



DYNALENS: at the CAMERA MART



DYNALENS COMPENSATED.



WITHOUT DYNALENS.

The Dynalens allows the cinematographer to shoot stabilized pictures even though the camera is hand held or mounted on a vibrating surface. It can be used with 16 or 35mm cameras with zoom or fixed focus lenses.

Of special importance is the fact that the Dynalens will provide image stabilization in motor boats, cars, trucks and helicopters. The Dynalens is available in several series for various power supplies: AC; belt-type battery supply; and a completely portable system.

Persons requiring additional information are invited to call or write Mr. Tony Cirillo of the camera rental department: 212-757-6977.



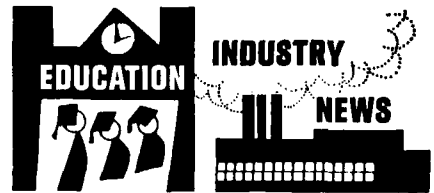
The Camera Mart Inc.

1845 BROADWAY (AT 60TH ST.) NEW YORK, N.Y. 10023
LIGHTING AND GRIP DIVISION: 887 NINTH AVENUE
PHONE: 212 • 757-6977

sure motion-picture and television coverage of all the Apollos and also to provide adequate lighting for round-the-clock work on the spacecraft; some of the more critical operations required light of extreme intensity and brilliance.

The problem of light for Apollo launch operations was solved by General Electric Co. which developed a system of high-intensity lighting (HIL) to meet the stringent requirements of the launch pad. HIL is described in detail in a paper by Max Kerr, "High Intensity Lighting for Photography of Launch Operations, NASA Project Apollo" in the February 1965 issue of the *Journal*.

A number of other *Journal* papers have dealt with the many aspects of the Space Program which involve motion-picture and television engineering.

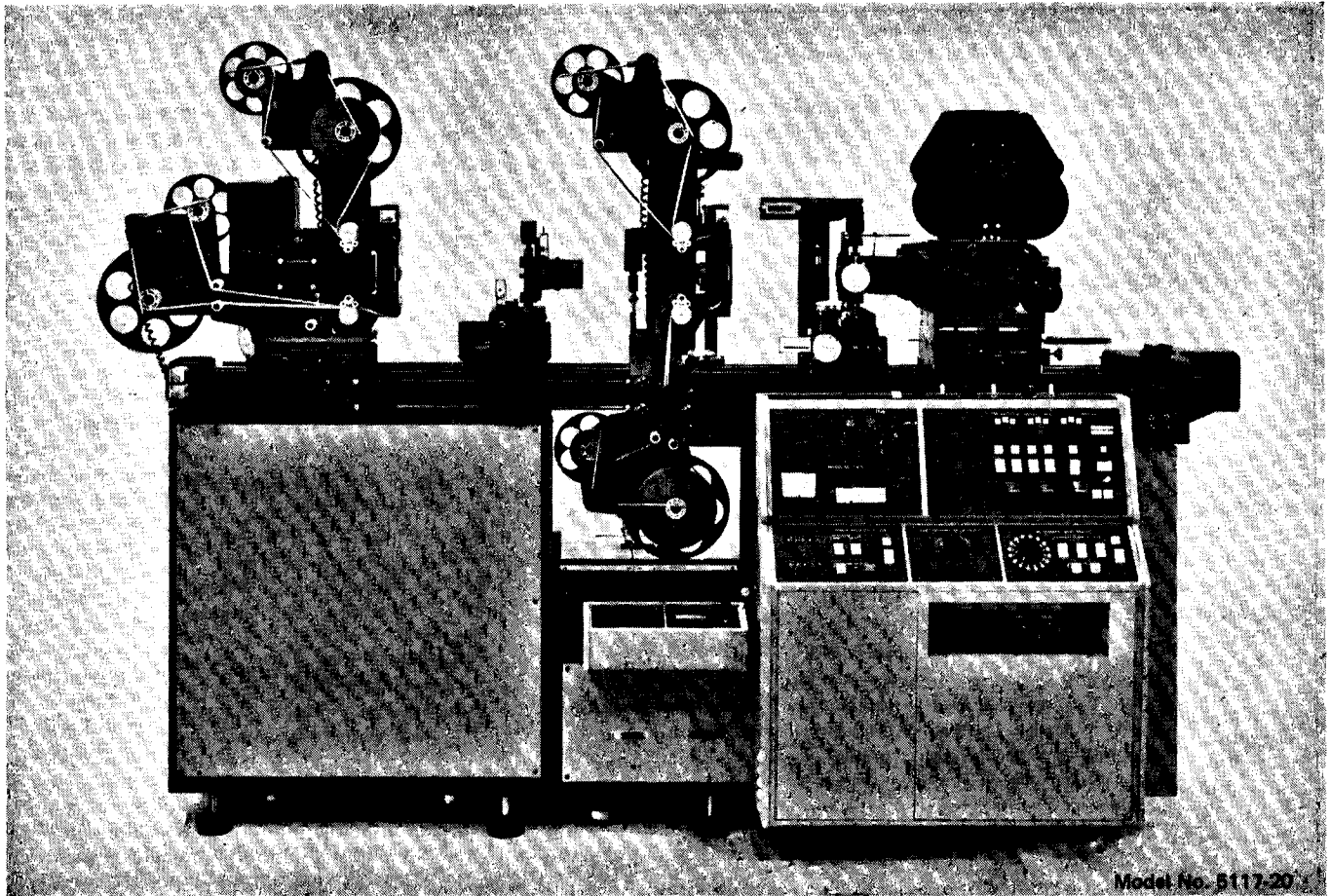


Ten Education Fellowship Awards have been announced by American Film Institute, 1815 H St., NW, Washington, DC 20006, under the Fellowship Program (now in its second year) established to assist graduate students planning to teach film or television. Up to ten Fellowships are granted annually with applications accepted from January through April. Grants of \$2,500 are awarded candidates for the Ph.D. degree and grants of \$1,500 are awarded candidates for the MA degree.

Ph.D. candidates receiving grants and the titles of their proposed dissertations are: Andrew Bergman, University of Wisconsin, "Film in the Depression"; Elsie Burgess, Columbia University, "Model Film Curriculum for Elementary/Secondary Schools"; Father Michael Callahan, University of Southern California, "The Anti-Hero in Contemporary Cinema"; Richard Corliss, New York University, "An Analysis of U.S. Film Reviews"; Stephanie Krebs, Harvard University, "Anthropological Filmmaking"; John Locke, New York University, "Critical Analysis of Film Aesthetics"; Eugene Rosow, University of California at Berkeley, "The American Gangster Film, 1927-35" and William Roth, University of California at Berkeley, "Film as a Technological Instrument Aimed at Artistic and Political Goals."

Candidates for the MA degree and the titles of their theses are: Joseph Adamson, University of California Los Angeles, "The Marx Brothers"; and Paul Davids, University of Southern California, "A Study of Special Effects Since the Mid-Fifties."

The 37th Convention of the Audio Engineering Society will be held October 13-16 in New York. Subjects of technical sessions include Noise Control, Transducers, Electronic Music Systems, Broadcasting, Audio

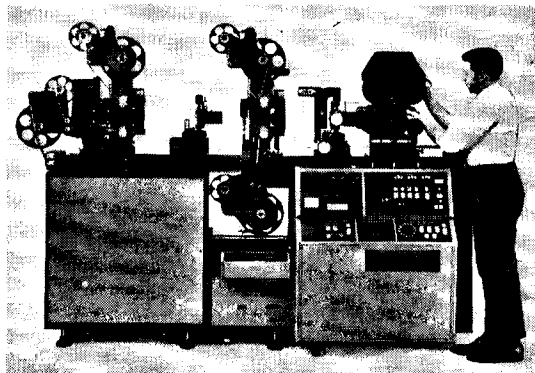


5117 Special Effects Step Optical Printer

OXBERRY®

■ So advanced we no longer produce our renowned 1500 and 1200 series Printers

- Increased light with 1500 watt lamp • Automatic light control • Automatic focus from 3½:1 enlargement through 1:1 to 4:1 reduction with or without the Beam-splitter prism in place
- Modular construction permits addition of up to four projector heads as needs require
- Compact control panel • Each control circuit on its own P. C. board • All control circuits individually protected by circuit breakers • Linkages minimized for control responsiveness • Increased sensitivity and stability for projector compound movements
- Composing screen for group viewing • Engineered for simplified maintenance



Detailed specifications
and prices available
upon request.
Write Ed Willette

"CONTROL" — A film describing this new OXBERRY Printer is available for viewing: request showing on Company letterhead.

See this Printer at Booth No. 1 at the SMPTE Conference in Los Angeles.

BERKEY TECHNICAL

25-15 50TH STREET, WOODSIDE, N.Y. 11377
CALIFORNIA: 101 1 CHESTNUT STREET, BURBANK

© 1969 Berkey Technical

A DIVISION OF
Berkey
Photo Inc. 

The sharpest thing on any screen.

Your Schneider Lens.

Whether your screen is movie or monitor, you start out sharper with a Schneider Variogon or Vidicon lens.

As one would expect.

After all, the Schneider name on any lens has been the hallmark of excellence for over 50 years.

And today Schneider lenses are better than ever.

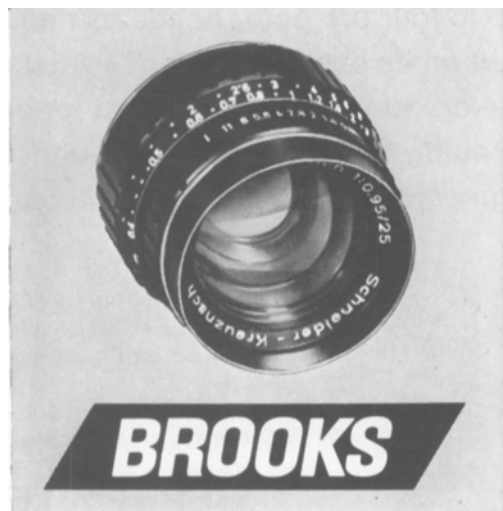
Schneider's infallible "inspectors" assure it. Because the inspectors that check and re-check every lens are the most advanced electronic instruments available.

They overcome the imperfections of the human eye, guarantee better quality control. They're responsible for the superior resolving power, the consistently correct color balance in every Schneider lens.

Schneider Vidicon lenses are specially designed for the exacting requirements of television. They feature standardized, vibration-proof mounts, chrome-plated for constant electrical conductivity, stability under temperature extremes and resistance to corrosion. Torque for both focusing and diaphragm rings is set at 500 cmg. Focus ring rotates through 300°. Individual f/stops are 8° of arc apart.

For TV and 35mm or 16mm movies, there's a complete range of Schneider lenses. They come in many sizes and many speeds (including the fantastically fast Xenon f/0.95 shown below), standard or zoom, and in focusing or barrel mounts. All are available for manual or remote operation.

Talk your requirements over with your dealer or write for a free catalog to Burleigh Brooks Inc., 44 Burlews Court, Hackensack, New Jersey 07601.



Aids to Medicine, Disc Recording and Reproduction, Audio Abroad, Magnetic Recording and Audio Apparatus and Applications. Session chairmen (in the order of subjects) are Cyril M. Harris, William S. Bachman, Earle L. Kent, Lewis W. Wetzel, Philip Kantrowitz, John M. Eargle, J. L. Ooms, R. C. Moyer and Hal Kaitchuck. A special program will be given on Sound Reinforcement for the Performing Arts. Further information is available from Convention Chairman George W. Bartlett, National Association of Broadcasters, 1171 N. St., NW, Washington, DC 20036.

The University of Wisconsin has announced a Video-Tape Recording Institute to be held September 24-25 on the campus at Madison, WI. The Institute is designed to provide educators, research workers, training directors and television engineers with an in-depth discussion of a variety of video-tape and film applications. Information is available from David P. Hartmann, Institute Director, 725 Extension Bldg., 432 North Lake St., Madison, WI 53706.

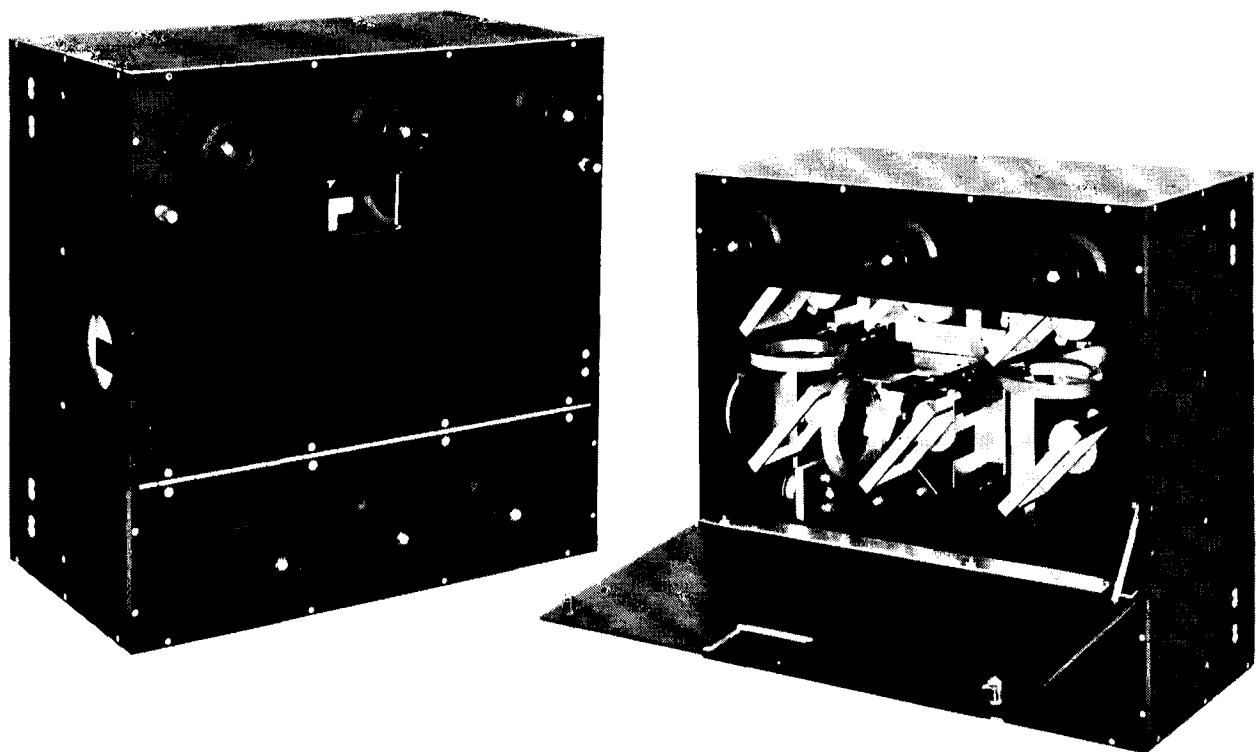
The American Science Film Association will hold its 1969 Conference September 17-19 in Washington, DC. Highlights of the program will include a film festival for public information and a showing of the NASA motion picture on the Apollo 11 lunar landing. Sessions will be held on Cinematography and Television in Space, Undersea and Biomechanics Research; Science Films and Television in Higher Education; New Technological Developments Relating to Science Films and Television (including production of computer-generated motion pictures, systems approach to learning and EVR) and Science Films and Television in Secondary and Elementary Education. Discussions during this last session will include the United States-Japan science film exchange project, teacher and student-produced films, BSCS inquiry type films and films for learning in mathematics. The Program Chairman is G. William Hughes, who is Supervisor of Motion Picture Services at Penn State University. ASFA headquarters are at 7720 Wisconsin Ave., Bethesda, MD 20014.

The Second Annual Armed Forces Audio-Visual Communications Conference will be held November 3-7 at the Sheraton-Park Hotel in Washington, DC. The Annual Audio-Visual, Pictorial, Television and Communications Equipment Symposium will be held November 3-5 in conjunction with the Conference. The Conference will cover a number of topics in applied audio-visual communications, including discussions and exhibits of still and motion-picture photography, television, instrumentation, audio-visual research and development, media management and utilization and career opportunities in the audio-visual fields. The latest developments in audio-visual equipments will be display. Further information is available from HQUSAF (AFXO-TV), 2AFVCC Registration Committee, Washington, DC 22030.

Brooks Institute Undersea Division, 2190 Alston Rd., Santa Barbara, CA 93103, has announced a schedule of courses in applied

HFC ADDITIVE LIGHT SYSTEM USING MANUAL VALVES

See the HFC Additive Light System
at the SMPTE Convention
in the Century Plaza Hotel, Los Angeles
Sept 28 - Oct 3 / Booths 79-80-81



FEATURES:

1. 50.025 Log E steps light change.
2. 48.0125 trim steps.
3. Compact light valve/trimmer unit.
4. Easily adapted to existing continuous, optical or step printers.
5. System used for one light printing.
6. Easily adjustable knobs with steps engraved.
7. Precision made with no backlash in shutters. Two sets of linear actuating shutters; trimmer and light change at 90° to each other.
8. 100% reproduceable on repeat settings.
9. Light changes and trimmer adjustments give diaphragming of lens at optical center line.
10. Hard coated dichroic mirrors.
11. 1,000 watt lamp (1,200 watt optional)
12. Douser for cutting off light.
13. Adjustable lamp base with a number of positions; Up & down, East & West, North & South.
14. External reflector at lamp.
15. High volume fan at base of lamp.

HOLLYWOOD FILM COMPANY

956 NORTH SEWARD STREET / HOLLYWOOD, CALIFORNIA 90038 / AREA CODE:(213) 462-3284 / CABLE: BENHAR

CARRY TODAY'S POWER



for tomorrow's applications

Providing compact, most advanced portable equipment, Yardney Electric's Silcad® and Silvercel® rechargeable batteries are the acknowledged leaders in the industry's most advanced cordless energy applications.

Reducing the weight and size of television and motion picture battery power supplies by as much as 75%, while offering greater energy and electrical power than other sources, Yardney Electric's batteries can provide up to 45 watt hours per pound and 2½ watt hours per cubic inch. It is this portable power which is presently serving a wide range of motion picture and television camera equipment.

Because of their extended cycle life, close voltage regulation over a wide current range, small volume, advanced modular design and excellent charge retention of up to 85% capacity over a 3-month period, these batteries are already successfully performing in a multitude of television and photographic applications, these include: ■ Portable color TV cameras ■ Portable lighting equipment ■ Camera drives ■ Recording equipment ■ Color videotape recorder-cameras.

Wherever space and weight requirements are critical, and high-energy conversion capabilities are essential, you'll find Yardney Electric's Silvercel® and Silcad® batteries supplying today's power for tomorrow's sophisticated portable equipment.

yardney

"PIONEERS IN COMPACT POWER"®

YARDNEY ELECTRIC CORPORATION
40 LEONARD ST., NEW YORK, N.Y. 10013

FOR MORE DETAILED INFORMATION REGARDING YOUR SPECIFIC REQUIREMENTS, WRITE OR CALL:

INDUSTRIAL SALES DEPARTMENT



PATENTS GRANTED AND PENDING

212 • WO 6-3100

undersea photographic techniques. Ten complete seven-week courses will be given. The Institute has been interested in undersea phenomena since 1952. The Undersea Research Division uses underwater television and video systems to acquire data for private and university studies. Presently in production for television and motion-picture release is a study on venomous and dangerous marine animals. The study is being filmed on the remote atoll of Rangoroa, Tahiti, in conjunction with the World Life Research Institute.

Chambers & Partners of London, creators of animated films, is seeking qualified writers in the United States to supply story material or scripts for entertainment animated cartoons suitable for the United States market. Animation writers are invited to send material capable of being made up as 13-min programs. A list of the author's credits should be enclosed with the material or inquiries. Communications should be addressed to Chambers & Partners at 5 Queen St., Mayfair, London W.1., England.

Panorama Film Productions is a newly created organization, founded by Allen T. Gilliland, owner and President of Standard Radio and Television Co., 645 Park Ave., P.O. Box 1188, San Jose, CA 85110. The new organization, formed to provide motion-picture film production services, is located at the same address. Services offered include client consultation, estimates, script writing, filming, processing, sound mixing, editing and printing. Panorama will also specialize in the production of film strips and slides.

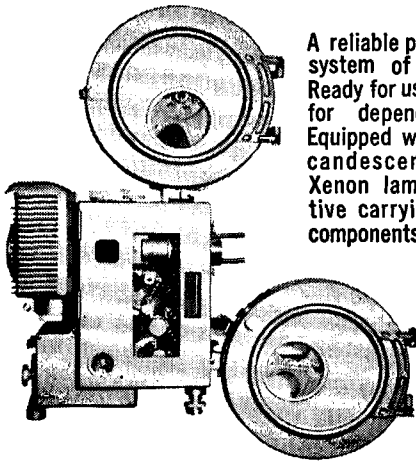
Fidelity Group Ltd., with headquarters in New York and offices in London, Geneva, Paris, Rio de Janeiro and Buenos Aires, is engaged in a film production program in collaboration with Les Films Corona in Paris and is also engaged in building a sound studio in London containing 75,000 ft² of floor space. The studio will include offices, production and recording facilities.

A new laboratory of physical optics has been established at Kodak Research Laboratories as part of the Physics Division. Initially the program of the new laboratory will be devoted primarily to applied mathematics and to the study and application of optical coherence phenomena. Head of the new laboratory is James C. Owens. Dr. Owens was formerly with the research laboratories of the U.S. Environmental Science Services Administration at Boulder, CO, where he was engaged in studies on optical propagation as related to atmospheric and geophysical problems.

McCarthy Distributors, 202 E. 44 St., New York, NY 10017, have added products of 13 manufacturers to their line of audio visual equipments. The firm continues to handle equipments produced by RCA, Projection Optics, Viewlex and Radient. In addition they now handle products of Kodak, DuKane, Fairchild, LaBelle, Wilson Tables, Apeco, Motiva, Hitachi, Shibaden, Audiscan, Bohn-Benton, Montage and Technicolor.

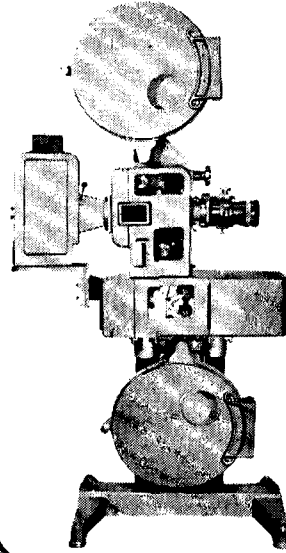
NOW! SOS PRESENTS 3 NEW 35mm PROJECTION SYSTEMS TO MEET YOUR INDIVIDUAL NEEDS!

No. 1—SOS PORTABLE:



A reliable portable projection system of superior quality. Ready for use. Ruggedly built for dependable operation. Equipped with standard Incandescent or optional Xenon lamp house. Attractive carrying case for all components.

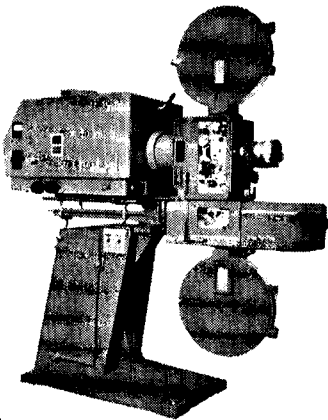
No. 2 SOS PREVIEW:



A complete package for your screening room. Heavy duty Geneva Projector with rotary oil damped direct drive soundhead on modern double post pedestal. Unique 3000' magazines for reels adaptable for loop projection. Available in Incandescent or Xenon light source. Standard or double system magazines, optical or magnetic sound reproduction and synchronous or non sync motors.

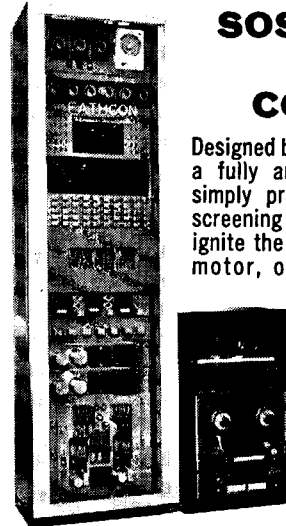
No. 3—SOS THEATRE:

A dual Projection System with advance design curved gate, water cooled fittings for use with maximum amperage lamps. High speed single blade conical shutter for high light transmission. Automatic filtered oil system; automatic safety switch; High Fi Theatre sound reproduction with transistorized optical pick up. Horizontal beam Xenon lighting system for balanced light distribution over entire screen.



A dual Projection System with advance design curved gate, water cooled fittings for use with maximum amperage lamps. High speed single blade conical shutter for high light transmission. Automatic filtered oil system; automatic safety switch; High Fi Theatre sound reproduction with transistorized optical pick up. Horizontal beam Xenon lighting system for balanced light distribution over entire screen.

SOS AUTOMATIC THEATRE CONTROLLER:



Designed by Toshiba Photophone of Japan, a fully automatic programmer that by simply pressing a button can make a screening announcement, lift the douser, ignite the lamp, dim the lights, start the motor, open the curtain, make the changeover and at the conclusion shut off projectors, raise the lights, close the curtain and closing announcement.

SOS
SOS PHOTO-CINE-OPTICS, INC.
A DIVISION OF F&B/CECO INDUSTRIES, INC.

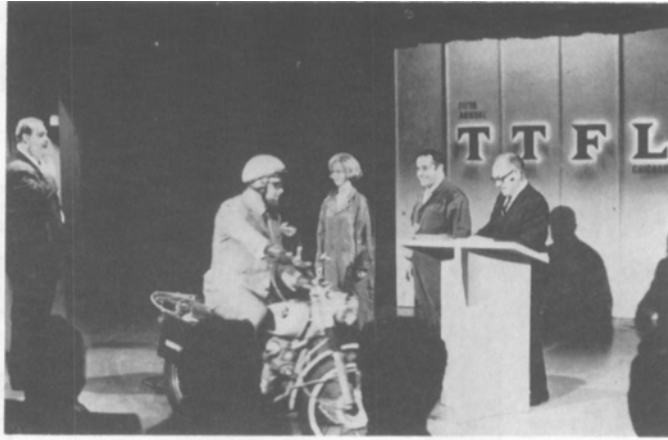
EAST COAST:

Dept. SM-9 311 West 43rd St., New York, N.Y. 10036 (212) MU 9-9150

WEST COAST:

7051 Santa Monica Blvd., Hollywood, Calif. 90038 (213) 469-3601

Over 40 years of quality service



The 5th Annual IES Theatre, Television and Film Lighting Symposium was held May 25-27 in Chicago. More than 200 persons attended the symposium which was held at the Chicago Sheraton Hotel, Goodman Theatre and WBBM-TV Studios. The symposium was conducted by the Theatre, Television and Lighting Committee of the Illuminating Engineering Society. The program included panel discussions, technical papers and demonstrations. Panel discussions included sessions on luminaires and light sources, lighting control systems, theater lighting, television lighting and film lighting intended to provide information on the present state of the art. A panel of experts answered questions from the audience. Demonstrations of theater and television lighting were held at Goodman Theatre and WBBM-TV Studios. A lighting progress show concluded the symposium. This annual event dramatizes new and exciting developments in lighting equipments. The host of the show was Red Blanchard. A scene in the lighting progress show is shown above.

The 6th Annual Theatre, Television and Film Lighting Symposium will be held in May 1970 in Hollywood. IES headquarters are at 345 E. 47 St., New York NY 10017.

The new Norelco FP-16 16mm Projector that...

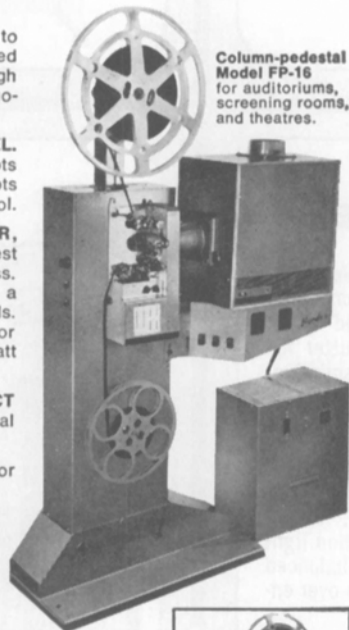
BRINGS BIG-THEATRE PERFORMANCE to your auditorium. This remarkably rugged projector is engineered to the same high standards demanded by professional motion picture theatres.

PACKS A 2½ HOUR FILM ON ONE REEL. No rewinding or reel changing interrupts the show. Runs forward or reverse. Adapts to automatic operation and remote control.

THROWS A BRIGHTER, CLEARER, STEADIER PICTURE across the largest auditorium. Doesn't require total darkness. Nine different Norelco lenses, including a new zoom lens, available to fit your needs. Uses Xenon or carbon arc light source—or can be purchased with built-in 500 watt ozone-free Xenon lamp house.

BRINGS FILM SOUND INTO PERFECT BALANCE with room acoustics. Optical and magnetic sound.

REMARKABLE VALUE! Send coupon for prices and facts.



Column-pedestal Model FP-16 for auditoriums, screening rooms, and theatres.

Norelco

MOTION PICTURE EQUIPMENT

North American Philips Corporation
Motion Picture Equipment Division
One Philips Parkway
Montvale, New Jersey 07645
(201) 391-1000

S4

Please send facts and prices on the new Norelco 16mm Professional Projectors.

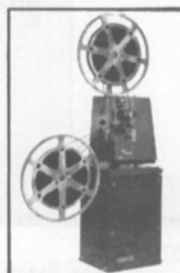
FP-16 with column-pedestal EL-5100 Portable model

Name/Title _____

School/Company _____

Address _____

City _____ State _____ Zip _____



Portable self-contained Model EL 5100 for outdoor showings, exhibits, social halls, etc. Uses incandescent light source.

Industrial Photographic Equipment Corp. (IPEC) is a new firm formed by the consolidation of Smith's Photographics Unlimited, Inc., Randolph, MA, and Fisher Photo and Graphic Arts Co., Hartford, CT. Under terms of the consolidation the company will continue existing business operations as divisions. Fisher Photo was incorporated in 1967 and Smith's Photographic Unlimited has been in existence since 1946.

RCA Corp. has announced a major program to renovate and rehabilitate its plant facilities in Camden, NJ. The rehabilitation activity is expected to continue for several years and to involve an investment of some \$20 million. The initial phase of the program is the improvement of working conditions in the RCA plants. RCA has been in Camden for 40 years and operates a plant complex consisting of 16 buildings covering 2,113,824 ft² of floor space. It employs some 8,500 persons in the Camden facilities.

Production of RCA 16mm sound motion-picture projectors for shipment to world markets outside the United States has begun at the RCA (Jersey) Ltd. plant on Jersey Isle in the English Channel. The expansion in Europe was prompted by rising world demand for film projection equipment, especially for educational and training purposes, the announcement stated. The projector is similar to the United States version, but is designed for the 50-Hz, 240-V market. The Jersey facility will also manufacture a 60-Hz, 120-V model for sale in Canada.

RCA Corp. and Thorn Electrical Industries of England have announced an agreement whereby the two companies will form a joint operation to expand the manufacture of color television picture tubes in the United Kingdom, subject to the approval of the Boards of Directors of the two

Magna-Tech's electronic method of altering sound tracks makes "looping" obsolete.



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

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

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

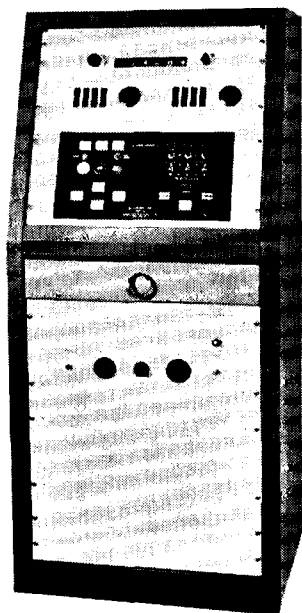
High speed return of the film to "start" saves time and permits new starts without waiting for a "loop" to complete its trip.

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

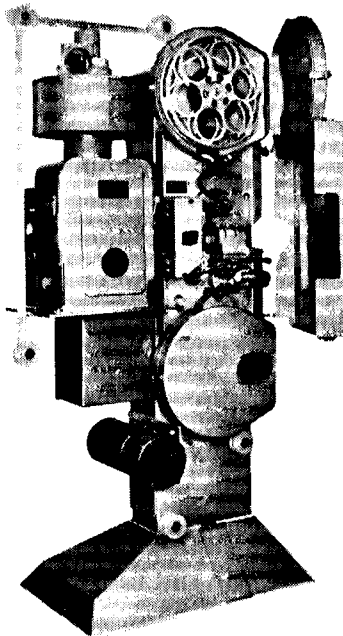
A complete remote control system is provided the director so that, once the recording engineer has preset footages, the director can take over if he wishes and directly control every facet of the recording.

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

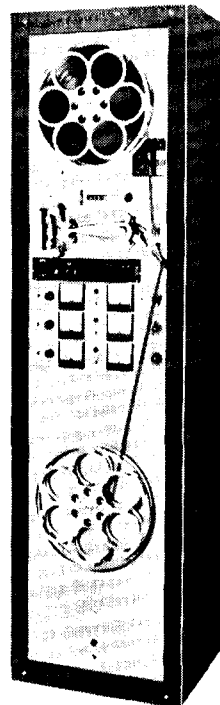
This track now has all of the final takes in sequential position and ultimately permits the screening of the picture and the final edited track in perfect synchronization. From this point the track is ready to go to a mix and no further editing is required.



Electronic Looping Console



35mm Projector



Master Magnetic Pick Up Recorder with Selective Erase



MAGNA-TECH ELECTRONIC CO., INC.

630 Ninth Avenue / New York, N.Y. 10036

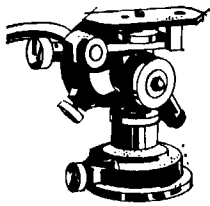
Ideal for new BNCR and cameras to 200 lbs.



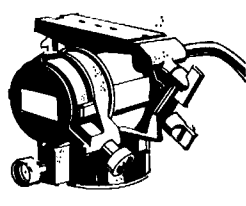
NEW!
O'CONNOR 200-B

You're always in complete command of your big camera with the new O'Connor 200-B fluid camera head. For use with such large cameras as the Mitchell BNC and color TV cameras up to 200 lbs., the 200-B gives you sure, positive, constant control under all conditions. Due to O'Connor's exclusive fluid action, plus Timken bearings, panning and tilting are smooth as glass. Quickly adjusted to keep the camera in perfect balance at all times. Incorporates all the features cinematographers want most plus many exclusive O'Connor features. Send for catalog on the complete O'Connor line.

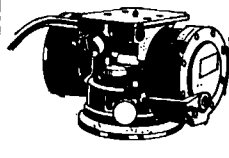
A HEAD FOR EVERY CAMERA



MODEL C
for cameras to 20 lbs.



MODEL 50
for cameras to 50 lbs.



MODEL 100
for cameras to 100 lbs.



O'CONNOR FLUID CAMERA HEADS

O'Connor Engineering Laboratories, Inc.
379 E. Green St., Pasadena, Calif. 91101

Send catalogs on camera heads: Model C. Model 50. Model 100.
 Model 200.

NAME _____

FIRM _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

companies. The joint operation will bring together the color tube activities of Thorn with manufacturing facilities at Brimsdown, Enfield, and RCA Colour Tube Ltd.'s activities at Skelmersdale, Lancashire.

Demonstrations of RCA color and monochrome cameras were held at San Francisco during the National Cable Television Association Convention. Cameras demonstrated included the PK-730, a color TV camera with a single pickup tube; and the PFS-710, a one-tube system for originating motion pictures and slides in color. The PK-610 three-vidicon color film system for larger cable TV studio operations was also demonstrated. Also shown as a control console developed especially for CATV operations.

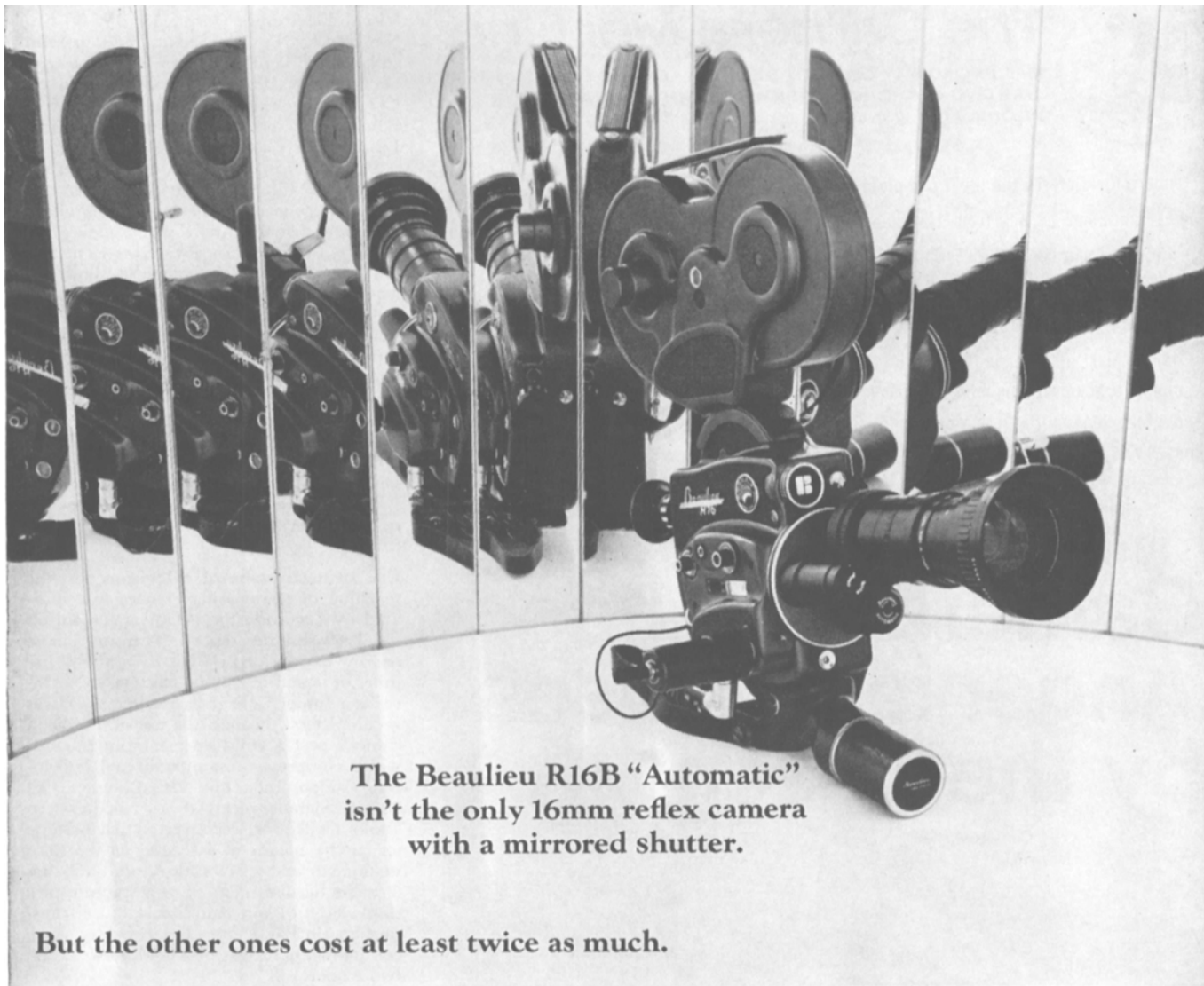
Sonderling Broadcasting Corp. has agreed to acquire the Lockwood and Gordon Theater Chain Group, which includes 32 motion-picture theaters and drive-ins, it was announced jointly by President Egmont Sonderling and Arthur H. Lockwood, President of Lockwood and Gordon Enterprises. The chain of theaters covers five New England States. There are nine theaters in Connecticut, 13 in Maine, four in Massachusetts, two in New Hampshire and four in Rhode Island. The present management of the Lockwood and Gordon Theater Chain Group will continue to direct the operation.

United Artists Theatre Circuit, Inc., 115 Middle Neck Rd., Great Neck, L.I., NY, has announced the purchase of the Broadway Maintenance CATV Corp., a wholly-owned subsidiary of Broadway Maintenance Corp. The cable television franchise, which covers the Brookhaven Township and Patchogue, L.I., area will be operated as Brookhaven Cable TV, Inc., a wholly-owned subsidiary of United Artists Theatre Circuit.

Data Memory Inc., 1255 Terra Bella Ave., Mountain View, CA 94040, has acquired Laser Applications, Inc., of Palo Alto, it was announced by Ray S. Stewart, President of Data Memory. Laser Applications, founded in 1967, specializes in custom laser systems engineering and manufacturing. The acquisition will allow Data Memory to combine laser technology with disc memory systems, the announcement stated. This will include devices for hard copy printout from disc memory computer peripherals, optical scanning, and various quality and process control applications.

PhotoHorizons, formed last January by Horizons Research Inc., 2905 E. 79 St., Cleveland, OH, to manufacture and market dry-working, nonsilver free radical photographic materials, has transferred its personnel and equipment from the laboratory at E. 79 St. to a new 10,000-ft² leased facility in Commerce Park, Beachwood, OH, it was recently announced. The leased facility will provide space for offices, supervisory staff and supporting personnel as well as engineering and development and manufacturing and marketing activities.

A narrow-band television system based on narrow-band video converters, produced by



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

But the other ones cost at least twice as much.

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

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

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

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

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



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

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

CINEMA  **Beaulieu**
A DIVISION OF HERVIC CORPORATION

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

Visit us at booth 34 at the SMPTE Exhibit



The Camera Mart Inc.

1845 BROADWAY (AT 60TH ST.) NEW YORK, N.Y. 10023
LIGHTING AND GRIP DIVISION: 887 NINTH AVENUE
PHONE: 212 • 757-6977

Camera Mart offers the most complete line of Angenieux lenses anywhere:

- 16mm Zoom Lenses from 17-68mm f/2.2 to 12-240mm f/3.5
- 35mm Zoom Lenses 35-140mm f/3.5 and 25-250mm f/3.2
- Fixed focal length 16mm lenses from 5.9mm f/1.8 to 150mm f/2.7
- Fixed focal length 35mm lenses from 14.5mm f/3.5 to 100mm f/2.0

Camera Mart also carries a complete line of zoom lens accessories: the Camart lens support bracket, motor drives, Camart sunshade and filter holders, close-up adapters, lens multipliers, data rings, all filters and custom carrying cases and lens extension tubes — for all lenses.



Camera Mart has Angenieux lenses by the dozen



SHOWCASE,
LIKE NEW AND
NEW MODELS
AVAILABLE

For further information call or write today: Sales Division 212-757-6977

Visual Electronics Corp., 356 W. 40 St., New York, NY 10018, was used to send still-frame TV pictures over telephone wire circuits from Atlantic City, NJ, to Denver, CO, and back again during a demonstration conducted during the American Library Association Convention held in Atlantic City in July. The video converters transmit 525-line TV signals over narrow-band, voice-grade communications channels. The demonstration, which took place at the AT&T Library Resources Center in Atlantic City, was intended to show the feasibility of a nationwide network enabling public, university and private libraries to function as one large information exchange center accessible to everyone. The narrow-band system is used as a computer input device by General Dynamics, MIT and NASA. Lawrence Radiation Laboratories, Livermore, CA, uses the narrow-band system as part of their security system; and Diebold Co., an Ohio firm, has installed the system in Indiana banking firms for use in signature verification.

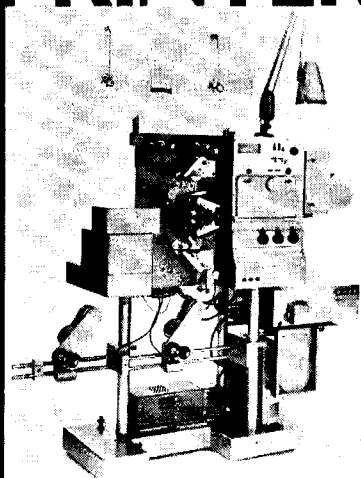
Use of narrow-band television for the teaching of engineering courses was initiated by Colorado State University during the 1969 summer session. Transmission of narrow-band video signals over about 150 miles of leased telephone circuits to Northeastern Junior College in Sterling, CO, was accomplished through the use of a vidicon camera and a solid-state sampling bandwidth compressor manufactured by Colorado Video, Inc., Box 928, Boulder, CO 80302. Signals received at Northeastern Junior College are reconverted to a 525-line format by means of a second device (also manufactured by Colorado Video) utilizing a magnetic disc memory. The pictures are displayed on 21-in monitors. Picture transmission time is 1 min and two-way voice communications was provided between the two schools.

Laser beams have been guided into thin crystal films by the use of prisms at Bell Telephone Laboratories during experiments that may lead to miniature laser circuits. The base of the prism is placed parallel to the film, but at a precisely controlled distance away from it. The laser beam, entering the prism through its longest side, reflects from the base, as predicted by the laws of conventional optics. However, contrary to conventional assumptions, the laser energy is not reflected totally. A portion of the light waves "tunnels" through the gap between the prism base and the film, and generates electric and magnetic fields in the film. Initial experiments have shown that more than 50% of the incident laser energy can be transferred into the film. Theoretical calculations predict a transfer efficiency of 80%.

The light waves can travel in the thin film in a number of distinct patterns of electromagnetic vibration, or modes. There is a characteristic speed of propagation for the waves of each mode. This prism-coupling method can excite any selected one of the possible modes by directing the laser beam at a proper angle, relative to the film.

Holograms that can be erased magnetically are produced by a new technique

CONTINUOUS HIGH SPEED OPTICAL REDUCTION PRINTER



A high speed continuous optical reduction printer for 16mm to super 8 film. Prints dual rank 1-3 format simultaneously and dual rank 1-4 format in two passes. Produces 222 f.p.m. of super 8 film after slitting. Available with B & H Additive Color Light Source in either automatic or manual versions.

**SEE IT & MORE AT
THE 106th SMPTE
FALL CONFERENCE
BOOTHS 17 thru 22**

PROFESSIONAL EQUIPMENT DIVISION

7100 McCORMICK ROAD, CHICAGO, ILL. 60645 U.S.A.



BELL & HOWELL

CANADA
BELL & HOWELL CANADA LTD.
125 NORFINCH DRIVE
DOWNSVIEW, ONTARIO, CANADA

CENTRAL-SOUTH AMERICA
BELL & HOWELL/INTERNATIONAL
7100 McCORMICK ROAD
CHICAGO, ILLINOIS 60645 U.S.A.

DOMESTIC
BELL & HOWELL/PROFESSIONAL
7100 McCORMICK ROAD
CHICAGO, ILLINOIS 60645 U.S.A.

INTERNATIONAL
BELL & HOWELL, LTD.
ALPERTON HOUSE, BRIDGEWATER RD.
WEMBLEY, MIDDLESEX, ENGLAND

reported by RCA. The holograms, called phase holograms, are produced on a special magnetic surface through the interaction of the heat and the light inherent in a laser beam, thus making it possible for an optical computer memory to store 100 million bits of data in a film one inch square that could be read out, erased and reused.

An extremely thin film of manganese bismuth, a magnetic material, is deposited in a single-crystal layer two-millionths of an inch thick on a base of mica. The film is then subjected to a strong magnetic field that forces all its magnetic atoms to line up with their north poles in one direction, their south poles in the other. The light from a pulsed laser is split into two beams, one going directly to the film and the other

going first to the information bit pattern to be recorded and then to the film.

At the points where the two beams interfere constructively (add their powers together) the heat from the laser beam warms the magnetic material sufficiently to allow its magnetic atoms to realign themselves so that the north poles of those in the heated portions point in the same direction as the south poles in the unheated portion. Where the two beams interfere destructively (tend to cancel each other) nothing happens. Thus, a magnetic pattern is created in the film that corresponds to the interference pattern created by the converging laser beams, producing a magnetic hologram. The magnetic hologram can be read out by transmitting laser beam through it or by

reflecting the beam from it. The hologram can be erased by electronically pulsing a nearby wire coil that subjects the film to a strong magnetic field and forces the magnetic atoms to line up, as at first, with all north poles in one direction, all south poles in the other.

A technique for improving the contrast of images displayed on cathode-ray tubes, fluoroscopes and rear-screen projectors has been acquired by Ingenuics, Inc., 425 North Frederick Ave., Gaithersburg, MD 20760, from Fairchild Hiller. The contrast is improved by bonding a circular polarizer to the front surfaces, thereby eliminating internal reflections within the glass faceplate or the groundglass screen. In applying the new technique, a linear polarizer is bonded to the glass to eliminate the reflecting surface at the glass. A quarter-wave retardation plate is then bonded to the polarizer and this moves the reflecting surface to the front of the "sandwich." Some of the light emitted by each picture element is transmitted through the sandwich to the eye of the observer. However, light which exceeds the critical angle is polarized and rotated 45° before it reaches the reflecting surface. After reflection the light is again rotated 45° and since its plane of polarization is now 90° to that of the linear polarizer, it does not get back through the polarizer. Since this reflected light is prevented from reaching the diffusing surface, it cannot be re-scattered toward the observer.

Undersea exploration by U. S. Navy Oceanographers is the subject of three 16mm color sound films produced by the Public Affairs Office of the Oceanographer of the Navy. *Land Beneath the Sea* (running time 24 min) deals with undersea geography and shows the discovery of submarine mountain ranges and canyons. *Scientist in the Sea* (running time 16 min) illustrates the study of oceans and marine life by scientists who, by learning more about undersea environment, may make discoveries useful to future generations. *Mission Oceanography* documents the Navy's studies of the sea, beginning with the whaling ships in 1840. This film is available in two versions, one running 16 min and the other 28.5 min. All three films are available as a loan without charge.

A catalog, published by the U.S. Naval Oceanographic Office, is available from the Superintendent of Documents, Government Printing Office, Washington, DC 20402. The catalog, priced at \$1.00 (D 203.24:C-4/3) lists and describes 155 films on oceanography and gives information on where they may be obtained.

Roy D. Cahoon, of Dollard des Ormeaux, Quebec, has been appointed Vice-President, Engineering, of Canadian Broadcasting Corp. He succeeds J. E. Hayes who retired in July following a 33-year career with CBC. Mr. Cahoon joined CBC's predecessor, Canadian Radio Broadcasting Commission, in 1935 as studio construction engineer at Ottawa. Since then he has held various supervisory posts within CBC. He has also, while with CBC, conducted post-graduate classes in communications at McGill University. The announcement of Mr. Cahoon's appointment was made by



NOW AVAILABLE FREE

The Industry's Most Complete Professional Motion Picture Equipment Sales and Rental Catalogs

Write on your letterhead or visit our booths #52 and 53 at the 106th SMPTE Conference, September 28-October 3, Century Plaza Hotel, Los Angeles

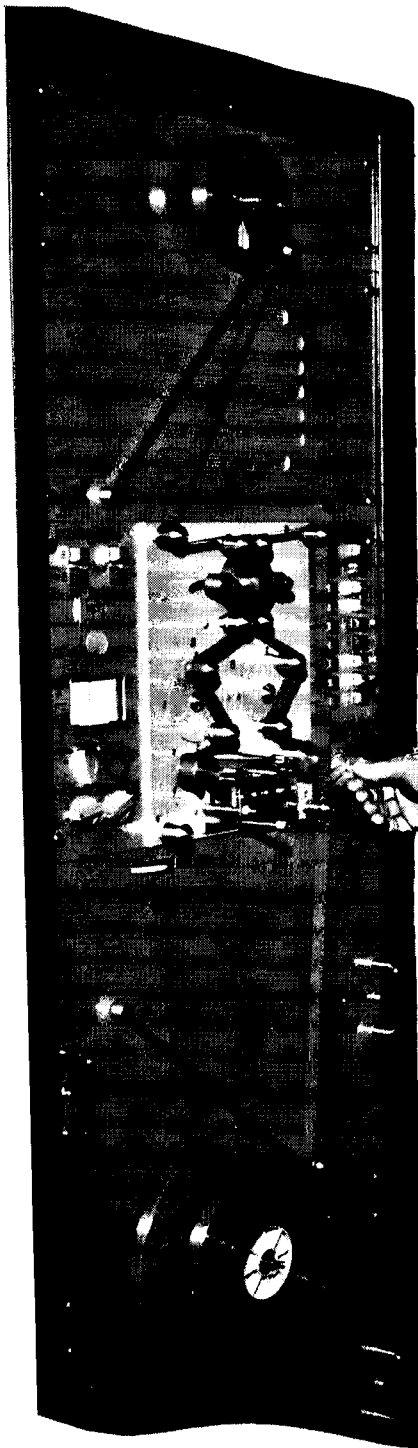
SERVING THE WORLD

alan gordon enterprises inc.



5362 NORTH CAHUENGA BOULEVARD, NORTH HOLLYWOOD, CALIFORNIA 91601
Telephone (Area Code 213) 985-5500

**SONDOR Breaks Through The
Television SOUND BARRIER**
And Makes All Existing Sprocket
Recorders **OBSOLETE**



16mm
17.5mm
35mm
16/17.5/35mm
1 to 8 Tracks



Don Collins demonstrates a SONDOR running in FULL INTERLOCK with a video tape recorder. Only SONDOR will run in true interlock with any VTR, Projector Audio Recorder, Pilot Signal, Camera, Distribution System, Etc.

SONDOR
MAGNETIC FILM RECORDER/REPRODUCER

- POSITIVE INTERLOCK WITH ANY VTR, FILM CAMERA OR FILM SYSTEM
- NO DISTRIBUTOR SYSTEM NECESSARY
- LOCK WITH ANY SYNC SIGNAL
- FAST FORWARD & REWIND MODES
- 5 msec START TIME
- INTERFACE WITH ANY PROGRAMMER
- VTR DOUBLE SYSTEM SOUND CAPACITY

Contact Don Collins or Frank Beemish in New York, or Tom O'Hara in Los Angeles

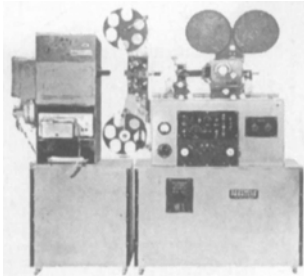
TELE-CINE INC.

294 E. SHORE DRIVE. MASSAPEQUA. N.Y. 11758

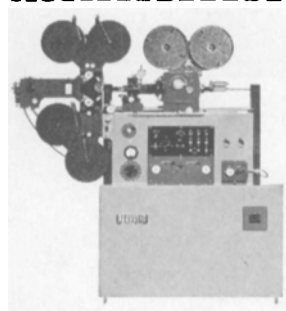
RESEARCH PRODUCTS



OPTICAL PRINTERS



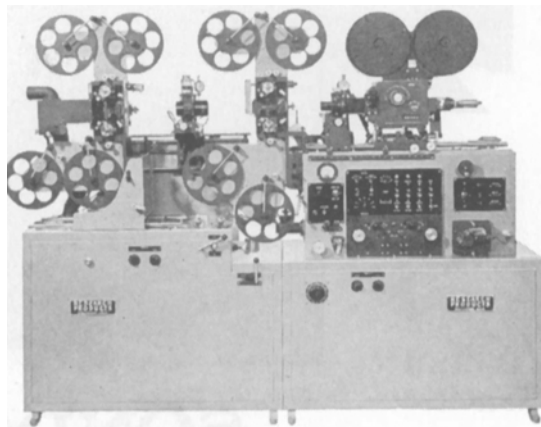
MODEL 999 is a simplified laboratory-type printer intended for printing operations not requiring a wide range of special effects. It is a basic unit especially adaptable to Super-8mm needs. Can be ordered with either the standard subtractive light source or the Bell & Howell additive head (shown). This "bread-and-butter" printer has won wide acclaim in high-volume laboratories. Purchase and lease plans available.



Model 1000 prints all format sizes from 70mm to 8mm in color or black and white. It utilizes latest design concepts to facilitate even the most complicated of optical effects. Provides an oversize optical bench, variable speed motor, automatic dissolve mechanism, and electric skip-frame programmer giving unlimited skip — or multiple — frame combinations.

Model 1001 combines all the features of Model 1000, plus an automatic zoom capable of 4x enlargement to 5x reduction.

Purchase and lease plans available.



Model 1002 makes use of the modular construction principle to effect a complete optical printing system. Adding a second in-line projector to a Model 1001, it provides a film-to-film aerial image for ease in accomplishing difficult traveling-matte shots. Optional features are a tilting camera, a motorized automatic zoom, and other special effects accessories. Aerial image module can be ordered at the same time as an optical printer or added at a later date, as feasible. Electrical and mechanical service problems are eliminated, as a replacement drive unit can be installed in minutes without disassembling printer. Custom engineering is available for unusual, specialized requirements, but the purchaser of any Research Products printer is assured equipment of custom quality and performance at the lowest price anywhere available. Purchase and lease plans available.

Research Products Optical Printers are the result of 25 years of experience in optical effects for theatrical, commercial and instrumentation films. They are designed around precision Acme camera and projector units, available in Super-8mm, 16mm, 35mm, 65mm and 70mm. All printers feature the Modular Drive, housing all mechanical drive parts in a single, easily-replaceable unit. Synchronization, being entirely mechanical throughout, is absolute.



Send for complete literature.

RESEARCH PRODUCTS, INC.

6860 Lexington Ave. / Hollywood, Calif. 90038 / (213) 461-3733

CBC President George F. Davidson who also announced that the office of Vice President, Engineering, is being transferred from CBC's corporate head office in Ottawa to the engineering headquarters in Montreal.

Frank P. (Pete) Clark has joined the staff of the Motion Picture and Television Research Center of the Association of Motion Picture and Television Producers Inc., 8480 Beverly Blvd., Hollywood, CA 90048, it was announced by Wilton R. Holm, Executive Director of the Research Center. Mr. Clark and Dr. Herbert Meyer, also a member of the staff of the Research Center, recently returned from a tour of research facilities of chemical and industrial companies in the midwest and east to study new materials and process that may be used in the motion-picture industry. Among companies visited were 3M, DuPont, Dow Chemical, Hercules, Rohm & Haas and GAF Corp. In his new post Mr. Clark will study materials and technologies involved in nonphotographic aspects of motion-picture production, such as set construction and special effects. He is the author of *Special Effects in Motion Pictures* published by SMPTE.

Raymond Fielding has been appointed Professor of Communications in the School of Communications and Theater, Temple University, Philadelphia, PA 19122. He was formerly Associate Professor in the Department of TV-Radio-Film, University of Iowa. Previously he was on the faculty of the University of California Los Angeles and he served as visiting professor at the University of Southern California and New York University where he was Director of NYU's Summer Motion Picture Workshop. Dr. Fielding is the author of a number of articles and books, the most recent being *A Technological History of Motion Pictures and Television*, which was awarded the Lion of St. Mark at the 13th International Exposition of Books and Periodicals at the Venice International Film Festival (*Journal* (p. 48, Jan. 1969)). The book was reviewed in the July 1968 issue of the *Journal* (p. 775). Dr. Fielding is the author of a paper, "Norman O. Dawn: Pioneer Worker in Special-Effects Cinematography," which appears in the January 1963 issue of the *Journal* (pp. 15-23).

Allan L. Williams has been appointed Manager of Product Planning, Motion Picture and Education Markets Division, Eastman Kodak Co. John M. McDonough succeeds Mr. Williams as Director of Motion Picture Film Product Planning. Mr. Williams joined Kodak in 1943 as a technical supervisor at the Tennessee Eastman Co. He transferred to the Kodak Park Division in 1947 as a junior chemist. He held various positions within the division and in 1965 he was appointed coordinator of product planning in the Motion Picture and Education Markets Division.

John Murray has been appointed Executive Vice-President and Director of Sales for Bardwell & McAlister, manufacturers of lighting equipment, 6757 Santa Monica Blvd., Hollywood, CA 90038. He joined the firm in 1968 as Vice-President in Charge of



"It's an automated projector"
"It's a filmstrip projector"
"It's a movie projector"
"IT'S A STILL PROJECTOR"

It's Super Projector!

Is there a super 8 movie projector that can be many things to many people? Well, if there wasn't one before, there is one now. It's the super new *Kodak Ektagraphic MFS-8 Projector*.

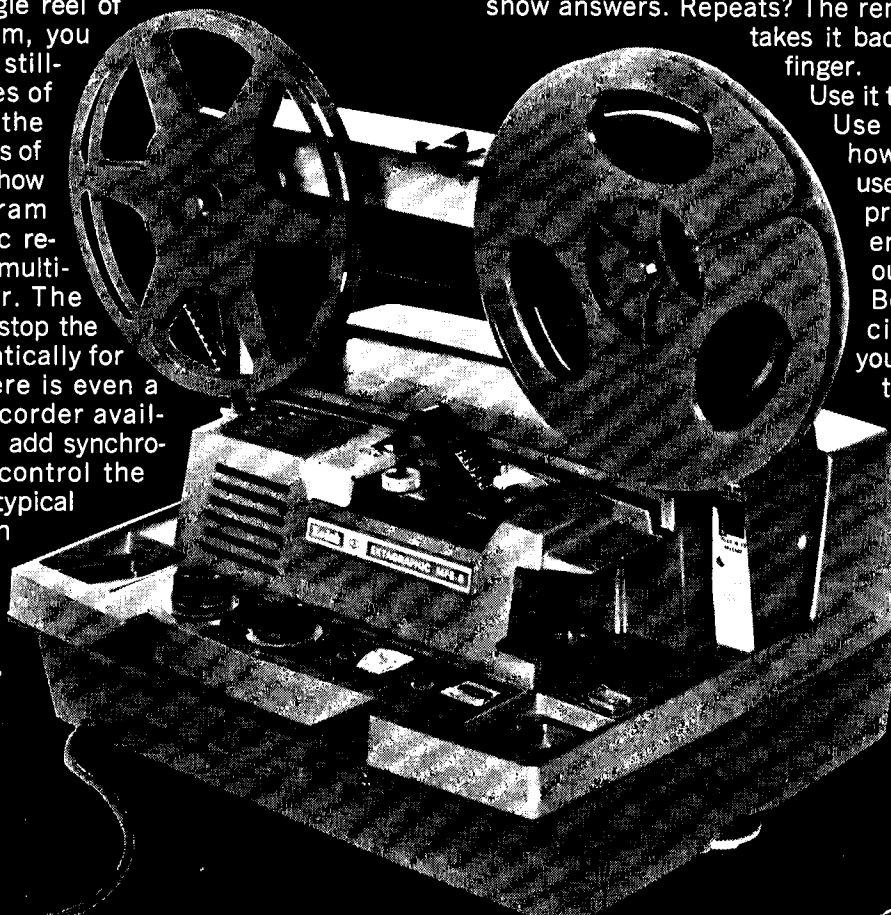
Now, on a single reel of super 8 color film, you can combine the still-frame advantages of filmstrips with the motion advantages of movies. And you show the entire program with an automatic remote-controlled, multi-speed projector. The cues on the film stop the projector automatically for still frames. There is even a cassette tape recorder available that lets you add synchronized sound to control the program. Take a typical show. A push on the remote-control start button and the projector operates just like an ordinary

motion picture projector until it senses a cue. Then it stops—for a title frame or whatever—and it holds until the start button is pushed again. Still frames may ask questions of learners, and then motion sequences may show answers. Repeats? The remote reverse control takes it back with a flick of the finger.

Use it to teach. Use it to sell. Use it to inform. Use it however you want, but use it—because this new projector represents an entirely new creative outlet for your talents. Be the first industrial cinematographer on your block to start using the super MFS-8 Projector. See your Kodak Audiovisual Dealer, or contact one of the offices listed below.

EASTMAN KODAK COMPANY

Atlanta: 404/351-6510
Chicago: 312/654-0200
Dallas: 214/FL 1-3221
Hollywood: 213/464-6131
New York: 212/MU 7-7080
San Francisco: 415/776-6055



Kodak

WESTERN Cine

COLOR
POSITIVE
RELEASE
PRINTING

INTER-
NEGATIVES
with
COLOR
CORRECTION

COMPUTERIZED PRINTING

Western Cine color duplicating is the better way to achieve the fine results you expect! Our computerized lab equipment permits wide flexibility that enables you to do more with your film. . . color correction, variable fade and dissolve lengths, zero cuts and R/F cueing.

And because the duplicating process is completely programmed and computerized, better quality control and economy result.

COMPLETE LAB SERVICES

COLOR PROCESSING
EKTACHROME COMMERCIAL EF & MS
LIPSNER-SMITH ULTRASONIC FILM
CLEANING ON ALL ORIGINALS
COMPLETE SOUND RECORDING
OPTICAL PRINTING TRACKS
OPTICAL PRINTING 16mm to 16mm
and 35mm to 16mm
INTERLOCK PROJECTION
8mm PRINTING

Send for Producers' Net Price List



DENVER
312 So. Pearl St. - Denver, Colo. 80209
HOLLYWOOD
Cine Craft
8764 Beverly Blvd. - Hollywood, Calif. 90048

Sales shortly after it became a division of F&B/Ceco. He has had some 17 years experience in the lighting equipment field.

John F. Ohliger, Assistant Professor of Adult Education, Center for Adult Education, Ohio State University, Columbus, has been appointed Editor of *Educational Broadcasting Review*, replacing Dr. Allen Koenig. Edward Foote will replace Campbell Titchner as Managing Editor. *Educational Broadcasting Review* is published bi-monthly by the National Association of Educational Broadcasters in cooperation with Ohio State University. Announcement of the appointments was made jointly by NAEB President William G. Harley and Richard B. Hull, Director of Ohio State University Telecommunications Center.

Three new appointments have been announced at Eastman Kodak's Motion-Picture and Education Markets Div. Robert S. Beeler has been appointed Director, Technical Service, Education Markets. George H. Gordon has been appointed Director, Technical Service, Motion-Picture Markets; and John G. Spence has been appointed Manager, Sales Service, Advertising and Customer Services. Mr. Beeler joined Kodak in 1954 as a photo specialist in the Sales Division and he was appointed Manager of Sales Service for the division in 1965. Mr. Gordon has been with Kodak since 1939 when he joined the Color Process Development Dept. at the Research Laboratories. He transferred to the Motion-Picture Film Dept., East Coast Div. in 1947. In 1968 he was appointed Director, Engineering Services, Motion-Picture and Education Markets Div. at Kodak headquarters in Rochester. Mr. Spence joined Kodak in 1951 as a part-time employee at Kodak Park. His full-time employment began in 1955 when he became a development engineer in the Cine and Sheet Film Div. He has held various positions at Kodak and in 1967 he was made a customer service specialist in the Motion-Picture and Education Markets Div. and early in 1969 he was appointed Coordinator, Personnel Development for the Division.

Leonard E. Wolff has been appointed Southwestern Sales Engineer for Philips Broadcast Equipment Corp. His headquarters will be in the Southwestern Regional Office in Post Oak Tower, 5051 Westheimer, Houston, TX. Mr. Wolff joined Philips Broadcast in 1969. He was formerly Marketing Manager for Texas Capacitor, Inc. Prior to that he was a television engineer for an NBC affiliate, KPRC-TV, in Houston. In his new post he will oversee sales activities in Arkansas, Colorado, Kansas, Louisiana, New Mexico, Oklahoma and Texas.

Gino Nappo has been appointed Southeast Regional Sales Manager for Philips Broadcast Equipment Corp. and Charles H. Golsen has been appointed Sales Engineer in the Southeast District. Philips Broadcast Equipment Corp.'s Southeast headquarters are at 2991-D North Druid Hills Rd., N.E., Atlanta, GA. Mr. Nappo has been with Philips since 1965. He was formerly with General Precision. Mr. Golsen joined

Philips in 1968. He was formerly with Telemet Co. as a sales and field engineer.

Gordon W. Bricker has been appointed Manager of the newly created RCA Professional Electronic Systems Dept., with headquarters in Burbank, CA, and Alfred W. Power has been appointed to the newly created position of Manager, Government and Closed-Circuit TV Sales, for the RCA Broadcast Systems Dept. with headquarters in Camden, NJ. Mr. Bricker has been with RCA since 1952. Prior to his present appointment he was Manager, West Coast Operations. Mr. Power has been with RCA since 1953. Prior to his present appointment he was Manager, Eastern Sales for RCA Professional Television equipment and systems. In his new post he will head an organization selling RCA radio and TV originating equipment to government agencies and for installations in schools, colleges and industrial organizations.

E. D. McConnell has been appointed Technical Manager of the Broadcast Division of Rank Precision Industries, Ltd., Welwyn Garden City, Hertfordshire, England. He returns from the United States where he has been Technical Manager in the Westinghouse Research and Development Center in Pittsburgh. In his new post he will be responsible for all technical aspects of Taylor Hobson lenses and special optics.

Gale Livingston has been appointed a Vice-President of the Professional Services and Equipment Group of Litton Industries. Mr. Livingston was formerly President of Litton's Aero Service and Westrex Divisions which will continue to report to him. Aero Service performs aerial photogrammetric surveys for economic development, oil and mineral exploration services on a worldwide basis. Westrex manufactures and sells professional motion-picture, sound recording, projection and electronic communication equipment.

Robert Friedman has been appointed Vice-President and General Manager of the Electronics Division of TNT Communications Inc., 62-10 34th Ave., Woodside, NY 11377. Mr. Friedman joined TNT in 1968 as Director of Marketing. He was formerly Vice-President of the Dalto Electronics Corp. and Manager of Advanced Visual Systems Development of the Link Group of General Precision, Inc.

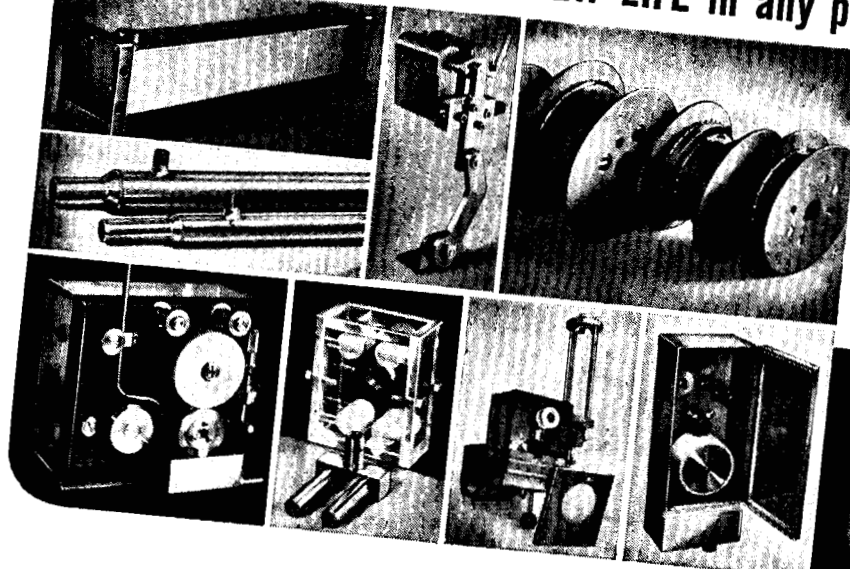
your lab processor
will operate

SMOOTHER!

with specially designed
**TREISE
FILM ROLLERS**

There's no drag . . . no film abrasion . . . no wear and tear . . . when you use Treise Rollers. Their unique ball-bearing design insures minimum film pull and provides exceptionally smooth processor performance. All rollers are molded entirely of durable plastic. Moreover, the lands in the rollers are angled so that the film "rides" with only the outside edges touching. The film image never comes in contact with the roller and thus never receives the slightest scratch or abrasion! Available in 8/16mm, 16/35mm, and 70mm. Sizes from 2½" O.D. to 7¾" O.D. Shaft diam: ⅜", ½", or ⅝". Choice of stainless steel or nylon ball bearings, or plastic bushings.

Treise Accessories put NEW LIFE in any processor!



**"SOFT TOUCH"
ROLLERS**

feature special "tires" composed of tiny silicon or rubber knobs that firmly grip the film and smoothly move it along. Ideal for use with unperforated or multi-perforated film, or for any film on tendency drive processors.

*Write for catalog on our complete line
of fine quality processor accessories!*

TREISE ENGINEERING, INC.

1941 FIRST STREET • SAN FERNANDO, CALIF. 91340