Advance Program

This 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 Paul Weiss, Program Chairman, c/o Du Pont Photo Products Dept., Parlin, N.J. (CLlifford 7-4600).

SUNDAY—OCTOBER 4

10:00–5:00 Registration

MONDAY—OCTOBER 5

9:00 Registration

9:30 CINEMATOGRAPHY

Two New f/1.9 Lenses for 16mm and Vidicon Cameras

G. H. AKLIN, Apparatus and Optical Div., Eastman Kodak Co., Rochester, N.Y.

Two new Cine Ektar lenses, a 25 mm *f*/1.9 and a 50mm *f*/1.9, introduced by Eastman Kodak Co., give improved resolution in accordance with the demands of present-day 16mm motion-picture production. The field covered by these lenses is adequate for use with the vidicon tube. These lenses are also matched in spectral transmission to avoid altering the color balance when changing from one lens to another in using color film.

Methods of Appraising Photographic Systems

F. H. PERRIN, Eastman Kodak Co., Rochester, N.Y.

The reason why resolving power has been found to be unsuitable as a criterion of quality for lenses and photographic emulsions is explained. The spread function and the sine-wave response function are described, and the method of computing the latter from the former is indicated. The experimental method of determining these characteristics is described. It is shown how a flat-topped spread function leads to spurious resolution, and the usefulness of the concept of sine-wave response is illustrated by its application to successive printing operations.

The Luminance-Difference Threshold in Viewing Projected Pictures

E. J. BRENEMAN, Research Laboratories, Eastman Kodak Co., Rochester, N.Y.

The luminance-difference threshold has been determined as a function of luminance for viewing conditions similar to those recommended by the ASA for the projection of professional motion pictures. A stimulus subtending an angle of 0.5° was superimposed briefly upon various areas within typical photographic reproductions. The results indicate the nature of the dependence of the luminance-difference threshold upon the luminance of the test area and upon the luminance of surrounding areas.

The National Seventy: A New Convertible Projector for 35mm and 70mm Film

WILLY BORBERG and BERNARD D. PLAKUN, General Precision Laboratory Inc., Pleasantville, N.Y.

Tentative Schedule of Committee Meetings

Tuesday, October 6

3:30 P.M. Association of Cinema Laboratories, followed by Cocktails and Dinner

Wednesday, October 7

10:30 A.M. Publications Advisory Committee
12:30 P.M. Editorial Luncheon
1:30 P.M. Papers Committee
2:30 P.M. Section and Student Chapter Officers
2:30 P.M. Board of Editors

Engineering Committees: The schedule will be listed in the Convention Program; and meeting notices will be mailed to Committee members.

Color Matching Between Picture-Tube Phosphors and Color-Film Dyes

LLOYD F. HOPE, Hazeltine Research Corp., Little Neck, L.I., N.Y.

Color sensation produced by transmission of light through a combination of color-film dyes can be matched by that produced by the combination of narrow-band lights radiated by the properly excited phosphors of a TV viewing tube. Equations for color matching are reviewed; graphic aids for conversion from coordinates based on dye primaries to coordinates based on phosphor primaries are presented; and these are applied to a practical problem.

Techniques in Color Duplication

ROBERT O. GALE, Color Technology Div., and WALTER I. KISNER, Motion Picture Film Dept., Eastman Kodak Co., Rochester, N.Y.

The production of black-and-white and color master positives and color duplicate negatives which lead to a final print quality comparable to that obtained in a print made from the original negative is a difficult problem for the motion-picture laboratory. This paper is intended to provide a better understanding of the proper techniques and to point out some of the pitfalls in color duplication operations for laboratory technicians engaged in this work. The requirements for good master positives and color duplicate negatives and the techniques for achieving optimum quality are discussed. As a practical guide, step procedures for producing master positives and duplicate negatives through different film systems are outlined.

Film Cataloging With IBM

GLENN D. McMURRY, Dept. of Cinema, Univ. of Southern California, Los Angeles

Report of Film Dimensions Committee

A. C. ROBERTSON, Eastman Kodak Co., Rochester, N.Y.

12:15 Get-Together Luncheon

Guest Speaker:

"Engineering in the Space Age"

EDWARD P. CURTIS, Vice President of the Eastman Kodak Company

MONDAY AFTERNOON

2:00 BUSINESS MEETING

2:15 FILM STEADINESS SYMPOSIUM

Steadiness and American Standards for Film Dimensions

DEANE R. WHITE, E. I. du Pont de Nemours & Co., Inc., Parlin, N.J.

Picture unsteadiness on a motion-picture screen could be caused by nonuniform perforation dimensions. Film slit and perforated within tolerance limits of American Standards should give acceptable performance when used in properly designed and maintained equipment. Dimensions most directly affecting film steadiness are discussed with review of some statistical data concerning dimension ranges occurring in practice.

Pin Registration

A. C. ROBERTSON, Manufacturing Experiments Div., Eastman Kodak Co., Rochester, N.Y.

The use of pin registration is almost necessary in making good motion

pictures, and is indispensable where process photography (or double-exposure) techniques are used. Several styles of guiding are described and the need for a set of different aperture plates in process printers is described. Pertinent factors in construction and operation are described of which control of relative humidity and temperature is an important matter. A type of guiding called "Edge and Point Guiding" has some virtues and is successfully used in some 16mm cameras. Some examples are given of errors caused by faults in design, workmanship and maintenance of equipment which detract from optimum performance.

Pin Locations in Special Effects Mechanism to Effect Steadiness

JOHN KIEL, Producer's Service Co., Burbank, Calif.

Cancellation

J. A. MAURER, JM Developments, Inc., New York

Demonstration of the Principle of Cancellation

A. C. ROBERTSON, Manufacturing Experiments Div., Eastman Kodak Co., Rochester, N.Y.

When the location of the pulldown claw in a camera and projector is the same, small errors of perforation in the film are cancelled, thus leaving as remaining sources of unsteadiness the errors in the camera and projector.

A demonstration using specially prepared film with large errors in longitudinal pitch shows that good workmanship alone is not sufficient to make a camera perform well under all circumstances. The disposition of the claw or positioning pin in the same location as that used in the projector is necessary to get ultimate performance under unfavorable conditions.

Interpretation of Dimensional Changes in Film

PETER Z. ADELSTEIN and JOHN M. CALHOUN, Manufacturing Experiments Div., Eastman Kodak Co., Rochester, N.Y.

A discussion is given of the factors which affect the dimensions of motion-picture film to correct some of the misinterpretations that are sometimes made. The distinction between standard film dimensions at the time of manufacture and actual film dimensions at the time of use is clarified. The stacking or cancellation of dimensional errors caused by variations in cutting or perforating, relative humidity, temperature, processing and aging, is explained. The application of the principles discussed to practical problems in the motion-picture and in the instrument and data-recording fields is illustrated.

MONDAY EVENING

8:00 SOUND RECORDING AND REPRODUCTION

The Testing of Microphones in a Simple Enclosure

R. W. CURTIS, National Film Board of Canada, Montreal

Lacking a free-space room, the National Film Board has investigated the use of a simple enclosure for routine microphone tests, with certain apparatus and techniques. The scope and limitations of the method are discussed.

A Highly Stable Variable-Gain Amplifier for Motion-Picture Film Recording

JAMES F. CORNELL, General Electric Co., Schenectady, N.Y.

The General Electric 4BA7A3-DS amplifier which is a GE BA7A Limiter Amplifier has been modified to operate as a backward-acting compressor incorporating a frequency-selective control voltage circuit to minimize accentuation of the upper and lower sounds in speech, an attack time of approximately 70 μsec and an adjustable recovery time. Such a unit has been used in dialog recording in an industrial film studio. Samples of dialog recorded with the unit in its various modes of operation are illustrated in a 16mm film recording.

Modern Control of Theater-Sound Equipment

GEORGE B. GOODALL, Ampex Corp., Redwood City, Calif.

There are now three distinct techniques used in recording motion-picture soundtracks — single-channel optical, four-channel magnetic and six-channel magnetic. Each normally requires a separate control system, resulting in a confusing mass of equipment and controls in the theater projection room. The use of a modern sound-reproducing system can eliminate duplicate controls and equipment, simplify operating and emergency procedures, and provide instant pushbutton selection of soundtrack configuration.

A Magnetic Disc Recording and Reproducing System for Broadcast Applications

GEORGE A. SINGER, Radio Corp. of America, Camden, N.J.

A New Method of Post-Synchronous Recording

DENNIS GUNST, Fordel Films Inc., New York

During the recording, the modulations of the actor's voice together with associated control tracks automatically position the new track against the original track, so that the burden of maintaining synchronization is removed from the actor and placed on electronic controls. Experiments have been made illustrating the principles of the method; a film demonstrates a recording made by these techniques.

TUESDAY MORNING—OCTOBER 6

9:30 SPACE TECHNOLOGY AND IMAGE SENSING

Image Sensors and Space Environment

M. H. MESNER and MILTON RITTER, Astro-Electronic Products Div., Radio Corp. of America, Princeton, N.J.

The types of sensors available for imaging from satellites have certain capabilities, and operational and logistic requirements. The influence of the space environment on the sensors and sensing systems is evaluated. Consideration is given to the thermal environment and the possibilities of radiative cooling of infrared sensing elements.

Infrared Imaging From Satellites

RUDOLF A. HANEL and W. STROUD, National Aeronautics and Space Administration, Goddard Space Flight Center, Washington, D.C.

Obtaining infrared images of the Earth's surface and atmosphere by means of satellites is related especially to systems design and to image conversion techniques. Knowledge of the Earth's infrared properties aids in the understanding of experiments. There are various detection systems and problems peculiar to satellite-borne infrared sensors. Data presentation and interpretation are investigated; and an outlook to future applications of image-sensing devices concludes the paper.

Image Sensing as Applied to Meteorological Satellites

DAVID S. JOHNSON, U.S. Weather Bureau, Washington, D.C.

Earth satellites provide meteorologists with instrument platforms capable of observing the weather on a global basis. One of the most promising satellite observations is of cloud distribution and type. Several image-sensing systems are being considered with the aim of recording cloud images, both day and night, with a resolution of about 0.1 to 0.5 mile. Problems in sensing instrumentation, communications, processing and data presentation must be solved before an operational system becomes a reality.

Pictorial Data Transmission From a Space Vehicle

JON F. BAUMUNK and SEYMOUR H. ROTH, Astro-Electronic Products Div., Radio Corp. of America, Princeton, N.J.

Space communications are essentially line-of-sight transmission complicated by nonstationary terminals and the literally astronomical distances involved. Severe limitations on available power and weight restrict transmitter power, and therefore narrow bandwidths for transmission of pictorial data are required. These unique conditions underlie certain problems and possible solutions.

Orbit Determination From Optical Tracking

DOUGLAS DUKE, Advanced Research Projects Agency, The Pentagon, Washington, D.C.

Experiences with data from optical tracking instrumentation at the Atlantic Missile Range have shown that excellent satellite orbit determinations can be obtained from such data. Results are exemplified by tracking data on passes of satellite 1958 delta one (Sputnik III rocket). Various methods of orbit determination are discussed and applications of some of the simpler methods are illustrated. For shortcomings found with existing equipment, specific improvements are recommended.

Solar Photography

HERBERT FRIEDMAN, U.S. Naval Research Laboratory, Washington, D.C.

The familiar techniques of photography in visible light are not at all applicable to imaging the sun in short-wavelength, ultraviolet light. Refracting optics must be replaced by mirror optics and attainment of highly reflecting surfaces becomes a major problem. Color filtration has been accomplished by predispersing the image spectrum and selecting the desired wavelength range for final imaging. Television-type scanning with photoelectric pickup in selected wavelength intervals appears quite feasible.

TUESDAY AFTERNOON
1:30 SPACE TECHNOLOGY AND IMAGE SENSING

Uses of Television in Man-in-Space Research

CAPT. F. KIRK SMITH, U.S. Navy, Naval Air Development Center, Johnsville, Pa.

Physiological measurements and recordings are of great importance in the observation of human reaction to stresses encountered in various phases and types of research undertaken to prepare Man for his personal exploration of space. In monitoring reactions and responses to these stresses, television offers the researcher immediate visual information that can be used in interpreting simultaneously the physiological data obtained. Television is also a valuable tool in the evaluation of a subject's report on his own reactions during an experiment and the effectiveness of the equipment and instrumentation.

Electrostatic Imaging and Recording

E. C. HUTTER, J. A. INSLEE and T. H. MOORE, Astro-Electronic Products Div., Radio Corp. of America, Princeton, N.J.

Simultaneous pickup and electrostatic storage of optical information are accomplished by using a transducer consisting of a pickup tube with a layer of photoconductor overlaid by a thin layer of highly insulating material. Recording is achieved by simultaneous optical exposure of the photoconductor and electronic beam contact to the insulator. A charge pattern corresponding to the optical pattern remains on the insulator. During the storage period, which may be for several days, the target is insensitive to light and radiation. When readout is desired, the charge image is read by an electron beam, as in a television pickup tube. The images may be stored on fixed rigid targets or on a flexible tape.

Satellite Astronomical Telescopes

NANCY G. ROMAN, National Aeronautics and Space Administration, Washington, D.C.

The planned Space Sciences Program of the National Aeronautics and Space Administration includes a broad program of astronomical observations from satellites. Telescopes with apertures up to 36 or 40 in. appear to be practical for satellite use. These will be individually designed for particular spectral regions and particular experimental objectives and most will be based on photodetectors and electronic imaging devices which will substitute for the camera and the human eye.

Television and Lunar Exploration

S. W. SPAULDING, Astro-Electronic Products Div., Radio Corp. of America Princeton, N.J.

Television techniques are planned to aid in the exploration of the lunar surface, with emphasis on the obtaining of high-resolution pictures from an impacting probe. A television link back to Earth will permit control of soft-landings on the Moon and subsequent surface examination. The optics, the television and the communications parameters are considered.

Mars Photographic Probe

PHILIP N. BOWDITCH and JOHN B. SUOMALA, JR., Instrumentation Laboratory, Massachusetts Institute of Technology, Cambridge, Mass.

The solar system is to be circumnavigated with a recoverable space probe which produces a high-resolution photograph of the planet Mars. A specific design for the space vehicle and the engineering problems of interplanetary navigation, attitude control, photography, communications and re-entry are presented.

Space Technology and Image Sensing — Summary

SIDNEY STERNBERG, Astro-Electronic Products Div., Radio Corp. of America, Princeton, N.J.

TUESDAY EVENING

8:00 PRESENTATION OF AWARDS

Guest Speaker: EDGAR M. CORTRIGHT, Chief, Advanced Technology Program, National Aeronautics Space Administration

National Space Program

The speaker will discuss the National Space Program in the light of past experiences, present activities and future planning. The presentation will be in the nature of a general survey of all aspects of the program, including space sciences, satellite applications, manned space flight, and developmental and supporting activities.

(The Program of Awards will appear in the Final Program for the Convention.)

WEDNESDAY MORNING—OCTOBER 7

9:30 EQUIPMENT PAPERS AND DEMONSTRATIONS

(See the Exhibit Directory)

WEDNESDAY AFTERNOON

1:30 COMMITTEE MEETINGS

(See separate listing, page 616)

WEDNESDAY EVENING

6:45 COCKTAIL PARTY, BANQUET, DANCE

THURSDAY MORNING—OCTOBER 8

9:30 TELEVISION EQUIPMENT AND PRACTICES

The Design of a 4½ Inch Image-Orthicon Camera Channel

GEORGE E. PARTINGON, Marconi's Wireless Telegraph Co. Ltd., Essex, England

The 4½-in. image orthicon was introduced in 1955 as a contender with various European camera tubes for top picture quality with maximum operational flexibility. Its special characteristics are considered, particularly by comparison with 3-in. tubes. The way these influence the camera channel design is illustrated with reference to a new 4½-in. camera channel which combines maximum performance with a greatly reduced operating effort.

An Improved Image Orthicon

E. D. HENDRY and W. E. TURK, English Electric Valve Co., Chelmsford

A review of the faults associated with early image orthicons and description of measures taken for improved performance in a new version of the tube.

A High-Resolution Vidicon TV System as Adopted to Broadcast Standardization

JOSEPH BELCHER, General Precision Laboratory, Pleasantville, N. Y.

A Unitized TV Camera for Data Transmission

JAMES F. TENNYSON, Hallamore Electronics, Anaheim, Calif.

Because of the increasing need for high-quality yet economical TV equipment, a new TV camera has been designed. This is a unitized camera in concept, yet it retains such features as regulated power, wideband video amplification, and stabilized sweep circuitry necessary for origination of clean, sharp and stable images. Additional special circuitry provides features previously found only in separate camera-camera control systems. Equipment of this type is planned for application in data transmission, surveillance and process control fields.

An Automatic Sensitivity Control for Monochrome Film Cameras

H. N. KOZANOWSKI, K. SADASHIGE and S. L. BENDELL, Radio Corp. of America, Camden, N.J.

The problem of accommodating unpredictable variations in average

density of films and slides used in TV programming has spurred interest in devices for automatic control of signal levels from vidicon camera chains. A practical device provides control over a wide range of densities, with the particular advantage that the method of injecting control avoids introduction of "bounce" into the video signal.

A Simplified Method of Conversion of Standard Intermittent Motion-Picture Projectors for Use With Television Storage Pickup Tubes

J. S. CHANDLER, Research Laboratories, Eastman Kodak Co., Rochester, N.Y.

A 35mm Simplex standard projection head was converted for use as a television projector with the 3:2 field sequence method of utilizing film taken at 24 frames/sec for the 30-frames/sec television standard. A 31% application time is obtainable with a 5-in. shutter blade running at 3600 rpm. The entire mechanism — including the take-up drive, feed and holdback sprockets, shutter and intermittent Geneva — are driven from a single 1800-rpm synchronous motor.

A timing-belt drive is used for the intermittent mechanism. An eccentric grooved idler pulley of twice the diameter of the Geneva-drive pulley is interposed between the motor and the Geneva drive to produce the required advance and retard modification of the rotary motion. Curves showing the timing and change of acceleration are presented in the text. This low-cost method of providing a TV projector also produces very little added noise or acceleration loading so that long life is expected.

Automatic-Sequencing Equipment for Television Operation

F. CECIL GRACE, Visual Electronics Corp., New York

An automated television program system has been designed wherein events, with the time alloted for each, are stored in beam-switching-tube memory elements, along with the time each event is to remain on the air. When an event is on the air, the time counts down to zero in the beam-switching tubes. When it reaches zero the next event goes on the air and again starts counting down.

Television Camera Switching Practices

A. A. WALSH, National Broadcasting Co., New York

THURSDAY AFTERNOON

2:00 TELEVISION EQUIPMENT AND PRACTICES

A Special-Effects Amplifier for Noncomposite or Composite Monochrome or Color TV Signals

RALPH KENNEDY, National Broadcasting Co., New York

A switching circuit has been designed to produce a doublet impulse transition of 0.05 μsec. The problem of clamping a color signal during the burst interval by means of crystal diodes is discussed and a solution presented. Nonlinear amplification of the switching data prior to regenerative clipping has been found to permit dependable switching with much smaller brightness changes.

A Noise-Stripping Process for Picture Signals

R. E. GRAHAM, Bell Telephone Laboratories, Inc., Murray Hill, N.J.

A nonstationary, nonlinear operation has been found which selectively removes moderate amounts of additive Gaussian noise from a received picture signal. No preparatory operation is required at the transmitter, so that the technique is compatible with existing picture transmission systems. The signal processing employed is based on experimental studies of observer preception of noise in pictures and on subjective factors affecting image sharpness. The process is applicable to conventional broadcast television, and could in principle be incorporated in home receivers to improve reception in fringe areas. A number of pictures are shown illustrating the noise-stripping process.

Eidophor: The Image Bearer

FELTON DAVIS, JR., Eidophor Inc., New York

After twenty years of developmental work, the Eidophor television projector is now ready for practical field use. This system of color television has numerous present uses and future potentials in closed-circuit, large-screen television.

An Advanced Audio Console for Television Broadcasting

EMIL P. VINCENT, American Broadcasting Co., New York

Audio facilities requirements for TV broadcasts have increased sharply during the past few years. Each successive year has brought altered re-

quirements necessitating continual realignment of the facilities to the point that design and installation of complete new facilities was in order. The new audio console design was conceived in the light of extensive experience and in consultation with the operating staff and with manufacturers. These considerations resulted in the development of an advanced console type which is expected to fully accommodate future television program requirements. The new console will be described.

A New Automated Punch-Card Lighting-Control System

ALBERT W. MALANG, American Broadcasting Co., New York

Automatic programming and remote control for studio lighting have been developed based upon a concept of using one silicon-controlled rectifier dimmer for each load circuit and a control system utilizing the IBM card punch and readout. The centralized control system provides for an unlimited number of scene presets and permits maximum flexibility with a minimum of manual effort.

A Television-Studio Lighting-Control System Employing High-Speed Digital Computer Techniques

DONALD D. BRITTON, International Telephone & Telegraph Labs., San Fernando, Calif.

This proposed system records the lighting-board operator's actions during rehearsals as a by-product of his normal setup procedure. During telecasting the machine then assumes the major routine workload while still permitting maximum operator control. Magnetic drum memory and solid state registers are used to affect maximum control. New command information may be distributed to every light in the house in less than one second.

The following advantages are effected in this approach: 100% reloading of lights; infinite presets; minimizing routine efforts; maximizing human control through human engineering; and economies in power consumption and air-conditioning requirements. This system was designed after several months of operations research at the NBC and CBS facilities in Hollywood.

A New Method of Measuring and Controlling Brightness Values for Studio Lighting

ROLLO GILLESPIE WILLIAMS, Century Lighting, Inc., New York

FRIDAY MORNING—OCTOBER 9

CONCURRENT SESSIONS

9:00 INSTRUMENTATION AND HIGH-SPEED PHOTOGRAPHY

Hue-Brightness Schlieren

ROCHELLE PRESCOTT, Avco-Everett Research Laboratory, Everett, Mass.

With all of the arrangements usual in schlieren photography there is no sensitivity to refractive disturbances which produce deflection of the light rays in some one direction; only that component of the refraction which is normal to this direction is visible. A method has been developed whereby mutually perpendicular components are shown as variations in brightness in the one case, and hue in the other.

An Improved f/10 Sweeping-Image Camera

BERLYN BRIXNER, Los Alamos Scientific Laboratory, Los Alamos, N.M.

A rotating-mirror sweeping-image camera with a mirror distortion corrector, greater writing speed, and an apochromatic relay lens has increased resolving power. An adjustable cylinder lens corrects astigmatism introduced by surface distortion of the mirror, rotating up to 2000 rps to give a maximum writing speed of 13 mm/μsec for about 10 μsec. The lens operates at $f/10$, giving static resolution of 36 lines/mm on film. The dynamic image observed with the sweeping-image viewer suggests resolution of 3×10^{-9} sec.

Ballistic-Range Applications of Millimicrosecond Photography

J. A. HULL and G. A. THEOPHANIS, Avco Corp., Wilmington, Mass.

The Kerr cell electrooptical shutter has been adapted to obtain millimicrosecond, high-resolution photographs of models fired on a ballistic range. Eighteen stations employing these shutters are used to obtain aerodynamic data on nose-cone models fired at velocities to 14,000 ft/sec. Energy stored in the Kerr-cell pulse generator is used to generate the light pulse necessary for making the shadowgraph and schlieren exposures.

A Quick-Start High Speed Camera

W. O. S. JOHNSON, E. I. du Pont de Nemours, Wilmington, Del.

CONCURRENT SESSION
9:00 SCIENTIFIC AND INTERNATIONAL TELEVISION

Cablefilm Equipment
C. B. B. WOOD, S. H. PADEL and P. RAINGER, BBC Research Dept. and Designs Dept., Broadcasting House, London

The Tunnel Diode
C. J. GALLAGHER, General Electric Research Laboratory, Schenectady

High-Resolution Television
L. POURCIAU, General Precision Laboratory Inc., Pleasantville, N.Y.

Wide-Band Television
ROBERT S. AHA, Tarc Electronics Inc., Westbury, L.I., N.Y.

Data-Link and Its Application to Television
DON ELLIS, General Electric Co., Syracuse, N.Y.

Flying-Spot Scanner Techniques as Applied to Video Tape
ROBERT S. MINER, Ampex Corp., Redwood City, Calif.

FRIDAY AFTERNOON
2:00 VIDEO-TAPE RECORDING

A Transport Mechanism Design for the Television-Tape Recorder
J. G. LEE, Broadcast and Television Equipment Div., Radio Corp. of America, Camden, N.J.

Double-System Recording and Editing With Video Tape
OSCAR F. WICK, National Broadcasting Co., Burbank, Calif.

It is customary, in the motion-picture industry, to record and edit sound and picture separately. The procedure affords vastly improved production flexibility over single-system methods. This added flexibility can also be used to considerable advantage with video tape. A system has been designed to provide separate magnetic sound and magnetic picture records.

Video-Tape Recording Interchangeability Requirements
K. B. BENSON and P. E. FISH, CBS Television Network, New York

The use of video tape in broadcasting service usually requires that recordings be played back with a different head assembly from that employed for the original recording. If such interchangeability of head assemblies is to provide optimum quality, it is essential that close control of many manufacturing parameters and operating standards be maintained. Mechanical dimensions of particular importance include those relating to the video-track azimuth, pitch, and width as well as the angular placement of the four rotating heads. Essential electrical parameters include the value of carrier frequency corresponding to reference video levels. In addition, response-frequency characteristics of audio, video, and carrier frequency channels must be standardized. These factors are discussed as related to current practices in CBS Television Network video-tape operations.

Interchangeability: Fact or Fiction
JOHN KING, Ampex Corp., Redwood City, Calif.

Analysis of Television Tape Dropout Factors
BERTEN A. HOLMBERG, Magnetic Testing, Minnesota Mining & Mfg. Co., St. Paul, Minn.

Recent improvement in video recording tape quality opens the way for better system performance. Studies on dropout amplitude and duration vs. certain machine characteristics demonstrate the need for coordinating these factors with tape evaluation. Tests with various head penetrations show inter-relationship of operating standards and dropout performance. Data on increased tape and head life with reduced penetration must be weighed against other performance criteria at the present state of the art. Simple instrumentation methods for insuring proper machine performance minimize dropout difficulties.

Analysis of Noise in Television Tape Recordings
JOHN VARNELL and HAROLD WALSH, Ampex Corp, Redwood City, Calif.

Video Tape Analyzer
A. A. GOLDBERG and MERLE R. HANNAH, CBS Laboratories, Stamford, Conn.