# 114th SMPTE Technical Conference Report

SMPTE had to share New York with the New York Mets and the Oakland Athletics as the Conference and the World Series came to the city simultaneously. Nevertheless, SMPTE attracted its own kind of attention from New York's film and television industries to the extent that this was one of the Society's most heavily attended New York Conferences in recent memory.

The Society has lately held its Conference in New York every year and a half, but this was the first time it was ever held at the Americana. The hotel was well located and provided excellent facilities for the technical sessions and the equipment exhibit. Notwithstanding the minor inconvenience of having sessions and the exhibit on different floors of the hotel, it was apparent that everyone was well satisfied with all aspects of the Conference: the physical arrangements, the program, and the equipment exhibit.

**Members of the Arrangements Committee.**

The program was slightly different than those of recent years. First of all, there was no two-day special-subject symposium on Thursday and Friday, as had been the case in recent conferences. Second, the subjects on the program were unusual, some of which had never appeared on an SMPTE Conference Program before, like Electronic Journalism, Digital Techniques in Television, and Mini-Computer Applications in Television, to name just a few. The similarity between this conference program and others preceding is that there was a certain stress on television papers. However, motion-picture subjects were not neglected, with sessions on Film Production Trends, Recent Advances in Film Cameras, and of course, Laboratory Practices, on which there was a full day of technical sessions.

In summary, the program was a little experimental, yet interesting and well received. Details of the program are outlined later in this report.

## Conference Committees

SMPTE Conferences don't just happen. They are planned, many months in advance, by members of local committees. Much of the work is long and hard, and unfortunately, thankless. The Society therefore takes this opportunity to thank members of the arrangements and program committees for providing the SMPTE with a Conference it can be proud of.

The Arrangements Committee is charged with the responsibility of all non-program activities and arrangements for the Conference. The titles of the Committee Chairmen indicate how far these responsibilities extend.

The Chairman of the Arrangements Committee was Charles Ahto, MPO/Tape Films Inc. Ahto had overall responsibility of Conference arrangements. Assisting Ahto were the chairmen of individual committees with responsibilities in specific areas.

Edward J. Messina, ABC-TV, was the Hotel Arrangements Chairman. He was the Society's liaison with the hotel. Kurt Wulliman, 3M Co., was the Banquet and Luncheon Chairman with the difficult responsibilities of planning menus, seating, and making sure everything went properly. Irwin Young, DuArt Film Laboratories, was Entertainment Chairman and arranged for the Banquet's fine band and show.

One of the most important jobs from the Society's point of view is that of the Auditor. Peter Cardasis, Movielab, Inc., handled those big responsibilities as he has done at previous SMPTE Conferences. Richard Streeter, CBS-TV was Registration Chairman, a job that requires the supervision of the all registration activities and is one of the week's most difficult jobs.

Samuel Bunchez, Vacuumate Corp., was Projection, Public Address and Recording Chairman. This is probably the most important job at the Conference because the quality of all the presentations depends so much on the equipment and personnel available, which were arranged for by him. The Chairman of the Equipment Exhibit was Dominick J. Capano, Cinecraft International. He started working months before the Conference, and his efforts were largely responsible for the excellence of the show.

Opening Film Chairman was Burton J. Stone, Precision Film Laboratories, who made sure every session opened with an interesting short film.

Hospitality Chairman was Herbert R. Pilzer, Motion Picture Enterprises, who saw to it that visitors to the Conference were well informed on sightseeing and miscellaneous goings on in New York. Marian Fuller, Geocine Films, was the Membership Chairman, and she succeeded in bringing more than 50 new members. Irwin B. Freedman, Agfa Gevaert, was the Message Center Chairman; William Cooper, WPIX-TV was Publicity Chairman, Sigmund Bajak, NBC, was Transportation Chairman. The Ladies Committee Chairmen were Marge Ahto and Edna Smith. E. Carlton Winkler, Imero Fiorentino Assoc. Inc., and Calvin Hotchkiss, Eastman Kodak Co., were the Administrative Assistants.

The Program Committee, as you might expect, is responsible for putting together the Conference program. Program Chairman was R. L. Pointer, American Broadcasting Co. He was assisted by the Associate Program Chairman Calvin Hotchkiss, Eastman Kodak Co., and by the Topic Chairmen: A. A. Goldberg, C.B.S. Laboratories, *Digital Techniques in Television;* Burton J. Stone, Precision Film Laboratories, *Film Laboratory Practice;* and Ben Greenberg, American Broadcasting Co., *Mini-Computer Applications.*

The program segment of the Conference is under the jurisdiction of SMPTE Editorial Vice-President Gerald G. Graham, National Film Board of Canada. Conference Vice-President Harry Teitelbaum, Hollywood Film Co., has prime responsibility for everything else.

## Get-Together Luncheon

This was truly one of the most inter-

Wilton R. Holm accepts the Progress Medal from SMPTE President Roudabush.

Kenneth M. Mason accepting the Honorary Membership award for Ralph M. Evans from President Roudabush. Evans was unable to attend.

Robert D. Shoberg accepts the E. I. Du Pont Gold Medal from President Roudabush.

**The Herbert T. Kalmus Gold Medal Award is presented to Charles J. Hirsch by President Roudabush.**

esting luncheons SMPTE has ever had. An excellent audio-visual presentation by the Guest Speaker Walter A. Fallon, President of Eastman Kodak, plus SMPTE's Awards Presentation, made this luncheon one which all those attending will not soon forget. The text of Kodak President Fallon's presentation appears earlier in this issue.

## Awards Presentation

Once a year, at its fall Conference, SMPTE presents its annual awards to those deemed worthy of recognition by the Society. The award recipients, and the citations appear below.

### Honorary Membership

It is the purpose of election to Honorary Membership of the Society to honor an individual who has performed a lifetime's work of eminent service in the advancement of engineering in motion pictures, television or in the allied arts and sciences.

*Ralph M. Evans has for some 40 years been a leader in the study and applications of the phenomena of color perception and its various ramifications. Among the most important applications have been color photography in still and motion pictures, and color television. In all of this work he was a close scientific student of the phenomena of color vision and applied his findings to make these display systems more realistic and attractive. No current discussion in this field can omit references to his extensive and authoritative contributions to the art, in books, articles and lectures.*

Ralph M. Evans graduated from Massachusetts Institute of Technology in optics and photography in 1928. From 1929 to 1933 he was engaged in color photography and process control work for Twentieth Century-Fox Film Corp., and, until 1935, when he joined the Eastman Kodak Co., in research and control work for DeLuxe Laboratories, Inc.

From 1935 to 1945 Mr. Evans worked on the development of color processes and research on visual effects in photography in the Kodak Research Laboratories, and was subsequently Director of the Photographic Technology Division until his retirement in 1970.

Mr. Evans is the author of two books: *An Introduction to Color,* John Wiley & Sons, Inc., New York 1948; *Eye, Film and Camera in Color Photography,* John Wiley & Sons, Inc., New York 1959; and co-author of a third: *Principles of Color Photography,* John Wiley & Sons, Inc., New York 1953. He has presented numerous technical papers on the phenomena of color.

Mr. Evans was Secretary of the Inter-Society Color Council 1952-1970, on which he was the representative of SMPTE, and from which he received the Godlove Award in 1959. His affiliations include Fellowship in the IES, OCA, PSA and SPSE.

In 1949 Mr. Evans was the recipient of the SMPTE Samuel L. Warner Award, in 1957 he was awarded the SMPTE Progress Medal, and he received the SMPTE Herbert T. Kalmus Gold Medal in 1961.

### Progress Medal

It is the purpose of this award to do honor to the individual by recognizing outstanding technical contributions to the progress of engineering phases of the motion-picture and/or television industries.

*A wide range of scientific and engineering disciplines and activities are conjoined to form the technological base of the motion-picture and television industry; each discipline has contributed in its unique way to progress in the presentation of sight and sound to human beings. In a highly specialized world, it is increasingly uncommon to find a scientist or engineer with the broad background and the versatility that one must have to contribute significantly to progress in several of the technologies in the motion-picture and television field. The conferring of the 1973 Progress Medal Award on Wilton R. Holm acknowledges not only the quality of his accomplishments as a scientist, author and administrator, but also pays tribute to his versatility and to the scope of his contributions.*

Wilton R. Holm, Vice-President, Technology, Association of Motion Picture and Television Producers, Inc. and Executive Director, Motion Picture and Television Research Center, is a physicist who began his professional career in 1942 with the U.S. Naval Research Laboratory in Washington, D.C. He served in the Navy until 1946, receiving a commendation for outstanding technical work during World War II.

In 1946, he entered the field of motion pictures as a color consultant instructing cameramen in color techniques; many of these cameramen became prominent color cinematographers. During this phase of his career, he advanced to the position of Director of Photographic Services and Chief Color Consultant with the Cinecolor Corporation.

In 1952, he began a new career with E.I. du Pont de Nemours and Company. He participated in the development of polyester film base, improved magnetic tape, ultrasonic tape splicing techniques, and motion-picture materials and processes.

In 1968, Mr. Holm organized the Motion Picture and Television Research Center in Hollywood and as Director, through his own inventive skills and as the leader of others, furthered the development of technologies and the growth of the industry. He holds several patents relating to a variety of subjects ranging from improvements in motion picture materials to advances in the design of zoom lenses. He has authored many papers and books on color motion pictures, color television, geometrical and physical optics and electronics. He has lectured extensively in many countries. He is a fellow of the Society of Motion Picture and Television Engineers and is Past President of the Society for 1973 and 1974.

### E. I. Du Pont Gold Medal Award

It is the purpose of this award to do honor to the recipient by recognizing outstanding contributions in the development of new techniques or equipment which have contributed to the improvement of the engineering phases of instrumentation and/or high-speed photography.

*Robert Shoberg's many contributions to the field of high-speed photography started over twenty years ago when he organized the Photographic Instrumentation Branch of White Sands Missile Range. Since that time he has been active in all phases of the discipline and has contrib-*

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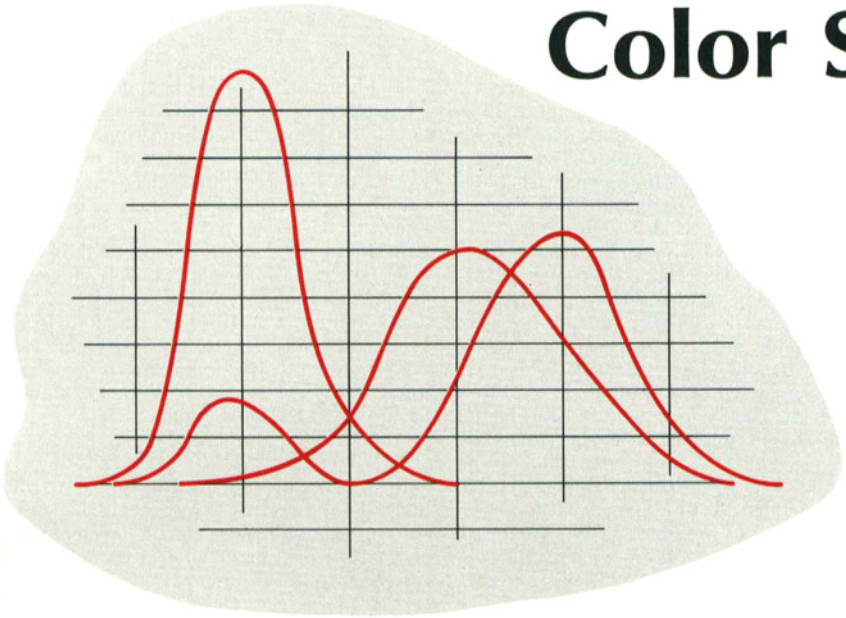
# Principles of Color Sensitometry



## THIRD EDITION

Edited by

Dr. Roderick T. Ryan

*With revisions and contributions by a panel of industry experts*

Color motion-picture photography is an exacting endeavor, affording little room for operation by guess or even by estimate. It demands that the worker — whether he be film manufacturer, cinematographer, or processing lab technician — have accurate, quantitative knowledge of the materials in use, of the effects of laboratory handling and of the resulting photographic images.

Color sensitometry is the quantitative measurement of all the responses of a photographic material to exposure and development. It provides a tool for the evaluation of the chemical and mechanical conditions that produced the visible photographic results. It measures the processed images, determining their character or content in terms most useful for the product's application or most significant in an operation's adjustment or stabilization. Finally, it provides a means for observers to relate their quality judgments to the physical characteristics of the photographic material.

The third edition of *Principles of Color Sensitometry* outlines the fundamental concepts of this discipline and describes some of the methods and instruments employed in order to give a comprehensive view of the present state of the science. The treatment is not complex, and in some places instead of mathematical discussion there is simple, verbal description for better understanding; but the coverage is comprehensive. The authors have presented and discussed, on a step-by-step basis, the routines common to nearly all of the diverse applications of color sensitometry.

CONTENTS



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## Society of Motion Picture & Television Engineers

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**President Roudabush presents the Eastman Kodak Gold Medal Award to John Flory.**

**The David Sarnoff Gold Medal is given to Arch C. Luther.**

**The Samuel L. Warner Memorial Award is presented to Loren L. Ryder by President Roudabush.**

**Walter A. Fallon receiving his Special Recognition Award from President Roudabush.**

*uted significantly to its growth and general acceptance as a useful tool by the engineering profession. He has also striven towards perfection in rotating prism cameras and has personally been responsible for major advances in equipment design.*

Robert D. Shoberg, President, Shotec, Inc., began his career in photographic instrumentation in the infancy of that art, and may be considered one of its true pioneers. He established many of the original techniques for the photographic instrumentation of early missile programs with Dr. Werner von Braun, Dr. Kurt Debus and other German scientists at White Sands Missile Range and Red Stone Arsenal during the period 1947 to 1954.

Mr. Shoberg was instrumental in the development of the single-shaft principle of image motion compensation in rotating prism cameras. Early work on this principle was conducted in cooperation with A. Kent Boyd and, later, Ernest Whitley, and the Hycam, Locam and Photec families of high-speed cameras were conceived and developed under his direct supervision.

After leaving the White Sands Missile Range in 1954 Mr. Shoberg was successively manager of the Fastax Div., Wollensak Optical Co., and manager, Photo Products, Beckman & Whitley, before opening his own company, Red Lake Laboratories, in 1961. At his present company, Shotec, Inc., he is continuing with the development of high-speed cameras.

Mr. Shoberg has played an active part in the work of the SMPTE Photo-Instrumentation Committee since its inception in 1951.

### Eastman Kodak Gold Medal Award

It is the purpose of this award to honor the recipient by recognizing outstanding contributions which lead to new or unique educational programs utilizing motion pictures, television, high-speed and instrumentation photography or other photographic sciences.

*The Eastman Kodak Gold Medal Award is presented to John A. Flory for his many years of leadership in furthering communications and the presentation of ideas in education, industry and the entire nontheatrical field through the use of 16mm and 8mm film. Through his intimate knowledge of the technology and broad acquaintance with individuals in all the related fields, he has been the catalyst in the development of many significant programs. Great credit is due for his continuing efforts in the education and training of young filmmakers at all levels for future careers in all related fields.*

John Flory, President, Spacefilms, Inc., is a veteran of more than 40 years in the motion-picture field. Following five years in Hollywood on the production staff of Paramount Pictures he founded his own company, Flory Films, Inc., in the forties to produce and distribute all types of nontheatrical and television motion pictures and filmstrips. From 1950 until his retirement in 1971 Mr. Flory was Kodak's consultant on nontheatrical films, working with individuals and organizations all over the country that use motion pictures for business, educational, religious, medical, television, governmental, scientific and other purposes.

Mr. Flory has lectured on motion-picture and television techniques at many universities, and was the editor of *The Dollars and Sense of Business Films,* published by the Association of National Advertisers. He also collaborated on the book, *Graphic Communication and the Crisis in Education,* published by the National Education Association, and was co-author of the book, *Designing New Apparatus for Learning,* a project of the SMPTE and the U.S. Office of Education. The company he presently heads is an independent unit engaged in bringing to the screen and TV some of the published works of Dr. Lloyd Biggle, Jr.; James Blish; L. Ron Hubbard; Dan Tyler Moore and others.

In 1962 Mr. Flory was recipient of the Information Film Producers Association's Jay E. Gordon Memorial Award for an "outstanding Contribution to Industrial Films." From 1971 through 1973 he has served on the Government Advisory Committee, International Book and Library Programs, U.S. Department of State.

### Herbert T. Kalmus Gold Medal Award

It is the purpose of this award to do honor to the recipient by recognizing outstanding contributions in the development of color films, processing, techniques or equipment useful in making motion pictures for theatre or television use.

*The Herbert T. Kalmus Gold Medal is awarded to Charles J. Hirsch in recognition of his leadership in the development of the Hazeltine Color Analyzer. As an executive of the Hazeltine Research Corporation, his work led toward the color analyzer becoming a commercial reality. The Hazeltine Color Analyzer, now in worldwide use, has provided a means of progressive improvements in motion-picture laboratories.*

Charles J. Hirsch, Consulting Engineer, received his early education in France and a degree in electrical engineering from Columbia University. After working as Chief Engineer for radio manufacturers in France and Italy he joined Hazeltine Corp. in 1942, rising from Design Supervisor to Executive Vice-President for Research and Director of the Hazeltine Research Corp. His principal work was with the development of color television and specifically with the development of the Hazeltine Color Film Analyzer, which won an Academy Award.

From 1959 to 1967, when he retired, Mr. Hirsch was with the Radio Corporation of America, concerned with television, radio, recording, records and radar. Since retirement he has done consulting work on ground beacons for air navigation and patents for FM stereo and color television, and has lectured extensively on color television to engineers of the principal manufacturers.

Mr. Hirsch has been an active participant in three Panels of the NTSC, chairman of the IRE Television Systems Committee and of the EIA Broadcast Television Systems Committee, and a member of CCIR study Group XI-Television. He also served as chairman of Panel I of the National Stereophonic Radio Committee and on numerous committees and working groups in the area of air navigation.

Thirty U.S. Patents have been issued to Mr. Hirsch, and he has published many articles on aids to air navigation, stereo-

phony and especially on color television. The last includes the definitive paper on the Hazeltine Color Film Analyzer, published in the SMPTE Journal in 1958.

### David Sarnoff Gold Medal Award

It is the purpose of this award to honor the recipient by recognizing outstanding contributions in the development of new techniques or equipment which have contributed to the improvement of the engineering phases of television, including theater television.

*The David Sarnoff Gold Medal Award is presented to Arch C. Luther, Jr., for major contributions to the field of magnetic video recording including development of the broadcasting industry's first quadruplex video tape cartridge recording system, and for contributions to the national and international standardization of quadruplex recording.*

Arch C. Luther, Jr., Chief Engineer, RCA Broadcast Systems, graduated in electrical engineering from M.I.T. and was engaged on circuit design of color television cameras and monitors for RCA Communications Systems Division during the fifties. Toward 1960 he began the activity for transistorization of broadcast products and contributed heavily to the extension of this technology throughout broadcast equipment.

During the sixties Mr. Luther's principal accomplishments included: development of the TR-22 recorder, the industry's first all solid state video recorder; a complete line of products based on the TR-22 design; the TR-70 highband video recorder; the development of long-life video head-wheels and the development and introduction of the TCR-100 automatic video cartridge recorder system.

In his present position Mr. Luther is responsible for technical planning and direction of all engineering and advanced development programs for broadcast systems including video recording equipment, television and radio studio equipment, and television and radio transmitting equipment. He is the holder of twenty-nine U.S. patents relating to the circuitry and equipment he had designed and is the author of numerous papers published in technical journals and presented before the SMPTE and the Montreux Television Festival. Mr. Luther is a Fellow of SMPTE and a member of IEEE and Eta Kappa Nu.

### Samuel L. Warner Memorial Award

It is the purpose of this award to do honor to the individual by recognizing outstanding contributions in the design and development of new and improved methods and/or apparatus for sound-on-film motion pictures, including any step in the process.

*The Samuel L. Warner Memorial Award is presented to Loren L. Ryder in recognition of his long and continued interest in the improvement of sound-recording techniques and, in particular, for his pioneering encouragement of the use of high-quality light-weight equipment.*

Loren L. Ryder, President, Ryder Sound Services, Ryder Magnetic Sales Corp., and four other companies, is known throughout the world as the inventor of VistaVision. His major accomplishments include the first transcontinental picture transmission over wire in 1925, the first 24-hr round-the-world re-broadcast in 1927, the winning of three Motion Picture Academy "Oscars," two plaques, three Honorable Mentions and eleven Nominations Awards. These include his awards for the first use of magnetic recording.

Mr. Ryder has been President of the Society of Motion Picture and Television Engineers, a Member of the Board of the Academy of Motion Picture Arts and Sciences, Motion Pictures Research Council, and a Member of the National Board of the Academy of Television Arts and Sciences of which he has served as National Treasurer and Secretary.

B.S. in physics and mathematics—Class of 1924 University of California. Joined the Telephone Company as a transmission engineer, then Assistant to the General Manager of Sherman Clay and Company, San Francisco; then Director of Engineering and Recording at Paramount Pictures Corporation. War Research Consultant—National Defense Research Committee and Office of Scientific Research and Development. Recipient of War-Navy Research Award. Past Vice-Chairman University of California Engineering Advisory Council. Member of Board of Hollywood Chamber of Commerce. Tau Kappa Epsilon.

Mr. Ryder retired from the position of Assistant and Technical Advisor to Mr. Y. Frank Freeman of Paramount Pictures Corporation to take over the active operation of his own companies. His staff is working with the SMPTE Sound Committee and the Motion Picture Research Center Committee on a compatible coding system to sync film either sprocketed or nonsprocketed with video and sound tapes.

**New Fellow Award Winners: Charles Rhodes, Paolo Zaccarian, John H. Seide, J. Karl Treise, Judith A. Schwan, Edmund M. DiGiulio, and Maurice L. French.**

### New Fellows of the Society

**Chester E. Beachell,** Senior Research Officer, National Film Board of Canada, was engineer in a number of Canadian radio stations before joining the National Film Board as sound transmission engineer in 1949. In 1951 he became Senior Research Officer in the Technical Research Division where four patents were issued to him in connection with his work on dual track optical recordings and the Sprocketape System. He was elected a member of "The Inventors" of Canadian Patents and Developments, a branch of the National Research Council, in 1961. Since 1961 Mr. Beachell has become active in underwater photography and sound recording and has participated in several Arctic diving expeditions. He is a former chairman of the SMPTE Montreal/Ottawa Section.

**James D. Caron,** Vice-President and General Manager, Capital Film Laboratories, Inc., North Miami, majored in chemistry at Akron University. He established and regulated all chemicals and color control procedures at Capital's Miami laboratory; worked out formula for re-use of developer overflows; was responsible for installing CRI, color positive, Ektachrome, B/W and other processing machines; supervised construction and layout of the new laboratory building; and set up a training program for new personnel. Mr. Caron is a member of the Board of Directors of the

**New Fellow Award Winners: Daniel Wells, Robert E. Johnson, James D. Caron, Chester E. Beachell, Tsuneo Utsumi, and Yasuo Saeki.**

**Yasuo Saeki accepts an SMPTE Special Recognition Award for his father, the late Robert E. Saeki**

Florida Cine Center and the Florida Motion Picture Producers Association and was instrumental in reestablishing the SMPTE Section in Miami. He served as general chairman for the 1973 SMPTE Winter TV Conference.

**Edmund M. DiGiulio,** President, Cinema Products Corp., has a B.S.E.E. from Columbia and a M.E. from UCLA. Previously a Vice-President of Craig Research Corp. and Mitchell Camera Corp., he has been since 1967 with his present company which designs, develops and manufactures 16 and 35mm professional motion-picture cameras and related equipment. Mr. DiGiulio holds several patents and has written many technical papers for SMPTE, ACS, etc. He is a member of the Technical Awards Committee of AMPAS, an Associate Member of ACS, and a member of the Academy of TV Arts and Sciences. He received an Academy Award for technical achievement in 1968.

**Robert Fehrmann,** Chief Engineer, Studio Hamburg Atelierbetriebsgesellschaft m.b.H., graduated from the Technische Hochschule, Berlin, and worked before the war in the sound department of UFA Filmstudios. In Hamburg since the war he was with Real Film and then its successor, Studio Hamburg, where he is in charge of all technical studio equipment and installations including conventional film techniques and electronic and TV equipment. In 1947 Mr. Fehrmann introduced the use of audio tape for film sound recording in West Germany. He is an active member of the German Standards Organization (FAKI) and chairman of its working group on stage techniques. He is a member of FKTG and BKSTS and a contributor to the SMPTE Annual Progress Report.

**President Roudabush presents an SMPTE Special Recognition Award to Erik Rasmussen.**

**Maurice L. French,** Supervisor of Technical Film Operations, Canadian Broadcasting Corp., made important contributions to CBC research on a standardized gray scale characteristic for vidicon telecine and on density and exposure control for television films. In 1959 he was appointed to organize the CBC film operations and continued the development of techniques and staff up to the present time. Mr. French has given numerous tutorial lectures to CBC staff and at the Ryerson Polytechnical Institute of Technology and his published papers in the CBC Engineering Review. He has frequently held office in the SMPTE Section in Toronto and has regularly assisted with the organization of the SMPTE Toronto-Rochester Little Conventions. Mr. French is Program Chairman for the Society's 116th Conference in Toronto in 1974.

**Karl-Erik Gondesen,** Head, Film and Magnetic Tape Department, Institut für Rundfunktechnik, Munich, graduated in telecommunications from the Technische Hochschule, Hanover. From 1945 to 1956 he was responsible for sound engineering development at the Northwest German broadcasting station in Hamburg and since 1957 has been active at IRT in all aspects of film sound recording for television. Mr. Gondesen is a member of the German Standards Committee on Cinematography, ISO/TC 36, CCIR Study Group X and Working Group G-3 of the EBU. He has published numerous papers on film recording for television in Germany as well as in the SMPTE and BKSTS Journals, and since 1958 has been a regular contributor to the SMPTE Annual Progress Report.

*Ed. note:* Mr. Gondeson died Sept. 20, 1973. His award was accepted by his widow.

**Robert E. Johnson,** Vice-President and Technical Director, Byron Motion Pictures, Inc., graduated from the Rochester Institute of Technology. With Eastman Kodak prior to the war and subsequently with the Naval Photographic Center, he has been with Byron Motion Pictures since the 1950's and collaborated in the design, engineering and installation of all equipment in the company's present plant. A paper by Mr. Johnson on "The First U.S. Installation of Arri Color Developing Equipment" was published in the November 1956 SMPTE *Journal*. He has been an officer of the SMPTE Washington, D.C., Section for a number of years, including Section Chairman, and has actively contributed, as Laboratory Practices Session Chairman and Assistant Chairman, at SMPTE Conferences in Washington, D.C.

**Edward J. Messina, Jr.,** Director, Film Services, American Broadcasting Company, studied at R.I.T. and Monmouth College. He headed the Photometric Branch at the U.S. Naval Air Test Facility, Lakehurst, N.J.; and was in charge of photoinstrumentation at Rocket Test Site, Thiokol Chemical Corp. Mr. Messina was co-designer of a portable motion-picture film processor for news media on remote locations, and of the Beckman & Whitley 16mm news film camera. He is the author of numerous papers on news film operations and logistics, and on film processing. In his present position Mr. Messina is responsible for all film programming and film commercials on the ABC Television Network. Besides SMPTE, he is a member of SPSE, SPIE and IPP of A.

**Charles W. Rhodes,** Manager, TV Products Engineering, Communications Div., Tektronix, Inc., developed the 12.5T Modulated Sine-Squared Pulse Paper, adopted for NTSC transmission testing nationally and internationally; the Type Z first differential comparator which increased voltage resolution and accuracy capabilities of the oscilloscope measurements by several orders of magnitude; vectorscopes for NTSC and PAL used almost universally by broadcasters; and a backporch feedback clamp circuit for the 527 and later the 529 waveform monitors. Mr. Rhodes has given numerous seminars and lectures on transmission testing in India and South America and has published some twenty papers in technical journals, including the SMPTE *Journal*

**Roland F. G. Chase is presented with an SMPTE Special Recognition Award.**

He has several patents issued and pending and is an active participant in technical committees of the EIA, JCIC, IEEE, CCIR and FCC.

**Yasuo Saeki,** President, Yokohama Cinema Laboratories, Inc., graduated from Keio University, Tokyo, in 1949, and has been with the company since 1952, becoming president in 1965. He introduced additive color processing in Japan and influenced the change from subtractive systems. In 1969 he worked with the Hitachi Company to produce the first color timing analyzer in Japan; he was the first to introduce into his country Photomec processing equipment and the Hollywood Film 16mm to Super 8mm Continuous Optical Reduction Printer; and in 1972 installed Ikegami Electric Co. 16mm color kinescope recording systems equipped with the Milliken 64B camera. Mr. Saiki is a member of the Motion Picture and Television Engineering Society of Japan and Executive Director of the Japan Color Cinema Laboratories Association.

**Judith A. Schwan,** Director, Emulsion Research Division, Kodak Research Laboratories, graduated in Chemical Engineering from the University of Cincinnati and has an MS in Physical Chemistry from Cornell University. She has been instrumental in the development of new reversal films including the Eastman Color Reversal In-

termediate Film in the Eastman color family, reversal films and reversal Ektachrome films. Her present responsibility covers the development of both Eastman color and reversal color films. Miss Schwan is the holder of twenty-one U.S., British, French, and German patents on light-sensitive materials and processes. Besides SMPTE, she is a member of ACS, SPSE, Rochester Museum, Art Gallery and Civic Music Association.

**John H. Seide,** Public Relations, CCTV Engineering, Mountain Bell, received his early training in electronics while in the Air Corps during World War II. From 1953 to 1961 he was Chief Engineer of KHPL-TV, Hayes Center, Nebraska, and KNOP-TV, North Platte, Nebraska, supervising broadcast facilities from construction permit through completion and testing. In 1961 Mr. Seide joined the University of Denver as Chief Engineer of the Department of Mass Communications, where he was responsible not only for planning, installation, operation and maintenance of all the technical aspects of electronic media but also for giving a number of courses in television technology and systems design. At Mountain Bell he is in charge of planning, installation, operation and maintenance of multimedia facilities.

**Murray H. Stevenson,** Engineering Consultant, Federation of Australian Commercial TV Stations, was from 1936 to 1956 Chief Engineer of Commercial Radio Station 2UE, Sydney, during which time he made several visits to the U.S. and Europe to study radio and television broadcasting and motion-picture sound recording. In 1956 he was appointed chief engineer of Amalgamated Television Services Pty. Ltd. and subsequently also of Artransa Park Film Studios Pty. Ltd. whose laboratory, renamed Atlab Film Laboratory Service, was also under his direction. He designed and equipped an additional sound stage, the first in Australia to use exclusively tungsten halogen lighting, to house the Electronicam three-camera film recording system. Since his retirement in 1971 Mr. Stevenson has also been retained as permanent consultant by J. Walter Thompson Australia Pty. Ltd.

**J. Carl Treise,** President, Treise Engineering, Inc., has promoted much innovative use of materials and applications of mechanical principles in the manufacture of professional motion-picture equipment. His company pioneered and extensively used marine plywood and fiberglass for tank construction; developed one of the first new drive systems for film transport, the SBR, in the last 30 years; and was the first to apply the principle of reverse torque motor loading on the take-up to commercially available processing machines. Mr. Treise ranks as one of the leading designers and manufacturers of motion-picture film processing equipment in the U.S.

**Tsuneo Utsumi,** Executive Managing Director, Far East Laboratories, Ltd., has many important engineering developments to his credit. These include design and construction of a reversible panel printer, a wet gate optical reduction printer, a new additive light valve system, aerial image composite equipment, pan and scan equipment, and a tendency-drive type film processing machine. Mr. Utsumi has published technical papers on the wet gate optical reduction printer, an additive light valve system for color printing, the use of aerial images in optical printing, and pan and scan equipment for making television prints from anamorphic negatives. He is the recipient of honors from the Society of Motion Picture and Television Engineers of Japan.

**Daniel R. Wells,** Director, Engineering & Technical Operations, Public Broadcasting Service, was responsible for design, construction and installation of all audio system facilities at CBS Broadcast Center, New York, from 1961 to 1963, including design of CBS Type 7A solid state audio console. From 1968 to 1970, as Director of Engineering Services for the CBS Owned and Operated Television Stations Division, he determined requirements, planned and coordinated major studio automation projects and new transmitter installations. At the Public Broadcasting Service he has been responsible for creation of a new 110-station interconnection network and the planning and construction of the new PBS technical center in Washington. Mr. Wells has presented many papers before the SMPTE and other Societies and is active on SMPTE, JCIC, AES, IEEE and CCIR committees.

**Paolo Zaccarian,** Deputy Director, Engineering Department, RAI-Radiotelevisione Italiana, graduated in industrial engineering from the University of Rome and joined RAI after two years' postgraduate work in electronics and telecommunications. In addition to the planning and supervision of television production installations at RAI he has been active with EBU, CCIR, IEC and SMPTE in international standardization as chairman of EBU Sub Group G-2 (Television Tape Recording), chairman of EBU Working Party G (Recording), member of CCIR sub-working group on television tape recording and IEC60B (Television Recording). Mr. Zaccarian is a member of the SMPTE Television, Color and Video Tape Recording Committees, of the Italian Technical Kinematography Association and of the Roman Association of Engineering Graduates.

## Special Awards

In addition to its regular awards, the Society this year, as it did last year, presented Special Commendation Awards to those persons who merit particular recognition. Those receiving the awards were: Robert E. Saeki (posthumously, received by his son Yasuo), Keiichiro Ryu, Alexandr A. Khrushchev, Roland F. G. Chase, Lennart Ljungberg, Erik Rasmussen, Walter A. Fallon.

## Program Highlights

*Film Production Around the World With Latest Trends in China and Russia*

*Filming in China* (Weill) summarizes the experiences and technical problems of the film crew which visited the People's Republic of China as part of the Women's Friendship Delegation during April 1973.

*From the Beginning — Producing at 22* (King) describes, in two case histories, the dilemmas which surround the production of a film by an untried filmmaker. The difficulties obtained both from a lack of financial backing and from the understandable skepticism of the general public.

*When an Immovable Object meets an Irresistible Force: Hardtimes Movie Company* (Gilligan, Salwasser, Clifton & Motz) presents background information about a new, small film production company. Their work in progress is discussed.

*An Interpretation of the Mythology Surrounding the Selection of a 16mm Color-Film Stock for Production Use* (Hampe & Behr) offers some opinions on the relative merits of three commonly available film stocks — ECO 7252, EFB 7242, and Color Negative 7254 (CNF) — and develops a rationale for the selection and use of a stock for 16mm color production.

*Electronic Cinemaphotography* (Connolly) gives an account of operational experience gained in engineering tests, in production and in post-production, using a live electronic camera and videotape recorder in the cinematic single-camera technique. The results obtained in the production and editing of a feature for television using this technique are presented. The motivation for use of an all-electronic technique in producing a television program is to reduce production and post-production costs, to reduce the time on the set and that required for subsequent editing work, and to equal or exceed the quality of such programs produced on film.

*A Universal Frame for Motion-Picture Production* (Wysotsky) outlines the experimental work performed by Mosfilm Studios in cooperation with research institute NIKFI to establish a new universal 35mm negative frame for motion-picture production in order to simplify the shooting process of film systems currently widely used in cinematography. The proposed negative frame which is the full width of the 35mm film between perforations (25mm × 16mm) is used for photography with non-anamorphic camera lenses. From the exposed area of this frame the appropriate areas are selected for optical printing to yield copies in the appropriate aspect ratio.

*Recent Development in Film-Camera Equipments for Television and Motion Pictures*

*Design Features of the Maurer Pro-16 Cinecamera* (Seymour-Lee) describes a typical example of the new generation of cameras now being designed to meet the new requirements of contemporary filmmakers. The design requirements are defined and the methods of meeting the requirements are outlined.

*Frezzi-Cordless Cameras — Design and Application* (Crawford) provides a summary of the developments in 16mm motion-picture camera conversions which parallels the evolution of the television newsfilm industry.

*The Systems Approach to the Design of a News Documentary Camera* (DiGiulio) discusses the reasons for many of the design parameters chosen by Cinema Products Corp. in producing their CP-16 and CP-16A cameras. The importance of keeping systems elements compatible with existing popular equipment is stressed.

*Laboratory Practices*

*Automatic Process Control Systems. Part I, Theory* (Kelch) describes a process-simulator model, which uses digital tech-

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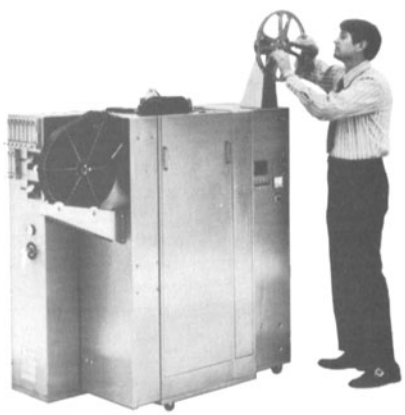

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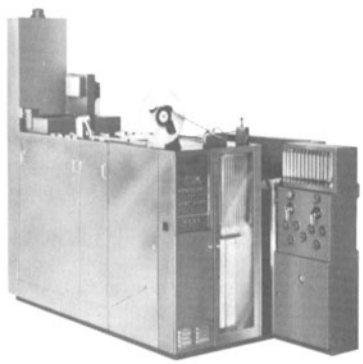

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niques very similar to those used for solving inventory and transportation problems in the operations-research field. This model permits computer simulation of the dynamic performance of photographic-solution systems. The performance of each system can be simulated and any necessary adjustments made prior to installation of process-control systems, assuring efficient start-up.

*Automatic Process Control Systems. Part II, Applications* (Erb) offers a replenishment technique based on the chemical-activity level of the processing solution. Such a replenishment system provides improved process control because fluctuations in water carry-in, exposure level, or changes from leader to film are accounted for.

*Nitrate Film Transfer to Safety Film* (Bennett) discusses various transfer techniques, including transfer from a print to dupe negative; transfer from an original negative to master positive and sequentially to dupe negative and soundtrack; and transfer from an original negative to composite direct master positive negative.

*Electrolytic Silver Recovery from Bleach-Fix Solutions Using High Current-Density Electrolysis* (Hendrickson) presents the theory of high current-density electrolytic silver recovery from bleach-fix solutions, including results of laboratory testing on samples of bleach-fix solutions from various manufacturers. Results of field installations, including the closed-loop recirculation of bleach-fix through electrolytic units, and the economics of such installations are discussed.

*Cross Modulation Tester* (Whitmore, & Stemke) describes an instrument for evaluating 35, 16 and 8mm optical soundtracks. It requires only a short (4- to 8-in) cross-modulation recording on the head of sound negative recorded on the same film at the same amperage and processed under the same conditions as the recording. When printed and processed a reel can be checked for optimum print density or minimum distortion, using procedures very much like those used in densitometric control with "head tests." The tester will indicate whether the processing has deviated, or whether a printing machine exhibits poor contact, or inimical motion characteristics between negative and positive materials.

*The Use of Bleach-Fixing Baths in Color Motion-Picture Print-Film Processing* (Roosen, Vanreusel & Verbrugghe) presents the results of practical laboratory processing experience with Gevacolor Printfilm T 9.85, whereby a shortened processing sequence has been applied comprising the following steps: prebath, rinse, color developer, rinse, bleach-fixer, wash, stabilizer. Regarding the sensitometric results no difference could be detected between the new process and the normal sequence. However, due to the absence of any hardening action in the new process, the uptake of water by the film material was higher so that longer drying times were required. One can state that the new process is reliable in the long run. The resulting simplification of machine layout and the reduction of processing time without increasing the bath temperature are obvious advantages. Of equal interest is the economical balance of the bleach-fix process; therefore a financial evaluation is given as far as chemicals are concerned.

*Is Redevelopment of Optical Soundtracks on Color-Positive Film Still Required?* (Staes, Hayen & Verbrugghe) concludes redevelopment is not necessary when using Gevacolor Printfilm T 9.85, because frequency response and optimum cancellation of dye soundtracks on this film are equivalent to those of silver soundtracks. The film has a specially selected cyan dye with high absorption in the far red.

*Scaling Techniques for Subjective Judgements of Picture Quality* (Jackson) discusses the various ways in which scaling methods may be classified, some of the judgement techniques which may be employed in obtaining these different scales, and the advantages and disadvantages of these techniques. The paper deals primarily with the philosophy of obtaining and scaling subjective data.

*Analysis and Scaling of Subjective Preference Data* (Wood) presents a methodology for the analysis of subjective judgements. The author explains that this process is necessarily sequential because it is only through a large number of confirmatory experiments that the investigator gains insight into the reliability of his conclusions. Also through the sequence of several experiments he acquires an appreciation of the complexity of the task and a realization that a sizeable commitment of resources is necessary to accomplish anything beyond a superficial study of a seemingly straightforward problem.

*A New Method for Applying Titles and Artwork to a Moving Image Using a Modified Aerial-Image System* (Amies) describes a system for titling that offers important advantages over the accepted configuration for an aerial-image artwork system: condensers having a longer focal length may be used and the back of the artwork on titles now faces the camera.

*An Alternative to Super-16* (King) offers a means of comparing the quality of various 16mm production techniques with 35mm. Three Eastman emulsions were selected for consideration: Ektachrome Commercial (7252), Ektachrome EF (5242, 7242), Color Negative (5254, 7254). The author suggests that the equipment the 16mm producers most need at this time is a full set of professional-quality anamorphic lenses for 16mm photography.

*The Economics of Super-8 Projection Cassette Loading* (Bauer & Scuteri) describes a study of the time and costs involved in loading of super-8 sound prints into Kodak Supermatic Cassettes. The various steps of the breakdown and loading procedures were listed and studied. A comparison was made of three levels of mechanization which would accomplish these steps.

### *Electronic Journalism and Other Developments in Television Broadcasting*

*Television News Gathering* (Flaherty) reviews the origins of the development of an electronic news gathering system and demonstrates the results being achieved daily. Compared to news gathering on film, electronic news gathering reduces significantly the time which elapses between the occurrence of a news event and its broadcast. Moreover, such an electronic news gathering system promises economies in overall operating cost, notwithstanding the higher initial capital cost of the electronic equipment. More than one half of the assignments given to the electronic news gathering crews could not have been completed by a film crew and made ready for the next scheduled news program in a timely manner. Editorial content has generally been improved because of the additional time available for thoughtful and considered editing and because the news director has a voice-communications link between the news center and the news-gathering crew on location to ensure that the best possible video coverage of the event is achieved.

*A Portable, Compact Color-Television Facility and Post-Production Unit* (Smalling) describes a facility which may be used in-house as a studio and post-production facility or on remote locations for two-camera production and post-production. All system elements have been carefully selected to provide optimum picture, editing and sound quality that may be easily integrated into material produced at large commercial production facilities. The system elements may be transported in a step van or shipped in integral protective cases providing maximum equipment protection.

*Quality Approach of a Portable Color Camera with ½-in Videorecorder for Electronic Journalism* (Groll) discusses the various problems encountered in the development of the Robert Bosch Fernseh handheld electronic color camera and various pieces of accessory equipment to increase the flexibility. Also discussed were the adaptation of a commercial portable video cassette recorder, to meet the stringent quality requirements of broadcast television with regard to the performance and transfer characteristics, and playback equipment to permit studio-synchronized playback of the recorded program material. Other signal sources can be faded-in at any time desired.

*Pre-Programed and Automatic Color Correction for Telecine* (Kitson, Spencer, Sanders & Wright) describes a pre-programer engineered to match the operational procedures of telecine installations. A demonstration of its capabilities is given.

*A Telecine Based on New Concepts* (Teed & Pay) outlines the design concept and operational characteristics of the new Marconi B3404 telecine. The user has been considered at all stages of the design: convenient layout has been achieved; and many new features have been incorporated in the design. The ability to fast wind on and back at ten times normal speed without the need to remove the film from the gate is one of the most important. A unique optical system has been employed which permits the previewing any of the four picture sources, irrespective of which one is on air at the time. This system allows the use of a simple multiplexer without any moving mirrors or semi-reflecting surfaces for picture source selection. Its time of operation is only 20 ms — in fact, the change is said to be indistinguishable from an electronically switched source.

*Color Television Film Recording from a Triniscope* (Lisk & Evans) have designed and built an experimental triniscope recorder in an effort to improve the quality of tape-to-film recording. This device employs three separate tubes, one for each

primary color. The three separate images are optically combined, registered, and photographed as a single image. The triniscope has many desirable features over the shadow-mask recording system. It is capable of higher resolution. The phosphors can be selected to match the sensitivities of the recording color film. Procedures for setting up the triniscope to achieve optimum resolution and correct color rendition are described. Recordings made according to these procedures are shown.

*Digital Techniques in Television*

*Digital Techniques in Special-Effects Generation for Television* (Busch) summarizes the developments over the past two years in television special effects based on the use of digital computers. Application of the digital concept has great appeal because of the equipment's simple set-up, stability and linearity. When this appeal is coupled, as in the case of the special-effects generator, with a significant expansion in performance it may prove decisive in future equipment design.

*The Use of Coding Techniques to Reduce the Tape Consumption of Digital Television Recording* (Chambers) offers that existing coding techniques can be combined to halve the data rate of digital videotape recording and thereby halve the necessary tape consumption. (At present, the data rate required for broadcast-quality digital television is over 100 Mbit/s; it is impracticable to record this with the amount of recording medium consumed in an analog recording.) A possible differential coding system is described which would reduce the number of bits necessary per word of digital television from the basic eight to five.

*Color Decoding a PCM NTSC Television Signal* (Rossi) examines a number of color-decoding techniques to determine the optimum format for PCM encoding of the NTSC signal. It is suggested that television broadcasting plants will tend toward digital circuits in the future.

*A Digital Remote-Control and Monitoring System (Bus System) for Automation in Broadcasting Studios* (Hogel & Heller) proposes the adoption of control-data bus lines (from the EDP industry). By means of an appropriate address code, any piece of equipment may be assessed from any control panel. Since such a bus system cannot be introduced without standardizing the control signals and junctions of the studio equipment, a standards proposal is offered. The advantages of such a system would be considerably lower costs for planning and installation, and no difficulties with the enlargement of existing plants nor with the building up the bus system gradually.

*Future Time-Base-Corrector Systems* (Acker) discusses some of the conventional time-base-correction methods used today and describes future ones that would employ the technology associated with ultrasonic delay lines, more specifically, surface acoustic delay lines. The particular device discussed was invented within the last three years and is presently being used in several military systems applications. It is known as the IMCON and possesses a linear dispersive characteristic which can be employed in time-base correctors. The device can be used to smoothly vary the time delay and accomplish delay correction. There are several performance advantages to this system relating to signal-to-noise, low signal distortion and wide bandwidth.

*ORACLE — An Information Broadcasting Service Using Data Transmission in the Vertical Interval* (McKenzie) describes an experimental information entry-and-editing system for the transmission of such program material as Stock Exchange quotations, local and national weather forecasts, program schedules, a 24-h digital clock, and subtitles for the deaf or in a second language. The experimental system also provides a limited "graphics" facility.

*A Novel TV Add-On Data-Communication System* (King) outlines a system for adding an auxiliary data channel to a standard NTSC television signal. An essentially invisible low amplitude subcarrier, phase modulated by a specially clocked data stream, is inserted into the NTSC video signal. It can then be detected without interference from the video components. Thus, an additional independent communications channel capable of carrying significant information rates can be added to the existing television channel. This data channel was used to transmit, simultaneous with the conventional program transmission, captions for subtitling, for example, as an aid to the deaf. Since the required information rate for captions is relatively small compared to the capability of the system it is possible to transmit them essentially simultaneously in several different languages. In this system a conventional television receiver would receive only the normal program material but receivers equipped with appropriate decoders would additionally display the captions in the language selected.

*A Multichannel PCM High-Quality Audio Transmission System for Use on Terrestrial and Satellite Video Facilities* (Wetmore) reports on the development of a frequency-diplexed four-phase PSK digital audio system for diplexing up to four 15-kHz audio channels onto a video channel. The system was developed in response to a request from the Network Transmission Committee of VITEAC for a combined audio-with-video transmission system for use on Bell System long-haul video facilities. The system has been successfully operated over a 6400-km (4000-mi) terrestrial television facility and over a communications-satellite link. The terrestrial tests included local loops as well as interexchange facilities. The phase relationship among channels is fixed which allows use of the channels for stereo. Relative audio-to-video delay is eliminated thus avoiding lip sync problems over long-haul circuits.

*Digital Frame Storage for Television Video* (Pursell & Newby) describes a solid-state memory device capable of storing up to a frame of television video signal to replace the relatively inflexible video disc. Whereas the video disc operates at identical rates during record and reproduce, the digital frame store described here can be switched from one data rate to another instantly or be written into at one rate and reproduced at another. This is a characteristic of all solid-state digital storage devices that operate asynchronously. These time-variant digital frame stores may be envisioned as a flexible rubber band whose length (as indicated by storage interval or capacity) is variable. A singularly important feature of the device is the ability to access any one of the approximately 250,000 picture elements or groups thereof by means of an *x,y* addressable cursor. Applications where this device may be employed are enumerated.

*CEEFAX — Broadcast Information Service* (Rainger) provides an outline of the technical aspects of a BBC study program to broadcast facts, information and entertainment, displayed as a text (alphanumeric characters) on the television screen. A brief description is given of the program services which could be offered by such a system and a start has been made to establish the system's market potential.

*Theater Projection Practices*

*Supersplit* (Richard) describes a 35mm two-sprocket-hole picture format having an image ratio of 1.66:1.

*Effects of Gate Design and Film Types on 35mm Projected Screen Images* (Jenkins) reviews and updates the technical papers of W. Borberg (*Jour. SMPTE*, Aug. 1952 and Oct. 1957). It is suggested that this work remains highly valuable in the 1970s in the field of 35mm theater projection.

*Projection in 35mm: Depth-of-Focus and "Depth-of-Film" Considerations* (Berggren) reports on test work to confirm that the proper match of film shape to lens field curvature solves both the flat screen, and shallow curved screen simultaneously, and that the solution becomes essentially universal, not special.

*Trends in Motion-Picture-Industry Development in the USSR* (Komar) contains information on the recent years' progress of motion-picture industry in the USSR and points out the prospects of its further development: volume of motion-picture production, release printing and distribution, and the number of theaters and their capacity. Peculiarities are considered in development of various cinema systems in the USSR: academic format, 35mm anamorphic, wide-screen and 70mm. Transition from one format into another is discussed. Basic features of technical facilities used in the USSR for motion-picture production are mentioned. Technical novelties in the field of acoustics and sound-stage equipment are considered. Perspectives of using TV technology and magnetic video-recording for film production of feature films are evaluated. Basic features and new technological and architectural-acoustical solutions in motion-picture theater design are given. Specifications of widely used and new unified equipment, intended for film presentation (projection, sound recording and reproduction, power supply) are also given.

*Two- and Three-Channel Stereophonic Photographic Soundtracks for Theaters and Television* (Uhlig) considers the relative advantages and disadvantages of two- and three-channel soundtracks and then discusses the advantages of the two-channel system with a derived center channel, as compared to a three-channel system. These advantages are: signal-to-noise ratio better than three-channel system, less expensive and less complex recording and reproducing equipment, and suitability for stereo television broadcasting.

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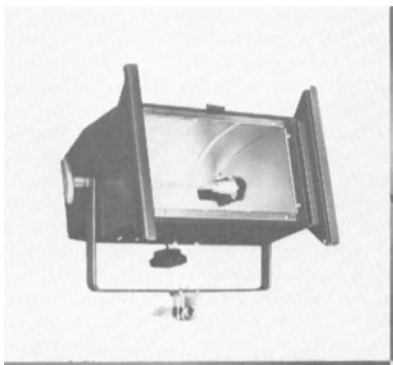

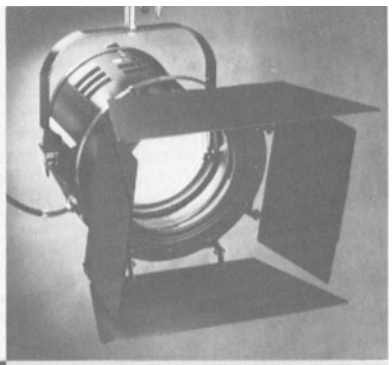

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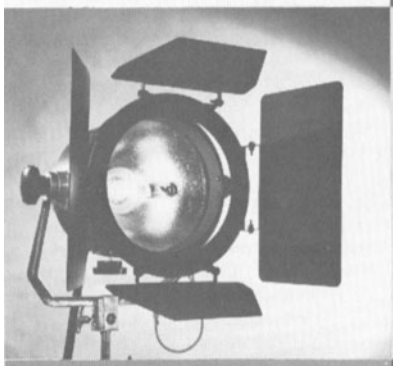

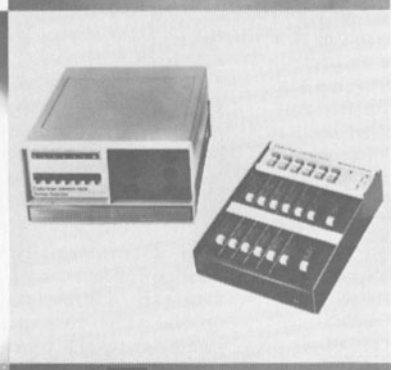

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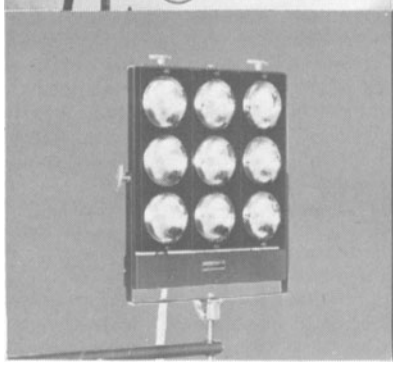

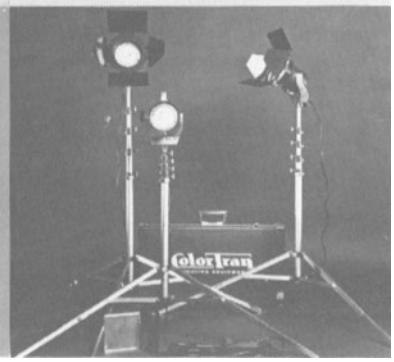


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*The New International Helical-Scan Two-Inch Tape Recorder and Other Recent Advances in Videotape*

*The Design of a Segmented-Scan Helical Broadcast Recorder* (Guisinger) presents the technical reasoning leading to the choice of a 180° wrap, two-head, segmented-scan video format. Technical advantages and disadvantages of the chosen format, in terms of interchangeability, and comparisons with the more conventional helical-scan techniques are described. Special features of the recorder include a chroma-match system as well as the conventional absolute auto chroma. The unique ability of the recorder to playback full-color pictures with no external synchronizing signals for "quick look" signal verification in remote locations are outlined.

*A Unique Timing-Reference System for Broadcast VTRs* (Dann) describes a system in which synchronous clocking is provided by a voltage-controlled oscillator locked to a multiple of the horizontal rate near 8 MHz. It is thus possible to provide the required array of pulses with one stable factory adjustment, i.e., the free-running rate of the voltage-controlled oscillator. Operating characteristics in normal record and playback modes and in edit-playback/edit-record modes are discussed.

*The Servo System for a Helical Broadcast Recorder* (Morgan) describes the IVC-9000 videotape-recorder servo system. New developments in the areas of tape-deck design, motor design, air-bearing techniques, and servo philosophy have been applied throughout the machine. The superior stability of time-base error at the demodulator output is a result of precise control of tape motion and tension by the system.

*Operational and Economic Features of a Segmented-Scan Helical Broadcast* VTR (Roizen) proposes a new format for videotape recording utilizing two-inch longitudinally oriented tape with a two-head configuration. The primary advantage over the existent quadruplex system is the addition of two more longitudinal tracks, which provide two channels of high-quality audio and a completely sepatate address-code track for automation and editing purposes. The recorder described represents the combination of the best mechanical characteristics of the helical-scan format with the most advanced electronic techniques for signal handling. The result is a videotape recorder of full broadcast quality, matching or exceeding the electrical-signal specifications of the present quadruplex machines now in regular use. In addition, it requires less setup time, less maintenance, and less operational skill to produce the highest quality color-television image.

*Possibilities for a New Compatible Quadruplex Video Recording Format* (Grever) offers some possibilities for modifying the existing video recording standard. Design tradeoffs that can be made between equipment cost, performance, reliability and operating features are discussed.

*Slow-Motion Sheet Videocorder and its Application to Sony Sports Clinic System* (Kihara & Odagiri) presents a detailed description of the basic elements of this recorder/reproducer system. The recorder uses as a recording medium a circular magnetic sheet with thin Mylar backing. As the sheet rotates, an air cushion is created with such dynamics that the sheet will stretch, generating the necessary head-to-sheet contact pressure. In contrast to video disc recording, the head-to-media surface contact no longer requires critical adjustment. The video is recorded on the sheet in a continuous spiral track by a moving record/reproduce head. This main head moves radially across the rotating sheet at a linear speed during record. In reproduction, the motion of the head is either linear or in steps at preselected rates. Two independent stationary heads, located at the periphery of the sheet and at opposite sides, are employed during slow-motion operation to record and reproduce a single field of video signal from the main head. For a system conceived to aid in visual analysis of moving objects, at selected slow rates, applications are numerous, especially in the fields of educational television and sports analysis. Other possible applications are also discussed.

*Advances in Videotape and Editing Practices*

*Automatic Videotape Editing System Utilizing Work Prints Made From Videotape* (Yura & Itoh) outlines a simplified video editing system. A "video rush" print is produced from the videotape at 30 frames/s (which is video frame-for-frame in the NTSC system). The work print is then edited normally. (Editing points can be determined independently as all the necessary address information is printed on the video-rush print.) A cue sheet is produced by the processor from the edited video-rush. And the final edited videotape is automatically produced using the cue sheet. The video-rush system is being utilized by the Far East Laboratories in Tokyo. It was first used by Nippon Television Network to produce a 60-min documentary comedy; it was filmed entirely with 8mm cameras, recorded on 2-in videotape, edited via video-rush prints, and the edited videotape was telecast.

*The Film/Tape Experience* (Jones) summarizes the advantages of electronic editing of 16mm film intended for network, local, cable and cassette television. The method described here uses two helical-scan videotape recorders to assemble a rough-cut workprint of the presentation originally shot on 16mm film and transferred to both 2-in quadruplex videotape and helical-scan videotape. Once the edited videotape workprint is approved, the editor reads the start and stop frame-addresses for every scene on the workprint and enters them — along with dissolve lengths and optical-effects notations — upon a manual off-line editing log. Then, utilizing a random-access programer the proper scenes on the original quadruplex wild-footage roll are duplicated in sequence to give the composite master. Once the final assembly has been approved, the finished film/tape production is ready for prompt duplication and distribution.

*Computer-Controlled Videotape Editing System Using Helical-Scan Recorders for Data Collection* (Habermann & Sauter) describes an economical electronic editing system proposed by the Institut für Rundfunktechnik to free their quadruplex recorders for program production and transmission. It utilizes small helical-scan machines for the (time-consuming) decision-making editing process. The final program assembly on quadruplex videotape is then automatically carried out using the data collected and stored in a computer.

*Application of Cassette VTRs in Programming, Editing and Production* (Busby) lists the unique production opportunities offered by the use of videotape cassettes. Each part of a program remains physically separate, within its own cassette. Unlike electronic editing, a part's length may be changed without altering the other parts and without erasure of video or program audio. Unlike mechanical editing, nothing is cut and discarded. Since scene manipulation is non-destructive, original recordings are used in the assembly. In this way, the end product can be one less generation removed from the original than is usually the case. Preparation for play (cueing) is done automatically and rapidly without replay of video. The usual excessive wear of the first part of the tape is avoided. Tape and head wear are further reduced by the protection from fingers and dust provided by the cassette.

*Automatic Editing System for Videotape* (Akrich) describes a system intended for use in small installations with quadruplex or helical-scan videotape recorders. The main functions performed are the following: to provide time continuity between two scenes as reproduced by two videotape recorders; to allow the operator to select and adjust adequately the timings which will correspond to the end of a given scene and the beginning of the following one; to simulate the edit thus defined and amend it if necessary until it is felt satisfactory; to shift the audio switching point with respect to the video one.

*The New NHK Hall* (Moriyama) outlines the design requirements and the audio, lighting and broadcast facilities of this new hall, completed in June 1973.

*Minicomputer Applications in Television*

*Computerized Election Display System* (Dubner & Berry) deals with the philosophy of the system design, the hardware and software details, the operational problems, the experience on election night, and recommendations for improvements for future election coverage.

*The Automated Television Station* (Hutchinson) discusses the increasing importance of the minicomputer in the control of broadcast television equipment. Broadcast automation applications are covered in some detail. The operation of the Central Dynamics APC-610-200 integrated broadcast automation system is described.

*Automated Television Waveform Measurement by Use of a Digital Computer* (McKenzie) reports on an extended field experiment in progress. This in general aims to test the efficacy of the methods of television-waveform technical-quality monitoring, as it may be applied to the regional control and monitoring centers of Independent Broadcasting Authority (England). In the experiment, a representative sample of uhf signals was received over air and demodulated, the vertical-interval test signal in the resultant video signal being analyzed by the computer.

*Computerized Continuity Control for a Third TV Program at ORTF* (Guillermin) describes a pilot program for the eventual

automation of the entire broadcast process.

*SynthaVision: A Dimensional Approach to Computer-Generated Visualization* (Myers, Jr.) reviews the use of the computer for the creation and modification of visual material. The SynthaVision process, a new commercial computer-based system utilizing combinational geometry and the principals of photography for the visual representation and movement of dimensional objects and backgrounds, is described and is differentiated from other computer and non-computer based systems. Program capabilities, hardware systems, and operational procedures are discussed.

**Opening the Equipment Exhibit are Conference Vice President Harry Teitelbaum, Exhibit Chairman Dom Capano, and SMPTE President Byron Roudabush.**

The following papers were not presented at the Conference though they were scheduled on the Final Program.

*Operational Experience with the ABTO System* (Einstein)

*Video Rushes for Hand-Held Camera* (Beauviala)

*Stroboscopic Analysis of 35mm Film in a Horizontal Curved Gate* (Nelson)

## Equipment Exhibit

The most astonishing thing about this exhibit was the consistantly high attendence level it maintained throughout the four days it was open. From the minute the exhibit doors flung open on Monday evening, till after its doors closed on Thursday night, there was never a time when the exhibit was not crowded. As it turned out, the total attendance for the exhibit was indeed the largest in any recent conference with well over 3,000 passing through the doors.

In all there were 47 companies exhibiting, taking a total of 69 booths. The majority of exhibitors showed motion-picture equipment, with practically every major brand of camera, editor, printer, on display. This is not to say that TV equipment was not shown extensively as several dealers has various kinds of TV equipment. In fact the largest display at the Conference was a manufacturer of TV equipment who introduced its new TV broadcast recorder. There was also a large number of booths showing lighting equipment, sound equipment in addition to miscellaneous items. A full listing of the exhibitors and what they showed can be found in the Exhibit Directory on the September *Journal*, pp. 776, 770, 772, 774, and 776.

The person in charge of this successful Exhibit was Dom Capano, Cincraft International, Inc., the Exhibit Chairman. Capano had started months in advance of the show working with the decorator on choosing a layout, then planning the promotion of the exhibit. He was in charge of all exhibit booth sales, and supervised the exhibit during conference week.

Companies exhibiting are:

Angenieux Corp. of America
Arriflex Co. of America
Audio Devices Inc.
Bell & Howell Professional Equipment Div.
The Camera Mart, Inc.
Canon, U.S.A., Inc.
Cinema Products Corp.
Cine 60, Inc.
Communication Arts, Inc.
Eclair Corp. of America
Ediquip Corp.
Elemack
F & B/Ceco-SOS Photo-Cine Optics Inc.
Frezzolini Electronics Inc.
General Electric Lamp Business Div.
General Enterprises, Inc.
General Rayfin Ltd.
GTE Sylvania Inc.
Guillotin Splicer
Hazeltine Corp., Industrial Products Div.
Hervic Corporation/Cinema Beaulieu
Hollywood Film Co.
Image Devices Inc.
International Video Corp.
I/O Metrics Corp.
KEM Electronic Mechanical Corp.
Laumic Co., Inc.
Lowell-Light Manufacturing Inc.
Magnasync/Moviola Corp.
Maurer Commercial Products, Inc.
Mead Technology Laboratories
Metro/Kalvar Inc.
Mitchell Camera Corp.
Mobius Cine Ltd.
Mole-Richardson Co.
Motion Pictures Enterprises, Inc.
Nagra Magnetic Recorders, Inc.
O'Connor Engineering Laboratories, Inc.
Oxberry, Div. of Richmark Camera
Paillard Inc.
Plastic Reel Corp. of America
Precision Laboratories, Div. of Precision Cine Equipment Corp.
Research Technology, Inc.
Rosco Laboratories Inc.
TV Associates
Wilcam Photo Research, Inc.
Gordon Yoder, Inc.

**Ladies Committee Co-Chairmen Mrs. Robert Smith and Mrs. Charles Ahto.**

## Ladies Program

The women who attended the Conference and participated in the ladies activities were treated to a week of well-planned and interesting events that took advantage of New York's uniqueness.

On Monday, the ladies viewed a lecture on needlework, then toured Bonwit Teller and had tea at the Plaza Hotel; on Tuesday, they visited the New York Stock Exchange, lunched at Fraunces Tavern and toured lower Manhattan by bus; Wednesday was a free day. Thursday, the ladies went up to West Point, and Friday, they toured the Frick Art Reference Library. Each day, of course, began with continental breakfast in the ladies headquarters suite.

Marge Ahto and Edna Smith were Ladies Committee Co-Chairmen and were responsible for planning of the ladies program. The following women served as hostesses during the week: Mrs. Sam Bunchez (Helen); Mrs. Dominick Capano (Mae); Mrs. William Cooper (Kay); Mrs. Irwin B. Freedman (Pat); Mrs. Richard Hyde (Flo); Mrs. John Kowalak (Irene); Mrs. John Maynard (Louise); Mrs. Edward Messina (Sue); Mrs. Arthur Miller (Dottie); Mrs. Herbert Pilzer (Pucki); Mrs. Edgar Schuller (Doris); Mrs. Burton Stone (Judy); and Mrs. Irwin Young (Diane).

## Banquet

The SMPTE Banquet, held on Wednesday night, was an enjoyable event for all

**Yasuo Saeki, Harry Teitelbaum, SMPTE Conference Vice President, and Tsuneo Utsumi.**

who attended. Kurt Wulliman, 3M Co., was Banquet Chairman and Irwin Young, DuArt Film Laboratory, was Entertainment Chairman, and together they combined to plan a memorable evening. The pre-conference cocktail party was sponsored by Fuji Photo Film USA, Inc.

## Committee Meetings

Conference week is the time when most SMPTE committees meet. Starting with the Sunday Board of Governors meeting, the week is full of meetings of every kind, from administrative to engineering.

The following engineering committees met during the week: Sound, Color, Standards, Television, 16 and 8mm, Film Dimensions, Film Projection Practices, Photo-Instrumentation, Laboratory Practices, and the delegates of PH 22 and USA ISO/TC 36.

There was also a joint meeting of the Board of Editors and the Publications advisory Committee.

## Short Film Subjects

Each session began with a short film. The following is the list of films for the week. These films were arranged for by Burton Stone, Precision Film Labs., the Opening Films Chairman.

*Cycles,* courtesy of the Glass Container Institute

*Two Faces of the Sea,* courtesy of the State of Maine

*For the Love of an Eagle,* courtesy of the South African Information Service

*Teeth Are Good Things To Have,* courtesy of Johnson & Johnson

*The Fable,* courtesy of Mobil Oil Co.

*The One Man Band That Came To Wall Street,* courtesy of New York Stock Exchange

*What Do You Mean By Design?,* courtesy of Peckham Productions

*The Magic of Hobby Ceramics,* courtesy of Modern Talking Picture Service, Inc.

*The Gentle Giants,* courtesy of Anheiser-Busch

*Invitation,* courtesy of State Farm Insurance

*Pan Am's World,* courtesy of Pan Am Airways

## Acknowledgments

The SMPTE thanks the following companies and organizations for providing necessary services and equipment.

*Coffee Club:* Philip A. Hunt Chemical Corp.

*Cocktail Party:* Fuji Photo Film U.S.A., Inc.

*Theater Passes:* Radio City Music Hall

*Ladies Gifts:* Agfa-Gevaert, American Broadcasting Companies, Inc., Ampex Corp., Arriflex Co. of America, Berkey Colortran, Inc., Calvin Communications, Inc., Carbons, Inc., Columbia Broadcasting System, Inc., Consolidated Film Industries, DeLuxe General Inc., DuArt Film Laboratories, Inc., Eastman Kodak Co., Frezzolini Electronics, Inc., Fuji Photo Film U.S.A., Inc., General Electric, Goldberg Brothers, Inc., Hollywood Film Co., KEM Electronic Mechanic Corp., Motion Picture Enterprises, Inc., Movielab, Inc., Tape Films, Inc., Technicolor, Inc., Vacuumate.

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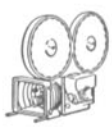

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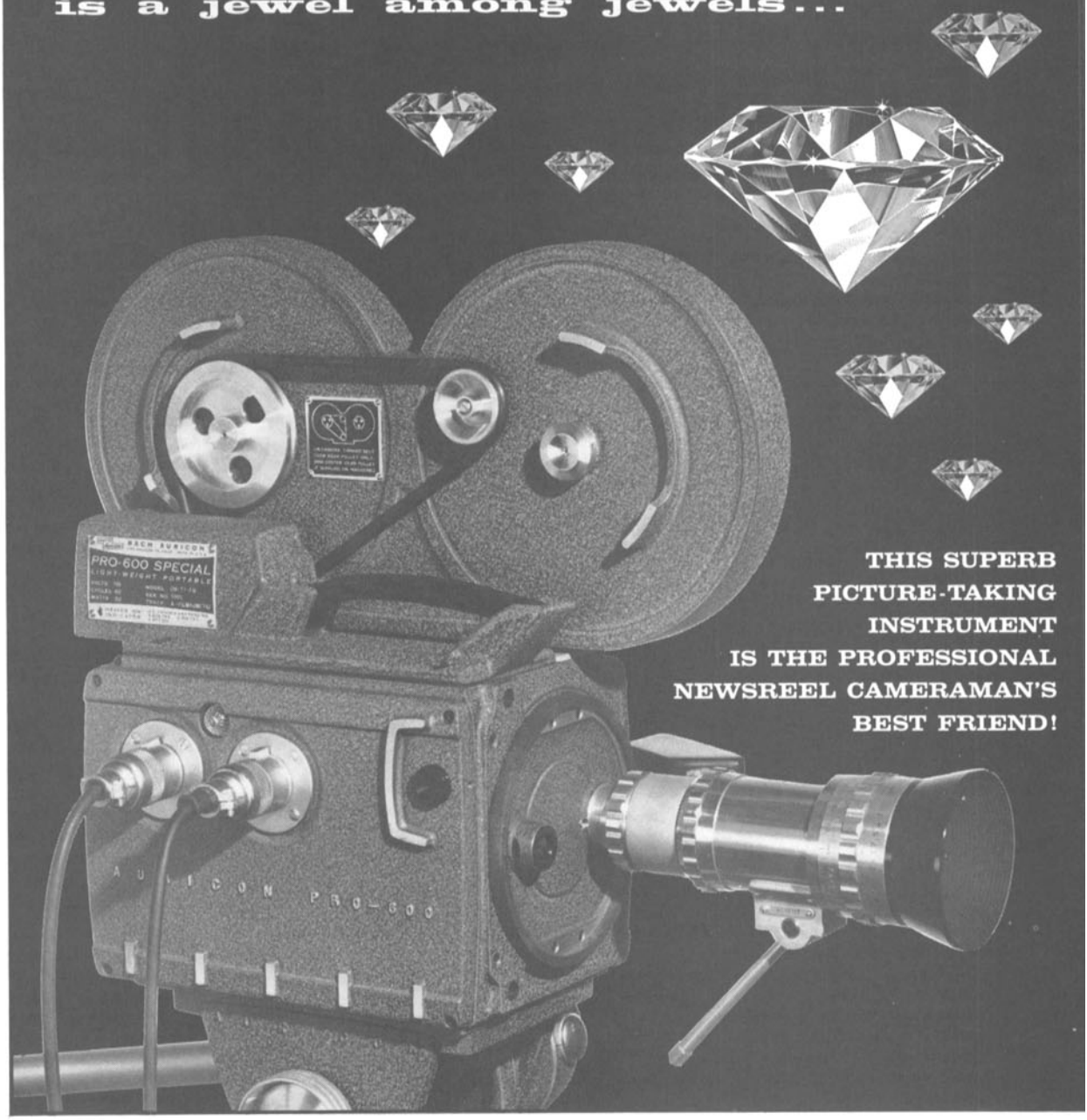


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