

# 89th Convention \_\_\_\_\_ Advance Program

King Edward Sheraton • May 7-12

**Theme: International Achievements in Motion Pictures and Television**

**T**his program is as complete and accurate as possible at press time — but there may be errors and there probably will be some changes for the Final Program. If attendance at a session is now being planned for only a specific paper or two, members are advised to inquire during the week before the Convention by telephoning to SMPTE Headquarters in New York (LONgacre 5-0172) or to Rodger J. Ross, Canadian Broadcasting Corp., 354 Jarvis St., Toronto, Ont. (telephone Walnut 5-3311, Local 4504).

## SUNDAY—MAY 7

**12:00-6:00 Registration**

## MONDAY—MAY 8

**9:00 Registration**

**9:30 CINEMATOGRAPHY**

### Some Psychological Aspects of Motion-Picture Montage

JOHN R. GREGORY, *Boeing Airplane Co., Vashon, Wash.*

A psychological theory which explains how an edited motion-picture film or a TV program communicates would be of value to the communications theorist and possibly to the practicing communicator. A model of the process may be based on the grammar of modern English; psychological theory may be found which underlies both English grammar and visual editing. Research with specially structured film-clips yielded test data relating to the theory.

### Effect Techniques as an Aid to Low-Budget Production

WALLY GENTLEMAN, *National Film Board, Montreal, Que.*

This paper describes the application of various feature film techniques, such as process projection, traveling mattes, painted mattes, model and miniature, and optical printing procedures, to low-budget production under the organization of the National Film Board of Canada. The planning and development of the various processes from conception to completion is dealt with. The integration of varied skills and crafts is considered and explained.

### Novel Technical Means of Expression in the Motion-Picture Art

FRANTISEK PILAT, *Czechoslovak Film Corp., Praha, Czechoslovakia*  
Technologies, recently developed in Czechoslovakia include (1) Polycran, a system for simultaneous projection on three or more screens disposed in space in various ways. Sections of motion pictures or diapositives are projected onto the screens. The sound accompaniment is directional and stereophonic. The operation is automatized. (2) Laterna Magica is a combination of projected films and diapositives, as well as sound reproduction with the performance of live actors. To this end special systems of technical equipment have been developed.

### Characteristic Features of Czechoslovak Motion-Picture Technique

VILEM TARAHA, *Czechoslovak Film Corp., Praha, Czechoslovakia*

The particular results achieved in Czechoslovakia in motion-picture production, laboratory processing and projection are related to characteristic features of some new technologies and the newly developed technical film equipment. The importance of international standards is stressed.

### Simulated Night Photography Using Color Reversal Films

GEORGE T. KEENE, *Color Technology Div., Eastman Kodak Co., Rochester, N.Y.*

The current methods of obtaining night effects in daylight photography are reviewed critically, and a number of possible improvements are explored.

An original given two stops overexposure and printed using a printing master is shown to give a desirable reduction of tone scale, less color saturation, and a more realistic night effect. The required compromise between realism and tone compression is explained. Night scenes photographed using artificial lights and moonlight are discussed briefly.

### The Super Technirama 70 Process

DONALD NICHOLSON, *Technicolor Corp., Hollywood*

The Technicolor Super Technirama 70 print process is described and illustrated. Attention is given to the camera and printing equipment used. The combination of large-area negative and large-area positive produces a screen result of outstanding quality. In addition, excellent prints may be made in a variety of aspect ratios on 35mm and 16mm print films. This flexibility is designed to meet today's exhibition requirements.

### 12:15 Get-Together Luncheon Guest Speaker—"What's New in Exhibition"



**J. J. FITZGIBBONS, Sr., Vice-President and Director, Trans Canada Telemeter, Ltd.**

## MONDAY AFTERNOON

**2:30 IMAGE FORMING SYSTEMS**

### INSTRUMENTATION AND HIGH-SPEED PHOTOGRAPHY

#### An Objective Method for Rating Picture Sharpness

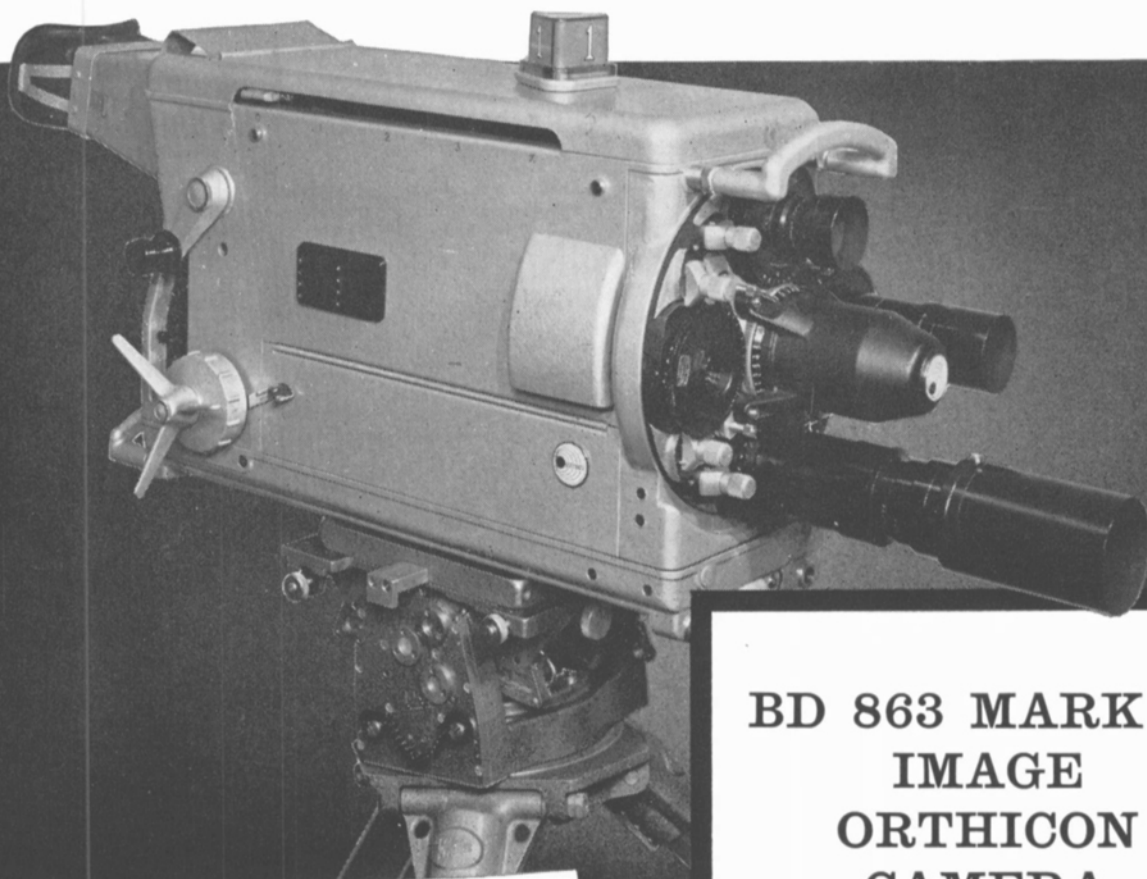
EDWARD M. CRANE, *Research Laboratories, Eastman Kodak Co., Rochester, N.Y.*

At a recent convention Fred H. Perrin reviewed the history and theory of sine-wave response determination (*Journal* 69, 151-156 and 239-249, 1960). The significance and usefulness of sine-wave response can also be empirically demonstrated. The effects of the printer on picture sharpness and the relative sharpness of various professional motion-picture films and release prints can be quantitatively described. An empirical approach to evaluation leads to a proposed objective sharpness rating.

# THE MARK IV CAMERA CHAIN

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## Detection of Binary States in the Presence of Noise

P. L. P. DILLON and J. C. MARCHANT, *Research Laboratories, Eastman Kodak Co., Rochester, N.Y.*

On the basis of an ideal physical detector, a general expression is derived for the probability of detecting binary states in the presence of noise. It is shown that this probability can be maximized for a given signal-to-noise ratio by the correct choice of the various parameters involved. The analysis is applied to the problem of detecting binary-coded information in a photographic film and the validity of the analysis is demonstrated experimentally.

## Optimizing Image-Converter Camera Performance

GEORGE L. CLARK, *Space Technology Laboratories, Inc., El Segundo, Calif.*

A number of factors affecting the performance of an ultra-high-speed image-converter camera have been investigated. Many of these factors are associated with the image-converter tube, such as electron optical resolution, photocathode resistance, grid circuit resonance, and distortion caused by space charge. The design of the optical system involves choices of lens apertures, fields of view and resolution. Since the factors are interdependent, each one cannot be optimized by itself, but must be considered as part of the system.

## Electrostatic Printing and Display Techniques, Using Charactron and Line-Scan Tubes

C. D. MILLER and K. MORGAN, *Information Technology Div., General Dynamics/Electronics, San Diego, Calif.*

A family of computer readout, display, facsimile and digital communication equipment has been developed using electrostatic images formed by high-precision Charactron and line-scan techniques. A comprehensive analysis of problems is given together with solutions encountered in the design of the equipment. Various applications of electrostatic images for the recording and retrieval of alphanumeric, pictorial or graphic data are discussed. Detailed attention is given to some of the basic problems involved in the transfer of cathode-ray-tube images to the recording surface.

## Principle and Proof of a Simultaneous-Writing High-Speed Streak and Framing Camera Concept

L. R. TEEPLE, JR., *Beckman & Whitley, Inc., San Carlos, Calif.*

A simple principle of a simultaneous recording of both streak and framing record of the same event makes possible direct separate frame observation during streak recording of high-speed events. The system permits progressive, full-frame identification from the same observation point of phenomena often difficult to identify with certainty on a streak record alone.

## Long-Focal-Length Sweep Camera for Backlighting Exploding Wire Photographs

H. S. BURDEN, D. D. SHEAR and F. D. BENNETT, *Ballistic Research Laboratories, Aberdeen Proving Ground, Md.*

A 15-nanosecond-resolution streak camera for photographing exploding wires uses a simple, intense backlighting source and a slow lens. 10-microsecond views of the explosion unobscured by its characteristic short, intense flash are obtained. Components of the camera, light source, and synchronizing circuits are detailed. Formulas for the effective lens speed and for the instantaneous sweep-speed of the finite thickness rotating mirror are given. The time resolution is considered. Typical photographs are displayed.

## Factors Limiting the Accuracy of Data Acquired by Photographic Instrumentation

L. E. DAVIDSON, *Ordnance Corps, Aberdeen Proving Ground, Md.*

The accuracy of data obtained by photographic instrumentation is affected by many factors. Some are controllable, others are unavoidable. At Development and Proof Services, Aberdeen Proving Ground, Md., studies have been made to improve the accuracies of data obtained photographically during weapons tests. Techniques are discussed for field calibration of equipment, exacting operational methods and use of high-speed computers during data analysis, to eliminate altogether or minimize effects which tend to produce data inaccuracies.

## Research and Development of Optical Tracking Methods and Instrumentation at the Ballistic Research Laboratories

DIRK REUYL and WALTER CARRION, *Ballistic Research Laboratories, Aberdeen Proving Ground, Md.*

Methods and instrumentation for the determination of missile trajectory, attitude and warhead functioning as well as target intercept are discussed. Detailed descriptions are given of the IGOR, SMT and RT-2 systems. The RT-2, a large-aperture, wide-field, precision tracking telescope with real-time shaft angle readout is the latest telescope developed by BRL. The applicability of these instrument systems to other problems is shown, particularly in the field of space probe and satellite research

## MONDAY EVENING

### 7:30 FILMS AND TELEVISION IN EDUCATION

#### A New Specialized Training Course for Television Technicians

D. E. C. FOWLER and N. R. OLDING, *Canadian Broadcasting Corp., Montreal, Que.*

A survey within CBC indicated that an improvement in operations was possible, particularly in certain technical areas. To achieve this, a small technical training center was established and it is now capable of training the student in logical trouble-shooting techniques. Lectures are supplemented by practical training in the required subjects, using overhead visual projectors and electronic building blocks. Experience gained by the trainee in this manner is applied directly toward the rapid location and correction of faults in technical equipment. A new approach to technical maintenance training is discussed in detail.

#### Successful Communication

CLIFFORD BROWN, *Canadian Marconi Co., Montreal, Que.*

A comparison is made between the concepts of the engineer and the educationist in the field of communication. The mass media are seen as the conjunction of two philosophies, which must now be linked by a bridge of semantics and symbology. Didactic and intuitive approaches to learning are considered in engineers' terminology, and the concept of the "educative interface" is postulated. Video-tape illustration of "A New Way To Teach Mathematics" supports the thesis.

#### Teacher-Student Communication

H. J. SCHLAFLY, *TelePrompTer Corp., New York*

Transmission of knowledge and ideas between the teacher and the student is greatly augmented by the integrated and planned use of modern communication tools. This type of system aid to the teacher is discussed together with working examples from both government and university level installations.

#### Technical Aspects of an Educational TV and Radio Station

J. L. MYLES, *WGBH-TV, Cambridge, Mass.*

Engineering and production achievements in the educational field of broadcasting are described, with emphasis on the improvement of station operating practices through local workshop seminars for production and engineering groups. Also included will be technical requirements of NET, of which WGBH, Boston, is an affiliate, which are in accordance with the SMPTE recommended practices and proposed practices and ASA standards.

#### The Technical Aspects of Educational Television in Detroit

JOHN F. X. BROWNE, Jr., *Detroit Educational Television Foundation, Detroit*

Educational television in Detroit has grown from a small part-time broadcast station to one of the largest educational television operations in the United States. The technical aspects of a six-studio television operation producing live programs for broadcast, two closed-circuit systems, national and local video-tape distribution, and airborne television involve almost every technical phase of television. Production and distribution of programs, and the compatibility and interchangeability of video-tape recordings in this complex operation require a high degree of flexibility but rigid technical standards are required to maintain technical quality.

## TUESDAY MORNING—MAY 9

### 9:00 NEW DEVELOPMENTS IN 8MM — 1

#### The Future Role of 8mm Sound Film

JOHN FLORY, *Eastman Kodak Co., Rochester, N.Y.*

8mm sound film, "another milestone in the communications revolution," may extend the boundaries of the motion-picture industry just as paperbacks have extended the field of publishing. Some major technical and economic obstacles must be overcome before the potential of 8mm for home entertainment, community service, religion, medicine, science, business and industry, and education can be fully realized.

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The Federal Science Pavilion at the Century 21 Exposition in Seattle will feature a revolutionary multiple image projection system (seven projectors are employed). Designed especially by Reevesound for the U.S. Department of Commerce. The system will show a highly imaginative film presentation created by famed designers Charles and Ray Eames who worked closely with Reevesound engineers.



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## Early 8mm Sound Developments

WM. D. HEDDEN and KENNETH B. CURTIS, *Calvin Productions Inc., Kansas City, Mo.*

Recently much interest and activity has been shown in the use of 8mm films. Although this interest in the 8mm field has flourished recently after the introduction of several 8mm sound projectors, much research and development had been done in the past by those interested in 8mm films. This paper presents an historical resume of the work of the late Lloyd Thompson and some of his early developments. Particular attention is given to the sound projection equipment he introduced and some of the film procedures that he utilized to make release prints.

## 8mm Magnetic Sound Equipment Round-Up

EYRE BRANCH, *Noel Enterprises, Hartsdale, N.Y.*

Recent developments in 8mm sound projectors, cameras and magnetic striping equipment are reviewed. Types of projectors described and illustrated include (a) built-in sound couplers operating with tape recorders; (b) conversion to sound by addition of separate recording and playback heads; and (c) complete 8mm magnetic sound recording and playback units. A recently developed 8mm sound camera is described, also new equipment ranging from the do-it-yourself hand-operated magnetic striping to the elaborate laboratory model. The growing interest in this medium of communication is evaluated.

## 8mm Magnetic Sound Film in Audio-Visual Applications

R. G. HENNESSEY, *Industrial Products Div., Fairchild Camera & Instrument Corp., Yonkers, N.Y.*

There are properties of 8mm magnetic film which permit exceptional life as well as initial economy in adaptation. Equipment advantages in comparison to previously existing machines are presented. Results of life test runs are presented as well as results of other tests. Various applications of 8mm equipment are described in detail.

## An Educator Looks at 8mm Sound Film

LOUIS FORSDALE, *Horace Mann-Lincoln Institute of School Experimentation, Teachers College, Columbia Univ., New York*

The development of 8mm sound film suggests important advances for film in education, including increased utilization resulting from decentralization of film libraries, increased use of film by small groups and individual learners, expanded lists of titles, new uses in research, and exploitation of local production possibilities. Many of these advances are critically dependent, however, on the availability of vastly simpler, lighter and cheaper projectors and viewers, and on improvements in 8mm sound cameras.

## 8mm and the Classroom Film Library — Potentials and Requirements

STEVE KNUDSEN, *Iowa State Univ., Ames, Iowa*

Our present educational usage pattern for film involves film rentals, special projection rooms, and passed-around projectors. Can 8mm serve as the agent to change this to a pattern in which an adequate library of films and the necessary projection facilities remain in and are an integral part of the classroom? If so, what will be the scope of such a shift? What are the requirements before such a shift can take place?

## An Endless-Loop Magazine for Projection of 8mm Film; Silent and Magnetic Sound

RICHARD C. GEARHART, *Cousino Electronics Corp., Toledo, Ohio*

The advent and promising commercial future of 8mm films has stimulated development of a simple, inexpensive magazine designed for accessory use with any commercially available 8mm projector, silent or magnetic sound. The magazine is suitable for applications in which both the print and magazine are expendable, such as conventions, window displays and short-term point-of-sale promotions, industrial engineering time studies, etc. Features and operation of the magazine are described and factors affecting film abrasion and breakdown life are discussed.

## Rear Projection of 8mm Sound Prints

FRED E. AUFHAUSER, *Vicom Inc., Rochester, N.Y.*

Problems encountered when making enlargements of 8mm are discussed and their solution illustrated by use of the New Vicaudio Sound 8 Projector and the showing of various films. The optical system needed to achieve a clear, brilliant picture is described.

## TUESDAY AFTERNOON

### 2:00 NEW DEVELOPMENTS IN 8MM — 2

#### New Possibilities in 8mm Projection

WALTER RYBKA, *Paillard Inc., New York*

The new Bolex 18-5 projector for 8mm, permits completely flickerless projection at 18 frames/sec and at a new slow-motion speed of 5 frames/sec, due to a new variable shutter which automatically changes the number of shutter blades, without appreciably changing the screen brightness. The projector is also used in combination with the Bolex Sonorizer for the recording and playing back of magnetic sound on 8mm. The Bolex Sonorizer has an overplay feature which automatically reduces the volume of a recording in order to permit overplaying a second soundtrack.

#### A Self-Contained Recorder for Motion-Picture Sound

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

Exciting techniques in motion-picture production now require compact camera and sound equipment. A self-contained, battery-operated and transistorized tape recorder is described which provides synchronization with both spring-driven and motor-driven cameras. The 13-lb recorder may be used in conjunction with 35mm, 16mm or 8mm cameras, and the resultant sound may be transferred to sprocketed film for editing and subsequent release, or it may be synchronized with projectors for double-system viewing.

#### High-Speed Inspection of Magnetic-Striped Release Prints

BEN KLEINERMAN, *Federal Manufacturing & Engineering Corp., Garden City, N.Y.*

A low-frequency (30-cycle) sine wave is recorded along with the audio when making the release print. This signal may then be picked up during high-speed (400 ft/min) examination of other physical defects. Thyatron-actuated relays stop the machine in the event of a dropout, splice or reduction in signal output level indicating an alteration in the soundtrack. The operator may then start up again at 24 frames/sec and listen for any objectionable erasure or re-recording.

#### 8mm Color Positive Release Prints With Magnetic Sound: A Progress Report

ROBERT A. COLBURN, *Geo. W. Colburn Laboratory, Inc., Chicago*

Silent 8mm color reduction prints were produced almost 25 years ago. Constant improvements in methods and materials led to many commercial uses. Although a paper on 8mm magnetic sound was first presented to the Society in 1947, little progress was apparent until late 1959. The Geo. W. Colburn Laboratory adapted existing equipment and designed and built new equipment to meet the demand for quality 8mm color sound prints in volume at a cost substantially lower than 16mm prints, despite many additional operations involved.

#### The Manufacture of 8mm Prints at Technicolor

W. E. POHL, *Technicolor Corp., Hollywood*

Methods used at Technicolor for preparation of 8mm magnetic-sound release prints made from 35mm Eastman Color Negative or 16mm Ektachrome source material are discussed.

#### Developments in Magnetic Striping 8mm Sound Films

EDWARD SCHMIDT, *Reeves Soundcraft Corp., Danbury, Conn.*

The advent of 8mm sound has prompted the design and construction of a single 8mm striping machine for photofinishers, a high-speed 8mm double striping machine for laboratory use and modifications to the standard Model "Z" striping machine. These various equipments are described and experiences on striping large quantities of unexposed double 8mm raw stock are discussed.

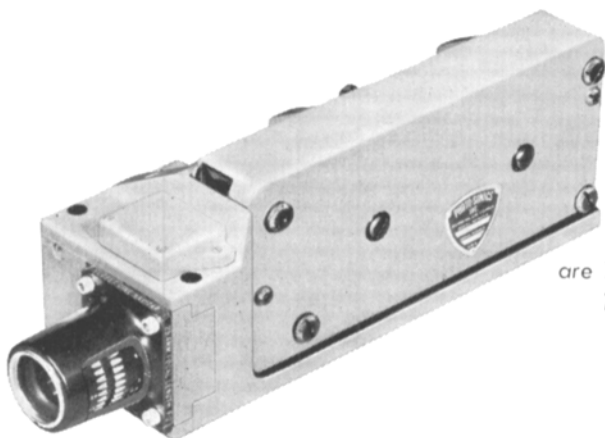
#### Precision Magnetic Striping of 8mm Film

F. J. KOLB, E. M. WEIGEL, R. LOVICK and J. PEER, *Kodak Park Works, Eastman Kodak Co., Rochester, N.Y.*

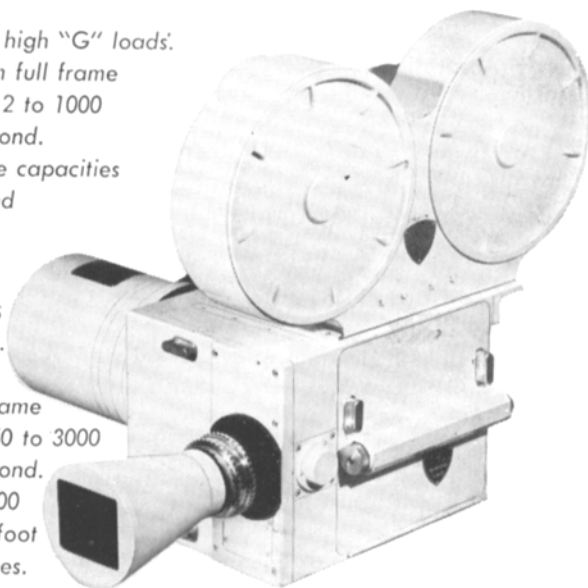
Magnetic sound recording on 8mm film demands close tolerances on both stripe dimensions and magnetic-audio performance because the system requires a narrow stripe and a low film speed. The requirements of good design of a striping machine are reviewed with particular attention to positive film positioning and stripe placement at the striping point, constant-speed film drive, and minimum film tensions. A coating head and a corresponding high-viscosity magnetic dispersion are described that together define stripe width, thickness and contour. This system has been used by the Eastman Kodak Co. to provide 8mm Sonotrack since May, 1960. Quality control data from this operating experience are reviewed to indicate reasonable production control for the guidance of processing laboratories who may wish to design similar striping systems.

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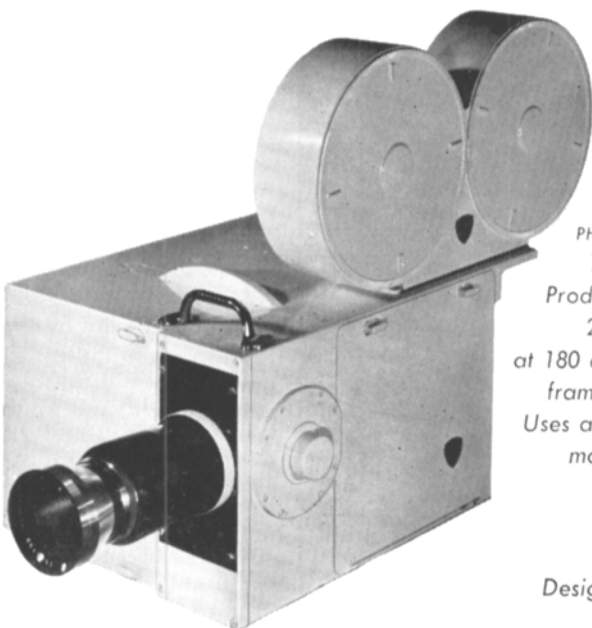
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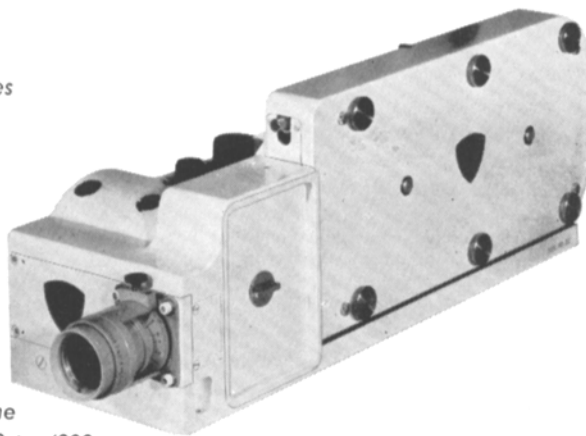
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## 8mm Film With Photographic Sound

JOHN A. MAURER, *JM Developments, Inc., New York*

For applications in which very large numbers of prints are required and low cost is important, photographic sound on 8mm offers major advantages, since no striping process is required and the sound can be printed in one operation with the picture. Photographic sound can be as good as magnetic; the belief that it cannot arises only from the general failure of the industry to explore the possibilities of photographic recording. Optimum procedures for the quantity production of high-quality prints are outlined. Sound quality is demonstrated, using an 8mm magnetic projector converted for the reproduction of photographic soundtrack.

## TUESDAY EVENING

### 7:30 FILM PROJECTION AND TELEVISION FILM

#### Energy Absorption Considerations in Motion-Picture Projection

ERIC A. YAVITZ, *Manufacturing Experiment Div., Eastman Kodak Co., Rochester, N. Y.*

Data on the energy absorption characteristics of color and black-and-white release films are presented. Calculations are made of the relative energy absorbed by these films when projected with a high-intensity carbon arc in conjunction with a silver or dichroic reflector. The results are compared to each other, and their significance and implications are discussed. The spectral distribution of the incident energy and its important bearing upon the performance of color films is reviewed.

#### The Xenon Light in Film and Television Industry

ALBERT JEKSTE, *Atlantic Films and Electronics, Ltd., St. John's, Newfoundland*

Some of the theories and characteristics of Xenon Light are discussed together with its historical development. There are practical applications in optical systems in motion-picture projection, rear projection, printing machines and sound recording.

#### Trends in 70mm Projection Equipment

GIOVANNI BOZZI, *c/o Cinemeccanica, Milano, Italy*

The future of 70mm production is largely dependent on the medium-size theaters, so it is imperative that economy of installation be made a primary consideration. Low-priced equipment that permits continuing use of equipment already installed, and compatibility of 70mm and 35mm operations to avoid a third projector operation have been the main goals in the design of the Victoria X, and particularly the new Victoria 8.

#### A Method of Producing Telecine Test Materials of Specified Density

LESLIE H. HOLMES, *Ryerson Institute of Technology, Toronto, Ont.*

Ten-step staircase test wedges on 2 by 2-in. slides and 16mm film have been manufactured to predetermined density values. A general account is given of a method of correlating subject reflectance with negative density, preparation of flashed paper strips to serve as a master copy and the problems associated with producing a predicted scale of densities.

#### Vidicon Light-Transfer Characteristics and Film Reproduction

R. G. NEUHAUSER, *Electron Tube Div., Radio Corp. of America, Lancaster, Pa.*

The light-transfer characteristics of the vidicon cannot be used directly to predict light-transfer characteristics of a television-film system. The practice of setting the darkest excursions of the video portion of a TV signal to black level, or cutoff of the TV picture tube, changes the effective light-transfer characteristic of the vidicon. Additional gamma correction of the electrical signal is required to reproduce film properly on television. The type of correction necessary for the proper reproduction of film meeting the new proposed specifications for density range and transfer characteristics of television film is described.

#### Making Films for Television in Canada

LEON SHELLY, *Leon Shelly & Co., Toronto, Ont.*

Some of the problems involved in making films for television in Canada are discussed. The cooperation of sponsors, advertising agencies, producers, laboratories, optical houses and television stations is needed for solution of these problems.

## WEDNESDAY MORNING—MAY 10

### 9:00 SOUND RECORDING AND REPRODUCTION — 1

#### Modifications of Tape Reproducing Equipment for Use With the Pilot-Tone Synchronization System

R. R. EPSTEIN and L. O'DONNELL, *National Film Board of Canada, Montreal, Que.*

Motion-picture production requirements for lightweight synchronous location equipment demand battery operated cameras and magnetic recorders. The speed variations of the location equipment are recorded on a low-frequency control track at the center of the  $\frac{1}{2}$ -in. tape perpendicular to the program modulations. The recordings are reproduced and speed corrected with a playback synchronizer originally designed for a high-frequency carrier system of synchronous recording. The modifications of the synchronizer for this additional use are described and performance data given.

#### Magnetic-Tape Multiple-Cartridge Reproducers for Re-Recording Applications

G. R. CRANE and G. A. BROOKES, *Westrex Corp., Hollywood*

Two new types of reproducers are discussed. Both have continuous loops of  $\frac{1}{2}$ -in.-wide magnetic tape stored in a series of individually removable cartridges. Each cartridge can contain a separate effects track and can be selected remotely from the re-recording console. One version contains up to 100 cartridges and employs a common reproducing head and pre-amplifier. The head traverses the cartridges to the selected position at which time the head and drive are engaged with the cartridge. A second version contains up to 15 cartridges and uses a separate reproducing head and pre-amplifier for each cartridge.

#### A Tape Recorder for the Production of Special Sound Material

HUGH LE CAINE, *National Research Council, Ottawa, Ont.*

For more than thirty years the handling of sound records has been one of the techniques required in making motion pictures, but only recently have composers considered the realization of a musical composition by processing and combining recorded material. The result is called "electronic music." Electronic music techniques have been used to produce all the background music in a motion picture, to augment scores for conventional instruments, to produce the unusual sound effects used in science fiction films, and for imaginative extensions of natural sound, as in the recent film *Rosemarie*. For these purposes sound records can best be handled by apparatus superficially resembling the familiar sound mixers, but designed to allow the maximum flexibility in modifying the recorded material. Such apparatus, especially designed for use in an electronic music studio, is described.

#### Integrated Audio—The "Package" Concept in System Design

J. R. SIMPSON, *Technical Marketing Services, Toronto, Ont.*

Integrated audio systems have been designed and constructed for the control and distribution of program and intercom sound in television and film studio applications. The electrical, physical and human engineering requirements of high-quality master control consoles are discussed, and the evolution of several systems, capable of handling up to twenty simultaneous inputs, is described. A new TV intercom system utilizing solid-state switching techniques and computer mechanics and an audio switcher for integration with TV video switching systems are also discussed. Recently engineered film production and TV studio installations serve as illustrations.

#### A Bilingual Drive-In Installation

F. DE RENZIS, *Westrex Company Italy, Rome, Italy*

Equipment used for the simultaneous bilingual presentation of sound films in an 800-car drive-in theater near Rome is described.

#### Multilingual Sound Installation—Palace of Science, Brussels World Fair 1958

GEORGE F. VAN WEYENBERGH, *Westrex Co., France-Belgium, Brussels, Belgium*

The sound picture installation used to present the story of the atom at the Brussels World Fair is described. The presentation includes picture, music and sound effects and a commentary in five languages.

#### Improving 16mm Optical Sound

RICHARD H. RANGER, *Rangertone Inc., Newark, N.J.*

Soundtrack quality for 16mm film has been on a plateau for about three

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Now television stations can produce true sync-sound news films locally, at substantial savings over existing methods. With Fairchild's new 8 mm sound movie equipment your productions cost far less than comparable 16 mm or 35 mm sound films.

You need just three pieces: a portable, hand-held 8 mm sound camera; a companion 8 mm sound projector; a rapid film processor. Total cost: about \$2,125.

**Camera is easy to operate:** The camera, weighing less than 5 pounds, has its own power supply and recording system built in. A reporter can carry the whole system in one hand and move quickly in tight places—recording sound as he films action.

The camera records on a 30-mil magnetic stripe, on the film between the sprocket holes and the edge. You set the volume according to the situation. The sound system records 100 to 4800 cps.

With the new camera, you can shoot for about 2¾ minutes on each half of the 50-

foot film. The spool is then reversed—for a total shooting time of about 5 minutes, ample time for most interview situations.

**Uses conventional processor:** You process the 50-foot film spools directly through Fairchild's Mini-Rapid 16 Processor, for negative developing at about 6 feet per minute. This processor, which is currently being used in TV stations throughout the country, requires no changes to handle film from the 8 mm sound camera.

**Projector runs the negative:** After the film runs through the Fairchild processor as a negative, you slit it to the 8 mm size, splice and run it through a Fairchild 8 mm sound projector. By reversing the electrical polarity of the tube output, the screen gets a positive image.

**FAIRCHILD**  
CAMERA AND INSTRUMENT CORP.

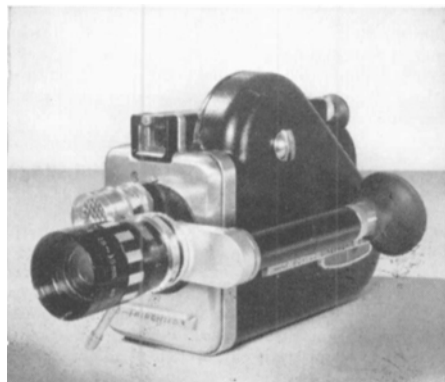
**Special TV projector:** The projector is a specially developed version of the Cinephonic 8 machine, built entirely to television projection requirements. Its drive motor is a synchronous type, 115V, which runs at 1800 r.p.m.

A five-bladed 50° shutter replaces the standard three-bladed 55° shutter. This makes the projector compatible with the scanning rate of the vidicon, synchronized with the standard 60 cycle reference.

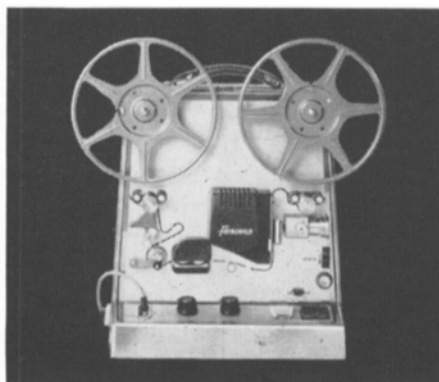
Normal projection lighting of picture is too bright for projection into the tube. So, a variable intensity control is added for changing projector light output. This lets you balance the output of your films.

**Free literature:** For complete information on the Cinephonic 8 sound motion picture system for TV stations, write to Mr. Herbert M. Oshan, Marketing Manager, Fairchild Camera and Instrument Corporation, Dept. SMP-4, 580 Midland Avenue, Yonkers, New York.

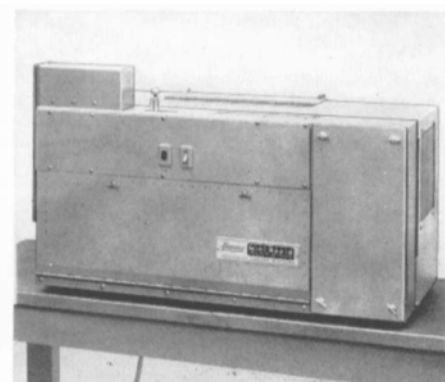
This lightweight camera lets you go almost anywhere to record lip-synchronized 8 mm sound newsfilms.



With the specially adapted Fairchild 8 mm projector, you run the negative as the "finished" sound news film.



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years since Eastman Kodak introduced the new color printing facility with the negative-positive technique which brought color sound up to the general level of black-and-white. Now both are due for a definite rise. Steps which may accomplish this include: (1) the use of reiteration techniques to increase sound intelligibility; (2) in tape-to-film transfer, the use of an advance pickup head to set compression and A.G.N. just before the same sound variations reach the regular tape playback head; and (3) a wider frequency band cross-modulation technique.

#### Forward and Reverse Operation of Projection Equipment in Review Rooms

R. A. BULL, *Westrex Co., Ltd. London, England*

Certain economic advantages result from the use of a reversing projection equipment in review rooms, remotely controlled from the auditorium. The essential features of such equipment are described.

### WEDNESDAY AFTERNOON

#### 2:00 SOUND RECORDING AND REPRODUCTION — 2

##### Artificial Reverberation Facilities for Auditoriums and Audio Systems

G. R. CRANE and G. A. BROOKES, *Westrex Corp., Hollywood*

Two new equipments for producing artificial reverberation are discussed. One is intended for audio studio application to introduce special effects. The other is used to increase the effective reverberation time of churches or other auditoriums where the natural reverberation time is below the desired value. The artificial reverberation is produced in a magnetically-recorded multiple-output memory system. In the auditorium application, the reverberation information is fed to a series of side-wall speakers which simulate a series of reflecting surfaces, each set receiving its own distinctive reverberant information. In both auditorium and studio applications, the reverberation time and reverberation frequency response can be controlled over a wide range.

##### A Wide-Range Wow and Flutter Indicator

L. G. COX, *Radio and Electrical Engineering Div., National Research Council, Ottawa, Ont.*

The design and operation of an instrument for oscilloscopic observation of frequency fluctuations in the output of sound reproducing equipment are described. The instrument indicates the instantaneous rather than average or rms frequency deviation, for frequencies between 500 cps and 20 kc/s. A phase-locked loop permits automatic following of slow-frequency variations over a  $\approx 20\%$  range.

##### Television Intercom Systems — Two New Approaches

GORDON B. THOMPSON, *Northern Electric Co., Ltd., Belleville, Ont.*

Two approaches to solving the TV intercom problem are examined, one which permits the extensive use of telephone-type headsets to provide efficient but economical communication among a great number of people, and another which employs loudspeaker-type communication to provide greatly expanded facilities with due regard to future changes or extension.

##### A Television Audio Console

JAMES A. LEITCH, *Meridian Films Ltd., Toronto, Ont.*

A 16 input, fully transistorized audio console has been manufactured to meet special requirements. Reasons for adopting practices not normally used in commercially available consoles are outlined. Reference is made to dynamic range in the microphone preamplifier.

##### Demonstration of the Infrared Transparency of Magnetic Tracks

GEORGE LEWIN, *Army Pictorial Center, Long Island, N. Y.*

Demonstration of Bilingual and Stereophonic recordings on 16mm film with completely superimposed magnetic and optical sound tracks, utilizing the principle of "Infrared Transparency of Magnetic Tracks." Some recent work with the new Eastman Stripe (Kodak Sonotrack) will be demonstrated and compared with the discontinued 3M laminated stripe.

### WEDNESDAY AFTERNOON

#### 2:00 EQUIPMENT PAPERS AND DEMONSTRATIONS

### WEDNESDAY EVENING

#### 6:45 COCKTAIL PARTY, BANQUET

### THURSDAY MORNING—MAY 11

#### 9:30 LABORATORY PRACTICES — 1

##### The Organization and Operation of a National Network of Kodachrome Processing Laboratories

ELDON E. BAUER, *Dynacolor Corp., Rochester, N. Y.*

A national network of processing laboratories for Kodachrome film has been established. All processing machines and auxiliary equipment have been designed and manufactured by Dynacolor Corp. Each laboratory is operated as an individual profit center, the manager being responsible for his quality and his costs. Independent evaluations of each station's quality and cost performance are made regularly by staff groups in Rochester and a monthly summary of operating efficiencies is published.

##### How Color Negative Film Surface Characteristics Affect Picture Quality

DAAN ZWICK, *Research Laboratories, Eastman Kodak Co., Rochester, N. Y.*

The surface of processed color negative varies according to the material, the image, and the process. Reticulation, image relief and other surface artifacts in the negative, ordinarily not considered a part of the picture image, can affect the quality of prints. Newton's rings, sharpness, graininess, and even tone and color reproduction can be a function of negative surface. The effects also depend on printing conditions such as degree of film contact or specularly of illumination.

##### Reversal Color Printing Through Masters

I. B. M. LOMAS, *Crawley Films Ltd., Ottawa, Ont.*

Many 16mm productions require prints made in two or more versions. Printing from the original necessitates constant change from one version to another: hence reversal color masters are proposed for each version. Reference is made to the problems encountered in obtaining masters capable of yielding satisfactory print quality. Particulars are given of the flashing and printing techniques used.

##### Variation of Speed Rating and Processing for a 16mm Color Film

R. G. F. CHASE and R. J. RUTHERFORD, *Color Film Services Ltd., London, England*

Filming in color under poor lighting conditions may result in inferior picture quality. A process has been developed for rating the film speed for Ektachrome Commercial Type 7255 according to location conditions, compensation being made during processing. The results of this treatment are described and demonstrated.

##### Arbitrary Scale at Technicolor

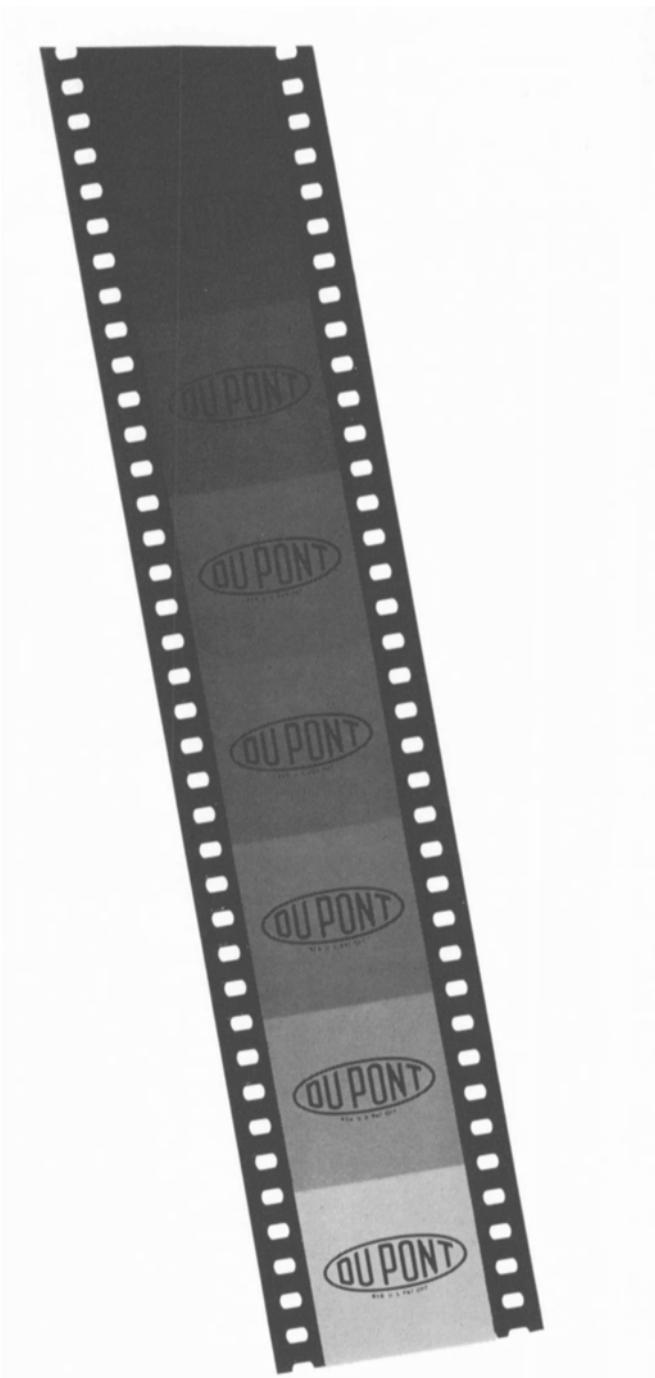
WADSWORTH E. POHL, *Technicolor Corp., Hollywood*

The arbitrary scale defines normally exposed negative as one which prints at arbitrary point 12. Good prints can be made from negative all the way from  $\frac{1}{2}$  under, to  $1\frac{1}{2}$  stops overexposure when normal exposure and arbitrary point 12 are defined in this way, and the arbitrary scale system is a simple reporting method from which a cameraman judges his results.

##### International Facilities for Release Printing by Technicolor

L. B. HAPPE, *Technicolor Ltd., London, England*

Technicolor laboratories in Hollywood, London and Rome provide unique international facilities for release print manufacture by the interchange of matrices prepared direct from original picture negative. Copies in different formats can be obtained with the same quality from one original and can include dissolve or fade effects by A&B printing without using duplicate negatives. Close technical cooperation ensures worldwide release prints of identical quality despite the use of different raw materials in the various countries.



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## Selective Printing of Motion Pictures at Technicolor

ITALO TINARI and WILLIAM B. TUCKER, *Technicolor Italiana S.p.A., Rome, Italy*

A&B printing was introduced by Technicolor in 1954. The system then used required making up the negative in two or more separate rolls with leader between scenes. New equipment has made possible A&B printing automatically from negative mounted in a single roll which gives the same excellent quality, with important savings in time and expense to the customer.

## THURSDAY AFTERNOON

### 2:00 LABORATORY PRACTICES — 2

#### Fiber Optics in the Motion-Picture Laboratory

ARTHUR J. MILLER and ROBERT HARTSHORNE, *Du Art Film Laboratory Inc., — Tri-Art Color Corp., New York*

There are several uses of "light pipes," made of fiber optics, in the motion-picture laboratory. Their use is particularly important in illuminating systems of motion-picture printers.

#### An Inexpensive Precision Microdensitometer

FRANK HERRNFELD, *Frank Herrnfeld Engineering Corp., Culver City, Calif.*

A medium-priced microdensitometer has been designed and built for photographic research. It has a resolving power of about 850 lines/mm when the scanning aperture is 1  $\mu$  wide and 40  $\mu$  long. The response is linear down to 0.1% transmission for the same aperture. By narrowing the aperture, the resolving power can be increased to 2000 lines/mm. Visual readings can be taken on a self-contained meter or a recording can be made on chart paper with rectangular coordinates.

#### A Constant-Time, Variable-Intensity Microsecond Exposure Sensitometer

FRANK HERRNFELD, *Frank Herrnfeld Engineering Corp., Culver City, Calif.*

A sensitometer has been designed to make sensitometric strips for film investigation in the microsecond region, utilizing the type 230 flashtube with a constant IT output for the three exposure times of 1.5, 15 and 150  $\mu$ sec. It features a straight platen with an aperture of 10 by 210mm. Evenness of field is better than 0.01 log E. Reproducibility of exposure during the useful life of the flashtube is better than 2%.

#### Rapid Processing of Motion-Picture Film by the Application of Viscous Coatings — Part I: Viscous Processing of Motion-Picture Film

GEORGE E. CUMMINS, JOHN R. TURNER and ROBERT J. WILSON, *Color Technology Div., Eastman Kodak Co., Rochester, N.Y.*

A method has been developed for the rapid processing of black-and-white motion-picture film by the application of thin coatings of viscous chemical solutions. The chemical treatments are carried out in an atmosphere saturated with water vapor at an elevated temperature. The physical and photographic quality of positive film processed by this method is equal to that obtained from conventional processing. The chemical solutions used for these treatments maintain their properties over extended periods of storage under normal conditions. The usual problems of chemical control are eliminated, thus permitting automatic operation of the processing system.

#### Rapid Processing of Motion-Picture Film by the Application of Viscous Coatings — Part II: A Machine for the Rapid Processing of 16mm Films

PAUL A. HERMLE, *Apparatus & Optical Div.,* and HAROLD D. LOWRY, *Color Technology Div., Eastman Kodak Co., Rochester 4, N.Y.*

A rapid simplified processing machine for 16mm black-and-white positive films employs thin coatings of viscous solutions for the developing and fixing treatments at a temperature of 125 F. The film is processed to a precontrolled density and contrast at an operating speed of 36 ft/min, and a dry-to-dry time of 1 min. Packaged chemical solutions are used, metered to the film from an 8-hr storage capacity within the machine. The only service connections required are electricity, hot water and drainage.

#### A High-Speed Continuous 16mm to 8mm Reduction Printer

KENNETH B. CURTIS and WILLIAM D. HEDDEN, *Calvin Productions Inc., Kansas City, Mo.*

Optimum quality 8mm release prints usually are obtained by direct reduction from 16mm negatives. Most 8mm reduction printers are of the step

type, operating at relatively slow speeds. A continuous 8mm optical reduction printer running at 250 ft/min is described. Quality advantages of reduction printing are combined with production advantages of continuous printing. Sprockets on a common driveshaft and a U-shaped optical system are used.

#### A Damping Device to Improve Image Sharpness and Steadiness of Prints Made on a Continuous 16mm Motion-Picture Printer

G. M. SEELEY, *Film Testing Div., Eastman Kodak Co., Rochester, N.Y.*

A simple modification to the gate shoe of a 16mm Bell & Howell Model J printer is described. A nylon velvet pad is positioned over the printing aperture in such a way that closer film-to-film contact is produced. This also reduces spurious film movements at the aperture.

#### Printer Steadiness: Its Rating and Its Improvement

A. C. ROBERTSON, *Kodak Park Works, Eastman Kodak Co., Rochester, N.Y.*

A method is described for determining the unsteadiness of printers independently of the steadiness of any projector which may be used to examine the prints. The operation of continuous and step printers is discussed. Quantitative measurements are given for the steadiness of prints made before and after adjusting the alignment of the machines. Similar data are given for prints made before and after altering the gates of continuous printers. Attention is called to the need for constructing the gates of step printers so that the pins are properly placed with respect to the picture aperture. This precaution is desirable in order to get the "cancellation" that minimizes errors in perforation even though these errors are small today. It has been found that systematic use of the printer steadiness test gives information in a useful form and leads to better maintenance of equipment than has formerly been the case.

## THURSDAY EVENING

### 7:30 TELEVISION RECORDING

#### Video-Tape Editing System

W. J. HANEMAN and H. OSTROW, *Astro-Electronics Div., Radio Corp. of America, Princeton, N.J.*

The television industry has a need for a system which will facilitate video-tape editing operations. The function of editing is to determine, on the basis of program content, the precise frame at which tape segments are to be added or deleted. It is then necessary to locate this frame and make the splice. A system of editing has been devised in which a number generator identifies each video frame with a frame number recorded on the cue track of the video tape. This number is used during tape playback in conjunction with three storage monitors and number displays to determine the exact frame at which the tape is to be edited. The monitors may display frames at fixed frame intervals or they may display only those frames selected by means of the frame numbers. An editing transport is used to search the tape for the selected frame number. The tape is stopped within  $\frac{1}{8}$ -in. of the selected frame and the splice may then be made. This system permits a splice to be made with single-frame accuracy.

#### A Standard for Positioning the Vacuum Guide in Transverse Track Video-Tape Recorders

A. H. LIND, *Electronic Recording Products Engineering, Radio Corp. of America, Camden, N. J.*

The SMPTE Video-Tape Recording Committee has developed a Recommended Practice for transverse track video-tape recording which results in a constant recorded video-track length per TV line period. Adherence to this Recommended Practice will improve the interchangeability and inter-spliceability of recorded tapes. The Recommended Practice establishes the proper position of the vacuum guide with respect to the axis of rotation of the video heads as a function of the vacuum guide radius. The background for this Recommended Practice is outlined and the relationships that are specified in it are explained.

#### Time Base Errors and Their Correction in Magnetic Television Recorders

AUBREY HARRIS, *Ampex International Operations, Inc., Redwood City, Calif.*

During the recording process, in a magnetic television recording system the time relationships of the various parts of the signal waveform are transferred to the recording medium in elements of space. This operation, and the inverse, which occurs on reproduction, may cause undesirable time displacement errors in the reproduced picture. The factors influencing these errors are outlined and discussed. Methods of reducing the errors and of increasing the time stability of the output signals by electro-mechanical and electronic means are described.

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## Equipment and Facilities of a Complete Motion-Picture Recording Service

JOSEPH E. BLUTH, *Glenn Glenn Sound Co., Hollywood*

Described is a major new facility, the Glenn-Armistead mobile TV recording units. Other facilities are also described and illustrated with slides. The firm's approach to editing is outlined with special emphasis on the integration of motion-picture techniques into video-tape production.

## CBS Television Standards Conversion Techniques

K. BLAIR BENSON, *CBS-TV, New York*

The advent of video tape has provided a means for the rapid intercontinental exchange of television programs wherein the transmission delay need not exceed the travel time of modern jet aircraft. However, the difference in picture scanning parameters employed by various nations often prohibits broadcasting the video signal in its original form and necessitates a conversion to the appropriate transmission standards. Problems related to the design of converters for this purpose are discussed and the equipments used by CBS are described.

## Shutter-Bar in Picture-Tube Recording

C. H. EVANS, *Research Laboratories, Eastman Kodak Co., Rochester, N.Y.*

Conversion from the rate of 60 television fields/sec to 24 film frames/sec in TV film recording is generally accomplished by omitting from the record every fifth consecutive half-field. Consequently, there is a picture splice across the center of every other film frame. In a camera having a properly adjusted mechanical shutter, all points of the picture receive the correct total exposure. However, the exposure intensity and time relationships differ for points inside and outside the splice, and this can lead to a density difference across the splice. This form of shutter-bar has been eliminated in a new experimental television recording film.

## Marconi Television Film Recorder

JAMES A. LEITCH, *Meridian Films Ltd., Toronto, Ont.*

A recorder has been constructed capable of producing a high-quality 16mm film from the television system. A description is given of means used to transfer the 30-cycle TV frame to the 24-frame/sec film standard, the electronic circuitry used to drive the cathode-ray tube is given. A sample of the film produced by this recorder is shown.

## FRIDAY MORNING—MAY 12

### 9:00 TELEVISION STUDIO PRACTICES AND STATION OPERATION

#### Design of Production Lighting Controls for British Television

F. BENTHAM, *Strand Electric & Engineering Co., Ltd., London, England*

In Great Britain, lighting control has assumed great importance both as an instrument of dramatic expression and for monitoring picture quality. The lighting supervisor (director) often works the control directly without the intervention of an electrician. The quality of automatic memory derived from the inertia of electromechanical dimmer systems has simplified the design of these controls and in consequence has caused many users in Britain to be reluctant to adopt all-electric forms of dimmer such as the thyatron and S.C.R. which suggest multipreset networks.

#### Television Studio Lighting

K. R. ACKERMAN, *BBC, London, England*

Imaginative equipment design can spectacularly reduce the time and labor required for the rigging and adjustment of lighting and for the setting of scenery. Considerations in lighting are dimming and lighting control equipment; the suspension, hoisting and adjustment of luminaires; and the design of luminaires. Scenery handling requires the use of electric hoists, electric tractors and trailers; cyclorama tracks and cloth-handling equipment; and rotating stages and portable audience seating. The equipment and devices noted above are used by the BBC Television Centre, London.

#### ADB Storage Memorized Light Control

JEAN DE BACKER, *ADB Etablissements Adrien De Backer S.A., Zaventum, Belgium*

Operation of lighting stages or TV studios becomes too complicated for the operator even with present preselection systems. Equipment involving a control console; remote controlled magnetic amplifiers, or silicon controlled rectifiers; intermediate triple electromagnet memory; punched-card machine; and repeater normal typewriter is used to reproduce automatically all lighting "states" determined during rehearsals. The operator controls the transfer from one state to the next one by pushbutton action.

## Black-and-White Television Picture Monitoring and Video Levels

HAROLD WRIGHT, *Canadian Broadcasting Corp., Toronto, Ont.*

The current state of TV broadcast monitoring is reviewed. The need for accurate control of video peak-to-peak voltages is justified by considering them relative to transmitter and video-tape recorder modulation, network transmission and the retention of picture aesthetics from source to audience. Generation of video waveforms by live and telecine cameras is reviewed and accurate interpretation of the oscilloscope display is emphasized. Black-and-white references are considered and the relation of these to face tones and glints is discussed with and without peak white clippers in operation.

## New Frontiers in Television Camera Tubes

R. G. NEUHAUSER, *Electron Tube Div., Radio Corp. of America, Lancaster, Pa.*

A multitude of new TV camera tubes have been brought out in the past year, including both vidicons and image orthicons. The performance of these tubes is discussed in terms of their suitability for different applications and the conditions under which they must operate. Performance of these camera tubes is discussed. In the image-orthicon line, the trend is towards specialization. New image orthicons have been designed to produce better black-and-white pictures and for new camera designs, or to produce color pictures in black-and-white studio-lighting levels; others were designed for very-low-light-level remote pickups where lighting conditions are extremely adverse. The performance of the new vidicons reflects recent improvements in sensitivity; lower gamma characteristics produce better tonal renditions and low-light sensitivity. In addition, several new types have been introduced for special pickup work for both broadcast and industrial TV uses.

## Picture Characteristics of Image-Orthicon and Vidicon Camera Tubes

R. G. NEUHAUSER, *Electron Tube Div., Radio Corp. of America, Lancaster, Pa.*

The vidicon has not generally replaced the image orthicon for live broadcast work in spite of the fact that its resolution is as good or better, and its effective sensitivity now approaches that of the image orthicon. This is primarily due to the basic difference in the picture characteristics of the vidicon and the image orthicon.

The secondary electron redistribution characteristics of the image orthicon, which are at times criticized as producing an inaccurate picture, can contribute to making the picture appear to be a somewhat better picture than the TV system is normally capable of producing, when the human eye and brain are considered as part of the system. These characteristics also compensate for some of the basic aberrations in a TV electro-optical system. Basic differences in the signal characteristics generated by the image orthicon and the vidicon are described in detail. Methods for obtaining the best performance from each are suggested.

## Investigation of Image-Orthicon Camera Flicker

KIYOSHI YAMAGUCHI, NOBORU YOSHIWARA, HARUO UMEHARA and KEIMA UEDA, *Nippon Hoso Kyokai (Japan Broadcasting Corp.), Tokyo, Japan*

Flicker is the most significant factor in the deterioration of television picture quality. Certain types of flickers from an image-orthicon camera originate in the low-frequency component, arising from the pairing of the interlace scanning and the asymmetrical distribution of the beam density. Several experiments and theoretical treatments about this flicker are given.

## FRIDAY AFTERNOON

### 2:00 TELEVISION STATION OPERATION AND EQUIPMENT

#### Technical Equipment and Facilities of the BBC Television Centre, London

SIR HAROLD BISHOP, *BBC, Broadcasting House, London W.1., England*

The BBC's new Television Centre, which is about four miles west of the center of London, and cost about £10 million, has been designed to include seven studios, in addition to two presentation studios. The first studio was brought into operation on June 29, 1960, and was followed later by a second studio; two more studios will be brought into operation in the summer of 1961. These four studios, with their ancillary areas and technical facilities, will complete Stage I of the project. Three more studios are to be added later, and the Centre will then be capable of producing 1500 hours of electronic program material each year, about half of the total output of the BBC Television Service. Equipment in the studios and their associated control rooms, and in the presentation studio, the central apparatus room, and the film scanner suite are described. A number of recent developments, incorporated in the planning of the technical facilities, are outlined.

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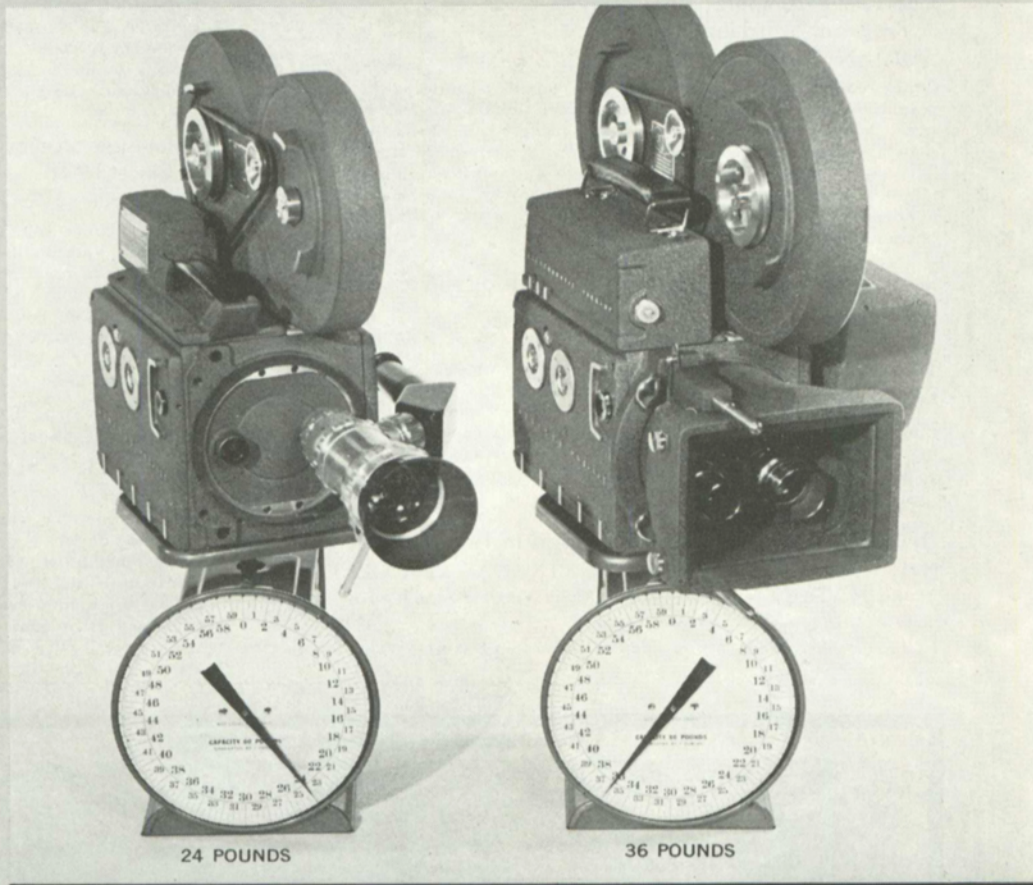
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## The Technical Organization Behind Eurovision

GEORGES HANSEN, *European Broadcasting Union, Brussels, Belgium*

The technical organization and facilities required for program exchanges among the twenty-four television services in sixteen countries that now constitute the European Television Community (Eurovision) are described. Practical problems are posed by fundamental differences in the cultural values and economic situations of the various countries, and by equipment and language differences. The present scale of operations is outlined and a number of possible future developments are predicted.

## CBS-KNXT Computer Control System for Program Switching

ADRIAN B. EITTLINGER, *CBS Television Network, New York*

On December 31, 1960, the world's first computer-controlled broadcasting plant went "on air." In the new CBS-KNXT studio plant, located in Hollywood, a special-purpose digital computer is used to control the sequential switching among the various program components. Automation of the switching functions during the recurrent station-break "panic periods" allows the operator to devote his primary attention to maintenance of quality. In addition to a detailed description of the KNXT installation, operational experience gained in this pioneer effort is reviewed.

## Reception and Rebroadcast of Stratovision Aircast Employing Parametric Amplifiers

D. M. WEISE, *Chicago Educational Television Assn., Chicago*

The Midwest Airborne Broadcasts on UHF channels 72 and 76 are received and are broadcast by WTTW, Chicago, on VHF Channel 11. The airborne transmitting location is about 150 or 160 miles from Chicago and thus offers unique opportunities for evaluating reception conditions employing parametric amplifiers at UHF television frequencies. The techniques employed, and reception data obtained are compared with standard broadcast UHF receiving equipment.

## The Edging of Letters Superimposed in Television Pictures

KIHACHIRO MATSUYAMA, TSUKASA TAKATSUJI, and KATSUYA MIYAGISHIMA, *Nippon Hoso Kyokai, (Japan Broadcasting Corp.), Tokyo, Japan*

In Japan, when broadcasting foreign TV motion pictures, white Japanese

letters, explaining or translating the dialogue are superimposed on the film. It is often difficult, however, to read the letters because of the variation of the brightness of the film scene. To make the white letters more clear and readable, an electric device is used to edge each letter in black and also to maintain an even brightness where the letters are superimposed without affecting brightness variation of the scene.

## A Television Technical Monitor

GORDON C. FIELD, *Northern Electric Co., Ltd., Belleville, Ont.*

A technical monitor has been designed to provide a high-quality means of visually monitoring television video signals. The problem of obtaining d-c restoration, unaffected by the presence or absence of synchronizing information, is considered. A back porch clamp circuit with a new drive arrangement is described with special reference to its design. Also discussed are the design of the wideband video amplifier, the low distortion deflection system, and the regulated power supplies of the monitor.

## Television Studio Camera Mounting Developments in Europe Since 1948

DENNIS C. WARD, *W. Vinten Ltd., London, England*

Motion-picture camera mountings were employed in the early days of television, and modified where possible to suit the new requirements. The new medium required special equipment to provide greater mobility in cramped studios, where the "long take technique" was employed on every live production. Today's television camera transporter designer works with the firm requirements of fast and silent operation coupled with extreme mobility. The magic words associated with future developments in this field appear to be "remote control."

## A Transistorized Synchronizing Signal Generator

J. S. MYLES and J. N. REID, *Research and Development Div., Northern Electric Co., Ottawa, Ont.*

A sync generator which employs only semiconductors as amplifying and switching devices is described. The standard EIA outputs are formed by a unique method of pulse selection from a single pulse train and the start and duration of each portion of these waveforms have a precise time relation to the originating pulse train. Some examples of the circuit design are presented and some of the electrical and mechanical features of the generator are discussed.

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