convert quickly to color, without increasing power consumption, thereby reducing the cost and weight of hanging and controlling lighting fixtures.

M-G-M recently conducted a series of feasibility tests to determine the advisability of substituting quartz-iodine lights for standard incandescent lights. An M-G-M movie set was lit up to a level of 150 ft-c, using almost 900 amp, with standard incandescents. But with ColorTran quartz-iodine lights the same set was brought up to 400 ft-c, using only 280 amp.

When test footage was evaluated in terms of correct color balance, power consumption, and shooting and labor economies, the results were completely acceptable with excellent color rendition and the artistic emphasis required for dramatic filming under all conditions.

As a direct result, M-G-M is now lighting each new television show with quartz-iodine lights. (A paper on Optical System Design Utilizing Quartz-Iodine Light Sources was presented at the 97th SMPTE Technical Conference in Los Angeles on April 2, 1965, by Richard Glickman, a co-recipient of the award.)

EDUCATION INDUSTRY NEWS

Careers in Photography, which has been recently revised and brought up to date, is one of a series of career booklets published by the Rochester Institute of Technology to give young people interested in photography a basic insight into the career opportunities in the photographic profession. C. B. Neblette, the author, is Dean of the RIT College of Graphic Arts and Photography. A recognized authority on photography, Dr. Neblette is the author of several books on the subject. The booklet is available upon request from the Public Relations Dept., Rochester Institute of Technology, 65 Plymouth Ave. South, Rochester, N.Y. 14608.

The 28-page illustrated booklet offers a great deal of practical advice to career-minded young people, including the salaries that can be expected for various types of photographic work. It also supplies a list of additional sources of information. The booklet is divided into the following sections and subheads:

The Fields of Photography: Range of Photographic Careers
Photographic Science and Engineering: Duties — Prospects and Earnings
Photojournalism: The Press Photographer—The Magazine Photographer—Documentary Photography
Motion Picture and Television Photography: Prospects and Earnings
Professional Photography: Advertising Photography—Commercial Photography—Prospects and Earnings—Portrait Photography
Industrial Photography: Prospects and Earnings
Photography in the Graphic Arts
Photographic Services: The Studio Laboratory—Prospects and Earnings—Photofinishing—Photocopying
Photographic Supply Industry
Education for a Career in Photography: Additional Information Sources
Education in Photography at RIT: Photographic Science—Professional Photography—Photographic Illustration—RIT Library
RIT Programs

Film courses offered by City College of New York which deal with cultural and aesthetic values of motion pictures will be transferred from the evening session to the day session to carry out plans to integrate such courses into the Liberal Arts curriculum, according to a recent announcement. Under the revised program, courses on the history of motion-picture and the documentary film will be given through the Department of Art. A course in film writing will be offered through the English Department.

The Society of Photographic Scientists and Engineers held a two-day seminar on Photographic Techniques and Measure-

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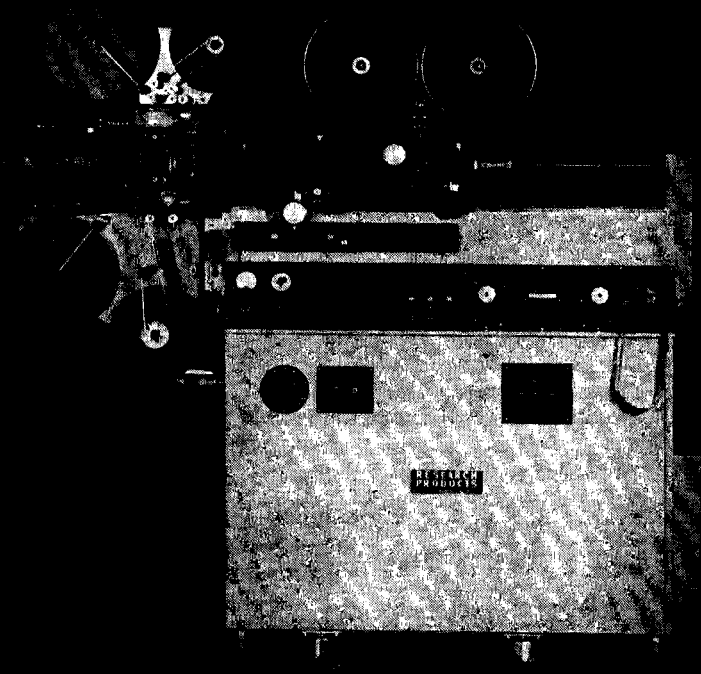

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ALBUQUERQUE, NEW MEXICO

U.S. NAVY
EL CENTRO, CALIF.

CINEMA RESEARCH CORPORATION
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ments for Engineers, June 3–4, in New York. The seminar was organized by the New York Chapter of the SPSE.

Ten topics were selected for discussion at the seminar and papers were presented by well-known authorities in the field. The authors and the titles of papers are: "Introduction to Photographic Systems," Heinz Nitka, General Aniline & Film Corp.; "Photographic Sensitivity," B. H. Carroll, Rochester Institute of Technology; "Photographic Sensitometry," Hollis N. Todd, Rochester Institute of Technology; "Photographic Lenses," Frank G. Back, Zoomar, Inc.; "The Use and Measurement of Photographic Lenses in Optical Systems," Mrs. Clarice Norton, Fairchild Space & Defense Systems; "Data Projection — Light Sources and Optics," John D. Hayes, Xerox Corp.; "Film and Paper Processing Techniques," Seymour Hersh, Fort Monmouth, N.J.; "Film Handling and Image Registration," Gordon C. Chambers, Eastman Kodak Co.; "Control of Tone Reproduction in Photographic Systems," J. L. Tupper, Eastman Kodak Co.; and "Information Capacity of Photographic Materials," George C. Higgins, Eastman Kodak Co.

The Seminar Committee consisted of the Council of the SPSE New York Chapter. Fordyce M. Brown was Program Chairman. Details on other activities of the SPSE New York Chapter are available from Anthony Caruso, Membership Chairman, P.O. Box 678, Church St. Station, New York, N.Y. 10008.

The Society of Photographic Scientists and Engineers honored individuals who have made notable contributions in the field of photography and engineering by presentation of awards during the SPSE annual conference, held during May in Cleveland.

Highest award went to Edith Weyde, eminent photographic scientist and engineer, who was made Honorary Member of SPSE. Dr. Weyde was honored for "her pioneering work in the development of new photographic products and processes which have significantly contributed to the broad field of image recording and reproduction."

Newly elected SPSE Fellows are: Paul W. Vittum, Director of Color Photography, Eastman Kodak Co.; Dr. Wolfgang F. Berg, professor and head of the Photographic Department of the Swiss Federal Institute of Technology; Dr. Lyman Chalkley, associated with his own chemical research laboratory; and Henry Yutzy, Vice-President of Eastman Kodak. All were cited for outstanding service in the "advancement of photography." Dr. Vittum has been involved in research in the field of color photography for more than 25 years. Dr. Berg is recognized for his achievements as an educator as well as for research in the field of photography. He has received many honors for his studies of latent image formation. Dr. Chalkley was cited for his contributions to photochemistry and for research on chemical imaging systems. Dr. Yutzy was cited for his development of unique photographic processes in the area of emulsion technology.

The SPSE Journal Awards for papers published during 1964 in the SPSE Journal went to James E. LuValle and Jean J. Robillard. Dr. LuValle, Director of Basic

Research, Fairchild Space and Defense Systems Div., Fairchild Camera and Instrument Corp., received an award for the best scientific paper. The Charles E. Ives Award for the best engineering paper went to Mr. Robillard, President of Cue, Inc.

In recognition of major service to the SPSE, Senior Member Awards were presented to Richard O. Edgerton, Supervisor, Photographic and Technical Training Dept., Eastman Kodak Co.; William A. Newman, Head, Photographic Services, Hughes Aircraft Co.; and Gustav A. Wiesehahn, General Aniline and Film Corp.

A three-day symposium on Processing Technology was held by the Science Committee of the Royal Photographic Society of Great Britain in London during May. More than 25 papers were presented covering such topics as raw chemicals, new developing agents, developer compositions, the chemistry of development and fixation, monobaths, processing equipment, and rapid-access systems, including stabilization methods and web processing. A random sampling of papers appearing on the program includes: "Phenidone in a Motion Picture Laboratory" by C. T. Davies of Geo. Humphries Ltd., London; "Recent Advances in Black-and-White Processing Chemicals" by L. F. A. Mason of Ilford Limited, Basildon; "The Superadditivity of Pyrogallol-Phenidone Developers" by Marilyn Levy of the Electronics Laboratory, Fort Monmouth, N.J.; "Very Rapid Monobath Processing" by L. Corben, A. Shepp and C. Bloom of Technical Operations Research, Burlington, Mass.; "Image Characteristics in Kodak Bimat Film Processing" by L. W. Tregillus of Eastman Kodak Co., Rochester, N.Y.; "Some Aspects of Fixing Bath Concentrates Based on Ammonium Salts" by K. Frank of Agfa-Gevaert, A.G.; "The Staining Properties of Ammonium Thiosulphate Fixers" by E. R. Brumpton and G. I. P. Levenson, Kodak Limited, Harrow; "Rapid Access Methods in the U.S.A." by John H. Jacobs of Bell & Howell Research Center, Pasadena, Calif.; and "The Development of Compact Equipment for Rapid Processing of Aerial Films" by R. C. Dando, R.A.E., Farnborough.

Further details are available from: The Hon. Secretary, Scientific and Technical Group, Royal Photographic Society, 16 Princes Gate, London, S.W. 7, England.

An earlier meeting arranged by the Scientific and Technical Group was held in the Spring to consider problems related to the adsorption of silver halide surfaces. Problems discussed at the meeting included basic problems of the mechanism of adsorption, the study of dye sensitizers in silver halide crystals and at definite crystal faces, the influence of color couplers on the adsorption of spectral sensitizing agents and the competitive adsorption of chemical sensitizers and retarders.

A three-day symposium on Microwave Applications of Semiconductors was held in London, June 30 – July 2. The symposium was conducted jointly by the IERE and IEEE. Session topics included: Microwave Properties of Semiconductor Devices; Generators; P-I-N Diode Circuits; Tunnel Diode Circuits and Mixers; Low Noise Devices; and Systems. A survey of the field covered by the symposium was presented by Prof. G. D. Sims of the University of Southampton.

The 13th Annual Meeting of the Fernseh Technische Gesellschaft will be held September 13–17 in Berlin. Papers will be presented covering various developments in television engineering. Other information is available from Prof. Dr. R. Theile, Institut fur Rundfunktechnik, 8 Munchen 45, Floriansmuchlstr. 60, or from W. Thonnessen, Fernseh-Technische Gesellschaft e.V, 61 Dormstadt, Berlin.

The Western Electronic Show and Convention will hold its annual meeting (Wescon) August 24–27 in San Francisco. Twenty-five technical sessions have been scheduled. Twenty sessions will consist of project teams of engineers discussing a single project or program. Five special sessions will feature authors and panelists individually invited to participate. A continuing series of motion-picture film presentations will be shown on a regular schedule each day as part of the technical program. About 17 films have been selected. A tour of Stanford Linear Accelerator

Center (SLAC) has been arranged. The 2-mile-long accelerator has a potential of 15 billion volts. More than 1,000 product and equipment displays will be exhibited at San Francisco's Cow Palace.

Under a new contract with the U.S. Office of Education, the National Association of Educational Broadcasters (NAEB) Educational Communications Systems (ECS) project will design three model systems to test the feasibility of furthering academic cooperation by multipurpose electronic networks. One system will emphasize intra-state cooperation, one will be regional, and one will concentrate on the use of non-university resources such as leading cultural and research institutions. The USOE contract will support the 18-month design phase at a cost of nearly $145,000.

The Delaware State Educational Television Network, the first to provide service to all the public schools in a state, will begin transmitting in September. The production center, located in Dover, will not be completed until 1966 so the first programs transmitted will consist of selected educational material presently available on film and television tape. The Diamond State Telephone Co. will provide major transmission facilities from the studios to each school. Seven microwave stations and more than 2 million feet of cable will be used to transmit three channels of information. The wiring of all the schools in the state was found to be no small undertaking. Many schools were partially wired and some not wired at all.

The Dover production center for the network will be a new 20,000-sq ft facility, with one studio having 40 by 60 ft of floor space and the other, 40 by 40 ft. Designed by Robert J. VanAbel, Production and Operations Director of the Delaware Educational System, and William C. Lewis, the Technical Services Director, the plant provides for an expanding film operation, technical facilities for eventual operation of six channels and additions of small "classroom" type studios and a television training facility.

Harvard University will install this summer a special $100,000 network of coaxial cables and amplifiers to provide throughout the University multichannel distribution of computer information, television signals, and other electronic data. The system will make use of the technical facilities of the WGBH Educational Foundation, located in the studios of WGBH-TV, and will eventually make it possible to link libraries, laboratories and classrooms of the University for prompt interchange of information and demonstrations. The underground coaxial cable system will initially provide a communications link between the studios of the WGBH Foundation on Western Avenue, the Harvard Business School on the Boston side of the Charles River, and the principal lecture and concert halls, classrooms, laboratories and research centers in the Harvard Square area. Aside from normal use, such as the televising of special ceremonies, lectures, performances or conferences, this system will permit recording, transmission and storage of audio-visual

aids for classroom instruction, the monitoring of apprentice teaching, the broadcast or reproduction of laboratory demonstrations and experiments, the transmission of important library source materials, the interchange and high-speed manipulation of data required in computer operation, and many other uses.

The new studios of the WGBH Educational Foundation, constructed at a cost of $1.7 million on land provided by Harvard University, contain nearly $2 million worth of equipment.

The annual worldwide TV survey conducted by the U.S. Information Agency's Office of Public Information, Washington, D.C. 20547, shows that the number of overseas television stations increased more than 34% during 1964 to a total of 4,628, and the number of television receivers in use rose more than 17% to a total of 94,474,400. At the beginning of 1965, 90 countries or territories abroad had TV stations in operation. Liberia, Ethiopia, Pakistan, Aden, Barbados and the French Antilles began broadcasting during 1964. (The survey does not include the United States, Canada, or Armed Forces stations abroad.)

The top six countries overseas in the number of television sets, as of January 1, 1965, are Japan, 17,710,000; United Kingdom, 14,616,200; USSR, 11,800,000; West Germany, 10,024,000; France, 5,582,000; and Italy, 5,406,300. In Latin America, Brazil led with 2,156,000 sets; Argentina was second, with 1,360,000; and Mexico third with 1,071,000. Almost half the overseas televison sets in use are in Western Europe, a total of 45,931,600. The Far East (because of Japan) is second, with 20,977,200. Eastern Europe is third with a total of 19,704,000. It was estimated that 67,100,000 television sets were in use in the United States and 4,950,000 sets in Canada at the end of 1964.

Some 2,000 million persons living in over 100 developing countries in Africa, Asia and Latin America and representing 70% of the world's population lack the means of being adequately informed of events and trends at home, let alone abroad. They have less than 10 copies of daily newspapers, 5 radio receivers and 2 cinema seats per 100 people.... Some 45% of the world's children lack educational facilities and some 700 million adults are illiterate....

These statements appear in a 14-page document from Unesco entitled "Suggestions to Member States on Measures to Promote the Free Flow of Information and Ideas." Showing the contrast between the vast volume of information that can be transmitted around the world with the speed of light through electronic communication and the shocking lack of access to information, especially in rural areas in developing countries, the document discusses various aspects of the problem and suggests measures for a more equitable dissemination of information. Overall suggestions include the setting up of national programs designed to promote the most effective use of mass media in education. Specific suggestions include studies in the use of mass media for adult literacy, pilot projects for the use of audio-visual materials and the promotion of the use of the media for vocational and industrial training.

The Eidophor projector and the Early Bird satellite have made possible an international art auction conducted simultaneously on both sides of the Atlantic. Pictures shown at Sotheby's of Bond Street, London, were seen at the same time by bidders in the New York sale room of the Parke-Bernet Galleries. In London, in a room adjoining Sotheby's sale room the Eidophor was installed by engineers of Peto Scott Electrical Instruments Ltd. To reduce the space occupied, the beam was reflected off a 45° mirror and filled a translucent screen measuring 7 by 5 ft. Although the sale room was lit to an intensity of about 100 ft-c, the Eidophor picture with a brightness of 8 ft-L was said to be of excellent quality. A similar set-up was arranged in New York. The event was shown on the BBC program, *Panorama*.

The CLIO Technical Achievement Award of the American TV Commercials Festival, with the participation of the Film Producers Association of New York, was presented recently to Eastern Effects, Inc., 333 W. 52 St., New York, N.Y. 10019, for the Emell Camera developed by Maurice Levy. The camera was described

as a live action camera that eliminated optical work and artwork while allowing zooms and pans to be done in the camera. Other CLIO awards were presented for specific TV commercials. The Festival includes a national competition intended to focus recognition upon the outstanding television commercials of the year.

Two leading French firms, Som Berthiot and OPL, have merged to form a new firm to be known as SOPEN (Société d'Optique, Précision, Electronique et Mécanique), according to an announcement by Paillard Inc., 1900 Lower Road, Linden, N.J. 07036. The Pan Cinor zoom lenses, produced by Som Berthiot, are to be manufactured by SOPEN and will continue to be distributed in the United States exclusively by Paillard.

Technical Operations, Inc., of Burlington, Mass., is building a new $\$\frac{1}{2}$ million 40,000-sq ft facility on a 6.3-acre site in Ellis-Middlefield Industrial Park, Mountain View, Calif., to consolidate its expanding Bay Area activities, it was recently announced. Tech/Ops Bay Area operations include Beckman & Whitley of San Carlos, Calif, a wholly owned subsidiary; the Western Branch of Tech/Ops Radiation Products Division in Santa Clara; and Technical Operations Research Western Div. in Sunnyvale. Completion of the building is scheduled in stages to coincide with expiration of present leases and to meet the needs of individual research and product groups. It is expected that the entire building will be completed late in 1966. Two future additions are planned, one of 21,600 sq ft and another of 40,000 sq ft to enlarge the facility to 101,600 sq ft.

The new facility is designed to meet the requirements of the various groups and features a number of innovations, particularly in the laboratory and manufacturing areas. There will be a completely equipped Isodensitracer laboratory for analysis of scientific films; several advanced optics laboratories; darkrooms; a high-speed camera and spectrograph applications laboratory; meteorological instrument research, development and test laboratories; electronics model shop; model-making machine shop; optics polishing laboratory; and a computer center.

A contract to supply rental equipment to Stage 54 West, Inc., 421 W. 54 St., New York, N.Y. 10019, has been signed by F&B/CECO, Inc., 315 W. 43 St., New York, N.Y. 10036. A similar agreement has been entered into with Myerberg Studios at Roosevelt Field, Long Island. F&B/CECO also operates its own studios in Hialeah, Fla. Under the rental agreements the studios are virtually fully equipped and rental is charged only for equipment actually used.

A new film-processing service has been announced by Bebell & Bebell Color Laboratories, Inc., 108 W. 24 St., New York, N.Y. 10011. In the future a 2-day delivery service of 35mm Color Reversal Workprints on Anscochrome Duplicating Film will be available. The faster service has been inaugurated because of the greatly increased use of color by the industrial and TV commercial motion-picture film industry, the announcement stated.

A laboratory for processing 16mm black-and-white film, for the Midlands and the North, has been established by George Humphries & Co. Ltd., at Ralli Bldg., Stanley St., Salford 3, Manchester, England. The firm's headquarters are at Mitre House, 177 Regent St., London W.1. In announcing the new laboratory, it was pointed out that the vast increase in the use of motion pictures for television, scientific, medical, industrial and educational purposes necessitates ready access to laboratory services in areas away from London.

An experimental photographic emulsion developed in Kodak Research Laboratories and coated on photographic plates may result in doubling the number of celestial objects that can be observed by astronomers, it was recently announced. The plates were tested on the 48-in. Schmidt telescope at the Mt. Wilson-Palomar Observatories in California. Light from celestial objects is reflected from the main mirror of the telescope and is brought to a sharp focus on the plate. The experimental emulsion has increased ability to detect very faint images in the presence of the much stronger

stray light that is always present in the night sky.

The strange behavior of liquid helium, which becomes a superfluid flowing without friction when cooled to temperatures near absolute zero, is evidently a large-scale manifestation of the the wave nature of matter. Recent experiments show that the atoms of superfluid liquid helium behave like coherent waves, interacting in such a way that the viscosity of the fluid becomes zero, thus confirming theories that superfluidity and superconductivity are related and explainable by the quantum mechanics concept that matter has the properties of waves as well as particles. The experiments, conducted by Paul L. Richards and Philip W. Anderson of Bell Telephone Laboratories were reported in *Physical Review Letters*, a publication of the American Physical Society.

Ever since the discovery about 30 years ago that liquid helium cooled below 2.19 K becomes superfluid, physicists have speculated that some underlying relationship must exist between superfluidity and superconductivity. Recent theories propose that the wave fields of pairs of electrons (in a superconductor) and of atoms (in a superfluid) are coherent. That is, like light waves in a laser beam, they have the same frequency, amplitude, direction and phase relationship. The experiment devised by Dr. Richard and Dr. Anderson to test the coherence aspect of superfluidity is analagous to an earlier experiment on superconductivity and seems to demonstrate the wave nature of matter.

Getter sputtering is a new deposition technique developed at Bell Telephone Laboratories to form metal films of high purity. Unlike conventional cathode sputtering, deposition of metal takes place inside a cylindrical container while the entire system is under a comparatively low vacuum. Previously, a vacuum as high as 10^{-12} Torr was necessary to prevent contamination of reactive-metal films formed by a vacuum deposition process. With the new technique, when an ionized gas is admitted to the system, the metal cathode emits or "sputters" atoms in all directions. Contaminating gases which may enter the system through openings for the cathode leads and electrodes are absorbed by some of the metal atoms and deposited on the container wall. A shutter shields the substrate from sputtered metal until the gases are "gettered" and proper conditions are reached. The shutter is then swung out of the way and a very pure, thin film is deposited on the substrate.

Telstar II, the communications satellite designed and built by Bell Telephone Laboratories turned off its VHF transmitter on May 16 during its 4,736 orbit. The satellite will still be able to transmit transoceanic telephone, television and data messages since this information is carried on microwave equipment which continues to operate. The VHF signal at 136 mc had supplied data on the satellite and its space environment to tracking stations around the world. Such data are now received only at microwave frequencies by Bell System's ground station at Andover, Maine.

Laser oscillation in a neon gas discharge at 2,358 A has been observed by scientists at Bell Telephone Laboratories, Whippany, N.J. This is the shortest laser wavelength that has been reported. Also, using neon, nitrogen, oxygen, argon, krypton or xenon, more than 50 distinct laser emission lines have been recorded in the ultraviolet region between 4,000 and 2,300 A. Short bursts of current from 10 to 200 amp were used to excite the ionized atoms in a 4-bore laser tube mounted in a resonant cavity with confocal aluminized mirrors. Most of the observed oscillations were found to originate from multiple-ionized atoms, i.e., atoms from which two or three electrons have been removed.

Wallin Optical Systems, Inc., has announced a change of address to 9186 Independence Ave., Chatsworth, Calif. 91311. The firm's new quarters occupy 6,000 sq ft of space specifically designed for the engineering and manufacture of optical systems and equipments.

J. W. McNair, Assistant Secretary and Technical Director of American Standards Assn., retired June 30 after 35 years of service. He was made Assistant Secretary

of ASA in 1956 and in 1958 he became Technical Director. As Technical Director he supervised the entire ASA technical program, covering nearly 500 projects in almost all fields of science and technology. He also supervised the technical aspects of the participation of the United States in international standardization, covering 55 IEC projects and 115 ISO projects. As Assistant Secretary, he acted as secretary of ASA's main administrative committee, the Standards Council and as secretary of its Committee on Procedure and Board of Review. He has also been closely associated with administrative operations.

During World War II, he was responsible for the ASA War Committees on Radio, Electrical Indicating Instruments, Photography and Cinematography, and Specifications and Dimensions for Wood Poles. The war projects on radio and photography were extensive in nature and resulted in a great many American War Standards which were used by the Armed Forces for military procurement.

His successor as Technical Director is F. Crampton Frost who has been Assistant Technical Director of ASA since May 1964.

H. J. Schlafly, Jr., has been advanced to Senior Vice-President of TelePrompTer Corp., 50 W. 44 St., New York, N.Y., following a year's leave of absence. One of the three founders of the corporation, he was formerly Vice-President of Engineering. As Senior Vice-President he will have expanded responsibilities in the areas of administration and special projects as well as engineering. Prior to the formation of TelePrompTer Corp. in 1951, Mr. Schlafly was associated with the Advance Development Group, Electronics Dev. of General Electric and was Director of Television Research for Twentieth Century-Fox.

TelePrompTer is one of largest owner-operators of community antenna television (CATV) systems. It also provides live and closed-circuit television production and technical services for industrial meetings and special events and operates television training facilities for the Ordnance Guided Missile School at Hunstville, Ala.

Curtis I. Kring and R. Donald Peterson have been appointed district sales managers for General Electric Visual Communications Products radio and television broadcast and closed-circuit television equipment. Both men previously served as district engineers in the territories they now cover in sales assignments. Mr. Kring's headquarters are in Leawood, Kansas. His district includes Kansas, Missouri, Colorado, Iowa, Nebraska, and North and South Dakota. Mr. Peterson's headquarters are in Pasadena, Calif., and his district includes Southern California, southern Nevada, Arizona, Utah, and Hawaii.

George H. Smith has been appointed Special Sales Representative for CBS Laboratories, 227 High Ridge Rd., Stamford, Conn. His headquarters will be in Washington, D.C. Before joining CBS Laboratories, Mr. Smith was a microfilm systems specialist with North American Aviation, Inc., Los Angeles Division. He served with the U.S. Navy from 1955 to 1959 as a photographer.

Robert E. Rutherford, Jr., has been appointed General Manager of the Electron Tube Department of CBS Laboratories, 227 High Ridge Rd., Stamford, Conn. He was formerly Chief Engineer of the Department. Rupert L. Stow has been appointed Manager of Program Development, Electron tubes.

Mr. Rutherford is a well-known authority in electron tube technology, particularly high-resolution cathode-ray tubes, photoelectric image tubes and related devices. He has been with CBS Laboratories since 1958 and participated in the development of the Line Scan Tube for the Photoscan reconnaissance system and the Lunar Orbiter, ultra-high-resolution cathode-ray tubes and high-performance image scanning devices, as well as other projects in the field.

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