



Members of the 112th Conference Arrangements Committee.

A Report on the 112th Technical Conference

By THOMAS E. KING
Assistant Editor

Advances in film technology, sound recording, film-television systems, cable television, and more, made the 112th Technical Conference in Los Angeles the excellent meeting that Society members have come to expect. The Technical Program offered diversity—of both new equipment and techniques. The Arrangements Committee had obviously gone to great pains to make the meeting a success. And the accommodations at the Century Plaza were excellent.

Over 3500 people attended the Conference, a thousand having registered for the technical sessions. As usual the Equipment Exhibit drew a large and appreciative crowd. The week's activities included the presentation of seventy-seven technical papers and panel discussions; an exhibition by sixty-one manufacturers and distributors of the latest hardware and services of interest to the industry; and a program of social events.

The overall responsibility for the Technical Papers Program at the Los Angeles Conference was given to Dr. Frank P. Brackett by Editorial Vice-President Putman. As Program Chairman Dr. Brackett selected the papers and carefully assembled them into 15 sessions. He was assisted in securing the papers by Associate Program Chairman Ralph Westfall and by the Topic Chairmen. Each of the Program Topic Chairmen was responsible for receiving or inviting papers in a specific area; they were:

Motion-Picture Studio Practices, Lighting, Exposure, etc., *Winton C. Hoch*; Sound Recording and Reproduction, *Petro Vlahos*; Photosensitive Materials for Motion-Picture and TV Practices, *Julian D. Hopkinson*; Laboratory Practices, *Fred J. Scobey*; Theater Presentation Practices, *Paul H. Preo*; Small-Format Films, *John H. Donlon*; Television Systems and Editing, *Melvin G. Sawelson*.

On Thursday and Friday, there was a Symposium entitled "Communications Satellites and Cable Television." Symposium Chairman Frank P. Clark assembled a most informative array of papers and panel discussions. This specialized topic did not draw a large audience but, in the words of SMPTE President Holm, "it is an important topic that will have meaning to many segments of the industry and it is better that we lead the way in presenting this information."

The Arrangements Committee, which provided the various services and equipment necessary for the Conference, was headed up by Anthony Bruno. Through his efforts and those of the Committee members listed below, the Conference appeared to run very smoothly. This *appearance* of smoothness belies the amount of work that was involved.

Of particular note was the very demanding task of providing projection and audio recording facilities for all of the technical sessions. This was accomplished, once again, by C. Carroll Adams and his staff. Another completely unnoticed but necessary job is that of Conference auditor; Russell Dubes devoted his entire week to this task.

Managing the registration desk at the Conference—supervising the staff of workers at the desk and handling the many exceptions to the rule—was the job of Gene Murphy. The Banquet Arrangements were handled most efficiently at this Conference, through the efforts of Vern Frith. Harry Lehman supervised the publicity and press room facilities at the Conference.

Arrangements Committee

Arrangements Chairman: *Anthony Bruno*; Assistant Local Arrangements Chairmen: *Don Henderson, Fred Detmers*; Auditor: *Russell F. Dubes*; Banquet Chairman: *Vernon Frith*; Assistant Banquet Chairman: *Dinny Clark*; Equipment Exhibit Chairman: *M. Warren Strang*; Hospitality and Foreign Delegations Chairman: *Charles Wright*; Hospitality and Foreign Delegations Co-Chairman: *Ken Erhardt*; Hotel and Motel Arrangements Chairman: *Ed Burns*; Ladies Program Co-Chairladies: *Mrs. Anthony D. Bruno, Mrs. Kenneth M. Mason*; Luncheon Chairman: *Jack Hall*; Membership Chairman: *Edward Whiting, Jr.*; Membership Co-Chairman: *Marvin Jacobs*; Opening Films Chairman: *Phil Singer*; Projection Chairman: *Don Kloepfel*; Public Address and Recording Chairman: *C. Carroll Adams III*; Publicity Chairman: *Harry Lehman*; Registration Chairman: *Eugene M. Murphy*; Transportation Chairman: *Scott Robertson*.

Get-Together Luncheon

On Monday at noon, after the close of the morning session, the traditional Get-Together Luncheon took place with a capacity attendance. SMPTE President Wilton R. Holm was the first of the luncheon speakers. He was followed by the guest speaker, Roy B. White, President of the National Association of Theater Owners. He spoke in opposition to proposed censorship legislation in California.

Excerpts from President Holm's Speech

This is the fourth and final Conference within my two-year term of office as President of our Society.

Serving as President has been a pleasure, a privilege, and an honor. I thanked you for this honor two years ago in this very room; and now that my two years as President are



Left half of double dais at Get-Together Luncheon.

about to end, I can honestly say that I still thank you.

During those two years our Society has gained in stature in many ways, both here in the United States and abroad. This is due to some small extent to my own efforts—but in a very large measure to the outstanding officers and governors of our Society with whom I have had the pleasure of working.

There is an old Chinese philosophy which states: "It is greater to get ten men to do the work, than to do the work of ten men." I, too, espouse this philosophy; and when a call went out to these officers and governors, they responded superbly. I cannot thank them enough, or praise them too highly. I take this opportunity to thank them publicly.

There is one topic about which I would like to speak very briefly today, and that is standardization.

If any important function of technology is taken for granted, it is standardization. Because of standardization—because all the physical aspects of the American film and film-handling equipment are compatible with others—the motion picture can travel anywhere in the world, and be shown in any country just as it is shown in any other country. This fact has made film the dominant carrier of sight and sound in all the world.

I need not remind you that this compatibility results from the unceasing efforts of motion-picture scientists and engineers of many countries; men and women who, working through technical societies like the SMPTE, and through motion-picture and television research organizations, meet frequently in plenary sessions to maintain technological compatibility against the thrust of technological innovation.

Nor do I need to point out that, commercially speaking, technological standardization is vital to the motion-picture and TV industries. But I must point out that standardization cannot be taken for granted. Standardizing activities cost money, much of which is made available by our Sustaining Members, for whose assistance we are extremely grateful. We hope that others also learn that they are investing in their own businesses when they support our standardization activities.

And now, ladies and gentlemen, because our program is long and we are working against the deadlines of our papers program, let me just thank you once again—especially for



SMPTE President Wilton R. Holm with luncheon guest speakers Roy B. White, President of NATO, and Jack Warner.

all the kind letters you have sent me about my talks and my writings. I am most grateful. I thank you all—very, very much.

Awards Presentation

SMPTE's annual awards presentation was once again an integral part of the Monday Get-Together Luncheon. SMPTE President Wilton R. Holm presented the awards to the winners or to those who accepted for the absent winners.

A report on who received awards, the citations, and biographical information follows.

Honor Roll

It is the purpose of election to the Honor Roll of the Society to honor an individual who in his lifetime performed eminent service in the advancement of engineering in motion pictures, television or in the allied arts and sciences.

The late Robert Richter has been elected to the Honor Roll of the Society in recognition of his lifelong contribution to motion-picture technology and particularly for the engineering design and development of professional motion-picture cameras.

Robert Richter, with his schoolmate, August Arnold, founded the German company, Arnold and Richter, in 1917. In 1925 Robert Richter came to the United States, where he worked in many areas of film production in Hollywood, including cameraman for Universal Films. He returned to Germany to complete his formal education and was graduated from the Munich Technological University as Dipl. Ing. and Doctor of Political Economy.

In 1936 his company introduced the Arriflex 35, a revolutionary camera based on the invention of a rotating mirror shutter. Dr. Richter received many honors for his pioneering work in the motion-picture field during his lifetime. Among these were the Grand Cross First Class of the Order of Merit of the Federal Republic of Germany, the Bavarian Order of Merit, the Oskar Messter Memorial Medal, the Diesel Medal and the Laterna Magica Medal.

In 1967 an Academy Award was presented to Dr. Richter for the Arriflex camera. Dr. Richter joined the Society in 1956 and was made a Fellow in 1968.

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.

The premier award of the Society, the Progress Medal, is given to Dr. Norwood L. Simmons in recognition of the energies and talents he has contributed during his professional career to the advancement and growth of the motion-picture industry, first by means of his own technical efforts and inventions, and later by his leadership and guidance in bringing to fruition the technical contributions of many groups and individuals in engineering developments through the years.

Norwood L. Simmons joined the Eastman Kodak Company in 1937. From 1941 to 1966 he was with the Motion Picture Film Department's West Coast Division in Holly-



Right half of double dais at Get-Together Luncheon.

wood, becoming General Manager in 1964. In 1966 he moved to Rochester and in 1969 became General Manager of the Motion Picture and Education Markets Division and an Assistant Vice-President of the Company.

A native of North Carolina, Dr. Simmons graduated from the University of North Carolina in 1933 and obtained an M.S. degree from the California Institute of Technology in 1935 and a Ph.D. in 1937 from the University of North Carolina. He is Past President and Fellow Member of the SMPTE, a Fellow of the British Kinematograph, Sound & Television Society, and a member of the Society of Photographic Scientists and Engineers and the Academy of Television Arts and Sciences.

Dr. Simmons is an Associate Member of the American Society of Cinematographers and of the Academy of Motion Picture Arts and Sciences. He holds seven patents relating to motion picture films and has had numerous articles published in professional journals.

In his early years Dr. Simmons originated a new anti-halation layer for motion picture films, which is still in general use. During the period of the introduction of Eastman Color Films, Dr. Simmons played an important role in the technical liaison involved in solving the problems encountered in the use of these films and in the definition of their characteristics.

Dr. Simmons has retired from Eastman Kodak Company as of January 1, 1973. His leadership in the motion-picture industry for so many years and his service to this Society as its President and in many other capacities is well appreciated. It is hoped that with his retirement his Society activity will increase rather than diminish.

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 con-

tributed to the improvement of the engineering phases of instrumentation and/or high-speed photography.

The E. I. du Pont Gold Medal Award for 1972 is presented to R. J. North for his valuable contributions to the technology of instrumentation photography and particularly for his work on brief light sources, color schlieren systems and on monochrome graded filter schlieren systems.

R. J. North, Chartered Engineer and Associate Fellow of the Royal Aeronautical Society, was with the Royal Air Force during World War II and for fifteen years after the war worked at the National Physical Laboratory, Teddington, England, where he was in charge of the instrumentation for their high-speed wind tunnel. Last year the Aerodynamics Division of National Physical Laboratory merged with the Aerodynamics Department of the Royal Aircraft Establishment at Farnborough.

Mr. North is now in charge of the Instrumentation and Data Systems Group, High-Speed Division, Aero Department of the Royal Aircraft Establishment.

Mr. North is co-author of a definitive book on schlieren methods and author of a great many scientific papers concerned with light sources for high-speed wind tunnel pictures and optical systems for the study of fluid flow. He has been a frequent contributor in papers and in discussions at the International High-Speed Photography Congresses and is a founder member of the British National Committee for High-Speed Photography, of which he is at present Chairman.

His reputation as a leading authority on all methods of visualization and measurement of fluid flow is international.

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.



Norwood Simmons receiving SMPTE's highest award, The Progress Medal, from President Holm.



A Special Recognition Award is presented to Dr. Harold A. Rosen, by SMPTE President Holm.



President Holm presents a SMPTE Special Recognition Award to Carroll H. Dunning.

The Eastman Kodak Gold Medal for 1972 is awarded to Eric M. Berndt for his development of 16mm sound recording equipment within the economic means of educational and independent film makers at a time when professional equipment was beyond the resources of most such organizations. His continuing contributions have encouraged experimentation in new formats and his interest in the historical aspects of the equipment has helped to insure the preservation of prime examples of early equipment for the study of future scholars.

Eric M. Berndt received his early training in motion-picture technology at Siemens in Germany. After immigrating to the United States in 1922 he was associated with various research and development projects, including projects at Duplex Motion Pictures Industries and RCA Photophone.



Eric M. Berndt receives the Eastman Kodak Gold Medal Award from President Holm.



B. J. Davies, chairman of BKSTS, presents the E. I. du Pont Gold Medal Award to R. J. North in England.



Daan Zwick (left) was the recipient of the Herbert T. Kalmus Gold Medal Award.

In 1932 Mr. Berndt established his own company, which produced the first professional sound-on-film 16mm motion-picture camera and the first 16mm sound recorder. In 1935 he was joined by John Maurer to form the Berndt-Maurer Corporation, which manufactured sound cameras, galvanometers, recorders and other motion-picture apparatus.

In 1939 Mr. Berndt moved to the West coast where he formed the corporation which developed into the Berndt-Bach Company, manufacturing Auricon 16mm sound cameras and recorders. Since leaving the company in 1960, Mr. Berndt has worked on special development projects and has also made a collection of early motion-picture equipment considered one of the best in the world.

In 1965 he was named Honorary Curator of the Motion Picture Section of the Hollywood Museum. Mr. Berndt has been a member of the Society since 1927 and was elected to Fellowship in 1939. He holds a number of patents relating to camera and sound for motion pictures.

The Journal Award

It is the purpose of this award to recognize the outstanding paper originally published in the *Journal* of the Society during the previous calendar year.

The Journal Award is presented to Renville H. McMann, Jr., Leo Beiser, Wendell Lavender and Robert Walker for their paper entitled "Laser-Beam Recorder for Color Television Film Transfer" published in the September 1971 issue of the Journal of the SMPTE.

Renville H. McMann, Jr., President, CBS Laboratories, received his degree in engineering from Yale University and is a Fellow of the Yale Engineering Society. In 1970 he was co-author with Dr. Peter C. Goldmark of the paper on color EVR that won the 1971 Journal Award.

Mr. McMann has been the recipient of two Emmy Awards, for a portable digitally controlled color camera and a color corrector for NTSC signals. He is a Fellow of

the SMPTE as well as a Fellow and Past President of the Radio Club of America and a member of IEEE and the Royal Television Society. Co-authors with Mr. McMann of the present award-winning paper are three engineers at CBS Laboratories: Leo Beiser, Wendell Lavender and Robert Walker.

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 theatre television.

The David Sarnoff Gold Medal Award for 1972 is presented to Peter Rainger for his pioneering development of all-electronic television standards conversion techniques to-

gether with numerous other important contributions to television technology.

Peter Rainger graduated from London University with a Bachelor Degree in Engineering. His work for the British Broadcasting Corporation, where he was head of the Designs Department from 1968 to 1971, has been in television equipment design, magnetic and film recording systems and line and field rate standards conversion.

Since November 1971 he has been head of the BBC Research Department directing all BBC research on sound and vision. Mr. Rainger received the Geoffrey Parr Award in 1964 and an Emmy Award 1967-68. He is a Fellow of the Institute of Electrical Engineers.

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 color motion pictures for theatre or television use.

The Herbert T. Kalmus Gold Medal Award for 1972 is presented to Daan M. Zwick for his many contributions to color technology in motion pictures as seen in theatres and on television receivers and for his extensive studies of the basic nature of graininess and sharpness of color photographic materials.

Daan M. Zwick is a graduate of the University of Vermont. His work in the Kodak Research Laboratories has included participation in the development of the original Eastman color family of motion-picture films, supervision of the Color Photographic Systems Laboratory and research in the use of color film on television in the Color Photography Division.

He presently holds the position of Senior Research Associate in the Kodak Research Laboratories where he is concerned with studying the interface between film and television for the benefit of both technologies.

Mr. Zwick has published several major papers dealing with color technology in the *SMPTE Journal* and in the journals of other scientific societies. He serves on the SMPTE Color Committee and is one of the Society's representatives to the International Commission on Illumination, the Inter-Society Color Council, the International Radio Consultative Committee (CCIR) Study Group X on Broadcasting and the JCIC Ad Hoc Committee on Color Television Study.

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 for 1972 is pre-



Recipients of the SMPTE Fellow Awards are: (left photo, l-r) R. A. Isberg, Claude L. M. Mercier, Calvin M. Hotchkiss, Ralph Westfall, Don Norwood, Vernon G. Frith, Boris Townsend, and Hugo A. Bondy. Recipients of the SMPTE Fellow Awards are: (right photo, l-r) Ralph D. Whitmore, Jr., Richard K. Schafer, Hans Schmid, Findlay J. Quinn, and Royce L. Pointer.

sented to George R. Groves in recognition of his many technological improvements for motion-picture sound recording.

George R. Groves graduated from Liverpool University, England, and came to the United States in 1923. From 1923 to 1925 he was at Bell Telephone Laboratories, New York during the period of development of electrical recording of phonograph records and synchronization of sound in motion pictures.

In 1925 he transferred to Warner Brothers with the first Vitaphone installation and recorded the first Vitaphone public showing August 6, 1926, which included the recorded musical score for "Don Juan" and various Vitaphone short subjects. In April 1927 he moved to Hollywood to record the original "Jazz Singer" with Al Jolson and in 1928 recorded the first all-talking picture "Lights of New York."

Mr. Groves has participated actively and in a supervisory capacity on all Warner Brothers productions to date, including 32 productions that have received Academy nominations for sound, three of which received Oscars.

From 1942 to 1945 Mr. Groves served as officer in charge of sound recording for the Army Air Force. He is presently engaged as consultant on modernization and extension of recording, re-recording and music scoring facilities for the Burbank Studios.

New Fellows of the Society

Hugo A. Bondy, Chief Engineer, WAGA-TV, Atlanta, was educated at Pace Institute, Columbia University and Capitol Radio Engineering Institute. He served as Senior Field Engineer in North Africa and Italy during World War II and has been with Storer Broadcasting Co. since 1951, where he has done distinguished work in the design, construction and installation of complete audio/video distribution amplifiers and switchers, projection/VTR control systems and VTR slaving and dubbing facilities. Mr. Bondy was Program Chairman of the 1970 Winter TV Conference

in Atlanta and has long been active in the management of the Atlanta Section. He has achieved general recognition in the broadcasting industry for progressive leadership in station engineering.

Frank L. Flemming, Vice-President, NBC Television Network, was graduated in electrical engineering from the University of Buffalo. Moving from Sylvania to CBS in 1954 he became Director, Plant Systems Engineering and was responsible for engineering of many new TV equipments and systems. He was Chief Engineer, Visual Electronics Corp., from 1967-1969. At NBC he has responsibility for design, specification, installation and costs of technical equipments and systems plus architectural design for NBC Television Network and NBC Radio Network. Because of his stature and the important and responsible position now held by

Mr. Flemming at NBC, he brought to bear a significant influence in the broadcasting engineering field.

Vernon G. Frith, President, Hollywood Valley Film Laboratory and Vice-President and Director, Dymat International Corp., founded the Hollywood Valley Film Laboratory in 1952. The laboratory specialized in the use of 8mm and he was one of the first to use Eastman color small format film. Mr. Frith built and used reduction and blow-up printers for 8mm, adapted many other pieces of laboratory equipment, and developed economical techniques for the processing of 8mm black-and-white and color films. He has been an active participant in many of the courses sponsored by the Society at the University of Southern California and in 1971 was a delegate to the International Standards Organization in London.

Calvin M. Hotchkiss, Coordinator, Engineering Services, for the Eastman Kodak Company's MP&EM Div., New York, graduated from Princeton in 1943 and obtained his M.A. from the University of Rochester in 1949. As Engineering Service representative for Eastman Kodak 1950 to 1971, he directly assisted many motion picture laboratories and television stations on the East coast in setting up black-and-white and color motion-picture processes. With Walter I. Kisner, he was active in setting up the Tutorial Papers Sub-Committee to encourage the preparation and publication of tutorial papers in the *Journal*. Mr. Hotchkiss has been active in the management of the New York Section and has held a number of committee positions at SMPTE technical conferences in New York, including that of Program Chairman for the 111th Conference.

R. A. Isberg, Consulting Communications Engineer, received his degree in Physical Science from the University of Northern Colorado. Positions Mr. Isberg has held during his distinguished career include Chief Engineer, KRON-TV, KRON-FM San Francisco; Senior Engineer in Professional Products Division, Ampex Corporation; Chief Engineer,

Television Office, University of California at Berkeley; and Director, Bay Area Radio Telephone Service, Inc. His present consulting activity specializes in communications systems programs and specifications for medical, educational and business buildings, also FCC and PUC matters. Mr. Isberg has been active for many years in the management of the San Francisco Section and at the 1971 Winter TV Conference in San Francisco. He has contributed many papers to professional journals and is a Fellow of the IEEE and the AES.

Claude L. M. Mercier, Assistant to the Director of Engineering, Office de Radiodiffusion-Télévision Française, received his education at the Ecole Polytechnique, Paris. In 1956 he became Director of Operational Services and since 1964 has been Director of Equipment and Operational Services. In these capacities, Mr. Mercier has organized the equipment and operation of the ORTF Television Services (live productions, recording and transmissions) over the past fifteen years. Mr. Mercier was a member of the French Delegation at the International Telecommunication Union's conferences at Atlantic City, 1947 and Stockholm, 1952. He has been a member of the Technical Committee of the European Broadcasting Union since 1952, Vice-Chairman since 1957 and Chairman since 1971. He contributed a paper to the February 1968 issue of *Spectrum* and presented a paper entitled "The Problems Posed By the Use of Film in Television Operations" before the EBU Technical Committee, Lugano, 1965.



President Holm congratulates George R. Groves for winning the Samuel L. Warner Memorial Award. The Award was presented by Samuel Warner's brother, Jack Warner, center, at the luncheon.

Don Norwood, internationally known for his development of exposure meters, was educated at Cal Tech and at engineering and flying schools in the Air Force. He has been granted twenty-six U.S. patents and several foreign patents in the field of light measurement for photographic exposure control. Mr. Norwood has contributed several technical papers to the *Journal*, including formulation of the basic creations for three-dimensional-incident-light meters. He is also the author of numerous other professional papers and a book "A New Approach to Exposure Control." He invented and developed the 3-D incident light meter which has been copied by every meter using the well known "golf ball" photosphere. He also invented and developed the "binary" type meter which compensates for the important center of the picture so that excellent exposures can be had with special meters built into the cameras. In 1969 Mr. Norwood received an Academy Award for his exposure meters.

Royce L. Pointer has been Director, Broadcast Engineering, American Broadcasting Company, since 1963. He has a B.S. degree in electrical engineering from Iowa State College. From 1959 to 1963 he was Assistant Director of Engineering for ABC, where he assisted in the development of the first all-solid-state video switcher in 1958 and designed

and built the first all-solid-state TV broadcasting studio in 1962. In his present position he is responsible for the planning and design of all ABC radio and television technical facilities, including networks and owned stations. Mr. Pointer is a member of the NAB Engineering Advisory Committee, the NAB Engineering Conference Committee, and the JCIC Ad Hoc Committee on Color Television Study. His contributions to the Society include serving as Topic Chairman for the 111th Conference and membership on the David Sarnoff Gold Medal Award Committee.

Findlay J. Quinn, President, Quinn Laboratories, Ltd., graduated from St. Patrick's College, Ottawa. He has had a distinguished career in the motion-picture industry in Canada, starting at the National Film Board, where he became Laboratory Manager in 1955. In 1957 he moved to Trans World Laboratory in Montreal as General Manager and in 1964 to Film House in Toronto as Vice-President and General Manager. He opened his own laboratory in 1969. He has contributed papers to the *Journal* and has served actively in the management of the Toronto Section for a number of years. Mr. Quinn has been a Director of the Association of Motion Picture Producers and Laboratories of Canada from 1968 to date and is currently a Director of the Association of Cinema Laboratories and Co-Chairman of the Program Committee.

Richard K. Schafer, Product Planning Specialist, Eastman Kodak Company, Rochester, graduated with a B.A. in physics from the University of Pennsylvania. As a photographic engineer for Eastman Kodak, he has participated in the design and performance evaluation of motion picture film, particularly those of the Eastman Color System. He has devised duplicating techniques and worked to maximize photographic quality for the various color motion-picture films. He was directly involved in the creation of Eastman Color Reversal Intermediate Film. Mr. Schafer has contributed several papers to the *Journal* and a paper on quality of 8mm prints published in the *Proceedings* of the Symposium on Super 8 Production Techniques. He has served the Society as Topic Chairman for the 111th Conference and has been active in the management of the Rochester Section, of which he was Chairman for 1972.

Hans Schmid, Senior Engineering Lab Supervisor, American Broadcasting Company, received his education in electrical engineering from Polytechnikum Friedberg, Germany. He has devoted his career to furthering the state of the art of television measurements. The ABC Open Loop Remote Sync Lock System was developed by Mr. Schmid and he was awarded the 1971 Emmy Award of the National Academy of Television Arts and Sciences for outstanding achievement in engineering development. Before going to ABC, Mr. Schmid was Chief Engineer of Telechrome Manufacturing Company and McCurdy Radio Industries. He has published a number of technical papers, including one in the *Journal*, on television transmission and locking systems. His present work at ABC is concerned with evaluation of broadcast equipment and the formulation of measurement standards. Mr. Schmid is a Senior Member of IEEE.

Richard Theile, Director of the Institut für Rundfunktechnik, Munich, was educated at the University of Marburg. Throughout his long career he has conducted research and development in the electronic television field, especially on electro-optical problems. His present work at the IRT and as a lecturer at the Technical University Munich is concerned with research and development for the broadcast organizations in the Federal Republic of Germany. Dr. Theile is a member of several national and international societies, including the Fernsehtechnische Gesellschaft (of which he is President) and the Deutsche Kinotechnische Gesellschaft für Film und Fernsehen. He is Chairman of the Ad Hoc Group on Color Television of the EBU. Dr. Theile



New SMPTE officers elected to serve 1973-1974: (l-r) Harry Teitelbaum, Conference Vice-President; Kenneth M. Mason, Executive Vice-President; Richard S. O'Brien, Secretary; Byron S. Roudabush, President; Gerald G. Graham, Editorial Vice-President, and Joseph T. Dougherty, Financial Vice-President.

has been the recipient of several industry awards and is a Fellow of the Royal Television Society.

Boris Townsend, Deputy Head of Engineering Information Service, Independent Broadcasting Authority, England, received his education at the London Polytechnic and the University of London, from which he has a Ph.D. Dr. Townsend has devoted a distinguished career to research and development in the field of television. He was Chairman of the Council of the Television Society 1963-1965 and Chairman of the Engineering Steering Committee of the BKSTS 1968 to 1971. In 1967, 1970 and 1972 he served on the Technical Papers Committee of the International Broadcasting Convention. Dr. Townsend has served on the Broadcasting Division Board of the Electronic Engineering Association and in 1969 was Foreign Office Delegate to the Asian States Broadcasting Union Congress in Sudan. He is the author of many technical publications related to color and tone reproduction for television. Dr. Townsend is a Fellow of the Royal Television Society, the Institute of Electrical Engineers and the BKSTS.

Ralph Westfall, Sales and Engineering representative, Eastman Kodak Company, Hollywood, was educated at RIT. As an engineer, Mr. Westfall has served the motion picture industry for over twenty-five years. He is widely recognized as an expert in the physical properties of motion picture film and their relation to defects caused in laboratory handling, projection, etc. His advice and consultation is frequently sought by major laboratories and production companies. Mr. Westfall has lectured at several courses sponsored by the Society at the University of Southern California and has contributed as Topic Chairman for Laboratory Practices at several SMPTE technical conferences. He has been a member of the SMPTE Laboratory Practice Committee for several years and is also a member of the Standards Committee.

Ralph D. Whitmore, Jr., Technical Director, Hollywood Film Company, has a B.S. in engineering. Mr. Whitmore designed and installed the first commercial spray processing equipment as well as portable processes for CBS News. He worked on the development of practical wet printing for step printers and continuous printers and directed the design and construction of high-speed step printers. Mr. Whitmore was the designer of the Cue Analog System and designed and built step printers for 35mm and 75mm blow-up, additive, wet. He also designed and built a processor for color reversal intermediate in 35mm and 65mm and invented the magnetic drive seal-less pump. Mr. Whitmore has contributed several papers to the *Journal* and is the Chairman of the SMPTE Sub-Committee on Book Publications.

Michael Z. Wysotsky, Deputy Chief Engineer, Head of Engineering Research, Mosfilm Studios, received his doctorate from the Moscow Electro Technical Communication Institute. One of the first to experiment in the USSR with

two-dimensional stereophonic sound in the thirties, Dr. Wysotsky has had a distinguished career in motion-picture sound engineering, chiefly, since 1946, at the Mosfilm Studios. As Chief Project Engineer, he directed the studio's reconstruction program, increasing capacity to 40 and more features per year. Dr. Wysotsky developed special equipment for production of various release prints from 35mm anamorphic and 70mm negatives. He has been the author of several books on sound engineering and about 100 articles in Russian and foreign professional journals. He is a member of the Editorial Board of *Technika Kino y Televideniya*.

Special Awards

In addition to the regular awards, the SMPTE presented Special Recognition Awards. These are unusual because the Society does not often give such extra recognition.

According to President Holm, who presented the awards, Special Awards were given to **Dr. Miroslav Jahoda** and **Prof. Dr. Eng. Jaroslav Boucek** of Czechoslovakia; **Prof. Dr. Victor Komar** and **Prof. Boris Konoplev** of the USSR; **Dr. Leslie Knopp** of Great Britain; and **Carroll Dunning** of Santa Monica, Calif.—all for outstanding contributions to motion picture technology.

A special award for outstanding contributions to Satellite Telecommunications was awarded to **Dr. Harold A. Rosen**. A special award for outstanding contributions to the motion picture industry was awarded to **Frank Capra**.

Program Highlights

The technical papers program had been divided into 11 sessions for Monday through Wednesday of the Conference Week: two on Laboratory Practices; three on Television Systems; and one each on Photoinstrumentation; Sound Recording and Reproduction; Special Interest Papers and Photosensitive Materials; Motion-Picture Taking Systems; Theater Presentation Practices; Special Interest Papers, Film and Tape. On Thursday and Friday a Symposium on Communications Satellites and Cable Television was held. This was followed on Friday afternoon by a Roundtable Discussion: The Great Film-Tape Debate—Coexistence or Conflict?

Laboratory Practices

Treatment of Complex Cyanides for Reuse and/or Disposal (Hendrickson & Daignault) presented the results of a joint study to recover or destroy complex cyanides in industrial-waste water effluents. Both procedures and a cost analysis were reported.

Computerized Printer and Process Control (Degenkolb, Larson, Michelson & Scobey) described the use of a process-control computer which is capable of interfacing directly with various electro-mechanical systems. Applications which have already been in successful operation for some time are:

color-positive process analysis; color-timing tape corrections; and additive-printer color balance control (to be published March *Jour.*).

Automated Information-Storage System for Use With Electronic Analyzers (Carter & Blumenthal) described a system comprising three components—a control board, a display unit and a memory unit. The system will interface either with an electronic timer or with the Carter/RAM-tronics computerized tape punching system.

A Multipurpose Total-Immersion Contact Wet Printer (Carter & Newell) discussed the latest configuration in Carter Equipment's line of total immersion wet-printing machines.

Datacue Programmer (Gyori & Scobey) presented a description of an encoder for a motion-picture printer that can also duplicate, read back and display existing programs, and insert corrective data (by entering the scene numbers of scenes to be corrected).

The Magnifying Comparator—A Tool for the Film Laboratory Technician (Gray) described the application of a standard scientific tool to film laboratories.

Preferred Color Balance for Motion-Picture Prints Intended for Viewing on Television and With Xenon-Arc Projection (Bauer, Fleischer & Thomas) reported the preferred color balance for each of three test scenes when displayed using xenon arc and using television. Various parameters of the test were discussed in detail.

Film Splicing—Equipment and Techniques (Wassel) a two-part paper, reviewed splicing techniques from 1922 to the present. With the introduction of synthetic film bases, new splicing methods were required. Those discussed include perforated pressure-sensitive tape, dielectric heating, conduction heating plus thermal adhesive, ultrasonic heating, liquid polyester solvent, and butt-weld radiant heating. The second part of the presentation discussed the model 2001 Metro/Kalvar splicer for use with polyester-base film.

Factors Affecting Cleanliness of Motion-Picture Film (Westfall & Knutsen) stressed the importance of providing a proper film-handling environment. Methods were offered of preventing dirt problems and of locating the sources of such problems.

Photoinstrumentation

INSTAR—A High-Speed Video System (Cahn & Aleks) presented a video system utilizing a 5-MHz IVC 1-in recorder, running at a tape speed of 176mm/s, which is capable of displaying 120 sequential pictures per second without motion blur.

A New 16mm High-Speed Rotating Prism Camera (Shoberg) described a new 16mm camera capable of taking 100 to 10,000 exposures/s. Optical diagrams and mechanical and electronic specifications were provided.

Super 8—A Tool for Photoinstrumentation (Pendley & Peterson) described an instrumentation camera in the super-8 format that embodies a drift-free servo speed control and a precision film transport incorporating a fixed register pin.

A Report on the 10th International Congress on High-Speed Photography—Nice, France (Endelman, Elmer & Quinn) summarized the information presented at this week-long meeting on photoinstrumentation (to be published March *Jour.*).

Sound Recording and Reproduction

Further Considerations on the Use of a High-Quality Noise-Reduction System in the Production of Wide-Range Low-Distortion Optical Soundtracks (Allen) reported the progress made in recent months in the utilization of Dolby noise-reduction equipment to produce optical soundtracks.

Recording and Reproducing 16 Parallel Soundtracks Within 5-mm Film Width (McKechnie) presented the results of a pilot study where 16 variable-density optical sound-

tracks, each 1/100-in wide, have been successfully recorded by modulating the output of light emitting diodes with the audio signal to be recorded and conducting the emitted light onto the moving film through the use of fiber light guides. Playback is accomplished by back-illuminating the moving film and picking up each audio channel with a separate optical fiber light guide, which conducts the modulated light to a phototransistor (published Feb. *Jour.*, pp. 65-70).

Stereophonic Photographic Soundtracks (Uhligh) outlined the possibilities available of recording two stereophonic channels each in one half the area of the normal variable-area soundtrack, this concept having been suggested in 1955 by Frayne.

An Improved System for Theatrical Reproduction of 35mm Optical Sound (Orban & Delantoni) described a technique based on "dynamic noise-reduction circuitry" for extending the bandwidth of the standard optical soundtrack without incurring objectionable film noise (published Dec. *Jour.*, pp. 926-927).

Television Systems

Apollo 15 and 16 Ground-Commanded Television Assembly (Soltoff) summarized how excellent color television quality was achieved during the Apollo 15 and 16 missions. Addition of ground-command capability permitted versatility and optimization of the television coverage, without diverting the astronauts from their primary role (published Dec. *Jour.*, pp. 901-906).

Progress Report of the JCIC Ad Hoc Color Television Study Committee (Benson) presented the results to date of this joint committee on inter-society cooperation whose purpose is to examine the entire television system in order to determine the cause of significant and objectionable deviations in color as viewed on the home receiver. The report has been subsequently published in the *Journal* (Jan., pp. 30-31).

An Automatic Color VTR Programmer for Cable and Closed-Circuit Television (Reynolds) describes a means for economically programming a battery of one-inch helical scan tape recorders using a simple automation technique. In another paper by Reynolds, *Recent Advances in Helical Scan VTRs for Color Broadcast Editing* reviewed the rather rapid evolution of 1-in helical scan recorders for broadcast use and then summarized the additional refinements that have been made recently to make this equipment practical for color, time-base-corrected production editing.

Automatic Skew Correction for Cassette Videotape Players (Cook) explains the operation of this correction circuit which senses a time difference between the two helical scan heads and provides a correction signal to reduce the time difference to $\pm 0.5 \mu\text{s}$.

ABC's Coverage of the 1972 Summer Olympics (Levens & Maltz) summarized the on-location technical facilities that were required to provide television coverage to the U.S.

Chromium Dioxide Videotapes for Helical-Scan Recorders (Jordan) presented the performance characteristics of both chromium dioxide and cobalt-doped iron oxide tapes when used both for original recording and for duplication.

An On-Line Videotape Editing System (Hill) described the operation of this system, which is now in use producing broadcast-quality master tapes.

Recent Developments in Electronic Indexing and Editing of Magnetic Tapes (Swetland) discussed application of new, low-cost, modular indexing and editing equipment for audiotape and videotape. All units conform to the SMPTE time and control code.

Video Processing in the PC-100 Color Television Camera (Van Roessel) described the special design requirements encountered and the decisions taken to satisfy these requirements.

Television Receiver White Color: How Does It Affect Picture Quality? (Zwick) presented the conclusions of an investigation of how the difference in white color of studio color monitors and the usually higher color temperature of home receivers affect picture quality.

The Average Picture Level of Some Television Films (Zwick & Brothers) offered a means for measuring the integrated optical density or transmission of a full frame, which value may be of use to designers of television camera equipment.

Use of a Waveform Monitor in the Television-Film Preview Room (Zwick) recommended the use of an inexperienced waveform monitor to detect the presence of densities less than the recommended minimum on films intended for telecasting.

New Video-Signal Processing Systems for Teleproduction Applications (Sarra, Acker & Paulson) discussed the design details of the Delta 44 Time-Base Corrector and various accessory products which have been developed to accommodate the complex requirements of post-production processing of helical-scan and quadruplex VTR tapes.

A Simple Motion Detector for Television Signals (Pearson & Dennis) reported experiments utilizing a detector that can readily detect motion at a particular spatial location in the television image, while negating the effect of spurious motion indications due to noise (published Jan. *Jour.*, pp. 17-21).

Color Converter and Its Application for Measuring Human Color Preferences in Color Television (Sugimoto, Ezawa & Tamura) discussed the relationship of color television to memory color, which is the viewers' subjective recollection of what color is appropriate to an object. It was found that memory color depends on the viewer (published Feb. *Jour.*, pp. 71-77).

Gray-Scale Luminance Rendition in a Color Film-Television System (Evans & De Marsh) concerned itself with the proper implementation of electronic control functions to ensure optimum transfer of projected image to television picture. In *Optimum Gray-Scale Rendition in Television* (De Marsh) experiments were conducted to determine the preferred average gray-scale characteristic for television.

Signal-to-Noise Measurements in Television Systems (Stoepfel) described the new Rhode & Schwarz Video-Noise Meter, Model UPSF, which is capable of measuring noise and extraneous voltage in a composite television signal.

In-Service Measurements of Continuous Random Noise Using the Vertical Interval (Rhodes) describes a noise measuring technique in which the operator is only required to match the amplitudes of the noise being measured against a display of the noise from a calibrated source. By making use of the vertical blanking interval, this technique can be performed in service.

Special Interest Papers & Photosensitive Materials

The Use of Bleach Fixing Baths in Color Motion-Picture Film Processing (Roosen, Vanreussel & Verbrugge) presents a brief history of the development of bleach fixing baths, followed by a survey of the principles and general properties of the baths and an examination of the advantages of their use.

A Standards Proposal for a Crystal-Controlled Time Marking System for Film, Requiring No Major Modification to Existing Equipment (O'Donnel) Describes a binary-code marking system already in production use at the National Film Board of Canada. The time, date and other fixed identification numbers are printed on the film edge using light emitting diodes as the light source. No modification is required to the standard tape equipment currently used for sync sound film recording.

An On-Line Computerized Light-Valve Monitoring System (Reichard, LaZare & Efron) describes a system of electromechanical equipment attached to the light-modulating vanes in the light-valve system of a motion-picture printer. This equipment will indicate any out-of-tolerance deviation between the desired and actual vane position and will initiate an automatic error procedure to facilitate correction.

Improved Emulsion and Processing Technology for Motion-Picture Color Negative Film (Anderson *et al.*) outlined the advantages and characteristics of Eastman Color Negative II Film (ECN-II), which has an enhanced image structure and a thinner film-emulsion sandwich.

The session closed with a Panel Discussion entitled *The Flexibility of Motion Picture Film*. Short talks were given by several of the panelists:

A Short History of Eastman Color Film (Ryan)

Applications for Film the Manufacturer Did Not Intend (Solow)

Improvisation in the Small Motion Picture Laboratory (Tobin)

The Shrinking of Film Format and Equipment (Newbern)

The panel discussion and lively question-and-answer period proved most interesting to both the neophyte and the experience film user.



Arrangements Chairman Tony Bruno with Program Chairman Frank P. Brackett (left). Public Address and Recording Chairman C. Carroll Adams III.

Motion-Picture Taking Systems

The AMPTP Electro-Explosive Safety System (Clark & Vlahos) offered a systematized method of protection against the various hazards involved in using electrically initiated pyrotechnical devices.

High-Pressure Xenon Lamp Safety—A Case History (Glickman & Clark) reported on a test program, initiated under the aegis of the AMPTP Research Center, to establish effective standards for evaluating personal safety equipment for use in the vicinity of high-pressure xenon lamps.

Super 16—A State-of-the-Art Report (Lightman) presented up-to-date information on the extended frame 16mm format, including the equipment conversions that will be necessary, and the lens types recommended to achieve optimum quality. There is a discussion of the various types of raw stocks that can be used successfully in super-16 filming and information is given on newly developed equipment designed specifically for super-16 production.

The Director Looks at Motion-Picture and Television Technology (Daniels) consisted of a compilation of director's opinions as to what might be improved in production and post-production equipment and working methods.

New Technology in Filmmaking—A Systems Approach (Di Giulio) considers a systems-engineering approach to both production and post-production equipment, in order to enable the filmmaker to address himself more fully to his primary task of artistic creativity.

The Snorkel Camera System for Motion-Picture and Television Production (Kenworthy) describes a camera system that remotes the optical viewing and control functions while utilizing existing camera bodies, to keep all operators and camera components out of the shooting area. The lens is now an inverted periscope-like optical relay tube that is suspended from the camera (to be published, March *Jour.*).

Theater Presentation Practices

Improved Lubrication from Space Technology for Movie Film and Magnetic Media (Blaney, Loran & Pardee) reported on field-test evaluations of aerospace lubricants as applied to current film and tape processing techniques.

Measured and Observed Discrepancies of Screen Luminances (Hurd) investigated some of the reasons for these discrepancies. The data presented suggest that photometric instruments might be modified to have a mesopic sensitivity, to more closely approximate the spectral response of a partially dark-adapted eye of an observer in a theater (published Feb. *Jour.*, pp. 87-91).

Theater Projection Screens: Tested Gain and Curvature for Optimum Efficiency (Berggren) offers test methods to evaluate theater screen characteristics. Test data are included on screen materials in sample form and test procedures are proposed for measuring screen gain ratio, either in the finished installation or in the laboratory.

Contour Shape of the 35mm Film at the Aperture During Actual Projection (Berggren) describes the current status of those affecting film contour shape during projection. Heat variation and film conditions are considered. The effects of air-pressure stabilizers and vertically or horizontally curved film gates are reviewed.

A Survey of Classroom Projection Conditions (Preo & Sullivan) described a survey of currently prevailing audiovisual projection conditions in classrooms. A suggested improvement in most cases would be the installation of more efficient window shielding to achieve lower stray light level (published Jan. *Jour.*, pp. 24-28).

A New Xenon Projection Lamphouse with Rotating Xenon Bulb Device and Integral Optical Aligning System (Pichel & Smith) presented design concepts intended to overcome the known disadvantages and maximize the many advantages of xenon projection lamps.

Post-Production Aspects of Wide-Screen Films (Rowen) summarizes the difficulties that had arisen in editing and screening super-16 and Techniscope materials. Equipment has recently become available that will be able to handle these wide-screen aspect ratios.

Special Interest Papers—Film and Tape

Existing-Light Concepts in Motion-Picture Color Photography (Gorman) enumerated the concepts upon which existing-light photography is founded and illustrated how those concepts are applied to super-8 motion-picture color

photography. To this end, a film/camera combination has been introduced—the high-speed film containing an increased red-sensitivity and the camera designed to maximize the light available for exposure at low-light levels.

Small Formats (Kent) describes the treatment, loading and splicing procedures of super-8 films into various types of silent and sound cassettes and cartridges. In addition, numerous recommendations are presented which help to obtain the best results with various types of endless-loop projection systems.

Professional Prints for the Profession Super-8 Producer (Colburn) announced the availability of professional services for the super-8 format, including a super-8 “wet gate” head for the optical printer.

A 24-Volt Standard for Audiovisual Equipment (Wyman) proposed a low-voltage standard for audiovisual systems.

Using Video for Business Communications (Paney) describes the experience of one company in using video techniques in their training programs.

Film vs Videotape in Syndication (Ballinger) maintains that videotape should be used by TV film distributors in preference to 16mm distribution prints. The reasons offered are that image quality is better on high-band videotape, that the equipment on which the videotape is edited and played is liable to be better maintained than film equipment, and that VTR technicians are liable to be more careful with the tape than film editors and projector operators are with film.

Computer-Animated Films and Videotapes—An Artist's Viewpoint (Lehman) outlined the problems confronting the artist- animator in trying to use computer-graphics technology and showed some of the effects possible from present state-of-the-art equipment in a film demonstration.

Symposium on Communication Satellites and Cable Television

Utilizing satellites for CATV interconnection was discussed thoroughly during the Symposium that took place on the last two days of Conference week. The requisite system design and capabilities of one pilot program of “interactive television” was described together with the requisite costs of the system. A systems analyst suggested the future technical possibilities satellite use. Representatives of the National Cable Television Association and of TelePrompTer Corp. provided the user's point of view—system requirements and economic factors.

Supplier information and the regulator's viewpoint rounded out the group of papers. This was followed by a panel discussion that provided additional opportunity for questions and rebuttal from the audience.

Panel Discussion: Film vs Tape?

The event which had one of the largest attendances at the conference was the Friday afternoon roundtable discussion entitled “The Great Film—Tape Debate—Coexistence or



A view of the 112th Conference Equipment Exhibit.



Exhibit Chairman Warren Strang (left) and President Holm congratulate a representative of the O'Connor Engineering Co., Inc. for winning the SMPTE Exhibit Award.

Conflict?" A demonstration was shown of the relative quality of film and videotape when used for theater projection or television. A series of scenes had been photographed simultaneously with 16mm and 35mm cameras and with a television camera. After the appropriate transfers—negative to positive film, original tape to duplicate, film to tape and tape to film—the scenes were played back, first over color studio monitors and then on a theater-size projection screen. The individual viewers were then able to decide the relative merits of each medium when viewed under "normal" circumstances and after conversion.

On the color monitor, the 16mm and 35mm film clips differed very little in sharpness and quality, but the videotape had consistently better sharpness and color. On the projection screen, however, differences between the 16mm and 35mm films were more apparent and the tape to film transfers did not compare well to the film negative to film positive clips.

The discussion indicated that "the nature of the original production will determine which medium is used for the original shooting. Subsequent conversions will then depend on the requirements of the organization distributing the programming."

Equipment Exhibit

Warren Strang, the Exhibit Chairman, did a fabulous job in putting together the Equipment Exhibit. The Exhibit area held 92 booths. They were sold out long before opening day. When the Exhibit got underway, and the crowds started jamming the aisles, several spaces that were originally thought unsalable because of obstructions, were sold to companies eager to display their equipment at the show. Several exhibitors displayed equipment in vans parked in the hotel's parking lot, making the 112th one of the largest Equipment Exhibits SMPTE has ever had.

As evidenced by the more than 3,000 persons attending, Equipment Exhibits are the most popular attractions at

SMPTE Conferences. There, in one large room, is all the equipment a professional could want to see. The Exhibit attracts a broad spectrum of interests and professional levels, more so than is attracted to the technical sessions or is represented by SMPTE's membership. Passing through the gates of the Exhibit were film and television producers and directors, cinematographers, editors, young filmmakers, and serious film students. There were many television people, particularly those who use film for television and are therefore interested in sophisticated film equipment.

Cameras were the item most heavily exhibited. Most of the major camera manufacturers took place, and of course the dealers who had booths were lavish in their display of cameras. Equipment for editing, lighting, laboratory, recording, and projection dominated this comprehensive exhibit. The following companies exhibited at the 112th.

Angenieux Corp. of America	L-W Photo, Inc.
Arriflex Co. of America	Lowel-Light Photo
Bell & Howell Co.,	Engineering
Professional Equipment Div.	Magnasync/Moviola Corp.
Berkey Colortran Inc.	J. A. Maurer, Inc.
Birns & Sawyer, Inc.	Mitchell Camera Corp.
Canon, U.S.A., Inc.	Mole-Richardson Co.
Carter Equipment Co., Inc.	Nagra Magnetic
Century Strand Inc.	Recorders, Inc.
Christy's Editorial Film Supply	Newsfilm Lab Inc.
Cinema Products	O'Connor Engineering
Communication Arts, Inc.	Labs Inc.
CueVue	Optical Coating
Eastman Kodak Co.	Laboratory, Inc.
Eclair Corp. of America	Oxberry
F&B/Ceco Industries, Inc.	Paillard Inc.
Filmkraft Services	Pako Corp.
Frezzolini Electronics Inc.	Peterson Enterprises, Inc.
Frigidheat Industries	Photo-Sonics, Inc.
General Electric	Plastic Reel Corp. of America
Lamp Business Div.	Precision Laboratories,
General Enterprises, Inc.	Div. of Precision Cine
Alan Gordon Enterprises, Inc.	Equipment Corp.
Gryphon Corp.	Producers Service Corp.
GTE Sylvania Inc.	Rosco Laboratories, Inc.
Guillotine Splicer Corp.	Cliff Sawyer Industries
Hazeltine Corp.	SFS Projection
Karl Heitz, Inc.	Engineering Corp.
Hervic Corp./Cinema Beautieul	Showchron
Hollywood Film Co.	Sol-Lux Cinema —
Image Devices Inc.	Century Optics
Instrumentation Marketing	Sound Genesis
Corp.	Tele-Cine Inc.
International Audio Visual	Teledyne Camera Systems/
J&R Film Co.	Visual Instrumentation
KEM Electronic	Corp.
Mechanic Corp.	Treise Engineering, Inc.
Lafayette Instrument Co.	Vega Electronics
Larson Enterprises	Williamson Camera Co.

Exhibit Award

O'Connor Engineering Laboratories, 3490 E. Foothill Blvd., Pasadena, CA 91107, was chosen the winner of the Exhibit Award at the 112th Conference. This was a particularly high honor owing to the strong competition from the many excellent booths on display at the show.

Manning the booth were Chadwell O'Connor, Regina O'Connor, Dick Charlesson and Pat Garden.

The booth, which had an unusual background, and was decorated with flowers, featured O'Connors line of fluid camera heads. They also had on display a new springless camera head, and the Hydro-Ped, a replacement for the conventional tripod.