

Advance Program

The Advance Program is as complete and accurate as possible. The arrangement of the Advance Program is tentative, however, because some papers received at deadline could be handled editorially only by adding arbitrarily to sessions. Other papers for which the Program Chairman has found time in certain sessions will appear in the Final Program. In the Final Program, *entire sessions may be differently scheduled* and it is recommended that members who can attend only part of the Conference should inquire a week before the Conference by telephoning Society Headquarters in New York (212 TN 7-5410) or Program Chairman *Gerald G. Graham* at the National Film Board in Montreal (514 RI 7-5511).

Tentative Outline of Program

Sunday 2:00-8:00 Registration

Monday

8:00 Registration
9:00 Laboratory Practice
12:15 Get-Together Luncheon
1:45 Awards Presentation
2:15 Business Meeting
2:30 Cinema Design
8:00 Science and Medicine

Tuesday

9:00 Sound
2:00 CONCURRENT SESSIONS
Projection
Television Equipment
8:00 International Developments

Wednesday

9:00 Equipment Papers and Demonstrations
2:00 CONCURRENT SESSIONS
Cinematography
Television Equipment
6:30 Cocktail Party, Banquet and Dance

Thursday

9:00 CONCURRENT SESSIONS
Education I (Bilingual)
TV Automation and Production Techniques
2:00 CONCURRENT SESSIONS
Education II (Bilingual)
Vertical Interval Test and Television Monitoring
8:00 National Film Board Tour
Education III (Panel: Educators/Engineers)

Friday

9:00 Television Test Methods
2:00 Television Transmission

Association of Cinema Laboratories: Fall Meeting, October 30, Queen Elizabeth Hotel, Montreal.

8:00 Board of Directors Meeting — Salon L'Etude
10:00 Laboratory Members — Salon Harricana
12:30 Luncheon — Galerie 2
2:00 Laboratory Techniques Forum — Galerie 2
6:30 Reception — Salon McKenzie
8:00 Banquet — Salon Duluth — *Industrial Photography* to present its Industrial Film Awards.

SMPTE Members are invited to attend the ACL meeting. For information and reservations, write: Preston Bergin, Assn. of Cinema Labs., 1925 K St., N.W., Washington, D.C. 20006.

A.M.P.P.L.C. Meeting: The Association of Motion Picture Producers and Laboratories of Canada will convene November 5 at the hotel. Plans are being made and additional information will be issued later.

SUNDAY—OCTOBER 31

2:00-8:00 REGISTRATION

MONDAY MORNING—NOVEMBER 1

8:00 REGISTRATION

9:00 LABORATORY PRACTICE

An Automatic Transistorized Optical Printer

MARIO CALZINI, Tecnostampa Labs, Rome

Printing 4-hole standard anamorphosed prints from 2-hole original negatives requires an optical printer that prints directly from the negatives and which contains an automatic device for special effects (dissolves, fade ins, fade outs), light changes and starting and stopping. The device is electronic and controlled by perforated tape and can be fitted to any optical printer to automate and speed its operation.

Evolutionary Operations (EVOP)

ALBERT D. RICKMERS, Rochester Institute of Technology, Rochester, N. Y.

EVOLUTIONARY OPERATIONS (EVOP) is a manufacturing operation system, the goals of which are to produce an acceptable product at minimum cost; and to secure information from the process which would lead to optimum operation. EVOP consists of making very small changes in process variables by statistical design. A photographic processor is used as an example, using machine speed and developer temperature as variables.

Two New High-Speed Ektachrome Motion-Picture Films

H. R. BEILGUSS, D. S. THOMAS and J. W. ZUIDEMA, Eastman Kodak Co., Rochester, N.Y.

Two new high-speed Ektachrome reversal color films (daylight and type "B") have been designed to provide improved sharpness, grain and color rendition with no sacrifice in speed. A simplification of the prehardened Ektachrome process, for which these new films are designed, is described. Still higher speeds can be obtained, when required, by a process modification. These films have wide application in the color television news, sports, industrial and educational fields. The characteristics of the films are discussed and a picture demonstration is presented.

Super 8 Processing With a 16mm Sprocket Machine

GEORGE W. COLBURN, Geo. W. Colburn Laboratory Inc., Chicago

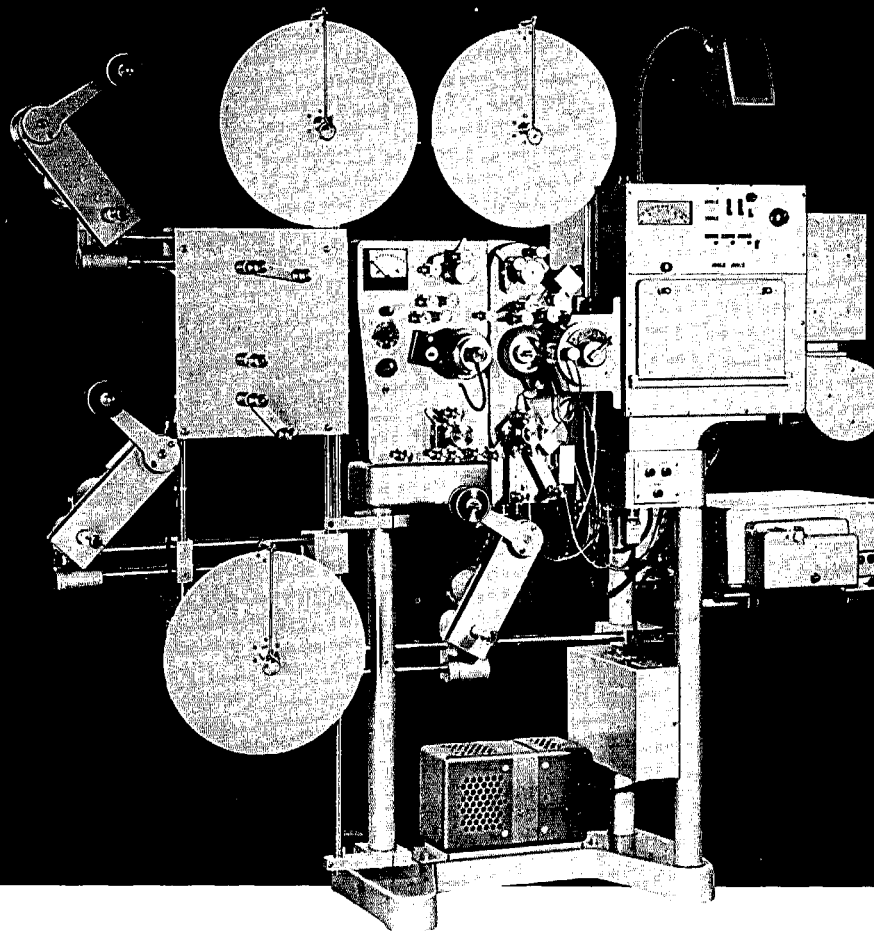
Specially designed combination drive sprockets have been substituted for the conventional 16mm drive sprockets in the processing machine. By an offset splice between super 8 film and regular 16mm film or double 8mm film, the film is automatically transferred to the proper set of sprocket teeth.

Determination of Silver in Thiosulfate Fixing Baths With Thioacetamide (A Noninstrumental Method)

BERNARD A. HUTCHINS, Photographic Technology Div., Eastman Kodak Co., Rochester, NY.

Silver is precipitated as silver sulfide from a thiosulfate fixing bath by reacting with thioacetamide. The silver is titrated, in effect, by adding graduated amounts of thioacetamide to aliquots of the fixing solution and then determining if all the silver has been precipitated. Each aliquot is filtered and the filtrate is allowed to run into more thioacetamide solution. Formation of more silver sulfide precipitate indicates that the end point has not been reached. If no precipitate

ADDITIVE COLOR PRINTING SYSTEM

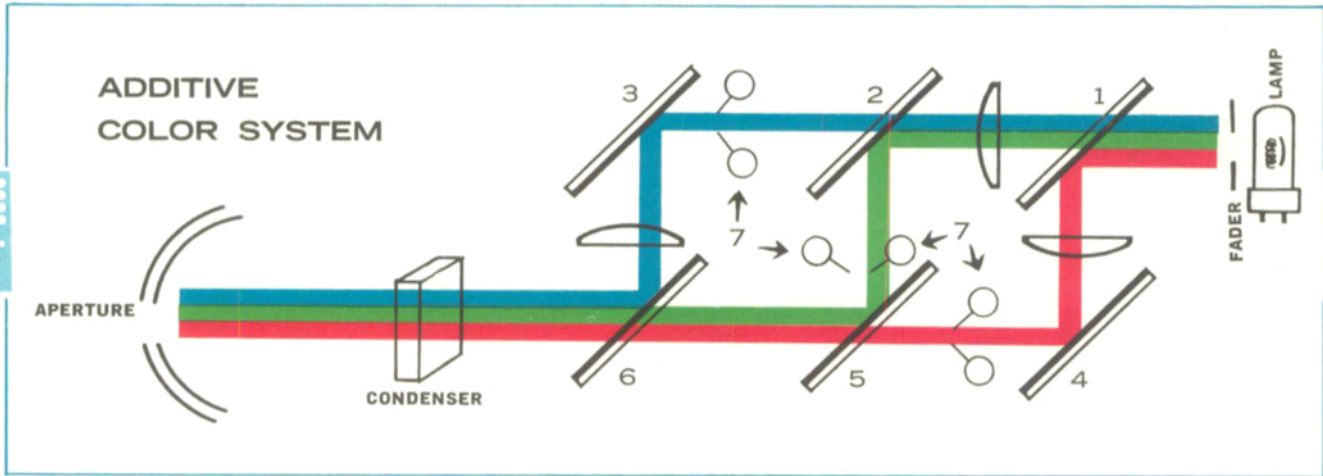


Designed around the revolutionary "light valve"—an electro-mechanical light control, program decoding and memory storage unit of remarkable precision and accuracy—the Additive Color Printing System as used on the new Model C Printer provides speed, quality and flexibility never before possible in laboratory film printing. Now available for any width of film up to 70mm, the Model C offers the following design-tested features:

- Completely automatic tape-controlled operation, utilizing laboratory-proven additive light control principle.
- Speeds up to 180 feet per minute, with ultra rapid light changes controlled either by film notches or by the new R-F patch cue system as desired.
- New "zero close" feature for completely blocking the light between scenes in each color channel when printing from A and B rolls.
- Tape-controlled integral fader providing six fade lengths varying from 16 to 96 frames.
- Tight-wind take-up design with automatic torque control to insure proper film wind throughout entire reel of film.

Bell & Howell

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EQUIPMENT DIVISION
7100 McCORMICK ROAD
CHICAGO 40645
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DICHROIC MIRROR	REFLECTS	TRANSMITS
No. 1	RED	GREEN and BLUE
No. 2	RED and GREEN (Since red has already been removed from this beam, it reflects green only.)	BLUE
No. 3	BLUE only, further reducing band width.	Unusable wave lengths

DICHROIC MIRROR	REFLECTS	TRANSMITS
No. 4	RED only, reducing band width.	Unusable wave lengths
No. 5	GREEN	RED
No. 6	BLUE	RED and GREEN

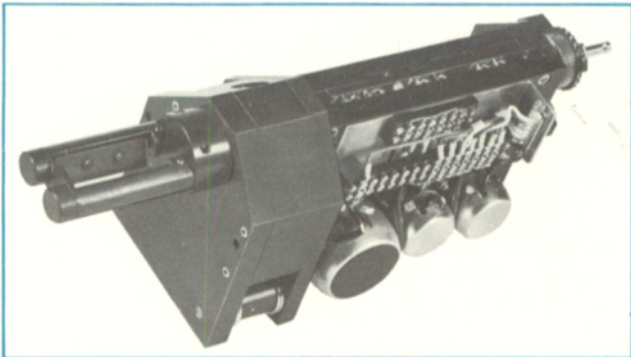
No. 7 LIGHT VALVES

The Bell & Howell Model "C" Additive Color Printer permits you to deliver prints with a color accuracy and fidelity never before attainable at high speed. Color stability and control are obtained through the use of dichroic mirrors which separate a single 1,000 watt light source of the new proximity reflector type into three primary color beams. The efficient and extremely stable dichroic mirror system filters and refines the three color beams into narrow band wavelengths specifically selected in the red, green and blue portions of the spectrum for the greatest printing efficiency on

photographic color emulsions. The refining process eliminates the unusable wavelengths while retaining the pure colors, thus accounting for its extreme efficiency. Dichroic mirrors are *not* subject to the deterioration from age and heat common to gelatin filters.

The printing lamp socket is adjustable in three planes to provide even illumination at the printing aperture and has been factory-set to insure optimum light conditions. Thus the blower-cooled printing lamp, with its proximity reflector and pin-type base, normally requires little re-alignment after lamp replacement.

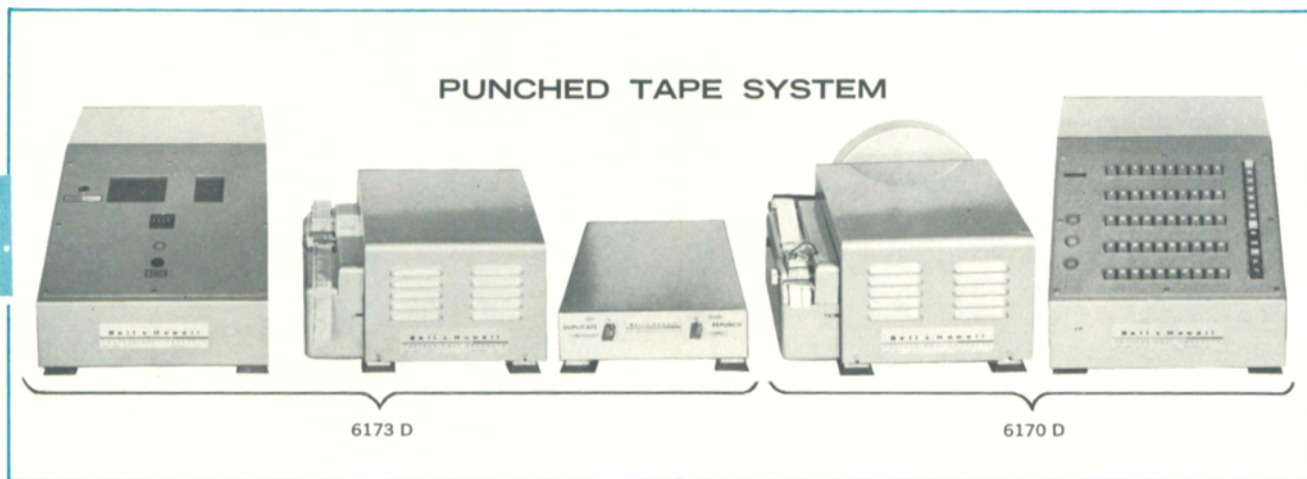
LIGHT VALVE



Each fundamental light beam is independently attenuated by a Bell & Howell "light valve", an easily replaceable and interchangeable module. For scene-to-scene correction, each primary color beam can be

modulated through 50 steps of .025 log E by an automatic tape reader. An additional 23 steps of .025 log E are available manually in each color beam to allow for necessary "trim" or emulsion correction.

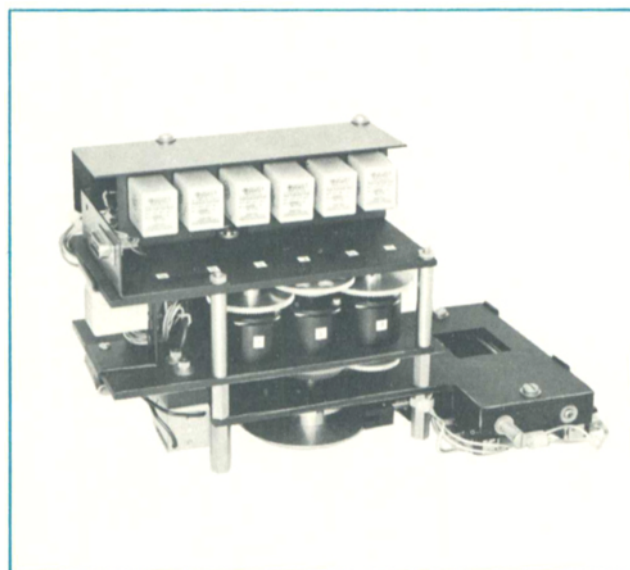
While one scene is being run, the reader establishes the next setting "in memory". On cue, the new color values are "dumped" into action within 5 to 8 milliseconds. A complete color change at 180 feet per minute takes less than a quarter inch of film. This high speed scene change capability, wide range of available color values, and the ease of punched tape programming make exact scene-to-scene color corrections practical for high speed printing operations. This multiplicity of color values allows the film editor sufficient flexibility to include mis-matched scenes previously considered unusable.



The high-speed scene-to-scene color compensation is controlled by a perforated tape system. The pre-selected color timing information is easily and quickly programmed on standard computer tape. This tape controls the scene-to-scene color balance as well as a choice of six fade lengths of 16-24-32-48-64-96 frames, plus a zero close for extended scene printing. As one scene is being printed, the color values for the next scene are in the memory unit awaiting the next cue. Light changes may be controlled by a standard film notch, or the new transistorized R-F patch cue system.

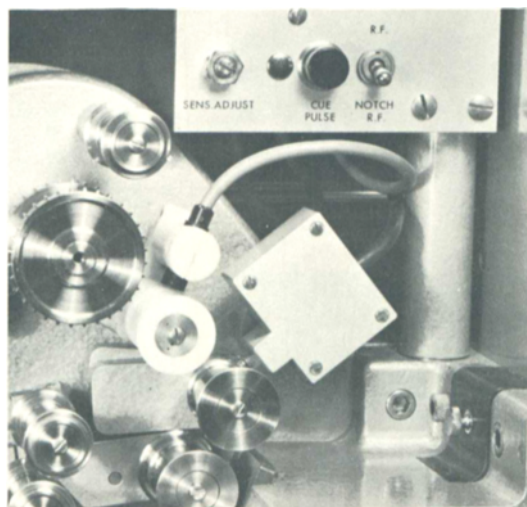
Since the Additive Color Printer requires perforated tape for automatic operation, at least one program perforator or tape punch is required for each laboratory installation. The Design 6170-D Program Tape Punch consists of a keyboard unit and a perforator unit with interconnecting cable. The keyboard unit includes three colored indicator lights (red, green and blue), an automatic scene counter and 63 push buttons for color control, zero close, the six fade lengths, zero fade, black and white mode, correction, start, tape advance and end. The 6170-D automatically indicates the sequence of color information being coded in each scene and provides spacing in the program tape to separate light change information, and to serve as a self-correcting step for an out-of-cycle condition.

The 6173-D, checker duplicator unit, verifies the program and allows for last minute corrections or additions in the control tapes.



FADER

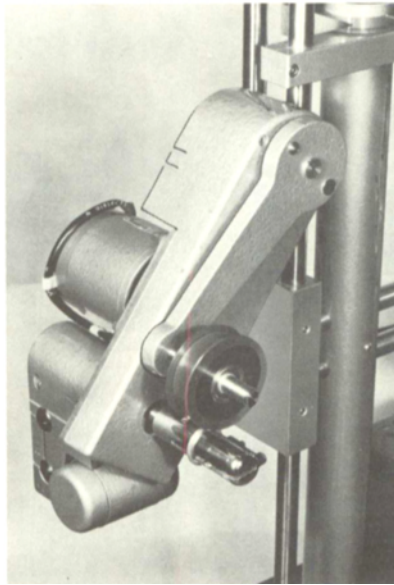
The fader assembly is mounted within the light control housing and will provide fade lengths of 16, 24, 32, 48, 64 and 96 frames. The fader is positively driven from the film transport so that fades will begin at the scene change and will always be of the chosen length regardless of printer operating speed. The particular length of fade for any given scene is selected by punching the appropriate code into the control tape during the perforating operation. This tape is fed into the reader which functions as the "command post" for automatic printing. From information coded on the perforated tape, the reader directs the proper intensity and color setting into each light valve memory unit, actuates the selected fade length and stands by to await the cue signal to "execute command".



RF CUE

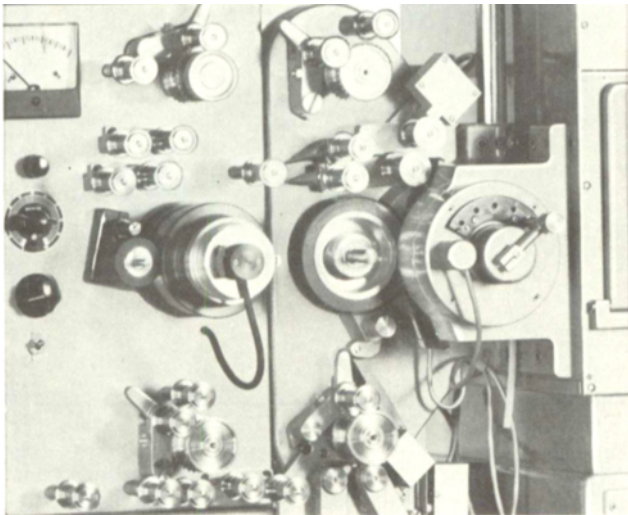
The R-F (radio-frequency) patch cueing kit consists of a transistorized amplifier, a special roller and probe mount assembly, and a probe capable of sensing (without touching) metallic dots passing beneath it at extremely high speeds.

Highly polished film transport rollers are mounted on permanently-lubricated ball bearings for smoothest possible film advance. A neoprene roller gate maintains constant pressure against the back of the positive film to assure intimate contact at the film aperture. A jet of compressed air, directed against the aperture from within, further assists in maintaining film contact and also serves to keep the aperture free of dust and lint. Edge printing on 16mm has been provided by cutting away the printing sprocket between the teeth, and the edge printing light intensity is controlled separately from the printing lamp. On 35mm models, edge printing facilities are at both edges of the film to permit heads or tails printing. The film transport housing is of die-cast aluminum. New tension rollers below the take-up sprocket incorporate a negative break switch to stop the printer in case of film breakage.



TAKE-UP ASSEMBLY

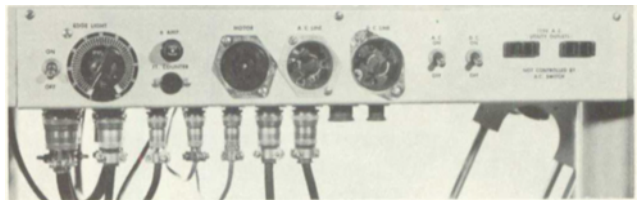
All models now have 2,400 foot film capacity. The feed assembly accepts standard raw stock cores, and a friction brake acts on the film roll to insure even unwinding from full roll to empty core. The "tight-wind" design of the take-up assembly incorporates an automatic torque control feature—a guide roller and rheostat combination which continuously regulates the torque of the take-up motor to insure proper film wind throughout the entire reel of film.



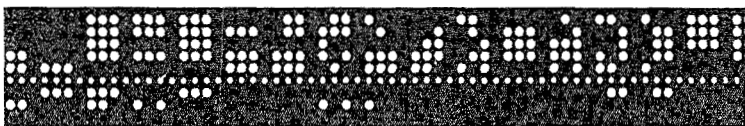
FILM TRANSPORT

The 16mm, 35/32mm and 35mm printers are designed for installation of sound printing attachments. These "soundheads" provide for the printing of a combined picture and sound record in a single pass. The soundhead will be installed at the time of manufacture with no additional charge for installation.

All controls, indicators and plug-in disconnects are clearly identified and readily accessible. Electrical connections to the printer, including those for R-F cue kit and soundhead installation, are provided at the rear control panel. Here also are located the main AC-DC switches and non-switch AC convenience outlets for accessories and test equipment. Push button switches at the front console switch panel are used to start and stop the printer. The remaining controls and indicators are mounted on the vane housing, included are the fader mode signal lights, high-low lamp range switch, speed indicator lights, and a DC voltmeter with illuminated dial. The intensity of the dial illumination can be varied to suit the operator.



REAR CONTROL PANEL



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forms, the end point has been exceeded. The method is most useful if only an approximate result is required, or especially, if a go-no-go type of decision is needed.

High Speed Additive Color Printer

HANS CHRISTOPH WOHLRAB, Bell & Howell, Chicago

To increase efficiency and reliability, a new high-speed continuous contact printer with additive color control has been developed. This printer prints picture and sound in forward and reverse directions. A new type of reader with solid-state circuitry makes light changes possible in less than half the scene length of the Model C printer, despite the higher printing speed of 240 ft. min. Several safety devices are provided to prevent film losses due to operator errors in film threading or tape handling.

M Format 8mm

ROBERT RHEINECK, Color Service Co., New York

MONDAY AFTERNOON

12:00 GET-TOGETHER LUNCHEON



Guest Speaker:
Claude A. Giroux,
President, Director, and
Chief Executive Officer,
Allied Artists Pictures Corp.

1:45 AWARDS PRESENTATION

2:15 BUSINESS MEETING

2:30 CINEMA DESIGN

Programing Considerations for Establishment of Criteria for Motion-Picture Viewing

BEN SCHLANGER, Consulting Architect, New York

Three kinds of motion-picture presentations are considered: (1) dramatic and musical presentation using 35mm and 16mm films; (2) informational presentations for educational, technical, business and exhibit use; and (3) impact presentations for exhibits, expositions and specially priced admissions of commercial showings, using 70mm film or narrower film with multiple projectors. While recognizing possible overlapping of various functions, these categories are considered analytically. Developmental and economic factors and potential audience capacity are discussed.

Specific Trends of Construction of Cinemas in Czechoslovakia

FRANTISEK PILAT, Czechoslovak Film Corp.; and JIRI STRUSKA, Research Institute of Sound and Picture, Prague, Czechoslovakia

Trends in motion-picture theater construction reflect new functions according to local conditions. In Czechoslovakia, large, open-air amphitheatres and theaters with standard parameters predominate. The sociological and economic problems of both types of theater and their different technical parameters are analyzed.

The Iso-Deformation Curves of Images and the Criterion for Delimitation of the Usable Areas in Ciné-Auditoriums

RUBENS MEISTER, University of Paraná, Paraná, Brazil

The origin of image deformations on screens, real and apparent deformations, and physical and psychic factors are discussed. Apparent deformations due to immobile and mobile images are considered with their respective deformation indexes. Iso-deformation curves of mobile and immobile images and their design are described. Even and cylindrical screens are examined and the delimitation of apparent deformations is investigated. The uses of normal screens, wide screens, CinemaScope, Todd-AO-70mm and Cincrama are outlined.

Display System Criteria for Rooms for Instruction and Conference Activity

A. L. TERLOUW, Sales Service Div., Eastman Kodak Co., Rochester, N.Y.

Visual requirements and design criteria for instruction and conference rooms require a display system which provides information by various methods and which does not interfere with live presentations or the social relationship within the group. System sophistication is a function of group requirements. A systematic procedure for determining these requirements is proposed and design criteria are presented. Image size and contrast, image luminance in relation to environment, requirements for simultaneous reference to live and projected information, and image quality criteria are discussed.

Lecture Hall and Learning Space Design: A Survey of Variables, Parameters, Criteria and Interrelationships for Audio-Visual Presentation Systems and Audience Reception

J. KARL JUSTIN, Fordyce & Hamby Associates, New York

The variables and parameters affecting architectural planning and audio-visual systems selection for lecture halls and other learning spaces are surveyed. Interrelationships of factors are discussed, including: design requirements for modern educational techniques as differentiated from cinema-theater-auditorium design; general hall geometry and seating plan as determined by the character of events, limitations of audience, required sight lines, and projection angles; illumination of hall, special events, and screens and the effect of hall light on screen; general acoustics; the need for integrating architectural design with selection of projection equipment and screens; the effect of front and rear projection; and lighting, audio and projection control. Guide lines for future research and bases for examination of economic optimums are given.

Modern Sound-Stage Construction

D. J. BLOOMBERG, Republic Productions, Inc., Hollywood; and M. RETTINGER, Broadcast and Communications Product Div., Radio Corp. of America, Burbank, Calif.

In 1965, several motion-picture studios built new sound stages, primarily for TV film production. Height of each stage ranged from 35 ft to the lower chord of trusses, to 50 ft to the highest point of the roof. The stage areas were approximately 14,000 sq ft (about 100 by 140 ft). The stages were constructed of 6-in. tilt-up concrete walls in 20-ft panels. Concrete columns were poured between the panels after construction to assure soundproof joints. Some roofs had an extra 2-in. layer of poured concrete over the standard fiberboard-plywood construction. To insure efficient sound-retarding seals, the large stage doors were of 6-in. concrete panels with leading and overhead edges in 2-ft deep sound-absorbent lined pockets.

MONDAY EVENING

8:00 SCIENCE AND MEDICINE

Two Examples of the Application of Motion-Picture and Television Photography to Medical Diagnosis, Education and Research

EDWARD F. McCLELLAN and JAMES LIEBERMAN, Public Health Service Audiovisual Facility, Atlanta

The fiberoptic and cinematography have recently been used to record disease manifestations in internal body organs (demonstrated on 16mm color motion-picture film). A plan has been proposed for linking an EKG machine, an oscilloscope and a television camera so that a patient's cardiac events would automatically provide synchronized video-tape recordings of the patient's clinical appearance and electrocardiogram.

Techniques for Metric Photography

J. G. WAUGH, A. T. ELLIS and S. B. MELLESEN, California Institute of Technology, Pasadena, Calif.

Three techniques for metric photography are described. In the first, missile position-time data are obtained from measurement of photographs of the virtual image produced in a precision-ground sphere by a timed stroboscopic point-source lamp. In the second, a rotating circular film disc is covered with sector-shaped exposures using a timed stroboscopic lamp. In the third, the previously described techniques are combined to obtain data simultaneously.

Direct Cine Micrography With the Electron Microscope

J. I. DANIEL and W. C. MACE, Jr., Battelle - Northwest, Richland, Wash.

Dynamic study of chemical and physical reactions by electron microscope is particularly valuable when combined with cinémicrography, using techniques such as time-lapse photography and continuous magnification changes. Direct use of the imaging electron beam for photographic exposure gives maximum photographic quality, but presents problems of slow speed of emulsions to electrons, outgassing and embrittlement of film in the microscope vacuum, and static discharge fogging. Several types of commercial 16mm film have been evaluated in microscopy experiments. Techniques for effective ciné-recording have been used with special electron microscope reaction methods for application to nuclear fuel ceramics.

Television Display of Thermal Images of the Human Body

RAY N. LAWSON and ERIK C. B. PEDERSON, M.D., Dept. of Experimental Surgery, McGill University and Royal Victoria Hospital, Montreal

Patterns of skin temperatures may be correlated with inflammatory, circulatory disorders and subsurface malignant tumors. Suitable temperature recording techniques are, therefore, of great medical value. The unsatisfactory methods which have been previously used to obtain thermal images are discussed. A new system is described which employs heat-quenched ultraviolet sensitive phosphors. Life-size temperature images are displayed on a television monitor. Quantitative measurements are made with a waveform monitor, gated to display a single selected scanning line.

The Use of Television and Motion Pictures in Diagnostic Radiology as Employed in Hospital Practice

G. B. SKINNER, M.D., and R. G. FRASER, M.D., Royal Victoria Hospital, Montreal

In the modern practice of radiology, ciné filming of a fluoroscopic image as derived from the output phosphor of an image-amplifying tube is common practice and has added the dynamic study of organ structures to the usual static film studies. This is facilitated by the use of television monitoring of the image during study of the patient and recording of the image on ciné film. Many procedures previously performed in darkened rooms may thus be performed in adequately lighted rooms. Closed-circuit television is utilized for teaching in the X-Ray Department and for the transmission of radiographic images from the X-Ray Department to the Emergency Department. A control console has been budgeted for and is being designed so that video-tape recording of fluoroscopic images from one of five examination rooms may be made with possible immediate playback. These motion-picture and television uses are discussed.

Adapted Eye Response

M. LURIE, Newark College of Engineering, Newark, N.J.

A recent theory of adapted color vision is applied to two visual phenomena: the ability to distinguish between two areas of nearly equal brightness under various conditions of surrounding brightness and hue; and color adaptation, including two-color synthesis. A change in brightness discrimination with surrounding brightness is predicted and verified experimentally. Calculation of the tristimulus values of the color produced by a mixture of colored lights viewed in a colored field is discussed.

Special Circuits for an X-Ray Television Camera Chain

T. HEISE, J. E. MARQUERINCK and C. J. SEUR, N. V. Phillip's Gloeilampenfabrieken, Eindhoven, Holland

Medical application of a TV camera together with an x-ray image-intensifier tube requires highest sensitivity and automatic adaptation to different x-ray doses. Maximum sensitivity of the special x-ray TV system has been obtained by imaging of the circular picture on the whole of the also circular target of the vidicon or Plumbicon with the aid of a large-aperture lens. Overscanning the target necessitates a circular blanking signal. The transistor circuit generating this signal is described with emphasis on stability problems. Automatic sensitivity control is effected by light dependent resistors in the video amplifier. The control voltage is obtained by measuring the peak value of the signal either over the whole of the picture or in a central circular area only.

TUESDAY MORNING—NOVEMBER 2

9:00 SOUND

Level Adjustment of Audio Signals by Means of a Solid-State Electronic Attenuator

RODGER BECK, McCurdy Radio Industries Ltd., Toronto

The design and development of a solid-state electronic attenuator for the remote control of signal levels in complex audio systems are considered. The requirements for such a unit are given and compared

with other methods, such as constant-impedance ladder-type attenuators and cadmium-sulfide cells. A detailed theory of operation of the RG243 Solid-State Electronic Attenuator is included. The integration of this unit into various audio systems is described.

Lightweight Synchronous Stereo Recording System

R. R. EPSTEIN, L. O'DONNELL and L. GREEN, National Film Board, Montreal

For a multiscreen exhibition project, a portable commercial $\frac{1}{2}$ -in. tape recorder has been adapted for two-channel stereophonic recording. This modification is described and performance data is given. Synchronous recording is possible with precision oscillators and a frequency-modulated control track system. The location equipment also permits synchronous playbacks, using the recorder's internal batteries as the power source for all auxiliary units. The studio equipment for the transfer of stereo location recordings is also described.

Versatile Mixing Console for Sound Service Studio

L. A. GREEN, National Film Board of Canada, Montreal

Preparation and setup for re-recording in a motion-picture sound service studio must be reduced to a minimum to provide the most profitable use of a client's time. A 16-channel mixing console with complete facilities is described, featuring pushbutton remote control of all switching operations. This design approach makes possible direct control of all re-recording functions and equipment within easy reach of one man seated at the console.

An Improved Transistorized Sound System for Studio Use

HEINRICH F. SCHMIDT, Siemens & Halske, Karlsruhe, Germany

Increased demands on sound control call for an improved technology. By exclusively using silicon planar transistors, a building block series was developed which corresponds to the high requirements of signal-to-noise ratio, harmonic distortion, and overmodulation reserve. Furthermore, this series permits a compact construction of control desks in connection with new switching elements. The features of the particular building blocks are described, and the qualitative final results, obtained by this system, are represented and discussed using diagrams. Some examples of complete units are shown.

Solid-State Theater Sound System

VICTOR NICELLI, Cinemeccanica, Milan, Italy

Reliable theater sound equipment can be made from properly designed solid-state circuits. A new solid-state theater sound system is described which is characterized by modular packaging, advanced circuitry and simplified operation and maintenance. Design philosophy, especially the performance requirements and reliability factors are discussed.

Interchangeable Modular Amplifiers for Magnetic Recording and Other Audio Applications

WILLIAM H. STUTZ and GEORGE ANDREWS, Amega Corp., Sun Valley, Calif.

Germanium- and silicon-type transistor circuits for direct coupling to record and play heads, interstage attenuators and special transformers are shown on slides. Other audio applications are discussed.

New Siemens 16mm Projector Amplifiers

NORBERT ENGELS, R & H Products Ltd., Montreal

The Siemens 16mm projector system consisting of component blocks includes three newly designed transistor amplifiers. The basic characteristics and function are described.

Recent Developments in Professional Audio Tape Recorders

D'ALTON B. JOLLY, Professional Audio Products, Ampex of Canada Ltd., Rexdale, Ont.

Specifications of magnetic tape recorders and designs to meet professional requirements are reviewed. Progress reports and test data are presented. Mechanical design features are given and comparative test data are presented for earlier tube electronics and recent transistor and nuvistors circuitry.

TUESDAY AFTERNOON

CONCURRENT SESSIONS

2:00 PROJECTION

The Development of Xenon Light for Projection Purposes

HERBERT TUMMEL, Zeiss-Ikon AG, Kiehl, West Germany

Beginning with a discussion of historical light sources (lime lights; arc lamps with condensers and mirrors; LI- and HI-carbon arc

lamps), the development of gas discharge lamps for projection purposes is described. Mercury high-pressure lamps, which came out after 1930, were suitable only for black-and-white film projection. The xenon lamp, which appeared on the market in 1954, could project both color and black-and-white films and therefore replace the open burning carbon light arc successfully. Thousands of theaters are now equipped with xenon lamps. The electrical capacity of xenon bulbs, which was only 900 w in 1954, has been increased to 6,500 w.

Design Parameters for the Use of Quartz-Iodine Lamps

ROBERT E. LEVIN and ARNOLD E. WESTLUND, Sylvania Lighting Products Inc., Danvers, Mass.

Quartz-iodine lamps are a relatively new class of incandescent lamps well suited to projection and theatrical applications. Data for equipment design using currently available lamps are presented. Filament size and average filament luminance are stressed. The variation of electrical and luminous parameters for large changes in operating conditions are described.

A Super 8 Magnetic Projector With Sprocket Scanning

ROBERT B. JOHNSON, Eastman Kodak Co., Rochester, N.Y.

An 8mm magnetic sound projector designed for the super 8 film format is described. The mechanism has an 18-frame sound-picture separation, automatic threading, 1,200-ft film capacity, and sound scanning on the sprocket. The sprocket scanning system, sound performance, and data relating to super 8 film life are emphasized.

The New Viewlex 8mm Super Optical-Magnetic-Silent Projector

MARVIN I. MINDELL, Viewlex, Inc., Holbrook, N.Y.

The Viewlex 8mm projector accommodates films prepared in the new "M" optical sound format as well as magnetic and silent films in the standard format. A new threading means allows simplified threading while maintaining good sound quality. A solid-state amplifier provides the necessary compensation for wide frequency response, low distortion and noise. Rugged mechanical and electronic design provides high reliability.

The Use of the Blown Arc in 35mm and 70mm Projection

HAROLD PLUMADORE, The Strong Electric Corp., Toledo, Ohio

Since the introduction of the air-blown carbon-arc lamp, many refinements have been made to enhance its use for 35mm and 70mm projection. The incorporation of a double-roller negative-feed mechanism assures accurate positioning of the negative carbon. A new 11.5 high-brightness positive carbon and a newly designed elliptical reflector have made this lamp especially adaptable to 70mm projection. A reduction in aperture temperatures has been achieved by the use of a dichroic filter.

CONCURRENT SESSION

2:00 TELEVISION EQUIPMENT

A Television Bar Graph Generator

GLEN SOUTHWORTH, Colorado Video, Inc., Boulder, Colo.

Bar Graph displays are applicable in many industrial, research and educational areas. The device described is used with standard TV systems to provide a graphic display of eight or more separate input signals in the form of a series of vertical bars, the height of each being proportional to the associated input voltage. Design philosophy permits flexible and effective displays including mixing with normal TV images, special bar identification, and color options. Equipment is compact and relatively low in cost.

Still Picture Scanners for Color Television

MICHEL FAVREAU, Compagnie Française Thomson Houston, Gennevilliers (Seine), France

The purpose and use of still picture scanners in television are discussed. The superiority of a flying-spot scanner is shown and the mechanics, optics and electronics of equipment for scanning color slides are described. Numerous refinements of the equipment are explained.

A Half-Inch Vidicon Camera

J. WILSON, Wells Div., E.M.I. Electronics Ltd., Somerset, England

A high-quality small-size closed-circuit television camera using the new E.M.I. high-resolution half-inch vidicon tube is described. This camera was designed primarily for viewing the insides of small-diameter pipes. It is 1.7 in. in diameter and 4.5 in. long. The design and the problems associated with obtaining optimum performance within this size are described.

A Digital to Video Conversion (DIVCON) System

R. J. CLARKE, RCA Victor Co., Ltd., Montreal

CBC - TV Mobile Units

PAUL CORIO, Canadian Broadcasting Corp., Montreal

Recent requirements for full studio-type facilities in mobile units have resulted in two new vehicle designs. The smaller unit, a modified passenger bus, is in use in Montreal. Two larger units, tractor-trailer combinations, are in use in Ottawa and Toronto. Each unit contains four 4½-in. image-orthicon chains, extensive switching, special effects and monitoring, dual language audio facilities and, in one trailer unit, a telecine chain. Each unit is fully air-conditioned to allow operation from -20 F to +90 F ambient.

Elevated Television Camera Systems

J. N. LEAVITT, Electronics Div., Canadian Westinghouse, Hamilton, Ont.

A lightweight TV camera system has been mounted on a stabilized, remotely steered, platform. The camera is attached either to an extended mast (Totem System - 35 ft) or to a miniature tethered helicopter (Periscope System - 600 ft). A wired link provides the camera scene on a ground monitor from which the viewer may steer and control the camera. Although developed as an army surveillance tool, the device may be readily applied to problems in commercial TV. The characteristics of the systems and possible applications are discussed.

An Economical Approach to Television Mobile Requirements

R. S. ANDERSON, Editel Productions Ltd., Montreal

TUESDAY EVENING

8:00 INTERNATIONAL DEVELOPMENTS

Development of Television in the United Arab Republic

SALAH AMER, FAROUK IBRAHIM ALI and ABDEL-LATIF I. AHMED, General Egyptian Organization for Cinema and Broadcasting Engineering, Cairo, UAR

Television in the UAR has been developed with basic video, audio and film facilities which are described. The problems of running 30 hours of programs daily are discussed. A comprehensive survey of the development of the UAR Television network includes discussion of abnormal propagation conditions and future extension projects.

Television in Nigeria

PHILIP J. GIBBS, NBC International, Lagos, Nigeria

The various television facilities in Nigeria, with lists of studio sizes and types of equipment used, are described. Some problems relating to this area are mentioned and an outline of the methods of technical instruction is given.

Television Planning for Developing Nations

P. L. GRANT, P. MUNDIE, I. W. CAMBELL and N. J. PAPPAS, N. J. Pappas & Associates, Montreal

The various problems of planning television in a developing nation with examples, where possible, of the methods used to assist the country in its television program are discussed. Basically four areas are covered: establishing the need for television and its need of financing; planning the structures required; planning the technical facilities required; and putting the station "on the air."

Television Engineering - The Amateur Point of View

C. GRANT DIXON, Herefordshire, England

The early pioneers of television were often dedicated amateurs. The amateur spirit is far from dead in today's competitive television industry and the relationship of the amateur to the professional is discussed. The special contribution which the amateur can make to television is pointed out. The role which the amateur television movement plays in the training of the technicians of the future is explored.

WEDNESDAY MORNING—NOVEMBER 3

9:00 EQUIPMENT PAPERS AND DEMONSTRATIONS

- Super Pro 16mm Single or Double System Editor (Demonstration): DOMINICK J. CAPANO, S.O.S. Photo-Cine-Optics, Inc., New York
- Type 529 TV Waveform Monitor (Demonstration): B. FELDMAN, Tektronix (Canada) Ltd., Montreal
- Wandel & Goltermann Model VZM-1 Distortion Measuring Sets (Paper): JOHN F. ROOT, ROR Associates Ltd., Don Mills, Ont.
- F & B/Ceco Aerovision Helicopter Camera Mount (Paper & Demonstration): JOHN BABB, F & B/Ceco, Inc., New York
- 400-ft Hycam High-Speed Motion-Picture Camera With Electronic Speed Control (Paper): ROBERT D. SHOBERG, Red Lake Laboratories, Inc., Santa Clara, Calif.
- Amega Model T-21 "Transolver" for Transferring From $\frac{1}{2}$ -in. Tape to 16 or 35mm Film and for Variable Control of Reproducers During Dubbing Sessions (Paper): WILLIAM H. STUTZ, Amega Corp., Sun Valley, Calif.
- Operational Performance of Elcon Target Glass Image Orthicons (Paper & Demonstration): WALTER E. TURCK, English Electric Valve Co. (Canada) Ltd., Rexdale, Ont.
- ColorTran Lighting Equipment (Demonstration): WILLIAM C. FINCH & JERRY LEE, Jack A. Frost Ltd., Toronto
- Automatic Sound Filmstrip Projector With Hold Control (Demonstration): HOWARD V. TURNER, DuKane Corp., St. Charles, Ill.
- New SM 5 Unidirectional Boom Microphone for Motion-Picture and TV Recording (Paper): ROBERT W. CARR, Shure Bros., Evanston, Ill.
- Soldi State Theatre Sound System (Demonstration): UMBERTO CECCHI, Cinemeccanica SpA, Milan, Italy
- Technicolor 8mm Single Concept Cartridge-Loading Projector for Educational and Industrial Use (Paper): G. W. MOORE, Anglophoto Ltd., Montreal

WEDNESDAY AFTERNOON CONCURRENT SESSIONS

2:00 CINEMATOGRAPHY

Making Available Light Available

GEORGE GILL, Eastern Manager, ColorTran Industries, Middle Village, N.Y.; and CHARLES E. SORENSEN, Manager, Brenner Photo Co., Washington, D.C.

Pictures taken under available light present the subjects in their natural form and environment. How to make sufficient available light available in situations where planning is possible is discussed. Photographers and TV personnel have an interest in the lighting in areas where newsworthy events occur. Photographed subjects have an interest in how they are lighted, since properly angled and directed lights can enhance appearance and the "image" projected. Lighting for press conferences, educational demonstrations, business, industrial and political meetings; particularly where free discussion takes place between speakers and audience, must be comfortable for all concerned, yet adequate for photography and TV pictures. Lighting for worship and ceremonies should not be a distraction for participants, congregation or observers. The lighting for such nontheatrical events should differ from the dramatic lighting of the theater.

Silenced Portable Electric Power Plant

JOHN B. HEIKEL, U.S. Naval Photographic Center, Washington, D.C.

To provide power for motion-picture and television lighting during location photography for the U.S. Naval Photographic Center, a self-contained, silenced, self-propelled, portable electric power plant was developed which could operate on and off the highway and produce d-c for arc lights, and a highly stable 60 cycle a-c for television and a-c lighting equipment. The output capacity is 1,000 amp with any combination of a-c or d-c load.

A Cruciform Screen System for EXPO 67

W. GENTLEMAN, National Film Board of Canada, Montreal

The evolution of a five-screen motion-picture presentation system is discussed from initial conception through development stages to final completion of the camera apparatus required to fulfill the function. Details of construction and problems in field cinematography with the five camera mount are reviewed. The design and fabrication involving five Technical Operations Divisions are explained.

D-C Interlock System With "Syncontrol"

CHESTER E. BEACHELL and STANLEY L. COLE, National Film Board of Canada, Montreal

An electronic control system to interlock five 35mm Arriflex cameras is described and illustrated. The system maintains shutter synchronism in either cordless 24 frames/sec sound synchronous mode, or variable speed ranging from 8 to 36 frames/sec. The power supply is 24 d-c at 15 amp for each 200-ft load in each camera. The system may be airborne.

Hologram Visual Displays

E. N. LEITH and J. UPATNIEKS, Institute of Science and Technology, The University of Michigan, Ann Arbor, Mich.

The theory of hologram photography is explained and current activities in this area are summarized. The storage capabilities of the hologram process are described, along with various ways of producing animated pictures. The advantages and technical difficulties of this type of display are explored.

Photography of the Moon From a Lunar Satellite

SIDNEY WANGER, Hughes Aircraft Co., El Segundo, Calif.

Lunar mapping by high-resolution photography has been studied to determine the optical requirements of the lens. Preliminary estimates show that it is possible to obtain 1-ft ground resolution when the spacecraft is at 50 nautical miles altitude if one uses a 9-in. diffraction-limited lens in conjunction with a 99.5% image motion compensation (IMC) system and film capable of resolving 225 lines/mm.

Photographic Optics — A Status Report

HELMUT NAUMANN, Optische Werke G. Rodenstock, Munich, Germany

The present state of photo optics, from simple lenses to the most complex lens systems, is described. The use of plastics, aspheric surfaces, and production techniques for large picture sizes are shown. The level of development of motion-picture optics, primarily lenses with variable focal lengths, is also discussed.

Em-Eil Camera

MAURICE LEVY, Eastern Effects, Inc., New York

CONCURRENT SESSION

2:00 TELEVISION EQUIPMENT

Television Recording Using Direct Electron Exposure

RICHARD F. DUBBE, 3M Co., St. Paul, Minn.

Factors affecting motion-picture film exposure and electro-mechanical frame conversion and film transport methods are compared for conventional television, kinescope recording and recording with an electron beam. The results indicate that direct electron exposure makes possible a substantial improvement in resolution along with a reduction of picture noise. Advantages of electron exposure in frame rate conversion are also discussed.

An Electron Beam Television Recorder

EDWARD W. REED, Jr., 3M Co., St. Paul, Minn.

Proper film handling and electron beam control provide superior black-and-white 16mm recordings of interlaced 525-line TV signals. An intermittent shuttle mechanism phase locked to the TV signal together with a timed deflection gate of the electron beam provides the conversion from 30 to 24 frames. Exposure control is obtained with a beam sampling servo system. A two-vacuum system minimizes start-up time and prolongs the electron gun filament life.

High-Band Magnetic Recording and Electron Beam Recording

JOSEPH ROIZEN, Ampex Corp., Redwood City, Calif.

A Monochrome Studio Camera With Plumbicon Pickup Tube

P. MARTINEZ, C. J. SEUR, and J. J. P. VALETON, N. V. Philips Gloeilampenfabrieken, Eindhoven, Holland

A studio camera with lens turret, specially designed for the Plumbicon is described. Differences with image-orthicon and vidicon cameras are emphasized. To make full use of the possibilities of this new pickup tube, some special electronic circuits have been designed. These are described with respect to the specific characteristics of the Plumbicon. Some of these circuits are: a servo-controlled iris drive mechanism with silicon controlled rectifiers as switches; a circuit giving level-dependent aperture correction; a gamma-correction circuit; and a circuit for blacklevel adjustment between +30% and -30% with constant peak-white (100%).

A Logical Approach to Mounting Plumbicon Cameras

WILLIAM P. VINTEN, W. Vinten Ltd., Suffolk, England

By separating the viewfinder from the camera, and housing only the essential electronic components with the pickup tube, a Plumbicon camera head weighing 5 to 10 lb can be achieved. This lightweight pickup head associated with a remote-controlled lens makes possible a new range of camera mountings on which the true flexibility of television cameras can be exploited.

Optical System for Plumbicon Broadcast Cameras
H. DELAND, G. BOUWHUIS and A. G. VAN DOORN, N. V. Philips Gloeilampenfabrieken, Eindhoven, Holland

WEDNESDAY EVENING

6:30 COCKTAIL PARTY, BANQUET AND DANCE

THURSDAY MORNING—NOVEMBER 4

CONCURRENT SESSIONS

9:00 EDUCATION I (Bilingual)

A National Program for Production and Use of 8mm Single-Concept Films in Biomedical Education

EDWARD F. McCLELLAN and JAMES LIEBERMAN, Public Health Service Audiovisual Facility, Atlanta

As one of the largest producers of 8mm single-concept films in the biomedical field, the Public Health Service Audiovisual Facility reports extensive firsthand experience in working with medical schools and others in the development of a program for the production and use of these films.

Teaching With the Overhead Projector

WILLIAM R. CROSBY, Edison Technical and Industrial High School, Rochester, N.Y.

The overhead projector has supplanted the blackboard as a means of face-to-face teaching. It frees the teacher from many restrictions and adds new dimension by the presentation of overlays, progressive disclosures, transparent rolls, movable parts, silhouettes, plastic mechanical models and polarization, as well as reproductions from various copying machines. Charts and graphs can be projected and work sheets and transparencies can be shown simultaneously.

Application of Small-Format Cinematography to the Biomedical Sciences: Clinical Use of 8mm Motion Pictures

JERRY H. ANDERSON, M.D., University of Puerto Rico School of Medicine, San Juan, Puerto Rico

Clinical use of 8mm film is proposed whenever the depiction of motion is of prime importance. Most clinical situations can adequately be photographed on 8mm film, and its advantages are sufficient for economical, limited production and use. Equipment requisites and some problems encountered in establishing 8mm production units are presented with a discussion of the applications of super 8 and other 8mm formats to the biomedical sciences for educational, research and record purposes.

Filmstrip Techniques

SELWYN ROBBINS, Manhattan Color Laboratory, New York

Present and future filmstrip applications and techniques are discussed. A discussion of certain misconceptions in filmstrip production and the relationship of the producer and filmstrip laboratory in their combined efforts to complete a successful filmstrip is presented.

Filmstrip Production Standards — The What and Why

JOHN LORD and ROBERT H. LARSON, DuKane Corp., St. Charles, Ill.

The significant increase in the number of filmstrips and sound filmstrips being produced indicates the necessity of uniform production standards. Picture and sound specifications must be uniform for efficient and trouble-free operation. The accepted standards discussed for producing 35mm single-frame filmstrips regarding aperture size, the leader, identification, focus frame, etc., have been depicted in the "Handbook for Production of Filmstrips & Records." Projected visuals and a comprehensive profile show techniques necessary to produce uniform filmstrips by these standards. Picture specifications are emphasized.

Computer-Indexed Film Handling

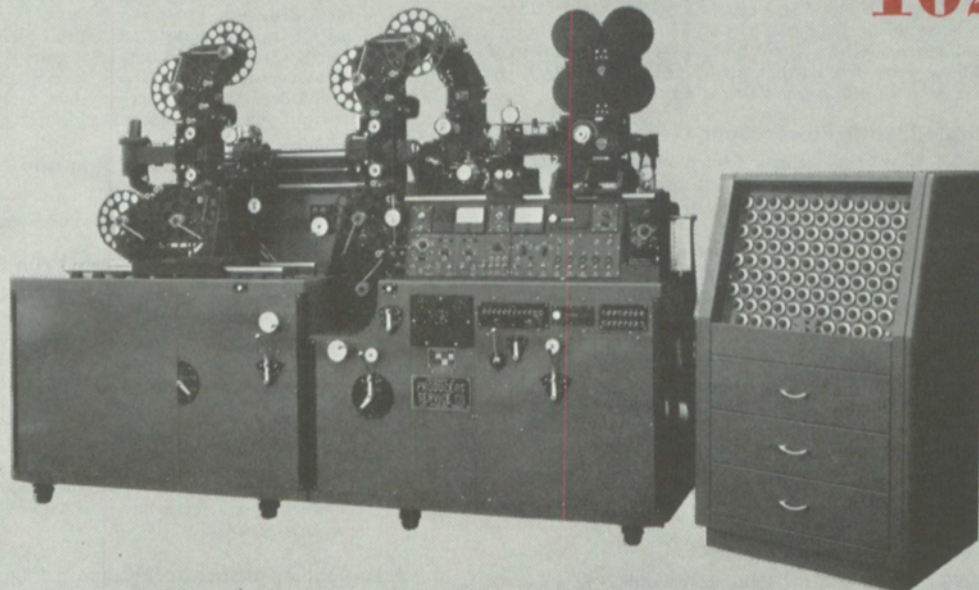
THEODOR H. NELSON, Vassar College, Poughkeepsie, N.Y.

Digital computers can be used with motion pictures, in editing, control of film libraries, and the presentation of variable-content and browsable films. In editing, computers can keep track of the con-

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tents of individual film segments and assemble them automatically under human direction both for intermediate tests or master output. Film libraries and archives may be cross-indexed with computers. The techniques of video recording, depth indexing and computer control make possible a new medium which is proposed: the hyperfilm. Hyperfilm is a collection of films which may be viewed in different combinations, in branching sequences, or in browsing. The problem is one of computer programming and file structure. An evolutionary list file for all these purposes is suggested.

Audiovisual Learning Center — The United States Pavilion, New York World's Fair 1964-5

SOL CORNBERG, Sol Cornberg Associates, Inc., Holmes, N.Y.

The center consists of three individual "study stations" from which programs may be selected, and in which the program selected is displayed as audio or video information, or both. The program is stored on audio and video tape, and slides. The audio is selectable in English or Spanish. Ten video programs with audio, and two audio programs are nonsequentially selectable at each station. In addition, one audio talkback is selectable. All equipments at the exhibit are seen by the public, as they select, search and play out. Selection, display, search and storage methods are described.

CONCURRENT SESSION

9:00 TELEVISION AUTOMATION AND PRODUCTION TECHNIQUES

A Simultaneous Video-Tape and Direct 16mm Film Recording System

WARREN R. SMITH and ROBERT FERBER, M-G-M Telestudios, Inc., New York

An optical/mechanical unit containing a 16mm film camera which couples to an available TV camera through a common zoom lens is described and illustrated. This direct film recording system, named Gemini, is used throughout the world to record television programs for distribution, thus eliminating the problem of multiple television standards. The system is becoming increasingly important for the filming of programs in color using black-and-white television cameras.

Live Program Production With Multiple Preset Cameras

G. L. BOWDEN, CFCF-TV, Montreal

The advantages and disadvantages of operating preset cameras for live programming in a large market are summarized. In one year of operation, many problems have been eliminated or reduced to an acceptable level, e.g., versatility, color-gray scale, talent reactions, lighting and the labor union.

VHF Television Remote Control Experiments in the USA

GEORGE W. BARTLETT, National Association of Broadcasters, Washington, D.C.

During the past 2½ years, the National Association of Broadcasters has conducted a series of field experiments to prove the feasibility and reliability of remotely controlling large VHF television transmitting facilities. These tests were conducted at four widely separated locations and utilized two different control system philosophies. The technical aspects of the test program, including a method of video and aural signal monitoring which is instrumental in controlling signal characteristics are discussed.

A New Approach to Television Studio Control Room Design

S. GLOVER, Canadian Broadcasting Corp., Montreal

Conventional control room layout is reversed to that production personnel have their backs to the windows looking into the studio, and face the picture monitors placed in a luminous wall. Design criteria have been obtained from the points of view of physical layout, seating arrangements and lighting for a controlled working environment.

A Study of Detectors for Automatic Control of Radio and Television Transmitter Centers

JEAN GUILLERMIN, Ingenieur des Telecommunication a l'O.R.T.F., Paris

Automatic Switching at the Edmonton TV Studios

S. GLOVER, Canadian Broadcasting Corp., Montreal

The Edmonton CBC television studios were installed in 1962 with the accent on unattended and automatic operation using a minimum of staff. Present facilities include a 2-camera studio, a single remotely

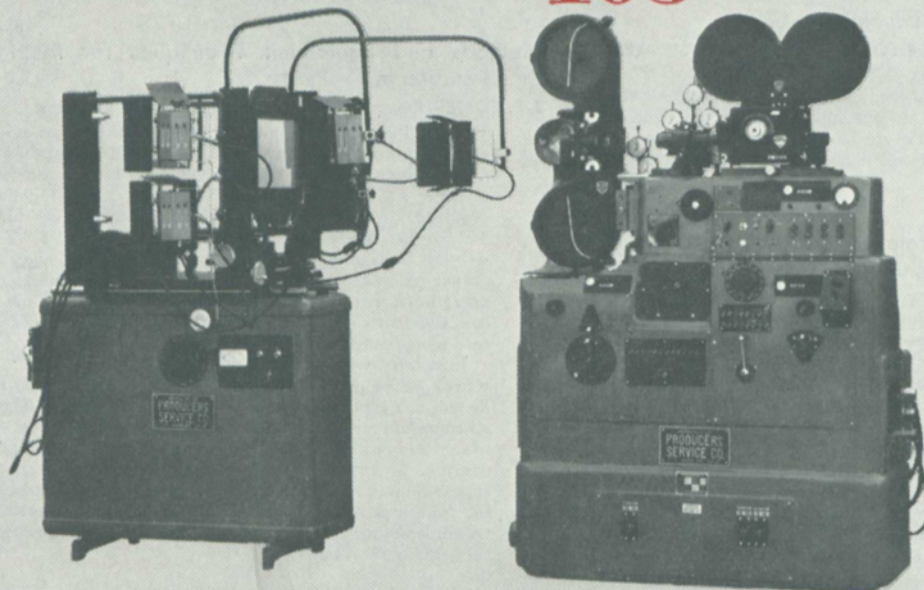
Not To Use a Producers' Printer?

Acme Special Effects Optical Printer

Model

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controlled camera studio, two VTR's, two telecines and two mobile units. The single operator master control position has now been automated using the "Chronolog" system. The advantages of this system in a television operation of this size are discussed in the light of two years of experience with it.

Application of Digital Techniques to Automatic TV Programming

K. P. DAVIES and F. JACKSON, Central Dynamics Ltd., Montreal

Television automation is reviewed and the features of a recently developed digital program control system discussed. The drum memory system, machine pre-roll unit, digital clock with its associated true or duration time, machine switching, special-effects and audio switching are emphasized.

THURSDAY AFTERNOON

CONCURRENT SESSIONS

2:00 EDUCATION II (Bilingual)

Multimedia Instructional Techniques, Facilities and Services for College Teaching

WILLIAM L. MILLARD, Rensselaer Polytechnic Institute, Troy, N. Y.

Current efforts to improve learning using audio and visual instructional resources suggest a multimedia approach to the development and implementation of new teaching techniques, instructional facilities and media services. The significant features of the multimedia program at RPI are described with emphasis on current instructional techniques utilizing a combination of multiple image projection, closed-circuit television and live demonstrations. The rolls of technologists and media specialists in the development of an effective educational program are emphasized.

A Modular Audio-Visual Instructional System

WILLIAM H. TROW, Graflex, Inc., Rochester, N.Y.

Use of audio-visual equipment designed specifically for individual instruction should be more widespread. Available units generally cannot be adapted to changing requirements and may restrict the selection of the most suitable method of presentation. A versatile system of interconnecting modules is described, accommodating various visual and audio media and allowing student response and other functions.

Emerging Uses of 8mm Film in Education

LOUIS FORSDALE, JOAN ROSENGREN FORSDALE and JOHN SWAYZE, Teacher's College, Columbia University, New York

A study made by Teacher's College, Columbia University, for the U.S. Office of Education covers various applications of 8mm film in education. First, the background of the study is given; then a thirty-minute film shot throughout the United States is projected to report the investigation.

Instructional Visual and Aural Telephonic Communication

R. A. ISBERG, Communications Engineer, University of California, Berkeley

Nine campuses of the University of California are interconnected through a dial accessed private-line telephonic system which can be utilized not only for telephone conversations and data transmissions, but also for two-way aural communication between public address systems, two-way handwritten messages by electrooptical projection systems, slow-scan television and facsimile. Facility arrangements and special provisions for interconnecting private-line telephone circuits to University facilities are described.

Modular Audio-Visual Multimedia Programming

ARTHUR M. SUCHESK, North American Aviation, Inc., Space & Information Systems Div., Downey, Calif.

Training problems created by increasing technological displacement and obsolescence in industry and education are discussed. A new technology in the science of education and training through the application of audio-visual multi-media programming and industrial systems design is defined. A new concept of modular audio-visual multimedia programming is introduced with details and demonstrations of the concept and equipment in operation and forecasts of specific applications in the training of a mass dispersed population.

Education and Engineering (Two Views of a Widget)

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

The engineer's unique relation to the nation's most important single business — education — and the kind of orientation which the engineer should have to fulfill his increasingly important role in that business are discussed. How to plug the engineer and the educator into the same communication system effectively depends upon the ability of each to see both sides of the same "widget" in a way which truly advances educational practice through technology.

Laboratory Films for Physics Teacher Training

ALEXANDER JOSEPH, College of Police Science, City University of New York, New York

Thirteen techniques used in making short laboratory films involving the photography of electric lines of force, alpha particle tracks and low-level electron tracks on a small fluorescent screen are described. Lighting and cameras used are discussed. Three short films accompany the paper: *Diffusion Cloud Chamber*, *Electric Lines of Force*, and *Magic Eye*.

CONCURRENT SESSION

2:00 VERTICAL INTERVAL TEST AND TELEVISION MONITORING

Vertical Interval Test and Reference Signals (VIT) in the CBC Television Network

C. A. SIOCOS, Canadian Broadcasting Corp., Montreal

Supervising the technical quality of the CBC television network by test and reference signals transmitted along with the program signal during the vertical blanking period is discussed. An account of the pilot plant for VIT installed at the outset to evaluate the use of such signals and to gain experience is included. The permanent VIT facilities are described, including system concepts and equipment highlights. Opinions regarding the full use of vertical interval and test signals are presented.

Monitoring of Vertical Interval Test Signals

CHARLES W. RHODES, Tektronix, Inc., Beaverton, Ore.

Vertical Interval Test Signals (VITS) permit continuous quality control of television signals. Principal test signals used are the multi-burst, modulated stairstep and sine-squared pulse and bar. VITS are monitored on a waveform monitor especially designed for this application. Such monitors must have a line selector and a positive-acting field selector. Some of the major design considerations in the development of suitable waveform monitors are discussed. While VITS provides many important measurements, it has some limitations which are also discussed.

Methods and Equipment Techniques for Multi-Line VITS Insertion in TV Relay

J. B. POTTER, Research Laboratories, Melbourne, Australia

Vertical interval test signal (VITS) insertion has now become a widely adopted means of on-line testing and monitoring of TV signal transmissions. In a network of relay links interconnecting a number of different user organizations, different VITS functions must be provided, depending on the user and purpose of the inserted signals. To provide the required flexibility of operation, a VITS insertion unit has been developed by means of which up to eight different test signals may be inserted and/or replaced. To accommodate varying operational requirements, the insertion line switching sequence is controlled by digital insertion program logic, prewired on a plug-in card which may be readily exchanged.

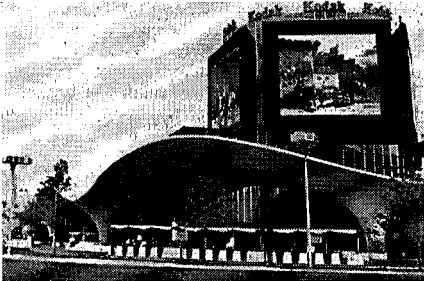
Integrated with the equipment is a sampled automatic gain control system which uses an inserted level reference waveform to provide the level adjustment criterion. Synchronizing and blanking signal regeneration is also provided, but on a substantially line-by-line basis which allows a number of VITS insertion units to be operated in cascade. To protect the TV signal transmission from being interrupted by a malfunction of the insertion unit, an extensive fault testing routine is built into the VITS unit. In the event of equipment failure, an automatic bridging of the insertion unit by electromechanical switches takes place.

Vertical Interval Test Signals in Australian Television

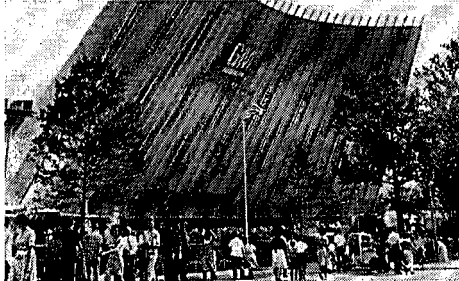
S. F. BROWNLESS, Australian Broadcasting Control Board; and R. W. HARNATH, Postmaster General's Department, Melbourne, Australia

The Australian Television Network, and the application of Vertical Interval Test Signals (VITS) for the continuous assessment of operational performance are described. The allocation of time during the

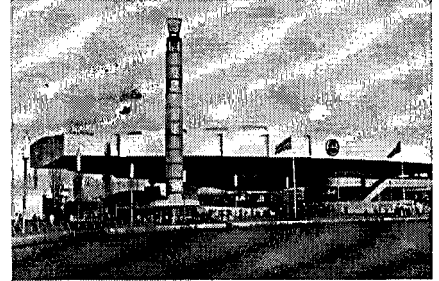
Norelco[®] projectors are everywhere at the Fair educating, intriguing and entertaining



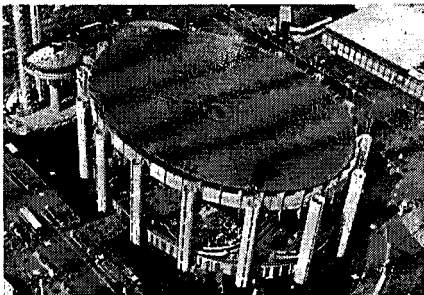
Eastman Kodak Pavilion
3 Norelco AA II 70/35mm Projectors
Supplied by Reevesound Company, Inc.



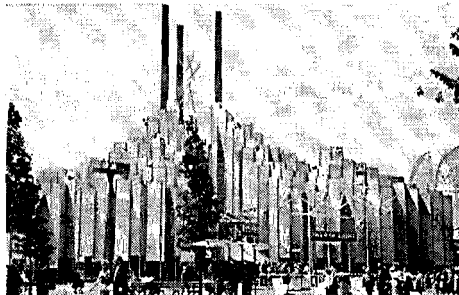
General Motors Pavilion
10 Norelco 16mm Projectors
Supplied by Reevesound Company, Inc.



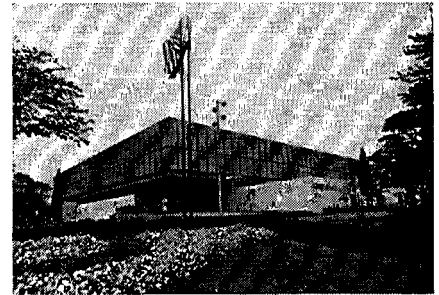
Bell System Pavilion
65 Norelco 16mm Projectors
Supplied by Reevesound Company, Inc.



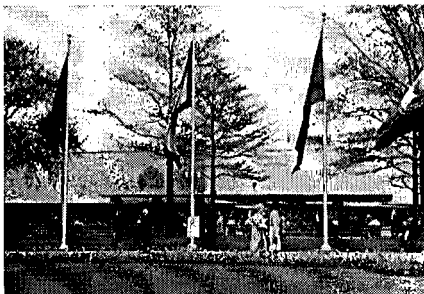
New York State Pavilion
6 Norelco Super Pulse-Lite 35mm Projectors
Supplied to Coleman Productions, Inc.
by Magna-Tech Electronic Co., Inc.



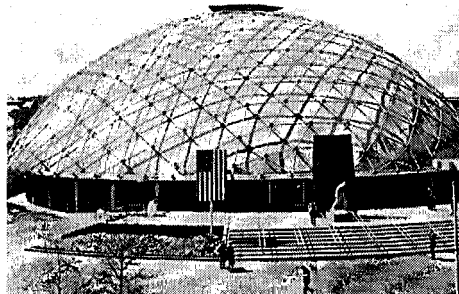
Power and Light Pavilion
5 Norelco Pulse-Lite 35mm Projectors
Supplied by Reevesound Company, Inc.



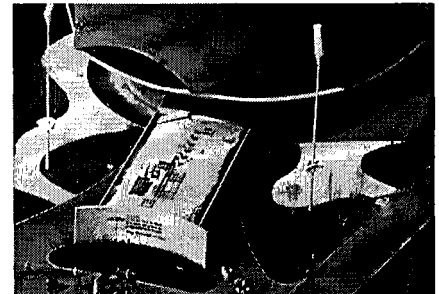
Spanish Pavilion
2 Norelco 35mm Projectors
Supplied by National Theatre Supply Company



Irish Pavilion
Norelco 16mm Projector
Supplied by Reevesound Company, Inc.



Churchill Exhibit
Norelco 16mm Projector
Supplied by Jerome Menell Company, Inc.



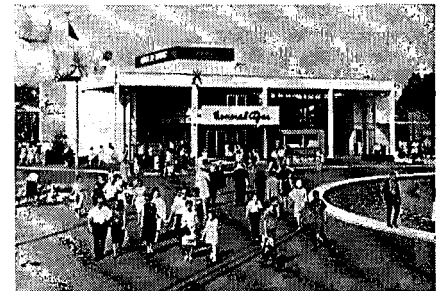
Travelers Insurance Pavilion
Norelco 35mm Projector
Supplied by Reevesound Company, Inc.



Billy Graham Pavilion
Norelco AA II 70/35mm Projector
Supplied by National Theatre Supply Company



Du Pont Pavilion
2 Norelco AA II 70/35mm Projectors
Supplied by National Theatre Supply Company



General Cigar Pavilion
Norelco 16mm Projector
Supplied by Reevesound Company, Inc.

NORTH AMERICAN PHILIPS COMPANY, INC., MOTION PICTURE EQUIPMENT DIVISION, 100 EAST 42nd STREET, NEW YORK, N. Y. 10017

These projectors are sold in Canada under the name of Philips through Philips Electronic Industries Ltd., 5930 Cote de Liesse Road, Montreal 9, Canada

vertical interval between station operators and the Australian Post Office (A.P.O.) is given, and the types of VITS used by both parties are considered. Methods of assessment of performance are outlined, and future developments in this field are discussed.

Network Transmission Coordination in U.S. and Canada: Panel Discussion of Technical and Operational Matters of Mutual Concern to Broadcasters and Common Carriers

J. T. STEPHENS, AT&T Co. (*Moderator*); H. T. DUNLAP, AT&T Co.; R. W. GAST, N.Y. Tel. Co.; H. C. GRONBERG, NBC; R. A. O'CONNOR, CBS; J. SERAFIN, ABC; C. A. SIOCOS, CBC; C. B. DOWDEN, Bell Telephone Co. of Canada

THURSDAY EVENING

8:00 VISIT TO THE NATIONAL FILM BOARD

EDUCATION III

(Panel: Educators/Engineers)

FRIDAY MORNING—NOVEMBER 5

9:00 TELEVISION TEST METHODS

An 8- by 10-in. Transparency Illuminator for Television

D. H. McRAE and R. E. J. HALLIDAY, Canadian Broadcasting Corp., Montreal

A good-quality illuminator for 8- by 10-in. TV camera alignment transparencies is described which has a controlled screen brightness from 25 to 250 ft-L; brightness uniformity within 5%; and constant color temperature. A 150-w floodlamp shines through a flashed opal diffusing glass into a chamber lined with second surface mirrors. The chamber, in turn, uniformly illuminates an opal Perspex screen. A movable plate, crossing the beam of the floodlamp, controls the brightness.

Modification of the Pulse-and-Bar Test Signal With Special Reference to Application in Color Television

PETER WOLF, Institut für Rundfunktechnik GmbH, Munich, Germany

It is proposed to modify the pulse-and-bar test signal, which has been used in England to measure linear waveform distortion in TV systems, by a special 20 T sine-squared pulse. This pulse is formed by the linear addition of a 20 T pulse to the pulse modulated on the color subcarrier. Transmission distortions can thus be recognized at the upper end of the video band. The deformation of the envelope of such a pulse indicates various transmission distortions of the luminance and chrominance channels. The combination of this 20 T pulse with the elements of the existing pulse-and-bar test signal is also suggested.

The Pluge Method of Adjusting Picture Monitors in Television Studios

S. F. QUINN, Canadian Broadcasting Corp., Montreal

An experimental installation of Pluge has been tried within the CBC, and, with some reservations, Pluge has been accepted as a means of setting up picture monitors. In this method only the white luminance is adjusted by reference to an exposure meter; the black luminance is adjusted subjectively.

The Practical Testing of TV Camera Tubes

WALTER E. TURK, Light Conversion Devices Div., English Electric Valve Co., Ltd., Chelmsford, Essex, England

The practical and philosophical aspects of testing TV camera tubes are discussed. Methods used in manufacturing and operations are described for the main performance parameters such as sensitivity, signal-to-noise ratio, resolution, gamma and spectral response. Various difficulties associated with the different types of broadcasting requirements are illustrated.

The CBC National Palette — A Paint Standardization System

W. N. DANAGHER, Canadian Broadcasting Corp., Ottawa

A nontechnical paper on the development of paint and color standardization for all CBC TV production centers is presented. An industrial engineering approach was used to bring together different ideas and departments which resulted in a common color language and standardized paint throughout the CBC. The colors are gray-scale related; there is a National Paint Contract, a pertinent paint specification and reduced cost. Although these developments took place for monochrome television, they were also preparation for color television.

Specification for a Standard Television Demodulator for the Australian National Television Service

PETER D. BARNES, Radio Section, Postmaster General's Department, Melbourne, Australia

At the end of the current (fourth) phase of expansion of the Australian National Television Service, the Australian Post Office will be operating 39 TV stations of 100-kw effective radiated power as well as several television translators. In measuring and monitoring the performance of individual stations, several types and makes of vestigial sideband demodulators are used and these have, in general, been supplied with the transmitting equipment by the particular station contractor. Although these demodulators were intended to comply with the standards of the Australian Broadcasting Control Board, more recent attempts to verify this have highlighted the basic limitations of the existing devices. The basis of the specification of a demodulator which is to become the standardizing demodulator for all stations of the Australian national network, including translators, and the testing of the standard demodulator, are discussed.

FRIDAY AFTERNOON

2:00 TELEVISION TRANSMISSION

Television Signal Cable Transmission Techniques

I. S. ROSNER, Rosner Television Systems, Inc., New York

Television signals are currently being distributed either at audio and video frequencies or as audio and video modulation on a carrier frequency above the video band. The characteristics of both systems are discussed and current techniques examined. The advantages and disadvantages of both systems are investigated and a comparative evaluation is presented.

The Regina-Marquis Rebroadcasting System

L. E. McBRIDE, Transcanada Communications Ltd., Regina, Saskatchewan, Can.

The Regina-Marquis Rebroadcasting System was developed from experience obtained in the operation of two other high-power, remote rebroadcasting stations. The desire was to have a reliable remotely controlled station that would ensure minimum losses of air time. The system incorporates several new and unique features, including many automatic sensing devices. The station has been on the air since September 1964 and has proved reliable.

Quadrature Distortion Correction for Vestigial Sideband Transmission

SIEGFRIED DINSEL, Institut für Rundfunktechnik GmbH, Munich, Germany

Vestigial sideband transmission produces nonlinear effects, quadrature errors, inherent in the system. These errors give rise to increased overshoots, loss in resolution and a change of the pulse ratio with square-wave signals. With the transmission of color signals, two types of distortion are known so far: incorrect reproduction of the brightness of colored areas, and phase modulation of the vision carrier. A possibility of correcting the quadrature errors is discussed. The equipment described is arranged in the video part of the transmitter to pre-correct the distortions. Home reception is thus improved.

The Absorption of Mismatch Echoes in Television Transmitting Antenna Feeders

WILLIAM E. BEARD, Radio Section, Postmaster General's Department, Melbourne, Australia

Split antenna systems and paralled transmitters are universally used by the Australian Post Office to improve transmission reliability. Generally the two transmitters are combined and the combined output is split again within the station building for transmission by twin feeders to the antenna system. Antenna mismatch echoes returning to the power divider and dividing at the junction are re-radiated. In certain circumstances the echoes may cause enhanced ghost effects in some parts of the service area. If a hybrid-type splitting transformer is used together with quadrature phasing of the twin transmitters, the bulk of the reflected energy may be absorbed in the diplexer and splitter balancing loads.

Canada's Communication Satellite Ground Station

M. F. MACPHERSON, RCA Victor Co., Ltd., Montreal

The Influence of the Steepness of the Nyquist Slope and the Position of the Carrier on the Distortions Caused in the Case of VSB Transmission

H. DOBESCH, Rundfunk- und Fernsehtechnisches Zentralamt, Berlin, Germany

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