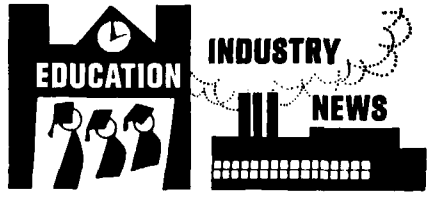
sure motion-picture and television coverage of all the Apollos and also to provide adequate lighting for round-the-clock work on the spacecraft; some of the more critical operations required light of extreme intensity and brilliance.

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.

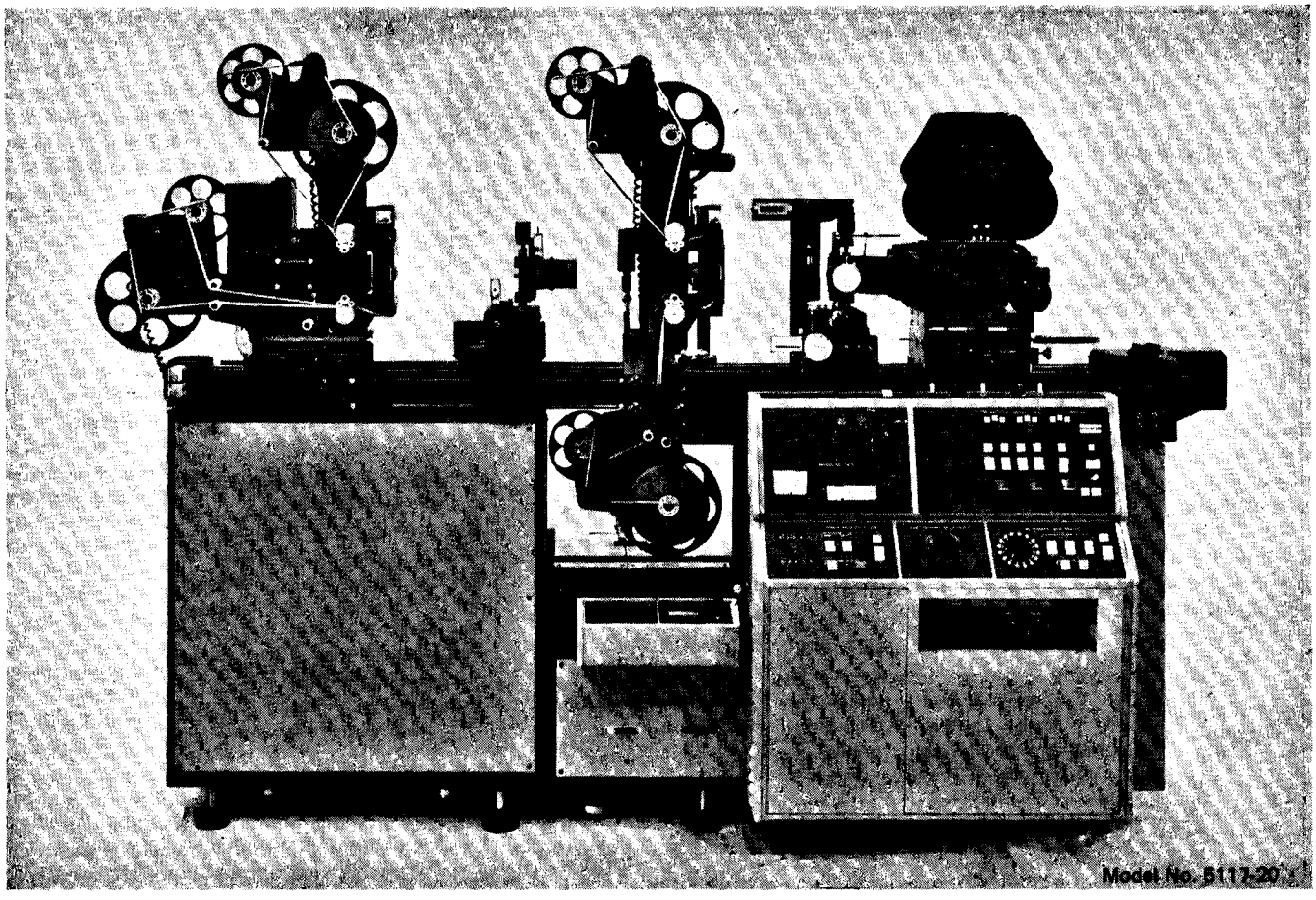


Ten Education Fellowship Awards have been announced by American Film Institute, 1815 H St., NW, Washington, DC 20006, under the Fellowship Program (now in its second year) established to assist graduate students planning to teach film or television. Up to ten Fellowships are granted annually with applications 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



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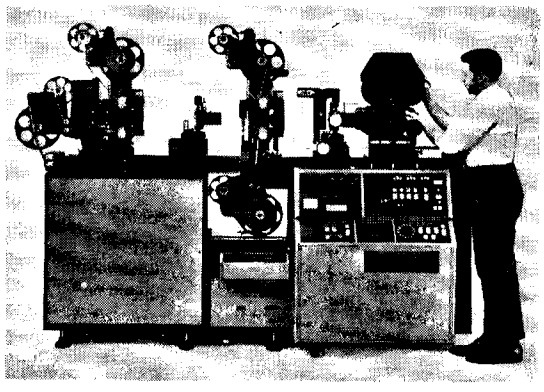

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Aids to Medicine, Disc Recording and Reproduction, Audio Abroad, Magnetic Recording and Audio Apparatus and Applications. Session chairmen (in the order of subjects) are Cyril M. Harris, William S. Bachman, Earle L. Kent, Lewis W. Wetzel, Philip Kantrowitz, John M. Eargle, J. L. Oooms, 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), 2AFAVCC Registration Committee, Washington, DC 22030.

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

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.

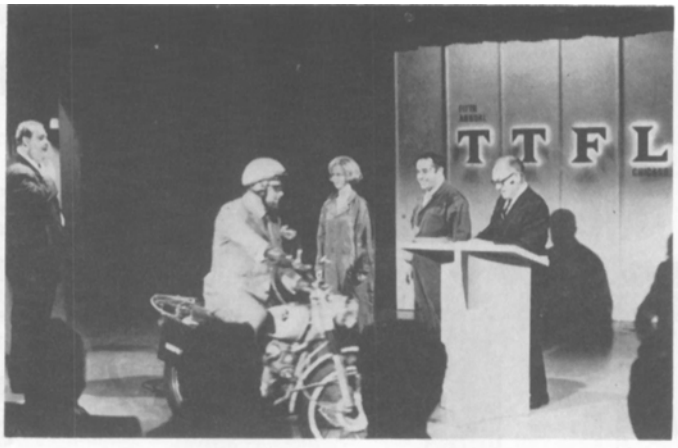
Chambers & Partners of London, creators of animated films, is seeking qualified writers in the United States to supply story material or scripts for entertainment animated cartoons suitable for the United States market. Animation writers are invited to send material capable of being made up as 13-min 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 Janiero 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.



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.

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

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.

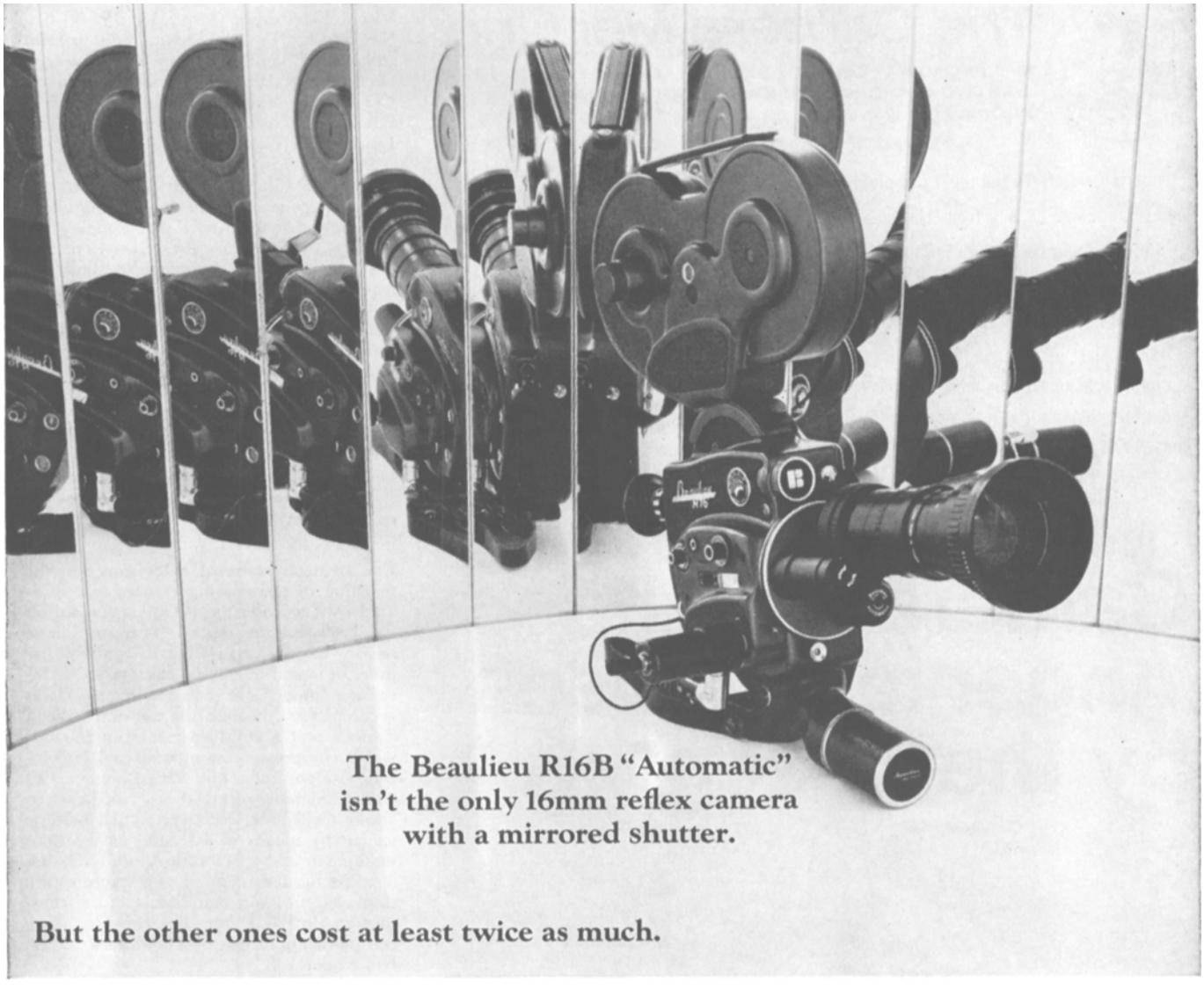
Sonderling Broadcasting Corp. has agreed to acquire the Lockwood and Gordon Theater Chain Group, which includes 32 motion-picture theaters and drive-ins, it was announced jointly by President Egmont Sonderling and Arthur H. Lockwood, President of Lockwood and Gordon Enterprises. The chain of theaters 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 Aritsts 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 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.

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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 acessible 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

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 groundlgass 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 rescattered 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 postgraduate classes in communications at McGill University. The announcement of Mr. Cahoon's appointment was made by

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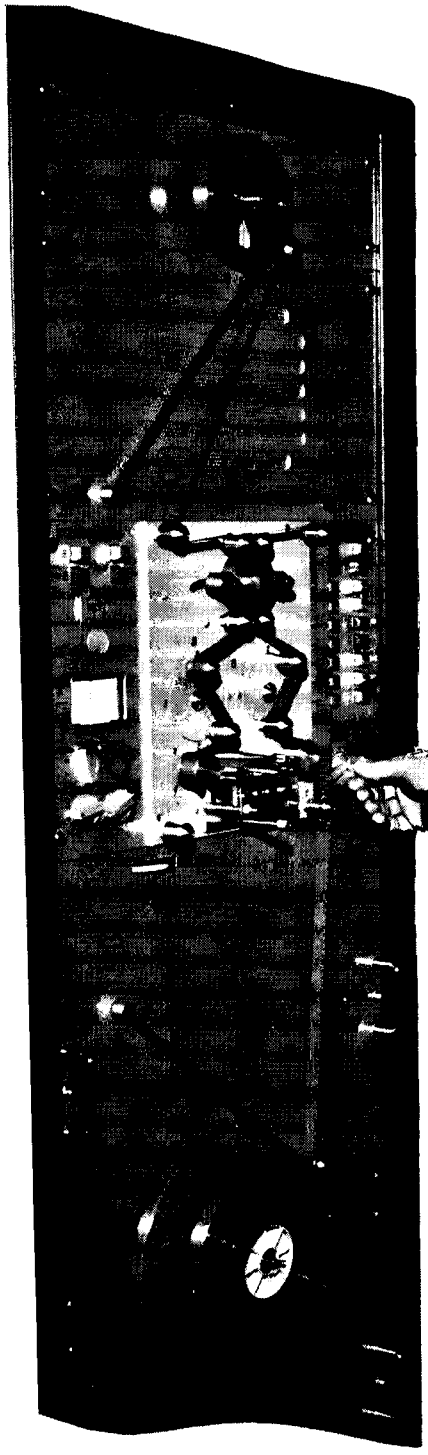

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CBC President George F. Davidson who also announced that the office of Vice President, Engineering, is being transferred from CBC's corporate head office in Ottawa to the engineering headquarters in Montreal.

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

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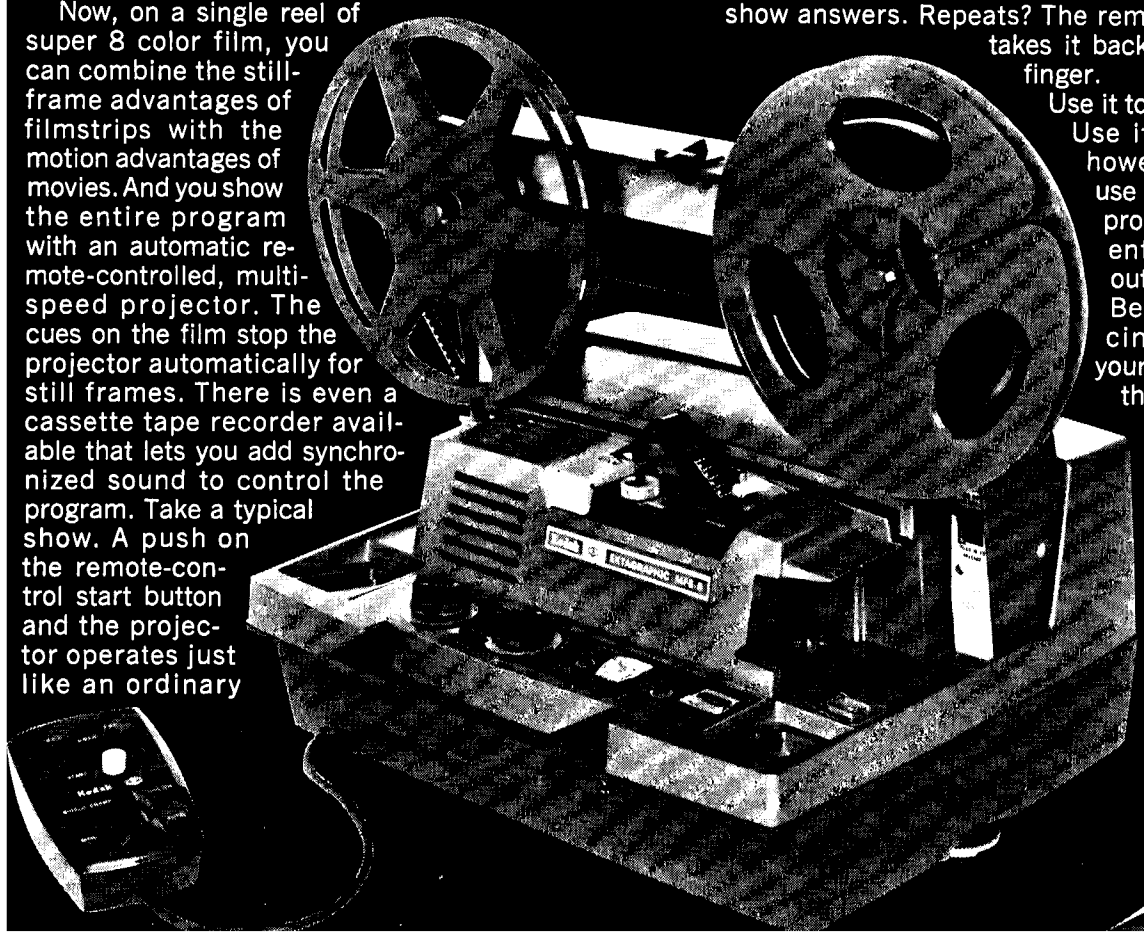

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New York: 212/MU 7-7080
San Francisco: 415/776-6055

Kodak

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.