

# 87th Convention \_\_\_\_\_ Advance Program

Ambassador Hotel, Los Angeles, May 1-6

Since the Convention Postal Announcement was mailed earlier this month Program Chairman Herb Farmer has made no changes in the schedule of sessions. *Instrumentation and High-Speed Photography* will be more strongly represented than indicated earlier. Carlos Elmer of Traid Corp. and Bob Shoberg of Beckman & Whitley have been responsible for high-speed photography papers to relate chiefly to the Space Age topics for which Lloyd Goldsmith is Topic Chairman. *Ben Hur* will be shown for registered Convention members on Friday evening at MGM Studios. This special showing will be followed by a brief question-and-answer period. *The Ladies Program* includes a trip to Disneyland with lunch at the Disneyland Hotel; a glimpse (at least) of the famous Balboa Bay Club; and a visit with Edith Head, Paramount's famous costume designer, and luncheon at the Studio. Wednesday evening is devoted to the cocktail party, banquet and dance. The traditional Coffee Club is sponsored by Hollywood Film Co.

Information on reservations and hotel rates, published in the February *Journal* (p. 122), is included in the Convention Postal Announcement. Members are urged to be prompt in mailing reservations.

If attendance at a session is now being planned for only a specific paper or two, inquire during the week before the Convention by telephoning Program Chairman Herb Farmer (Richmond 8-2311, Exts. 328, 269, 200).

## SUNDAY—MAY 1

10:00-4:00 Registration in the Ambassador Hotel, Los Angeles

## MONDAY—MAY 2

9:00 Registration

10:00 GENERAL SESSION

### Historical Television Equipment and Materials Collections

SYD CASSYD, *Univ. of Calif., Los Angeles*

Current history recorded by television stations has a slender chance for survival because of the nature of magnetic tape, which can be wiped in a matter of seconds. To prevent this loss, historical television collections are being established in Washington, D.C., Hollywood and New York to preserve films, television-film and magnetic-tape recordings. Cooperation is urged to save this film material, especially the 1930 to 1949 period, and tapes in particular from the beginning.

### Subjective Screen Brightness

GERHARD LESSMAN, *Bell & Howell Co., Chicago*

Subjective estimates of screen brightness do not correlate with photometry based upon the CIE, standard photopic luminosity function. Results of some preliminary measurements of subjective screen brightness at various color temperatures are reported. Computations based upon modified luminosity functions postulated for the viewing angle and brightness corresponding to motion-picture projection tend to corroborate these findings. A simple correction factor based on color temperature is suggested for converting measured brightness into subjective screen brightness. An investigation to establish this correction factor is proposed.

### An Electrostatic Color Map Printer

DONALD J. PARKER, *Radio Corp. of America, Camden, N. J.*, and F. C. MYERS, *Army Engineer Research and Development Laboratories, Fort Belvoir, Va.*

A feasibility model of an Electrofax Color Map Printer has been constructed and demonstrated under a contract with the U.S. Army Engineering Research and Development Laboratories, Fort Belvoir, Va. This machine is designed to print five color maps 22½ by 29-in. by optical exposure from 70mm cartographic separations. The feasibility equipment uses liquid color Electrofax development with electronic flash exposure triggered photoelectrically from the paper. The machine is web fed, the paper transport being accomplished by means of air bearings. The Electrofax approach to tactical map reproduction greatly reduces the requirement for storage of large quantities of printed maps. It reduces the logistics problem to supply of raw materials. The make-ready time is a few minutes.

### Synchronous Camera and Sound Drives

LOREN L. RYDER, *Ryder Sound Services, Inc., Hollywood*

### The U.S. Army Signal School and Modern Trends of Audio-Visual Education

MICHAEL J. VENEZIA, *U. S. Army Signal School, Fort Monmouth, N.J.*

### 12:15 Get-Together Luncheon

Guest Speaker: To Be Announced

## MONDAY AFTERNOON

### 2:30 ACOUSTICS AND SOUND

#### Controlling External Noise for Recording Studios

DONALD P. LOYE, *Consulting Engineer, Los Angeles*

Quite recently, oil wells have been drilled on studio properties, creating new noise and vibration problems. Solutions to these problems include the suitable location of each drilling site relative to studio activities; acoustical insulation of drilling derricks and associated machinery and the mounting of machinery on vibration isolation mountings.

#### New Sound-Retarding Doors for Motion-Picture Sound Stages

D. J. BLOOMBERG, *Republic Productions, Inc., North Hollywood*; and M. RETTINGER, *Radio Corp. of America, Hollywood*

After discussing the various factors determining the sound-retarding qualities of sound stage doors in general, various such doors, as used at Republic Studios, are described in detail. For the sake of convenience, they are classified as Inside Doors and Outside Doors. The former are double doors using a 1-in. cement plaster coating on each side of the steel frame of the door; the latter are solid concrete doors, 6-in. thick, with an internal steel frame.

#### Recent Applications of Acoustical Engineering Principles in Studios and Review Rooms

WILLIAM B. SNOW, *Ramo-Wooldridge Corp., Canoga Park, Calif.*

Designing the interior surface of a studio or review room for acoustical control combines science and art in that some problems must be solved scientifically and others require subjective judgments made on the grounds of artistic validity. A specified reverberation characteristic can be obtained with fair accuracy, but other problems must be approached more intuitively. Examples are given of solutions combining engineering and rule-of-thumb approaches.

#### Transistorized, Portable, Magnetic Film Recording Channel

C. E. HITTLE, M. RETTINGER and KURT SINGER, *Radio Corp. of America, Hollywood*

A portable, magnetic film recording channel has been designed

with a transistorized mixer and recorder, plus some accessories. The mixer provides for switching, equalizing and mixing of up to four microphones. Two independent VU meters indicate recording and magnetic playback levels. Optional accessories consist of microphone impedance matching transformers, headset transformers, precision gain controls and transistorized compressor. A high-gain transistorized playback amplifier and bias oscillator are located in the recorder. The recorder is manufactured by the "matched-plate" method in which the structural support for the primary rotational elements is provided by two match-bored magnesium panels to effect flywheel suspension between two bearings rather than by cantilever fashion.

#### **Audio Scoring, Dubbing and Transfer Techniques Used in Video-Tape Productions**

JOHN D. SILVA, *KTLA, Los Angeles*

Many video-tape productions require post-production addition of music and sound effects to the original dialogue. Various methods are employed including the use of an 8-track audio tape machine, incorporating control track, cue track and self-synchronizing features. The equipment allows up to seven audio tracks to be recorded in sync with any or all previous recordings.

#### **An Edit-Dubber System**

FRED G. ALBIN, *Ryder Sound Services, Inc., Hollywood*

## **MONDAY EVENING**

### **7:30 OPTICS and IMAGES**

#### **Fiber Optics — A New Tool in Electronics**

L. J. KROLAK, *Radio Corp. of America, Camden, N.J.*; R. NEUHAUSER, *Radio Corp. of America, Lancaster, Pa.*; and W. P. SIEGMUND, *American Optical Co., Southbridge, Mass.*

A program in fiber optics has been carried out by RCA for the past 2½ years in cooperation with the American Optical Co. A unique method of stabilizing an airborne TV camera utilizing fiber optics is described. This system uses a vidicon picture tube with a fiber optics face plate and a flexible fiber optics bundle. Also described are a completely nonmechanical high-resolution TV system and a high-speed print-out device, both utilizing fiber optics.

#### **The Design of Zoom Lenses**

R. KINGSLAKE, *Eastman Kodak Co., Rochester, N. Y.*

Zoom, or varifocal, lenses have been known since 1930, but they were seldom used until after World War II when they became generally applied to television cameras. During the past ten years several types of zoom lenses for 8 and 16mm motion-picture cameras have been developed. These are either mechanically or optically compensated, and necessarily contain many lens elements. The optical design is difficult, and it is only recently that zoom lenses comparable to ordinary cine lenses have become available.

#### **Films for Machine Use**

HARRY BRUEGGEMANN, *Tridea Electronics, Inc., South Pasadena, Calif.*

For the past hundred years, photographic films have been designed to the satisfaction of one judge — the human eye. Recently, however, films have been used for machine read-out, and a new judge must be satisfied — the light-sensitive cell. In nonphysiological applications of film, a fundamentally new engineering approach is required.

#### **A Single-Lens, Peripheral-Field Cinematic Process**

RICHARD VETTER, *Univ. of Calif., Los Angeles*

Current research and training requiring driver, flight and gunnery simulation have stimulated efforts to develop practical and effective cinematic means for presenting fields-of-view of up to 180°. A preferred system for simulating peripheral vision should utilize a single lens and film in addition to standard photographic and projection equipment. Thus far, major developmental problems have included poor resolution, image distortion, lack of light in photography, and low illumination in exhibition. The process under discussion satisfies the single-lens, standard equipment requisites and adequately resolves the commonly inherent problems. It is currently in use in certain simulation installations.

#### **The Relationship of Anamorphosis to Object Distance**

WALTER WALLIN, *Wallin Optical Systems, Inc., Tarzana, Calif.*

Conventional focusing of a cylindrical anamorphoser is found to result in a variation of anamorphosis as a function of object distance. Since projection takes place at a fixed distance, the proportions of the screen image of an object vary with the distance at which the picture was taken. The nature of this function and possible means of its control are discussed.

#### **The Effect of Composition of Altering Aspect Ratio in Printing**

DONALD NICHOLSON, *Technicolor Corp., Hollywood*

When making prints from a negative with a given aspect ratio to positives of different aspect ratio or smaller image size, negative information is lost. This basic concept imposes restrictions on composition when exposing a negative that is to be so printed. The reasons for these restrictions are considered for a number of standard formats and printing methods. Diagrams are given which permit visualization of these composition requirements and limitations.

#### **Motion-Picture Camera Lenses**

J. D. HAYES and W. S. FUJIMURA, *Bausch & Lomb Optical Co., Rochester, N.Y.*

Improvement in the quality of motion-picture equipment and materials necessitated by the large-screen presentation of films has required a re-evaluation of the optical characteristics and performance requirements of "professional type" motion-picture camera lenses. Highly corrected lenses, characterized by long back focal length, balanced illumination, flat field performance and high contrast have been developed for use with 35mm and larger format professional-type motion-picture cameras.

## **TUESDAY MORNING—MAY 3**

### **9:00 FILMS IN INDUSTRY**

#### **Film Communications in the Space Age**

ROBERT S. SCOTT, *Douglas Aircraft Co., Santa Monica, Calif.*

The problems involved with exploring, interpreting and understanding the Space Age are considered as a challenge to film communications. Examples of solutions include high-speed, infrared, and x-ray photography; remote control devices; missile-mounted cameras; the Earth as seen from distant missiles; and some new developments in animation.

#### **Planning and Production of Industrial Films for the Bell System**

H. L. VANDERFORD, *American Telephone and Telegraph Co., New York*

The production of public relations and training films for the Bell Telephone System requires a staff thoroughly familiar with the telephone business as well as motion-picture techniques. About 17 films are produced annually by the A.T.&T.'s film staff. One of the functions of the staff is to program production of films and associated materials of common interest to the majority of the 21 associated telephone companies where uniformity is desirable and economies can be realized through centralized production. An annual film program may include various types of employee training films as well as films for public exhibition in the form of science shorts, musicals, animated cartoons and screen plays.

#### **An Industrial Audio-Visual Department**

JAMES A. BOSTWICK, *Audio Visual Dept., General Motors Photographic, Detroit*

Extensive facilities and personnel are organized to produce 2 by 2 slides for illustrations and motion pictures. The types of films produced are described and samples shown.

#### **The X-15, the Case History of a Film**

WILLIAM M. BROSE, *North American Aviation, Inc., Los Angeles*

The history of the production of a documentary film on the X-15 is told from the film writer's viewpoint. Recording the chronological progress of this space research vehicle resulted in a 26½-min. program for public release. Evolution of the film from a series of engineering progress reports into a comprehensive review of the developmental period is discussed in detail.

## TUESDAY AFTERNOON

### 1:15 INSTRUMENTATION IN THE SPACE AGE

#### Application of 35mm Sprocket Hole Film to Instrumentation Recording

G. R. CRANE and J. W. STAFFORD, *Westrex Corp., Hollywood*  
Perforated-type film has certain inherent advantages as a recording medium. Performance characteristics of flutter, drift, skew and general operational stability of a typical transport system using 35mm perforated film are given. Standard 5-mil cellulose acetate, as well as 3-mil and 1<sup>1</sup>/<sub>2</sub>-mil Mylar base films are included at speeds from 9 to 126 in./sec. Analysis of performance serves to indicate advantages to be gained in applying sprocket-hole film to instrumentation recording.

#### A New Look at High-Frequency Magnetic Recording

CHARLES E. ANDERSON, *Ampex Corp., Redwood City, Calif.*

Hundreds of magnetic recorders are in use throughout the world as storage devices for television images; but there are relatively few instances of full use of the recorder's capabilities in other fields. The possibility of using the magnetic recorder in new fields is explored. Improvements developed for nontelevision recording are examined for usefulness in television recording.

#### Ultra-High-Speed Streak Camera Utilizing Mirror Optics

JACK PATTERSON, *Beckman and Whitley, Inc., San Carlos, Calif.*

Parameters for conventional sweeping-image camera design are easily exceeded through the use of a new mirror optical-relay system. This optical configuration allows all components to be arranged in a simple "on axis" design. The incorporation of mirror optics into streak camera design opens new areas of observation and new fields of application.

#### Radio-Controlled Remote Starting and Automatic Synchronizing Device for Cameras and Recorders

ARTHUR FLORMAN, MICHAEL SHRAYER and DOMINICK NOTTO, *Florman & Babb, Inc., New York*

A device for starting and synchronizing the Mitchell NC and the Magnasync Mark IX recorder has been designed to be especially useful in situations where the setting or subject precludes the use of slates and clapsticks. It is activated by a remotely positioned radio control and only one switch is required to initiate the operation. The device may also be activated by means of a pocket-sized radio control.

#### A Transistorized Vidicon Camera for Industrial Use

M. H. DIEHL and RICHARD J. CLARK, *Studio & Industrial TV Eng., General Electric Co., Syracuse, N.Y.*

A compact, single-unit camera has been designed to be capable of high-quality television picture. Problems encountered in transistorizing video, sync, sweep and power supply circuits are discussed. There are four integrated optical accessories: remote focus, remote iris, remote turret and douser. Performance characteristics of the camera under conditions of shock and vibration, temperature extremes and high acoustical noise level are given.

#### Cinetheodolite Measurements of Earth Satellite Orbits

D. F. KEYES and D. L. TIEMANN, *Naval Ordnance Test Station, China Lake, Calif.*

Askania and Naval Weapons Plant cinetheodolites at the U.S. Naval Ordnance Test Station, China Lake, Calif., are providing accurate measurements of artificial earth satellite orbits in a flexible, low-cost program. A natural outgrowth of many years of experience using cinetheodolites to determine missile trajectories, the satellite observation program is extending the capabilities and usefulness of these precision instruments.

## TUESDAY EVENING

### 8:00 Address by Krafft A. Ehrlicke, Director, Vega and Centaur upper-stage rocket programs, Convair (Astronautics) Division, General Dynamics Corp.

### 8:30 SPACE TECHNOLOGY

#### Eyes for the Astronaut

H. G. SENNERT and C. D. MAURER, *Missile & Space Div., Lockheed Aircraft Corp., Sunnyvale, Calif.*

In the vast reaches of space unaided human eyesight is incapable of performing the myriad of required functions. There are numerous applications in which motion-picture and TV equipment become a powerful aid to the astronaut. Such applications impose new rigorous requirements on equipment design and performance and highlight a whole series of technical problem areas. The urgency of Space Age problems has served as a catalyst to trigger industry creative ability. Space applications of motion-picture and TV equipment are a current reality.

#### Direct-View Monitor for a Photo-Transmission System Employing Storage Tubes

WILLIAM ARM, *Fairchild Camera and Instrument Corp., Syosset, N.Y.*

The function of the Direct-View Monitor is to give an instantaneous visual presentation of successive video frames as they are being transmitted from some remote position. Each frame is visually retained, without noticeable deterioration, for at least 16 sec which is about twice the transmission time of one frame. If desired, any frame can be retained for a longer period. Two RCA 7315 storage tubes are employed as display units. Each tube alternately displays every other frame. Thus, while one tube is writing a frame, the other is displaying the preceding one. Any completed frame can be retained for a longer period of time on one tube, while the subsequent frames are successively displayed on the other. The logic circuits involved in switching the storage tubes and the general operation of the storage tubes and their associated circuitry are discussed.

#### A Narrow-Bandwidth Video-Tape Recorder for Use in a Satellite

JOSEPH A. ZENEL, *Radio Corp. of America, Princeton, N.J.*

A magnetic tape recorder intended for use as a video recorder, that is, a storage device for television-originated images, has been developed. How the extremely smooth tape motion is obtained within the limited volume and weight permitted a recorder intended for a satellite is described. The novel design which has been developed also satisfies the requirement of very low power consumption. Electrical performance and physical characteristics are presented in detail.

## WEDNESDAY MORNING—MAY 4

### 9:00 EQUIPMENT PAPERS and DEMONSTRATIONS

(See the Directory of Equipment Exhibits on subsequent pages.)

## WEDNESDAY AFTERNOON

### 1:15 PHOTOGRAPHIC MATERIALS AND EQUIPMENT

#### A High-Speed Black-and-White Negative Film

F. W. SPANGLER and H. R. BEILFUSS, *Film Emulsion Div., Eastman Kodak Co., Rochester, N.Y.*

The new camera film, Eastman Double-X Panchromatic Negative Film, Types 5222 (35mm) and 7222 (16mm), has been designed to give more than twice the speed of Eastman Plus-X Panchromatic Negative Film (Type B), Types 4231 (35mm) and 7231 (16mm), without any significant increase in graininess. This permits exposures under adverse lighting conditions, or with increased depth of field without an increase in illumination, or with greater economy in set lighting. The new film will find wide application for general motion-picture work and television use. Processing and printing procedures are compatible with those used for Types 4231 and 7231. The characteristics of the film which affect picture quality are discussed.

#### Two High-Speed Color Films and a Reversal Print Film for Motion-Picture Use

N. H. GROET, T. J. MURRAY and C. E. OSBORNE, *Research Laboratories, Eastman Kodak Co., Rochester, N.Y.*

Eastman (or Kodak) Ektachrome ER Daylight and Type B films are high-speed color reversal camera films designed for 35mm and 16mm motion-picture photography. Ektachrome Reversal Print Film, designed for the same process as the camera films, may be used for making high-quality duplicates of the camera originals. Film structure, sensitometric characteristics, exposure requirements, suggested filters and printing behavior of the new films are discussed.

#### A Solvent Cleaning Machine for Motion-Picture Film

R. V. POWER and H. L. BAUMBACH, *Computer Measurements Co., Sylmar, Calif.*

A machine has been developed to clean motion-picture film automatically at speeds up to 300 feet/min while it is submerged in a solvent bath. Special design aspects of the machine include rotating velvet covered rollers which clean the film as it passes over them in the solvent bath; a solvent recovery system; film drying, and the selection and use of special solvent resistant materials.

#### A Cartridge Loaded, Variable Speed, 16mm Motion-Picture Projector

LEONHARD KATZ, *Woburn Engineering Co., Woburn, Mass.*; and NORMAN C. DAHL, *Massachusetts Inst. of Technology, Cambridge, Mass.*

A motion-picture projector was designed especially for use in classrooms as a teaching aid. Requirements included ease of loading, high light levels, high-quality sound and general "school-proofing". A model was constructed with endless loop cartridges which require no rewinding; high-fidelity stereophonic sound; very low noise level of the projector; variable frame rate of the film from 0 to 16 frames/sec with constant flicker rate over the entire range; automatic start and stop; automatic loop formers without sprockets for the film; electronic speed control and synchronization.

#### A New Sound 8 Projector

ROBERT J. ROMAN, JOHN M. MORIARTY and ROBERT B. JOHNSON, *Apparatus & Optical Div., Eastman Kodak Co., Rochester, N.Y.*

A new Sound 8 Motion Picture Projector is described. Color slides are used to illustrate a detailed product analysis covering basic construction, the projector drive, sound drive and electronic system. Major aspects of projector performance are presented together with some comments on the use and future of this development.

#### Engineering Aspects of 8mm and 16mm Magnetic Film Striping for High-Quality Audio or Data Recording

WALTER BACH, *Bach Auricon Co., Hollywood*

Magnetic record and playback contact and wear characteristics affect various types of pre-stripped 8mm and 16mm motion-picture film. These characteristics are analyzed and illustrated.

#### Double-System Sound for 8mm

WILLIAM B. STANCIL, *Stancil-Hoffman Corp., Hollywood*

A practical, inexpensive, highly portable 8mm motion-picture recording system is described. A standard amateur camera and a standard dual-track, self-contained portable recorder are connected electrically to provide lip-synchronization during recording. Reproduction may be either double system or a magnetic-stripped print made by transfer.

## WEDNESDAY EVENING

### 6:45 COCKTAIL PARTY, BANQUET, DANCE

## THURSDAY MORNING—MAY 5

### 9:00 LABORATORY PRACTICE

#### A Survey of Footage and Scene Counters Used in the Motion-Picture Industry

CARL W. HAUGE and SIDNEY P. SOLOW, *Consolidated Film Industries, Hollywood*

A number of counting systems and various types of read-out units have been developed in the last few years. Comparison of the counting techniques are made and advantages and disadvantages summarized.

#### The Use of a Strobe Lamp as a Stable Light Source in a Cinex Tester

EDWARD H. REICHARD and LEONARD L. SOKOLOW, *Consolidated Film Industries, Hollywood*

By using a strobe lamp with its capacitor discharge power supply, a simple, highly reproducible light source is built into a Cinex Tester. This light source eliminates voltage and/or ammeter settings and a mechanical shutter, all of which can contribute errors. The exposure is 1/100-sec duration, which automatically eliminates the effects of reciprocity failure and therefore produces an image in which the tone reproduction exactly matches that of the printing machine.

#### Optical Printing of Liquid-Coated Negatives at Technicolor

HENRY O. IMUS and JOSEPH W. SCHMIT, *Technicolor Corp., Hollywood*

Surface grain and abrasion defects emphasized in optical printing from single-strip color negative for wide-screen presentation were formerly minimized by means of lacquer coatings and diffuse printer optics. This method resulted in lacquer dirt and loss of definition. Technicolor matrices of greatly improved quality are now printed from "wet" negatives, i.e., the negatives are run through a perchlorethylene bath, doctored by means of air and/or vacuum squeegees, printed, then dried with air jets before being taken up.

#### Automatic Developer Solution Replenisher Control by Infrared Cuing

ROBERT M. GRUBEL and CARL W. HAUGE, *Consolidated Film Industries, Hollywood*

By using an infrared light source and a phototube sensitive in this region, it is possible to monitor the film entering the developing section of a continuous processing machine and to control the replenisher rate to match load conditions. The developing solution used with this system is discussed with reference to stability.

#### Film Processing and After-Treatment of 16mm Films

L. J. WHEELER, *British Broadcasting Corp., London*

A daylight-operated continuous film processing equipment is used in the BBC TV newsfilm service. It uses a sprocket drive and is capable of processing 16mm film at a speed of 60 ft/min. The paper also describes equipment for applying a protective coating to the film after processing, and gives the results of tests on the degree of protection achieved.

### Control Techniques in Film Processing

E. H. REICHARD, *Consolidated Film Industries, Hollywood*

For more than two years the Society has been engaged in the preparation of an authoritative text and reference book on laboratory control procedures. A review of the book includes a description of the contents and brings out the importance of this publication to the industry.

### Exposure Control in Television Film Recording

RODGER J. ROSS, *Canadian Broadcasting Corp., Toronto*

Attempts to "improve" the picture quality of film recordings by adjustments of recorder setup or modifications of the film process have, for the most part, produced disappointing results. The advantages of a constant density and density difference film process are outlined. Sensitometric analysis of film response characteristics and exposure conditions may be employed for accurate control of image formation. A linear overall transfer characteristic may be achieved by selecting the most favorable operating conditions. To maintain these conditions a sensitive and accurate recorder photometer is required, together with a standard reference staircase signal. A photometer has been designed, using a modified Densichron amplifier and probe, and a calibrating light source.

### Cathode-Ray Tube and Photographic Film Characteristics Related to Film Recording for Television

MEIER SADOWSKY, *Continental Electronics Corp. of Calif., Los Angeles*

Today's needs in TV film recording are related to the cathode-ray tube parameters of phosphors, screens, aluminizing spot size and operating characteristics. The spectral emission and decay characteristics of phosphors pertinent to photography are described; the effects of the physical characteristics of the phosphor and screen are evaluated in relation to problems of uniformity and impurities. Methods of exposure and the response characteristics of commercially available film are evaluated. The relation of phosphor screen characteristics to film in the optical system is shown.

### Shutter Cycles for Television Film Recording

F. N. GILLETTE and B. D. PLAKUN, *GPL Div., General Precision, Inc., Pleasantville, N.Y.*

The camera used in transferring television program material from the picture tube to motion-picture film requires special shutter treatment. Since the TV image is formed in successive downward sweeps, shutter opening must be timed to span one complete sweep cycle; otherwise, the film shows an overlap or underlap strip known as "shutter bar." This and other factors affecting shutter bar are described by reviewing fundamental relations between the film exposure cycle and the television scan. Practical arrangements for eliminating shutter bar are described and analyzed. Effects of phosphor persistence and reciprocity law failure are considered.

## THURSDAY AFTERNOON

### 1:30 TELEVISION RECORDING

#### An Analysis of the Problem of Splicing Video Tape

MELVIN W. SMITH, *S & S Mfg. Co., Alta Loma, Calif.*

Physical joining of television magnetic tape requires extremely close mechanical tolerances. This paper discusses design considerations of the splicing machine and techniques which make tape splicing a fast, simple procedure even for a relatively untrained operator.

#### An Improved Device for Splicing Video Tape

HAROLD HUMMEL and FRED PFOST, *Ampex Corp., Redwood City, Calif.*

After consideration of the basic requirements for a television-tape splicer, a novel method has been designed for locating field pulses without the use of "tape developer" by employing specially designed flux sensitive heads. The new unit is self-contained and includes precision tungsten carbide cutting bars.

### Multiple Standard Switching System for Video-Tape Recording

KURT MACHEIN, *Ampex International, Redwood City, Calif.*

The operational use of multiple-standard recorders by broadcasters who wish to make taped programs which can be broadcast in countries which do not use the 525-line 60-field system is described. Application to specialized nonstandard scanning systems, such as proposed for Stratovision, or high-fidelity 1000-line recording is suggested.

### Intersynchronization of Television Magnetic Tape Recorders: A New Tool for the Television Broadcaster

HAROLD V. CLARK, *Ampex Corp., Redwood City, Calif.*

Synchronizing the playback of a television magnetic tape recorder with other video signal sources in the station imposes stringent requirements on the control of the rotating video scanning head, since 0.1- $\mu$ sec timing error will result from only 0.00864 degree of error in instantaneous angular position of the head. Some possible methods of control are reviewed and the development of a practical system is described.

### Intersynchronization of Television Magnetic Tape Recorders: A Circuit Analysis

DONALD B. MACLEOD, *Ampex Corp., Redwood City, Calif.*

An account is given of the circuit design and techniques used in the drum control servo. The circuits described, many of which have been transistorized, include the means for the vertical and horizontal sync pulse phase comparison and the utilization of these signals in a linear phase modulation system to control the drum motor to a high order of precision. Several auxiliary circuits such as the 30-cycle edit pulse derivation are also mentioned.

### The Measurement of FM Deviation in TV Tape Recording

A. H. LIND and A. C. LUTHER, *Radio Corp. of America, Camden, N.J.*

The recording of the video modulated carrier on the tape in TV tape recording must be done with care if the maximum potential of the system is to be realized on a basis that permits universal interchangeability of tapes in playback. A discussion of the basic limiting parameters in the system is followed by a description of several methods of measurement, including a new technique that offers greater operational convenience than previously available.

### Effects of Pre-emphasis and De-emphasis in Videotape\* Recording

SIDNEY S. DAMRON, *Ampex Corp., Redwood City, Calif.*

Pre-emphasis, de-emphasis, carrier frequency, and deviation are among significant parameters affecting tape interchangeability in monochrome and color Videotape\* recording. In addition, these factors are important because of their relationships to signal-to-noise ratio and bandwidth. The design philosophy of the color-monochrome, modulator-demodulator for the VR-1000B Videotape\* recorder was heavily influenced by these considerations. The practical problems posed and their solutions are discussed along with the improvements achieved. (\*Trademark, Ampex Corp.)

### A Progress Report on Video-Tape Standardization

CHARLES E. ANDERSON, *Chairman, SMPTE Video-Tape Recording Committee.*

The SMPTE Video-Tape Recording Committee was constituted July 11, 1958. The first report was presented by A. H. Lind before the Society's 1959 Spring Convention in Miami Beach. This report covers the current status of the work of the Committee and outlines progress made during the year.

## THURSDAY EVENING

### 7:30 TELEVISION RECORDING

#### Thermoplastic Recording

W. E. GLENN, *General Electric Research Laboratory, Schenectady, N.Y.*

A method is described for recording electrical signals. Information

is written by means of a very fine electron beam on a film consisting of a low-melting thermoplastic material. This can be projected as a black-and-white or full color image or can be converted to an electrical signal. The film is processed by quick heating and can be erased and reused. The process and the recording equipment are described and a thermoplastic record of off-the-air television is demonstrated.

#### The New Video-Tape Recorder, Toshiba System

NORIKAZU SAWAZAKI, MOTOI YAGI, MASAHIRO IWASAKI, GENYA INADA and TAKUMA TAMAOKI, *Matsudo Research Lab., Tokyo Shibaura Electric Co., Kawasaki, Japan*

The new video-tape recording system, Toshiba VTR, uses only one revolving head, and is capable of continuous recording of the whole TV field on a slant track on the magnetic tape. Problems previously encountered with multiple head systems are avoided, and simplification in both construction and operation results from this innovation. This system is expected to be particularly effective when used for color video recording.

#### Operational Features of the VR-1000B

JOSEPH ROIZEN, *Ampex Professional Products Co., Redwood City, Calif.*

#### A Video-Head Assembly for Recording Primary Standard TV Tapes

A. H. LIND and H. G. WRIGHT, *Radio Corp. of America, Camden, N.J.*

A need exists for standard reference recorded tape for alignment of TV tape recorders. Techniques for making such tapes include the use of a precision standard video-head assembly to record primary standard tapes.

#### Teleproduction With Video Tape

ROBERT DAY, *Ampex Professional Products Co., Redwood City, Calif.*

#### Video Tape in Education

HOWARD TOWN, *National Education Television and Radio Center, Ann Arbor, Mich.*

## FRIDAY MORNING—MAY 6

### 9:00 TRAINING PERSONNEL FOR TELEVISION AND MOTION PICTURES

#### A Brief History of Professional Education in Cinema

ROBERT W. WAGNER, *Ohio State University, Columbus, Ohio*

The history of the motion picture is the story of trial and error, of improvisation, of imitation and intuition. The apprenticeship system was, and largely remains, the usual method of learning motion-picture techniques. In the late 1920s and early 1930s a few universities began offering organized courses in film technique. Today, many educators and leaders in the motion-picture industry agree that the medium deserves serious and critical study, and that there is a critical need for a larger pool of talented young people who must be specifically trained if we are to maintain our historic leadership in the motion-picture arts and sciences.

#### Film and Television Education: A Marriage of Convenience or Necessity?

RICHARD J. GOGGIN, *New York University, New York*

We can arrive at criteria for future successful curricula initially through a knowledge of the past practices in motion-picture and radio education, and more particularly through an examination of the present interindustry relationships. These relationships have more than the obvious relevancy for teachers; they provide academically sound and professionally necessary guideposts leading to the goal of developing creative and well-rounded students who have been trained within the context of internally-integrated curricula in motion-pictures and television.

#### Training for Film AND Television

RUDY BRETZ, *Univ. of Calif., Los Angeles*

In the all too short time available for training a student we can give him either a thorough vocational training in a limited field or a more cursory familiarization over a broader area. For some students the first is desirable. For the university student, however, the broader view is preferable. In training production personnel for television and motion pictures we are unrealistic if we allow a student to limit himself to the study of just one medium.

#### Training of Motion-Picture and TV Personnel in Europe and the Middle East

DON G. WILLIAMS, *Univ. of Kansas City, Kansas City, Mo.*

Training available today for motion-picture and television personnel in France, Italy, Spain, Germany, Great Britain, Russia and other European and Middle Eastern Countries varies in greater or less degree from country to country. A comparison of training methods and available facilities suggests a relationship between technical progress, and quality and availability of training. Training methods are evaluated in terms of national and international requirements.

#### An Analysis of Motion-Picture Production Courses at Ten Universities

JOHN H. TYO, *System Development Corp., Santa Monica, Calif.*

A depth survey was made of motion-picture film production courses in the ten U.S. universities which have been identified as offering the largest number of such courses. Eleven subject-areas including cinematography, editing, directing, recording, writing, etc., are analyzed, first for each school, and then for all ten schools, from the point of view of amount, content, methods of teaching, and evaluation techniques. Administrative practices for film production courses are compared.

#### Training Army Personnel for Motion Pictures and Television

MAJ. DOUGLAS W. GALLEZ, *Army Pictorial Center, Long Island City, N.Y.*

The Army has continuing need for personnel trained in motion-picture and television production, for sociopsychological researchers to evaluate production techniques, and for skilled technicians to operate and maintain equipment. Visual media are being exploited for education and training, and for morale purposes. Increased emphasis upon research and development has occasioned greater demand for personnel experienced in photographic instrumentation and engineering. The training program existing today and anticipated future needs are discussed.

#### Television Viewing in Classrooms

JOHN W. WENTWORTH, *Broadcast & TV Div., Radio Corp. of America, Camden, N.J.*; G. J. WHITLEY and H. K. SHOAF, *RCA Victor Div., Radio Corp. of America, Camden, N. J.*

The viewing of television programs in classrooms involves problems slightly different from those encountered in normal home TV viewing. Some of the major problems analyzed are ambient illumination, glare, viewing angles and ratios, and audio power requirements. A receiver designed specifically for classroom viewing is described.

#### A Closed-Circuit Television System for Centralized Audio-Visual Projection

RUDY BRETZ, *Univ. of Calif., Los Angeles*

A method is proposed of installing of closed-circuit TV as a means of transmitting instructional motion pictures, films, magnetic tapes, slides and live television to television receivers in classrooms and auditoriums throughout the University Campus. A central projection room will be established containing three film chains and projectors. Additional chains and projectors will be added as needed. Facilities will be provided for a maximum of eighteen simultaneous transmissions.

#### Transmission Facilities for the Anaheim Educational Television Project

MAX P. BEERE, *Pacific Telephone and Telegraph Co., San Diego, Calif.*

The Anaheim Elementary School System's educational television

network interconnects 17 schools with its studio. The schools are located within an area of about 20 miles and are linked together by some 22 miles of coaxial cable, suitably amplified. The network is designed for six adjacent channels utilizing the five standard low-band channels plus one channel in the FM band.

## FRIDAY AFTERNOON

### 1:30 TELEVISION EQUIPMENT AND PRACTICES

#### The Problem of the Unrestored Television Receiver

ROBERT J. NISSEN, *KQED, San Francisco*

It is maintained that correct gray-scale reproduction is the most important parameter of television picture fidelity. The absence of d-c restoration in the modern home receiver, under certain picture conditions, will almost totally destroy proper gray-scale reproduction. Results are reported from a survey of set manufacturers which questioned their reasons for excluding this critical circuitry. To alleviate the unrestored picture problem, until restoration circuits are again included in the home receiver, operating procedures and standards based on the use of the transmission waveform as a guide are proposed to the broadcast engineer.

#### An Analysis of Noise in the Image Orthicon

B. H. VINE, *Electron Tube Div., Radio Corp. of America, Lancaster, Pa.*

The problem of how to design a camera tube to operate at light flux levels lower than those presently used without reduction of the signal-to-noise ratio is examined. It is shown that any increase in photocathode sensitivity or mesh transmission allows a corresponding reduction in the light required for equal performance. On the other hand, increases in the secondary-emission ratios of the target of first dynode, even if indefinitely large, can only produce a limited reduction in the light required for equal performance.

## New Concepts in TV Cameras

S. L. BENDELL and H. N. KOZANOWSKI, *Radio Corp. of America, Industrial Electronics Products, Camden, N. J.*

Television cameras, electrically stabilized to produce optimum picture quality with a minimum of operator attention, have been developed. Such cameras have long-term precision recycling characteristics and are interchangeable without readjustment. Reliability is obtained by the use of premium tubes, nuvistors, and conservative design. These attributes have been incorporated in a new 4½-in. image-orthicon camera.

#### Operation of a New Image-Orthicon Camera

CYRIL TEED, *Marconi Wireless Telegraph Co., Ltd., Chelmsford, Essex, England*

Operation features of the new 4½-in. image-orthicon Marconi Camera are discussed with emphasis on broadcasting problems and requirements. A new design idea has been incorporated to achieve stability and versatility and to simplify the operation of the camera.

#### A Versatile Distribution System for Telecine and Video-Tape Signals

GLEN AKINS, *American Broadcasting Co., Hollywood*

An auxiliary video switcher employing a compact, low-capacitance rotary switch permits a typical television switching system to handle an additional forty input signals. Sync mixing and audio switching functions are automatic. An interlock facility is provided for joint operation of two or more switching systems.

#### A Mobile Color Video Tape Recording Unit

WILLIAM BARNHART, *Ampex Professional Products Co., Redwood City, Calif.*

## FRIDAY EVENING

### 7:45 BEN HUR, MGM STUDIOS (THEATER)

# Exhibit Directory

**Ampex Corporation**  
Redwood City, Calif.

Booths 212, 214, 216

*Exhibiting:* Two new Ampex Videotape Recorders; Marconi Mark IV Television Camera Chain, and accessories.

*Personnel:* Jack Miller, Joe Silver, Hal Hummel, Bob Day, Jack Neitlich, Joe Roizen, Cyril Teed, Bill Barnhardt, Eldon Brown, Charles Swisher, Ed Aleks, Tom Merson, Frank Gonzalez, Bill Wallace, Jack Hauser.

**Arriflex Corporation of America** Booths 208,  
257 Park Ave. South, New York 10 210  
7303 Melrose Ave., Los Angeles 46

*Exhibiting:* The Arricord—a single-unit double-system synchronous sound recording outfit comprising an Arriflex 35 and a 17½mm magnetic film recorder in a single blimp; Arriflex 16 with signal generator and Maihak ¼-in. tape recorder; Schneider lenses in new series of Cinegons and Cine Xenons; Taylor Hobson Cooke lenses in Kinetal series and Speed Panchro Series II; nickel cadmium batteries with built-in Mini-charger.

*Personnel:* Paul Klingenstein, Victor James, Michael Zois, Abbott Sydney, Richard Halpert, Carl Nuernberg.

**Bach Auricon, Inc.**

6946 Romaine St., Hollywood 38

Booth 115

*Exhibiting:* Auricon and Datasync 16mm Sound-on-Film and Data Recording Cameras, including Auricon Cine-Voice II, Auricon Pro-600, Auricon Super 1200, Filmagnetic Recording Systems, Datasync "Photo-tape" Electronic-Optical Data Recording Equipment, Multiple-track Datasync Filmagnetic Projection Equipment, Auricon "VFR," Video Film Recording Equipment.

*Personnel:* Walter Bach, William G. Straube.

**Bell & Howell Co.**

7100 McCormick Rd., Chicago 45, Ill.

Booth 102

*Exhibiting:* The Bell & Howell Model JM 16mm Motion-Picture Printer, and accessories.

*Personnel:* James L. Wassell, Malcolm G. Townsley.

**Birns & Sawyer Cine Equipment, Inc.** Booth 201  
6424 Santa Monica Blvd., Hollywood 38

*Exhibiting:* Omniscope Tracking Finders; Omniscope Lenses (telephoto system); Omnipod Lens Cradles; Birns & Sawyer Heater Barneys; new tripods for Arri cameras; sports and tracking finder for Arri cameras.

*Personnel:* Jack Birns, Cliff Sawyer, Pat Watson.