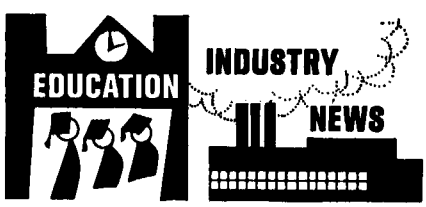
His work in coherent optics included such developments as spectrum analyzers, correlators, matched filters and holograms. Among the inventions for which Mr. Ingalls holds patents is a two-dimensional coherent optical spatial filter equipment called a Laserscan. It was developed especially for processing seismic oil exploration data. More recently he has been engaged in the optical processing of stereoscopic photogrammetric data and he has also worked with optical processing using holograms as data storage units and as filters.

His work in infrared technology included the design of a diffraction limited infrared scanner. His work in the field of laser optics has included the design of special lenses for use in both the visible and infrared regions, laser cavity design and analysis and the study of optical surface quality influence on laser light and its coherence properties, noise and bandwidth.

In 1961 he left the university to become the head of the Department of Optics Research of Conductron Corp. and in 1965 he decided to become a consultant. He opened an office in Ann Arbor and, quite recently, he moved to 2835 Montmart Dr., Orlando, FL 32809. He has equipped an office there with full-size drafting facilities and a Friden electronic calculator.

Mr. Ingalls is the author of a number of technical papers which have appeared in such journals as *Journal of the Optical Society of America* and *Applied Optics*. He has been a member of the Society since 1955.



SPSE Charter Fight to Photokina

The Society of Photographic Scientists and Engineers (SPSE) is sponsoring a charter flight for the benefit of SPSE members and other interested persons who plan to attend the 1970 Photokina. The flight will leave September 17 from Kennedy Airport in New York and will fly nonstop to Cologne, Germany. The return flight will leave from Cologne on October 11 and will fly nonstop to New York. The roundtrip fare is $165. The group will arrive in Cologne two weeks before the opening of Photokina (October 3) to give the group members an opportunity to see Europe on their own before the event. There is, of course, no obligation to attend Photokina, if some group member should prefer to continue his travels during the week rather than to attend the 1970 Photokina. Autos will be available for rental. SMPTE members may obtain further information from Fred Garretson, Bywater Rd., Annapolis, MD 21401. He can also be reached by telephone at (301) 268 1518.

The 1970 Photokina will be held at Cologne, Germany, October 3–11. Some 650 companies from 23 countries will participate. Twenty-five exhibitors from the United States will show photographic equipment including motion-picture cameras and accessories, protectors, lenses and audio-visual equipments. Among the highlights of Photokina will be an exhibit of historical items of equipment, including antique motion-picture cameras and projectors, to celebrate the 75th anniversary of film projection.

The announcement of the historical exhibit notes that the first film projection by Louis Lumière on March 22, 1895, was an industrial film entitled *Workers Leaving the Lumières Factory* shown to the Société d'encouragement à l'industrie nationale. A few months later Max and Emil Skladanowsky projected the first short film in public. On November 1, 1895, they used the Bioskop designed by them to show short entertainment films as part of a variety program at the Berlin Wintergarten.

A tutorial seminar on the Science and Technology of Information Display will be held September 14–18 at the Long Island Graduate Center of the Polytechnic Institute of Brooklyn, Farmingdale, N.Y. The seminar is under the auspices of the Office of Special Programs, Polytechnic Institute of Brooklyn. There will be 18 sessions designed to provide an understanding of the concepts underlying modern information display and to relate these foundations to contemporary practice. Topics to be discussed include Image Information Theory; Geometrical Optics and Image Formation; Coherent Optics and Holography; Electron Beam Principles and Cathode-Ray Devices; Lasers; and Sub Systems Large Screen Displays. Further information is available from Mrs. Helen Warren, Polytechnic Institute of Brooklyn, Long Island Graduate Center, Route 110, Farmingdale, L.I., NY 11735.

The 38th Convention of the Audio Engineering Society was held May 4–7 in Los Angeles. Session topics were: Motion-Picture Sound Techniques; Acoustical Noise and Noise Control; Disc Recording and Reproduction; Audio in AM, FM and TV Broadcasting; Microphones and Playback Cartridges; Loudspeakers; Electronics Applied to Music; Audio Measurements and Instrumentation; Architectural Acoustics and Electroacoustics; Signal Control and Processing; Magnetic Recording and Reproduction; Music, Speech and Hearing; Amplifiers and Audio Circuitry; Sound Reinforcement; and Audio Applied to Education, Science and Industry. A special feature of the program was a recording studio workshop held in several recording studios in Los Angeles and Hollywood. Audio Engineering Society headquarters are at Room 428, Lincoln Bldg., 60 E. 42 St., New York, NY 10017.

The Illuminating Engineering Society (IES) held its annual Theatre, TV and Film Lighting Symposium May 24–26 in Los Angeles. Highlights of the symposium included roundtable discussions on production techniques, light sources, luminaires and control systems and demonstrations of set and studio lighting. A technical paper entitled "Light and Color in a Multiple-Purpose TV Studio," describing the equipping of Studio "A" of WAJA-TV Channel 23, Miami, was presented by the author, George Gill. The paper had previously been awarded first prize in a competition conducted by the IES S.E. Florida Section.

The Primary Pattern Generator (PPG), a new machine that makes use of a laser to draw patterns for tiny integrated circuits more intricate than previously possible, has been developed at Bell Telephone Laboratories, Mountain Ave., Murray Hill, NJ 07974. The machine will be used for creating circuit patterns in photolithographic masks, which, in turn, are used by Western Electric Co. in the production of integrated circuits for Bell System equipment. The PPG consists of a moving table to hold an 8- by 10-in photographic plate; an argon laser as the light source; modulators and lenses to control the laser beams and a 10-sided mirror rotating on air bearings to reflect the laser beam and expose selected portions of the photographic plate. The laser beam can be controlled "with pin-point precision" to traverse the photographic plate along 32,000 scan lines and with 26,000 positions per scan line. The beam can be directed with an accuracy of less than one arc-second. The PPG must be operated in a special controlled environment chamber, where the temperature is maintained within 0.25°F and each cubic foot of air contains fewer than 100 dust particles larger than one micron. Operation is so fast that the PPG takes only about 12 minutes to complete a sophisticated circuit mask which formerly required more than 12 hours of machine time.

An holographic system employing sonographic and holographic techniques to produce three-dimensional pictures underwater has been developed at CBS Laboratories by a team of scientists one member of which was Dennis Gabor who developed the first hologram in 1948 and pioneered sonography, the detection of objects in murky water at great depths and long distances by probing with sonar devices.

The "see with sound" system uses an acoustic wave transmitter which illuminates 1/100th of an object field, each 1/100th of a second, with a narrow beam which scans the entire field. The reflected waves of 100 object points in each illuminated portion of the field are sensed by 360 hydrophones arranged in a circular array. The output from each hydrophone is amplified and then modulated by a signal corresponding to an equivalent reference sound wave outside the object field having a frequency equal to that of the transmitted acoustic wave. Each joint signal is then translated into a corresponding light beam for imaging in a corresponding circular array onto an intermittently driven photographic medium with a 1000 : 1 reduction in scale from the hydrophone array. The photographic medium is devel-

oped and when the images, corresponding to holograms of the entire illuminated object field, are illuminated by a beam of coherent light, a visible picture of the entire object field is reproduced.

According to Dr. Gabor, to take pictures with sound, it is necessary to use many hydrophones arranged in a ring. A sound pulse is sent out in a narrow cone. When the pulse strikes an object, such as a ship, a buoy or a mine, a return wave strikes the hydrophone ring. By using a local oscillator of the same frequency to record the incoming signal, full information is available on the direction of the object. The complicated patterns of the elements of the object are reconstructed through holography and the interference pattern on the ring is transformed into a small light hologram by means of a cathode-ray tube.

The system has been patented and the patent assigned to Columbia Broadcasting System, Inc.

The U.S. Metric Study authorized by Public Law 90-472 is now underway. The law provides for a program of investigation, research and survey conducted by the Secretary of Commerce with the aim of determining what effects the increasing use of the metric system of measurement is having on this country and what action, if any, should be taken. The study is now in the data-gathering phase preparatory to writing a final study report. Responsibility for the study was assigned to the National Bureau of Standards. The first phase of the study dealt with planning and development of key questions to be answered by the study and identification of economic sectors requiring survey, and other areas to be investigated such as engineering standards and history.

Answers to several questions are being sought in the study: How much is the metric system used now in this country? Would accelerated increase of metric usage be in the best interest of the United States? If so, should the country follow the present practice of having each sector of our economy increase its metric usage if and when it sees fit to do so? Should it follow a planned schedule of increased metric usage so that over a period of time all sectors of the economy will convert to metric?

If the entire country converts to metric, the question arises as to how it should be done. One way would be to change the measurement language in which an object is described, the other by physically changing the size of an object to conform to a metric standard. The latter method of change would include the question of metric engineering standards, the interlocking characteristics of various segments of industry in the fabrication process (e.g., mating of components such as metric-sized fasteners to fit into metric-sized threaded holes) and the availability of metric-sized materials and parts called for in the specification.

A patent covering fundamental "off-axis" methods of producing holographic images has been granted by the United States Patent Office to Emmet N. Leith and Juris Upatnieks, researchers at the University of Michigan's Institute of Science and Technology, for inventions made by them in the early 1960s. Announcement was made by Holotron Corp., 1007 Market St., Wilmington, DE 19898, a jointly held subsidiary of E. I. du Pont de Nemours and Co. and Scientific Advances, Inc., which was formed in June 1966 to develop commercial applications of holography. Holography, which has been described as "three-dimensional imaging with lasers," is a revolutionary method for recording and reconstructing images. The basic patent, filed in April 1964, covers such techniques as methods for producing and reconstructing "off-axis" holograms, methods of stacking holograms and making holographic color images. Possible application of holography to three-dimensional TV was described by Upatnieks, Leith, Hildebrand and Haines in the October 1965 issue of the *Journal* ("Requirements for a Wavefront Reconstruction Television Facsimile System").

The portable Lunar Communications Relay Unit (LCRU) is being developed by RCA Defense Communications Systems Div., Camden, N.J., for NASA to make possible full-color TV coverage of the Apollo lunar module lifting off from the moon. The LCRU will measure 5 by 13 by 21 in and will weigh 50 lb (9 lb moon weight). It will be mounted on the Lunar Rover vehicle which astronauts will ride during exploration of the moon. Its first use is planned for the Apollo 16 mission. The LCRU will transmit voice, telemetry and color TV and receive transmissions from the earth without the signals being relayed through the lunar module. This will make it possible for the astronauts to engage in extensive exploration of the moon while maintaining contact with earth. The color TV camera will be connected by cable to the LCRU.

Associated British Cinemas, a subsidiary of Associated British Pictures Corp., which was acquired last year by Electrical & Musical Industries, Ltd., of London, will construct two and possibly three triple theater complexes in London this year, according to a recent announcement. The first triple theater constructed by Associated British Cinemas was opened last November in Edinburgh.

Wollensak, Inc., of Rochester, NY, has acquired the optical and electronic operations of Polan Industries, a division of Republic Corp., Huntington, WV, according to a recent announcement. Polan will be operated as an autonomous division of Wollensak. Lawrence W. Ferber, Polan's Vice-President and General Manager will continue as head of Polan's operations. Wollensak products include lenses, shutters, prisms and optical flats.

Chris McGuire Cinemas now under construction or in the planning stage are being reviewed for possible conversion to twin theaters or, in some cases, to triplex and quadruplex theaters, it was announced by Charles H. Netter, President of Chris McGuire, Inc. There are 30 Chris McGuire Cinemas now open in Georgia, Florida, Louisiana and Alabama and some 60 more are scheduled to be in operation by the end of 1970.

TVC Dailies is a new division of TVC Laboratories, Inc., 311 W. 43 St., New York, NY 10036. The new division will have its entire capability devoted to color dailies put-through. It will occupy 10,000 ft² of floor space on a floor of its own adjacent to, but operationally independent of, other divisions of the TVC Laboratories complex. The new color laboratory division will have the capability of processing Eastman Color for features as well as for commercials.

Zolomatics Corp. has moved to new quarters at 941 N. Highland Ave., Hollywood, CA 90038. The firm was formerly located at 5875 Melrose Ave. in Hollywood.

Audiotronics Corp., 7428 Bellaire Ave., North Hollywood, CA 91603, manufacturer of audio-visual equipment, has reached a preliminary agreement of joint venture with Standard Radio Corp. of Japan for the manufacture and marketing of videotape recorders and cameras which conform to the new compatible 0.5-in format design standard, it was announced by Don E. Warner, President of Audiotronics. Under the terms of the agreement, the firms will share engineering and tooling costs, and Audiotronics will have exclusive marketing rights for the new line of video products in the Western Hemisphere. The video products will be marketed under the brand name Setchell Carlson. Setchell Carlson Electronics, Inc., a subsidiary of Audiotronics, manufactures a line of educational and industrial TV receivers and monitors. Standard Radio Corp. manufactures electronic equipment, including tape recorders, stereo AM/FM receivers, TV sets and citizens band and marine transceivers.

Photographic Sciences Corp., 23 West Main St., Webster, NY, is a newly formed company specializing in photographic and art generation services relating to such products as optical targets and reticles and form slides for Computer-Output-Microfilm equipment. Activities of the new company will include consulting and applied research and development in the technical photographic field. The company was founded by John E. Blackert, formerly of Xerox Corp., and Lawrence P. Albertson, formerly of Eastman Kodak. The company's Board of Directors includes William S. Shoemaker, Richard Zakia, Albert D. Rickmers and Hollis N. Todd.

Kalvar Corp. has established its Systems Development Laboratory (SDL), 800 S. Jefferson Davis Pkwy., New Orleans, LA 70125, as a separate operating division, it was announced by Harold C. Harsh, President of Kalvar. SDL was formed in 1968 from Kalvar's Physical Research Dept. with the primary assignment of designing and manufacturing specialized equipment used to print and process Kalvar dry-

process vesicular films. I. H. De Barbieris has been appointed Manager of the new division. He has been associated with Kalvar Corp. since 1956.

Camera Mart, Inc., 456 W. 55 St., New York, NY 10019, has been appointed distributor for the Crystamatic Computer Camera Control System. The system was designed to eliminate the need for the clap-stick and sync cable while providing for synchronous multicamera operations using lightweight battery supplies.

International Video Corp. of Canada, Ltd., 9545 Cote de Liesse, Montreal, Que., Can., is a new subsidiary of International Video Corp. established to market IVC products in Canada, including color TV cameras and videotape recorders. Emil Adamyk has been appointed Vice-President and General Manager of the new subsidiary.

Video Matrix, an innovative use of television developed by Harvey Lloyd Productions, of New York, for American Can Co., was shown at the New York Coliseum during the American Management Assn. 39th Packaging Exposition, April 20–23, as part of the American Can Co. exhibit. The Video Matrix system is modular, made of chrome steel and Plexiglas based on two-foot cubes. Fifty-six TV monitors, six videotape playback units, six vidicon cameras, switching circuitry and control equipment are housed in the cubes, exposed "to create a glittering pulsating electronic environment," the announcement stated.

At the exhibit, six different pre-taped programs were run at the same time. After a short taped message, automatic switching turned one bank of monitors to live cameras and viewers could see themselves. Interviews going on at the control console were televised to 50 black-and-white monitors. Color programing was broadcast to six color monitors. The Video Matrix format stresses "visual immediate communication" using photographs, videotape, film, slides, live action, pictures and film.

At the Coliseum, the Video Matrix exhibit was shown in an environmental theater composed of three large screens where a simultaneous film and slide presentation was shown.

The EVR Partnership of London, headed by John C. Lewis, Managing Director, held a weeklong series of private demonstrations of color EVR in Tokyo for representatives of leading Japanese firms. Mr. Lewis reported "uniformly favorable reaction." Color EVR was first demonstrated in the United States March 24. The color EVR system was described by Peter C. Goldmark, President and Director of Research, CBS Laboratories, in a paper on "Electronic Video Recording" presented on May 1 at the Society's 107th Technical Conference in Chicago. Dr. Goldmark is the recipient of many honors for the development of EVR and other developments including the long-playing record.

Pre-recorded EVR (Electronic Video Recording) programs will be marketed by Motorola Systems Inc., 4501 W. Augusta Blvd., Chicago, IL 60651. The firm manufactures the Motorola Teleplayer. EVR, developed by CBS Laboratories, is the first commercially available system for playing color and black-and-white cartridged programs through any standard TV set. Motorola has been licensed by CBS Laboratories as the exclusive manufacturer in the United States and Canada through 1971. The firm plans to develop programs in the EVR format for hospitals, hotels and motels, public safety agencies and other special audiences. A hospital package is planned to consist of a Motorola Teleplayer which can transmit to all television sets connected to the hospital's master antenna a series of suitable programs. The new color Teleplayers utilize solid-state modules similar to Motorola's Quasar construction. A flying-spot scanner electronically scans the EVR film as it moves by.

More accurate color balancing of 16mm color prints for television has resulted from an agreement among TV networks and producers to color balance all 16mm prints for television at a projection color temperature of 5400 K. This is close to the color temperature of home receivers. Previously, 16mm prints for television were timed at laboratories at 3200 K and 5400 K. The resulting color balance at the home set can switch rapidly when a series of 10-, 20-, or 30-s local station color commercials follow in quick succession. The many variables connected with proper color balancing were discussed by E. C. Genock at the Society's 107th Technical Conference in Chicago in a paper on "TV Commercial Color Quality and Consistency — Whose Responsibility?"

FBC Cablevision, Inc., Irvine, CA, has announced the purchase of closed-circuit TV equipment for CATV operation, including equipment to develop four color TV studios and four monochrome mobile production vans. The studios and vans will be used to televise events in Pueblo, Colo., Oceanside and Menlo Park, Calif., and Poughkeepsie, N.Y. All four vans will be constructed by TeleMation, Inc., which will also install the studios in Pueblo and Poughkeepsie. Ward/Davis will install the two California studios. The vans will contain TeleMation cameras and control equipment and a Bell & Howell videotape recorder. The studio equipment will include Bell & Howell color cameras, videotape recorders and projectors, TeleMation film multiplexing systems, program switching and video distribution systems, Ball Brothers/Miratel and Conrac monitors, Alma distribution switchers and a combination of Sparta and Electro-Voice audio equipment. The programs are planned to meet local interest.

Plans and specifications for building a laminar flow clean room have been made available by Agnew-Higgins, Inc., P.O. Box 857, Garden Grove, CA 92642, at a price of $25. The plans include architectural, mechanical and electrical drawings for a 40- by 50-ft clean room of the latest laminar flow type. Architectural drawings show plans, elevations and details as well as materials of construction. Mechanical drawings show air-conditioning elements, ductwork and piping layout. Electrical drawings show wiring diagrams for connecting air conditioner and controls, laminar air flow system and layout for lighting connections and convenience outlets. Specifications include callouts of approved materials by name of manufacturer. HEPA filter modules manufactured by Agnew-Higgins are specified for the laminar flow clean air system, but other means of establishing the filter bank may be substituted.

Membrane Microfiltration, a 28-min color film produced by Tech Films Corp., Waltham, Mass., won a special award at the Fifth International Technical Film Festival held in Budapest in the spring of 1970. The film was directed by Ed Shaw, Vice-President of Tech Films. The film was narrated by Alexander Scourby with music scoring by George Craig. The purpose of the festival was to award films that successfully communicated the results of engineering and science technology. The Tech production explains singular planar filtration techniques. The festival was attended by Ed Shaw who participated in an international roundtable conference assembled to discuss the use of films in industrial and scientific development and education.

National Showmanship Services, Inc. (NISSI) will provide technical services on a nonprofit or no-cost basis for student filmmakers at the Columbia University School of the Arts according to an agreement between Columbia and NISSI, it was announced by Davidson Taylor, dean of the School of the Arts, and Joseph J. Macaluso, President of NISSI. The film students will be permitted to use the professional facilities of the various NISSI subsidiaries including recording and mix facilities at Manhattan Sound Studios, processing facilities at Cineffects Color Laboratory, Inc., and optical facilities at Cineffects, Inc. NISSI will also make its sound and laboratory facilities available for educational field trips by the students.

The Electronic Engineering Company of California, 1601 E. Chestnut Ave., Santa Ana, CA 92701, has been selected by RCA Corp., Commercial Electronic Systems, to supply TV editing equipment for use with the RCA TR 60 and TR 70 series of high-band videotape recorders. Newly designed EECO editing equipment will be supplied. The updated equipment uses a computer compatible time code to identify each frame.

TLA-Lighting Consultants, 72 Loring Ave., Salem, MA 01970, is a new consulting firm headed by Thomas M. Lemons. Facilities include a 1200-ft² development laboratory and a 180-ft² hot or cold temperature chamber. Services include designing lighting installations, equipments and optical systems, market planning and evaluation and testing of lighting systems.

Fortune Audio-Visual Systems and Equipment, 35 Bergen Turnpike, Little Ferry, NJ 07648, is a new firm organized to provide design, fabrication and installation of

audio-visual systems. The firm can provide consultation or total design. Such services as audio-visual requirements in special equipment, conference rooms, auditoriums, management information centers and training facilities are within its capabilities.

Cybernetics International Corp. (OTC), 280 Park Ave., New York, NY 10017, has formed a division, known as Cybernetics Cinema Exchange Div., to consolidate the film distribution functions and other "back office" services for the motion-picture industry. Computer management techniques will be applied in centralizing and handling various services for American film companies in Europe. The services will include the physical control, handling and shipment of prints, a regionalized print inspection service and the processing of orders for trailers and accessories.

Bardwell & McAlister Inc. has moved to a new and larger facility at 12164 Sherman Way, North Hollywood, CA 91605. The new facility covers 13,800 ft² and houses a complete showroom and a substantially enlarged plant. The firm manufactures Fresnel and quartz lighting equipment.

The Clearinghouse for Federal Scientific and Technical Information, U.S. Dept. of Commerce, Springfield, VA 22151, has announced the availability of magnetic tapes of the *U.S. Government Research and Developments Reports (USGRDR)* published on the 10th and 25th of each month. The tapes will be available on the same dates. The *USGRDR* tapes will be released on 600-ft "mini-reels." The subscriber may select 7-track tape, 556 or 800 characters/in and odd parity, or 9-track tape, 800 characters/in and odd parity. Annual subscription rate for the 24 issues is $1,500.

Compendex, a computerized engineering index which makes the world's engineering developments available on magnetic tapes for computer processing, has been announced by Engineering Index, Inc., 345 E. 47 St., New York, NY 10017. *Compendex* contains the important contents of more than 3,500 sources of engineering literature from professional and trade journals, publications of engineering organizations standards, papers from conferences and symposia and books and other documents. The user is provided with more than 5,000 abstracts monthly with their citations indexed under headings and subheadings and cross-referenced. It includes the works of some 67,000 authors annually and codes the information for machine manipulation and retrieval. Tape specifications are 9-track, 800 bpi, written in EBCDIC or 7-track BCD. *Compendex* is available as a three-part package containing 12 monthly issues of the tape (1970) priced at $6,000; one subscription to *Engineering Index Monthly* and one subscription to *Engineering Index Annual* priced (both) at $500 and 12 reels of tape priced at $300 ($25 per reel). Total price of the *Compendex* package is $6,800.

A Student's Introduction to Educational Broadcasting, a bulletin prepared by the National Association of Educational Broadcasters (NAEB), 1346 Connecticut Ave., NW, Washington, DC 20036, contains a great deal of practical information for high-school students who are beginning to think about the future. The bulletin presents a brief history of educational broadcasting and discusses noncommercial stations and their services. The bulletin also explains to the student what skills are needed, how to plan a career and what to expect in the future.

Reprint rights for the *Engineering Index Annual* volumes covering the period 1959–1968, have been granted to Western Periodicals Co., 13000 Reymer St., North Hollywood, CA 91605, by Engineering Index, Inc., 345 E. 47 St., New York, NY 10017. The *Annual* contains all the abstracts published each year in the *Engineering Index Monthly* — from about 40,000 to 50,000 abstracts per volume for 1959–1968.

Table Talk is a new "how-to-do-it" series of bulletins available from Motion Picture Laboratories, Inc., 781 South Main St., Memphis, TN 38102. MPL also publishes *The Recorder*, a bimonthly newsletter that contains survey stories, information on new camera films, producers' "How-I-Did-It" stories and other stories of interest to motion-picture producers. *The Recorder* is in its 12th year of publication.

The new *Table Talk*, which will be published several times a year, is more specifically a "how-to" publication containing exact directions and illustrations. The first two issues of *Table Talk* discussed splicing techniques. The third issue contained information on sound recording.

Audiovisual Market Place 1970, a 226-page directory listing sources of audio visual equipments and services, is available from R. R. Bowker Co., 1180 Ave. of the Americas, New York, NY 10036. It is priced at $12.25 (United States and Canada) and $13.50 elsewhere.

The directory is designed primarily for educators. It contains detailed listings of producers/distributors, associations, educational radio and TV stations, manufacturers, reference books, serials and review services, and a calendar of conferences and film festivals. Both hardware manufacturers and software producers/distributors are arranged alphabetically by firm name and in indexes classified by product line. Entries indicate names of key personnel, addresses and phone numbers, types of material or equipment offered, availability of catalogs and availability of printed instructions or other materials supplied with the product. The directory was edited by Olga S. Weber.

The EMC Directory of Summer Session Courses on Educational Media lists some 1700 courses in educational media offered by 400 colleges and universities. A number of courses in the motion picture are listed as well as survey courses, courses in utilization of media, media materials, television, graphics and media theory. A copy of the *Directory* is available upon request to The Educational Media Council, 1346 Connecticut Ave., N.W., Washington, DC 20036.

Engineering Education, the journal of the American Society for Engineering Education, reported in the April 1970 issue on the systems approach to engineering as applied to environmental problems. Papers by leading educators on systems engineering discussed problems of modern environment and how students can successfully carry out interdisciplinary systems projects in the university. Reports on two surveys are presented, one on systems engineering as an academic discipline and the other on educational preparation for systems engineering. The April 1970 issue is available from ASEE Publication Sales, Suite 400, One Dupont Circle, Washington, DC 20036 at a price of $1.25 per copy.

Kenneth M. Mason has been appointed Regional Sales Manager, Pacific Southern Region, Motion Picture and Education Markets Div., Eastman Kodak Co. He succeeds Walter L. Farley who will retire on August 1. Announcement was made by Norwood L. Simmons, Assistant Vice-President and General Manager of the Division, who also announced the appointment of John H. Maynard to the post of Regional Sales Manager, New York City Region. Mr. Mason has been with Eastman Kodak since 1935, except for two interruptions, once when he left (in 1938) to complete his college education and in 1942 when he joined the U.S. Navy. He has been Sales Manager, Motion Picture and Education Markets Div., in the New York City region since 1965.

Mr. Maynard has been with Eastman Kodak since 1936. He was appointed Supervisor of Sales and Engineering Services, MP&EM Midwestern Region in 1966.

George A. Howard has been appointed General Manager of the Film Division of Ealing Corp., 225 Massachusetts Ave., Cambridge, MA 02140. He succeeds David M. Lutyens who is now Vice-President and Publisher. Ealing Corp. produces and distributes single concept films for education.

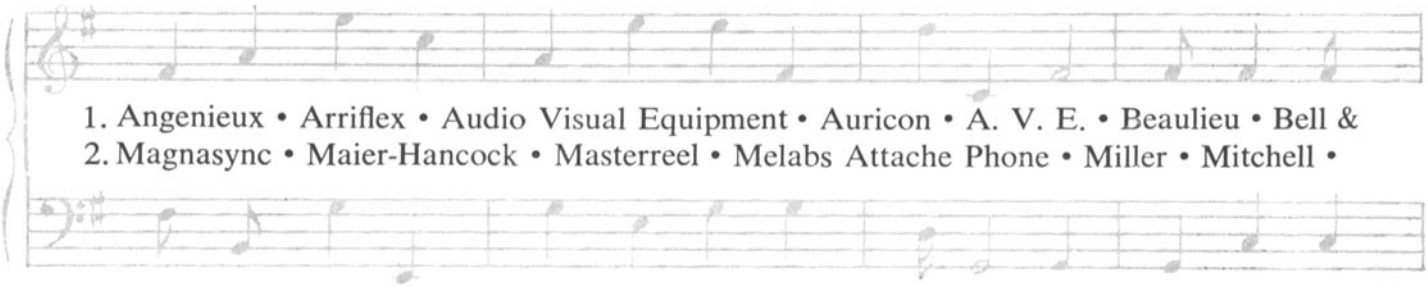
David M. Kaplan has been appointed Corporate Counsel of Movielab, Inc., it was announced by Saul Jeffee, President of Movielab. Mr. Kaplan has a broad legal background in corporate and labor law. He was formerly Corporate General Counsel and Secretary for Shahmoon Industries. For the last 10 years he has been a Visiting Lecturer at the City University of New York, Baruch College, teaching courses in Labor-Management Relations and Techniques of Management Surveys.

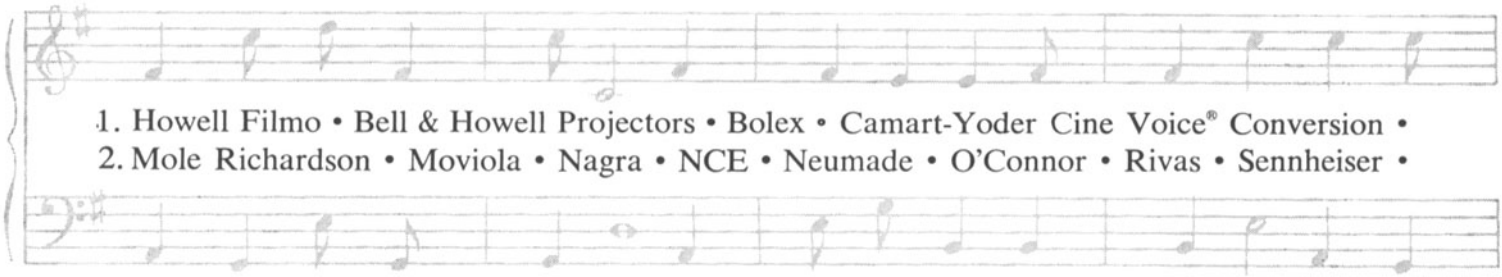
Peter B. Snook has been elected Vice-President and Hugh Fisher has been appointed General Sales Manager of W. B. Snook Manufacturing Co., 751 Loma Verde Ave., Palo Alto, CA 94303. Mr. Snook has been associated with the firm since it was

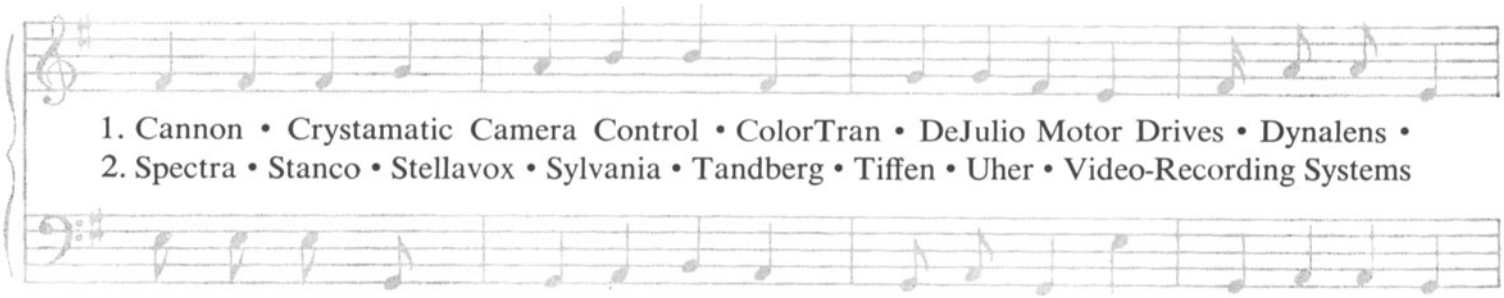
The Camera Mart Theme Song

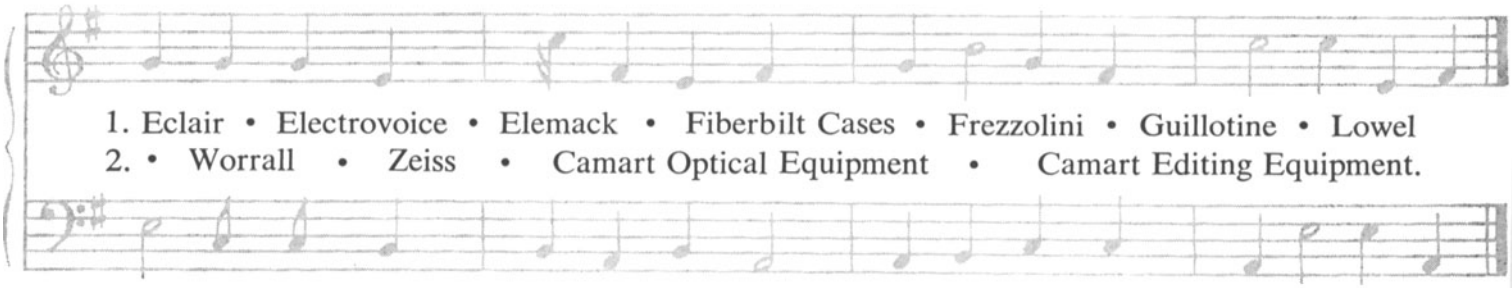
(Recorded at the Camera Mart Building)

Words by Samuel "Chick" Hyman **Music by Paul Meistrich • Anna Browning**









founded in 1946. He joined the company on a full-time basis in 1960. He is presently responsible for all manufacturing, engineering and production operations of the company. The firm holds the basic patent on the Rotating Disc Cathode technique for electrolytic silver recovery.

Mr. Fisher joined the company in 1969 as Assistant Sales Manager.

Edwin S. Raymond has been appointed Director of Engineering Services for CBS Television Stations Division. He succeeds Daniel R. Wells who resigned to join the Public Broadcast Service network in Washington, DC. Mr. Raymond will advise and assist CBS-owned television stations in engineering and technical activities. He joined CBS Television Network in 1963 and previously was associated with RCA Corp. as a design engineer.

Robert A. M. Coppenrath is the new President of Agfa-Gevaert, Inc., Teterboro, NJ 07608, succeeding Rene Aerts who retired. Mr. Coppenrath joined Agfa-Gevaert in August 1969. He was formerly with Photo Importing Agencies Ltd., of which he was founder, president and general manager, a Canadian firm which is the agency for the distribution of Agfa-Gevaert products in Canada. He is a native of Antwerp, Belgium. He presently holds the title of Foreign Trade Counsellor for Belgium and is a recipient of several honorary decorations bestowed upon him by Baudouin I, King of Belgium.

Charles Buzzard has joined Ampex Corp. as a sales engineer for the Video Products Div. in the Midwest Region. He will be stationed in St. Louis, Mo., and will be responsible for sales of all Ampex video products to commercial, educational and military broadcast installations in Missouri, Kansas, Nebraska and part of Wisconsin. Mr. Buzzard was formerly Chief Engineer for WSNS-TV.

Sims Howell has joined Alderman Studios, High Point, N.C., as Manager of Operations Research and Engineering, following his retirement from the U.S. Navy (July 1) with the rank of Lieutenant Commander. Lt. Cmdr. Howell completed 24 years of service in Navy photographic assignments including five tours of duty in the Motion Picture Dept. at the Naval Photographic Center. He also served on the Navy's first guided missile ship, on the staff of the Commander of the U.S. Sixth Fleet and as Officer-in-Charge of the Fleet Air Photographic Laboratory in Atsugi, Japan. His most recent assignment prior to his retirement was that of Navy Representative in the Department of Defense Office of Audio Visual Activities.

Marvin I. Mindell has been appointed Vice-President, Engineering, of the Graflex Div. of The Singer Co., Rochester, N.Y. He was formerly Chief Engineer for Viewlex, Inc., in Holbrook, N.Y. In his new post he will be responsible for engineering programs on all Graflex audio-visual and photographic products for industrial, educational and government markets.

James Noble, Vice-President, Engineering, Altec Lansing, 1515 S. Manchester Ave., Anaheim, CA 92803, has been made a Fellow of the Audio Engineering Soc. "for his contribution as a designer and director of engineering for a broad line of audio electronic equipment." Mr. Noble joined Altec Lansing in 1941. During World War II he helped make electronic components for submarine detection equipment and in 1944 he joined the U.S. Navy.

Richard A. Walker has been appointed Director of Engineering for Photo Research Corp., 3000 N. Hollywood Way, Burbank, CA 91502. He was formerly with Eastman Kodak Research Laboratories and he has also been associated with Hughes Aircraft Research Laboratories and Houston Fearless Corp. Photo Research Corp. manufactures photometric and photographic equipments.

Maxwell A. Kerr has been appointed Manager of Educational Technology, Distribution and Data Processing Center, Allied Educational Council, Galien, MI 49113. He will also continue his ADAMAX Audio-Visual activities which had been based at Daytona Beach, Fla.

CHICAGO, Feb. 24—The February section meeting was prefaced by a delicious roast beef dinner at the Harlequin Room at the Knickerbocker Hotel held in honor of our guest speaker. The members and guests attending the dinner joined another group in the Penthouse East for a very informative and enjoyable evening. Prior to the main program we were entertained by the showing of two animated films through the courtesy of the International Film Bureau. Our speaker for the evening was William Hedden, Vice President of Calvin Communications, Inc., Kansas City, MO. He presented his ever popular paper entitled "8mm Printing Systems." This paper covered the early development work in 8mm printing through the latest designs in super 8 printing equipment used in Japan and at various labs in the U.S. Due to the length of the paper it was presented in two parts with a short intermission at the half-way point. The meeting was adjourned at 10:00 PM and 48 members and guests departed with a wealth of knowledge on 8mm printing.—Charles Zichterman, *Secretary-Treasurer.*

HOLLYWOOD, Mar. 17—This program at the Jet Propulsion Lab., California Institute of Technology, Pasadena, was extremely well received by those who attended. The large number (295) who attended attests to the glamor and high interest in space-oriented programs. The program was divided into two segments. One segment included an extensive tour of the Space Flight Operations Facility (SFOF) and the Image Processing Laboratory. On this tour in addition to seeing the vast amount and variety of equipment used to direct the space flights, we were also shown how the in-flight data was received and flight correction data transmitted. We also were given detailed explanations of the equipment used in tracking all space flights. Everyone agreed that the facilities were overwhelming and exciting. The second portion of the program was equally as interesting as the tour Robert Steinbacher, JPL, described and illustrated the actual equipment used to accomplish the fantastic achievements of the Ranger, Surveyer and Mariner projects. He covered in detail the evolution of the equipment used in these flights. He also described the objectives of the Mariner 71. Tom Rindfleisch, JPL, dealt with the problems of producing pictures that are sent from space. He described in detail the techniques of image enhancement and illustrated how these techniques are being used on an experimental basis for diagnostic work in the field of bio medicine. Messrs. Steinbacher and Rindfleisch were complimented for presenting two highly technical topics in a manner which made them both informative and interesting to the layman.—Anthony D. Bruno, *Secretary-Treasurer.*

HOLLYWOOD, Apr. 21—Howard Anderson of the Howard Anderson Optical Co., presented the subject of Reflex Front Projection for Composite Photography. In his presentation he strongly indicated that reflex front projection has many advantages over both the rear-projection and blue-screen techniques. He cited savings in time and money, practically unlimited screen size, and improved quality as proven advantages for this system, which has been used successfully in many productions by his company. Excerpts from "My World and Welcome To It" were shown to illustrate some technical points covered in his talk. He pointed out that the system has a very high potential, with new and innovative uses being found constantly. The 210 people in attendance presented Mr. Anderson with an abundance of questions which he answered to everyone's satisfaction. The consensus was that he had successfully covered a very important and interesting subject.—Anthony D. Bruno, *Secretary-Treasurer.*