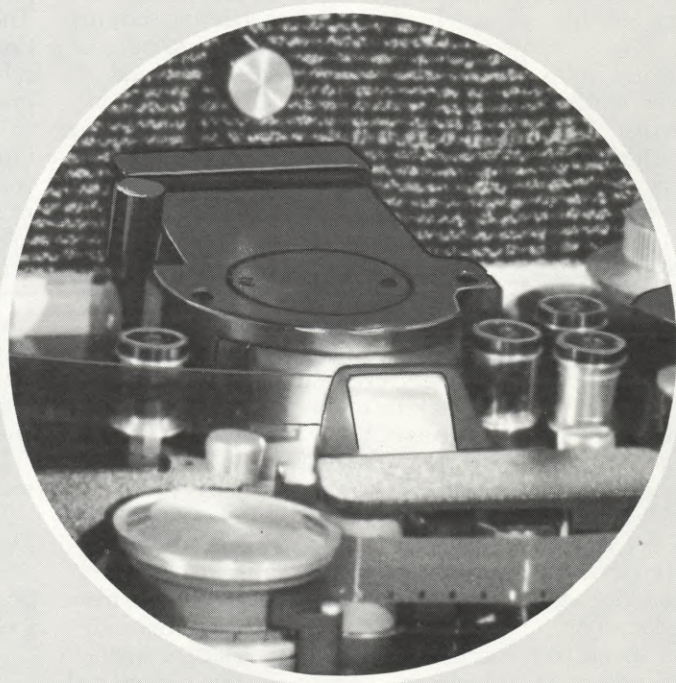
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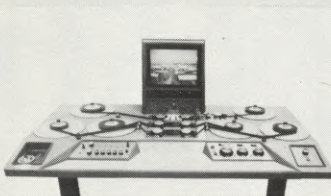
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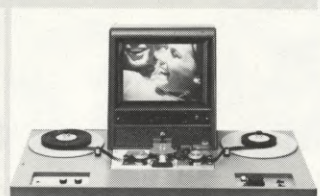
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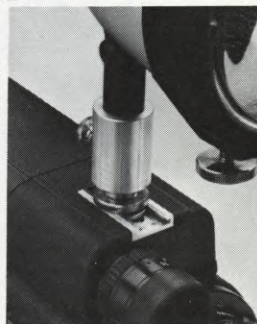
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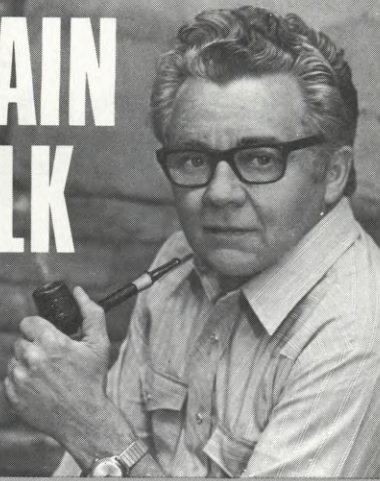
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# PLAIN TALK



by *J. Carl Treise*

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## QUESTIONS & ANSWERS

Conducted by CHARLES G. CLARKE, ASC.  
and WINTON HOCH, ASC.

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



**Q** When using a 35mm film lens with a C-mount adapter on a Bolex 16mm Rex 5, is the effective focal length four times that of the 35mm still camera lens? For example, when using a 55mm lens with adapter on a Bolex, would the effective focal length for the 16mm film be 220mm?

**A** A 55mm lens is always a 55mm lens regardless of the camera with which it is used. The factor of four that you mentioned derives from the fact that the film width of the 35mm still camera is four times the film width of the 16mm camera. Therefore, to equal the 55mm lens mounted on the 16mm movie camera, the 35mm still camera must use a 220mm lens to cover the same photographic field. Restated, a 55mm lens on the 16mm camera is equivalent to a 220mm lens on a 35mm still camera.

**Q** I am a student in the fourth year in the Film School in Lodz, studying in the cameraman's department. I am working on my theoretical diploma which deals with the latest achievements in the techniques of traveling matte systems. I would like to use the Stewart T-Matte bluescreen for my tests, which is not available here in Poland. Would you possibly help me to get a specimen of this blue screen? I don't want to use painted blue screens because of much poorer results and trouble with acquiring a denser covermatte. Do you think that the Kodak Wratten 47 & 2B filter could substitute for the Stewart T-Matte?

**A** The corporation that you are looking for is the Stewart Screen Film Corporation in Torrance, California. The cost is between \$2.50 and \$3.00 per square foot. The front projection screen may be used as a blue screen by placing a water cell containing a mixture of water and a deep blue textile-type dye in front of the projector lens. This system is very useful in alleviating the problems encountered when photographing foreground subjects that have reflective surfaces, such as the wet deck of a submarine, since the rays from the projector return to the camera on the identical axis that they have been emitted there are no blue-reflections.

At present the onus here is on the use of painted canvas blue screens.

This system has several advantages over the Stewart Translucent Screen, portability, less cost for the lighting. An equal separation to that of the Stewart Screen is obtained by lighting the painted screen with white carbon arcs using a TD25 filter.

In regard to your question about the Wratten 47 & 2B filter, the 2B is unnecessary. Backlighting a rear projection screen with such a light source will produce a sufficient separation. The problem encountered would be the control of the ambient light on the face of the screen.

**Q** I had always thought that the Bell & Howell fixed pilot pin was the rock-steadiest registration for motion picture cameras, but in “Logan's Run” they used a Mitchell which has a different and more complicated system. Which is the steadier for multiple exposures and bi-pack printing?

**A** The Bell & Howell fixed-pin design is still used on most optical printer and animation cameras, particularly in bi-pack situations. However, the movement is noisy and the advent of sound brought the development of the Mitchell pin-registered design. Although the registration pins of the Mitchell-type film moving mechanisms are moving, they oppose the perforations at right-angles, so they are full-fitting in their full registration position. This type of movement can be used for bi-pack and multiple exposure work. However, because of the mechanism's design, it cannot be used on a film movement for projection heads on an optical printer as the Bell & Howell movements are used.

It is obvious that the moving-pin type of mechanism involves more points of wear than a fixed-pin system where the fit of the pins themselves determines more than anything else the accuracy of the final registration.

In doing any form of multiple-exposure work, whatever camera is used should be pre-tested for steadiness. The camera should be secured to a rock-steady camera platform and a grid of crossed lines photographed, this time offset a few thousandths both vertically and horizontally from its former position. Obviously, projection of the resultant film will expose any movement between the two sets of double-exposed cross-lines. ■

'touch&go' -

# Sachtler

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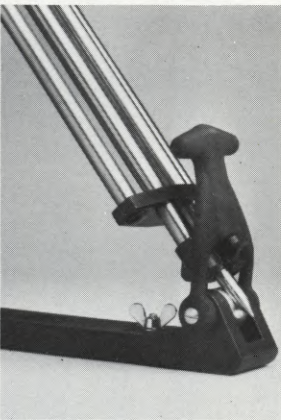
design manufactured with the latest space-age lightweight metal combination of aluminium and titanium steel easy to make adjustments with extra large hard rubber butterfly lock knobs.



### Triangle:

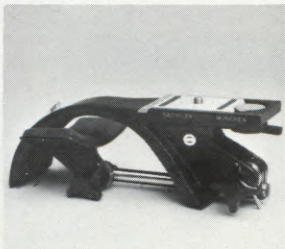
Made of unbreakable hard rubber that will not slip on or scratch the smoothest surface. It is quick and easy to fold without removing from tripod, however, a very slight pull on the rubber locking

handgrips will separate the triangle from the tripod legs.



### Shoulder Brace:

A unique design with new quick release one touch camera mount. A new lightweight easy to fold shoulder support that will safely hold the camera in the folded position.



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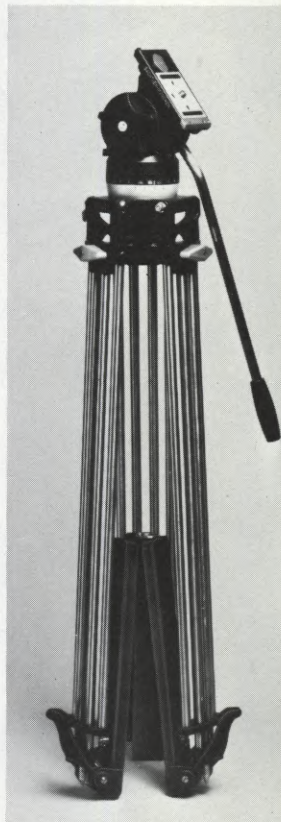
### The Super Fluid Head:

With 16 combinations and 2 x 4 panning and tilting speeds. Allow ultra quiet and slow movements to extremely fast panning action covering all sporting events. The Touch and Go System is

the latest innovation of the forward thinking Sachtler Co. A new design approach making the basic fluid head tripod, triangle (spider) and shoulder brace much easier and faster to use.



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Filmtechnische Geräte  
Osterwaldstraße 10  
D-8000 München 40  
Telefon 0 89/36 40 65  
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The heart of the Touch and Go System is the entirely new quick-release one touch camera mount, ending forever the fumbling to mount camera to tripod head. Now, with one soft touch of your finger, the camera is released from head and quick mounted on shoulder brace - Touch and Go.

# touch&go 16

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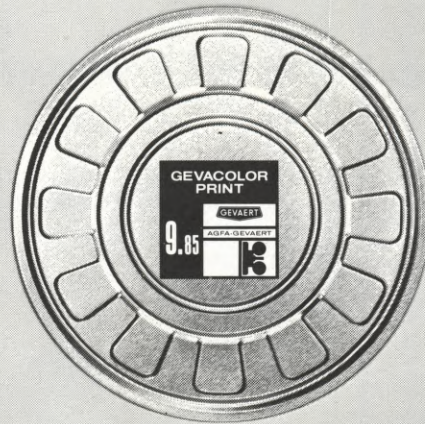
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New Jersey 07608



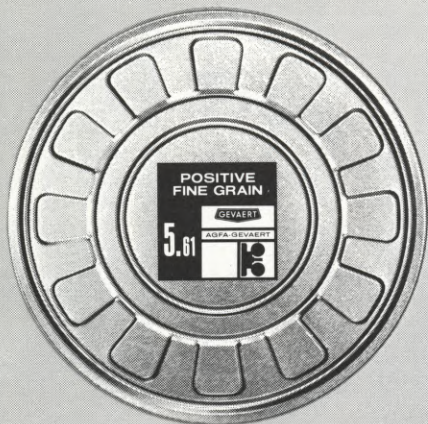
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# CINEMA WORKSHOP



By ANTON WILSON

## AUDIO BASICS VI — LEVEL METERS

The VU meter appears to be a mysterious device. Because of "ballistics" or inertia, the VU cannot present an accurate indication of complex signals. Therefore, a soundperson must be constantly aware of the VU "personality" to properly interpret readings. The unsuspecting recordist could be led astray by a VU meter, with resulting over-modulation (distortion) or a weak signal (noise).

The peak reading meter or modulometer takes almost all the mystery out of good recording. While in most cases, the modulometer is still a mechanical meter, it is connected to a complex electronic circuit.

This electronic circuit receives the audio signal that is being applied to the recording heads. Because this circuit is purely electronic, it can sense instantaneous peaks in the audio signal as short as a millisecond. The circuit is designed to "memorize" these peaks for about one second or so before "forgetting" them. This memory signal is then sent to a somewhat standard voltmeter. The combination of this "memory" circuit and the fast-responding voltmeter becomes a peak meter or modulometer.

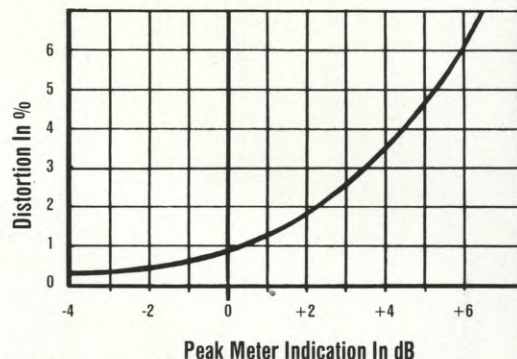
In practice, an audio peak comes along and is gone before any mechanical meter could possibly respond to it. But, in this case, the peak-reading circuit "holds" the peak long enough for

the mechanical voltmeter to respond fully to the maximum amplitude of signal. Even though the audio peak has long since gone, the peak-reading circuit remembers it long enough for both the meter and the recording engineer to respond.

In essence, the mystery is gone. The peak meter presents an accurate and precise picture of the maximum amplitudes being recorded. The type of signal rarely has to be considered in interpreting a peak meter. Whether it be voice, music, sound effects, etc., the meter will follow maximum levels and, thus, prevent overloading on peaks. Likewise, on signals with little or no peaks, the meter will allow higher recording levels, making use of the headroom that might have been unused with a VU meter. This results in a quieter recording (improved signal-to-noise ratio).

One thing is important to understand with a peak-reading meter: **THERE IS NO HEADROOM!** The meter is calibrated to indicate tape overload at 0 dB. (See FIGURE 1) Remember that the VU meter is calibrated in such a way that 0 VU is actually 8-10 dB *under* actual tape saturation. Not so with the modulometer.

When the peak meter says 0 dB, it means it. That is the limit. (Compare FIGURE 1 to last month's diagram.) As a matter of fact, when transferring from a VU-metered recorder to a peak-metered machine, the 0 dB reference

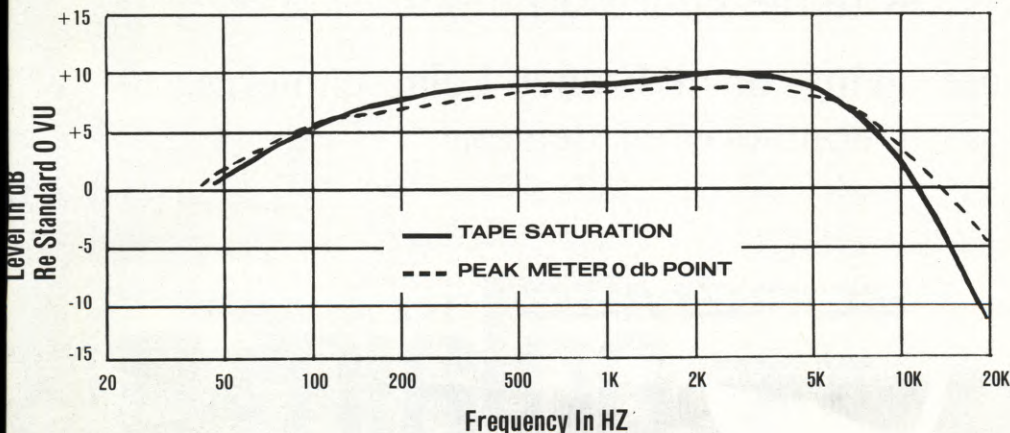


**FIGURE 2 — Distortion does not commence the instant 0 dB is exceeded. It gradually builds up from insignificant amounts to about 1% at 0 dB. Above 0 dB distortion rises quite rapidly. However, at +3 dB the distortion may still be acceptable on some high-quality recorders.**

tone on the VU meter should be set to a -8 dB on the peak meter. The distance between the -8 dB and 0 dB (8 dB) on the peak meter thus corresponds to the 8 dB of headroom built into the VU meter. It should be clear, then, that 0 dB on the peak meter is the bitter end.

I should mention that at 0 dB, the tape doesn't become instantly distorted. As the signal exceeds the 0 dB point, distortion slowly increases (FIGURE 2) with level. A top-quality recorder employing the latest tape formulations can usually tolerate a +2 or +3 dB signal before distortion really approaches the objectionable point. However, in normal practice, this 2 or 3 dB should be kept for emergencies, and the 0 dB point should be considered as maximum. A quality modulometer should facilitate optimum recording levels under almost all circumstances. ■

**FIGURE 1 — The 0 dB point on a peak meter or modulometer does not correspond to the standard 0 VU level. The 0 dB point on a modulometer follows the level of actual tape saturation. It is important to understand that there is NO headroom with a peak meter.**



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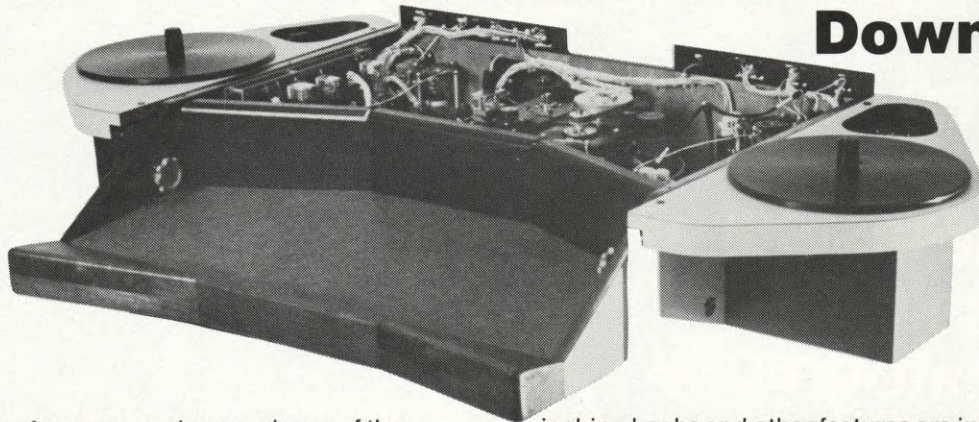
\* We also adapted and modified the special Zeiss f/0.7 lenses used by Kubrick to film the "Barry Lyndon" candle-lit scenes.



# The Reason Showchron Works So Well For You Up Here



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The quality performance and convenience of the Showchron console was no accident. We put hundreds of hours into the development of each individual feature just to make your work a little easier. The digital counter displays were designed to give you instant readings of not only feet/frames but also minutes/seconds and frame displacement.

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All the features of the Showchron are 'Human Engineered' to give you maximum efficiency in your flatbed editor. The digital displays, master controls,

inching knobs and other features are just part of the story. We designed the Showchron as a mechanical machine utilizing relays, pulleys and belts instead of complicated electronic circuitry. This simplifies maintenance and service. We designed a 'Flip Top' feature into our editor to give you immediate system inspection and allow you to transport the Showchron in a compact easily handled package. (Try to put one of our competitors' editors in the back of a station wagon.)

And with all these features, we worked just as hard to keep the price low. The American-made Showchron is under \$8,400, and we think that is an important feature, too. Stop by your nearest Showchron dealer today and look at all of our hard work. We think it will make yours a little easier.

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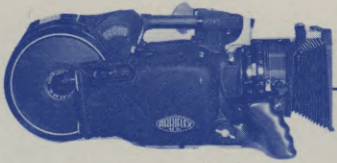
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## photokina photokina photokina COLOGNE 1976

Every two years at the Photokina in Cologne, Germany, manufacturers of photographic equipment from all parts of the world meet and introduce to the industry their newest products along with previews of existing and advanced designs to come.

This year was no exception and ARRI was there with important new equipment, highlights of which we present here, for your reference:

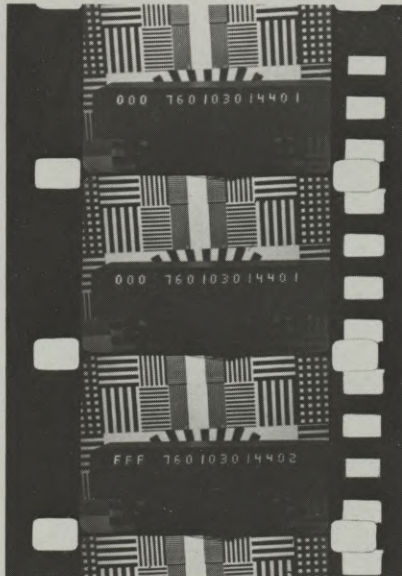


### 1) Time-Base Coding

Ever since the introduction of crystal controlled cameras and tape recorders, various international groups have been working to develop and standardize a time-base coding system. The purpose was twofold: Liberate sync-sound filming from slates and clapsticks, and, free editing from the limitations of laborious, manual film handling.

Such a coding system has now been completed and introduced at the recent Photokina in Cologne. The system was developed by the Institute for Radio Technology (IRT) in West Germany. It was built into practical,

working hardware by key manufacturers of motion picture cameras, tape recorders and editing tables.



Clip shows encoded time data along edge of film, between perforations. The clock display in the picture area is included for the purpose of illustration. Either single or double perf film may be used.

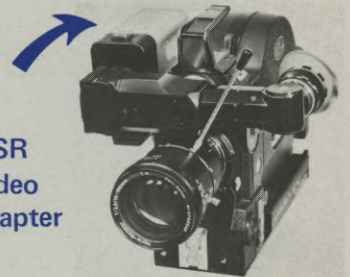
At the camera end, Arriflex designed and demonstrated a coding system for the Arriflex 16SR. The timing code generator was engineered and contoured to fit as a slim sub-base on the camera. It is fastened to the camera by means of the tripod socket. All electrical connections are made automatically. All 16SR cameras are fitted with the necessary contacts and internal wiring. The only component that needs ARRI Service Department installation is the light-emitting-diode block in the filmgate.

To describe it briefly, the system is based on a precise, digitalized quartz time-code which is recorded simultaneously on the film and the tape. Code marks are repeated and updated

once every second, i.e. every 24 frames. Just prior to an assignment, the camera and a properly equipped Nagra tape recorder are synchronized with an accessory master clock which encodes the camera number, the year, month, day, hour, minute and second of either real time or randomly selected time. The system can also be synchronized by means of a simpler "zero-time" unit which puts camera and recorder working on an elapsed time basis.

In order to get the full benefit of a time base coding system and its inherent efficiency in post production, a suitably equipped editing table can be used to find any code mark on film or track and match them automatically.

The time base coding system, in our opinion, is the most important new technology that was introduced at this year's Photokina.



### 2) 16SR Video Adapter

Another major accessory for the 16 SR ARRIFLEX announced at the Photokina, is the video adapter, designed to provide television monitoring or taping of the camera viewfinder image.

This important accessory extends the use of the 16 SR ARRI, particularly in commercial or multi-camera production fields where maximum directorial and editorial control is desirable, both during and after filming.

*(continued on page 2)*

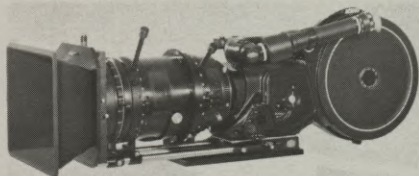
# photokina

(continued from front page)

The video adapter is fitted as a complete unit, easily interchangeable with the standard 16 SR viewfinder tube. It is completely pre-aligned and no camera or finder adjustment is necessary when it is installed.

The reflected viewing image is transferred to the video adapter without interference with the camera-operator's optical viewing system.

The video adapter is available with a standard vidicon camera, or the higher quality silicon system with higher sensitivity, better definition and no "lag effect" of standard vidicons. The video scan is synchronized from the camera. The entire system including monitors can be operated from mains or from the camera battery.



### 3) New 35 BL II

A new updated 35MM Arriflex, the 35BL II, was demonstrated for the first time at the Photokina. Five years of practical field experience have provided the basis for significant improvements that further enhance the camera for its application in feature and commercial motion picture production.

Most importantly, a lower noise level of less than 26 dB (weighted A) has been achieved by optimizing the control and drive elements (sound level measured 1m in front of the lens housing).

A new high-torque crystal controlled motor, utilizing quartz electronics designed as plug-in modules, improves overall camera performance over a wide range of ambient conditions and temperature.

The 35BL II operates at 6 to 50 fps. A special high-speed ver-



### NEW DEANAMORPHOSER

New 35BL deanamorphoser viewfinder accessory, designed to give the cameraman an undistorted view of either academy or anamorphic images. The new finder accepts the standard 35BL eyepiece.

sion of the camera is designed to operate from 6 to 100 frames per second.

New instrumentation on 35BL II includes: electronic digital readouts for the camera speed indicator and the footage counter. The film footage remains in memory even when the camera is disconnected from the power supply.

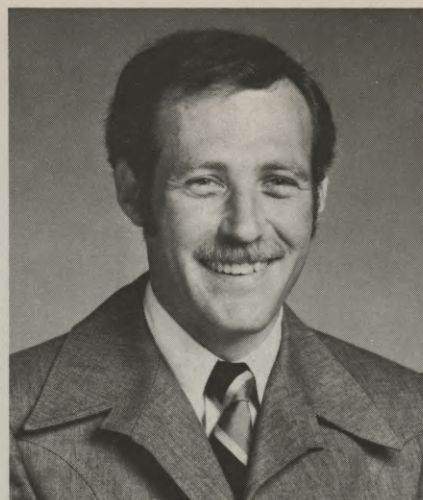
An additional ON/OFF switch on the camera housing (left front) increases operational comfort when filming from tripod or dolly.

The accessory program for the new Arriflex 35BL II has been extended by several interesting new items. A special lens housing for Angenieux 25-250mm, Angenieux 20-120mm and Cooke-Varotal 20-100mm zoom lenses with servo zoom drive is available. The viewfinder extension offers more convenient operation from tripods and dollies. A special version with deanamorphoser is also included in the program.



### 4) New Zeiss Lenses

Three additional Zeiss lenses were introduced at the Arri Photokina show: an 18mm, T1.4 Distagon; a 135mm T 2 Planar and the 9.5mm T1.3 Super Speed Distagon illustrated above. The new 9.5mm lens complements the 12, 16 and 25mm Super Speed Distagons currently available for the new 16SR and other Arri 16mm cameras.



George Corbett is Product Manager for the Bauer Theater Projector line. He brings with him more than 10 years of service with Projection Products, Inc., and experience in the design, installation and service of theater projection systems.

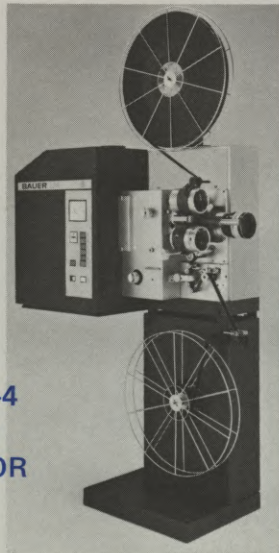
### BAUER THEATER PROJECTORS

This past July, Arriflex Company of America was appointed US Agent for the complete line of Bauer theater projectors. This is a separate line, in addition to the Bauer 16mm single/system and double/system portable projectors that we also distribute. The theater projector line includes 16, 35 and 35/70mm models.

Bauer Photokino Company, founded in 1906, is a wholly owned subsidiary of Robert Bosch, Gmb H, one of West Germany's largest and most prestigious industrial companies. Bauer theater projectors are recognized and used all over the world because of their innovative engineering, exceptional reliability and for their near-perfect suitability for the modern motion picture theater. Bauer machines are built at the factory to include the base, the projector head, Xenon lamphouse and film feed and take up assemblies. Every major subassembly is designed, manufactured and aligned into a single integrated machine. This means a single source, a single service organization and a single responsibility right down the line.

If you are involved in professional film projection in theaters, screening rooms, large auditoriums or studios, it will be worth your while to know more about these superior projectors. Write or call: Arriflex Company of America; Bauer Projector Division.

## BAUER U-4 THEATER PROJECTOR



The model U-4 Bauer Theater Projector illustrated, features ball-bearing drive shafts for trouble free, all day operation, a three-lens turret for the most widely used academy and wide screen formats, a lamphouse that accommodates Xenon lamps from 900 to 4000 watts, push-button controls that can be interfaced with automatic systems. The machine can be coupled to a film platter system capable of handling 15,000 feet of film.



Sorry, we goofed! No doubt many of you noticed that in our first issue of Update, that the man we identified as John Alcott in the "Barry Lyndon" production still, was someone else entirely. So, here now, with our sincere apologies, we present a picture of the *real* John Alcott, Director of Photography, who won an Academy Award for his skillful and imaginative cinematography in "Barry Lyndon."



## CAMERA OPERATION AT LOW TEMPERATURES

We're well into the time of year when getting good, reliable equipment operation means coping with the problems that crop up in sub-freezing temperatures. It means attention to the specific environment, to the camera and its accessories and to the power supply. To help Arri cameramen working under the adverse conditions of extreme cold, we have prepared the "Hints" that follow.

### Operation Down to +10° F

*The Camera:* Arriflex cameras are treated with our special wide temperature range lubricants, and will function without any special modification down to about +10° F. However, it is vital that the camera be in excellent condition and that the lubrication be clean and relatively fresh.

Pay attention to large, sudden temperature changes. For example, a camera stored at room temperature can be taken out into the cold without too many complications. However, if there is apt to be snow, or rain, then the camera outfit must be stored in a sheltered outdoor shed until it is as cold as the outdoor air. Otherwise, snow or rain will quickly freeze over the entire outfit. It is also helpful to punch small holes into the rubber eyecup to prevent condensation on the eyepiece lens. Deep sunshades should be used to protect the front lens element from icing up in case of driving snow or rain—BUT watch out for vignetting,

especially with WA lenses.

Going from the cold outdoors into a warm room is a hazard because of moisture condensation. Before coming indoors, the camera outfit should be enclosed in a sealed, airtight plastic bag. This lets the equipment reach room temperature safely, because moisture settles harmlessly on the outside of the plastic bag.

*The Battery:* The battery too must be given special consideration. It must be in excellent condition and fully charged. Battery terminals, cable connectors and similar parts should be clean and free of corrosion and oxidation.

The effective capacity of a good N/C battery may be as little as 50% of normal at about +32° F! There are precautions which will help: The battery should be carried inside outer clothing, or in a heated, insulated outer covering. Recharge the battery after use and/or after long storage. Have a reserve of extra, fully charged batteries on hand. Finally, if possible, use batteries of higher voltage (and higher capacity). The new Arriflex HVQ 14.4 Volt batteries, for example, are preferred to older 12 volt types, when working at temperatures down to +10° F.

### Operation from +10° F to -60° F

*The Camera:* For filming in the range down to -60° F, Arriflex cameras must be specially winterized by a qualified, knowledgeable, service department. This costly process is the equivalent of a complete overhaul of the camera and its accessories.

The entire system must be lightly lubricated with a suitable, low temperature lubricant. Oils and greases with a silicon base should not be used because of the danger of contaminating optical surfaces. Before returning winterized cameras to warm climate operation, they must be normalized; that is, disassembled, cleaned and relubricated with standard wide temperature range lubricants. This process, too, is

*(continued on page 4)*

## CAMERA OPERATION AT LOW TEMPERATURES

(continued)

the equivalent in time and cost of a complete overhaul.

All electrolytic capacitors should be replaced with Tantalum types for low temperature operation. All electronic components, especially transistors should be tested by spraying them with an instant freeze aerosol. All friction contacts should be replaced with soldered connections. All rubber covered cables should be replaced with cold resistant neoprene or cloth wrapped asbestos cables. The rubber eyecup should be covered with a shammy cloth and perforated with small air holes.

Attention! Cold film is razor sharp. At temperatures below  $-40^{\circ}$  Fahrenheit, polyester based film is preferred to acetate based film. Normal acetate-type film loses its elasticity in extreme cold and breaks very easily during loading. During loading, the film should ideally have the same temperature as the camera and all film should be stored airtight until just before loading so as to keep its elasticity and humidity content at a maximum. Static discharges of dry film in low humidity conditions is an additional problem to guard against.

**The Battery:** At temperatures below  $+10^{\circ}$  F and down to about  $-60^{\circ}$  F, effective battery capacity may drop to as low as 10% of normal, or the battery might cease to function altogether. It is mandatory under these conditions that the batteries be kept warm, to around  $+40^{\circ}$  F and higher if possible.

When it is impractical to keep the battery well above extremely low temperatures it may be best to use special, higher voltage, higher capacity, lead-acid batteries. If your assignment calls for filming at these deep freeze extremes, consult our Arriflex Service Departments in Woodside, N.Y., or Burbank, Calif.



## LETTERS TO THE EDITOR

We're pleased to reproduce the following letter from Allied Film Artists' Ronald Cohen, intact, for your reference:

Dear Volker:

*As you know we just completed filming a science film for Encyclopedia Britannica Educational Corp. within the Grand Canyon of the Colorado River. We left on the 300 mile river trip with only one main production camera, the new Arriflex 16SR.*

*I simply cannot say enough about the faultless performance we received from this camera. All equipment was exposed to  $100^{\circ}$  heat, blowing sand and a constant spray of white water. With conscientious cleaning and quite frankly a minimum of shelter from the elements the camera ran thousands of feet of film without any malfunction, jamming, or even camera hairs.*

*The camera was mounted to an O'Conner 50D head and O'Conner legs. This rig was chained to the engine mounts on the inflatable raft. The entire setup remained in place for the duration of the trip. We filmed from the boat while running some of the largest navigable white water in the world. The camera simply did not fail us once.*

*For the type of outdoor filming we do, and the variety of environments we continually subject our equipment to, the Arriflex 16SR is the finest production camera made.*

Sincerely,  
ALLIED FILM ARTISTS, INC.

Ronald J. Cohen  
President

We are looking for unusual Arri assignment experiences, difficult and challenging to shoot; if you have one, won't you share it with us? Ed:

## SEASON'S GREETINGS

As this issue of News Update goes to press, 1976 is rushing into history. The close of another year moves us to think about our many, many Arri friends and to thank them once again, as we have had occasion to do so many times over the years, for their good wishes and for their loyal support.

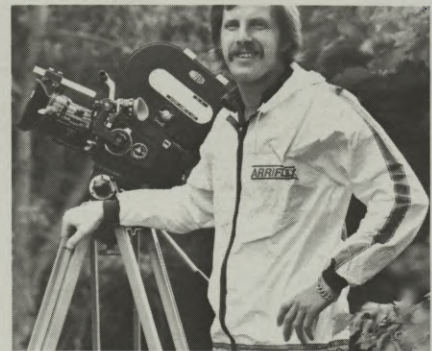
Our entire staff joins me to wish you, your family and associates:

A HAPPY HOLIDAY AND  
A PEACEFUL PROSPEROUS  
NEW YEAR!

*Volker W. Balabanian*

## FILE UNDER "ARRI"

May we make a suggestion? Carefully remove your copy of the Arri News Update from the magazine and file it for future reference.



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# PROFILE: A.S.C.

By JOHN ORMOND

## FRANK PHILLIPS, A.S.C.

"I have to be one of the luckiest people in the whole, wide world. I have to be!"

Cinematographer Frank Phillips, ASC, made that comment three times during a late-morning interview on the set of "PETE'S DRAGON" at Walt Disney Studios in Burbank. And when he related this story, it was easy to understand why he feels that way.

For one thing, he's been in the business he loves since he was eleven years old. He's risen to the top in his chosen profession. He has traveled around the world, photographing motion pictures in many different countries. And now he's working at a studio where he's happier than ever.

Phillips first worked for Disney as a cameraman in 1965, on the tenth anniversary of the opening of Disneyland. His liking for the Disney "family" from the beginning has obviously been a two-way street. Since that first camera assignment, Frank Phillips has practically become the unofficial "resident" director of photography at that studio.

In eleven years, he has photographed more than 20 of the studio's biggest films, and has won a reputation among his peers as one of the outstanding cinematographers in Hollywood.

Yet his relationship with Disney goes back much farther than 1965.

When Frank was eleven, Disney was filming a series titled "ALICE", and he hired neighborhood youngsters in Hollywood to work in the shows. Phillips was one of those chosen. And he was paid 25 cents a day.

"One afternoon in 1965, I reminded Walt about this, and told him that I was paid the princely sum of 25 cents a day," Phillips reminisced.

"Walt gazed at me for a moment or two, raised himself to his full height, and aswered, 'Frank, I never paid any-

body less than 50 cents a day in my whole life!'"

Phillips is convinced his lifetime lucky streak has been due to being in the right place at the right time — just as he was as a neighborhood youngster when Disney was hiring kids for his show.

A native of Southern California, Phillips was born in San Bernardino, 60 miles east of Los Angeles. The family moved to Hollywood when he was very young, and he later attended Hollywood High School.

He started out in the film business in 1931, as an office boy at Metro-Goldwyn-Mayer. That job lasted eight months. Then he transferred to the camera department as a camera loader.

"I was lucky then, in that a young man could learn his craft from the ground up, so to speak," noted Phillips. "Nowadays, it's naturally much more difficult to become a cameraman, and there are so many more people trying to get into our profession."

Phillips had plenty of time to learn his craft at Metro. He was a camera loader for six years, during which time he "understudied" with some of the biggest names in the world of the camera.

"When you can watch the masters at work, it's only natural that some of their excellence will rub off on you," he commented.

Three of the directors of photography he remembers most were Harry Stradling, Charles Rosher and Joseph Ruttenberg. All three, he said, helped him "tremendously."

Yet it was not until 1949 that Frank Phillips got his big break. That was when he was promoted to camera operator for Bob Surtees on "KING SOLOMON'S MINES".

"We made that picture in different

sections of Africa, and we visited places so remote that they're not on the tourist maps, even now."

What was even more important than the travel, though, was the fact that "KING SOLOMON'S MINES" turned out to be a big winner at the box office — and it helped Surtees win the Academy Award for Best Cinematography that year.

In the process, it catapulted Frank Phillips into cinematic prominence.

Darryl Zanuck saw a print of the film, and heard some words of commendation for Phillips from people associated with the picture. Not long after, Frank was given his first cameraman's stripes, and awarded the top camera job on the second unit of the Kirk Douglas movie, "THE RACERS". That turned out to be a seven-month location stint in various parts of Europe.

Since that time, Frank has alternated his camera assignments between motion pictures and television, with the emphasis on movies in recent years.

From 1957 to 1963, he worked mostly in television. His series included "NAVY LOG", "HAVE GUN, WILL TRAVEL", and the highly-successful "GUNSMOKE". Then came the long association with Disney.

Frank and his wife, Pat (they were married a couple of years ago), have a home in the Tujunga district, north of Los Angeles. They like to travel, and take every opportunity, when he isn't working.

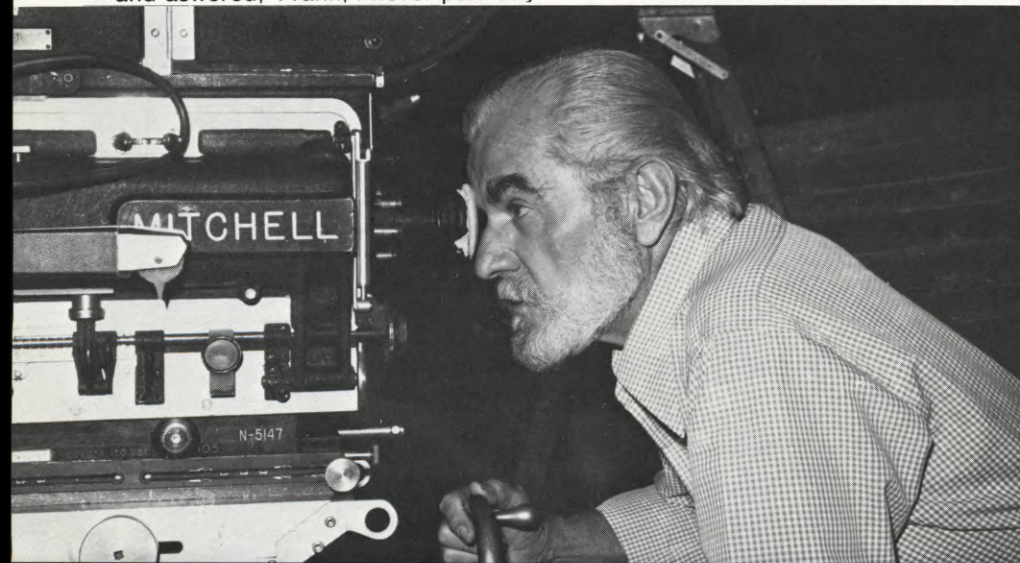
He has three daughters, all grown up, by his first marriage. And one of them, Lorna, has a ranch in Yreka, Calif., where he breeds racehorses.

"I own a well-bred mare named Lin's Regret," he related proudly, "and we now have a very promising young colt. The mare's father was a half-brother to Swaps, winner of the Kentucky Derby, so we have high hopes for the yearling."

Frank's other hobbies are golf and still photography. He now plays golf rather infrequently, but since purchasing a Rolleiflex not long ago, he has been actively involved in amassing a collection of black-and-white and color stills.

When Phillips concludes his work on "PETE'S DRAGON" at Disney's, he is hoping to take off with Pat for a six-week trip to the Orient. She used to live in the Phillipines and in Hongkong, so both areas are on the Phillips itinerary. That's assuming, of course, that he doesn't get another assignment on a picture.

"With my luck, though, even if I get another picture assignment right away," he grinned, "I'll bet it would be on a picture with locations in the Orient!"





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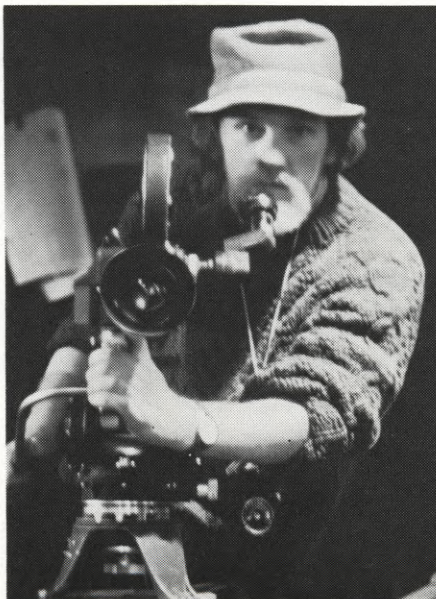
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Independent Producer-Cameraman  
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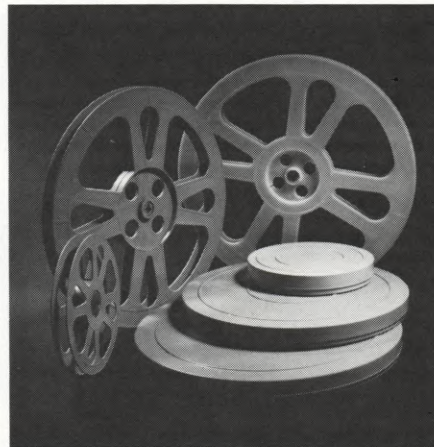
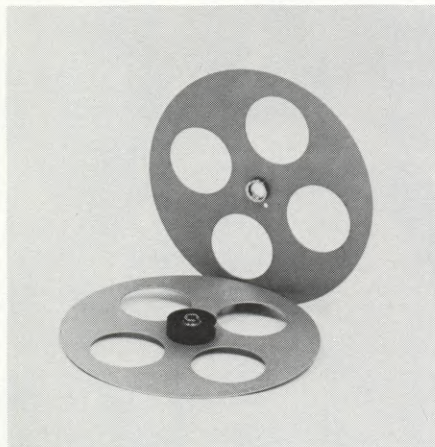
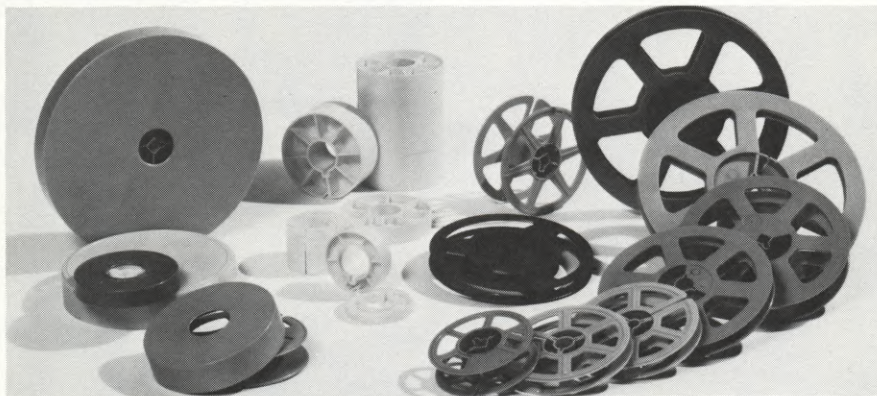
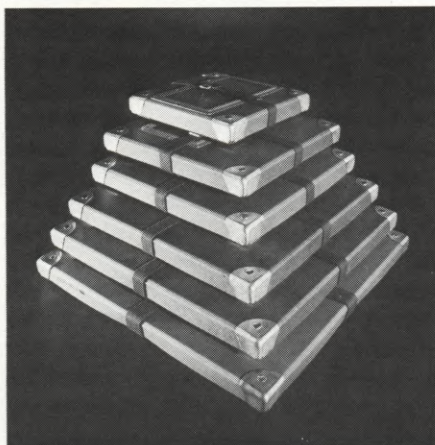
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## THE BOOKSHELF

By GEORGE L. GEORGE

### ASPECTS OF FILM CRAFT

Seminars held in Hollywood with outstanding directors under the auspices of the American Film Institute have supplied the extraordinarily rich contents of Eric Sherman's *DIRECTING THE FILM*. Altman, Bertolucci, Chaplin, Bondarchuk, Cukor, Fellini, Friedkin, Mamoulian, Huston, Polanski and Vidor are among the 75 top directors whose taped comments on the various areas of their art are quoted in a well organized and invaluable volume. (Little, Brown \$15.)

An enlightening survey of film creativity, Richard Koszarski's *HOLLYWOOD DIRECTORS 1914-1940* offers a perspective on the evolution of the craft in the writings of 50 leaders of the profession, including D. W. Griffith, Edwin S. Porter, Cecil B. DeMille, F. W. Murnau, Tay Garnett and Lewis Milestone. Their views underline filmmakers' empiric attitudes during an era of changing techniques. (Oxford U. Press \$13.95/3.95)

Prof. Charles B. Ketcham, who teaches religion at Allegheny College, offers his views on *FEDERICO FELLINI* as a creative artist "in search of a new mythology." Granting the technical and esthetic excellence of Fellini's films, Ketcham challenges their philosophical impact in their depiction of our troubled times. (Paulist Press \$3.95)

Donald W. McCaffrey's *THREE CLASSIC SCREEN COMEDIES STARRING HAROLD LLOYD* discusses *Grandma's Boy*, *Safety Last* and *The Freshman* in detailed analyses of their structure, characters, and comedic techniques. It is a scholarly work that includes searching 1965 interviews with the actor, a bibliography and a filmography. (Fairleigh Dickinson U. Press \$15.)

Studied and illustrated in *THE TOUGH GUYS* by James Robert Parish are such symbols of assertive masculinity, good looks and acting ability as Cagney, Lancaster, Mitchum, Douglas, Ryan, Robinson and Muni. (Arlington \$19.95)

A lively chronicle of the turmoil caused by the filming of her best-seller novel, *MARGARET MITCHELL'S "GONE WITH THE WIND" LETTERS*, reveals the author's outgoing per-

sonality, her literary skills and the effect on her life of overnight fame. (Macmillan \$12.95)

A chatty, delightful and frank autobiography, *MY SIDE* is Ruth Gordon's book of reminiscences of a full and exciting career. Actress, playwright and scenarist, she writes in an easy, conversational style about people and events that filled the first 80 years of a busy life. (Harper & Row \$12.95)

The involvements of flamboyant attorney Melvin M. Belli with entertainment personalities among other famous (and infamous) figures is told with flair and flourish in *MY LIFE ON TRIAL*, an eminently readable and colorful autobiography. (Morrow \$10.95)

A substantial section of Radu Florescu's *IN SEARCH OF FRANKENSTEIN* is devoted to films dealing with the creature in the course of this all-encompassing, solidly documented study. (Warner \$1.95)

#### VIEWS AND OPINIONS

A standard reference work now in its 27th year of publication, John Willis' *SCREEN WORLD 1976* offers a thorough survey of all 1975 movies with over 1000 stills, a complete cast-&-credits listing and other relevant industry data. (Crown \$12.95)

Aimed at young people interested in the movies as a career, Derek Bowskill's *ALL ABOUT CINEMA* is a skillfully written, practical book that outlines the intricacies of filmmaking. (Transatlantic Arts \$6.95)

Film fashion is investigated by David Chierichetti in *HOLLYWOOD COSTUME DESIGN*, a thoroughly documented yet intimate look at the wardrobes created for the screen by couturiers Adrian, Edith Head, Cecil Beaton and many others. A glamorous, lavishly illustrated and thoroughly referenced book. (Crown \$12.50/15. after 12/31/76)

Costume designer for screen and stage, Irene Sharaff records in *BROADWAY AND HOLLYWOOD* her personal and professional experiences in designing her award-winning creations for 56 shows, 16 ballets and 28 films, including *West Side Story*, *Guys and Dolls* and *Funny Girl*. (Van Nostrand Reinhold \$12.50)

A useful research tool for period pictures, Mary Evans' *HOW TO MAKE HISTORIC AMERICAN COSTUMES* covers garments worn by American Indians, Eskimos, Colonists, Civil and

Revolutionary War soldiers. Practical instructions and illustrations complete this well documented book, first published in 1942 (Gale \$11.)

Over 1500 award-winning films from many lands are catalogued and evaluated in Salvatore J. Parlato, Jr.'s *SUPERFILMS*, a useful directory of notable scope and diversity. (Scarecrow Press \$13.50)

The use of films in communicating information on progress in technical skills and social attitudes is the burden of Jean Marie Ackermann's critical international guide, *FILMS IN A CHANGING WORLD*, a broadly selected and perceptively analyzed compilation of movies from all over the world. (Society for International Development, Washington, \$4.)

The American Revolution and social upheavals in other parts of the world are evoked in *REVOLUTIONARY FILMS/ CHICAGO '76*, a basic annotated catalog of films from the Americas, Europe, Asia and Africa shown at the Chicago Bicentennial Festival. (School of the Art Institute, Chicago, \$2.50)

Now a paperback, Hugh Fordin's *THE WORLD OF ENTERTAINMENT* details the achievements of the Arthur Freed unit at MGM, responsible for many of Hollywood's greatest musicals. (Avon \$4.95)

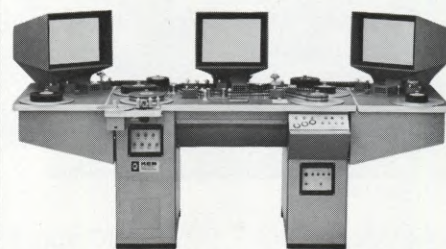
\* \* \*

#### PORTRAIT GALLERY

Studios used to maintain a staff of still photographers whose portraits of stars offered a heady mixture of the glamorous and the artistic. A collection of 100 such stills is assembled in *THE GREAT GARBO*, an eloquent adjunct to Robert Payne's detailed and effusive story of her life and career. (Praeger \$12.95). In *BRIGITTE BARDOT*, unusually beautiful photographs by Ghislain Dussart and a sensitive biography by novelist Françoise Sagan combine to make it a celebration of womanhood. (Delacorte \$12.95)

In *HOLLYWOOD GLAMOR PORTRAITS*, John Kobal has collected 145 stars of the 1926 to 1949 period, an exquisite selection of the best of Clarence Sinclair Bull, Ernest A. Bachrach, George Hurrell, Paul Hesse, Otto Dyar and their gifted colleagues. (Dover \$5.) Notorious paparazzo Ron Galella's *OFF GUARD* shows the often startling effects of his no-warning technique of flashbulb popping at screen, stage and society celebrities. (McGraw Hill \$6.95)

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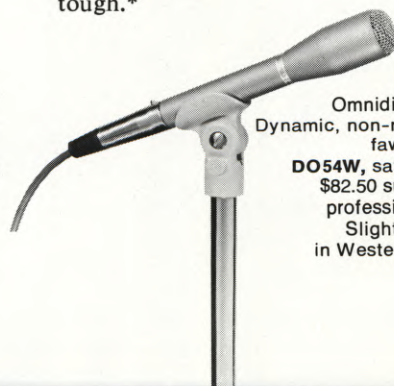
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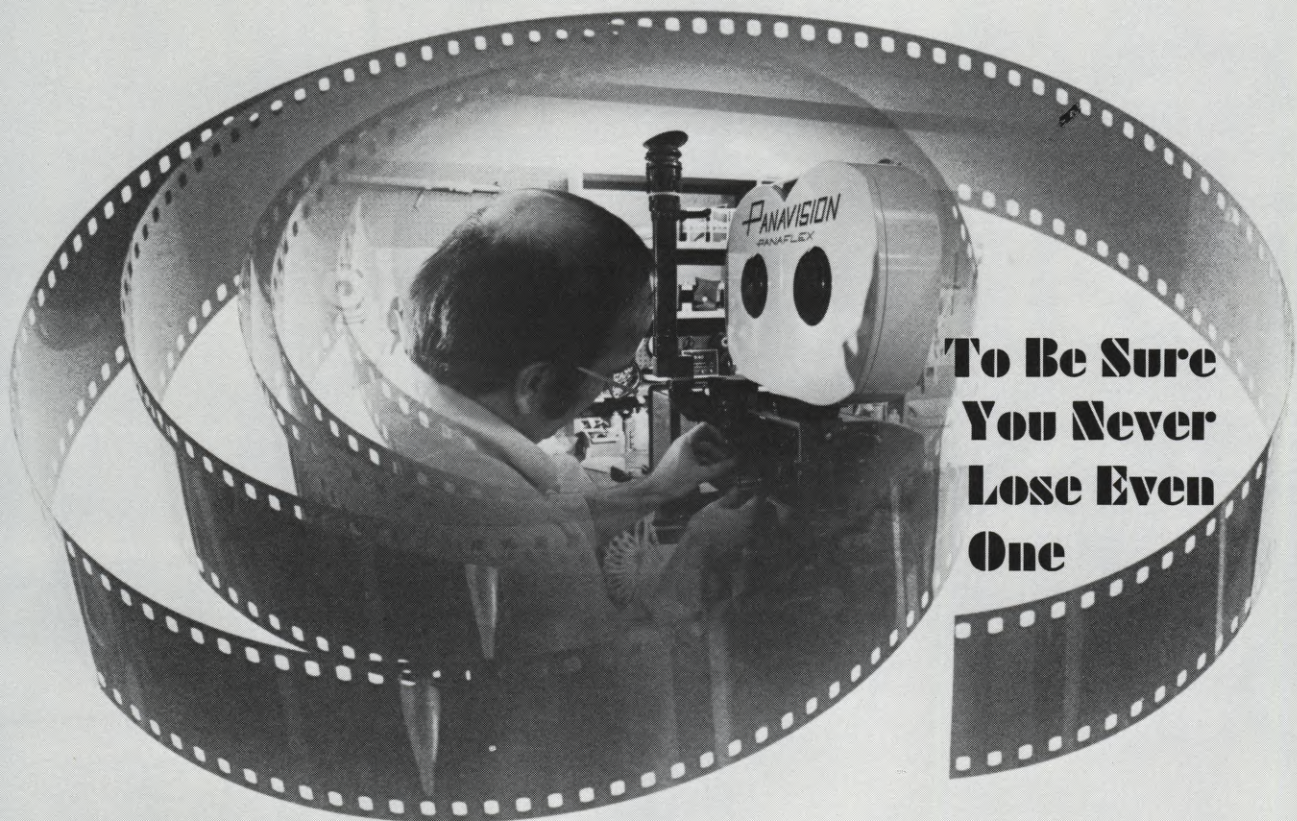
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Canadian film - theatre - tv

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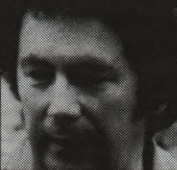
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PORTRAIT OF FRENCH CANADIAN FILMMAKERS



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Luck Gailbeault



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volume 4 number 5

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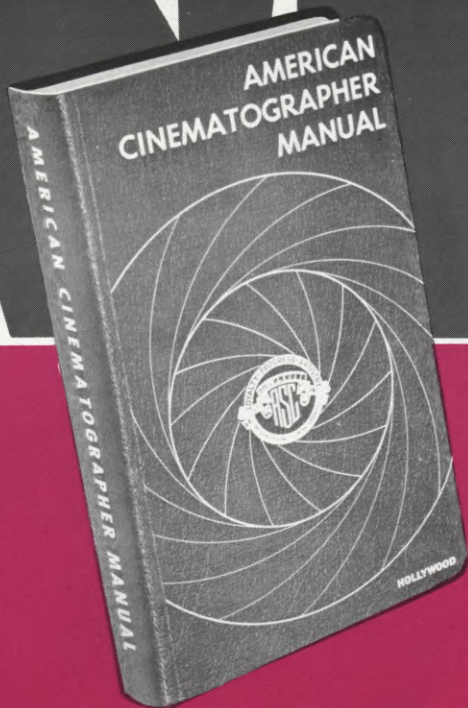
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Whenever there's something new from Cine 60, you know it's going to be something that helps you do a lot more, for a lot less. And these new products are no exceptions:

**We've done it again with battery power.**

Now, there's a line of Cine 60 Power Packs to give you the same kind of rechargeable, nickel-cadmium performance and reliability as our popular Power Belts. Available in 6-30 volts and up to 7 ampere-hour capacity, to match the power requirements of motion picture cameras, portable videotape systems and sun guns. Use it on a belt, shoulder strap or tucked in a pocket.

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**We've done it again with a very versatile pod.**

The new Combi Pod, designed especially for portable video and super-8 cameras, reflects over a decade of experience in making popular shoulder pods for cameras like Arri, Bolex, Eclair and many others. Weighing in at less than 2 pounds (!), the Combi Pod features comfortable rubber-cushioned shoulder and waist pads, plus a universal ball joint, for easy leveling. Folds quickly and compactly, for easy packing, too.

**We'd like to tell you more...** about these and the many other Cine 60 innovations. Call or write for catalog and prices.

## AND AGAIN.

CINE 60

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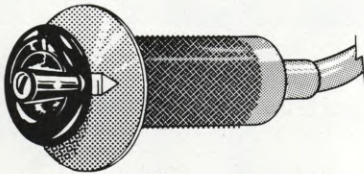
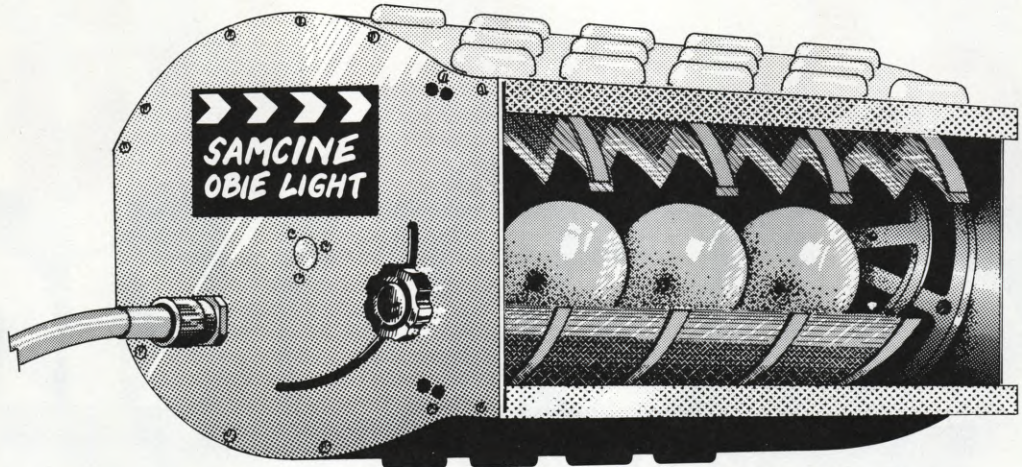
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# THE SAMCINE OBIE LIGHT



Fill lights have been attached to cameras for many, many years. Legend has it that a famous Hollywood cameraman always used one when photographing Merle Oberon, and nicknamed it the 'Obie Light', and in sunny California at least, the name has stuck.

Any Director of Photography who has ever used an Obie light (or blimp basher as they are sometimes called) will be familiar with the problem of adjusting the intensity of the light as the subject-to-camera distance changes during the course of a scene, without either the colour temperature or the evenness of illumination being affected.

With colour film, dimmers cannot be used because the change in colour temperature makes even the fairest maiden blush (or appear to do so). Shutters are impracticable, because at close distances light and dark stripes may appear across the artist's face. And other methods, such as sliding a neutral density wedge in front of the light from a single direction tend to make the light uneven, with more light to one side of the scene than the other.

At Samcine we have overcome the problem by producing a luminaire which incorporates two contra-rotating cylinders of layered stainless steel mesh, set at an angle to each other and with the edge of one cylinder saw-toothed and the other plain. Four photoflood bulbs are used, switchable simultaneously or individually.

The intensity of the light output is varied by rotating the cylinders, placing up to six layers of wire mesh in front of the light source. This operation may be carried out from either side of the luminaire or remotely by flexible cable.

Indicators show the Director of Photography exactly where the cylinders are set. A slide and frame on the front of the lamp are provided to position filters or diffusers.

It all sounds terribly complicated but it isn't really and it works . . . and works well.

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# REPORT FROM

# photokina photokina photokina Köln 1976

An on-the-site description of what's new in motion picture equipment, as displayed at the biannual "World Fair of Photography" in Cologne

By HERB A. LIGHTMAN

COLOGNE, West Germany

As constant readers of *American Cinematographer* know — since this journal has been covering the event in depth for the past decade — *Photokina* is a giant trade fair of still and motion picture equipment held every two years here in this bustling city on the Rhine.

Looking rather bare prior to the opening of *Photokina '76* in Cologne, the main entrance to this renowned biannual trade fair was later swarming with people, as 112,000 visitors from 11 nations crowded into the mammoth complex to check the latest state-of-the-art offerings of still, motion picture and video equipment — the latter receiving more display this time out than ever before.

It is several things to many people. To exhibitors it is an opportunity to present to the world of potential buyers their latest wares. To those representing production and sales organizations in various nations, it is a chance to see and handle, all in one place, the newest (and presumably the best) state-of-the-art devices, gimmicks and

gizmos in the fields of still, motion picture and (increasingly) video production. To the general public — which has, more and more, been discouraged from attending these past few years — it is a vast toyland of glittering under-the-Christmas-tree temptations. To those of us actively engaged in the industry or reporting the event for the world press, it is an unparalleled opportunity to examine the latest, while warmly renewing contacts with favorite colleagues from just about everywhere.

*Photokina '76*, like its predecessor of two years ago, is slated to run for seven days — which is just about as long as the exhibitors and their staffs can comfortably cope with the pressures. This year, we are informed at the opening press conference, *Photokina* will be "bigger and better than ever." In its 14th time out, the event includes 916 firms from 31 countries, 545 from nations other than Germany. This represents the largest concentration of products ever shown in Cologne, the total number of exhibitors being almost 11% ahead of those showing at *Photokina '74*.

Foreign firms now comprise 60% of the total, and the U.S.A. heads the list with 111 companies. Then comes Great Britain with 90, Japan 74, France 73,



Italy 60, Switzerland 41, Holland 21 and Belgium with 15 firms.

As in years past, many of the exhibits are slanted toward the amateur trade, with a majority of the booth space devoted to still photographic equipment. The exhibits fill twelve gigantic exhibition halls in the sprawling permanent complex that extends along the riverfront on the bank just opposite the main sector of the city. To get there, one crosses an imposing bridge, rides the ferry — or swims. The items of professional motion picture equipment — those of prime interest to readers of this publication — are concentrated in Halls 11 and 12.

Almost invariably, at each successive *Photokina*, there is one item of professional motion picture equipment that captures the imagination and active attention of the crowd, quickly becoming the "must-see" conversation piece of the event. This year, the "hit of the show", hands down, is Cinema Products' unique camera-stabilizing device, the STEADICAM (see *American Cinematographer*, July 1976). Day and night the Cinema Products booth is packed with crowds gazing in awe, as the STEADICAM's designer/inventor, Garrett Brown, puts the device through its spectacular paces. Showing continuously on a closed circuit video monitor is a stunning demo film, plus clips from such features as "THE MARATHON MAN", "BOUND FOR GLORY" and "ROCKY", all of which have utilized the STEADICAM most effectively.

Of special interest is the fact that making its debut here is the new

Universal Model of STEADICAM, which (unlike the original model that is "married" to a built-in, modified Arriflex IIC camera) can accommodate almost any hand-held video, 16mm motion picture or 35mm motion picture camera. The Universal Model sparks considerable interest because it permits those renting the equipment to use a wide range of cameras, including those which they already own.

Spectacular though the STEADICAM may be, to me the most significant single element, by far, evident at *Photokina '76* is the emergence of the Time Base Coding technology as a practical cinematographic production tool. In the talking stage and on the drawing boards for several years, it finally surfaces here in Cologne as a definite "closed-loop" system, combining camera, recorder and editing console. At long last a *fait accompli*, the Time Base Coding System offers a super-precise way of maintaining continuous sync along every frame of picture and sound without any external connections whatsoever.

Displayed at *Photokina '76* are Time Base Code-equipped cameras by Arriflex, Eclair and Aäton — recorders by Nagra and Stellavox — and an editing console by Steenbeck. While all of the aforementioned are 16mm items, the adaptation of Time Base Code technology to 35mm equipment is, I'm told, a simple matter, and I predict that within the next few years, all new professional motion picture equipment will have this important capability built in. A comprehensive report on Time Base Coding at *Photokina '76* appears

elsewhere in this issue.

At *Photokina* two years ago, the big news was the development of metal-halide (HMI) lighting as a potentially valuable tool to the motion picture and television industries. At that time, several manufacturers had daringly, though tentatively, exhibited HMI units, several in prototype form — but with cautious statements that such problems as delayed restart, flicker and ponderous ballasting had not yet been solved. Obviously, much progress has been made in the interim, for here at *Photokina '76* virtually every lighting manufacturer is displaying production-line HMI units. Several, including Kobold and Rosco, are showing light-weight battery-operated portable HMI lights, and Kobold even has a couple of fascinating-looking prototypes of underwater models. Most manufacturers claim that they have solved the restart and flicker problems in one way or the other, and the ballast units, though still essential to HMI lighting, are noticeably more compact and lighter in weight.

Speaking of HMI ballasts, Quartz-Color Ianiro, which scored the original breakthrough to flicker-free HMI lighting (see *American Cinematographer*, October, 1975), is showing here a new three-phase ballast designed to run three HMI lights simultaneously.

As at past *Photokinas*, Lowel-Light Manufacturing, Inc. of New York has come through with a little gem of location lighting equipment — the Lowel Omni-System. It is based upon the Omni-Light, a compact, but

Continued on Page 1380



Shown at *Photokina '76* were the latest wares of 916 firms from 31 countries — including 545 from nations other than Germany. This represents the largest concentration of products ever shown in Cologne, the total number of exhibitors being 11% ahead of those showing at the previous Fair, *Photokina '74*.



# TIME BASE CODE SYSTEMS AT PHOTOKINA '76



After years of research and wrangle, a breakthrough to a full camera-sound-editing system for syncing and conforming picture and track very rapidly, based on a time constant

At *Photokina '76* perhaps the most important single element in evidence, considering its potentially far-reaching effect on the film industry, was tangible hardware to implement the long-heralded Time Base Code system as a viable production method linking camera, sound and the editing process.

For the past several years there has been much talk, and little else, about a Time Base Code system that could greatly speed up the post-production phases of film-making. While the video industry took the ball and ran in that direction, various committees concerned with possible applications to film production continued to research and wrangle about which system would be best and, consequently, merit canonization as the industry standard.

While all of this was going on, the Institut für Rundfunktechnik (IRT) at Munich, closely observed by the European Broadcasting Union (EBU), proceeded to develop the camera-sound-editing Time Base Code system displayed at *Photokina '76* in cameras by Arriflex, Aäton and Eclair, recorders by Nagra/Kudelski and editing tables by Steenbeck.

Whether or not this particular system, one of several viable possibilities, will actually become accepted as the standard of the industry remains to be seen, but its incorporation into such outstanding hardware as that mentioned above would seem to indicate a

trend that will be difficult to reverse, should the johnny-come-latelys eventually arrive at a system which they consider to be superior. In the meantime, the production hardware on display at *Photokina* (especially the seemingly magic search-and-select automation of the Steenbeck consoles) spurred excited interest on the part of professional film-makers present.

## What is Time Base Code?

The very term is exotic and not fully understood even by many professionals engaged in film production. Briefly described, in an over-simplified way, it refers to a system of continuous frame-by-frame synchronization of picture and sound, without external connections and in such a way as to make possible extremely rapid, automated conformation during the editing process.

Traditionally, the trusty clapperboard has been used since the advent of sound filming to provide head (and occasionally tail) sync between picture and sound track — and it is still universally employed. Other systems have been used, involving a cable connection or radio-link between the camera and sound recorder, but it has long been felt that operations could be simplified if the precise time when the exposure and recording was taking place were to be recorded separately on both the film and the sound track,

since, subsequently, it would be necessary only to match up the timing information. This theory began to make even more sense following the relatively recent advent of crystal-sync, which effectively freed cameras and recorders from their previous umbilical connections.

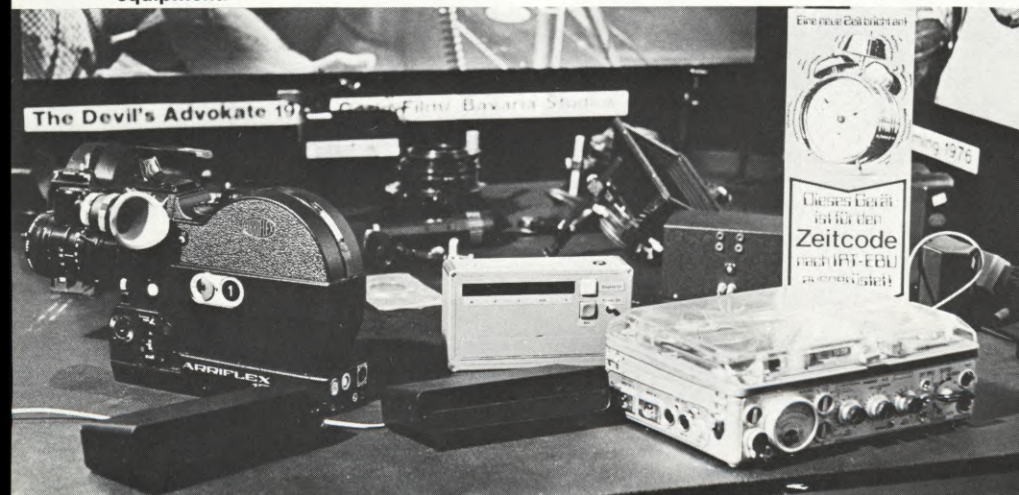
Certain parameters became obvious as research into possible Time Base Code systems proceeded. First, such a code should be capable of being recorded on picture and sound track in a simple manner and in such a way that the required auxiliary equipment on portable cameras would not add significantly to their weight. Second, the marking system used should be visible on the picture film. Third, the system adopted should be relatively inexpensive for incorporation into new equipment and possible modification of existing hardware.

The Time Base Code system incorporated into the various aforementioned items of equipment on display at *Photokina '76* satisfies these parameters.

The digital time code used in the video industry proved to be far too complex for film, so the system adopted is based on four readily-available light-emitting diodes that can easily be installed within the height of a single film frame, whatever the film format likely to be used (including Super-8). This system provides a suitable bit-rate for the time code of 96 or 100 bits per second, depending upon whether the film runs at 24 or 25 frames per second. The binary-coded decimal system adopted identifies each foot of film and track with the year, month, day, hour, minute and second of filming (plus, optionally, a camera number).

The common denominator of this Time Base Code system is the master clock which is plugged into each camera and recorder involved in a shoot to "set" them individually in perfect synchronization, based on the time indicated by the clock. This synchronization remains accurate within one frame for a period of at least four hours, no matter how often cameras and/or recorders are turned on and off within that period. The number of cameras and recorders that can be synchronized in this manner for a particular shoot is theoretically unlimited.

At *Photokina '76* Arnold & Richter exhibited a complete array of camera and sound elements involved in Time Base Coding. Included were the Arriflex 16SR camera, Time Code display reader, master clock and specially modified Nagra 4.2 sound recorder. The necessary elements are lightweight and compact, scarcely increasing the mass or weight of the basic equipment.





In the editing stage, picture and track which have been run through any of these cameras or recorders can be conformed to the frame in almost instant sync by a decoder of the type developed by Steenbeck for its editing consoles. Eliminating the classic clapper-board entirely, this electronically automated sync-conformation system can greatly speed up the editing process.

As to the cost factors involved in initiating a Time Base Code system, it is still a bit early to arrive at an exact figure, but based on information supplied by the various manufacturers currently producing components, the cost for a complete system (consisting of one camera, one recorder and one editing console) would add up to approximately \$8,500. This is for the Time Base Code elements alone, in addition to the cost of the basic equipment.

Whether such additional cost is justified only time and experience will tell. If one considers a Time Base Code system as simply a method of synchronization, it may not be — but if such a system is used as a means of considerably speeding up post-production (especially in cases where multiple cameras and/or recorders are employed), it may well prove to be a minor investment indeed.

What follows are comments by various individuals and representatives of

companies involved in the development of the Time Base Code system on display at *Photokina '76*:

### COMMENTS ON TIME-BASE CODING

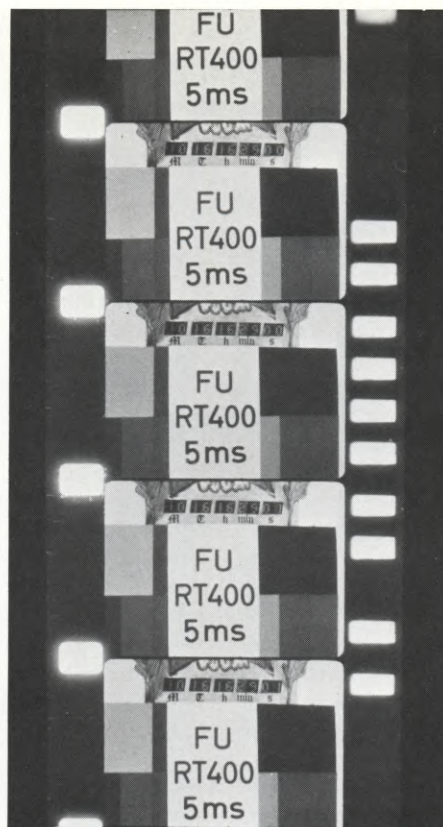
By Volker Bahnemann

Vice President/General Manager, Arriflex Company of America

As probably the most important new technology introduced at the 1976 *Photokina*, Time Base Coding was part of several major companies' exhibits, including Arriflex, Eclair, Nagra, Aäton, Stellavox and Steenbeck.

For a good number of years — as a matter of fact, since the introduction of crystal-controlled camera and recorder drive systems — several informational standardizing bodies have been engaged in researching a Time Base Code system that would be capable of providing a precise sync and take information on film and tape without requiring a physical link between camera and recorder.

Such a system has now been completed, standardized and built in pre-production samples by a group of leading manufacturers of cameras, sound recorders and editing tables. The system is based on a concept submitted by EBU (European Broadcasting Union) in 1973, and which was subsequently engineered and introduced.



A clip of 16mm film showing a partial segment of the Time Base Code information recorded in four-bit binary code on the edge of each foot of film. The sound track carries corresponding code signals.

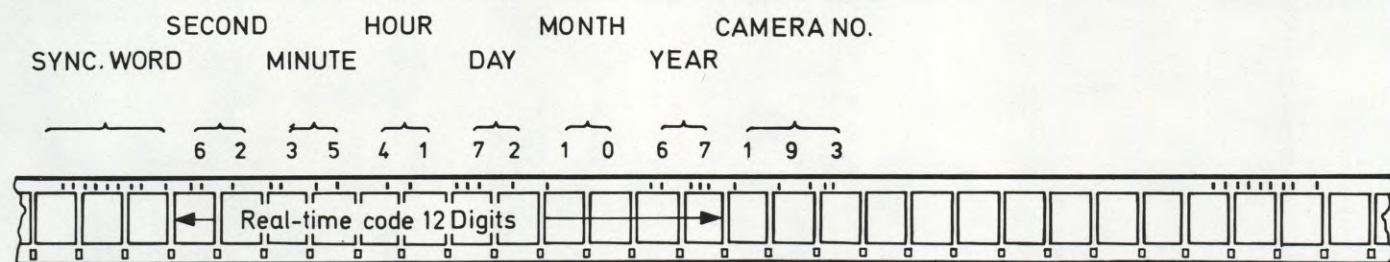
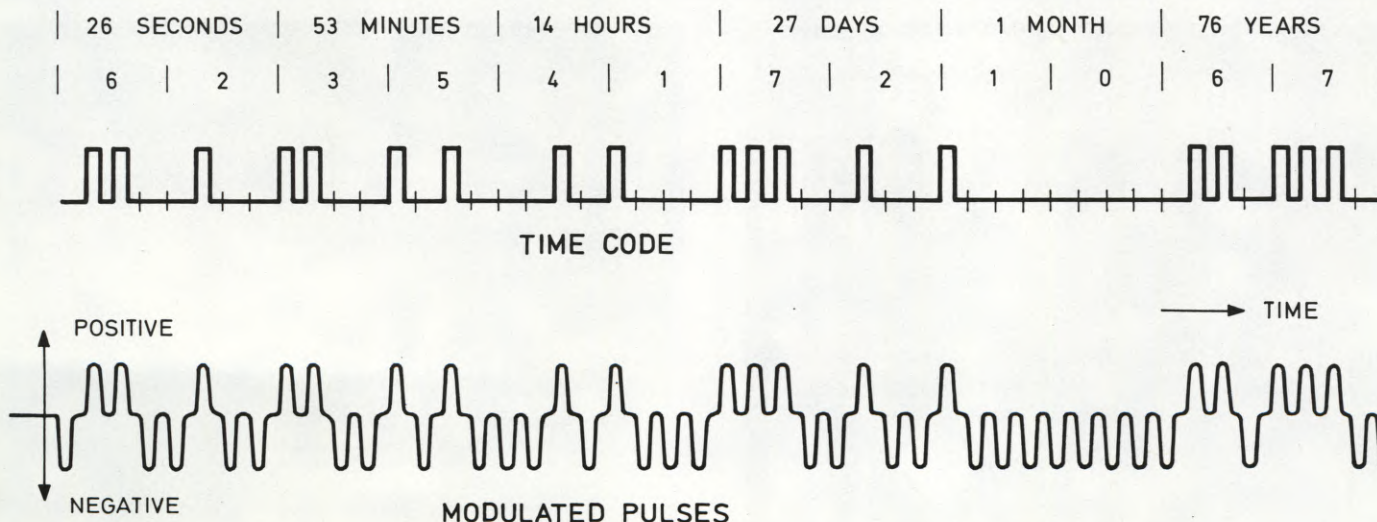


Diagram showing the recording of the time code in binary groups on 16mm motion picture film. In this example, the film is coded for: "27th January, 1976, 14 hours, 53 minutes, 26 seconds, Camera No. 391". The synchronizing word enables the direction of travel to be determined.

Diagram showing code modulation on the magnetic tape. The time reference corresponds exactly to that of the picture code illustrated in the diagram above. The time code, recorded on standard 6.25mm tape, can be recopied onto 16mm magnetic film to facilitate the editing operation.



# CINEMA PRODUCTS UNVEILS NEW "UNIVERSAL MODEL" STEADICAM



Introduced at Photokina: a model of this impressive stabilizing device that will accept almost any hand-held motion picture or video camera — and it quickly proves to be the "hit of the show"

Upon the initial introduction of STEADICAM several months ago, Cinema Products' new and revolutionary camera stabilizing system has gained immediate acceptance in the professional 35mm feature film production field. The reason for STEADICAM'S immediate acceptance and growing success was that it greatly increased the creative latitude of the cinematographer and the director by solving the problem of image steadiness when shooting with a hand-held 35mm camera. While effectively reducing production costs, STEADICAM permits greater ease of operation when shooting hand-held with greater crea-

tive latitude, delivering remarkably steady and jitter-free moving shots of dolly-quality smoothness.

First used by Haskell Wexler, ASC, on *BOUND FOR GLORY* (see the July 1976 issue of *American Cinematographer*), STEADICAM has since been used extensively on *MARATHON MAN*, *ROCKY*, *THE HERETIC* and *THE CAR*.

In the course of filming these feature productions, it quickly became obvious that, with STEADICAM, most track-laying for dollies used in location shooting can be eliminated, and that shots of practical interiors can be made esthetically pleasing with great ease, in spite of tight, confining movements.

Some crane shots could be easily simulated by means of a ramp or temporary stairs.

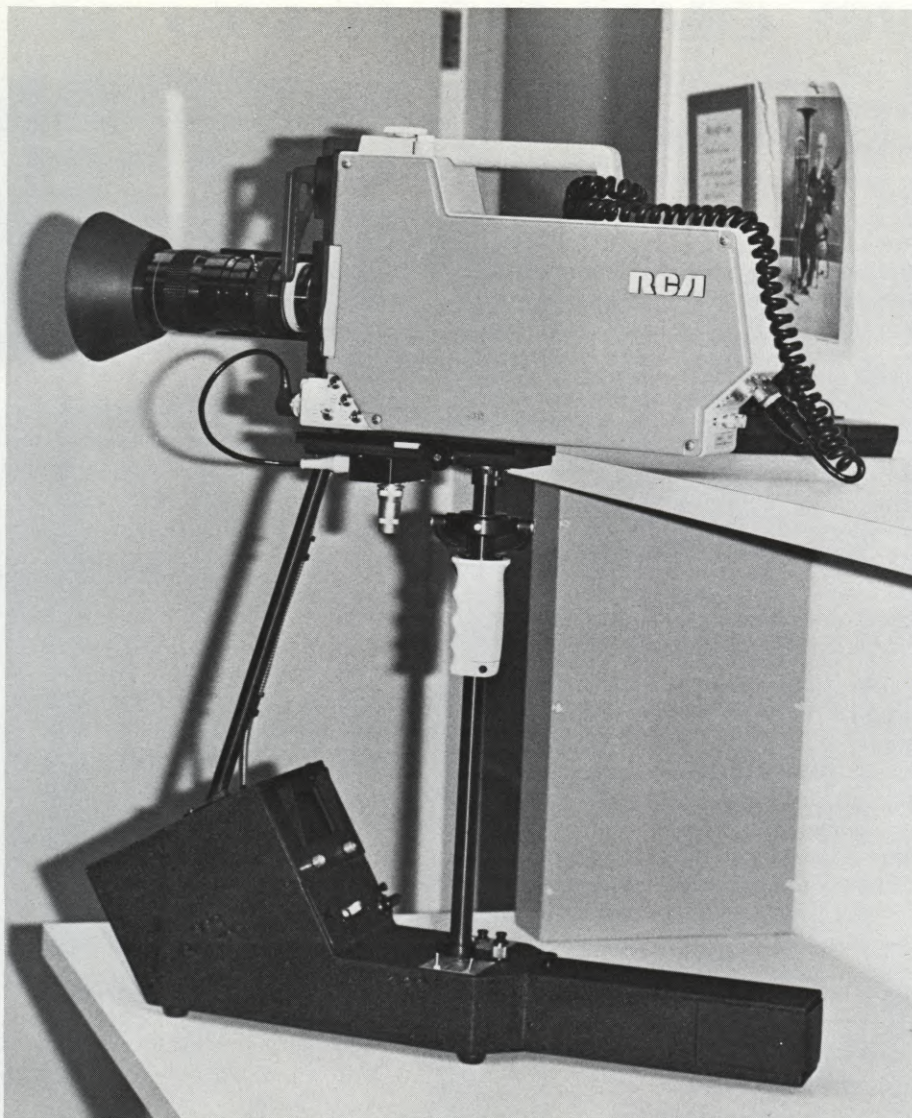
The obvious limitation of the original STEADICAM model was that it required that the camera — an extensively modified Arri IIC — be tied permanently to the system, making it impossible to use the camera by itself.

## Cinema Products introduces a Universal Model at Photokina '76

Another version of the STEADICAM camera stabilizing system was introduced by Cinema Products at Photo-

Crowds continually packed the Cinema Products booth at *Photokina '76* to view the company's revolutionary new camera stabilizing device, the STEADICAM. It was demonstrated by its inventor, Garrett Brown, and visitors were encouraged to try it themselves. Clips shown on a closed-circuit monitor illustrated STEADICAM's usage in several recent feature films.





The new "Universal Model" STEADICAM, shown here with RCA video camera mounted, was designed to supplement the original model, which features a built-in modified Arriflex IIC camera. The sled-like assembly at the bottom of the Universal model contains the video viewfinder, all the electronics to run it and the battery pack to power both the camera and the viewing system.

*kina '76* — a universal model that allows the camera to be removed from the system, and permits the use of *one* STEADICAM system interchangeably with either a hand-held video camera, a hand-held 16mm camera or a hand-held 35mm camera. This, of course, results in considerable savings for film and/or television production companies since it permits the cameras to be used independently of the system: an important consideration especially for production houses that use both film and video.

The basic features of the STEADICAM camera stabilizing system remain unchanged. The complete system consists of a body brace (a padded close-fitting harness-like jacket), with a support arm attached to the body brace at one end, and (through a free-floating gimbal) to the camera system at the other end.

The exoskeletal-type articulated support arm parallels the operator's

arm in any position, and almost completely counteracts the weight of the camera system with a carefully calibrated spring force. The camera moves and glides freely in all directions while the camera operator easily guides and controls the position of the camera with a gentle movement of his hand. The system permits the camera to move with the operator as if it were an extension of his own body and part of his internal "servo-system", constantly adjusting and correcting for body motions. The camera seems to be free-floating in mid-air, yet it is completely balanced at all times. The operator can boom up or down nearly three feet, he can pan a full 360° and tilt up or down to 60° — all this while the camera operator is himself in motion, walking or running. By filtering out low as well as high frequency vibrations, STEADICAM turns virtually any vehicle — car, boat or aircraft — into a perfect camera platform.

Convenient two-eyed viewing is provided by means of a special 3" high-intensity monitor using a special kinescope tube of such brilliance that it produces over 4000 footlamberts on the screen of the tube before passing through a special filter, designed to virtually eliminate any reflections on the face of the tube from all ambient light sources, including direct sunlight.

#### Advantages of the Universal Model.

The major difference between the universal model of STEADICAM and the original version used only for 35mm is in the new, flat, sled-like configuration of the lower portion of the camera assembly, which contains all the electronics for the video viewfinder and the battery pack powering the camera as well as the viewfinder system.

In the Universal Model, the 3" high-intensity monitor is no longer set on the camera itself (at eye level), but is now mounted directly onto the "sled" at approximately 45° downward. The placement of the monitor in this position makes it possible for the operator to see what he's shooting and still know exactly where his feet are, whether walking or running up and down stairs.

Attached to the "sled" are two vertical members which support the camera-mounting platform (which is adjustable back and forth in order to maintain camera balance).

The Universal Model configuration makes it possible to remove the camera from the platform and use it independently, hand-held or on a tripod. It also makes it possible to mount the camera on a tripod adjacent to the  
Continued on Page 1377

On the Universal model, the 3-inch high-intensity video monitor is mounted directly onto the "sled" at approximately a 45° downward angle.



# THE NEW LOWEL OMNI-LIGHT SYSTEM



An impressive new tungsten-halogen lighting system that promises to be almost all things to almost all film-makers scores an auspicious debut at Photokina '76 in Cologne

One of the more inspiring success stories in terms of professional motion picture equipment design and manufacture is that of Lowel-Light Manufacturing, Inc. of New York, which has, in a relatively short time, carved out a unique niche as a company dedicated to the creation of super-lightweight, super-efficient location lighting equipment.

The company began humbly enough, when Ross Lowell, a hard-working cinematographer then engaged mainly in the filming of documentaries and other location subjects, designed, initially for his own use, a few very compact, extremely lightweight lighting units that could be readily toted around in the trunk of a car and set up to provide efficient illumination in small rooms and other tight places. These early units were refined for manufacture into the basic Lowel-Light, a small tape-up, clamp-on unit that could be mounted almost anywhere with the aid of Lowel's Gaffer-Tape, and the workhorse Quartz "D", a compact, lightweight focusing unit (using interchangeable 1000, 750 or 500-watt lamps), with a quick-change accessory reflector system that transforms it from a versatile general-purpose light to a high-intensity, long-throw source.

At previous *Photokinas*, Lowel

stunned the industry by introducing first its Folding Softlight, which has a fraction of the weight of studio units and folds into a compact case for travel, and, two years later, the revolutionary Tota-Light System, based upon a tiny folding luminaire that accepts 1000, 750 and 500-watt quartz lamps and features a wide range of lock-on mounting and control accessories.

Now, at *Photokina '76*, the big news from this vital young company is the new Lowel Omni-System, described by its manufacturer as follows:

The Lowel Omni-System\* is the product of a four-year program to create a compact, versatile focusing location light and accessory system designed to complement our existing equipment and to meet the exacting requirements of professional motion picture, video and still photographers.

The Lowel Omni-Light\* is the heart of the new system. It easily fulfills our original objectives and becomes the "state-of-the-art" in location lighting design.

Some of the outstanding features include:

## BATTERY OR AC LINE OPERATION

Omni can be powered by 120 or 220/240 Volt A/C line sources and

existing commercially available 30-Volt DC battery sources. The tungsten-halogen lamps are readily available throughout the world and offer a choice of wattages.

## OUTSTANDING PERFORMANCE

The unprecedented output of the Lowel Omni-Light\* as indicated by the performance figures (see technical specifications) are achieved through the use of our revolutionary double-parabolic peened reflector. This unique design offers an extraordinary focusing range; a wide, even light-pattern in flood; an excellent "tight" spot and an exceptionally smooth light-pattern throughout the entire focusing range.

The standard diffuse reflector, from which all of our performance figures are derived, is interchangeable with a specular reflector for increased output in the spot position and a gold reflector for special color effects.

## COMPACTNESS

The overall size of the light for storage is only 3-3/8x8 1/2x5-5/8" (4 1/2x8 1/2x6 1/4" with barndoor). It weighs only 1 lb., 10 oz. without cable, (2 lbs. 8 oz. with 16' cable).

## STAND MOUNTED

The stand fitting of the Omni enables it to be securely mounted to a light stand or camera light bracket from 1/4" to 5/8" diameter. It also enables the Omni to tilt and pan a full 360 degrees and allows two Omni-Lights to be stacked together.

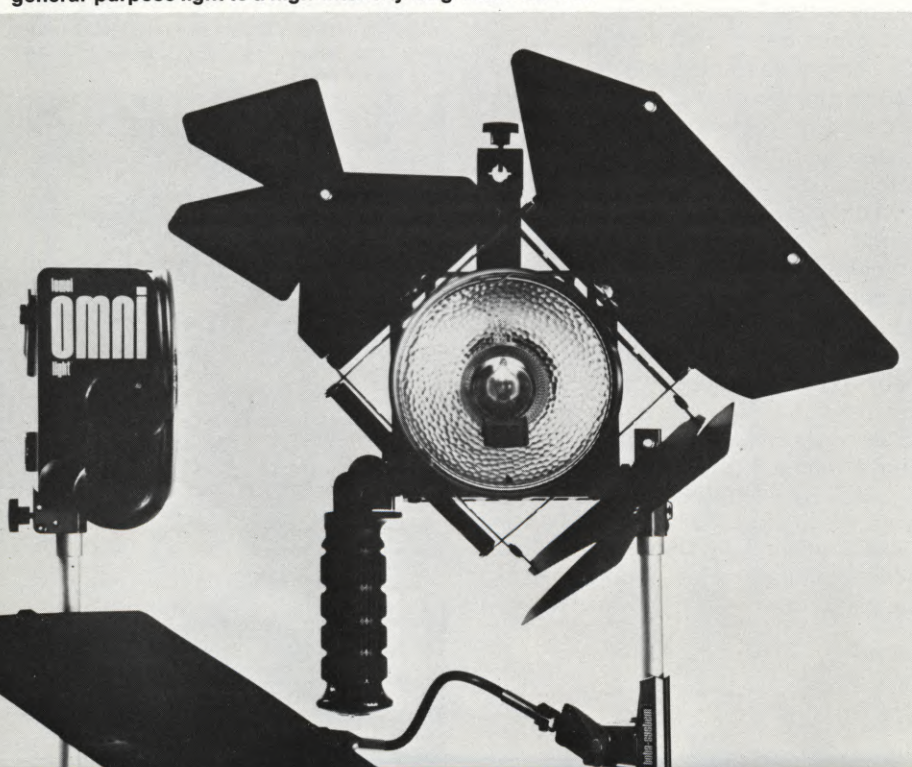
## HAND-HELD

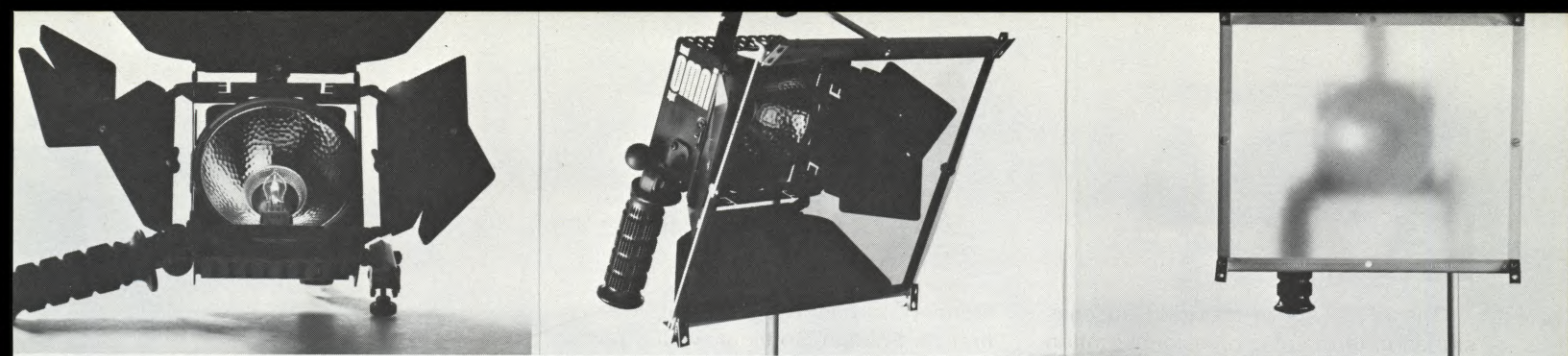
An extra large, "cool", comfortable swing-away handle is an integral part of every Omni-Light. The handle of the Omni-Light is designed to permit one-hand tilt, pan and spot-to-flood focus control when Omni is hand-held... a major advantage to the professional film or video news cameramen on the go. The Omni handle, like the stand fitting, folds snugly against the body of the light for compact storage when not in use.

## IMPROVED BARNDOORS WITH STANDARD ACCESSORIES

The Omni-Light features a four-leaf barndoor. Each leaf has three sections for more precise control. Each door can be easily removed from the barn-

**Core of the new Omni-System introduced at *Photokina '76* by Lowel-Light is this Omni-Light, a compact, lightweight focusing unit (using interchangeable 1000-watt, 750-watt or 500-watt lamps), with a quick-change accessory reflector system that transforms it from a versatile general-purpose light to a high-intensity long-throw source.**





(LEFT) The Omni-Light is self-balancing on the floor or a table. Three-point support provides pan and tilt control. (CENTER) The same gel-frame used with the Toyota-Light system holds a wide variety of pre-cut gels for many effects. (RIGHT) In addition to a choice of three voltages: 30, 120 and 240 — Omni has instant convertability from hard light to semi-soft (shown here) to very soft (with umbrella). It also has high-intensity, long-throw capability with special reflector.

door frame by an innovative quick-release quarter-turn fastener. (Please note: the doors do not have to be removed for storage in kits.)

The barndoors rotate 360 degrees. The barndoor frame serves as an accessory holder allowing up to two accessories to be used at the same time (more with the use of a snoot and extra barndoor frame).

Standard accessories include scrims, dichroics, safety glass, cookaloris, snoot and others.

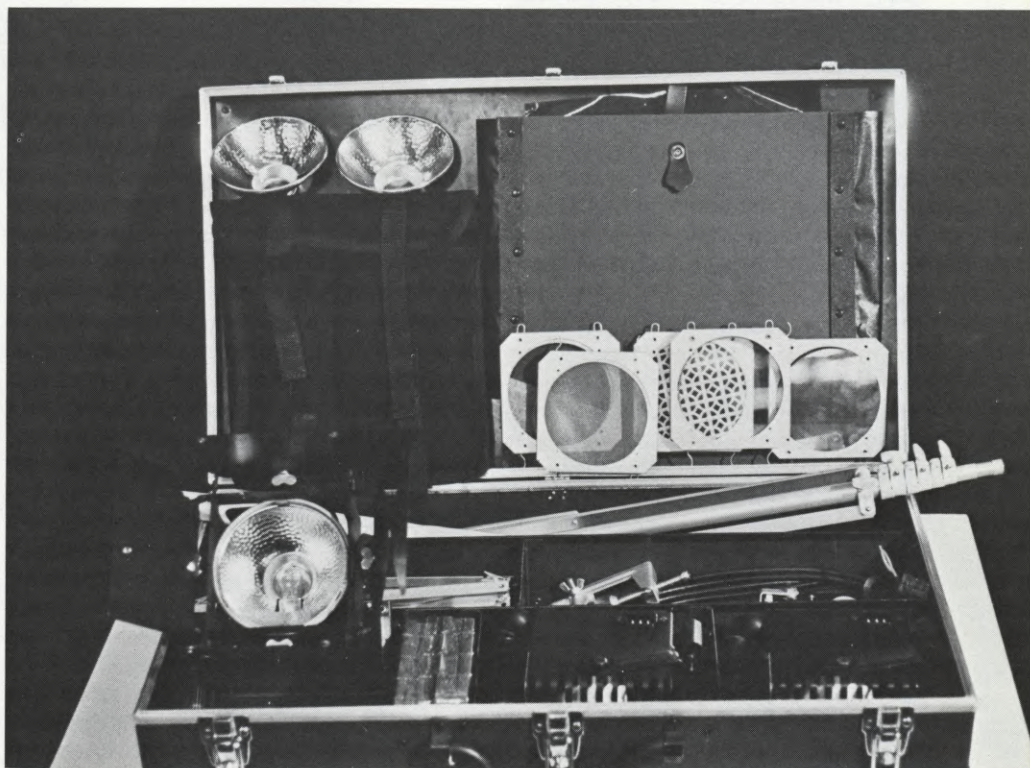
#### FULLY COMPATIBLE WITH TOTA-SYSTEM\*

A swing-away bracket, which can support either an umbrella for soft-bounce lighting or a gel-frame holder for diffusion, color correction, neutral density or special effect color filtering, is an integral part of the light. Both the umbrella and the gel-frame holder are the same as those used in the widely accepted *Tota-System*\* which, in terms of its specialized mounting bracketry, flexible shafts, flags and reflectors is FULLY COMPATIBLE WITH THE *LOWEL OMNI-SYSTEM*\*.

#### OMNI-STAND; NEW CASES; NEW KITS

The Omni-Stand, a new lightweight stand with KS stand clamping features, and new cases and kits will be available at time of introduction.

Lowel-Light Manufacturing, Inc. takes great pride in announcing the availability of the Lowel Omni-Light\* and the entire Lowel Omni-System\* for



The Omni-Kit, shown at *Photokina*, holds 3 Omni-Lights, 3 Omni-Stands, 3 complete Omni-Barndoors, 2 full scrims, 1 half scrim, 3 Tota-Frames, 2 packages of assorted gels, 1 Tota-Brella, 1 Tota-Clamp, 1 Tota-Mount, 1 12-yard roll of Gaffer Tape, 1 Omni-Lampak and 1 Omni-Case. Kits to be available later will feature spare space for customizing.

world-wide distribution during the first calendar quarter of 1977.

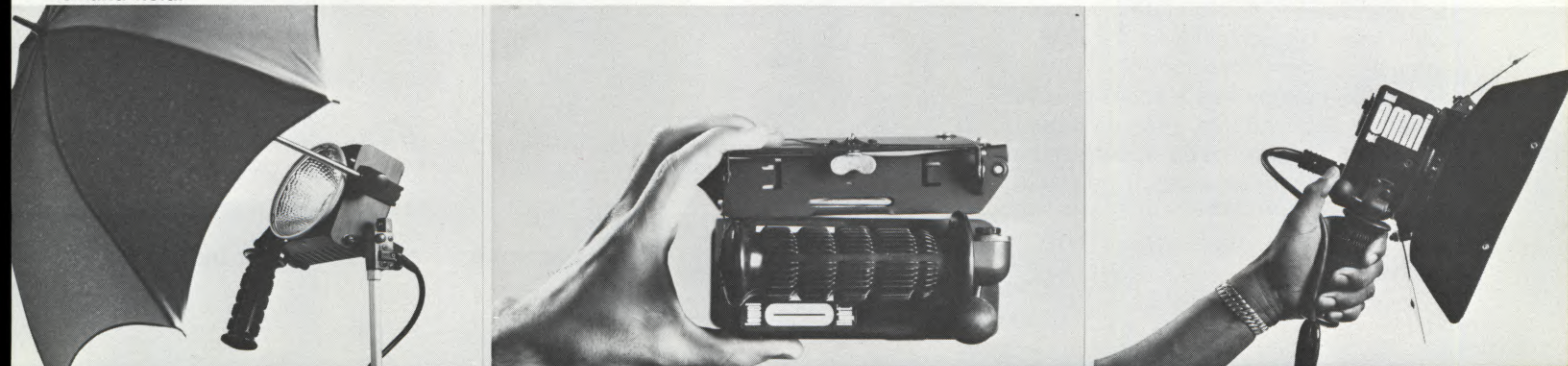
For further information contact: Art Kramer, Sales Manager; Lowel-Light Mfg., Inc.; 421 West 54th Street; New York, New York, 10019; Telex: 666597UW; Cable: Lowelght, New York; Tel: (212) 245-6744

\*Trade Mark

#### MORE ABOUT THE OMNI-LIGHT By Ross Lowell

The new Omni-Light fills a very important gap in our system, in that it is an incredibly sophisticated newslight, an extremely compact production light and, to a great extent, everything in between. Of course, there is obviously no

(LEFT) The same umbrella used with Tota-Light locks into Omni gel-brella bracket. Barndoor frame with dichroic can convert this soft source to daylight. (CENTER) Omni-Light folded for storage with barndoor and four extendable flaps attached. Because units and accessories are so compact, kits are small. (RIGHT) The handle of the Omni-Light is designed to permit one-hand tilt, pan and spot-to-flood focus when the unit is hand-held.





(LEFT) Omni's standard double-parabola reflector can be replaced in seconds with special-purpose reflectors. Expandable barndoors allow for many configurations, are removable with quarter-turn fasteners. (CENTER) Omni mounts on cameras with studs from 1/2" to 5/8". It operates on 30-volt power packs, 120-volt or 240-volt line sources. (RIGHT) All accessories from the Tota-System can be used with Omni-Light. Here a Lowel clamp secures light to a ladder. Extra-large handle can be used in any position.

such things as an "all-purpose" light, but this one comes as close as perhaps one can come to it.

In addition to operating off line current, the Omni-Light has a 30-volt battery operation capability. It can be held in the hand very comfortably and the focus control is right under the thumb, so that with one hand you can aim and focus the light. At the same time, it is suitable for stand operation with full production capabilities. It has very sophisticated barndoors with leaves that can be expanded to cover a large area, but can be closed in so that only a very narrow slit of light is emitted. The doors don't have to be removed in such a case, nor do the flaps, but the flaps can be removed in special cases where you may want not four, but three or two, one or none.

The barndoor system is very much like that of our 1000-watt Quartz-D light. The whole accessory system is very similar. On the other hand, the Omni-Light is very close to the Tota-Light and uses Tota-Light accessories — the same gel frame, the same umbrella, etc. This means that if you already own Tota-Light accessories, you won't have to buy new ones for the Omni-Light. Also, when working on location, you can take along relatively few accessories because they will work on both systems. Eventually we will have kits that combine several Omni-Lights with several Tota-Lights, because they are highly compatible with each other. Our whole philosophy is not to proliferate equipment or increase the number of accessories that people have to buy and carry, but to keep these to an absolute minimum, while assuring versatility in the field. I think this system does that.

The Omni-Light has a snoot and it's modular. For example, you can mount the snoot, put a set of barndoors at the end of it and another snoot at the end of the barndoors, and at any point you can

use the barndoor flaps to make sharper cuts. I must say that snoots used with non-lens systems have limited value, but by having an expandable system on the snoots you can still get some kind of cut.

With the Omni-Light we have a new stand which is basically a smaller version of the stand designed for the Quartz-D and the Softlight — the one that you see so frequently imitated at *Photokina*. It's become the "state-of-the-art" light stand and, in a sense, I guess it's flattering to have it imitated. The new stand has the same locking system as the Quartz-D stand, but is about the size of the one that we have for the Tota-Light and its gel frame has the same capability. You can use frost gels, neutral density gels, daylight correction, or special color gels for various effects. We also have a dichroic with this one and it's possible to use the dichroic with an umbrella, which gen-

erally isn't possible with mini-systems. Obviously, the light is drastically reduced when you use a dichroic in this way, so you would probably double up on units.

What we have shown at *Photokina* is not the final reflector for the Omni-Light, but very close to it. The focusing range for the prototype reflector (with a 120-volt, 600-watt lamp) is a startling 16-to-1, but in the production reflector we intend to build up the center intensity from the present 50 footcandles to somewhere between 60 and 75 footcandles and, at that point, the focusing range will drop from 16-to-1 to, we estimate, about 10-to-1. It's give or take a tiny bit, because a slight increase in the center drastically affects the focusing range.

Right now (with the 120-volt, 600-watt lamp), we have 800 footcandles in the spot position and that shouldn't

Continued on Page 1391

## TECHNICAL SPECIFICATIONS — LOWEL OMNI-LIGHT\*

SIZE:	3-3/8" x 8-1/2" x 5-5/8"							
WEIGHT:	1 lb. 10 oz. 2 lbs. 8 oz. with 16' cable.							
VOLTAGE:	30 V, 120V, 220/240V.							
MAX. WATTAGE:	650 Watts at 120, 220/240 Volts 250 Watts at 30 Volts See Lamp Chart.							
OUTPUT:**	With DYS lamp 600 Watts 120 Volts and standard Diffuse Reflector. Full Flood: 50 f.c. at 10 ft. (beam angle 60°). Full Spot: 800 f.c. at 10 ft. (beam angle 14°). Focusing Ratio: 16:1 With DYS lamp 600 Watts 120 Volts and specular reflector. Spot (only): 1250 f.c. at 10 ft. (beam angle 11°).							
CABLES:	AC Operation: 16 foot — 3 wire #18 SVO black hypalon with in-line switch. DC Operation: 5 foot — 3 wire #18 SVO black hypalon with in-line switch and standard Amphenol connector.							
LAMPS:	VOLTAGE	WATTS	ANSI CODE	LOWEL CODE	KELVIN	AVE. LIFE HRS.	TYPE	AMPS
	30	250	DYG	01-41G	3400	15	clear	8.3
	120	420	EKB	01-42B	3200	75	clear	3.5
	120	600	DYS/DYV	01-43S	3200	75	clear	5.0
	120	650	EKD	01-44D	3400	25	clear	5.4
	220/240	650	DYR	01-45R	3200	50	clear	3.0/2.7

\*\*All photometric data derived from prototype reflectors. Production units should reflect a final design goal of a 10:1 ratio or at 10 Ft. approximately 75 f.c. in full flood and 800 f.c. at full spot with diffuse reflector and 600 Watt DYS lamp.

\*Trade Mark

# THE ECLAIR ACL CAMERA WITH SINGLE-SYSTEM CAPABILITY



Presented at Photokina '76 was the long-awaited redesign of the popular Eclair ACL camera, embodying an electronically controlled facility for practical single-system sound recording

Visitors to *Photokina '76* were given a preview of a long-awaited development — namely, a practical single-system version of the popular Eclair ACL camera. The new system is markedly different from previous single-system attempts by Eclair, the major difference being that it is totally electronically controlled and does away with the flywheel principle formerly employed. What follows is the manufacturer's description of this interesting new equipment.

The department ECLAIR INTERNATIONAL of the Society SOREMECEHESS will offer from the beginning of 1977 a new type of Eclair ACL camera of original conception which will include sound recording directly onto magnetic striped film. The new camera, the performance of which is remarkable, will be known as "the Eclair ACL Single System — Compact Version", the commercial code name being SISYS.

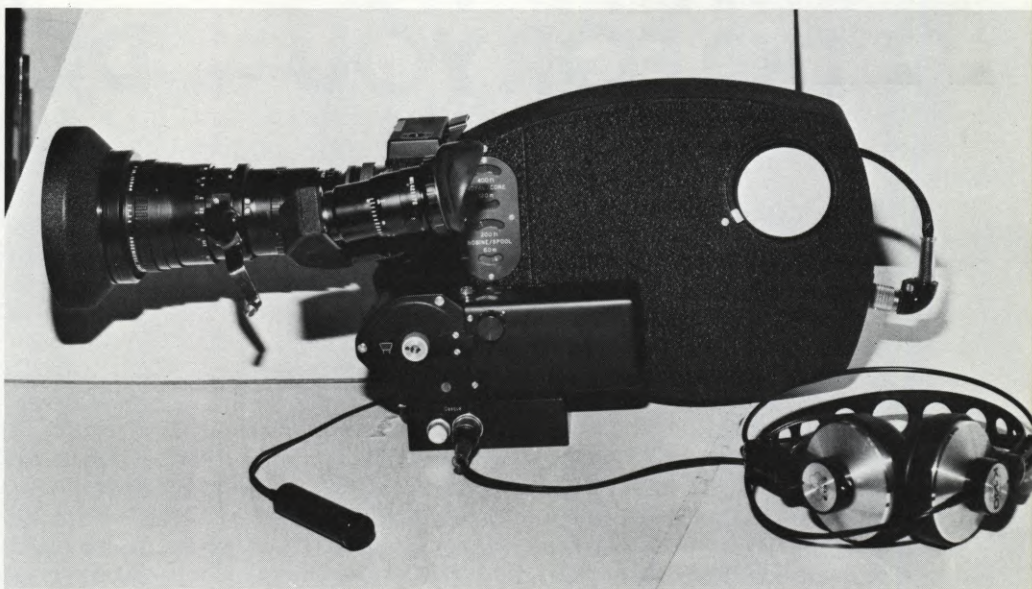
This ACL SISYS camera comprises the camera head, including the exposure indicator system and the MIVAR motor as it is supplied actually. This assembly is mounted in a new module which has a flat base large enough to support the camera. This module contains all the electronics and the controls of the single system.

The 60m (200-foot) and 120m (400-foot) magazines are of a new type but they retain the easy-threading facilities and the rapid-change of pre-loaded magazines. They include modules which ensure the passage of film and the recording of sound: a fixed upper assembly, a lower assembly removable for cleaning and a plug-in heads block easily interchangeable (recording and replay heads) with automatic electrical connections. A link cable ensures the connection between the magazine and the flat camera base.

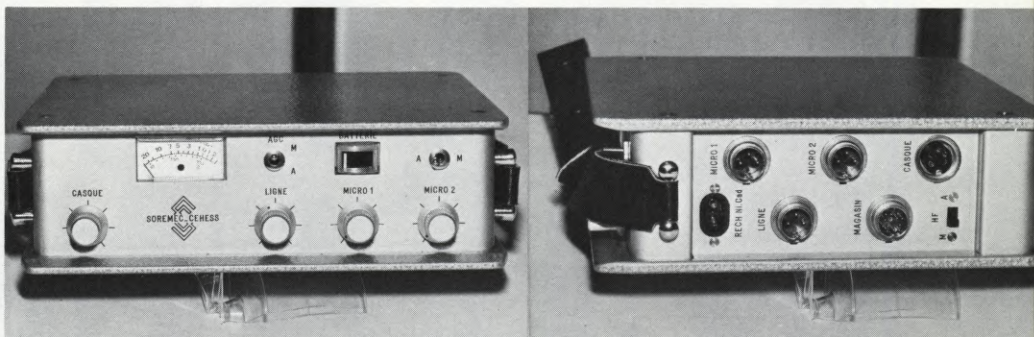
The above assembly, therefore, permits a single operator to film and to record sound.

In the case where a sound recordist is utilized, he must be equipped with a separate amplifier which will be connected directly to the camera magazine by a 10m link cable. This amplifier comprises all the electronics of the system, the indications, the controls, the plugs, the connection sockets and an integral power supply unit.

Continued on Page 1392

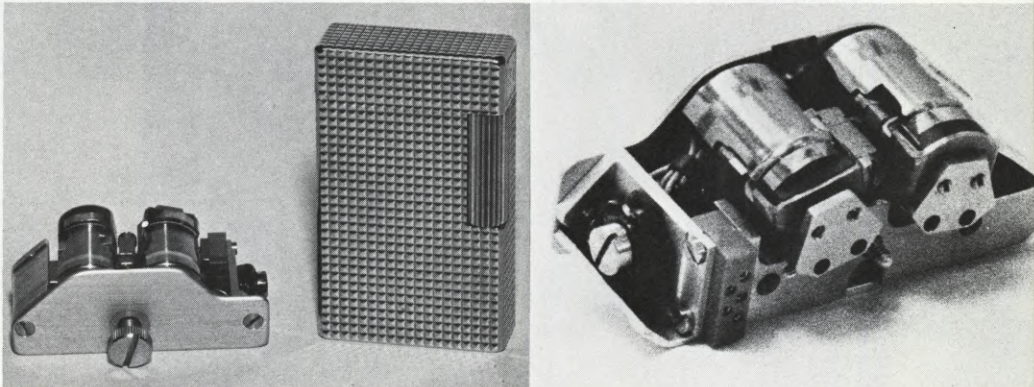


The new Eclair ACL Single-System Camera — Compact Version, which carries the commercial code designation: SISYS, and is described by its manufacturer as "of original conception". It is shown here ready for single-system filming, complete with 120-meter (400-foot) magazine, microphone and headphones.



The Eclair ACL SISYS camera is mounted on a module which contains all of the electronics for one-man single-system operation. However, where a sound recordist is utilized, he must be equipped with a separate external amplifier, which is connected directly to the camera magazine by means of a 10m link cable. (LEFT) Control panel side of the external amplifier. (RIGHT) Connections side of the external amplifier.

(LEFT) Front view of the SISYS heads block (combining recording and playback heads), shown with cigarette lighter for size orientation. (RIGHT) Rear view of the heads block. These plug-in blocks are easily interchangeable, having automatic electrical connections.



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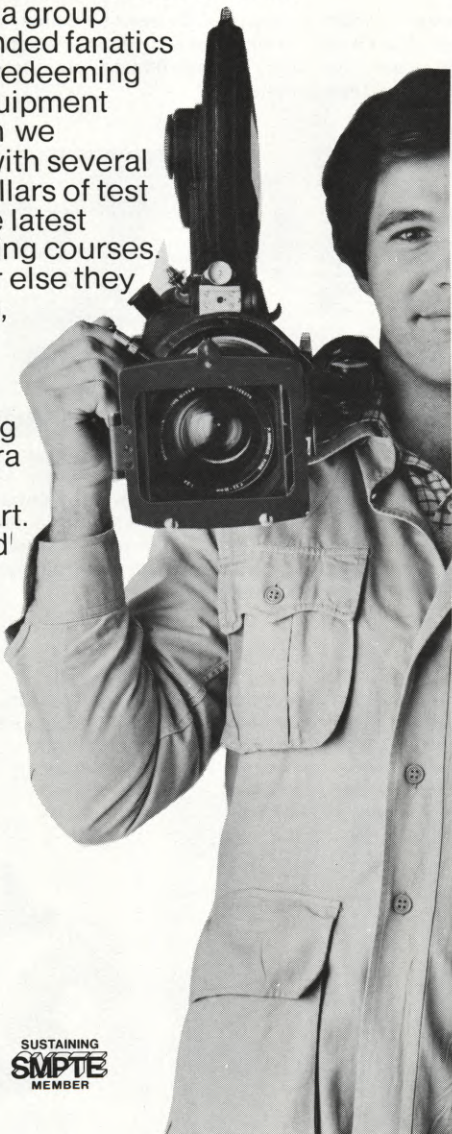
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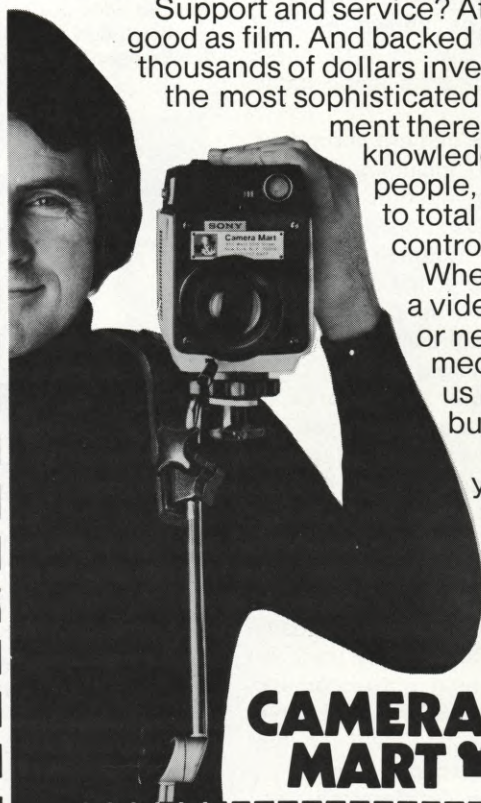
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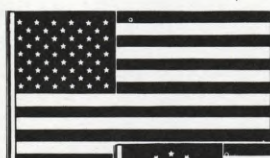


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## TIME BASE CODE Continued from Page 1335

duced by IRT (Institute for Radio Technology) in the spring of 1976.

In this system, real time information obtained from a highly accurate quartz clock is recorded in binary code. (BCD-code) Four bits are used to mark the second, minute, hour, day, month and year on the edge of the film by means of LED's once every second. The same information is recorded on the tape in the form of bi-polar code modulation, i.e., one being a positive pulse, zero being a negative pulse.

During the tape transfer from 1/4" to 16mm fullcoat, this information is picked up and recorded onto a separate track. An editing table, equipped with the complementary time base reader can then not only read and display this information, but also be programmed to find any position on the film or the tape and line them up in absolute synchronization.

Of course, from an engineering viewpoint, this is a rather simplified description of the system. However, its practical potential, the IRT Time Base Coding, is enormously exciting.

With this system it is possible to sync up a recorder, or several, with any number of cameras and allow them to move and operate totally independent of each other, maintaining constant synchronizing information on film and tape.

A practical example would be the filming of a concert or any "situation" where recorders are running in various positions and a number of camera crews are scattered over a large area.

The editor could program the table to find any given position on every sound and film track without the crew ever having used a clapstick.

The Time Base Coding represents a significant advance in motion picture production and post-production tech-

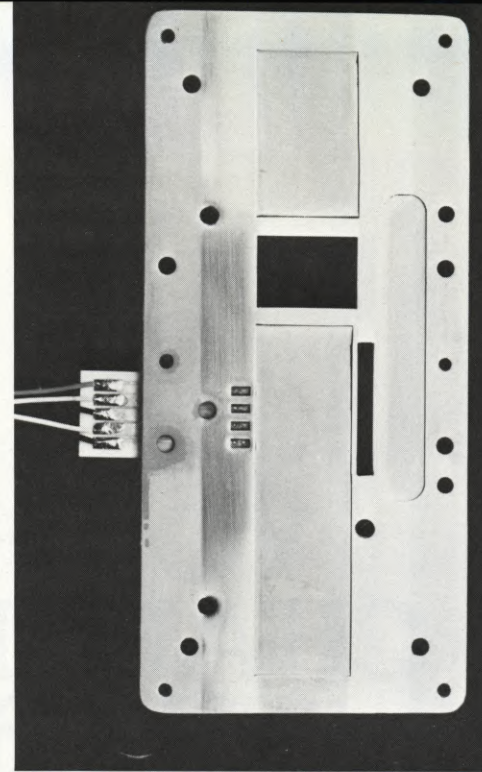
niques. We at Arriflex have anticipated Time Base Coding as a part of our Arri 16SR camera concept, so any 16SR can therefore be retro-fitted with the IRT system. ■

## Aäton TIME BASE CODE SYSTEM

After the days of pilotone, and then crystal, chronometric marking on sound tape and cinefilm today represents an important step in the evolution of double system filming. The clapper board, or some sort of RF transmission, are no longer needed. A marking system makes it possible to synchronize dailies automatically; synchronization of any given moment of a shot can be obtained during editing. The marking system gives an indication not only of hours, minutes, and seconds, but also the date of the shot and a number identifying the production or the camera. The script girl's work is thus much simplified, and film classification, mixing, and archive searching are facilitated as well.

Chronometric marking uses the crystals of the camera and sound recorder as the time base of a code generator which registers the seconds, minutes, hours, and date between the perforations on the edge of the film, and on the pilot track of the sound recorder.

The problem of synchronization between the various instruments is solved with the use of a master clock. The time and date displayed on this master clock are transmitted to the instruments by simply plugging in a cord. The advantage of such a system is that with a single injection of the time from the master clock, any number of instruments equipped with the chronometric marking system can be synchronized with each other. Any one of these instruments can be reset without having to gather together all the equipment used on the shoot (this is an ob-

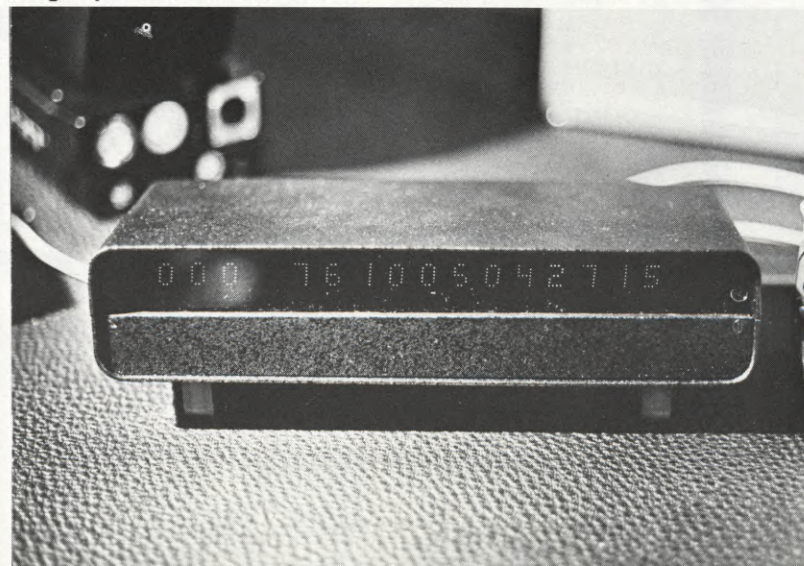


Aperture plate of a Time Base Code-modified Eclair ACL camera, showing slots through which light-emitting diodes (left) expose the binary code in terms of four bits to the frame.

vious advantage in cases of multi-camera filming). The precision of the master clock must be quite high, as it serves as a standard to all the equipment. During a filming day, it is used to reset instruments whose synchronism is reliable from 4 to 8 hours depending upon the quality of the crystals used.

Aäton has provided a system for chronometric marking, using a master clock and a code generator, linked for setting by a small cord. As simplicity and protection from error are of prime importance, Aäton sought to combine in the *master clock* a maximum of possibilities with ease of use and great security. As it uses the TDF coded transmission system (which functions according to the EBU's time coding

(LEFT) The Time Base Code module for the Arriflex 16SR camera is a flat electronics package that fits trimly onto the base of the camera. All cameras of that type are fitted with the plugs and cable harness to accept Time Base Coding. (RIGHT) Separate visual display unit provides a constant readout of Time Base Code information available for recording on picture and track.



principles), the master clock transmits information quite simply, similar to the transmission of TV signals. A specific low frequency serial coding (2400 Hz), and negative synchronization pulses are the basic elements of the system. The 2400 Hz is versatile: as a multiple of 60, 50, 24, and 25, it can be used to command a variety of different instruments.

The *link* between the master clock and the code generator in the camera is a single two-wire cord. This cord is the same one used for the on-off switch on the Aäton 7 handgrip; thus a spare is always on the camera should the clock/generator cable be misplaced.

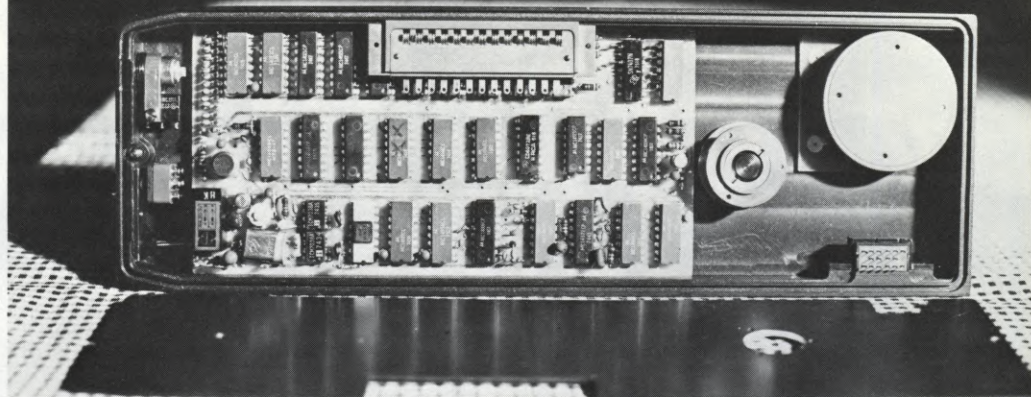
The *code generator*, a removable accessory of the camera, has 4 main functions:

- to indicate the time as it elapses;
- to drive the camera in perfect synchronization with the generator's own internal clock;
- to register the information on the film edge with the use of light-emitting diodes placed in the aperture plate. This information consists of the digital address, the elapsed time, and the equipment number. It can also be in the form of clear numbers directly read like the feet edge numbering, such as French TV channel TFI has requested.

- to indicate the seconds on a 7 segment display, therefore showing the actual figures (as opposed to the coded figures obtained from the diodes in the aperture plate). This display is on the outside of the camera body, allowing the cameraman to make sure his equipment is running efficiently.

It is in this fourth point that lies one of the more important aspects of the Aäton chronometric marking equipment. One of the guiding principles in all equipment Aäton makes for the cinematographic industry is that it should be made *for* the cameraman, and not in spite of him. This led Aäton to invent the Crystal Control Module six years ago, allowing the cameraman to check camera/recorder synchronization on location. Here again, the value of the equipment is increased immeasurably if the cameraman can be absolutely sure, *on location*, that his chronometric marking system is performing correctly.

Aäton so designed the code generator that if the seconds run correctly on the camera, there is no possible error in any of the coded date time information (use of serial incrementation). This is checked by comparing it side by side with the master clock, and is done with the naked eye. Both camera and clock



**Time Base Code module for the Arriflex 16SR camera, with cover removed to show the electronic circuit board. Every Arriflex 16SR camera is equipped to accept the IRT Time Base Coding, which has been accepted as the standard by European equipment manufacturers, though the choice of a standard system is still being debated elsewhere.**

should show the same second and beat at exactly the same instant. When the seconds appear in synchronism, the cameraman is sure that the system is running without any malfunction, and that the shift over, say, 4 to 5 hours is so negligible that it has no effect on the reliable performance of the system. ■

#### **TIME BASE CODE AND THE NAGRA RECORDER**

**By Henri Suter**

*Sales Engineer, Nagra Kudelski*

We have modified the well-known Nagra 4.2 recorder for Time Base Coding and, in so doing, we have taken certain circuits out of the machine — the built-in quartz, the slating receiver system and the frequency meter. This was necessary in order to have enough room inside to lodge the Time Code circuit.

Mechanically the machine is practically the same, except for the fact that we've had to separate the pilot from the sound track, so that we now have a sort of stereo head for the recording and the playback. This became necessary because, during the tests that we made in the factory, we found that the very sharp rises necessary for the code

information with a normal pilot head were actually breaking through onto the sound track, so we had to literally separate one from the other.

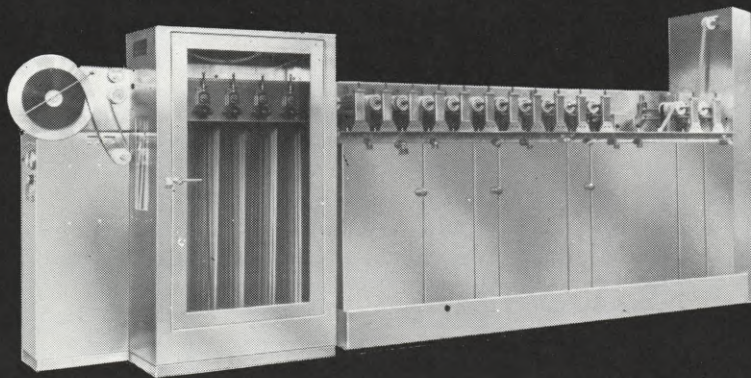
We have introduced a feature which was not originally requested by the E.B.U. Commission, nor by the I.R.T., and that is that you can still use the Nagra 4.2 after modification as a machine for conventional pilot recording, either by cable connection to the camera or by using the built-in quartz crystal. Once the external pilot is introduced to the tape recorder, the Time Code device is immediately switched off and recording takes place with the normal pilot in the conventional manner, with the same features for playback synchronization or transfer in sync with the mains power supply for transfer to perforated tape machines. This is an interesting feature, because we still have the same facility for synchronization, even if we are using the Time Code on the tape. We still have a sine-wave output from the Nagra which can be used to feed back as a signal for synchronizing the machine — again, with the Time Code to the mains power supply or to an external reference, as may be required.

**Continued on Page 1394**

**The heart of the Time Base Code system is this master clock, actually a highly accurate quartz crystal signal generator. The code generators of all cameras and recorders involved in a particular shoot are "set" by means of the same master clock prior to filming and they will remain in perfect time-based sync for at least four hours.**

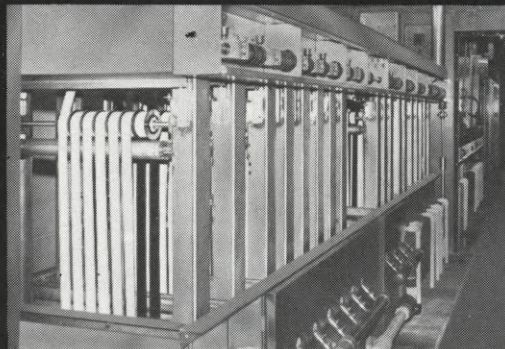


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### SIGNIFICANT MICRO-DEMAND FEATURES:

- |                      |  |                          |   |
|----------------------|--|--------------------------|---|
| <b>Versatility</b>   | Any speed, any process.  | <input type="checkbox"/> | Push-Button operation, and reliability allows operator to perform other functions while the machine is running! |
| <b>Reliability</b>   | Rugged construction, quality materials and sound engineering. Always ready when you are!   | <input type="checkbox"/> | Automatic compensation for elongation and contraction of film during processing cycle.                          |
| <b>Flexibility</b>   | Any format 35mm, 35/32mm (1-3), 35/32mm (1-4), 35mm 5R S8, 16mm — 70MM-105MM etc.  | <input type="checkbox"/> | Virtually eliminates all film breakage, scratches and static marks.   |
| <b>Dependability</b> | Can stand the gaff of long, continuous, top speed runs with "Zero-down-time."  | <input type="checkbox"/> | All film spools use standard bearings or bushings.  |
| <b>Credibility</b>   | Ask the labs who own them. Most of them own not one but several.   | <input type="checkbox"/> | Entire upper film shaft/roller assemblies easily removed. No tools needed.                                      |
| <b>Maintenance</b>   | Exclusive Maintenance Monitor tells when and where the machine needs attention. Significant savings assured.   | <input type="checkbox"/> | Stainless steel construction used throughout.   |
| <b>Performance</b>   | Every Filmline machine is backed by a superb performance record compiled in over 25 years of continuous service to the industry. Twenty five years in the forefront of processing machine design and innovation. | <input type="checkbox"/> | Proper operation can be determined at a glance, while machine is running.                                       |
|                      |  | <input type="checkbox"/> | Submerged developer racks.  |
|                      |  | <input type="checkbox"/> | Pumps for recirculation and agitation of all required systems.  |
|                      |  | <input type="checkbox"/> | Professional spray bars.  |
|                      |  | <input type="checkbox"/> | In-line filters on all required systems.  |
|                      |  | <input type="checkbox"/> | Professional air and wiper squeegees.   |
|                      |  | <input type="checkbox"/> | Temp-Guard Temperature Control System. Thermistor sensing and transistorized controller.                        |
|                      |  | <input type="checkbox"/> | Film-Guard dry box with dual heat input and dial thermometer.   |
|                      |  | <input type="checkbox"/> | Individual switches for all control functions.  |

"Filmline Engineering and Consulting Services for Complete Laboratories are Available Worldwide."

Filmline Continuous Film Processors are used throughout the world by: Deluxe-General, Technicolor, Inc., Capital Film Labs, Byron Motion Pictures, TVC Labs., Movielab, Radiant Laboratories, Guffanti Labs, Precision Film Labs, Bellevue-Pathé, ABC, CBS, NBC Network TV, NASA, General Motors, RCA, IBM, AEC... and thousands of others.

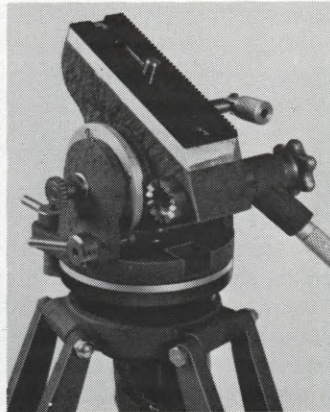
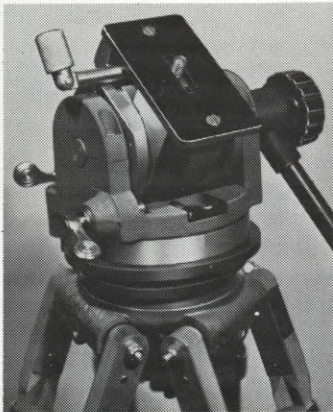


Filmline Corporation, Dept. AD-76  
Milford, Connecticut 06460 — 203-878-2433

Eastern Hemisphere:  
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# “Pro-Jr. is the best tripod in the business and priced far below competitive products.”\*

**PRO-JR. FLUID HEAD.**  
Silicone fluid assures maximum smoothness. Features adjustable tie-down screw to balance camera; accessible camera-mounting knob; panhandle with adjustable angle position; L-spirit level; 360° pan, 55° tilt action backwards and forwards. Accommodates any camera up to 30 lbs.  
Weight: 11 lbs.  
Fluid Head Complete with Swivel Bowl and Legs. \$675.00.  
Without Legs \$550.



**PRO-JR. MINI FLUID HEAD**  
Exclusive silicone formula fluid assures maximum smoothness. 360° pan, 55° tilt action backwards and forwards. Ball leveling. Spirit level. Tilt tension adjustment. Positive locks. Adjustable tie-down screw to balance camera. Accessible camera mounting knob; pan handle with adjustable angle positions. Swivel bowl and top tripod casting. Accommodates any camera up to 20 lbs.  
Weight 9 lbs. Head complete with swivel bowl and Mini-Pro Jr. Legs. \$450. Mini Fluid Head and Pro-Jr. V-Grooved. Legs. \$495. Without Legs. \$375.00.

## After 40 years, 10,000 Pro-Jrs. are still in daily use.

But over those 40 years we've never stopped improving it. And the all-new ball-joint heads and V-grooved legs reflect the Pro-Jr.'s continuous improvement in design and operation. Pro-Jr. is now all magnesium. To make it the most efficient and most light-weight tripod ever made.

*Now Pro-Jr. is the strongest, the smoothest and the lightest. And you can't beat the price.*

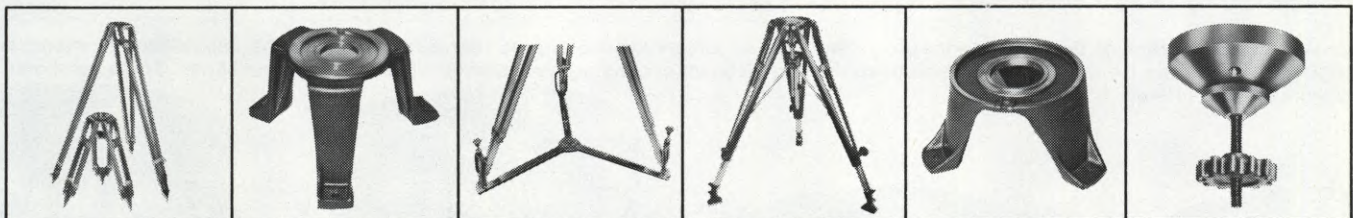
It has an instant leveling swivel bowl that helps you keep the camera level. It eliminates time consuming leg adjustments. And its magnesium fluid drive and friction drive heads can be used with all cameras. They're tough. They're dependable. They provide you with years of trouble-free service. Efficient operation is guaranteed in temperatures from 20° below zero through 120° above.

Find out about the improvements in the Pro-Jr. and you'll find out why it's the best tripod in the business.

Available from professional equipment dealers—or direct from F&B/Ceco.

*\*Say 64 major equipment dealers throughout the U.S. and 30 foreign countries.*

### Other tripod accessories available from F&B/Ceco:



**PRO-JR. ADJUSTABLE  
V-GROOVED LEGS**  
\$125.00

**PRO-JR. HI-HAT**  
\$48.00

**PRO-JR. COLLAPSIBLE  
LEG CLAMP TRIANGLE**  
\$69.95

**PROFESSIONAL  
ALL METAL TRIPOD**  
\$350.00

**MITCHELL TYPE HI-HAT**  
\$48.00

**UNIVERSAL BALL ADAPTER**  
\$60.00

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SALES—SOS DIVISION

315 West 43 St., New York, N.Y. 10036/(212) 586-1420  
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# NEW NIPPONSCOPE ANAMORPHIC LENS SYSTEM



A set of high-speed anamorphic lenses designed for feature film production and available for sale—plus a series of adaptors to convert prime lenses for anamorphic use

Ryudensha Co., Ltd. introduced at *Photokina '76* its new "NIPPONSCOPE" system of anamorphic lenses, primarily designed for use by the feature motion picture industry. Ryudensha offers these lenses for sale only.

The NIPPONSCOPE system features a number of characteristics that should prove interesting to professional cinematographers:

*Nipponscope offers Ultra-speed Anamorphic Lenses*

Claiming to be T/1.4 throughout the system, these lenses are consistent with the industry trend toward the use of fast lenses — particularly for location and night shooting.

*Anamorphic Adaptor offered separately from prime lenses*

Adaptors to supply the NIPPO-

SCOPE anamorphic lenses as complete units incorporating fast prime lenses, Ryudensha also is making available anamorphic adaptors as detachable components, permitting the prime spherical lenses to be used separately and, thereby, reducing the cost of the anamorphic system.

*No loss of lens speed from prime lenses*

Since the anamorphic element is positioned at the front end of the prime lens, there is no loss of speed in the NIPPONSCOPE system.

*Interchangeable adaptors for further cost savings*

Because the cost of the anamorphic component is very much higher than that of the prime lens, NIPPONSCOPE has engineered a new system that permits one anamorphic adaptor to be

fitted to more than one prime lens. Adaptor interchangeability is as follows:

"A" ADAPTOR: 40mm and 50mm prime lenses

"B" ADAPTOR: 50mm and 70mm prime lenses

"C" ADAPTOR: 50mm, 75mm and 100mm prime lenses

*Anamorphic adaptors for zoom lenses*

NIPPONSCOPE also offers rear anamorphic adaptors for all makes of zoom lenses. In this case, the loss of speed is two stops.

**FEATURES OF NIPPONSCOPE LENSES**

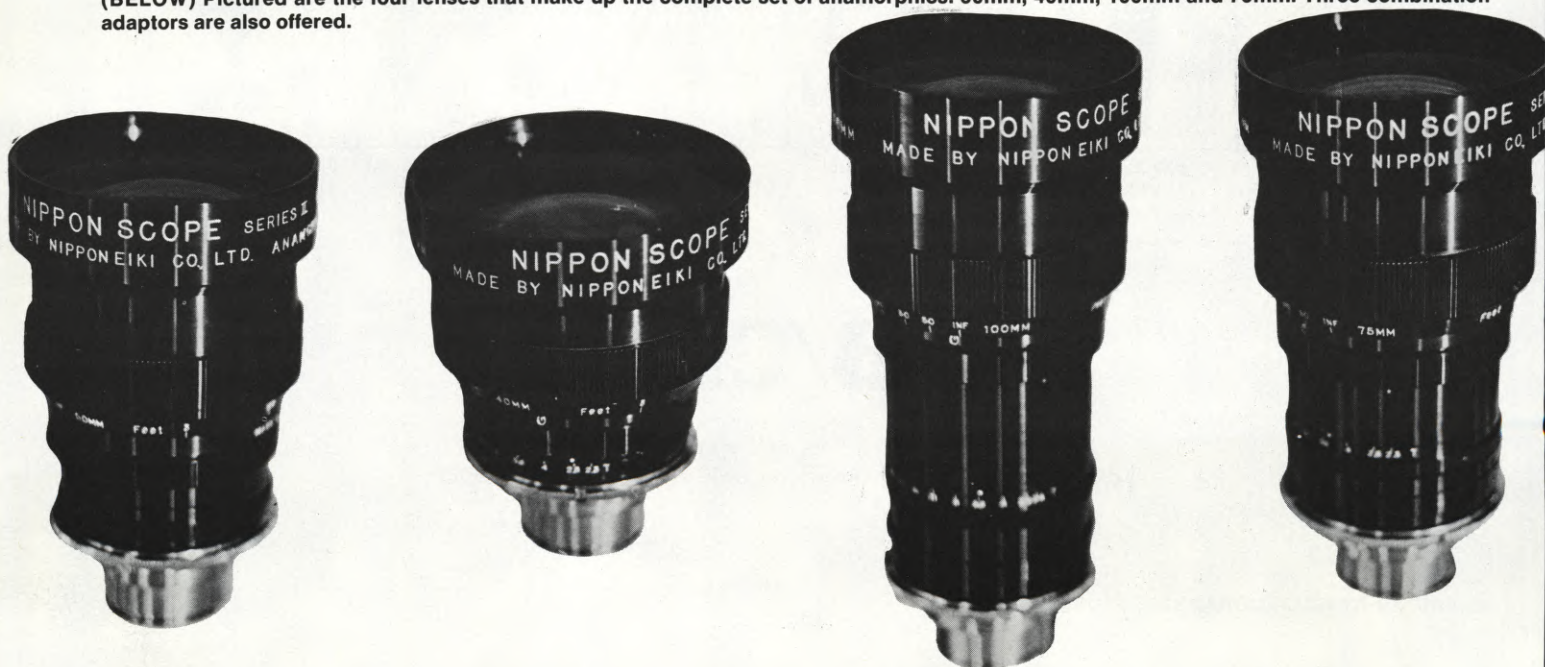
- New Nipponscope Anamorphic Lenses have T-stops (except for rear

Continued on Page 1392

## SPECIFICATIONS...

Focal Length	Lens type	Lens Construction (components elements)	Front glass diameter	Rear glass diameter	Distance from front glass to focus	Distance from rear glass to focus	Vertical angle	Horizontal angle	Code number
40MM	Fixed Proxar-focus type	6-8	95	30	131.24	29.74	22.7	57.2	14-40
50MM	Fixed Proxar-focus type	6-8	88	25	157.55	35.55	18.3	46.6	14-50
75MM	Fixed Proxar-focus type	5-8	88	65	201.49	43.49	12.2	32.7	14-75
100MM	Fixed Proxar-focus type	5-8	88	75	232.83	62.83	9.1	24.7	14-100
50~500MM	Rear attachment	3-8	30	25	55.00	26.00	20.6~2.1	46.2~4.9	R-100

(ABOVE) Specifications of the four anamorphic Nipponscope lenses available, plus rear attachment for the 50mm-500mm zoom lens. (BELOW) Pictured are the four lenses that make up the complete set of anamorphics: 50mm, 40mm, 100mm and 75mm. Three combination adaptors are also offered.



# THE NEW O'CONNOR MODEL 30 FLUID CAMERA HEAD



A small, lightweight fluid head specially designed to support motion picture and video cameras weighing up to 30 pounds, but having the features and smooth action of much larger heads

For more than twenty-five years, O'Connor Engineering Laboratories, Inc. has been specializing in the design and manufacture of fluid camera heads.

Introduced at *Photokina '76* was the newest addition to the O'Connor line — the Model 30, which the manufacturer considers to be the culmination of its quarter-century of experience in building fluid heads and regards as quite possibly the most desirable head the company has ever built.

It is surprisingly small and weighs only 5 lbs. Yet it will easily handle motion picture and video cameras weighing up to 30 lbs. It has all the features and smooth-steady action found on the largest and most elaborate O'Connor heads.

This entirely new fluid head is unlike all others in its engineering. The counterbalance is unique in that it can be easily adjusted for a 10- to 30-lb. camera while in the field. The continuously adjustable new fluid type drag mechanism is a totally new concept for O'Connor providing very smooth and sensitive panning through 360°, and tilting up to ± 60°. Both the pan and tilt locks are independent of the fluid system.

For smaller motion picture and video cameras, the Model 30 is the perfect head for ultra-smooth action photography.

## FEATURES:

1. Pan and Tilt Drag rather than being adjusted with one knob, are independently adjustable. The fluid range will be a minimum of a 3-to-1 ratio.
2. The bearings have been changed from sleeve to roller type to give smoother operation and eliminate breakaway friction.
3. The spring design and operation eliminates the spring feel and still counterbalances the camera so that you are able to stop a tilt and the camera remains in that position. Effectively, you feel no weight or spring, only fluid.

## SUMMARY:

The Model 30 is lighter, works smoother and compensates for camera-weight better than past heads and is priced well within the budget of

film and video cameramen around the world.

## SPECIFICATIONS

Capacity ..... 30 lbs. (13.6 Kg)  
 Weight ..... 5 lbs. (2 Kg)  
 Size ..... 4¼" high, 7" wide, 5" long  
 Pan ..... 360°  
 Pan lock ..... Independent from fluid system  
 Tilt ..... 60° up and 60° down  
 Tilt lock ..... Independent from fluid system  
 Counterbalance .... Adjustable in field from 10 lb. to 30 lb. camera  
 Camera mounting screw ⅜"-16 (¼"-20 on special order)  
 Base ..... Flat (⅜"-16 threaded insert) options available

Handle .... Vertically and horizontally adjustable

Temperature range ..... -20° to 120°F  
 -29° to 49°C

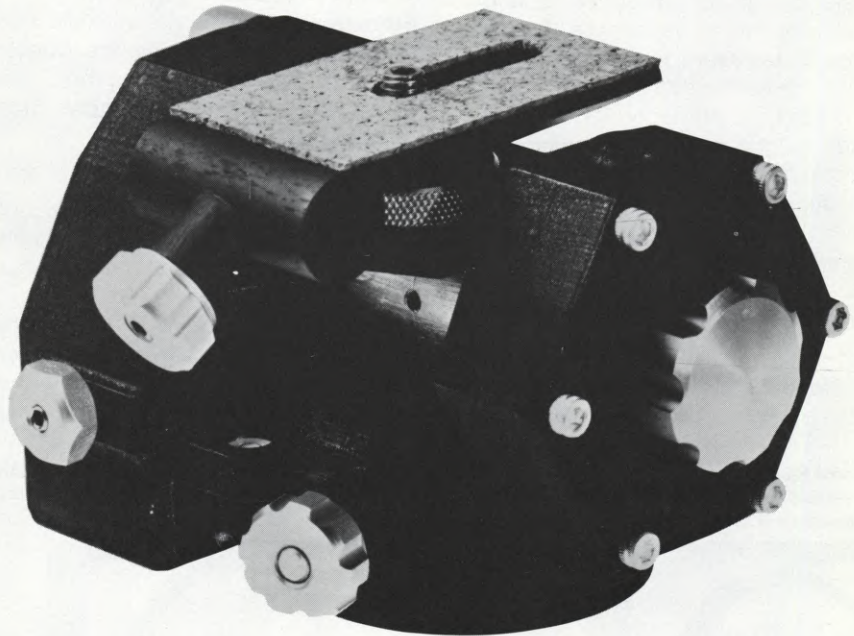
Material ..... Cast aluminum  
 Finish ... Black wrinkle baked enamel, anodized or plated

Bearings ..... Roller

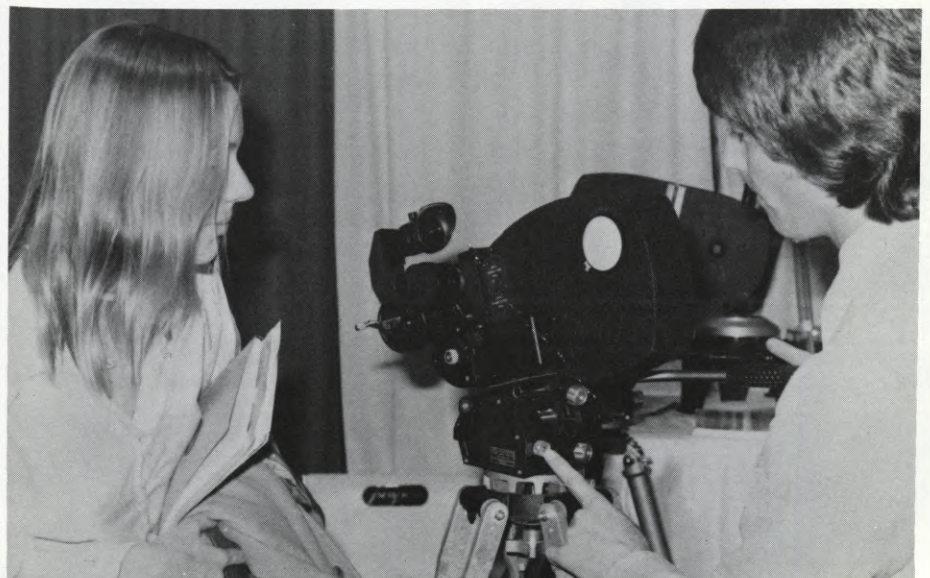
Shipping weight ..... 7 lbs. (3.2 Kg)

Accessories ... Pro Jr. base, claw ball base, removable plate platform, video double handles and metal shipping case and assorted tripods

For further information, contact: O'CONNOR ENGINEERING LABORATORIES, INC., 100 Kalmus Drive, Irvine Industrial Complex, Costa Mesa, California 92626. ■



(ABOVE) The O'Connor Model 30 Fluid Head weighs only 5 pounds and has a unique counterbalance which permits easy adjustment for a 10- to 30-pound camera in the field. (BELOW) Cary Clayton of O'Connor Engineering Laboratories, Inc. demonstrates the new Model 30 Head.



# NEW SPECTRA SERIES II ELECTRONIC EXPOSURE METERS



The manufacturer of the exposure meter which has been the classic workhorse of the film industry for decades introduces a line of new and handsome models that are even more versatile in scope

Ever since the early 1940s, the familiar Spectra meter has served as the standard of the professional motion picture industry for the precise measurement of incident light.

Based on a 1941 design by Capt. Don Norwood, the classic model has undergone many changes in sophistication and sensitivity during the past few decades, while still retaining its basic rectangular configuration, large "photosphere" light collector and the feature of employing multiple slides for the accommodation to various ASA ratings.

However, at *Photokina '76*, Photo Research, long the manufacturer of the Spectra meter, startled the industry by making a wide departure from its classic design to introduce a completely new line of handsome "Spectra Series II" exposure meters which feature a "streamlined" modern configuration that comfortably fits the hand, lighter weight, a slightly smaller light collector and the elimination of the multiple slides (which some cinematographers have found cumbersome to cope with).

Photo Research describes the characteristics of its new Spectra II Electronic Exposure Meters as follows:

- **Incident Light Readings**

Preferred by pros because subject

brightness and contrast do not affect reading accuracy. The Spectra PHOTOSPHERE® gathers all light falling on the subject and, instantly, provides a single reading for correct exposure of all tonal values of the subject.

- **Reflected Light Reading**

Where incident readings are impossible or impractical, Spectra meters can be quickly converted to measure reflected light.

- **Direct Aperture Readings**

Whichever method you choose, you can read the correct f-stop directly on the large, clearly marked computer scale. No calculations necessary.

- **Convenient Swivel Head**

Permits reading the meter scale from any angle while keeping the Spectra head in measuring position and preventing unwanted shadows from affecting the reading.

- **Widest Versatility**

Every Spectra exposure meter accepts a number of ingenious accessories with which to solve just about any light measuring problem.

The Spectra Series II meters are the finest and most sensitive ever offered. True state-of-the-art instruments, they are built with traditional Spectra

precision and embody the most advanced U.S. solid-state technology. Here are some of their unique refinements.

- **Ultra-Wide Sensitivity Range**

Their light measuring capabilities, extend from near-total darkness — as low as 0.004 foot candles — to a full 100,000 fc, a brightness range of 25 million to one!

- **Silicon Photocell**

Most advanced of all light sensors, with four important advantages: (1) greatest sensitivity at low light levels; (2) instant response; (3) no "memory" — will not cause faulty readings after exposure to brightest light; (4) most uniformly accurate response to all colors of light.

- **Solid State Design**

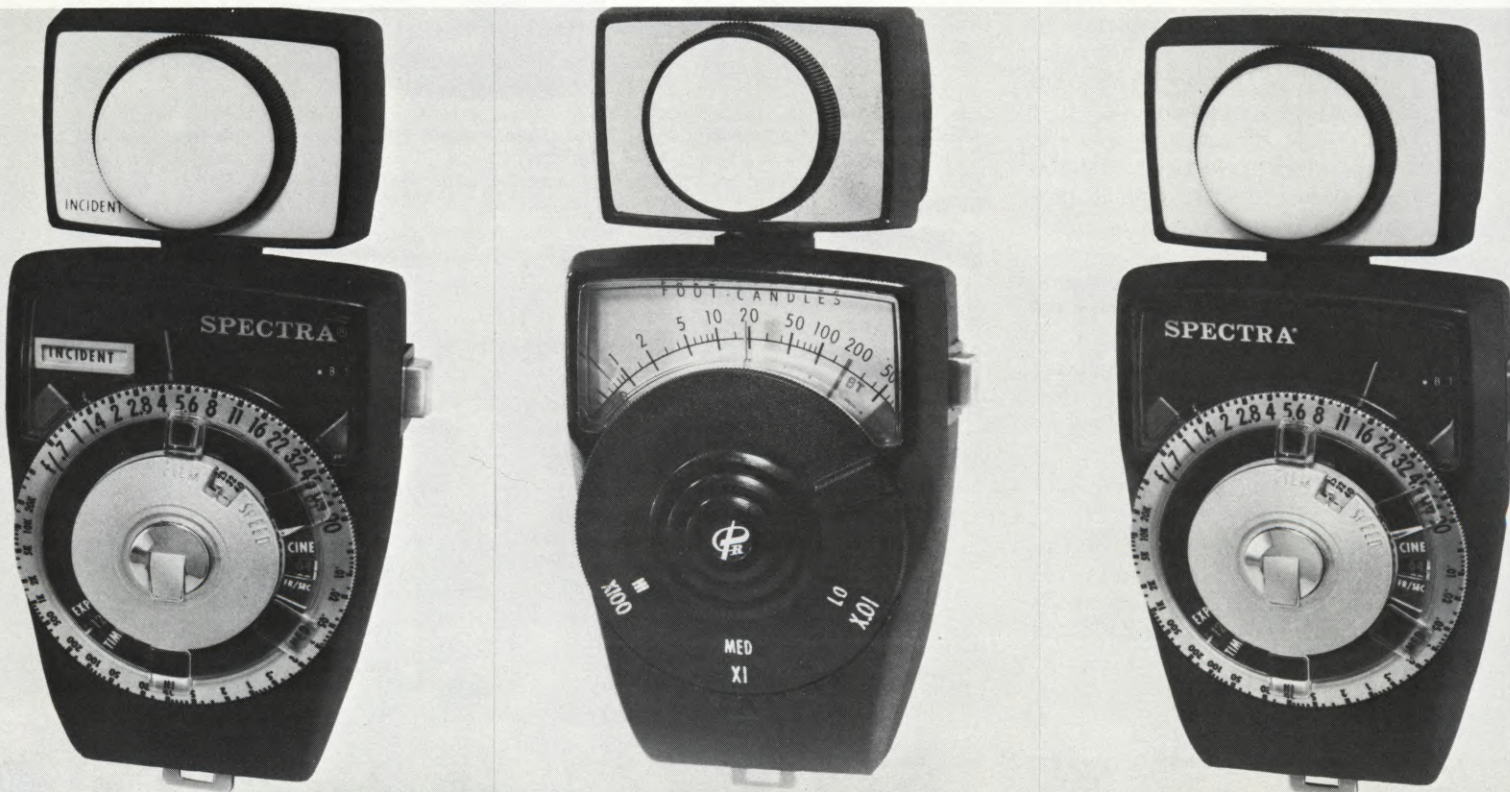
Latest integrated electronic circuitry is another reason for the instant response of these Spectra meters; also helps assure their complete, enduring accuracy.

- **Push-Button Computer Readings**

Simply touch a button and read the correct aperture on the clearly legible scale (individually calibrated on every Spectra meter). Built-in pointer lock holds readings.

Continued on Page 1389

The new Spectra Series II Electronic Exposure Meters are completely different in appearance from the classic Spectra exposure meter which has served as the world-wide standard since 1941, (LEFT) The Spectra Combi II (CENTER) The Spectra Lumicon (RIGHT) The Spectra Professional II.





# KOBOLD REPORTERLIGHT 200-EL PORTABLE HMI UNIT



Displayed at *Photokina '76*, and attracting considerable attention, was the Kobold REPORTERLIGHT 200-EL Portable HMI Unit which, according to the manufacturer, offers the daylight equivalent to 1000 watts of halogen incandescent light from the battery at a power consumption of only C. 200 watts, with light intensity and color-temperature variations "that can practically not be measured" — namely  $\pm 5\%$ , independent of the discharge of the battery, within the range of power available.

In addition, it offers that feature con-  
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A portable battery-operated HMI unit which offers the daylight equivalent of 1000 watts of tungsten-halogen light at a power consumption on only 200 watts with stable light and color values

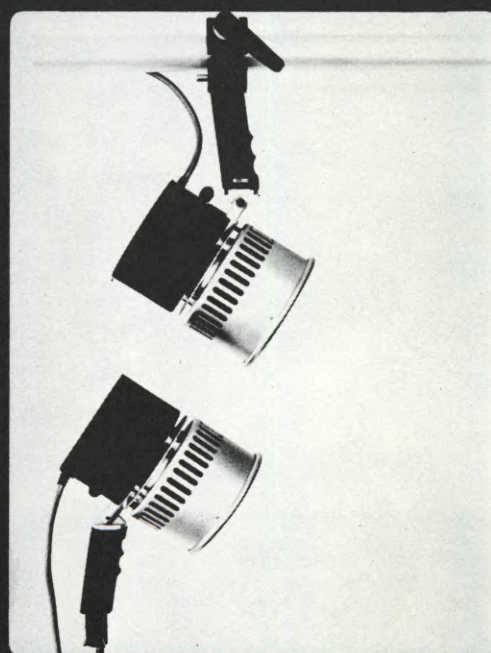
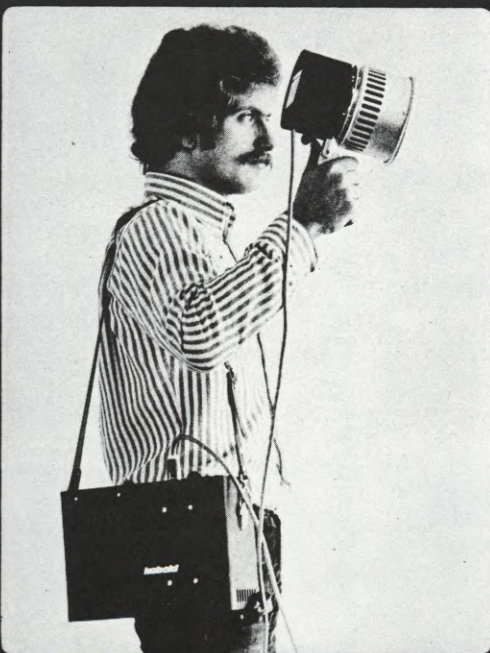
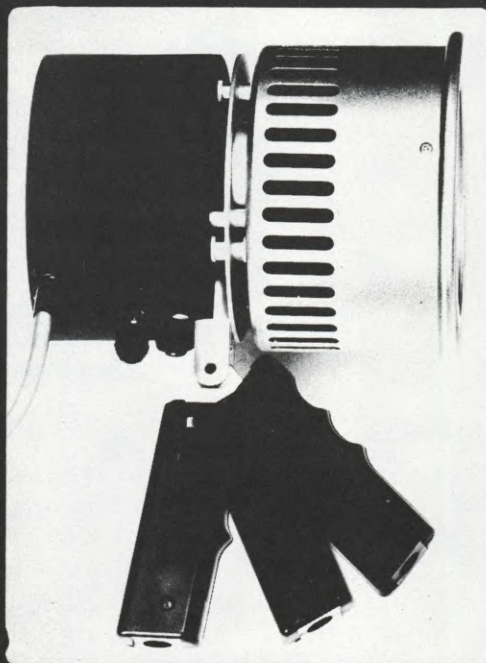
## UNIT CONSISTS OF:

DLf080	head with igniter, handgrip with 3/8" thread, 5/8" stud, cable 2,5m
DLf011	4-leaf barn door with filter holder
DLf012	diffusion filter in case
DLf013	HMI lamp 200
DLf081	electronic module with clip-on mechanism for battery pack
BA-30EL/7	NiCad battery pack 30v 7Ah with LED voltage-meter and automatic cut-off for battery protection
LA-30E	charger 110/220v 50Hz
DLf082	carrying strap
DLf083	case

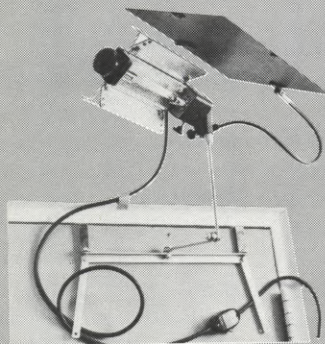
## ACCESSORIES:

BA-30EL/4	NiCad battery pack 30v 4Ah with LED voltage-meter and automatic cut-off for battery protection
DLf018	dichroic filter 3200k in case
ST-262	aluminium stand $\phi$ 16mm/5/8" bushing 68.6/240 cm
DLf084	'rain' protection shield for electronic + battery pack
DLf085	battery tester to check battery pack without head/electronic module

The new Kobold Reporterlight 200-EL Portable HMI unit, shown here in its various aspects, offers the daylight equivalent of 1000 watts of tungsten-halogen light, with a power consumption of only 200 watts. In addition, it offers that feature considered most important in metal halogen daylight units: no flickering — independent of camera speed, shutter angle and speed variations of motor.



# Location lighting's not what it used to be.



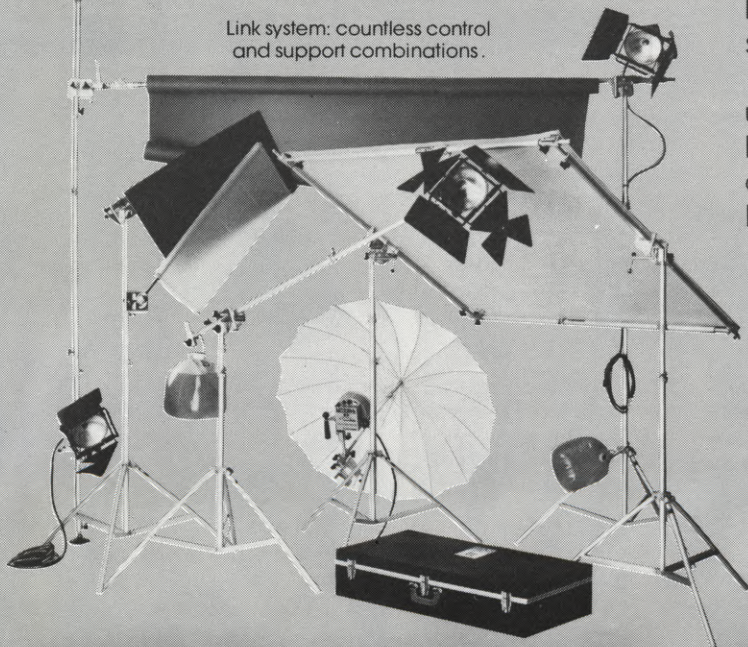
Tota-Light: new flexibility in mounting and control.

Location lighting imposes a number of unique requirements for well-thought-out, durably-built equipment. Over the last fifteen years, Lowel systems have proven themselves in a wide variety of applications in motion pictures, still photography and video. And, in the process, changed location lighting from a compromise to a creative tool.

**Tiny Tota-Light.** More than a small 1000, 750 and 500-watt light with an ultra-wide, even pattern: it's the first professional quartz light built like a system camera, with lock-on mounting and control accessories.

**Modular Link System.** Solves grip and control problems as they occur on location. Rugged, light-weight components interlock to form flags, booms, diffusers...dozens of other rigs. Outstanding stands: with unusually high strength-to-weight ratios.

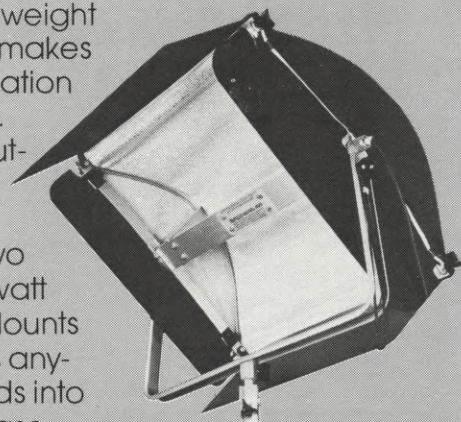
Link system: countless control and support combinations.



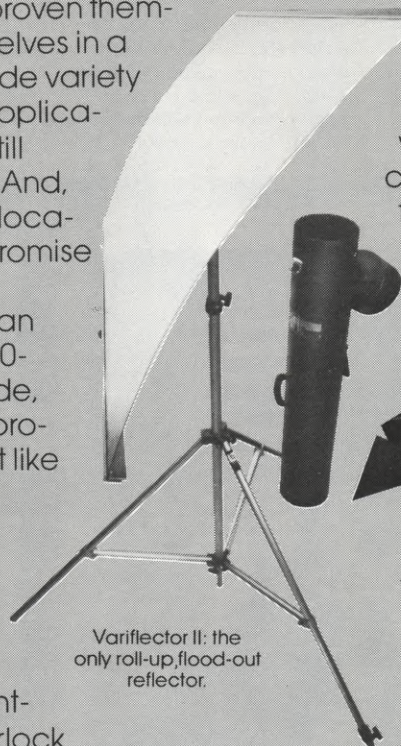
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**Folding Softlight 1500.** Only a fraction of the weight of studio units, it makes soft-shadow location lighting a reality. Delivers more output than most 2K softlights

with two 750-watt lamps. Mounts or clamps anywhere...folds into compact case for travel.

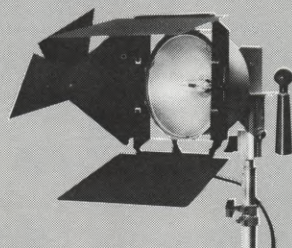


Softlight 1500: the large, soft-shadow source that fits in a small case.



Variflector II: the only roll-up, flood-out reflector.

**Roll-up Variflector II.** The only truly portable, professional reflector. Complete flood control through 3:1 ratio, to adjust brightness and spread. Rolls up to fit in compact case with stand.

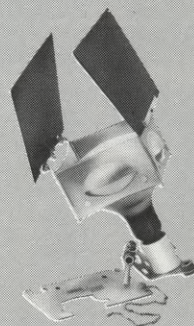


Quartz "D": 7-1 focusing plus high intensity.

**Workhorse Quartz "D."** Studio versatility in a compact, light-weight focusing unit with wide (7:1) spot/flood ratio and inter-

changeable 1000, 750 and 500-watt lamps. Quick-change accessory-reflector system transforms it from a versatile general-purpose light to a high-intensity, long-throw source.

**Lowel-Light.** The tape-up, clamp-on light that helped change the industry's approach to location lighting, and introduced Gaffer-Tape™. Some of the original units are still going strong, after 15 years of rental.



The Antique.

For more information on Lowel products see your dealer or contact us.

**lowel** 

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West Coast: 3407 West Olive Avenue,  
Burbank, Ca (213) 846-7740

# the problem solver

**PROBLEM:** Produce a television series that uses many oversized props combined with chroma-keying where standard boom microphone techniques would be virtually impossible.

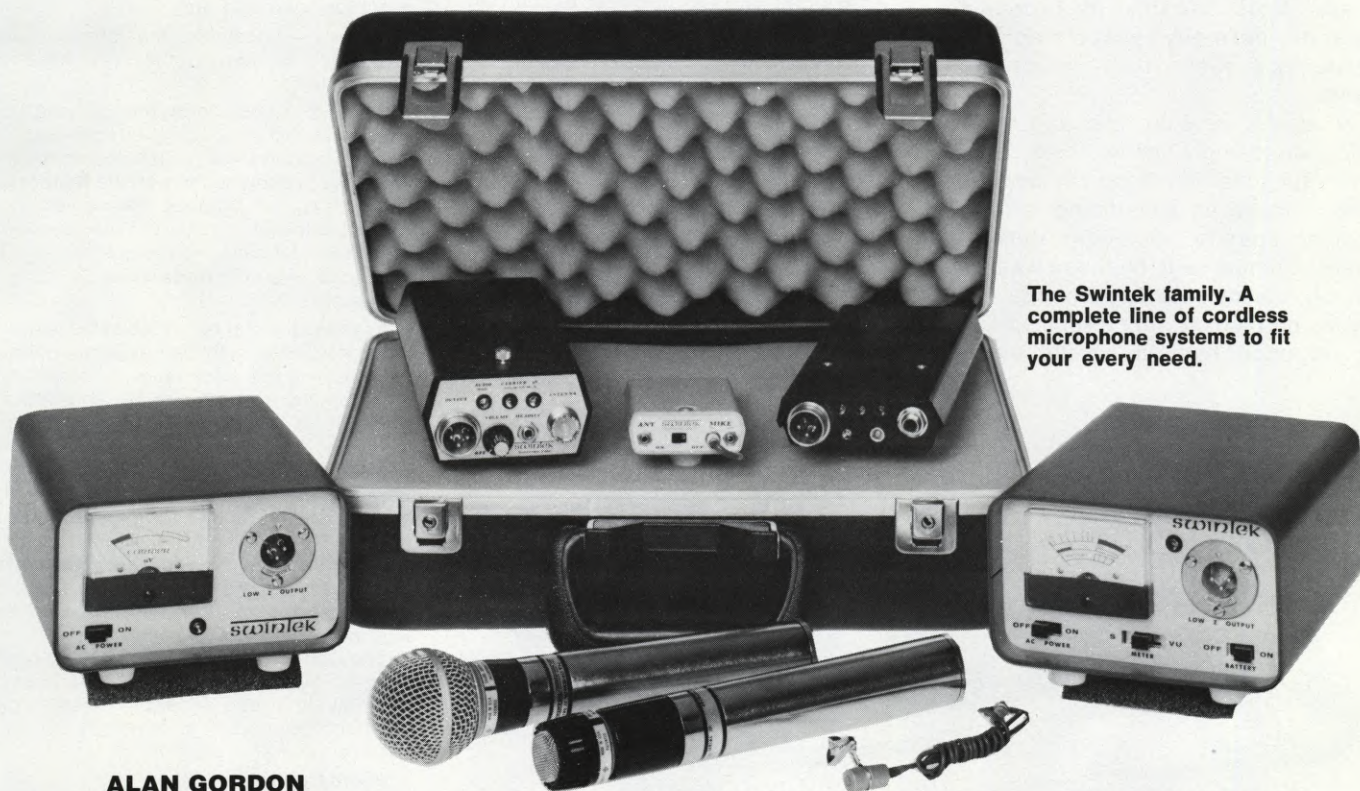
**SOLUTION:** Uses six Swintek wireless microphones on cast principals, thus allowing complete freedom of movement without the need of mike booms or cords.

While versatility is one of the many Swintek features, performance is the most important quality this outstanding cordless sound system offers. The six wireless microphones used to solve the above problem produced optimum sound quality with no interchannel interference, no case noise and no multipath or weak RF in three months of continuous daily production. **Can Swintek solve a sound problem for you? Call or write us today.**



Six Swintek cordless microphones were used on the cast principals in the production of the Krofft Supershow, "Dr. Shriner," which airs on ABC-TV. The six Swintek receivers are shown above, just off the giant chroma-key stage used for the series. Swintek equipment allowed for a minimum of set-up time on the show's six sets and provided outstanding professional sound.

## Swintek Cordless Microphone System



The Swintek family. A complete line of cordless microphone systems to fit your every need.

**ALAN GORDON ENTERPRISES, INC.**

1430 N. Cahuenga Blvd.  
Hollywood, Calif. 90028  
(213) 466-3561/(213) 985-5500

**VICTOR DUNCAN, INC.**

200 E. Ontario, Chicago, Illinois 60611 (312) 321-9406  
2659 Fondren, Dallas, Texas 75206 (214) 369-1165  
11043 Gratiot, Detroit, Michigan 48213 (313) 371-4920

**MOBIUS CINE LTD.**

7 East 47th Street  
New York, N.Y. 10017  
(212) 758-3770

Swintek wireless microphones were selected by ABC, CBC, The National Film Board of Canada, and The Olympic Radio and Television Organization for use at the 1976 Summer Olympiad, Montreal.

# 350S "STYLOPHONE" SYNTHESIZER FOR ELECTRONIC MUSIC AND SOUND EFFECTS



An amazing electronic instrument small enough to fit into a brief case, yet capable of simulating the tones of almost all of the instruments of the orchestra, plus a wide range of sound effects

In recent years the ingenious Moog Synthesizer has become almost standard equipment in the recording of unusual electronic musical scores and effects for motion picture sound tracks. However, great as it is, not everyone (and least of all, low-budget film producers) can gain access to or afford the mighty Moog.

For those who would, nevertheless, like to achieve similar results on a rock-bottom budget, Dubreq, a London-based electronics company, has introduced (and demonstrated at *Photokina '76*) an extremely compact and simple-to-operate, but highly sophisticated synthesizer which enables all but the totally "tone deaf" to record a musical background and some highly original sound effects for their films.

The 350S "STYLOPHONE" Synthesizer weighs a mere 4½ pounds and is small enough to carry in a brief case, but one should not be misled by its tiny mass. It is capable of producing sounds normally associated with instruments twenty times its size and price.

It would be simplistic and hardly accurate to imply that the 350S can do everything that the Moog can do, but it can produce an astounding range of similar sounds, including those of piano, trumpet (with muted or waa-waa effect), clarinet, violin, trombone, bassoon, harmonica, jazz organ, church organ, oboe, flute, tin whistle, piccolo

— and many totally original sound effects.

The 350S Synthesizer has no actual keyboard. Instead, its operation is based on the simple action of writing — the movement of a stylus across the numbered areas on a flat metal plate — and the basic technique is mastered in minutes.

Depending upon the aptitude and musical prowess of the individual, plus the availability of one or more tape recorders, tracks can be laid ranging from the authentic sound of a single instrument to that of (by means of over-dubbing) a full orchestra — although, admittedly, the achievement of the latter result would be rather time-consuming. In the field of sound effects the range is almost limitless.

The power supply for the 350S is 2xPP9 or equivalent batteries. The unit has a healthy volume of its own, but can be plugged into an amplifier to gain an even "bigger" sound. It can be used with earphones or headphones for "silent practice" or precise monitoring purposes. When plugged into a tape recorder, record player or rhythm unit, their sounds will combine with those produced by the 350S.

For further information about the 350S "STYLOPHONE" Synthesizer, contact: DUBREQ LIMITED, Stylophone House, 120-132 Cricklewood Lane, LONDON NW2 2DP, ENGLAND.

## Technical Specifications

Frequency Range: 6½ Octaves from 'A' (2-¼ octaves below Mid. C) to 'E' (4-¼ octaves above Mid. C.)

Power Output from Internal Speaker: 0.7 Watts RMS. = 1.4-1.5 Watt Peak Power.

**Input Socket.** Input voltage required for full output = 0.5v RMS.

**Input Impedance:** = 100 k ohms.

The Input socket can be used for most Tape Recorders, Radios, Record Players, Rhythm Units, etc., but will not work directly from a microphone.

**Swell Pedal.** When a swell pedal is connected the photo-electric cell is switched off, and the same functions are obtained from the pedal. Recommended resistance of the pedal is 50-100 k ohms.

**External Output.** Will provide an output to drive headphones, tape recorders, amplifiers, etc. Output voltage 0.6 volts RMS, and the radio input socket on the tape recorder should be used. The output impedance is 130 ohms, suitable for driving headphones of 10-1000 ohms impedance.

## Key to General Layout (see accompanying diagram)

**1. Stylus 1** — Located on the right hand side, this stylus is held in the right hand for normal playing.

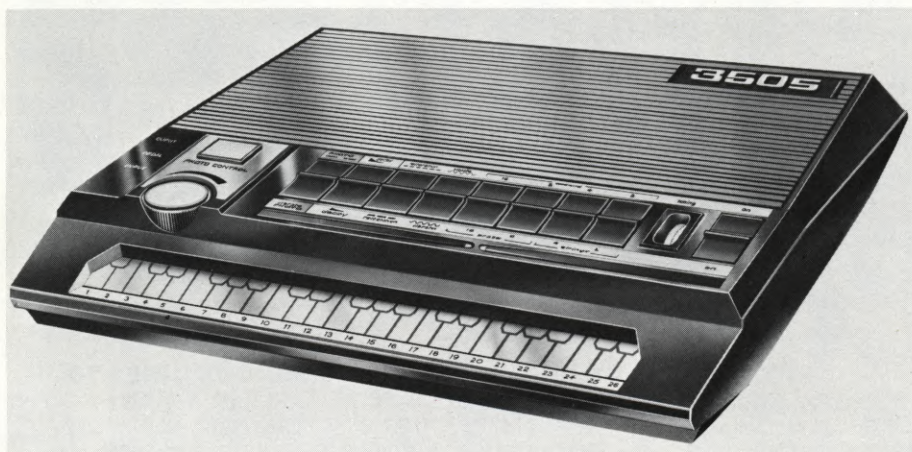
**2. Stylus 2** — Located on the left hand side, and used for producing effects such as Banjo, Mandolin, etc., held in the right hand, and used in conjunction with the **Reiteration Switch (7)**. To produce harmonies, hold **Stylus 1** in the left hand, and play notes lower down the keyboard. Harmonies can only be produced when the **Reiteration Switch** is in operation.

**3. Keyboard** — Set out in the same way as a piano keyboard, with the upper row of notes representing the black notes, or sharps and flats. Sound is produced by applying the metal tip of the stylus to the keys, using a pressure much the same as, or slightly heavier than that used when writing. **It is essential that both keyboard and stylus tips be kept clean and free from fingermarks or grease. For normal purposes a soft cloth or tissue will suffice. An occasional polish with a nonabrasive metal cleaner is recommended to keep the keyboard and styli in excellent playing condition.**

The Control Switches are operated on the 'Rocker' principle. They may be pressed down at either end depending on the voice or effect required — or they may be left at flat — or neutral — position.

**4. Photo Control.**

**5. Photo Switch (Swell/Waa-Waa/Photo Vibrato).** The **Photo Control (4)** is used in conjunction with the **Photo Switch (5)**. It is light-activated instead of mechanical, thus giving a more natural expression to the sound. The required effect must be set on the **Photo Switch** prior to use. With the **Photo Switch** in the neutral, or flat position, a **Swell** effect is produced by covering the **Photo Control** with the hand. With the switch



The 350S "STYLOPHONE" Synthesizer, by Dubreq of London, weighs a mere 4½ pounds and is small enough to carry in a brief case, but it is capable of producing sounds normally associated with instruments twenty times its size and weight. It can reproduce the tones of almost all of the instruments of the orchestra, plus a wide range of unusual electronic sound effects.

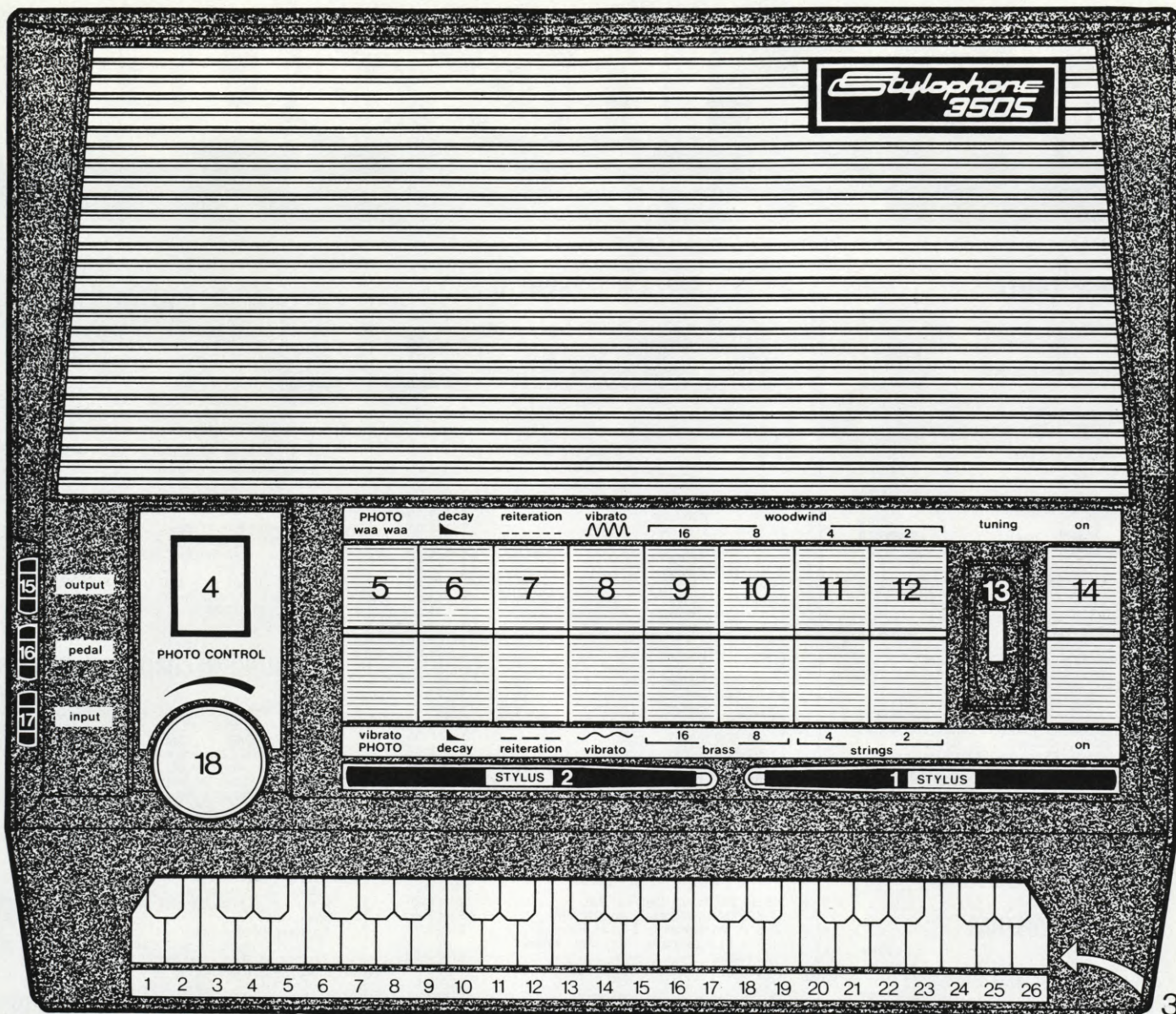


Diagram of the 350S Synthesizer. The numbers (except for those on the bottom strip) correspond to those in the accompanying "Key to General Layout", in order to explain the instrument's operation in detail. The STYLOPHONE can be plugged into an external amplifier to gain greater volume and it can be used with a tape recorder to over-dub onto existing tracks. Its compact size, light weight and low cost should make it attractive to low-budget film-makers for music and effects recording.

set to **Waa-Waa**, the effect is again obtained when the **Photo Control** is covered. The **Waa-Waa** is most effective on the '8' and '16' stops. On **Photo Vibrato**, the vibrato is brought in when the **Photo Control** is covered, and the **Vibrato Switch (8)** must be in use when this effect is required.

When the **Photo Switch** is set to **Photo Vibrato**, and the **Vibrato Switch (8)** is off, the **Photo Control** is inoperative and the volume is set with the **Volume Control** only.

**6. Sustain/Decay.** In the neutral, or flat position, notes are sustained as long as the stylus is in contact with the keyboard. In the **Long Decay**, the note will decay approximately 1½ seconds after the note has been played, and with the stylus still in contact with the keyboard. With the switch on **Short Decay**, the note will fade rapidly, giving a percussive effect rather like a piano.

**7. Reiteration** — When simulations of instruments such as Banjo, Mandolin, etc., are required, this switch is brought into operation. There are two reiteration speeds — **Fast ...** or **Slow---**. When using this effect, **Stylus 2** is held in the right hand.

**8. Vibrato** — For use when continuous vibrato is needed, with a choice of **Fast** or **Slow** speeds. When used in conjunction with **Photo Vibrato (4&5)**, the vibrato will not be effective until the **Photo Control** is covered.

**9. 10. 11. 12. Voicing Switches** — These control the voices — from the 2' stop at the top end of the musical range — to the 16' stop at the lower, or bass end. In addition to simulating some of the more conventional musical instruments, they produce original sounds, and may be played singly or in combination with other voices.

**13. Tuning Control** — This enables the pitch of the **350S** to be altered to match other musical instruments or accompaniment such as tape or disc.

**14. On/Off Switch** — As the illustration shows, the switch is **On** in either of two positions, and **Off** in the flat or neutral position.

**15. Output** — This socket enables the 350S to be used with an external amplifier, and also for Headphones or Earphone for silent practice. The output impedance is 130

ohms, and is suitable for headphones of 10-1000 ohms impedance.

**16. Pedal** — This socket takes a standard Foot Pedal to produce the effects of the **Photo Switch (5)** and over-rides the **Photo Control** which is automatically switched off when the pedal is plugged into the socket.

**17. Input** — Into this socket may be plugged a tape recorder, record player, rhythm unit, etc. The sounds from these sources will emanate from the speaker of the 350S, together with the sounds of the 350S itself.

**18. Volume Control** — This controls the overall volume of the instrument, pre-setting the maximum volume necessary for Swell & Waa-Waa effects. ■

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# THE NEW NAGRA T STUDIO MODEL RECORDER



A basically non-mobile (but transportable) recorder that fits onto a stand or rack and can accept either flat reels or spools up to 300mm (12 inches), the norm for non-mobile studio units in Europe

Up to now, the largest model Nagra recorder has been the Nagra IV which, without external accessories, takes 178mm (7") reels only but can still operate during transportation: thus it can be considered a portable recorder.

The Nagra T takes reels or flat spools up to 300mm (12") in diameter, this being the norm for non-mobile studio units in Europe.

As a fixed installation the Nagra T is mounted on a stand but it is transportable for outside work and can be fitted into a rack.

The Nagra T is a double capstan unit having a speed stability of a close loop system and a threading ease of an open loop one.

Two versions of the Nagra T are envisaged:

Nagra TIns (instrumentation) for laboratory use (measurements) Nagra TA (audio) for sound recording.

Depending on the guides, heads and stops, both versions can be adapted to take 3.8, 6.25 or 12.5mm (.15, .25, .5") tapes.

## Description

### 1. General

The Nagra T is composed of two main parts: the body of the machine formed by a very rigid framework, and on top the tapedeck which opens like the lid of a chest.

On the tape deck are found five motors (2 capstans, 2 spool motors and the servo to engage and disengage), heads, guides, tensionmeters, etc.

However, since all the "logical" functions are electronically operated, the Nagra T has very few mechanical parts and few parts liable to wear, so that long life and reduced maintenance costs constitute major attributes.

The upper part of the body of the machine contains the logical circuits controlling the mechanical parts of the deck. The lower part is fitted with removable plug-in containing recording and reproduction circuits. In view of this structure, the Nagra T is very adaptable and can easily be modified to become a specialized version.

### 2. Size

The Nagra T is 399mm (15.7") wide, 389mm (15.3") deep and 167mm (6.57") high with the lid closed (quarter inch tape version).

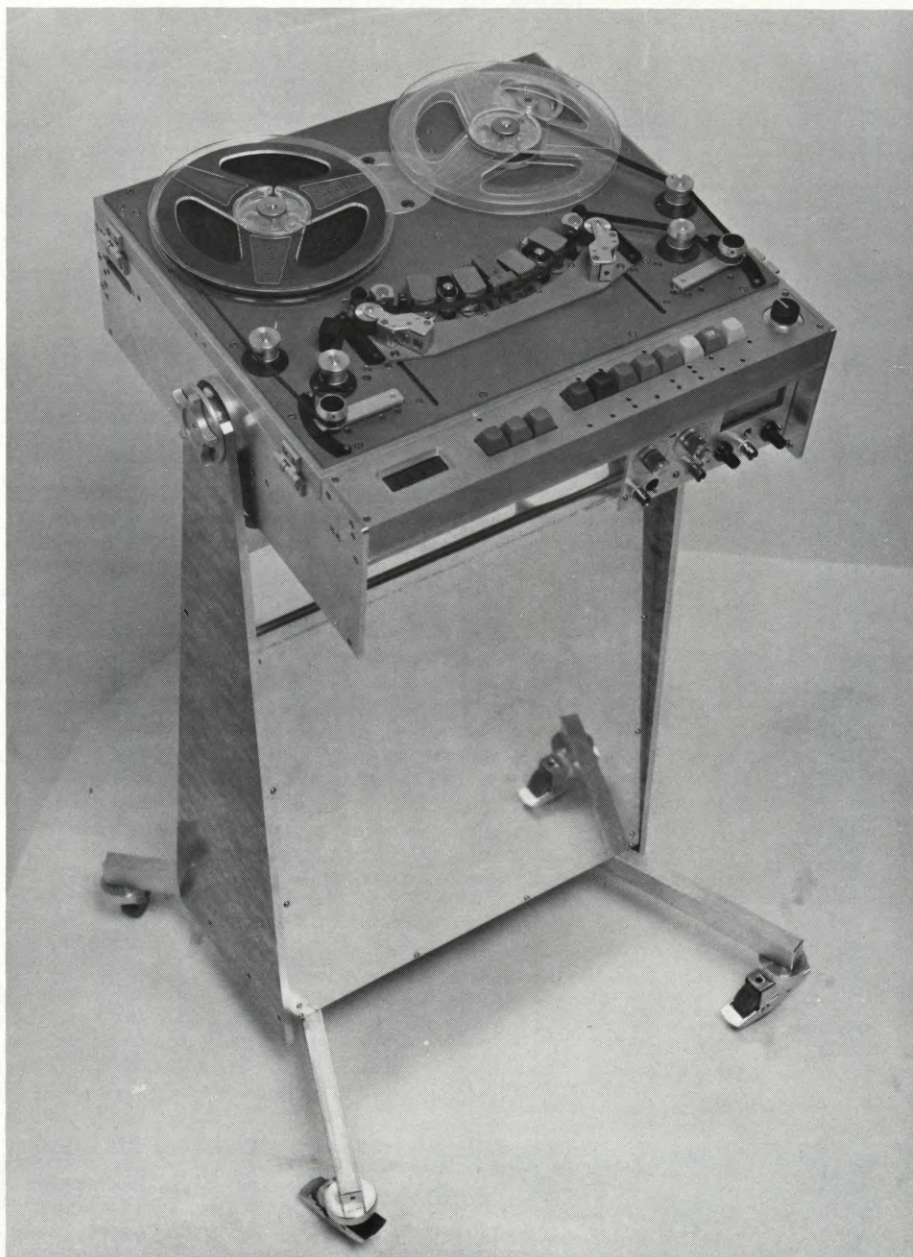
### 3. Spools

The spools fit on to the spool-supports which are removable and thus variable to take European cores (AEG), NAB or classical spools (Cine 8). But the Nagra T has four reel-supports, the inner ones for 180mm (7") spools with the lid closed, the outer ones for 300mm (12") spools. Thus if 180mm (7") reels are sufficient, the machine can hardly be considered cumbersome.

The tension of the tape between

reels is controlled by two tensionmeters with differential transformer. In contrast to potentiometers, the life of differential transformers is virtually unlimited. The control device is two-directional. Thus, when the machine is switched on, the debiting spool motor is also activated instead of simply revolving by tape traction, and fast starts cannot stretch the tape. Thus the Nagra T does not even damage 3.8mm x 9 microns (15" x .0004") tapes when the spool core is only 28mm (1.1") (SN).

THE NEW NAGRA T STUDIO MODEL RECORDER





However, in this case, the tension-meter must be adjusted, but this is a simple operation.

#### 4. Tape transport

Nagra T has two capstans. Each has its own individual motor directed by a tachymetric loop. The average speed of the two capstans is either controlled by a quartz, or is variable; but on the other hand, the speed difference is subject to the interhead tensionmeter. This gives a better winding quality than any observed until now, whatever the size, weight or price of the machine.

The guides, containing watch-makers rubies, adjust to ribbon width deviations. The Nagra TIns has 7 speeds and the Nagra TA three (15,7.5 and 3,75"/s). The Nagra TIns runs both forwards and back and can also operate with just one capstan. Since the two capstans can turn independently in opposite directions and at selected speeds, it is possible to operate in a back-and-forth manner which is especially useful for data retrieval. We could, on request, fit a Nagra TA with the logical system of the Nagra TIns, thus providing all these advantages for retrieval of documentary information. The tape speed is usually locked to a crystal, but can also be controlled by a pilot signal or be variable (Knob on the control panel). The variation zone is such that speeds from the slowest to the fastest can be continuously covered. By connecting a counter to the remote control output, the real speed in each case mentioned above can be accurately measured.

#### 5. Power supply and fast tape winding

The Nagra T can function with one continuous power supply of 23-28V: for example, an accumulator cassette attached to the back of the machine. Tape-winding speeds would thus be rather moderate.

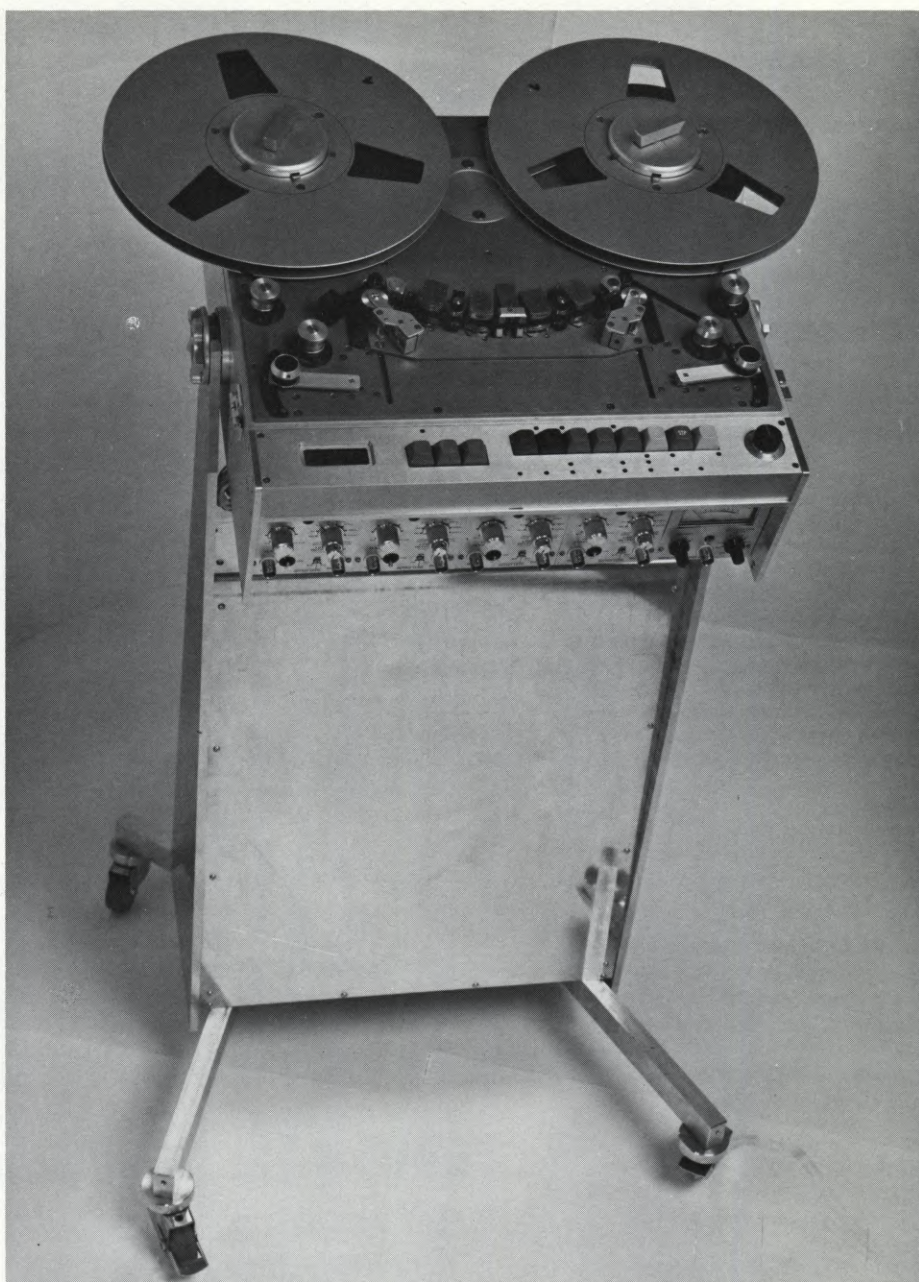
However, when connected to a mains supply, the Nagra T has an auxiliary 36V voltage which allows fast tape winding with variations such as fixed speed, continuously adjustable speeds, forwards and backwards, with middle stop.

As a "portable" recorder, mains supply is connected to the back of the machine, but in fact it is possible to use both mains and battery cassette simultaneously, the latter being charged by the former. Should there be a power failure, the machine automatically transfers to batteries.

On those Nagra T used as fixed installations the mains point and battery packs are found in the stand.

#### 6. Heads

Recording and playback heads are positioned between the two capstans.



THE NAGRA T RECORDER EQUIPPED WITH NAB SPOOLS

They are mounted on cam supports which have proved to be particularly stable even under vibration.

The Nagra TIns has one erasing head, two recording heads, two playback heads, separated by IRIG standardized distances. The Nagra TA has the classical erasing, recording, pilot and playback heads.

#### 7. Counter

An optical encoding counter is installed on the tape path and can be graduated in minutes and tenths of minutes. Counter information is available on the remote-control panel in order to carry out more complex systems. Machines using a time code can present exact time reading data.

#### 8. Operations

The structure of the control panel of

the Nagra T resembles to some extent that of a computer. All commands in the form of digital words are transferred to an 8 wire bus. Their source could be the keyboard, an external control board (number unlimited) or a computer.

The Nagra T language is identical to that of 'mini' or 'micro' processors. This has, of course, been developed in order to enable the Nagra T to be incorporated in automated systems.

The Nagra TA has a simple keyboard similar to that of classical studio machines. But the Nagra TIns keyboard enables 64 different commands required by the complexity of the instrumentation.

A lighting panel keeps the operator informed of the status of the machine.



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AC-1276

# ROSCOLIGHT 200-WATT PORTABLE DAYLIGHT (HMI) SOURCE



A lightweight, portable, battery-operated 200-watt unit that provides the equivalent of 1,000 watts of quartz light, particularly for film and electronic newsgathering crews

This new 200-watt Roscolight provides the equivalent of 1,000 watts of quartz light, balanced for daylight.

The new "portable daylight" unit uses HMI (metal halide) bulbs which produce full spectrum daylight — 5600° Kelvin. Unlike 3200° lamps, HMI requires no filters to achieve daylight balance.

The new unit is particularly useful for film and Electronic News Gathering crews, since it allows them to bring daylight with them wherever they go. The unit is far more efficient than present equipment. A typical quartz bulb, for example, provides about 25 lumens per watt. Filtered for daylight, the typical output is under 15 lumens per watt. But this new HMI source provides over 80 lumens per watt (16,000 lumens) of 5600° Kelvin light.

The square wave, flicker-free electronic system allows this Roscolight to be used for film, videotape or live transmission without any stroboscopic effect.

The lighting head weighs less than 5 pounds. It has a focus adjusting lever and a pistol grip so it can be operated with one hand. Two unique LED displays indicate when the light is up to full intensity and when the battery requires

The Roscolight 200-watt head weighs less than 5 pounds. It has a focus adjusting lever and pistol grip so that it can be operated with one hand.

recharging. Four-leaf barndoors permit sharp cutoffs of light for precise framing.

The shoulder strap power pack weighs 22 pounds when fully loaded with NiCad batteries. The batteries provide 30 minutes of continuous light output between chargings. The Roscolight can also be used on a stud-equipped light stand.

## FEATURES

- Highly efficient — provides the equivalent of 1,000 watts of daylight corrected quartz light
- New square wave, flicker-free ballast eliminates strobing possibility with film cameras running wild over a wide range of film speeds
- Fully loaded power pack weighs only 22 pounds
- Light requires no filtering, it's already balanced for daylight
- Cool beam: energy converted to light, not heat
- 30 minutes continuous operation with constant light output from 30-volt Nickel-Cadmium battery pack
- 500 hour warranted lamp life

## TECHNICAL DATA

**Light Output:** 16,000 lumens  
**Light Efficiency:** 80 lumens per watt  
**Color Temperature:** 5600° Kelvin  
**Lamp Type:** HMI 200  
**Lamp Life:** 500 hours warranted  
**Weight**

**Head:** 4½ lbs.  
**Power Pack:** 15½ lbs. (with Silver-Zinc batteries)

## System Components

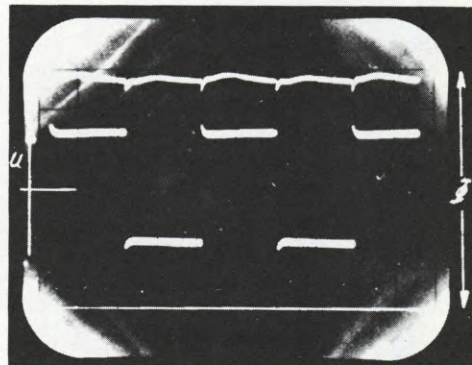
Head, with built-in igniter, 4-leaf barndoors and filter holder  
 10' connecting cable  
 Power pack with interchangeable or gangable battery pack  
 Charger  
 Carrying case to hold all system components

## Battery Operation Time

Nickel-Cadmium: 30 minutes,  
 Silver-Zinc also available

In addition to its 200-watt portable model, Rosco features HMI Roscolight units in 1200 watts (110,000 lumens of daylight), 2500 watts (240,000 lumens) and 575 watts (49,000 lumens). All of these Roscolights operate on 60-cycle current and may be plugged into any

## LUMINOUS FLUX SQUARE WAVE

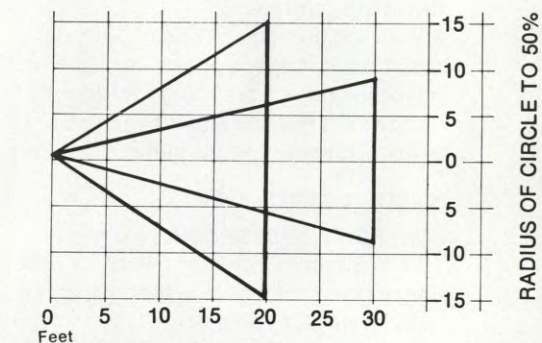


Light output wave produced by flicker-free electronic ballast

120 volt outlet. They may be hung on pipes or mounted on stands. The standard unit includes the source, a specially manufactured ballast, and 30' of connecting cable. For use in film production, the power source must be a constant and sure 60 cycles AC and the camera shutter speed precisely controlled to 24 frames per second. Under such conditions, the resulting film will have no strobing, no light flicker.

For further information about Roscolights, contact: ROSCO; 36 Bush Avenue, Port Chester, N.Y. 10573; (914) 937-1300; 11420 Ventura Blvd., Studio City, California; (213) 980-0622. ■

## PHOTOMETRIC PERFORMANCE CHARACTERISTICS



Footcandles at Various Distances

<b>SPOT</b>	640	160	70	40	26	13
<b>FLOOD</b>	220	55	25	14	—	—

# THE NEILSON-HORDELL DUAL SCREEN FRONT MATTE PROJECTOR



Studio space, lighting and reflector screen size are considerably reduced with this unique front projection device that makes possible trick shots that cannot be achieved through normal front projection

The Neilson-Hordell Dual Screen Front Matte Projector is a completely new and patented concept in front matte projection which reduces time and costs.

Studio space, lighting and reflector screen size are also reduced and the lighting cameraman is able to save a considerable amount of time when illuminating the artists. Another advantage of the system is the ability to create trick shots which are not possible using normal methods of front matte projection.

The Dual Screen Front Matte Projector is based on the principle of splitting the projected image on to two screens, the first being behind the artist and only large enough to cover any movements while the second, being part of the Front Matte Projector unit itself and positioned above the camera, receives a projected image via a beam splitter.

The Neilson-Hordell Front Matte Projector can be used in both Cine and TV forms, the relevant speeds of either 24 f.p.s. or 25 f.p.s. being attained by a simple pulley change.

To indicate how the system works in practice, let us consider a scene in which a man is required to sit behind a desk overlooking a power station. A small screen, only two metres square and behind the artist, will be necessary. The rest of the power station will be projected via a beam splitter on to the second screen. Simple soft edge mattes would mask out the surplus image of the station being projected on to the artist and another simple matte would mask out the artist on the screen above the camera.

With the addition of Zoom Optics it is possible to portray a space ship, say, or any other object as though it were flying towards the camera while the back projection shot remains static.

## 26.00 SPECIFICATION

VOLTAGE 120/240v. 50Hz.

The 35mm Projector Head is designed for running at either 24 or 25 f.p.s. forward or reverse.

Four registration pins and four transport pins insure maximum steadiness and minimum print wear.

The gate is normally fitted with negative type Bell & Howell registration pins

but positive pins can be substituted if requested.

The film feed and take-up spools are for 150m (500ft).

The standard 400w. lamphouse is sufficient for a 10 metres (30-ft.) wide projected image. A 1000w. C.S.I. lamphouse is available as an additional extra and is sufficient for an image 15 metres (50-ft.) wide. The projector has a fast pull down movement which causes a frame of the print to be held stationary in the projector gate for a period longer than the opening of the camera shutter. If the camera is fitted with a mirror shutter then the operator is able to view the composite scene through the viewfinder. If no such movement is fitted, the operator will see only a blur of the background scene since it will be moving during the entire time that the image is reflected into the viewfinder.

## LENSES

While the standard lens fitted to the projector is 44mm, longer focal length lenses can easily be mounted.

The projector is also capable of receiving a zoom lens which considerably reduces setting-up times and allows additional effects to be created.

## SYNCHRONIZATION

In order to synchronize the camera and projector, it is necessary for the camera to have a 24 or 25 f.p.s. synchronous motor. It is then possible for the operator to obtain synchronization within a few seconds simply by viewing two flashing neon lights and turning the synchronization handle until the lights themselves are synchronized.

## ALIGNMENT

To achieve accurate alignment between camera and projector, the latter can be moved along the camera lens axis. In addition, it is possible to remove the 35mm projector completely and to replace it with a 12.70 x 10.16cm (5" x 4") Still Projector.

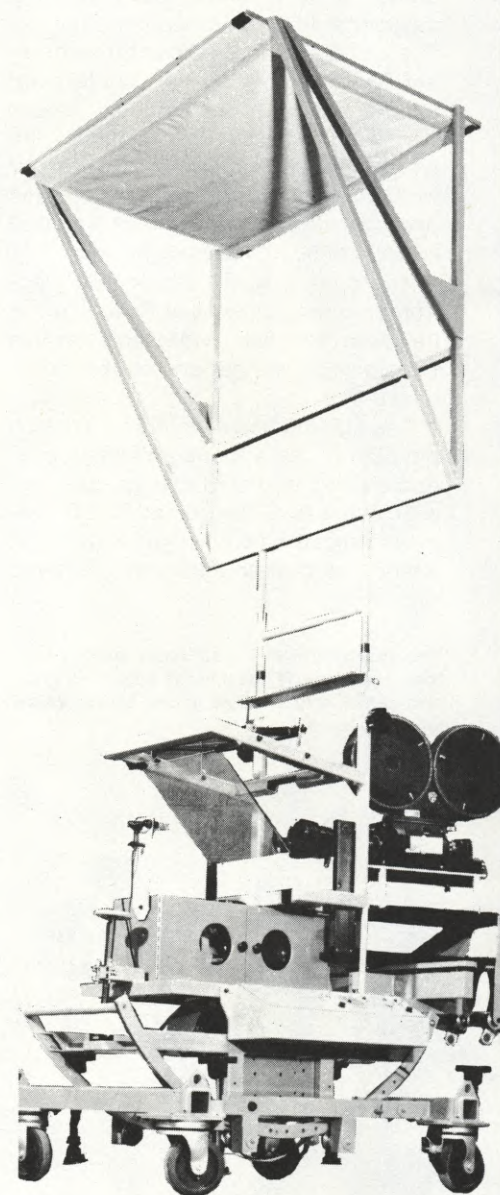
## CAMERA AND PROJECTOR MOUNTING

The Camera Mount is designed to receive most studio cameras by using simple adaptor plates. These adaptors also allow the camera lenses to be cor-

rectly positioned at the nodal point so that optical alignment can be maintained.

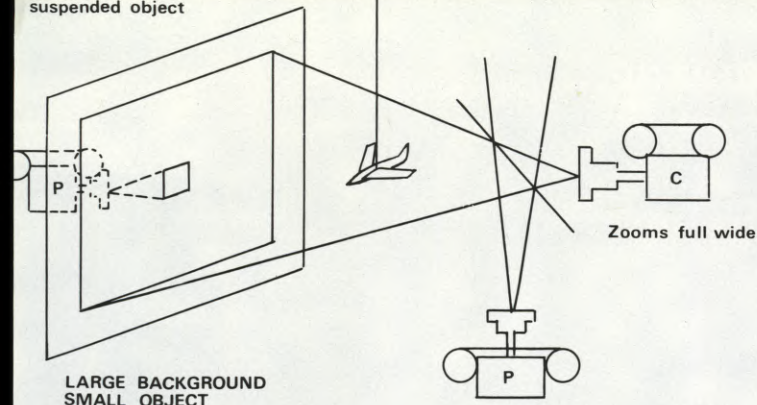
The Pan has 50° total movement and the Tilt has 16° total movement.

The Camera and Projector are mounted on a tubular steel trolley which has a fine Tilt adjustment of 20°, both up and down. Each of the four

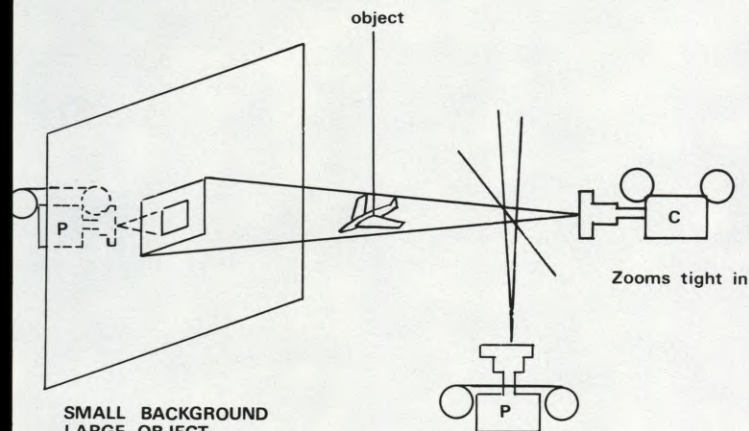


The Neilson-Hordell Dual Screen Front Matte Projector employs two reflective screens — one behind the actor (just large enough to cover movements) and a small screen for the full background scene, positioned above the camera. The foreground and background images are blended with soft-edge mattes.

suspended object



LARGE BACKGROUND  
SMALL OBJECT



SMALL BACKGROUND  
LARGE OBJECT



Zooms full wide

Zooms tight in

## STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

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mortgages, or other securities: DNA

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status of this organization and the exempt  
status for Federal income tax purposes have  
not changed during preceding 12 months.

Extent and Nature of Circulation: Total  
number copies printed (Net Press Run):  
average number of copies each issue during  
preceding 12 months, 19,286; actual  
number copies of single issue published  
nearest to filing date, 20,200.

Paid circulation: Sales through dealers  
and carriers, street vendors and counter  
sales: average number copies each issue  
during preceding 12 months, 4,728; actual  
number copies of single issue published  
nearest to filing date, 5,428.

Paid circulation (Mail Subscriptions):  
average number copies each issue during  
preceding 12 months, 13,959; actual  
number copies of single issue published  
nearest to filing date, 13,959.

Total paid circulation: average number  
copies each issue during preceding 12  
months, 18,687; actual number of copies of  
single issue published nearest to filing date,  
19,387.

Free distribution by mail, carrier or other  
means (Samples, Complimentary, and  
Other Free Copies): average number copies  
each issue during preceding 12 months,  
300; actual number copies of single issue  
published nearest to filing date, 340.

Total distribution: average number copies  
each issue during preceding 12 months,  
18,987; actual number copies of single issue  
published nearest to filing date, 19,727.

Copies not distributed (Office use, left  
over, unaccounted, spoiled after printing):  
average number of copies each issue during  
preceding 12 months, 199; actual number  
copies of single issue published nearest to  
filing date, 473.

Returns from news agents: average  
number of copies each issue during  
preceding 12 months, 100; actual number of  
copies of single issue published nearest to  
filing date, 0.

Total press run: average number copies  
each issue during preceding 12 months,  
19,286; actual number copies of single issue  
published nearest to filing date, 20,200.

I certify that the statements made by me  
above are correct and complete. HERB A.  
LIGHTMAN, Editor.

The ZOPTIC, used with the Neilson-Hordell Front Matte Projector, gives apparent movement to objects without any actual movement. As illustrated above, the aircraft appears to fly close to the camera, while background remains same size.

corners is provided with lifting holes and provision is also made for sliding a 50mm (2") diameter scaffold tube through the frame to enable the projector to be tower-mounted.

### ADDITIONAL EXTRAS

#### 26-10 C.S.I. LAMPHOUSE

1000w. C.S.I. Lamphouse and Ballast Unit.

#### 26-04 GEARED PAN AND TILT HEAD

This is fitted in place of the standard head, and enables the operator to follow the artist's movement in a manner similar to that of a standard geared head.

#### 26-15 ZOOM OPTICS

This is a patented system which interlocks two 20:1 zoom lenses and provides the facility to zoom the foreground while leaving the background unchanged. It is an ideal system for such objects as flying models.

### DIMENSIONS

Length: 1.57m (5ft. 2in)

Height: 3.85m (11ft.) max

Width: 0.86m (2ft. 10in)

For further particulars please write to: Neilson Hordell Ltd., Central Trading Estate, Staines, Middlesex, TW18 4UU, England; Tel. Staines (STD Code 0784) 56456; Cables: Neilson, Staines; Telex: 25608.

## ZOPTIC SPECIAL EFFECTS DEVICE

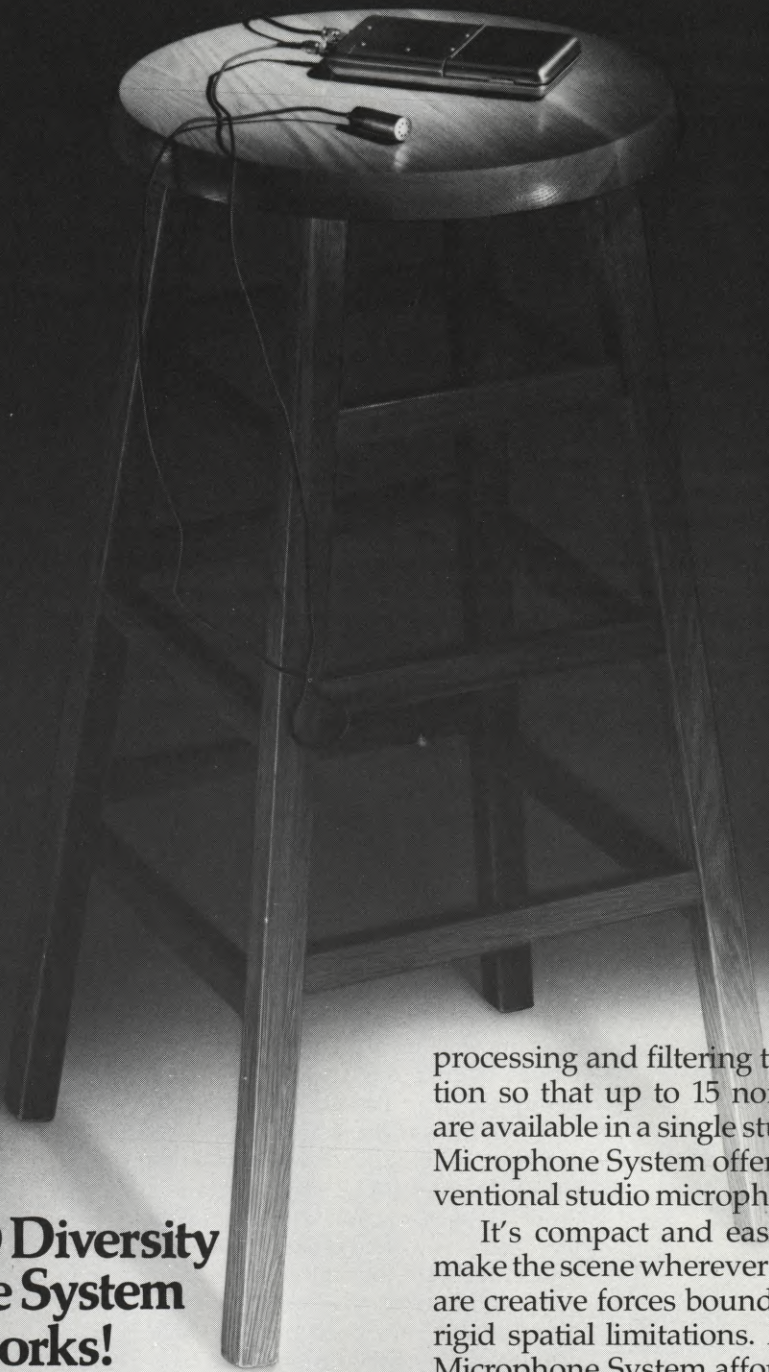
ZOPTIC is a revolutionary new patented system giving movement in depth to a subject without the subject itself moving at all. Objects such as model aircraft and spaceships, and people or animals can be made to smoothly grow to giant size or shrink.

Used in conjunction with the NIELSON-HORDELL Dual Screen Front Matte Projector, ZOPTIC saves time and money and creates effects of flying which are infinitely variable and controllable. Until now these kinds of flying effects have been possible only with the use of the costly and time consuming color difference systems where the final composite image cannot even be seen until the entire laboratory process is completed — by which time it is too late to make any adjustments. ZOPTIC allows a shot to be rehearsed to determine the appropriate speed and the correct line up by watching the actual composite image through the camera. At the end of a take you know whether it has worked or not!

Also available in Technovision Anamorphic.

Manufactured by Nielson-Hordell. Available for Rental from exclusive agents: David Pringle Cameras Ltd.; Twickenham Film Studios; St. Margarets TW1 2AW; London, England; Telephone: 892-7125.

# Introducing...



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Automatic diversity switching using two antennas and high dynamic range front-ends, insure dropout-free performance, even in difficult locations.

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processing and filtering to reduce intermodulation so that up to 15 non-interfering channels are available in a single studio. The 950 Diversity Microphone System offers the reliability of conventional studio microphones.

It's compact and easily concealed. Able to make the scene wherever the action is. No longer are creative forces bound by cables, booms nor rigid spatial limitations. And the 950 Diversity Microphone System affords the flexibility of interchangeable microphones.

It will revolutionize studio programming and remote operations for news, sports, and special events.

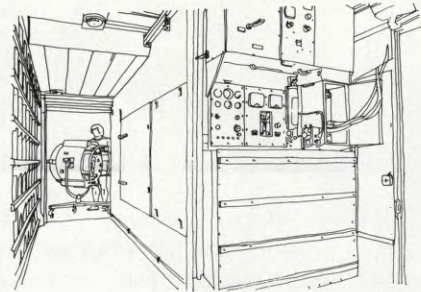
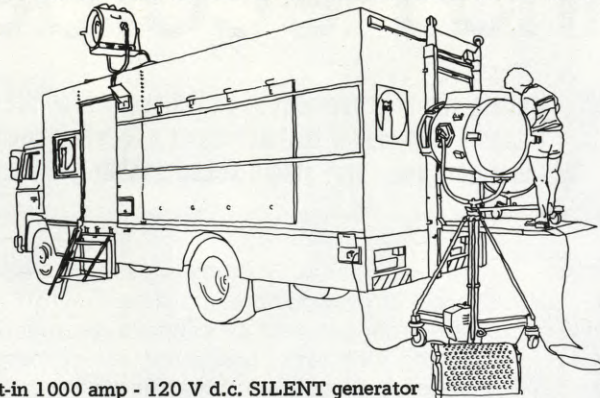
950 Diversity Microphone System. The broadcast-quality wireless microphone that goes anywhere, captures anything. Already successfully on the job, it really works!



**THOMSON-CSF LABORATORIES, INC.**

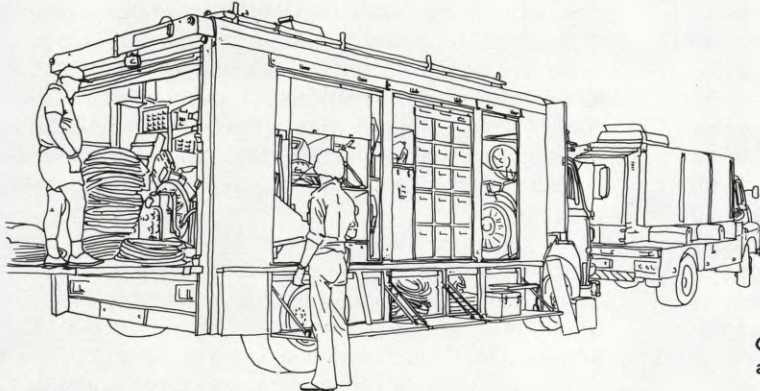
37 Brownhouse Road, Stamford, Connecticut 06902  
(203) 327-7700/TWX (710) 474-3346

# LOCATION LIGHTING MOBILITY...



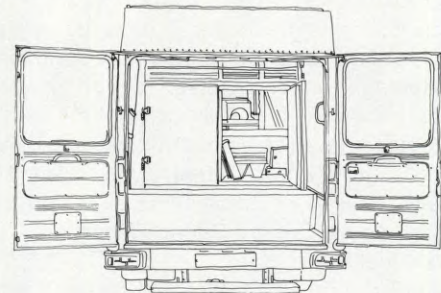
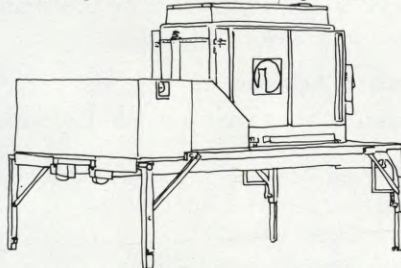
OWL III. Built-in 1000 amp - 120 V d.c. SILENT generator

... and 874 cu. ft. of storage space

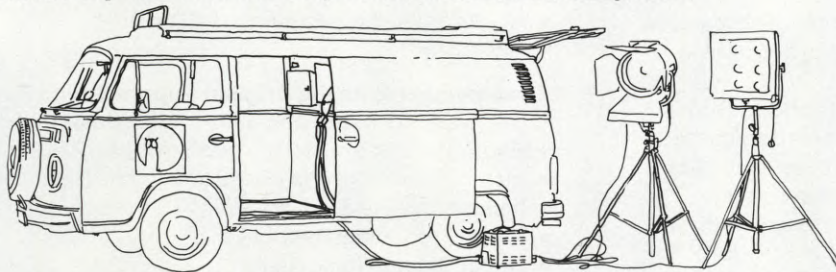


SAM III. Lighting/Grip mobile with separate 1000 amp - 120 V d.c. SILENT generator

OWL II. Built-in 50 kVA - 120/240/415 V a.c. SILENT alternator with 311 cu. ft. of storage space (see below).



'D' Mount 250 amp - 120 V d.c. SILENT generator, shown left in working mode



OWL I. Built-in 15 kW - 120/240 V a.c. SILENT alternator with 144 cu. ft. of storage space

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# Super8 Sound Recorder II



Update and improvement of an instrument for the professional Super-8 film-maker that serves as a location sound recorder, laboratory resolver, studio sound dubber and transfer recorder

In his summary of "PROFESSIONAL SUPER-8 AT PHOTOKINA '74", *American Cinematographer* Contributing Editor Anton Wilson wrote: "The most important addition to the Super-8 scene is the Super8 Sound Recorder, offered by Super8 Sound, Inc. of Cambridge, Massachusetts. This unit fills the void that has existed in the Super-8 field since its inception. It facilitates professional-type double-system recording compatible with almost all of the better Super-8 cameras, with no modification to the camera."

Mr. Wilson's optimism in regard to this equipment would seem to have been justified by its subsequent enthusiastic acceptance by Super-8 professionals, and it comes as no surprise that a "second generation" of the device should make its appearance at *Photokina '76*. Called, logically enough, "Super8 Sound Recorder II", the new model embodies a considerable number of significant improvements over its predecessor, and what follows is a detailed description of its characteristics by the manufacturer:

Super8 Sound Recorder II records on Super-8 fullcoat magnetic film and combines the functions of location recorder, laboratory resolver, sound studio dubber, and transfer recorder. It is fully compatible with all other sync sound systems: Professional or Amateur, Pilotone or New Digital 1/F (once-per frame) Sync Pulse, Reel-to-Reel or Cassette, Crystal or Cable Sync. It is also fully compatible with the original Super8 Sound Recorder — the standard of Professional Super-8.

Super8 Sound Recorders can be used with a number of Super-8 cameras, with no camera modifications, to shoot original sync sound. They produce a sound track directly on easily edited Super-8 fullcoat magnetic film. The camera must have a 1/F sync pulse, a pilotone (60Hz) sync pulse, or be crystal-controlled.

Super8 Sound Recorders can transfer sound to Super-8 magnetic film from any sync sound tape recorder, cassette or reel-to-reel. The tape recorder must have a standard sync output, either pilotone or the 1/F digital sync pulse.

Super8 Sound Recorders can synchronize with any Super8 Sound projector (equipped with a standard 1/F contact switch) making possible transfers of sound from edited magnetic film to the magnetic edge stripe of a release print. They can also be used to transfer Ektasound single-system sound from edge stripe to Super-8 magnetic film, for professional double-system editing.

Any number of Super8 Sound Recorders can be interlocked in sync with the AC line frequency for multiple-track studio work. The Recorder can also synchronize to a pilotone track on a four-channel tape recorder for multi-track transfers to and from quarter-inch tape. A safe copy of a fullcoat original track can be made on any stereo recorder.

Super8 Sound Recorders operate at both professional (24fps) and amateur (18fps) film speeds, and have built-in quartz crystal control for cableless sync work at 24fps. They also record on new split-sixteen magnetic film at 7.2 ips (24fps). A separate built-in sync meter provides positive indication of sync condition.

The separate ACPAC unit is a Preamp, AC Adapter, and Charger. It provides preamplification of 1/F low-level sync pulses from cassette sync tracks, permits AC operation, including Line sync, and automatic recharging of NiCad batteries. It contains an automatic start circuit triggered by a beep tone or flash frame (PhotoStart included).

All sync cables are compatible and interchangeable with those of S8SRI. Audio cables are standard DIN types.

Super8 Sound Recorder II is a modified Uher 4000 Report IC quarter-inch tape recorder. It operates on 5 "D" cells or 60Hz/110 AC. Super8 Sound Recorders have a one year warranty on parts and 90 days on labor, and an unconditional full refund if returned within two weeks of purchase.

An extensive Super8 Sound Recorder User's Manual is supplied, and can be purchased separately for \$1. Super8 Sound Recorder II can be ordered directly from Super8 Sound or from our authorized dealers in the U.S., Canada, and Europe. Export models operate on 50Hz, 220V or 110V; they synchronize at 24fps, 25fps, and 18fps, and with a built-in 25fps crystal.

Super8 Sound Recorders are protected by U.S. Patent No. 3,900,251 and other patents applied for.

## Super8 Sound Recorder II Accessories

The following accessories are supplied with the Super8 Sound Recorder II:

- 380 feet Super 8 Fullcoat Polyester Magnetic Film on a 5-inch Autothread Reel with Hub Adapter
- Empty 5" Autothread Super 8 Reel
- Uher 4000 Report IC Operating Instructions
- Super8 Sound Recorder User's Manual
- AC Adapter/Sync Preamp (ACPAC)
- PhotoStart

## Improvements on the Original Super8 Sound Recorder

- Separate VU Meter and Sync Meter (Built-in)
- PhotoStart/BeepStart included (with ACPAC)
- Instant Pause Control (Electromagnetic Solenoid)
- Instant Remote Start/Stop
- Wider Frequency Response
- Better Signal/Noise Ratio
- IC Amplifier
- Tape Tension Control
- NiCad Battery Charger Included
- Controls and Switches More Conveniently Grouped
- Meters Visible in Over-the-shoulder Operation
- Locking DIN-type Microphone and Sync Connections
- Metal Case/Rugged Construction
- Lighter Weight (3/4 Weight)
- Smaller Size (2/3 Volume)





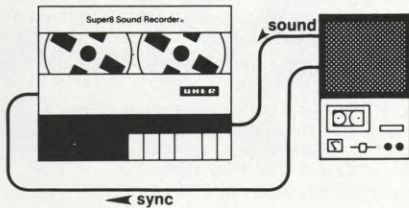
## On Location

The Super8 Sound Recorder II will record in sync on location with over 40 available Super-8 sync sound cameras. The cameras must be equipped with a 1/F contact switch (electronic flash PC socket), or tone burst, a pilotone generator, or be crystal-controlled. A quick-acting electromagnetic solenoid provides start/stop operation from cameras equipped for tape recorder remote control (asterisks in list of sync cameras below).

Crystal controls are available for a number of cameras from Super8 Sound. Single-system cameras can also be used as location recorders, with transfers to Super-8 magnetic film made in the laboratory.

Bauer C-Royal 8E\*, 10E\*  
 Beaulieu 4008ZM2, 50008S  
 Bolex 450, 480\*  
 Canon 814E, 1014E, DS8\*  
 Chinon 806SM, 1200SM  
 Cinema Pathe DS8  
 Elmo Super 110R, 612  
 Eumig 830XL, 860PMA, 880PMA  
 Fujica Z800, ZC1000

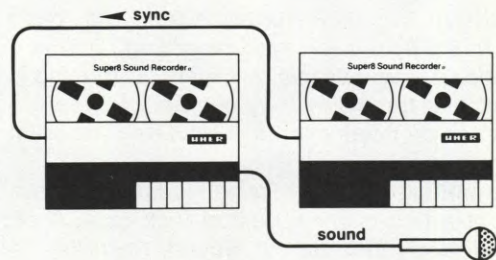
GAFF ST/802, ST/1002  
 Leicina Special  
 Minolta Autopak-8 D12  
 Minolta XL400  
 Nikon R8, R10\*  
 Nizo 136XL, 148XL, 156XL,  
 S480\*, 481\*, S560\*,  
 561\*, 801\*, 800P\*  
 Sankyo CME444, CME666,  
 CME1100



## In the Laboratory

Transferring sync sound to Super-8 magnetic film requires a sync signal that provides frame rate information to the Super8 Sound Recorder II. The Recorder servo-controls its speed so that one frame of magnetic film passes the recording head for each "frame" of the sync signal, whether a pilotone or digital 1/F signal. Transfers can be made from professional sync recorders such as Nagra, Stellavox, Arrivox-Tandberg, and Uher Neo-Pilot, and from new sync cassette recorders such as Phillips 2209 AV, Uher CR134 and CR210, Super8 Sound's XSD Recorder, and others.

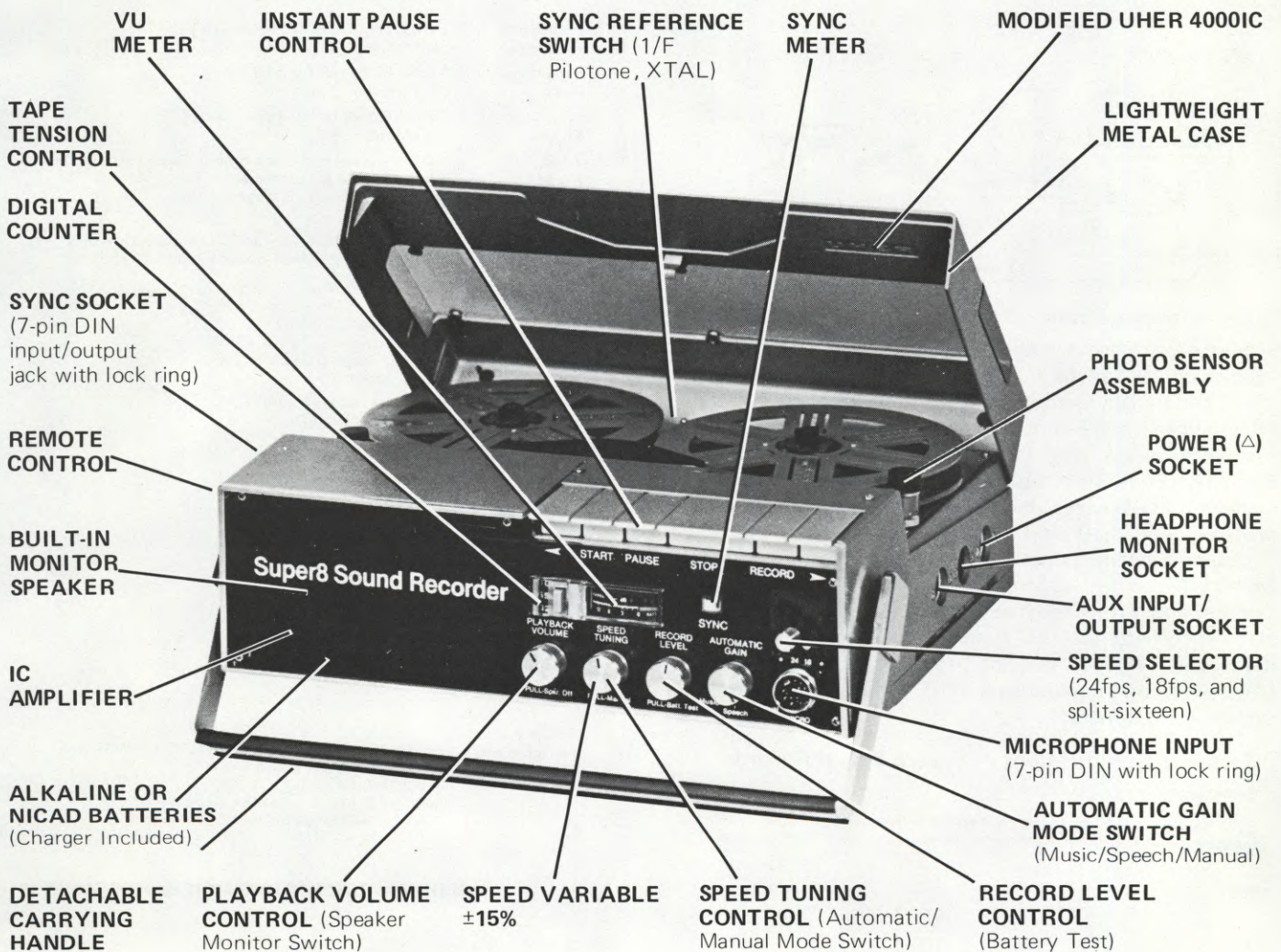
Transfers can also be made from the magnetic edge stripe of a single-system film by connecting the Super8 Sound Recorder to a projector with a 1/F contact switch. Professional sound labs can use the Super8 Sound Recorder in AC line sync with their other recorder/reproducers.



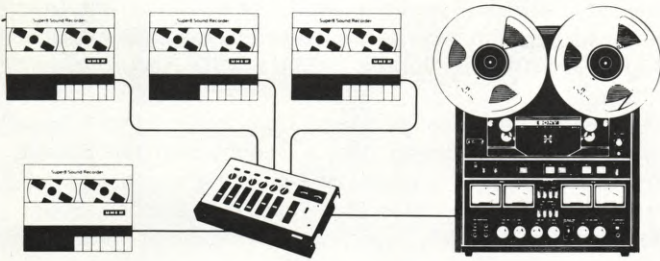
## In the Dubbing Theater

Since the Super8 Sound Recorder will run in perfect

# Super8 Sound Recorder II Features



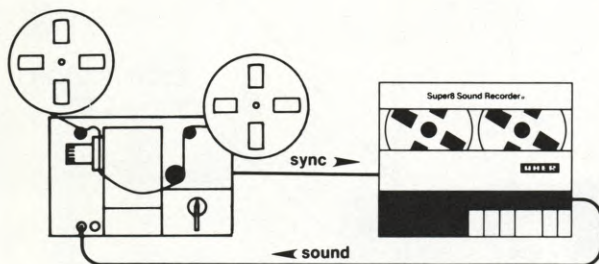
interlock with other Super8 Sound Recorders, with Super8 Sound Sync Projectors, and even with the Super8 Sound DoubleBand Projector, the possibilities for dubbing and mixing are extensive. Filmmakers can listen to the original sync material, on headphones, while they prepare new material, over and over if necessary until perfect, on a second fullcoat mag film recorder.



### In the Sound Studio

The Super8 Sound Recorder offers two basic approaches to multiple-track sync recording. One is to use multiple fullcoat magnetic film recorders, all running in sync with the AC line frequency. Any number of Super8 Sound Recorders can be interlocked this way. No sync rollback is possible.

Another method is to transfer edited lip-sync material to one track of a four-channel quarter-inch tape. A pilotone sync signal from the Super8 Sound Recorder is also recorded as a control track. Now the same Super8 Sound Recorder can transfer a second fullcoat strand, with additional sync material, to a third track of the four-channel machine. The Super8 Sound Recorder will maintain sync against the control track. The fourth track can be used for music, narration, etc. All three tracks can then be mixed down to make a composite master fullcoat track, again on the same Super8 Sound Recorder synced to the control track.



### In the Screening Room

Sound on fullcoat magnetic film, from the first look at synced-up rushes to the final composite master sound track, can be run in double-system sync with any projector equipped with a 1/F contact switch. Projector and Recorder are synchronized using the supplied Super8 Sound PhotoStart. The PhotoStart reacts to a flash frame in the picture leader, and releases the Super8 Sound Recorder for precisely repeatable starts.

Double-System interlock screenings with a sync rollback capability can be accomplished on the Super8 Sound DoubleBand Projector. The Super8 Sound Recorder will also synchronize with AC synchronous equipment such as the Kodak TVM100A telecine projector. The Kodak Videoplayers can be supplied with a 1/F sync pulse for double-system video transfers.

### Technical Specifications of Super8 Sound Recorder //

#### Sync Section

**Sync Socket Inputs** PIN 1: With SYNC REFERENCE switch set to 1/F, this pin accepts an external 1/F pulse at

a rate between 21-27fps (nominal 24fps) or between 16-20fps (nominal 18fps). Voltage swing must be 500mV minimum, 5V maximum. Virtually any wave form with a 1/F repetition rate is acceptable.

With SYNC REFERENCE switch set to PILOTONE, this pin will accept the standard pilotone 60Hz sine wave, 1 volt rms, or any 60Hz signal between 0.7 volts rms and 4 volts rms. Input impedance at PIN 1 is 15K ohms.

**PIN 3:** With SYNC REFERENCE switch set to 1/F, this pin accepts a 1/F switch closure, at the frame rates described above. Maximum "on" resistance of the switch and cable connections that will produce a guaranteed sync is 100 ohms.

**PIN 4:** This pin is prepared to accept an external speed control input, to be used in the future for catch-up sync circuitry.

**PIN 6:** This pin accepts a switching signal to ground (PIN 2) that starts and stops the S8SR11 by remote control (from a camera, for example)

#### Sync Socket Outputs

**PIN 5:** The output of the photosensor, a 1/F signal that swings between 0V and approximately 5V, is supplied on this pin, for use by an external frame counter or catch-up correction circuitry.

**PIN 7:** No Connection.

**PIN 2:** Ground.

#### Crystal Sync

With SYNC REFERENCE switch set to XTAL, the S8SR11 will run at 24fps  $\pm$  one frame in 13 minutes,  $-10$  to  $40^{\circ}$  C. (accuracy 0.005%-50ppm).

#### Sync Function Switches and Controls

SYNC REFERENCE SWITCH (3 position): 1/F, Pilotone, XTAL  
 SYNC MODE SWITCH (Incorporated in Speed Tuning Control)  
 PUSH-Automatic Speed Control  
 PULL-Manual Speed Control  
 SPEED TUNING CONTROL Knob  
 SPEED SELECTOR SWITCH (4 position): 24fps, 18fps, and split-sixteen 24fps.

#### Audio Section

##### Speeds

24fps (4ips), and 18fps (3ips) using Super 8 fullcoat magnetic film. Each speed is variable plus or minus 15%. Export model (S8SR50-1) is 25fps and 18fps and can synchronize also at 24fps.

##### Frequency Response

24fps: 35-16,000Hz, 18fps: 35-12,000Hz  
 Split-sixteen: 35-19,000 Hz

##### Signal/Noise Ratio

24fps: 63dB; 18fps: 61dB  
 Split-sixteen: 64dB

##### Wow and Flutter

24fps: 0.18% (rms); 18fps: 0.25% (rms)  
 Split-sixteen: 0.15% (rms)

##### Track Location

NAB standard half-track monophonic (.082 inches wide opposite sprocket holes). Proposed SMPTE standard for Super 8 magnetic film

##### Recording Time

5 inch reel, 24fps standard sound speed: 19 minutes on polyester base Super 8 mag film (380 feet)

##### Audio Inputs

Microphone Input  
 Unbalanced  
 Impedance: 200 $\Omega$   
 Sensitivity: 0.12mV-40mV  
 Plug Type: DIN 5-pin, 3-pin, or 7-pin (with lock-ring)  
 Auxiliary Input (Radio)  
 Impedance: 47K $\Omega$   
 Sensitivity: 2.4mV-700mV  
 Plug Type: DIN 5-pin  
 Auxiliary Input (Phono)  
 Impedance: 1M $\Omega$   
 Sensitivity: 45mV-20V  
 Plug Type: DIN 5-pin

##### Audio Outputs

Speaker Output  
 Impedance: 4 $\Omega$   
 Level: 2 Volts  
 Plug Type: DIN 2-pin  
 Auxiliary Output:  
 Impedance: 15K $\Omega$   
 Level: 1 Volt  
 Plug Type: DIN 5-pin

##### Audio Function Switches and Controls

PLAYBACK VOLUME Control Knob  
 STOP, START, PAUSE, FAST FORWARD and REWIND Keyboard  
 RECORD INTERLOCK Key  
 RECORD LEVEL Control Knob  
 AUTOMATIC GAIN Control Switch (3 positions): MUSIC/SPEECH/MANUAL

# THE MPE (MINIMUM POSSIBLE ENVELOPE) 16mm CAMERA



The size of an amateur Super-8 camera, this diminutive new electronic camera is strictly professional, embodying many of the highly sophisticated features found only on larger cameras

The designation MPE means Minimum Possible Envelope. The MPE has been designed to be the smallest and lightest professional motion picture camera in the world. Many components of the camera are of proven conventional construction, such as the pulldown and the crystal sync circuitry, but some features use technology unavailable even a few weeks ago. The MPE camera is planned as part of a complete sound and camera system which will render film-making a far less conspicuous activity.

Overall dimensions 66mm wide x 90mm high x 175mm long.

Weight loaded with 30m of 0.15mm or 60m of 0.06mm film, including battery and lens, 1 kg.

Synchronous drive system used proven Cinema Products circuit board with easy exchange feature. Speed 24 fps. or 25 fps. crystal sync with accuracy within 1/2 frame in 160m over a temperature range of -18°C to +60°C.

Battery: Sealed rechargeable nickel-cadmium AA cells in a quick-change package which is 18mm wide, 75mm high, 58mm long which will run approximately 300m of film. An optional reloadable battery holder for five penlight cells will run the same amount of film when recharging from mains is not feasible.

Time base display: The latest Hughes Microcircuit liquid crystal chronograph is incorporated in the camera with a tiny strobe to fill the start frame with the day, date, hour, minute, second, tenth, hundredth when the take begins. No decoding necessary.

## Optics:

Lens mount accepts C-mount lenses, or lenses adapted to C-mount. Lens seat is user-adjustable so variations up to 0.08mm lens back focus can be compensated without having to dismantle the lens.

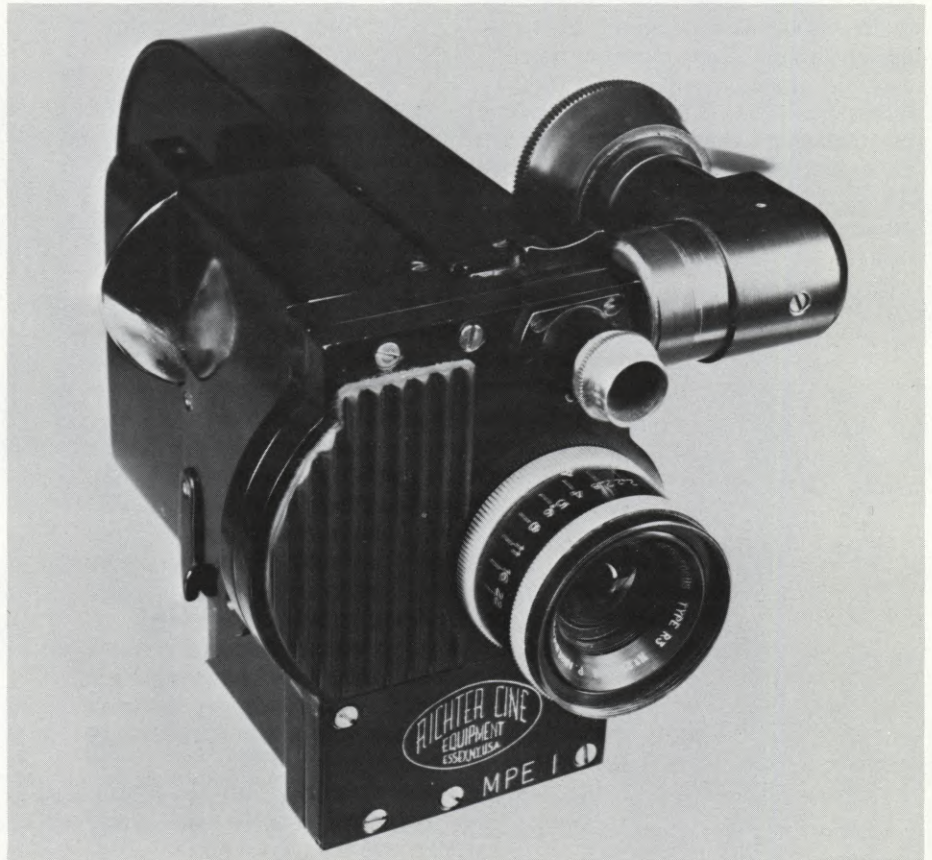
Viewing system uses Bell and Howell positive viewfinder objectives. Forward mounted eyepiece enables user to hold

camera firmly on side of head.

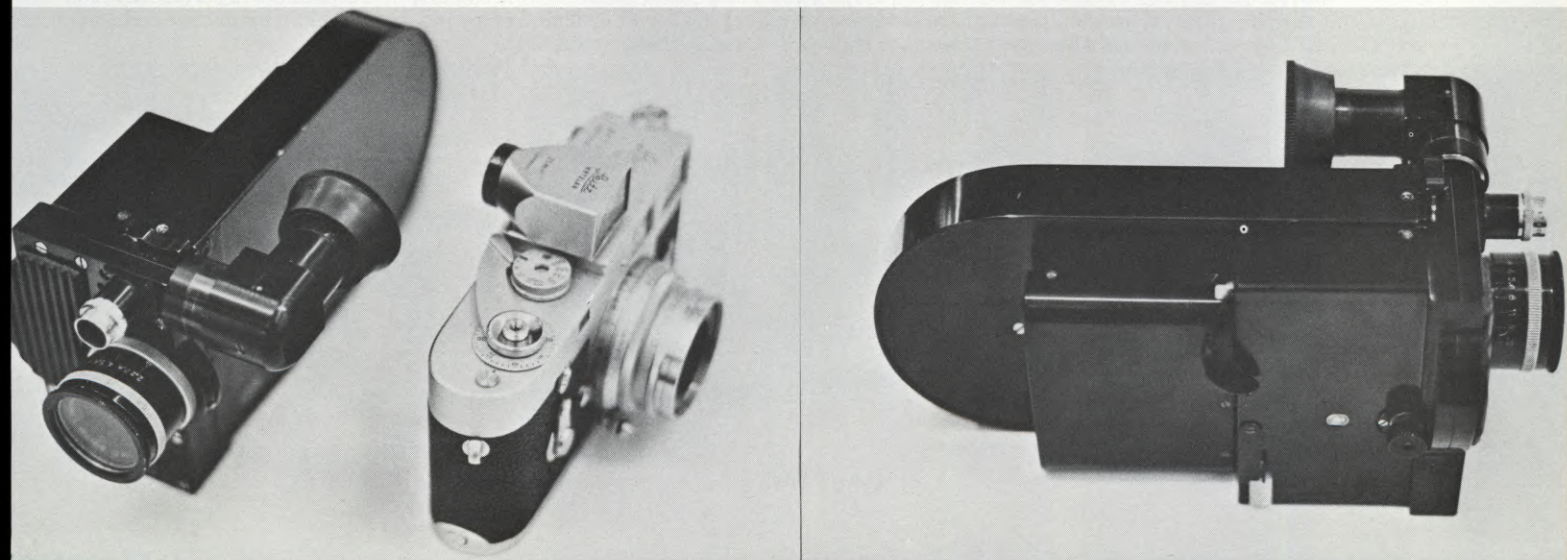
Zoom lenses with AV 30 short finder also usable, providing through-the-lens focus and viewing.

## Movement:

Simple, reliable quiet claw on helical gear gives same image stability as conventional cameras using same pulldown system. Movement and aperture  
**Continued on Page 1377**



(ABOVE RIGHT) Prototype of the new MPE 16mm camera, designed by engineer/cameraman Kenneth Richter and previewed at Photokina '76. (BELOW LEFT) The MPE is only slightly larger than the 35mm Leica still camera shown with it for the sake of relative size comparison. (RIGHT) The MPE is powered by a battery pack of sealed, rechargeable nickel-cadmium AA cells, which will run approximately 1,000 feet of film. The new camera has only 11 moving parts.



# REPORT FROM THE 118th SMPTE CONFERENCE

By **ANTON WILSON**

*American Cinematographer Contributing Editor*

The annual Technical Conference and Equipment Exhibition of the Society of Motion Picture and Television Engineers, held in New York this year, breaks attendance records and scores a huge success

The 118th SMPTE Technical Conference was held in New York this past October 17-22, just a few weeks after the gigantic international *Photokina* held biannually in Germany.

The fact that the SMPTE Conference followed so closely on the heels of *Photokina* in no way diminished its success and impact. Quite to the contrary, this was by far the most exciting SMPTE Conference I have ever attended. Registration for the conference topped 1,000, which is among the highest on record. Even more impressive was the attendance figure at the exhibits. More than 5,000 people visited the technical exhibits during the four days, setting an all-time record. This figure will not surprise anyone who attended the exhibits, as it was quite evident, by the level of excitement as well as the sheer number of people, that this year's conference was an unqualified success.

The equipment exhibits offered no specific earth-shaking breakthroughs or major surprises. What made the show a success was not any one or two major new items, but rather a myriad of technical improvements, updated models, new accessories, and new techniques. There were more than 165 booths at the show, representing well over 105 companies, another SMPTE record. In most cases, the booths were staffed by the most technically proficient personnel of each company. As a result, anyone attending the exhibition had, under one roof, access to an unlimited source of technical information on almost any film or video subject or product.

Each year it seems the equipment

exposition takes on even greater importance by keeping the film/video community abreast of the rapidly advancing technology of our industry. It wasn't many years ago that I could cover the entire exhibit area in one day. I spent all four days at this year's exhibit and still found myself running around at the 6 p.m. closing hour on Thursday, trying to cover the last items.

## LIGHTING

There are two definite trends in light-

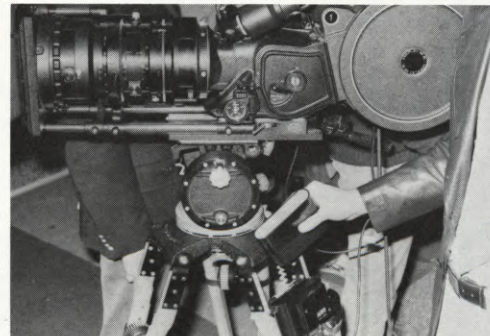
ing equipment. The first signals that standard tungsten-halogen lights are getting smaller and lighter. There is no doubt that Lowel-Light best exemplifies this trend. Lowel shook the industry not long ago with their Tota-Light compact system. Now they have done it again with the "Omni" light. This tiny light boasts full professional features, such as wide-range focusing, even light-field, and a complete line of accessories. Most interesting is the almost complete compatibility of the

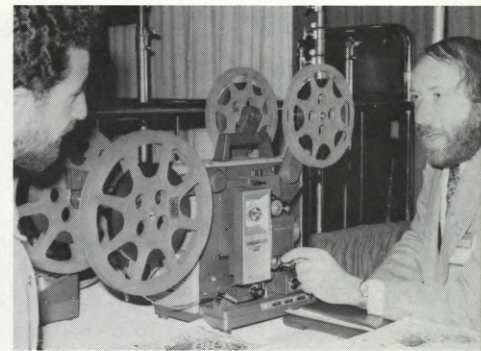
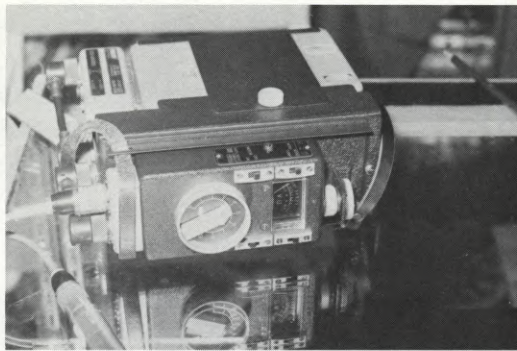
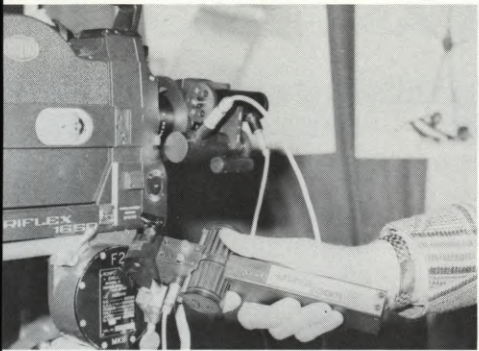


(LEFT) Ray Isaia of Matthews' demonstrates some of his new grip equipment, including light stands with extra range. (RIGHT) Mike Sheppard of Beiden Communications displays the LEE CSI light, which provides very high efficiency in a weatherproof housing.



(LEFT) Camera Mart Inc. had the most impressive and diversified exhibit at the show, stretching for an entire aisle and encompassing no less than six booths. (CENTER) The Cinemonta is a new and very clean flatbed editor imported from Holland. It is available in a variety of configurations and formats. (RIGHT) Arriflex showed a new 35BL housing for the 25mm-250mm zoom lens, a new studio matte box and tripod bridge assembly. Also featured was a new line of compact, high-torque, quick-change batteries.





(LEFT) Image Devices Inc. unveiled their new Super Zoom control, which features positional servo-feedback control of the focus. (CENTER) Stuart Cody displayed a device which gives the Nagra SN miniature recorder the flexibility of a full-size recorder. It employs two microphone pre-amps with manual controls and a VU meter. (RIGHT) Norm Bleicher of Victor Duncan, Inc. shows their new Magnaflex 16 Mark III double-band projector. The top of the line studio model features sync motor and two-track mixdown capability.

Omni and Tota-Light accessories: stands, flag frames, clamps, etc. A kit can be made up of, say, four Tota-Lights, three Omni-Lights, stands, barndoors and other accessories, representing a complete location lighting pack, and yet be no larger than the size of the average salesman's sample case. The new Omni-Light should be available early next year.

The other trend in lighting is the move to HMI (metal-halide). The advantages of the HMI system should be familiar at this point. Most impressive is the HMI daylight (6,000° K) color temperature and its efficiency, which is typically three times the light output of tungsten-halogen.

The drawbacks of HMI are diminishing. Almost all manufacturers have perfected a "flickerless" type ballast, and the ballast itself is becoming lighter and more compact. ColorTran, for example, showed two HMI models with built-in ballast. The single unit integrates the ballast and striking electronics right into the light head. The only cable from the head goes right into the wall like that of a standard tungsten-halogen unit. The "Sun\*Broad" is a 575-watt HMI unit with integral ballast, yet weighs only 16 pounds complete. The "Sun\*Spot" is a 575-watt HMI Fresnel unit with integral ballast and is focusable. Total weight is 26 pounds. Color-

Tran informs me that 1,200-watt units will soon be added to this integral ballast/head series of lights and, surprisingly, the size and weight of the new units will not greatly exceed those of the present 575-watt lights.

The prize for the most complete line of HMI lights has to go to the French firm of LTM, which makes no less than 13 different styles. Included are the Luxarc series of Fresnel spots in wattages of 200; 575; 1,200; 2,000; and 4,000. There is also a 1,000-watt CSI Luxarc. The Ambiarc series is a lensless floodlight type of HMI, available in 200, 575, 1,200 and 2,500-watt sizes. The Spotarc series is a highly specular long-range spotlight in 575, 1,200, and 2,500-watt sizes. The LTM line is rounded out with the Softarc 575. This is an HMI softlight with a matte-white circular reflector of an approximately 27-inch diameter. The entire unit is only 15 inches deep and weighs 19 kilograms. This ballast is an additional 9 kg.

Rosco is also in the HMI business with a line of lightweight units that are focusable. The line includes 200, 575, 1200, and 2500-watt units. The most interesting is the portable 200-watt light which will put out the equivalent of 1,000 watts of quartz light at 6000° K. The head weighs 4½ pounds and the ballast/battery pack weighs 22 pounds.

Mole-Richardson, in addition to their complete line of standard lighting equipment, also showed the Solar-Arc series of the focusable HMI, including 575, 1200, 2500, and 4000 watt models.

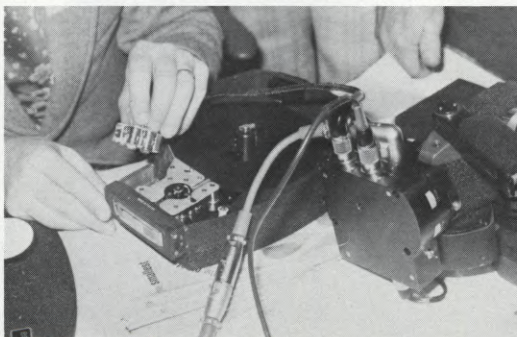
There is another type of light that is gaining wide popularity on location. The CSI or Compact Source Iodide light offers about the same efficiency as HMI at a slightly reduced color temperature. Typical of these units is the LEE CSI 1K and 2K twin. These CSI units, which are distributed in the United States by Belden Communications, are weatherproof, light, and compact, and offer an excellent alternative to the old Brute arcs.

#### TRIPODS

With the advent of *Cinema Verité* during the 50's, one might have gotten the impression that the tripod was becoming *passé*. Well, guess again, folks. It appears that camera stability is once again in fashion, and audiences have gotten over the novelty of having their eyeballs jiggled out of their heads. Bridging the gap between the tripod and complete hand-holding is the amazing STEADICAM. Although the Cinema Products STEADICAM has been around for almost a year now, it was still one of the hits of the SMPTE exhibit, as few people have actually had

Continued on Page 1374

(LEFT) Sennheiser demonstrated their new studio monitoring headphones (#HD 224-X) which provide excellent isolation and frequency response. (CENTER) Eclair showed their new single-system capability for the ACL camera, a very practical and well-designed unit. A LED VU device is employed in the viewfinder of the camera. (RIGHT) Quick-set showed a new Hercules tripod with 142-pound capacity and interchangeable cams designed to perfectly counterbalance virtually any camera/lens combination.



# NEW LENS ACCESSORIES FROM ANGENIEUX



At Photokina a famous lensmaker introduces two handy new aids to the cinematographer — a retrozoom wide-angle lens adaptor and a unique servo zoom/pistol grip control system

Two new accessories were introduced into the extensive Angenieux lens line at the 1976 *Photokina*. The retrozoom, wide angle zoom lens adaptor for the Angenieux 15x10, 10-150mm, T/2.3 lens, and a unique servo zoom/pistol grip control system were the highlights of the Angenieux display in Hall 11.

The 15x10 normally has a focal length range of 10-150mm. When the rapidly removable bayonet-mounted retro is attached to the 15x10, the focal length range changes to 7.5mm-112mm. While the geometric aperture of f/2 remains constant, there is a slight loss in transmission, reducing the photometric aperture from T/2.3 to T/2.5. It is important to note that the full 15-to-1 zoom range is retained when using the retrozoom wide angle zoom lens adaptor. In addition, the focusing range is increased from infinity down to 12" from the front glass (normal focusing is infinity to 24").

At the longest focal length of 112mm and at the shortest focusing distance of 12" from the front glass, the field of view is approximately 15x20mm. In essence, the 15x10 with the retrozoom attachment offers the highest degree of magnification of any zoom lens now on the market, regardless of close focusing distance.

The retrozoom concept was actually introduced many years ago for use with the Angenieux 4x17, 17-68mm, f/2.2. This retrozoom changed the focal length to 12.5-50mm, retaining the geometric aperture of f/2.2. While both retrozooms accomplish the same geometric feats, the new retrozoom for the 15x10 is considerably more sophisticated, having about the same amount of glass as the 15x10 lens itself. All of this glass is required in order to provide the many corrections necessary for such a wide angle, close-focusing, high-range zoom lens (remember, the original retrozoom was designed for a 4x zoom with a minimum focal length of 17mm and a minimum focusing distance of 4 ft., while the new retrozoom is designed for a 15x zoom with a minimum focal length of 10mm and a minimum focusing distance of 2 ft.).

The thumb-actuated servo zoom control was displayed on the Angenieux 15x10 zoom. The built-in appearance of this unit was, in itself, an

outstanding feature. While there are many other zoom drive systems, all of them appear as an appendage to the lens, rather than creating a custom-fitted, built-in look. The thumb switch on the removable pistol grip controls both the direction and speed of the zoom. By moving the thumb to the right, the lens zooms toward the long focal length. The further the thumb switch is moved to the right, the faster the zoom. The same is true when the switch is moved to the left, with the exception that the zoom travel is reversed, i.e., toward the short focal length.

A most outstanding feature of this zoom control system is the fact that the pistol grip control can be removed and either mounted on the lens itself, as shown in the accompanying illus-

tration, mounted in the tripod socket of the camera, or with an accessory kit mounted on the pan handle of the tripod (much in the same manner as studio broadcast cameras). The pistol grip also has provision for actuating the camera with a start/stop button. Although the servo zoom drive system was displayed on the 15x10 zoom lens, it can be made available to fit most of the many other Angenieux zoom lens configurations.

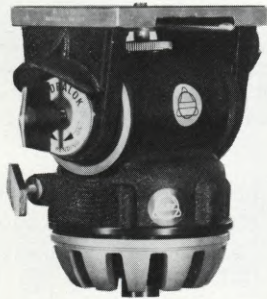
Both units shown at the Angenieux exhibit were prototypes and therefore, production is not expected before the end of 1976. As a result of the opinion of those who inspected both of these lens accessories at *Photokina*, it appears that the Angenieux factory will have a difficult time keeping up with the demand. ■

**The new Angenieux highly corrected retrozoom wide-angle lens adaptor shown mounted on a 15x10 Angenieux 10mm-150mm, T/2.3 lens. Below is the unique servo zoom/pistol grip control system, which has a custom-fitted built-in look. The bayonet-mounted retrozoom adaptor, when attached to the 15x10 lens, changes its focal length range to 7.5mm-112mm.**



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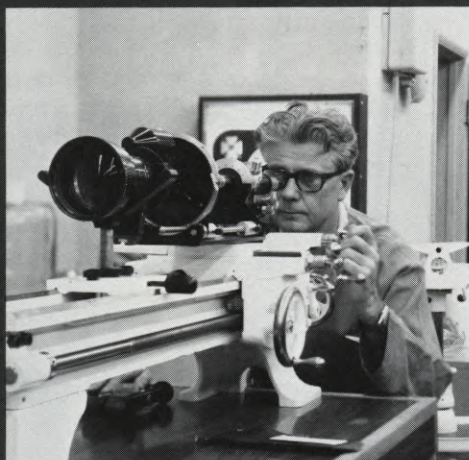
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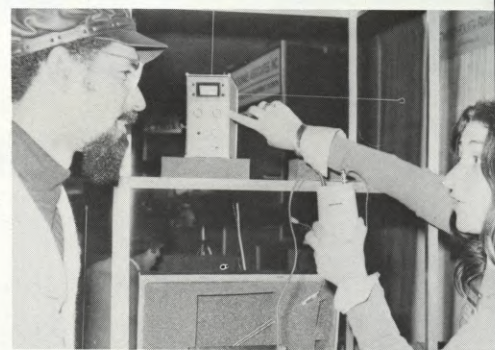
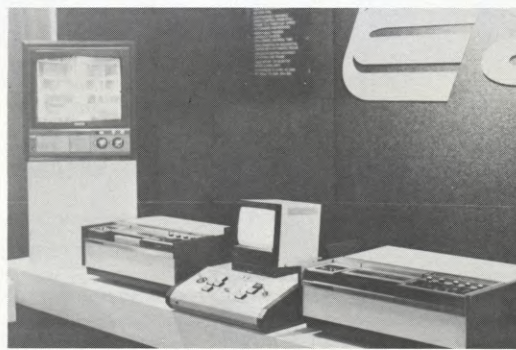
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(LEFT) Jim Frezzolini demonstrates the mirror-reflex system of his new Frezzi-Flex news-type camera. (CENTER) The Convergence editing console, when coupled to two 3/4" color cassette machines, provides "Steenbeck-style" editing. Cassettes can be controlled forward or backward at any speed from three times sound speed to single frame or freeze frame. The device will automatically preview the cut and perform the edit. (RIGHT) Cindy Becker of Ferco demonstrates the new Vega diversity receiver for their wireless microphone.

## 118th SMPTE CONFERENCE Continued from Page 1371

the opportunity to see it in action (let alone try it on). The STEADICAM is, in essence, a body-brace device that allows, by virtue of a unique design, the camera to float virtually weightless and impervious to shock and vibration. Being totally isolated from the camera-person's body, the visual effect is not unlike a magic carpet.

In the area of conventional tripods, O'Connor has introduced a new Model 30 head. It weighs just 5 pounds, yet will support cameras up to 30 pounds. The counterbalance system can be field-adjustable for cameras weighing between 10 and 30 lbs. Cinema Products has also introduced a new fluid head designed for cameras up to 30 lbs. A unique feature of the CP Universal 2030 is the "Autoslip" which allows self-adjusting breakaway free pan.

Quick-Set showed their complete line of Hercules tripods, designed primarily for the video industry. Among their new items is a 140-lb.-capacity cam head. This new head features a field-interchangeable cam that perfectly counterbalances any camera. In addition to stocking cams for the more popular combinations, Quick-Set will custom design a cam to perfectly

balance any camera/lens combination.

While not really a tripod, the new Gruber "Wheelit" definitely deserves attention. The ENG news crew usually has quite a bit of weight to haul around: camera, CCU, VTR, batteries, etc. The Gruber ENG-1 combines a cart and tripod into one unit for a quick and mobile operation. The video camera sits on a camlink head on an elevator column. The remainder of the electronics paraphernalia is strapped to the specially-designed cart. And away we go!

## MOTION PICTURE CAMERAS AND ACCESSORIES

Arriflex displayed a myriad of new and useful accessories. Pictured is the new complete zoom housing for the 25-250 zoom lens. Also available is a zoom servo-motor, follow-focus mechanism, and the new studio matte box, incorporating three rotating 6 X 6 filter stages. A bridgeplate is also provided to mount the camera and lens housing on a single support. Also pictured is the new ARRI HVQ quick-change battery pack used for the 35 BL, 16 BL, and 16 SR, as well as the new ARRI 12-volt universal motor for the 16S. This new battery provides significantly more reserve torque than do conventional 12-volt batteries, yet is only half the size

and weight. A similar compact quick-change battery was shown for the ARRI 35 and 16. ARRI also showed the new IRT time code system which is compatible with units shown at both Nagra and Steenbeck.

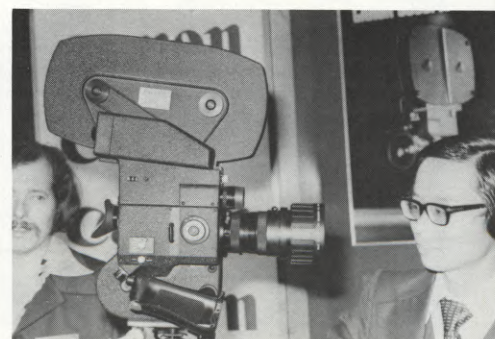
Most interesting to the thousands of ARRI 16S owners is the new Universal motor. This 12-volt motor does almost everything. It has stabilized variable speed (5-75), crystal 24 frames, forward and reverse, and external reference slave ability and, last but not least, a single-frame capability. I am sure this motor will be on the top of many a Christmas list.

ARRI also exhibited the complete line of professional Bauer projectors for which they are now the sole importer. Included was the new Bauer Selectron II with an improved vertical xenon lamphouse.

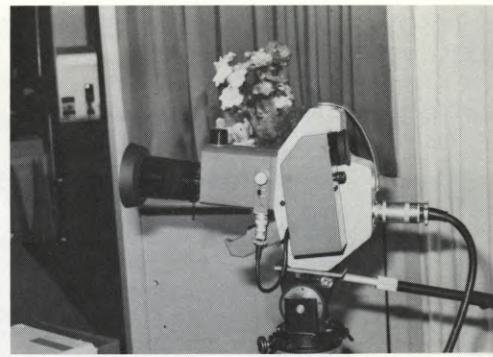
While on the subject of projectors, Victor Duncan, Inc. is importing the new Magnaflex 16 MK. III double-band projector. This is quite an impressive unit that is available in several configurations from a double-system preview projector up to a full-blown studio rig capable of two-track recording and mix down.

On the innovative side, Hollogon Optical Systems Corp. showed a projector incorporating their new Hol-

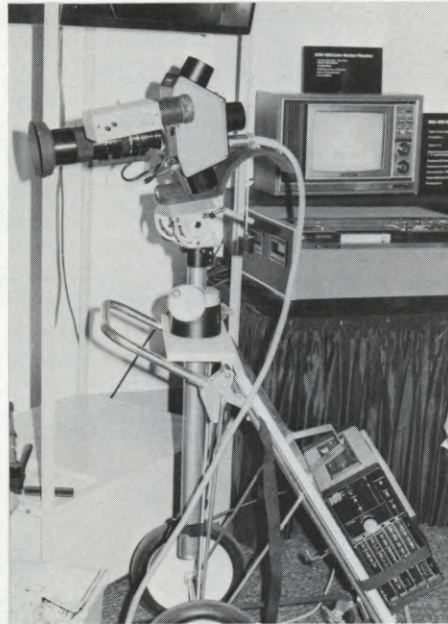
(LEFT) Frank Kelly demonstrates the latest Swintek communication radio device. The antenna is mounted on top of the headset for added performance and range. (CENTER) Ed Clare of Cinema Products shows studio-equipped CP16 camera with video viewfinder. The entire unit sits on the new Universal 2030 fluid head tripod, which features "Autoslip". (RIGHT) Canon Scoopic MS camera with 400-foot magazine adaptor and 1-1/2X converter on the 12.5mm-75mm zoom lens.







(LEFT) Colortran introduced a new line of HMI lights with integrated light head and ballast. The all-in-one units are available in both flood and Fresnel spot models of 575 watts. 1200-watt units are to be made available soon. (CENTER) The Hitachi SK-80 ENG video camera. Studio quality in a shoulder unit. (RIGHT) Philips' compact LDK-11 ENG color video camera. There was more video equipment in evidence at this SMPTE Conference than ever before.



(LEFT) The new JVC 4400 portable 3/4" color video cassette recorder/player. (RIGHT) Is it a bird or a plane? Neither. It's the Gruber ENG-1 Cart that holds the video camera atop a cam-link head on an elevator column tripod. The lower part of the cart carries the CCU and recorder.

logon Scanner which provides *completely* flickerless projection with *no intermittent*. It has none of the aberrations associated with prism-type systems. It has special appeal for use in telecine chains where the projector speed can be varied at will with no

interdependence with the video sync rate.

Back to cameras — Bolex showed some fine items that should start many Bolex owners salivating. Most impressive was a wide-angle adapter that converts the already wide-angle Switar

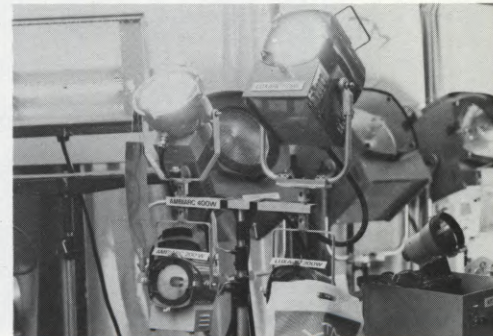
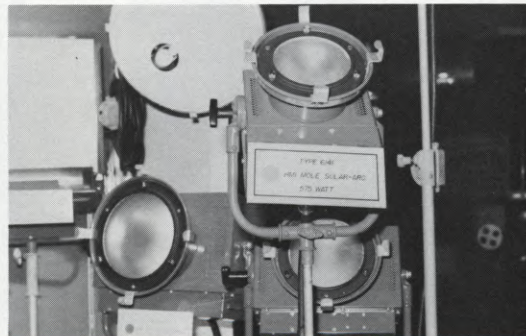
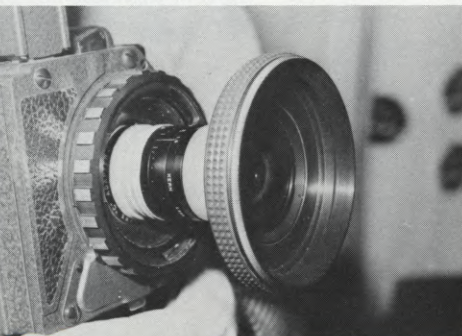
10mm lens to a (would you believe?) 5.5mm lens. I am usually skeptical of "adapters", as they seldom attain the quality of the lens they are supposedly adapting. Not so with this item. The quality of the 5.5mm Aspheron is equal to that of the high-quality Switar 10mm, incorporating both spherical and new aspherical lens elements. A special refractive glass is used, as well as a highly efficient coating which maintains the f/1.6 rating of the Switar. Most important, the 5.5mm combination is virtually distortionless; all lines remain perfectly straight, even at the edges. This lens adaptor was surely one of the most exciting accessories at the show.

Bolex has introduced a new TV ground glass that will be available in new cameras and can be retrofitted into existing EBM, EL, and late model Rex 5, SB and SBM with high magnification viewfinders. A new sophisticated intervalometer for the EL camera was also displayed.

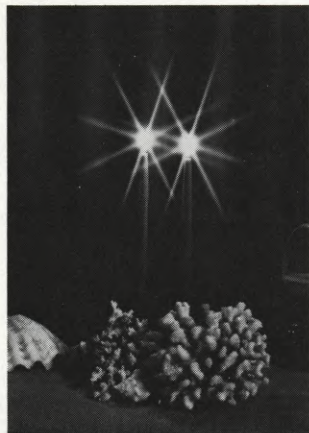
Canon also introduced some new accessories, including a 9mm adapter and 1½X converter for their 12.5-75 and 12-120 zoom lenses. An adapter is also available which makes possible the mounting of a 400-foot magazine on the Scoopic MS.

Frezzolini displayed the final pro-  
**Continued on Page 1400**

(LEFT) Bolex previewed its new Aspheron adaptor which converts the Switar 10mm lens to an amazing 5.5mm ultra-wide-angle optic. This quality aspheric lens is virtually distortionless. The Aspheron will probably cost about \$350. (CENTER) Mole-Richardson displays its complete line of HMI lights, ranging in size from 575 watts to 4000 watts. (RIGHT) LTM offers a very complete line of HMI lights, featuring no fewer than 13 models.



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## THE NEW MPE 16mm CAMERA Continued from Page 1369

plate are in camera head, so the frame-line remains stable, not subject to possible variations in film chamber position.

### Magazines:

All magazines incorporate a carefully and subtly designed pressure plate and guide system for maximum film plane stability during exposure.

Each magazine has its own digital counter reading to tenths of a meter of exposed film. Reset of the counter is inside the magazine to avoid accidental reset.

There is a choice of three magazines: 30m Core load. With this magazine the camera has its smallest envelope. This chamber will also hold 60m of 0.06mm polyester base film. It must be loaded in dark.

30m daylight spool load: This makes the camera 52mm longer and 8mm taller, but offers the convenience of loading in daylight.

120m Coaxial magazine has the torque motor inside the takeup hub, reducing the overall dimensions to 175mm diameter, 36mm wide, 120m long.

The 120m magazine sits on the shoulder. Another version of the 0.06mm polyester base film will only be 145mm in diameter.

The camera is an exceptionally simple mechanism with only eleven moving parts, six in the magazine and five in the camera head. Flicker, from uneven frame-to-frame exposure, often comes when motor rotation is transmitted via gear train to shutter. In the MPE both the shutter and the sync chopper are mounted directly on the motor shaft. The result is extraordinary exposure stability and freedom from flicker.

The MPE was designed by Kenneth Richter, internationally known cinematographer, film producer, and designer of the R2 Reflex Autocollimator. It is manufactured by the Avicon Corporation of Burlington, Vermont, in a new factory built to make the MPE camera and the other components of the MPE system.

The MPE system is intended to open a whole new approach to movie-making. ■

*(EDITOR'S NOTE: The MPE Camera described above was shown at Photokina '76 by its inventor/designer, Kenneth Richter, in prototype form only. Mr. Richter stated that further modifications to its design were in progress. For further information about the MPE Camera, including its ultimate market availability, contact: AVICON CORPORATION, 1205 Airport Parkway, South Burlington, Vermont 05401.)*

## "UNIVERSAL MODEL" STEADICAM Continued from Page 1337

"sled," drawing power from the "sled" system, and using the attached 3" monitor as an added video-assisted viewfinder.

Since there are many hand-held cameras — video, 16mm and 35mm — of approximately the same weight, it is possible (with minor adjustments) to use the same STEADICAM Universal Model for any of these.

At *Photokina '76*, the cameras used in conjunction with the STEADICAM Universal Model were a CP-16R reflex camera — ideally suited for the STEADICAM because of its already available optional Cinevid-16 video-assist system — and a modified Arriflex IIC similar to the modified Arri IIC utilized in the original version.

The modified Arri IIC is equipped with a "hard front" to accept the new Canon aspheric super-fast prime lenses (and other lenses in standard BNCR-type mount), and its drive circuit is modified to permit the reflex mirror to stop in the viewing position at all times. In addition, a 2/3" video camera has been coupled to the Arri IIC viewing system to provide reflex viewing by means of Cinema Products' specially designed 3" high-intensity monitor.

For use with the Universal Model, the crystal-controlled sync/variable speed motor drive for the newly modified Arri IIC has been moved back up on the camera which now features an entirely new flat base, permitting it to be easily

**Designer/inventor Garrett Brown demonstrates the original STEADICAM, which will continue to be marketed.**



British Assistant Cameraman Paul Samuelson tries the STEADICAM. Visitors appreciated the opportunity for a "hands-on" (or, in this case, "body-on") tryout of this unusual new equipment.

attached to the STEADICAM camera-mounting platform.

The STEADICAM Universal Model was first used with an RCA TK-76 color video camera to provide coverage for ABC-TV's telecast of the National Academy of Television Arts and Sciences 28th Annual Emmy Awards presentation in May, 1976.

The Universal Model is currently being used with the TK-76 for the taping of a new John Denver Special at Universal Studios. It is also being used in Japan with the NEC MNC-61 video camera. Minor adapters are now being designed by Cinema Products to permit similar use with the Fernseh video camera and other video cameras in the same general weight class.

**Original STEADICAM-35 version will continue to be marketed.**

For motion picture studios and production houses engaged strictly in the production of 35mm feature films, it would probably be advisable to use the original STEADICAM model with the built-in modified Arri IIC camera. That is because in the original version, the placement of the high-intensity monitor at eye level provides a greater measure of forward vision, making it easier for the operator to frame the action more precisely, which is a prime requirement in 35mm feature film production. ■

# REPORT FROM THE UNIATEC CONGRESS IN MOSCOW

By **DAVID W. SAMUELSON**

*American Cinematographer Contributing Editor*

At the XIIIth Congress of the International Union of Technical Societies, holographic motion pictures are introduced to the world

Every two years, immediately following *Photokina*, the International Union of Cinema Technical Societies (UNIATEC) holds a technical congress which alternates between East and West Europe. Two years ago we gathered together in the warmth of Italy and Italian hospitality; this year we met in Moscow where we enjoyed high technology and a warm welcome, not only from our fellow technicians who have become our personal friends over the years, but also from all the backroom people who do not have the opportunity to travel as widely.

For a few the UNIATEC period commenced with two days of judging the 24 films entered in the Technical Film Competition. In this event up to 10 minutes of a particular film is judged on the basis of its contribution to technical advancement and accomplishment. The British entries were a section from Stanley Kubrick's "BARRY LYNDON", which illustrated the use of ultra-wide-aperture lenses (T/0.7) to film by candlelight, and "FINITE ELEMENTS", a computer-animation film made by the Atlas computer division of Rutherford Laboratories.

Although not winning the Grand Prix,

**UNIATEC is a unique organization and its biannual Congress brings together delegates from many nations which are usually not represented in other film and television technical conferences.**



Every two years the UNIATEC Congress is held in a different country. This year the host nation was the USSR, which welcomed delegates from all over the world. They are shown here gathered in the Conference Hall where papers and demonstrations were presented. Simultaneous translation into several languages was available.

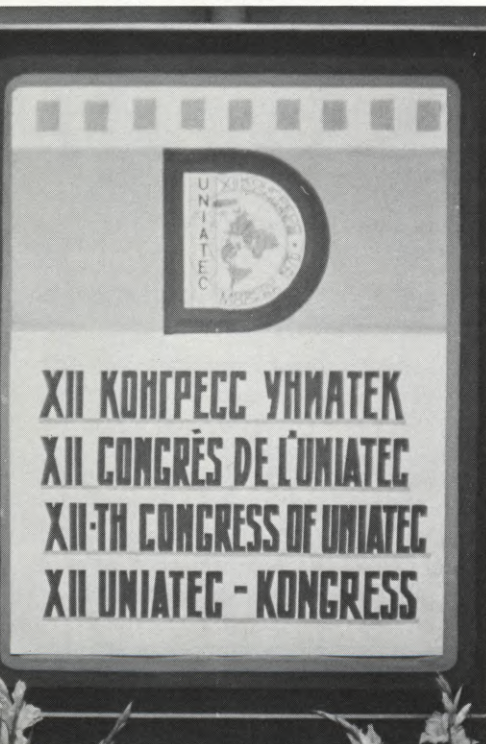
Britain did win awards for both entries. "BARRY LYNDON" won the Prix d'Excellence and "FINITE ELEMENTS" a Special Mention.

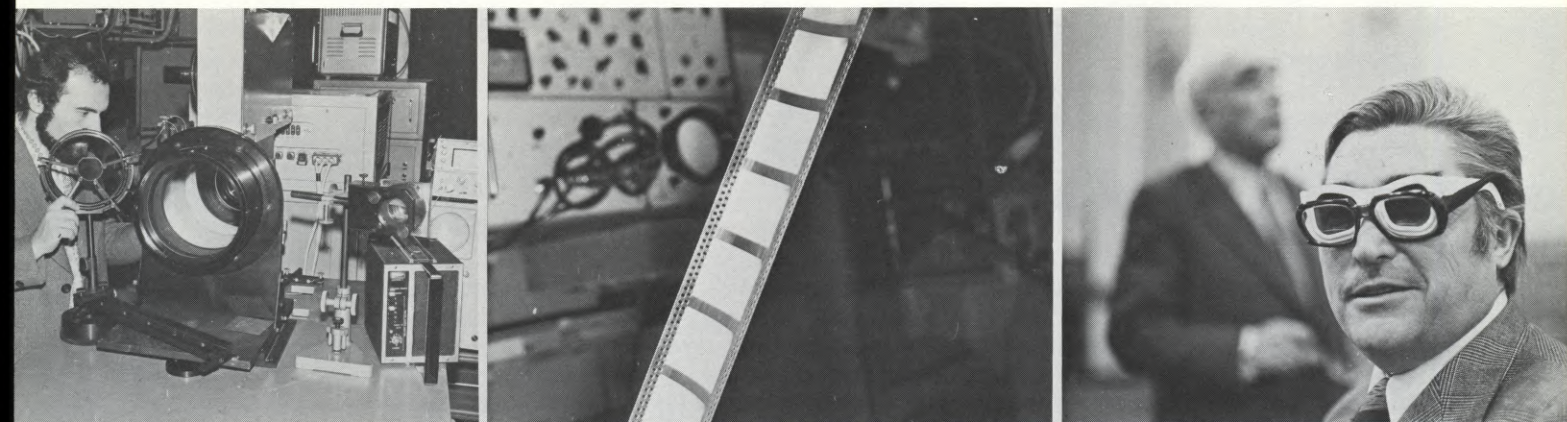
The Grand Prix de l'UNIATEC went to an East German film, "CONCERT FOR POT AND ORCHESTRA", an amusing combined live action and animation film which featured a three-legged coffee pot which became quite human. Some of the combined shots involved camera tracking movements with the live action material closely integrated with the animated movement of the coffee pot.

Although it did not win the first or even a second prize, I particularly liked a stunningly beautiful segment of film from Italy entitled "EXCELLENT CORPSES". It showed scenes in a Sicilian catacomb and a Mafia funeral where the blacks were jet, jet black and the contrast extraordinarily high, but without affecting the flesh tones. It was photographed by Pasqualino de Santis, who won an Academy Award for his photography of "ROMEO AND JULIET". The dense blacks and high contrast were achieved by putting an extra stage into the print development processor to additionally develop the image in a special "sound track" bath.

Gathered together for the Congress

Film laboratory practices authority Bernard Happé (BKSTS) addresses the Conference. Experts from every phase of film and television production exchange views at these events.





(LEFT) Holographic motion picture camera, equipped with a lens of large aperture (200mm), utilizes a ruby pulse frequency laser. (CENTER) A strip of 70mm holographic film. (RIGHT) Claude Soulet, Secretary General of UNIATEC, wears polaroid glasses to view demonstration of the latest Russian STEREO-70 3-D process, which employs 70mm film on which the two images are placed side-by-side. (BELOW RIGHT) A closer view of the Russian holographic motion picture camera.

were 188 overseas delegates from all the 22 UNIATEC countries, plus 300 from the host nation. From the UK came the President of the B.K.S.T.S., Dennis Kimbley, together with Robin Aldworth, J. Allen, R. Allen, R. Carpenter, B. Happé, D. Humphreys, F. Gloynes, A. Lumkin, J. Radcliffe, D. Robertson, C. Smith and myself. Delegates from the USA included the President of the SMPTE, Ken Mason; their Secretary, Dennis Courtney; Jim Branch; Milt Forman; Bob Gale and Harry Teitelbaum. The delegation from France was headed by the President of UNIATEC, Andre Coutant; the Treasurer, J.P. Houguenade; the President of the CST, C. Leon; and their Secretary, who is also General Secretary of UNIATEC, Claude Soulé. A strong delegation from the USSR was headed by those responsible for the impeccable organization: the President of the Congress, B. Konoplev, together with O. Ioskin, V. Trusko, E. Iofis, L. Dyko and B. Belkin.

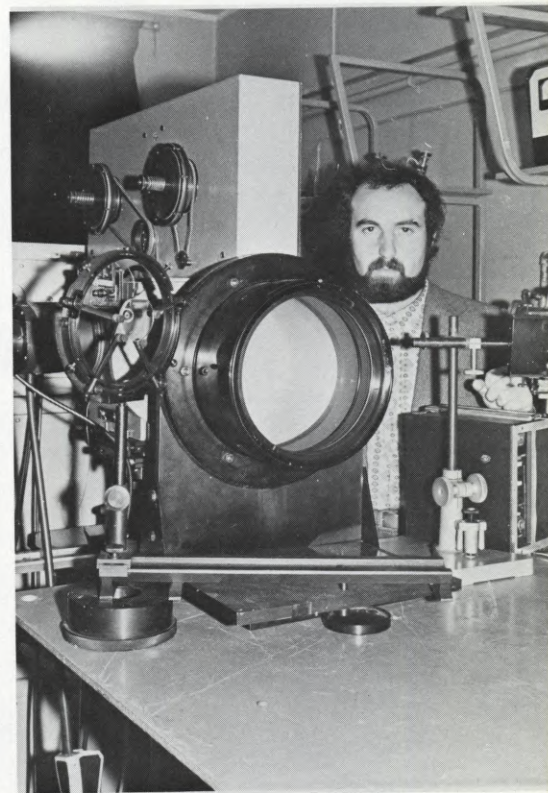
The first paper of the Congress, by V. Komar (USSR), described the theory

behind the new system of Motion Picture Holography, an incredibly technical paper which, I would guess, was understood by very, very few of those present. Much more down-to-earth was the report from the SMPTE presented by Ken Mason. He described very clearly the work done by that organization.

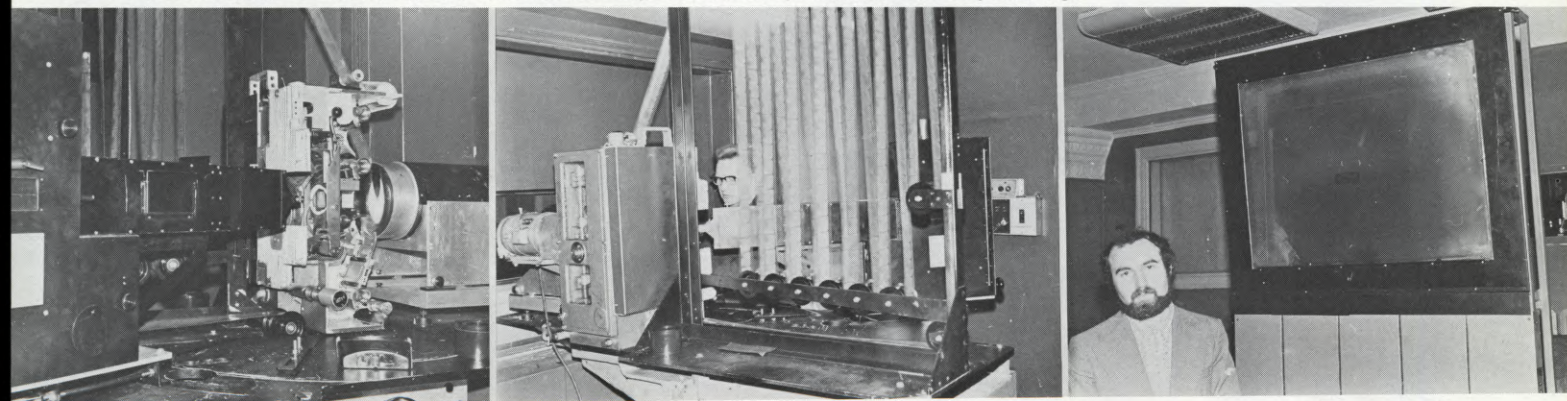
Karel Ludvik of Canada rounded off the first day of the Congress with a well-illustrated paper describing the ORTO coverage of the Olympic Games.

On the following day, Dr. F. Gloynes described in detail (and showed clips of) film to illustrate the system of film-to-tape transfer using modulated light from three laser beams. Afterwards, Bernard Happé presented a *résumé* of almost every other known form of transfer, ranging from the most simple method of direct photography off a television tube to the most sophisticated form of enhanced image with increased lineage to sharpen definition. To have the opportunity to compare, on the screen, every one of these systems

Continued on Page 1397



(LEFT) AT NIKFI, the Soviet motion picture research organization, this projector with mercury lamp and lens of large aperture (200mm) was used to project the first holographic motion picture ever. (CENTER) The test demonstration holographic film projected for delegates consisted of a 30-meter continuous loop of a single scene lasting 30 seconds. It is shown here threaded for projection. (RIGHT) Holographic focusing multiplying screen. Though this first test was very crude, future possibilities are very exciting.



**REPORT FROM PHOTOKINA '76**  
**Continued from Page 1333**

versatile luminaire which can be operated from 120 or 220/240-volt AC line sources or existing commercially available DC battery sources. It features a revolutionary double-parabolic peened reflector which, in the prototypes being shown, achieves the astounding spot-to-flood focusing ratio of 16-to-1. However, bending over backwards to present an honest appraisal of the new product, its designer, Ross Lowell, states that he expects the production units to have a spot-to-flood ratio of 10-to-1, still an extraordinary range.

In the field of camera design, the most intriguing item displayed is the prototype of the new MPE (Minimum Possible Envelope) camera designed

by Kenneth Richter. It is an unbelievably diminutive 16mm camera which is about the size of the average Super-8 camera and is only slightly longer than a 35mm Leica. Moreover, though simple in design, it boasts some very sophisticated features. Although purposely designed to look like an amateur camera in situations where low profile is a plus, it is thoroughly professional in concept and operation. It is emphasized that only a prototype is being shown at *Photokina*, there being some further modification still in the offing.

Cameras previously introduced to the market, but being shown at *Photokina* with their latest upgraded modifications include the 35BL and 16SR Arriflex models, the Eclair ACL and the long-awaited Aäton, now finally in production.

**One of West Germany's most famous landmarks, the beautiful and imposing Cologne Cathedral has long since become an unofficial symbol of *Photokina* and an art motif for its posters. Hotels in this bustling city on the Rhine are filled to capacity long in advance for *Photokina*, and some visitors are accommodated aboard Rhine steamers, such as the one in the foreground.**

Making a big splash at *Photokina '76* is the new line of Spectra Series II Electronic Meters, which represent a sleek departure from the classic Spectra meter which, for the past few decades, has been the workhorse standard of the industry for still and motion picture photography. The meter among them which I find especially fascinating is the new Spectra Combi II, a unique design which features two silicon detectors on opposite sides of the head — one for incident, the other for reflected light measurements — *and the capability for taking both simultaneously and averaging them into a single, direct reading.*

Presented by Nagra Kudelski is the new Nagra T recorder, a basically non-mobile studio unit that takes reels or spools up to 300mm (12 inches) in diameter. It is a double capstan unit having the speed stability of a closed loop system, but the threading ease of an open loop system. As a fixed installation, the Nagra T is mounted on a stand, but it is transportable for outside work and can be fitted into a rack.

One of the most interesting items on display is the Neilson-Hordell Dual Screen Front Matte Projector, a device for achieving a wide-scale front projection effect in close quarters. It is based on the principle of splitting the projected image onto two screens, the first being behind the actor and only large enough to cover any movements, while the second screen, being part of the Front Matte Projector unit itself and positioned above the camera, receives a projected image by way of a beam splitter. Simple soft edge mattes are used to meld the two segments into a single scene. An auxiliary device, the "ZOPTIC" special effects unit, permits zooming of a foreground object, with no change in image size of the background scene.

Introduced at *Photokina '76* is Magnasync/Moviola's new generation of a studio recording, dubbing and projection system, utilizing an especially modified M85-AH Flatbed with a built-in AMI-48 Stellavox Mixer.

While the concept of using a flatbed/mixer combination interlocked to recording/dubbing equipment was first illustrated by Magnasync/Moviola at the 1973 SMPTE show, this new equipment incorporates technological advances designed to minimize effort, save time, reduce operating space and maximize the artistic abilities of the operator. For the first time, one man can transfer sound, edit sound and picture, and mix down any number of tracks with the proper combination of elements.

The 350S "STYLOPHONE" Synthesizer, presented here by Dubreq of



London, is an ingenious device which should find favor with low-budget film-makers who have long coveted the range of electronic music and sound effects possible with the Moog Synthesizer, but who have not had access to this fine instrument or been able to afford it.

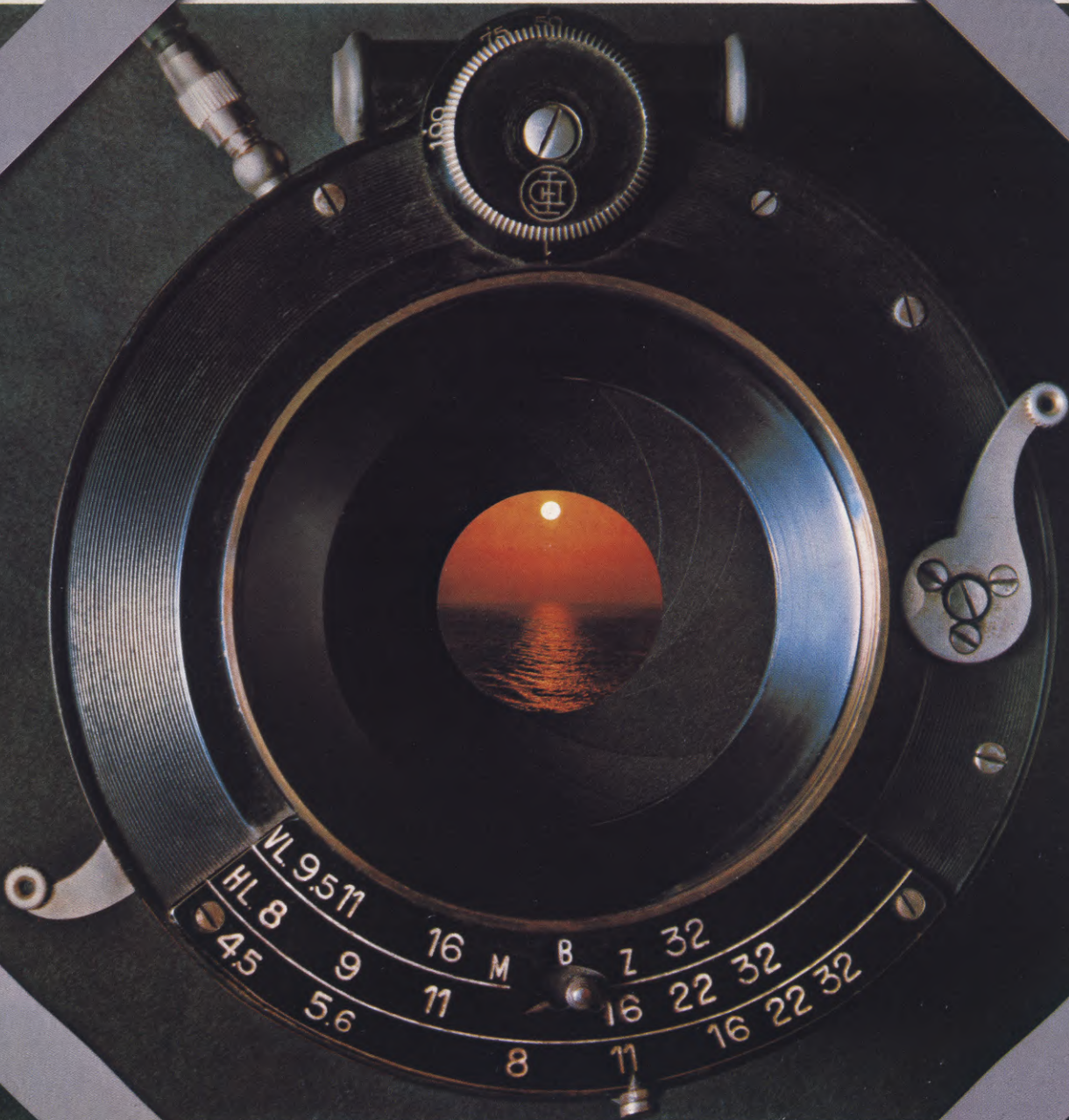
The 350S is no Moog, but it is capable of an extensive repertoire of similar effects. It is small enough to fit

into a brief case and costs no more than a decent cassette tape recorder, but is a highly sophisticated electronic instrument. It has no keyboard, but is "played" by running a stylus across a serrated and numbered metal strip. It can also be plugged into an amplifier to achieve volume of almost "mighty Wurlitzer" proportions and can be coupled with a tape recorder for over-dubbing onto previously recorded tracks.

In addition to the aforementioned items of equipment, all of which are documented in detail elsewhere in this issue, there is the usual proliferation of smaller gadgets, gimmicks and gizmos that round out the film-maker's working gear.

As for the crowds . . . the first day's attendance is almost uncannily sparse, but it picks up from there and ap-  
**Continued on Page 1384**

# photokina photokina photokina



# NEW CONCEPT IN POST-PRODUCTION RECORDING FROM MAGNASYNC/MOVIOLA



by **CARL NELSON**  
Vice President/Chief Engineer  
Magnasync/Moviola

**First showing of the new generation of a studio recording, dubbing and projection system that utilizes a flatbed/mixer combination interlocked to recording/dubbing equipment**

*Photokina* 1976 marked the first international showing of Magnasync/Moviola's new generation of a studio recording, dubbing and projection system utilizing an especially modified M85-AH Flatbed with a built-in AMI-48 Stellavox Mixer.

While the concept of using a flatbed/mixer combination interlocked to recording/dubbing equipment was first illustrated by Magnasync/Moviola at the 1973 SMPTE Show, this new equipment incorporates technological advances designed to minimize effort, save time, reduce operating space and maximize the artistic abilities of the operator. For the first time one man can transfer sound, edit sound and picture, and mix down any number of tracks with the proper combination of elements. The system herein illustrated consists of a 16mm, EBU Two-Track, Master Pick-up Recorder/Reproducer, a 16mm, EBU Two-Track, Double Reproducer and the above-mentioned Flatbed.

**The system illustrated consists of a 16mm, EBU Two-track Master Pick-up Recorder/Reproducer, a 16mm, EBU Two-Track Double Reproducer and an especially modified M85-AH Flatbed with a built-in AMI-48 Stellavox Mixer. This system, devised by Magnasync/Moviola, incorporates technological advances designed to minimize effort, save time, reduce operating space and maximize artistic abilities of the operator.**

The Stellavox Mixer was chosen for this installation for its professional mixing features packaged in an ultra-compact format, although other mixers can be used, either in the Flatbed or placed alongside it. To minimize effort, all the transports' motion, whether crystal sound speed forward or reverse, are conveniently located at the Flatbed within easy reach of the operator's right hand. A variable speed knob, likewise located, is used for rock and roll motion, varying speed from less than a frame per second to ten times sound speed (240 FPS) in either direction. To the left of the operator, in a recessed panel, pushbuttons remotely control the record, playback, sync playback functions of the recorder's amplifiers. The mixer, electronic footage counter and viewing screen are all located within the operator's main field of vision — all in all, facilitating a pleasant, time-saving working environment.

An unusual feature of this system is

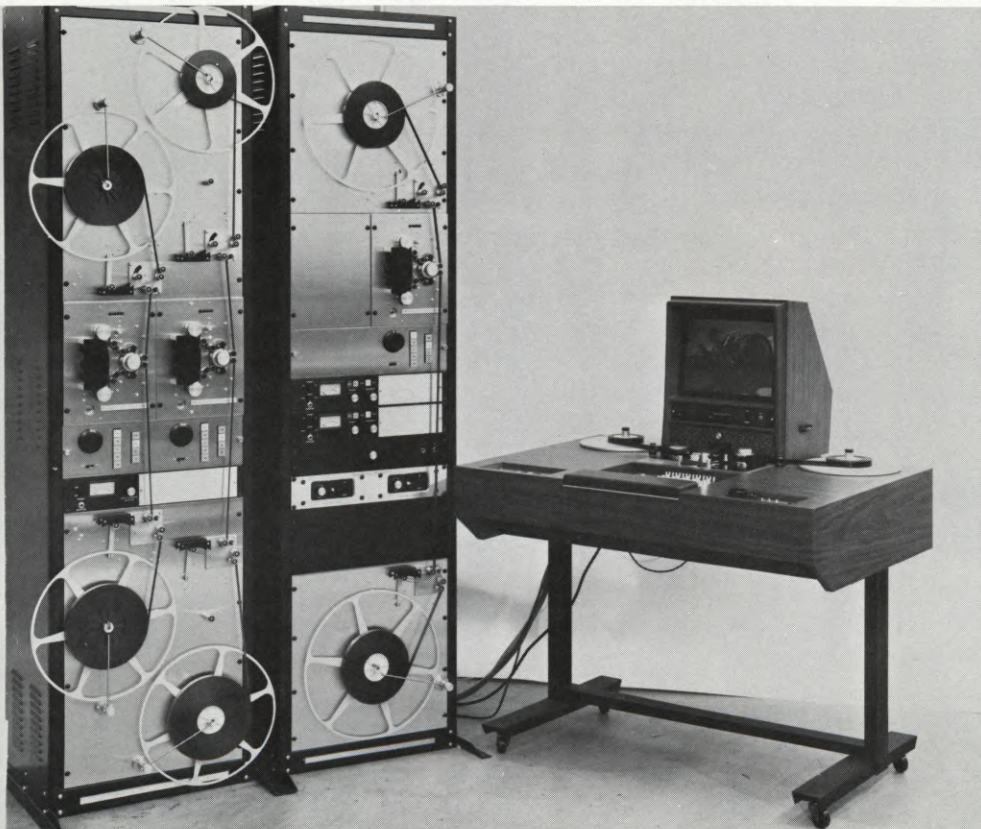
its ability to remember true position at any acceleration/deceleration rate and maintain true sync at any constant velocity. The feat is accomplished by means of a memory circuit capable of storing over 200 feet of film position information, thus "remembering" true position at all times. STOP commands vividly illustrate the functioning of the memory as the system ramps down to a halt, overshooting the true position stop point, automatically reversing itself and halting at that point, all in a matter of seconds.

A major design goal was to eliminate, under any operating mode, film damage due to operator error or defective film splicing resulting in film breakage. Film gates command a unit to gently stop whenever film presence is lost due to film breakage. Accidentally dropping units out off or onto active buss line will result in commands to gently stop or ramp up to operating speed, as the case may be.

System reliability has been considerably increased by incorporating cool running CMOS circuitry. Thoughtful design has resulted in unprecedented serviceability as all circuit boards are easily accessible by removal of front or back panels.

The recording/dubbing system is by no means limited to functioning with a Moviola Flatbed. Interlock accessories are, or can be made, available to slave the equipment to other manufacturer's high-speed projectors and recording/dubbing equipment.

In short, then, a powerful new tool is now available to post-production facilities, whether large or small, capable of offering state-of-the-art film recording and viewing with great ease of handling at no expense in safe-handling those precious original takes. ■



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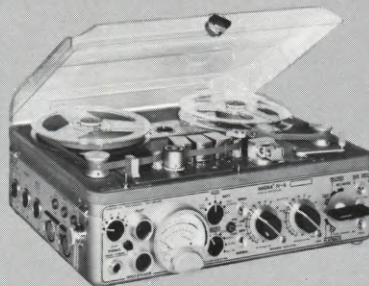
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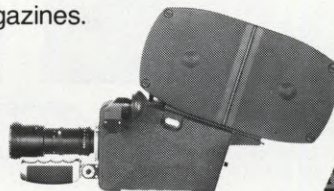
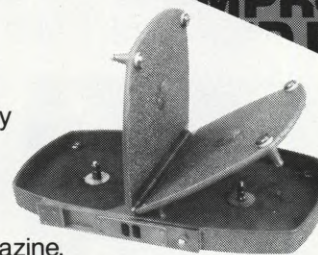
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## REPORT FROM PHOTOKINA '76

Continued from Page 1381

proaches near-record proportions. Despite the high admission fee, purposely pegged that way to discourage the rubber-necking general public, the magic of *Photokina* continues to lure the crowds. ■

### PHOTOKINA '76—THE SUMMING UP

The 14th *Photokina* in Cologne opened by the West German Economics Minister Dr. Hans Friderichs closed with very positive business results on Thursday, September 16, 1976, after lasting seven days.

112,000 visitors from 111 nations came to the World Fair of Photography, including 38,000 foreign visitors. Total attendance was up 18 per cent, foreign attendance 15 per cent on the 1974 *Photokina*. More than one third of all trade visitors came from abroad.

The exhibitions of photographs, which remained open until September 26, were attended on the first seven days by some 40,000 visitors.

869 direct exhibitors and 47 other represented firms from 31 nations took part in the 1976 *Photokina* in Cologne which occupied a gross floor space of 1,022,200 sq.ft. (95,000 sq. metres). This total included 500 direct exhibitors and another 45 represented firms from countries other than Germany.

Cologne's next *Photokina* — the World Fair of Photography — will be held from September 15 to 21, 1978.

### Good to very good results from the fair

The sectors, offering still and ciné cameras, lenses, slide and film pro-



The enormous complex of twelve exhibition halls on the banks of the Rhine River which, every two years, is the site of *Photokina*, the World Fair of Photography. In the background (top) can be seen the famous Cologne Cathedral, spectacular landmark of the city, and a familiar site to those visiting the many trade fairs and exhibitions held in Cologne.

jectors, darkroom and laboratory equipment, photographic lighting systems, accessories, photochemicals and sensitized materials, were unanimous in describing business as quite positive. This applies both to home business, where firms are satisfied with the general ordering trend, and to exports for which many direct orders were received and new business initiated. This was equally apparent in the amateur and professional fields.

Opinions of attendance varied according to the products offered by firms. Most exhibitors described trade attendance at their stands as "good" or "very good". Verdicts of trade attendance from foreign countries were mainly "very good". Many manufacturers stressed the fact that *Photokina* had never been attended by so

many trade visitors from abroad.

The number of qualified and very interested users, including serious amateurs, had also grown. Some initial fears that the restrictive effect of the price charged for admission could have influenced attendance had to be corrected; on the contrary, there were even some pleas in favor of a more marked filtering function.

As far as the effects of *Photokina* on the photographic market were concerned, the majority of exhibitors stated that the World Fair of Photography definitely fulfilled this function. In general, *Photokina* is regarded as an important sales promotion instrument for the photographic industry and it is emphasized that world-wide publicity for the fair met with a very positive echo among the trade and consumers. ■



869 direct exhibitors and 47 other represented firms took part in the 1976 *Photokina* in Cologne, which occupied a gross floor space of 1,022,200 sq. feet (95,000 sq. meters). This total included 500 direct exhibitors and another 45 represented firms from countries other than Germany. A total of 38,000 foreign visitors attended. Overall attendance was up 18%, foreign up 15% over the previous *Photokina* in 1974.



# QUARTZCOLOR IANIRO THREE-PHASE HMI BALLAST



HMI lamps, as it has been generally acknowledged, are capable of supplying a new form of illumination with an incredibly high ratio of lumens per watt.

This source of high-level light, however, under some filming circumstances, especially when filming at high speed, caused a disconcerting flickering or "beating" effect, the famous flicker problem. The uncertain reliability of HMI sources with regard to motion picture use led American technicians to stick with Brute arcs until 1974. At *Photokina 1974*, Giovanni Ianiro, President of QuartzColor Ianiro SPA, and Mario De Sisti, his head of engineering, assured the industry that after a deep study of the problem, their company was able to supply a ballast capable of eliminating the flicker nuisance from HMI lighting.

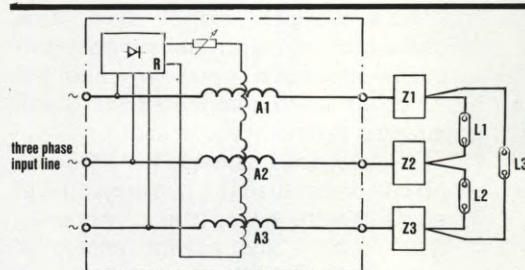
An electronic device, never used before, was able to supply to the HMI lamps an operating voltage no longer having a sinusoidal wave form, but a square wave form that could feed the lamps for the whole period with no interruption.

Front and side views of the new QuartzColor Ianiro Three-phase ballasting unit for HMI lights, designed in cooperation with Irem S. Antonino (Turin), who had the basic idea. At *Photokina* the unit was shown running three 2.5KW Sirio lights simultaneously, taking its power from a three-phase line at 220 volts or 380 volts plus neutral.

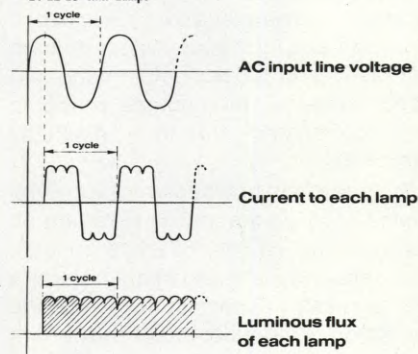
Based on its reception by the final users, this ballast was much appreciated because it allows filming beyond 4000 frames per second, although its dimensions and weight did not permit practical and efficient use for motion picture location shooting (where 24 frames per second is frequently used) and also because it is suitable for operating one spot-light only. QuartzColor Ianiro SPA has now designed, in cooperation with Irem S. Antonino (Torino) who had the basic bright idea, a new ballast which is free from the infamous flicker and is to be regarded as a breakthrough in HMI lighting.

A new three-phase ballast unit has been introduced by QuartzColor Ianiro SPA this year at *Photokina* in Cologne, and feeds three spotlights simultaneously (those shown at *Photokina* were three Sirio lights, each 2.5KW) taking the power from a three-phase line at 220V or 380V plus neutral. This ballast has not totally resolved the flicker problem, but it has certainly solved the problem of how to practically use three spotlights equipped

A relatively lightweight and compact new ballasting unit that can run three large HMI (metal-halide) lights simultaneously, and which, while not totally eliminating flicker, helps to minimize it



A1-A2-A3- Magnetic amplifiers  
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## Special three phase system for HMI Lamps

with HMI lamps.

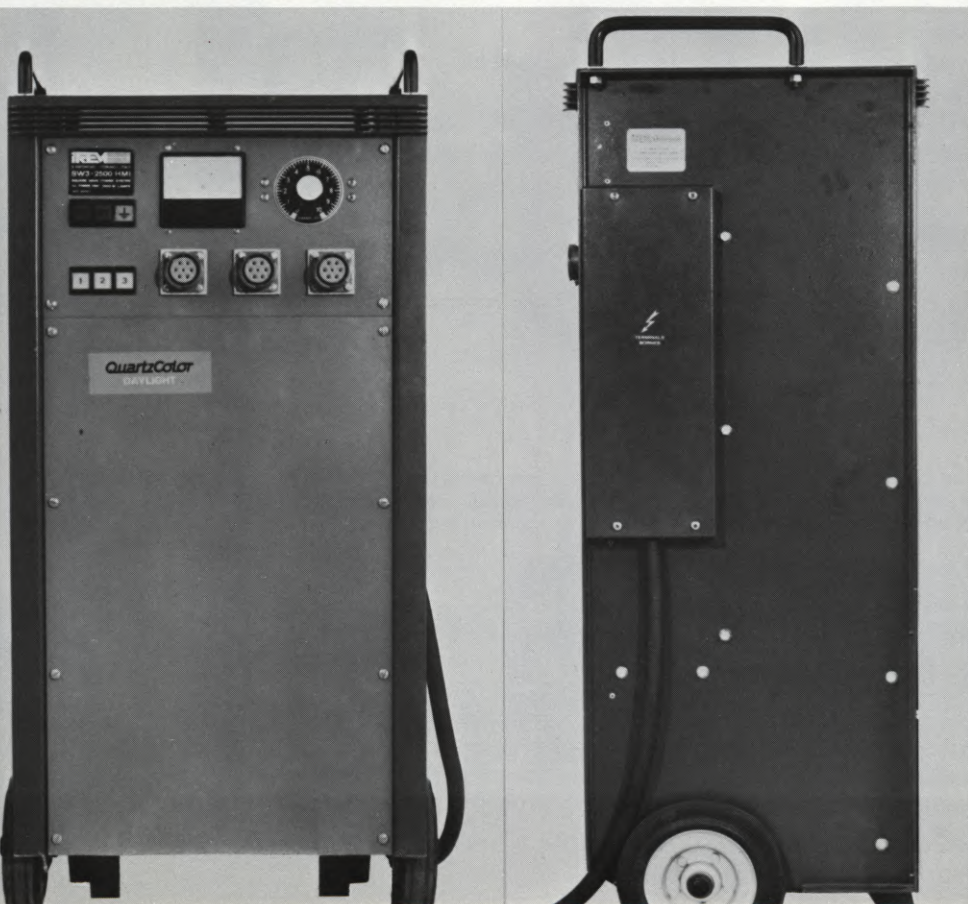
The unit shown at *Photokina* is very compact in size, can be easily carried on wheels by means of a robust handle and its weight is only 120KG.

Much appreciated was the correct weight distribution inside the unit shown: the center of gravity is high enough with regard to the vertical axis of the wheels. Therefore, very limited stress is required to move it. The outside diameter of the wheels (150mm) has been carefully calculated so that any transportation need can be easily met.

At the QuartzColor Ianiro booth, a long discussion was held with Mr. Mario De Sisti on the advantages of this new unit. He suggested, due to the particular structure, that the ballast be installed inside of a generator, not to be removed, so as to have one apparatus only.

The feeder cable from the ballast is long enough to reach Sirio lights placed up to 40 meters distance. Feeding conditions of the lamps are in no way altered. In fact, voltage drop on the above cables is negligible, almost non-existent, over the whole length of cable (48 meters). Cable does not create any

Continued on Page 1404



# THE NEW MINIATURE AÄTON 30 VIDEO CAMERA



This tiny video camera that is the size of a flashlight and looks like a microphone can be hand-held for news reporting or built into a film camera to serve as an electronic viewfinder

Low weight, small size, low consumption, high sensitivity, and stable electronic circuitry make the Aäton 30 video camera particularly well adapted to three types of use:

1. As a news camera, the Aäton 30 (\$) can be handled like a microphone at arm's length, giving the cameraman total mobility and a wide choice of shooting angles. The actual reporting conditions as well as the relationship between the reporter and the observed change considerably. As both definition and light sensitivity are much increased over those of most handheld video cameras, the images made in such conditions are thus distinctly improved.

2. In the field of cinematography, the choice of three standards (525 line 30 fps, 625 line 25 fps, 651 line 24 fps), high sensitivity, and small diameter are the necessary specifications making the Aäton 30 ideal to build into a film camera. It then functions as a flicker-free viewfinder at 24 or 25 fps. In addition, the scanning inversion and positive negative possibilities make this camera suitable as a video pick-up on all cinematographic equipment.

3. In scientific industries and medicine, it provides a solution in situations where reliability is of prime importance, and where the space is very limited. E.g., medical microscopes, airborne equipment, automobiles, and conditions where work is to be done in infrared.

## Description

The video head, in itself very small (36 mm in diameter) contains a 2/3" tube. At present, 2/3" tubes are widely used, and are constantly being improved by constructors because of their major application to portable color video cameras.

In shape and volume, the video head is similar to a microphone, and can, without particular requirements, be added to most existing instruments; its low heat dissipation and light weight bring only a minimal change to the running conditions of the machine into which it is built or added (6 W: 12V x 0.55 A). The video head is connected to the control unit by a 19 wire cable with Socapex bayonet lock plugs. Ref. SPX 19, length: 1.25 m. An adaptor can be screwed onto the front of the head, so as to adjust the back focus for all lens types; the standard camera is delivered with an adaptor for "C" mounts. As for electronics, the video head contains the high voltage dividers and the low-noise FET transistor pre-amplifier.

(When the cylinder is opened to change vidicon tubes, the target voltage and high voltages can be modified in function of the new tube's specifications. For example, the 8V target voltage will go up to 45V if a silicon tube is replaced by a cadmium selenide tube.)

The control unit can be installed up to 3 metres from the video head. Its

shape lends it to use in various situations: it can be attached to the cameraman's belt, or added onto the base of a film camera. The wing of a plane can carry it, or it can be attached to the cover of a VTR.

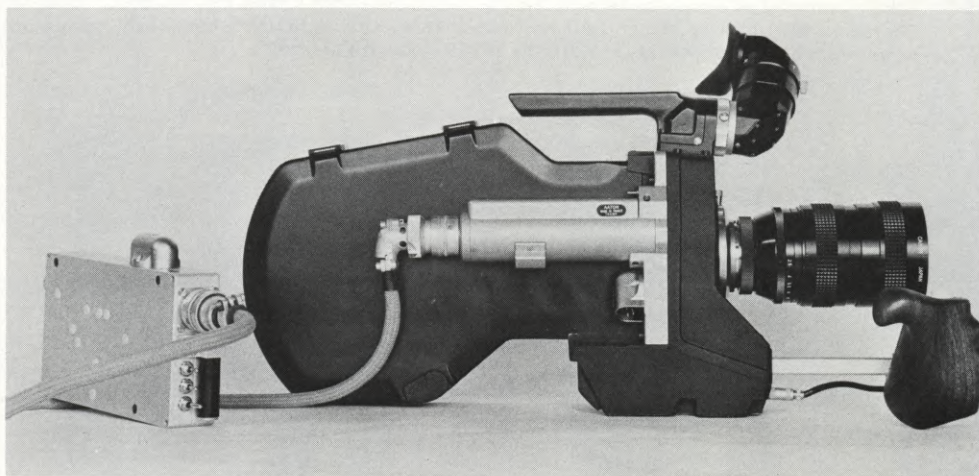
The Power supply is through either a 12V battery (Cannon XLR 442) or a VTR (using the universal 10 pin EIAJ cable). Ref. HND 10 length 2 m. Video outs through either an EIAJ plug, a BNC plug, or a Jeager plug to run a small control monitor.

The control unit contains the general on/off switch, a remote control switch for the VTR, a horizontal scanning inverter, positive/negative inverter, and a LED showing when the system is running.

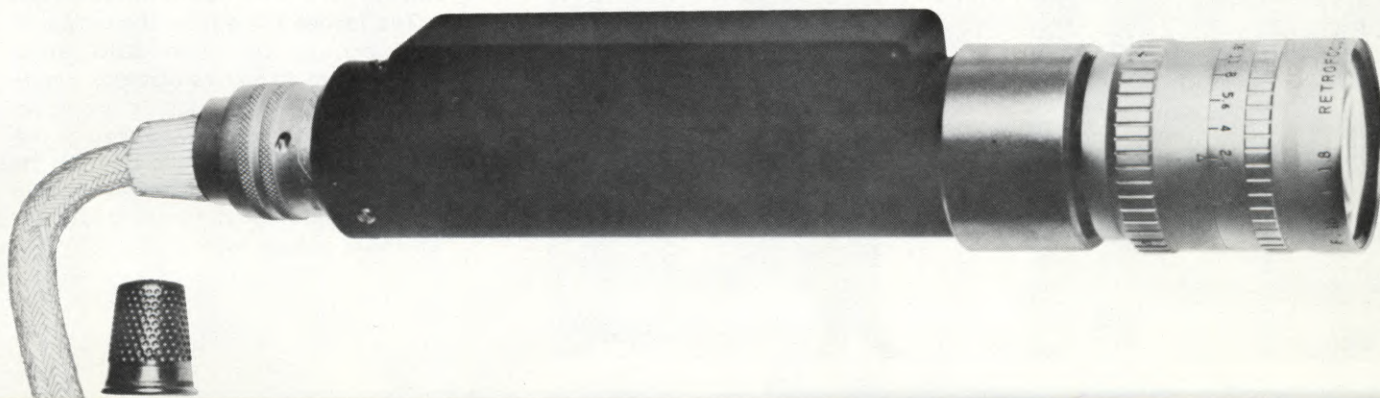
The electronic circuits contain a converter which delivers the various regulated voltages, the sync signal generator, the scanning amplifiers, and the analog processing chain for the video signal.

High reliability is attained through the use of silicon transistors, tantalum capacitors, CMOS digital circuits, and

**Continued on Page 1393**



(ABOVE) A modified version of the AäTON 30 video camera built into the famous AäTON 7 film camera to serve as an electronic flicker-free viewfinder. (BELOW) The AäTON 30 (shown here with a thimble for size relationship) looks and handles like a microphone, making it very inconspicuous when it is used for news reporting. It offers total mobility and a wide choice of shooting angles.

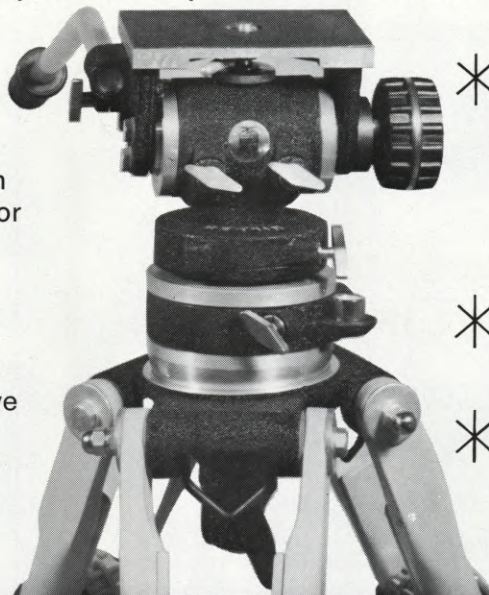


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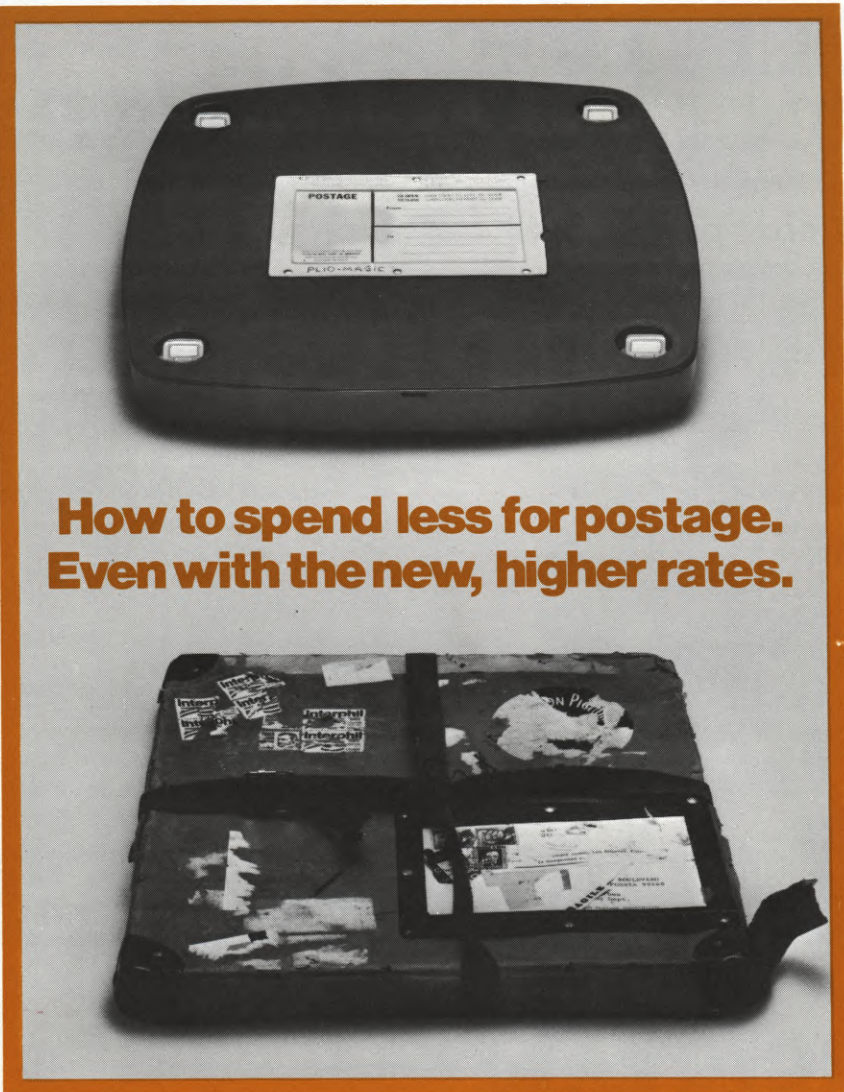


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## **KOBOLD REPORTERLIGHT** Continued from Page 1351

sidered most important in connection with a metal halogen daylight unit: no flickering — independent of camera speed, shutter angle and speed variations of motors.

### **THE LIGHTING UNIT**

Swivelling Handle for individual adjustment of the angle of inclination towards the head.

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4-leaf barndoor with filter-holding device and which can be rotated by 360°.

Dichroic filter with only 36% loss of lighting intensity when changing from 5600K to 3200K.

### **ELECTRONIC/BATTERY MODULE SYSTEM**

Two battery packs are available:

- BA-30EL with 4Ah  
Nickelcadmium cells  
Capacity: 20-25 minutes
- BA-30EL with 7Ah  
Nickelcadmium cells  
Capacity: 30 — 35 minutes

Both Battery packs are provided with an automatic circuit breaker, a switch on/off, LEDs to indicate voltage and the necessary automatic switch-off to prevent complete exhaustion.

Charging unit:

LA-30E fully insulated charging unit with automatic switch for 110/220V

The electric can be separated from the battery-pack or from the mains adapter\* in a simple way. This way batteries can be exchanged without loss of time.

### **THE ELECTRONIC:**

Adaption of the battery voltage to values necessary for operating bulb

and ignition.

No dark spots occurring within the luminous flux by means of square-wave current which warrants flicker-free operation of the bulb.

Adjustment of performance with an accuracy of  $\pm 5\%$  independent of the degree of discharge of the battery.

Central computer for control diode on the head and for controlling the ignition procedure.

And, of course, a solid transport case for all parts and accessories!

\*in preparation.

#### WEIGHTS AND MEASURES:

Head	1,9kg	145x180
4-leaf barndoor	0,6kg	150x150
Dichroic Filter 3200K	0,5kg	172x134
Electronic	3,2kg	220x152x122
Battery-pack 4Ah	4,5kg	220x106x122
Battery-pack 7Ah	6,5kg	220x137x122
Charging Unit	2,0kg	95x104x150
LA-30E	2,0kg	95x104x150
Transport Case	4,5kg	232x705x352

(all measures in mm)

For further information, contact:  
KOBOLD LIGHTING, D819 Wolf-  
ratshausen-Munich, West Germany. ■

#### SPECTRA SERIES II METERS Continued from Page 1350

##### Spectra Combi™ II

Unique design features two silicon detectors on opposite sides of head — one for incident, the other for reflected-light measurements — and capability for taking both simultaneously and averaging them into a single, direct reading! Added to almost incredible sensitivity and widest versatility, it puts the Spectra Combi™ II in a class by itself. Accepts all Spectra Series II attachments.

#### TECHNICAL DATA

Sensitivity: 0.004 to 100,000 footcandles, in 3 ranges: (a) 0.004-10 (b) 0.4-1,000 (c) 40-100,000. 25 million to-1 sensitivity range (24 f/stops)

Direct-reading Aperture: f0.7 to f90

ASA Film Speeds: 0.10 to 25,000

Shutter Speeds: 1/8000th second to 8 hours

Cine Speeds: 1 to 256 frames per second

Reflected Light (Acceptance Angle): 42° (1° with accessory PhotoSpot™.)

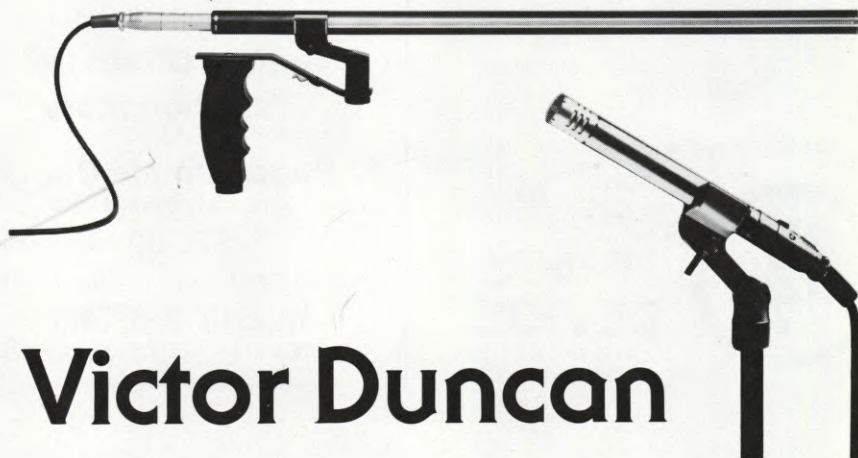
##### Spectra Lumicon™

Specially designed as the fastest and most convenient means for obtaining direct footcandle readings. Individually calibrated scale spans light level range of 25 million: 1. A must for gaffers, lighting directors and chief electricians in TV and motion picture production; a reliable precision instrument for any application involving accurate light measurements. Accepts accessory PhotoSpot™ for direct read-out of brightness (Foot-Lambert) as well as all other Series II accessories.

#### TECHNICAL DATA

Sensitivity: 0.004-100,000 footcandles, in 3 ranges:

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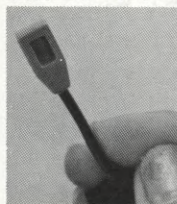
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#### TECHNICAL DATA

Sensitivity: 0.008-80,000 footcandles, in 3 ranges:  
(a) 0.008-8 (b) 0.8-800 (c) 80-80,000. 10 million-to-1 sensitivity range (23 f/stops)

Direct-reading Apertures: f0.7-f90.

ASA Film Speeds: 0.10 to 25,000

Shutter Speeds: 1/8000th second to 8 hours

Cine Speeds: 1 to 256 frames per second

Reflected Light (Acceptance Angle): 42° (1° with accessory PhotoSpot™.)

### Accessories for Spectra Series II Exposure Meters

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Provides selective 1° spot-metering with brilliant, life-size focusing viewfinder. Exposure reads directly as in normal use. Parallax correction adjustment for greatest accuracy. Invaluable for precise reflected-light measurements of small, faraway, or inaccessible subjects.

#### Spectra® Flexi-Probe™

Unique 24" Fiber-optics probe with 3mm measuring diameter. Used for off-groundglass light measurements, photography of inaccessible subjects, photomicrography, and densitometry (in conjunction with light box or table).

#### Spectra® PhotoReader™ Probe

Rigid 1"-long probe with 5.5mm-diameter measuring aperture; used for measurements on groundglass, focusing screen, or viewfinder eyepiece and similar applications.

#### Spectra® Spot-Reader™

Gives highly accurate exposure information for black-and-white or color enlarging. Selective 3mm-diameter aperture provides on-easel measurement of image corresponding to 0.4mm section of 35mm negative in typical 8" x 10" enlargement. Also used for B & W densitometry in conjunction with controlled light source.

#### Spectra® Microscope Adapter™

For exposure measurement through microscopes or telescopes with standard 25mm-diameter eyepieces. Meter needle and scales are correctly oriented — right-side up for easy reading. An economical adapter is available for mounting this accessory on telescopes and other instruments with 1¼"-diameter eyepieces. ■

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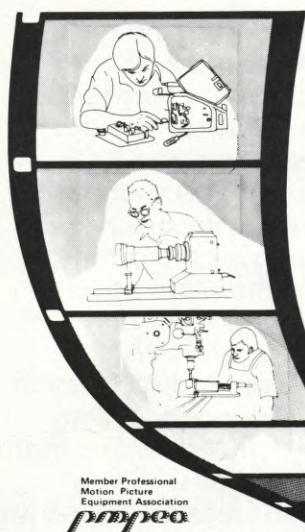
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change at all, but the flood intensity will pick up a little bit.

We also have interchangeable reflectors with this system, as we do with the Quartz-D. There is a specular reflector and a gold reflector for warming things up. Years ago in shooting, I remember, we were doing a sunset shot and the sun went down before we finished. I just put the gold reflector in and the gaffer mounted the light at the end of a pole and walked along with the actor in closeup. We were able to shoot with what was, in effect, an artificial sunset, and it worked out very nicely. We will probably introduce one more special-purpose reflector, but I'd rather not talk about it, in case we decide not to follow through with it. At any rate, the interchangeable reflector capability offers some interesting possibilities.

One of the things that we are going to do, more so than ever before, is provide kits that will offer the people in the field a wide range of lighting equipment options. There will be a great deal of space left in these kits, so that if they want to add an extra light or more accessories they will be able to do so without any trouble. This will allow them to customize a kit to their needs — and change it as those needs change. In the field they will be able to move in different directions, depending upon the problems that may arise. With this in mind, we have been anxious to make the Omni-System compatible with as many other systems as possible — our Modular Link grip system and the Total-Light System, for example.

One of the most important things about the Omni-System — and much more so than with any other system I've worked on — is that its development was a team effort. Marvin Seligman made major contributions to it, and we have a new engineer, Al Calanai, who came in toward the very end of it and really helped pull it together for *Photokina*, because, I suspect, we wouldn't have had the time and energy, and perhaps the sophistication, to produce some of the detailing that he was able to achieve. He recently joined Lowel-Light as our Chief Design Engineer and, although he's not worked in our field before, he's a very sensible man with a lot to contribute.

At *Photokina* we've had some very nice reactions to the Omni-Light, as well as some very worthwhile suggestions regarding what we could do to make the system even more versatile and practical. That has been one of the most stimulating aspects of the show. ■

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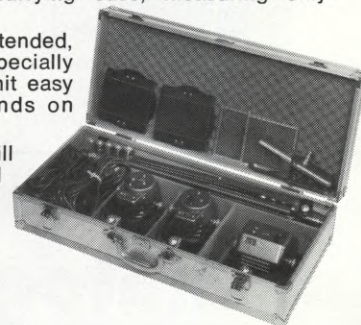
## AERO-KIT

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The compact AERO-KIT, which weighs less than 31 lbs., includes two focusing spot lights with two detachable rotating four-way barndoors; one focusing fill light with integral four-way barndoors; two scrims; three 10 ft. long three-wire cables (with in-line switches); three 15 ft. long three-wire extension cables; one gator grip; three professional-type stainless steel light stands; and a sturdy aluminum carrying case, measuring only 6½" x 12" x 26½".

The light stands (10 ft. high when fully extended, and 24" high when telescoped) are specially designed with adjustable legs which permit easy and stable placement of the light stands on uneven ground surfaces.

The two focusing spots and focusing fill light (equipped with new and improved quartz lamp sockets which are extremely heat resistant) operate at 120-volts AC/DC with 600-watt lamps, and can also be used with 250-watt lamps for 30-volt battery operation.

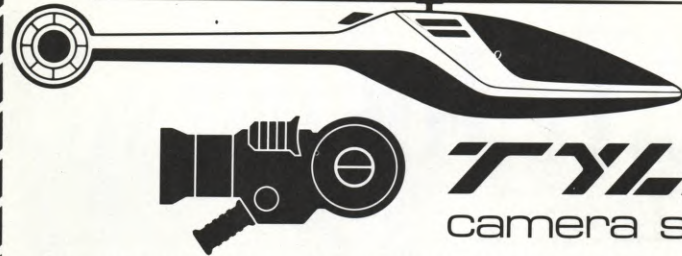


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**NIPPONSCOPE ANAMORPHICS**  
Continued from Page 1348

attachment). • New Nipponscope Anamorphic Lenses keep the 2-to-1 ratio at any focal length. • New Nipponscope Anamorphic Lenses are free of any deviation in optical axis because the Anamorphic and master lenses are fixed. • New Nipponscope Anamorphic Lenses have a long-lasting helicoid because the Anamorphic and master lenses are fixed. • New Nipponscope Anamorphic Lenses permit smooth focussing because the Anamorphic and master lenses are fixed. • New Nipponscope Anamorphic Lenses have a BNC and standard ARRI mount. • New Nipponscope Anamorphic Lenses are the world's first lenses newly developed to obtain T1.4.

For further information about the new NIPPONSCOPE anamorphic lenses and adaptors, contact: Ryudensha Co., Ltd.; Dai 6-Toyo-Kaiji Building; No. 7-2, 4-chome, Shinbashi, Tokyo, Japan; Telephone: 436-3033, 4; Cable: "RYULIGHT TOKYO"; Telex: "RYULIGHT J-24509".

**ECLAIR ACL SINGLE-SYSTEM**  
Continued from Page 1341

**EXISTING CAMERAS:**

In addition to proposing the new Eclair ACL SISYS camera, the Society SOREMEC-CEHESS will also make it possible, for those who wish, to update and modify their existing ACL cameras for recording "Sound on Film".

Two possibilities are available to use standard ACL cameras already in service:

1. *Transformation to ACL SISYS type Compact:*  
The camera head (preferably with an Exposure indicator) has to be mounted on a new electronic module and a flat base, in addition to the new 60m or 120m magazines.
2. *Use of standard ACL* equipped with a thin electronic base and MIVAR motor.  
*Use of standard ACL* (with or without Exposure indicator) equipped with a thick electronic base and a MIALA, MIMUL or MIVAR motor, in addition to the new 60m or 120m magazines and the separate amplifier.

For further information on the new Eclair ACL SISYS camera, contact: SOREMEC-CEHESS, Department ECLAIR INTERNATIONAL, 14 Rue Gaillon, 75002 PARIS, FRANCE. Telephone: 266 16-30.

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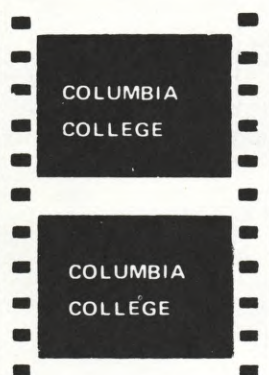
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**AäTON 30 VIDEO CAMERA**  
Continued from Page 1386

glass epoxy circuit boards. And maintenance is simple: the circuits are completely accessible, and distributed in two interchangeable elements: the video head and the control unit.

Initial adjustments:

- choice of standard to be used: 625/50, 525/60, 651/48
- scanning amplitude
- focus current
- black level

Once these initial adjustments have been made, any further adjustments during use are eliminated by extensive use of feedback compensation techniques, beam current, focus current, and scanning current.

**General Specifications**

Video head

- diameter 36 mm
- overall length 157 mm
- weight 0.3 kg
- 2/3" vidicon tube (see comparative graphs of various tubes)
- printed circuit deflection yoke

Control unit

- dimensions: 180 x 100 x 35 mm
- weight: 0.7 kg

Power

- supply: 10 — 14 V DC
- drain: 0.55 A

Environment

- ambient temperature 0° to + 40° C
- humidity: 95% non condensing

Sync pulses

- internal: crystal generated
- external: separate horizontal and vertical sync

pulse (EIAJ) H<sub>D</sub> V<sub>D</sub> for multi-camera use

Video output

- 1 V composite signal

Scanning standards

- switch for 625/50, 525/60, or 651/48 (24 f/s cinema); 2:1 interlace
- standards compatible with US, Japanese, and European line frequencies for VTRs and video monitors.

Video bandwidth

- 6 MHz min. at 1 dB.
- resolution: 400 lines for Si tube; 500 lines for CdSe tube
- gamma corrector  $\sigma = 0.5$

Sensitivity

- depends on the tube used; functions properly at an average of 0.1 lux.

Noise level

- pre-amplifier: noise current 0.6 nA  
eff. signal current: 150 to 200 nA for 1 lux on the target (tungsten light).

For further information, contact: Aäton Cinematographie; 2, Rue Pdt Carnot-BP 31; 38001 Grenoble, France; Telephone (76) 42.64.09 ■

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**TIME BASE CODE**  
Continued from Page 1345

The Time Code unit is lodged inside the machine and a rectangular circuit board carries all of the integrated circuits. Somewhat to the left of it is quite a sizeable space that has been left open to lodge temperature-compensated crystals, if they are really required. The crystal that we are using at present is the one that has been suggested by the I.R.T. organization and it has sufficient precision to maintain at least four hours of sync with less than one frame of deviation between camera and tape. It covers a temperature range from 0 to +25°C and is the crystal in standard use. However, if you are going to use this equipment under more adverse conditions, then it is absolutely necessary to use temperature-compensated crystals in order to avoid any desynchronization due to temperature deviation.

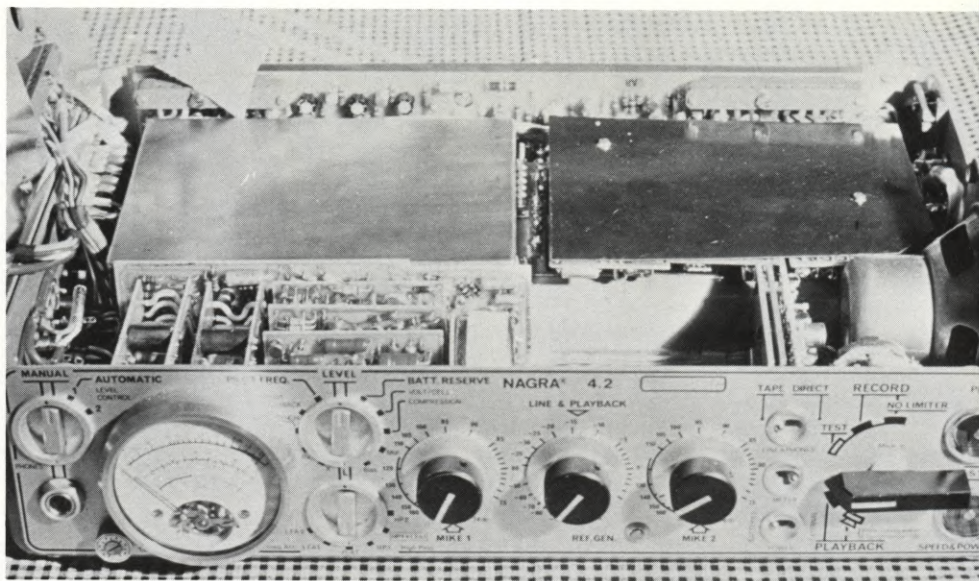
The recorder is "set" by means of a master clock, which is exactly the same unit that is used to set the camera. By introducing the plug of the master clock into the recorder and pressing the SET button, the Time Code of the master clock is automatically introduced into the memory circuits of the Nagra, and externally on the recorder a light-emitting diode begins to blink at the rate of one blink per second to show that the count is working normally. This will function for a period of four hours and then it will automatically stop. If, during the four-hour period of running the tape recorder is switched off, the counter will be reset to ZERO and it will function for another four-hour period. It is only when you come back to ZERO from RECORD that your count starts for the four-hour period. The idea of the four-hour period is that if you should leave your machine on the shelf for a couple of days, for example, the user would find the machine with no information inside and be forced to use the master clock again to set the counters to the correct time.

For the moment we are dealing only with 50 cycles in relation to the Time Code capability. We haven't gotten around to the 60-cycle version yet. ■

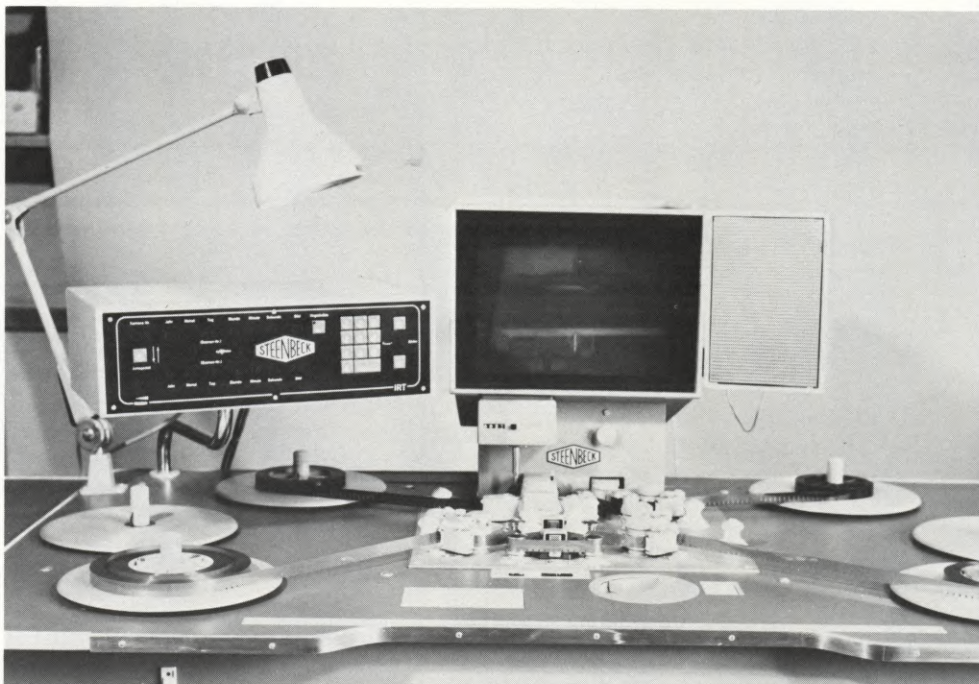
**THE TIME BASE CODE AND THE EDITING PROCESS**

By Gunter Bevier  
W. Steenbeck & Co.

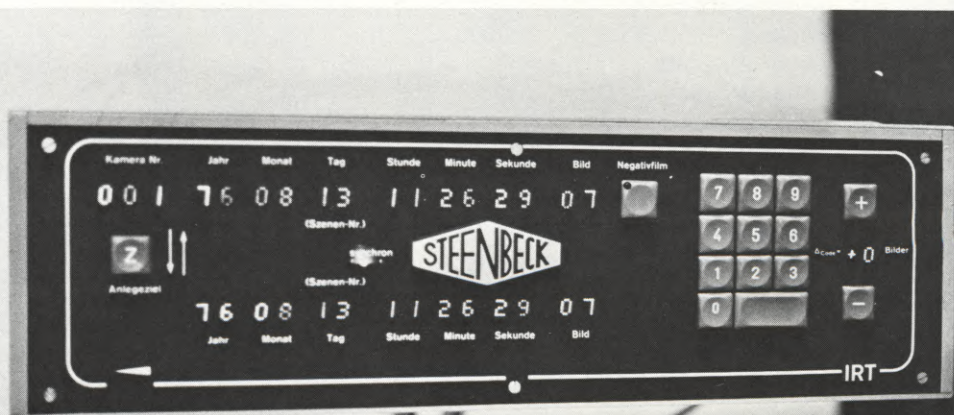
Five years ago Steenbeck was asked to develop the Time Base Code system for its editing tables, under the assumption that German television would be mainly equipped with Steen-



Nagra 4.2 sound recorder with top cover removed to show Time Base Code generator in place. In order to make room for this generator in the Nagra, it is necessary to remove the built-in quartz, the slating receiver system and the frequency meter. The master clock automatically inserts the Time Code into the memory circuits of the Nagra.



(ABOVE) Steenbeck flatbed editing console equipped with Time Base Code component. (BELOW) A close shot of the Time Base Code component showing readouts of the binary code information available on picture and track. By punching up designation of a particular scene the operator can instantly locate it and sync up the corresponding sound track, thus saving much time in post-production.



beck tables.

Various proposals came under discussion, including a decimal-numeral system and a dot system, and in that definition phase Steenbeck was asked to give a yes or no answer regarding each one. It was our conclusion that the dot system would be suitable for the editing stage, while the decimal-numeral system would *not* be suitable for the editing stage.

Following the definition phase, the IRT developed the system as it stands today and Steenbeck, like Arriflex, proceeded accordingly. Specifically, Steenbeck developed the control electronics and readout electronics for their tables — in other words, for the editing application of the Time Base Code. The initial development at Steenbeck concentrated on the pick-up head to pick up the coded information from the film. The decoding electronics were developed for the tables and, a year ago, the first table prototype was manufactured and made available to the IRT for further systems tests. Three months ago the first series production table was delivered to German television for field use. At Steenbeck today the pick-up head and decoding device are in series production to be incorporated into their wide range of tables. Not only can new tables be equipped with the decoding device, but existing tables can also be post-converted.

It should be pointed out that the Time Base Code system has been able to advance to its present stage because all participating companies have cooperated in a very fruitful spirit. Following the lead of the IRT in its function as the governing research body, the first companies associated with the system were Arnold & Richter on the camera side, Kudelski on the sound recording side and Steenbeck on the editing side. Later on, Stellavox and Eclair joined the club.

When one considers the potential advantages of a Time Base Coding system, it becomes apparent that there are advantages to be derived that cannot be measured in economic terms. The independence of camera and tape recorder, for example, can be measured in artistic terms, but not in terms of economics. For the editing sector, there are economic advantages to be gained from the system, which allows for speedier post-production in the synchronous cutting of picture and sound. For example, with the new system, even the finding of start marks in the conforming stage can mean a saving of time of up to 80%.

Another example concerns a situation — a long interview or news event — in which the sound recording

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is continuous over a certain period of time, but one or more cameras cut in and out to cover only certain intervals of the action. In such a case, it would take a cutter hours, or even days, to conform and sync the various camera sections to the continuous sound record. With the Time Base Code system it would take only a fraction of the time. In other words, it would take only minutes to sync the camera portions to the respective sound portions.

In multi-camera operations, especially, where the main camera would film continuously with the sound record, while various cutaway cameras would also be shooting intermittently, it has always been a very tedious operation to find sync points for the cutaway cameras. However, with the new Time Base Code system, cutaway cameras equipped with time code generators could expose film which would immediately conform to the continuous sound record, so that in the post-production area, the savings in time — and, consequently, in money — would be considerable.

In the conforming process on an editing table, if you have a roll of film with 35 takes on it and a separate roll of corresponding magnetic sound track, it is a very time-consuming procedure to search for the clapper point on each scene and then search for the sound mark that can be conformed to that visual clapper point. This procedure would have to be repeated 35 times on that single roll of film, with the sound sync marks being indicated by means of crayon marks on the track. These steps are eliminated when using the Time Base Code system.

Consider another situation, for example, in which the pictorial material has been selected, but the production head later decides that for a particular scene another angle is perhaps better, but the other shot has been cut out and is now stored on a huge roll of film. With the time code information dialed into the table, the needed shot can be immediately identified and retrieved from the cut-out roll.

In any case, the recording of time-code information on picture and track offers many possibilities which perhaps, up until now, have not been exploited, but which may well open up a new era of film identification and automated film handling. ■

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was an education. The pity was that he did not also state their relative costs. It could be assumed, however, that the greater the sophistication the higher the quality — but that images originated in an “old-fashioned” film camera were the best of all.

Very few papers dealt with pure TV. An exception was a paper by J. Brousard of France. He described a new video disc system and went on to forecast that it would replace film as a favoured means of image recording, that yet-to-be-developed TV projectors would replace film projectors for even the largest screens and that the disc matrices could equal the hieroglyphics of ancient Egypt as the most durable means of image preservation. Perhaps in a few thousand years' time, someone will discover a 1976 video disc player in working condition which will become the Rosetta Stone of the period.

K. H. Trissl of West Germany presented a paper which detailed the EBU time base code system of picture/sound synchronization. It is to be hoped that the Eastern European countries will also adopt this system to increase its universality.

Milt Forman described the STEADICAM system and showed excerpts from films which used the system. In show business parlance, it was a “show stopper”. An outbreak of spontaneous applause indicated how much the possibilities of using this form of camera support were appreciated. This paper was followed by one from Bulgaria about a helicopter mount described as “Gelevision”.

A totally new technique in image recording was described most eruditely by Tony J. Jeong of Chicago. “White Light Illuminated Transmission Holograms” which are originated from motion picture film have been developed within the last two years and would appear to have a future in many fields, including advertising and science. The system of holoplexing was precisely described and a 360° White Light hologram of his children with which he illustrated the techniques was three-dimensional, moved, and provided a charming means of portraiture.

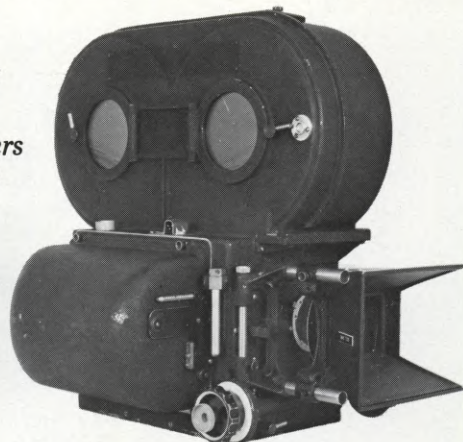
When it comes to holographic research, however, the USSR must be considered to be the world leader. It is said that ten times as many scientists are working on holographic research in the USSR as in the USA and their results are spectacular. We were taken to NIKFI, their motion picture research or-

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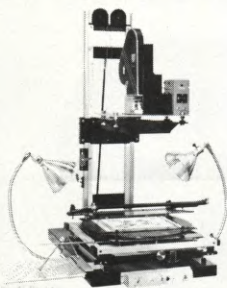
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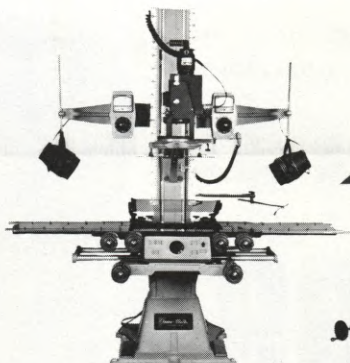
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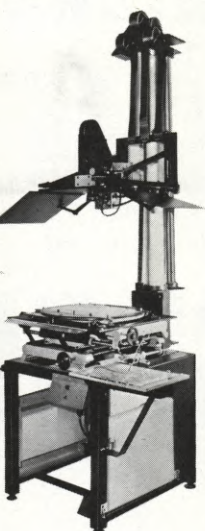
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ganization, to witness the first-ever demonstration of a ciné hologram, as had been described by Dr. Komar earlier in the week.

This very first experimental film had been shot only one week previously and consisted of a 30-metre continuous loop of film of a single scene lasting 30 seconds. To view this, two people could sit on one side of a holographic multiplying screen to see a transmitted image and two sit on the other side to see the image by reflection. The position of the viewer's head was critical and there was no possibility of movement. What we saw, when our turn to view arrived, was a 3-D, monochromatic ghost-like motion picture image of a young woman placing jewels in a wine glass set in front of her.

The fact that the film was formed into a loop, was a first flickering demonstration of a system which has endless possibilities, that the head could not be moved, etc., made the occasion reminiscent of that moment in cinema legend described in Terry Ramsay's "Million and One Nights" (P.66) when, upon returning from the Paris Exhibition of 1889, Edison was shown the first-ever motion picture in which Mr. Dixon himself stepped onto the screen, raised his hat and smiled, while uttering the words of greeting: "Good morning, Mr. Edison, glad to see you back. I hope you are satisfied with the kineto-phonograph." (The first movie ever was a talkie.)

No one there, on Oct. 6, 1889, at West Orange could have foreseen the modern motion picture and for sure, primitive though it was, no one at NIKFI on Oct. 7, 1976, could possibly foresee the future of ciné holography. One might draw yet another comparison and say that no one looking at the Wright brothers' biplane at Kittyhawk in 1904 could have foreseen the Concorde or the Russian SST.

Also shown on that day at NIKFI was the latest Stereo-70 3-D system. Employing 70mm film on which the two images are placed side-by-side, this form of stereo cinema, using polaroid glasses, is now well developed and we saw a bright, evenly-lit, well-defined picture with saturated colors on a screen 43 feet wide by 31 feet high.

After this *tour de force*, I suppose it was only natural that the remaining papers programme and "outside visits" should seem tame by comparison.

Concurrently with the Congress, the Russians provided a very good social programme. For the first time at such an event in the USSR, a "Ladies' Programme" was organized, with visits to many cultural centres. This provided an

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opportunity for us to meet the wives of many of the men with whom we have become acquainted when they were delegates at Western conferences. Some of these ladies attended an intensive course in English and could hold a reasonable conversation after only 20 days of tutoring. For all of us there were visits to Obrauskov's Puppet Theatre and, perhaps the highlight of the entire week, the Bolshoi Ballet. ■

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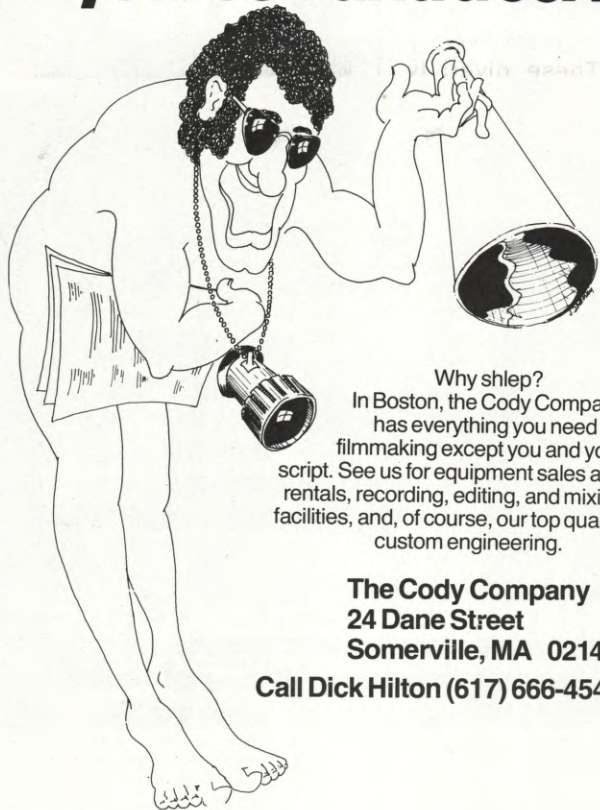
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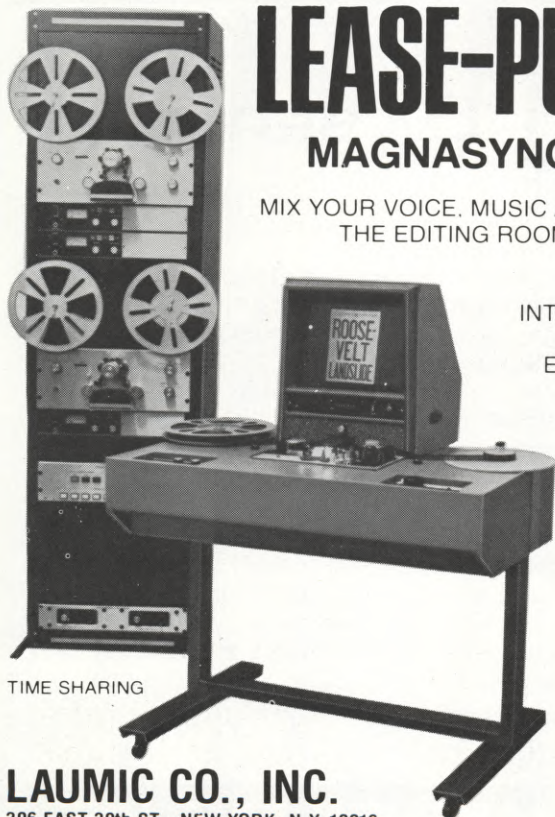
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118th SMPTE CONFERENCE  
Continued from Page 1375

duction version of their Frezzi-Flex FR-16 documentary-type camera. This new mirror-reflex camera incorporates a Bach-Auricon movement and weighs 16½ lbs. "ready-to-roll". It has speeds of 12, 18, 24 crystal, 36, and 44 fps and accepts standard Mitchell magazines. Frezzolini also displayed their complete line of battery systems for film, ENG, and lighting.

Eclair revealed both a 200' and 400' single-system magazine for the ACL. The built-in amplifier is absolutely minuscule and takes up only about an inch under the camera. A switch converts the 7 LED exposure display in the viewfinder into a VU meter, and two miniature recessed knobs control volume for the two microphone inputs. This was the first practical camera person-controlled single-system rig I have ever seen. The camera on/off, exposure/VU, and twin volume controls are all within the reach of the index finger of the hand that is supporting the camera. The sound quality is excellent, especially considering the fact that there is no flywheel. Instead, a sophisticated feedback system with tachometer electronically (rather than mechanically) reduces wow and flutter.

In the area of camera accessories, Image Devices Inc. introduced a very sophisticated "Super Zoom" servo lens control for zoom and focus. The control can be mounted on the tripod handle and the twin motor system can be installed inside most blimps, such as the ARRI, Cine 60, and Mitchell. Not only does the unit provide excellent joystick-type control of the zoom but also *positional* feedback control of focus. In other words, the focus control knob is not a simple joystick like most zoom controls which only control speed. This focus knob is part of a closed-loop servo system that is literally an extension of the lens focus ring itself. This should definitely be a welcome accessory.

The Spectra light meter that has become such a familiar sight to camera people around the world has been superseded by the new Spectra Series II line of exposure meters. The new modern design uses a data ring into which you preset ASA, shutter angle, fps, etc., and the meter will then read out directly in "T" stops. The ultra-sensitive silicon cells have a range of 25,000,000:1. The new Series II also has a complete line of accessories, including a 1° spotmeter attachment, a Flexi-Probe, enlarger and microscope attachment.

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### SOUND

The technology in sound seems directed to peripheral devices: noise reducers, wireless microphones, and complex yet compact mixing consoles. Thomson CSF showed a very sophisticated high-frequency dual-channel diversity wireless microphone system. Vega also displayed a diversity receiving system. These diversity receivers use two receiving antennas placed at different locations. The circuitry automatically chooses the channel with the stronger and cleaner signal, thus eliminating receiver dead spots.

Swintek also showed several new devices, including a new receiver with bright LED indicator in lieu of the conventional VU meter. The slim "Hitchhiker" receiver has no internal power and can be connected to almost any portable recorder or camera. Swintek also demonstrated an improved version of their two-way communication device. Any number of units can be used to provide communication between director, assistants, camera- and soundpersons, etc. Image Devices Inc. had an updated version of their communicator system which performs a similar function.

Sennheiser has a new headphone specifically designed for high quality monitoring. Designated the model HD 224X, these phones offer excellent isolation from ambient noise and boast a response of 16-20,000 Hz. Also in the area of phones, A.G.E. has a new "Q" Master Receiver that is smaller than a dime and fits entirely concealed in the listener's ear. Alan Gordon Enterprises Inc. markets the "Sound Genie" headset and microphone. It is an extremely lightweight unit that incorporates a tiny noise-cancelling electret microphone. The microphone is very effective in high-ambient noise conditions where all sounds originating more than two inches from the microphone are virtually eliminated.

Audio Services in New York displayed the full line of SELA mixers which they are now importing. These compact units are well matched to location recording requirements. Coherent Communications of Sylmar, California, also showed a nice line of location mixers, featuring three-band equalization and pan pots on all inputs.

Stuart Cody of Boston, Mass. had an entire booth filled with sound-related goodies. Among those were the new dbx noise-reduction units designed specifically for the Nagra recorders. The model 194 is matched for Nagra III, IV and 4.2. It features a four-input

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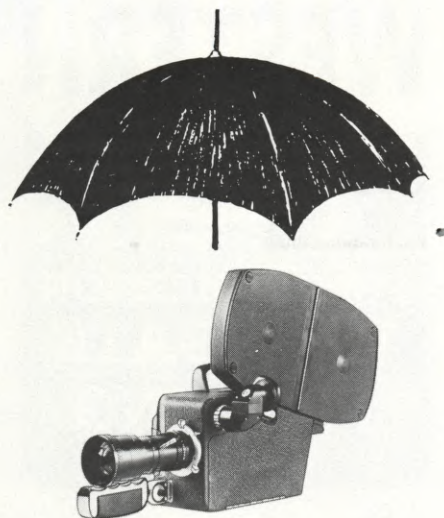
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microphone mixer in addition to the noise-reduction circuits that provide more than 30 db in additional s/n, or the equivalent of 100 db of dynamic range. The model 142 is compatible with the two-track Nagra SL and plugs directly into the NR connector. It provides the same remarkable results as the 194.

Stuart Cody also imports the SQN accessory for the Nagra SN which makes the miniature Nagra function like a 4.2 Nagra with fully controllable volume and V.U. meter. Two microphone inputs are also available.

### VIDEO

Probably the most significant change in the exhibit area is the number of video-oriented exhibitors. Only two or three years ago, video participation was virtually nonexistent. This year, almost a third of the total number of exhibitors was video related. Of most interest to cinematographers are the ENG hand-held video cameras. This latest generation of cameras employs 2/3" Plumbicon-type tubes and offers studio quality in an extremely compact size.

Ikegami offers two cameras: the HL 37 and the HL 77. The cameras are virtually identical, except that the HL77 is self contained, requiring no separate CCU. The HL37 breaks the HL77 into a camera head and a separate over-the-shoulder CCU. The Hitachi SK-80, like the HL 77, is a self-contained camera and weighs only 16½ lbs., less lens.

Philips showed the LDK-11, a highly respected ENG camera employing separate camera head and backpack. The camera head with 10:1 lens weighs in at 14 lbs. The backpack is an additional 24 lbs. with batteries. It is interesting to note that Thomson CSF did *not* show their new Microcam camera which weighs less than 10 lbs. with lens and uses a CCU that weighs a mere 3 lbs. Nor was RCA present with their TK-76.

Video tape recorders were well represented, with JVC showing their already popular 4400 3/4" portable cassette recorder. IVC showed the latest 1" and 2" helical scan broadcast machines and Sony also was present with their updated 3/4" portable.

Most intriguing were the smaller companies offering sophisticated editing consoles for the 3/4" cassette format. Typical of these was Convergence Corp. Their device made editing video easier than a flatbed Steenbeck with film. The joystick on each machine allows both forward and reverse scanning of the tape at any speed from three times normal to single-frame and full-freeze. Once a scene is selected, a

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### ADDENDUM

Editing tables were represented by Magnasync/Moviola, Steenbeck, KEM, Cinemonta, and Twenty-Fourth Frame. The Super-8 format was more than amply represented by Super8 Sound Company. Bob Doyle and Julie Mamolen brought all their fantastic goodies down from Boston. These included the now famous Super8 Sound recorder, crystal sync units, complete editing tables and consoles, etc.

I have most likely omitted several items; however, it is almost impossible to catch everything at the show. Hopefully I have covered the most significant items, and I apologize if I have sloughed over anyone.

As usual the 118th SMPTE conference included a complete program of papers and symposiums. Most of the papers were of a highly technical nature; however, many had definite appeal to the cameraperson. Most interesting to the filmmaker was probably the PMPEA-sponsored symposium, moderated by Walter Wood, which featured a distinguished panel of experts from many areas of film production.

Other papers included a demonstration of the Magicam system for combining live action and miniature sets, and a look at the new improved Eastman 5247 Type II improved. Some papers covered the practical aspects of new products, such as HMI lights, ENG cameras, and location VTR's. Irwin Young of Du Art Labs presented a film exploring the practical aspects of blowing up 16mm 7247 and Super-16 7247 to the 35mm format for release.

And no SMPTE conference would be complete without the awards banquet. Fifteen fellows were newly elected, and 29 members received awards. This year's Progress Award went to Edward H. Reichard.

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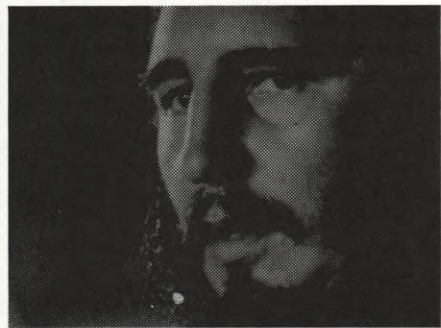
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**QUARTZCOLOR THREE-PHASE**

Continued from Page 1385

space problem, as each Sirio unit is equipped with 8 meters of cable permanently installed, and the other 40 meters comes in five interconnecting extensions, having a length of 8 meters each. The three Sirio spotlights simultaneously fed from this ballast unit form an incomparable lighting source.

Many visitors have made the point that often it is not necessary to have three lights working simultaneously because, in many normal filming situations, only one would be enough. In this case, the other two lights would be positioned "out-of-field" but would still represent the same power consumption. The answer to this question makes evident another good point regarding this unit: limited working expenses. It has, in fact, been demonstrated that even though one operates a 10KW spotlight "Vega" only, fitted with a daylight conversion filter, one still saves power, because the three-phase ballast which feeds the three 2.5KW Sirio lights has an absorbed power of only 8 to 8.5 tKW, as against 10KW from the halogen incandescent lamps. The particular construction of the system allows one to obtain a higher light output and a greater color temperature stability of the light emitted from the lamphead.

While in the Vega 10KW lamphead, color temperature depends only on the quality of the daylight filter, in the Sirio unit its value can be continuously adjusted by means of a control placed on the three-phase ballast. It's clear that this last advantage has to be regarded as of special importance if we think in terms of an additional fundamental qualification: The three spotlights, when simultaneously operated and fed from the same ballast unit, do not unbalance the load of the three-phase mains supply. In fact, the same current of 34A from 220V supply and 22A from 380V supply, when the three spotlights are in operation, goes along the three-phase cores before the ballast, creating an identical voltage drop on the line.

A selector, different from that which is used to control voltage stabilization, allows one to preset both inside and outside circuits for 220V and 380V power supply.

Mr. De Sisti from QuartzColor stressed the fact that the engineers from IREM had also designed an efficacious protection system. He said that the ballast unit is equipped with a three-phase thermal switch, functioning to cut down the power supply when even one spotlight is not lighted. Furthermore, in series with the lamp's

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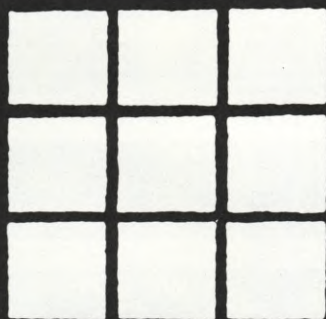


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circuit and after the switch, each phase has a 25A fuse which pilots the main switch whenever a current higher than said value is circulating. A double-protection system has then been designed to function when no power reaches the system, if the ballast unit is not correctly operated or because of any failure in the lamp's circuit.

Reference is made to the accompanying principal diagram of the electronic circuit (see POS. 1) and the wave forms of the magnitudes mainly affecting the ballast unit operation. POS. 2 of the drawing shows the wave form (purely sinusoidal) from the line voltage and POS. 3, the absorbed current from each lamp: This is no longer sinusoidal and the diagram itself can give one an idea of how the problem was solved. POS. 4 represent the flow path of the luminous flux emitted from each spotlight. It can be observed that this is not pulsating and the resulting diagram is quite level. This means that only one of these spotlights, fed through the new three-phase ballast, is capable of illuminating a scene for motion picture filming, free of any flicker effect.

The prototype introduced at *Photokina* was used to carry out a series of film tests which were particularly significant. High-speed shots were filmed with a specific shutter angle. Using an Arriflex 35mm 2C camera with the shutter at 170°, a scene was filmed at 18-24-25-27-32-46-89 frames per second and no flicker was noticed. All film stocks examined by Mr. De Sisti and his collaborators did not reveal any non-illuminated frame. On the contrary, the adoption of the three-phase ballast to feed the three 2.5 KW spotlights resulted in fully solving the problem of high-speed filming.

It should be borne in mind that this new model will not make obsolete the other model introduced at FILM 75, (square wave ballast, see *American Cinematographer*, Oct. 1975 issue) which unit has been universally adopted for scientific applications filming, but it comes as a new version suitable to be efficaciously used in the motion picture field.

The new ballast unit comes in various versions to operate the entire Sirio range, from the smallest 575-watt to the largest unit. It will be certainly regarded as a useful tool by all those involved in the most sophisticated motion picture filming who are intending to use HMI lamps. It will be subject to future improvements as a result of suggestions which may come from lighting experts, but undeniably its realization means a success that cannot be minimized.

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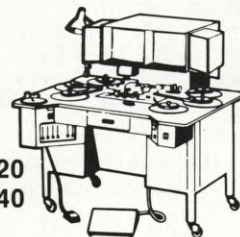
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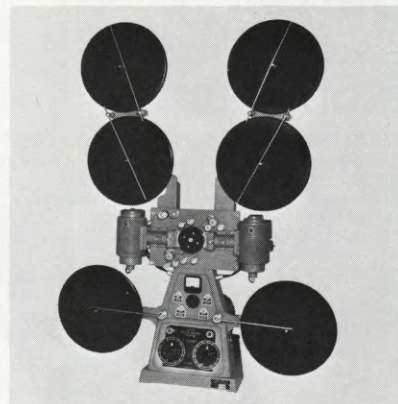
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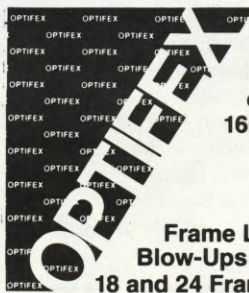
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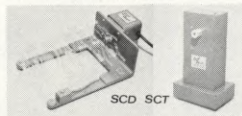
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