Abstracts

Abstracts from other Journals, chosen for importance and timeliness, are published in the *Journal* from time to time. The greater number of these abstracts are translations, chiefly from the U.S.S.R., and made available by the Research Laboratories of Eastman Kodak Company.

The subject areas are grouped below

High-Speed Photography and Instrumentation

History

Printing and Optics

Projection

Sensitometry and Image Structure

Sound Recording and Reproduction

Television

HIGH-SPEED PHOTOGRAPHY AND INSTRUMENTATION

The "Time Microscope" (in Russian), Alecandru, Marin, Engineer, *Stinta si Tehnica*, No. 9, 22–23, 1961. EA VI, 3/62.

The author briefly describes slow-motion photography and various cameras used for it. The conventional motion-picture cameras can be used only for a maximum speed of 200 to 300 frames/sec. For industrial or scientific purposes, however, considerably higher speeds may be obtained by special devices or cameras. A speed of up to 40,000 frames/sec can be achieved by a continuous motion of the film and by using optical compensation of the film motion. The 16mm Soviet SKS-1 cine camera is used for frequencies of 150 to 4,000 frames/sec, whereas the ZLI cine camera made in the GDR can be used for 18 by 22-mm frames at frequencies of 250 to 2,000 frames/sec. By reducing the size of the frames to 4 by 4.5 mm, the ZLI camera can make 40,000 frames/sec, using a 35mm film. Drum-type cine cameras, with or without optical compensation, can make 18 by 24-mm frames at 5,000 frames/sec. By reducing the height of the frames to 8 mm each, drum-type cameras with optical compensation achieved a speed of 100,000 frames/sec. Very high speed may be obtained by a system of "optical commutation," where the film stands while the successive images of the subject "sweep" the film surface. The Soviet SFP camera has a filming frequency of 2,500,000 frames/sec, each frame being 5 by 5 mm. The method of decomposing the images into small surfaces distributed on the photosensitive film according to a given "code" makes it possible to increase the filming speed to 100 million frames/sec. However, this high-speed photography requires very good lighting. Some other difficulties are due to the synchronization between the runoff of the photographed phenomena and the operation of the cine cameras. Synchronization may be achieved by electronic-optical, electromechanical, acoustical and electrothermal devices, controlled by the photographed action, which release the camera and the lighting system.

The Use of the SKS-7 Camera as a Streak Camera (in Russian), S. M. Provornov, O. S. Grebenikov and V. P. Grusev, *Zhur. Nauch. i Priklad. Fot. i Kinemat., 6:* No. 5, 386–388, Sept.–Oct. 1961.

Alterations have been made to a Soviet-made SKS-1 high-speed camera so as to adapt it for streak photography. The optical compensator was removed and the objective was replaced by a special optical system. In its modified form the camera has a time resolution of 3 by 10^5 mm/sec.—S.C.G.

International Congress on High-Speed Photography and Cinematography (General Review) (in Russian), A. A. Sakharov, *Zhur. Nauch. i Priklad. Fot., i Kinemat. 6:* 457–462, Nov.–Dec. 1961.

In September, 1962, the 6th International Congress on High-Speed Photography and Cinematography is to be held in Holland, practically ten years after the holding of the first congress. Those congresses which have been held to date are discussed from the point of view of the

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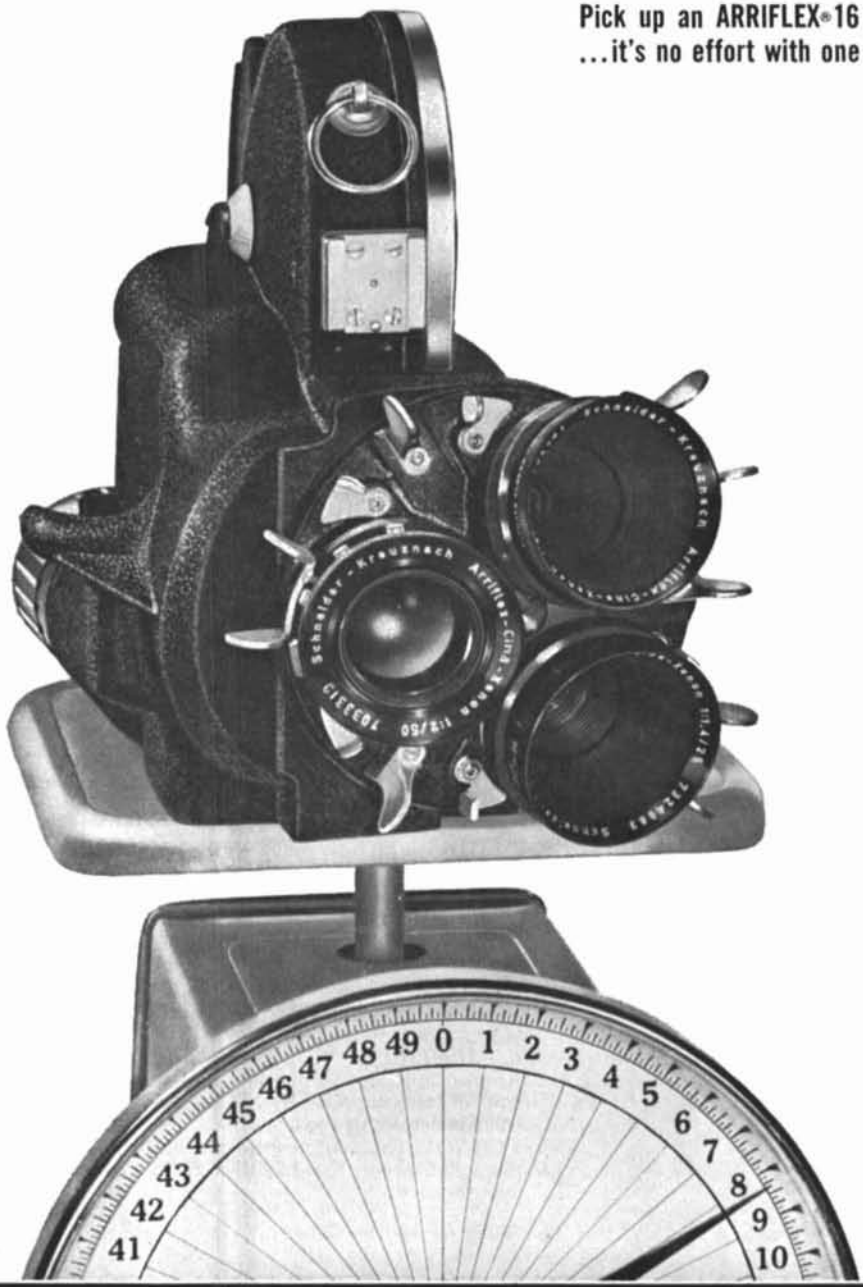

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mode of publication of the proceedings, the nationality of the participants, organizations (i.e., universities, research institutes, industrial laboratories, etc.,) presenting papers and the subject matter of the papers. The analysis is displayed in tabular form.—S.C.G.

High-Speed Camera, E. A. Tarantov and A. M Petrov, Avt. sv. SSSR, cl. 57a, 61, No. 135756, 15.02.60. 20 Zh 110 Patent *Referat. Zhur.*

Proposes a high-speed cine camera in which a rotating mirror is used with a double coating and at a small distance between the reflecting surface and the axis of rotation to increase the probability of recording a process taking place during somewhat less than one frame in mirror systems.

The Ballistic Camera Pinpoints a Missile in Space, Northrop Corporation product circular. Special purpose cameras: high-speed cameras; tracking system, NSS 26, printed Aug. 1961.

The Nortronic Ballistic Camera has an *f*/2 lens with a 600-mm focal length and a high-speed between-the-lens, louvre-type shutter with a 12-in. aperture; it can record the exact trajectory of missiles and aircraft by photographing attached strobe lights against a star background. The angular accuracy achieved is one part in 200,000, and with proper geometry the same linear accuracy is possible, e.g., a missile 1000 miles out in space can be located within 26 ft, and it can be used for calibrating electronic tracking instruments. pulsing will allow several cameras to be used for sequential exposure along a ballistic path. After alignment, the lens elements, the largest of which is nearly 15 in. in diameter, are fastened rigidly with a strain-free technique which, under normal conditions, maintains factory alignment indefinitely; the iris is remotely controlled by a servo loop with an integral motor driving the iris diaphragm. This ballistic camera is reported to be the largest camera in the world.—M.B.K.

HISTORY

The 89th Conference of the American Society of Motion-Picture and Television Engineers in Toronto (Canada) (in Russian), V. G. Komar and M. Z. Vysotskiĭ. *Tekh. Kino i Televideniya, 5:* 51–55, Sept. 1961.

The proceedings of the Society's Conference held in Toronto from May 7 to 12, 1961, are summarized.—S.C.G.

Aleksandr Fedorovich Shorin (in Russian), E. Goldovskii, *Kinomekhanik,* 34–37, Dec. 1961.

Shorin (1890–1941) was a Russian inventor who played a large part in the development of the sound cinema in the Soviet Union. His life is briefly outlined and his methods of photographic recording and reproduction of sound are described.

PRINTING AND OPTICS

Systems of Optical Compensation Using Rotating Prisms (in Russian), M. Vechera, *Tekh. Kino i Televideniya, 5:* 59–61, Nov. 1961.

In a rotating-prism system of optical compensation in a film camera with continuous film transport, the image deviates from its correct position in the frame because the relation between the angle of rotation of the prism and the position of the image is not linear. Two methods of overcoming this difficulty are described. In the first the prism is in two wedge-shaped parts, one of which is moved to and fro along the axis of the rotating member by a cam mechanism in such a way that the optical thickness of the total prism varies so as to compensate for the nonlinearity. The second makes use of a Cardan coupling between the electric motor drive and the compensating prism, the geometry being so arranged that retardations and accelerations are introduced into the rotation of the prism so as to correct for the incomplete compensation—S.C.G.

A Method and Device for Obtaining Anamorphotic Images without Anamorphotic Optics (in Russian), I. Cerny, *Tekh. Kino i Televideniya, 5:* 12–17, Oct. 1961.

A simple method is described for obtaining a compressed image of, for example, a chart for testing wide-screen projection. The original is first photographed at an angle which will give a

lateral compression but introduce perspective distortion. The photographic image so obtained is rephotographed at an angle but in such a way that the lateral compression is increased while the perspective distortion in the opposite sense cancels the first distortion. In the simplest form of the method the angle used is 45°, when the single lateral depression is $\sqrt{2}$ and the total compression is 2. This and more difficult cases involving other compression ratios are analyzed mathematically. A simple stand is described in which the angle of the original being copied and the camera distance can be quickly adjusted.—S.C.G.

Apochromatic Taking Objectives for the Trick Cine Camera TKS-3, M. M. Rusinov and M. I. Kuz'mina, Avt. sv. SSSR, cl. 42h, 4/20, No. 134468, 25.12.60.

Discusses patented objectives (50mm and 35mm *f*/2.3) used in the TKS-3 camera for making double exposure 35mm cine pictures in the visible and infrared by the method of wandering masks with a beam splitter. The objectives provide accurate register of the images in the visible and infrared parts of the spectrum and the correction of secondary chromatism. The components of the objective are of special flint, for example OF-3; and between a negative meniscus and an inner positive component is located a plano-parallel corrector with chromatic radii, consisting of three components of special flint OF-3 or dense crown, for example TK-9.

PROJECTION

Reduction of the Distortions of Motion-Picture Images with Separate Projection of Parts of the Frame onto a Concave Screen (in Russian), E. M. Goldovskiĭ, *Tekh. Kino i Televideniya, 5:* 22–28, Sept. 1961.

The mode of formation of distortions in motion-picture projection onto curved screens is discussed and a number of methods of reducing them are considered. Particular attention is paid to systems in which the middle and sides of the scene are recorded on separate areas of the film and are projected separately.—S.C.G.

Selenium Rectifiers for Motion-Picture Arc Power Supplies (in Russian), A. Sukhov, *Kinomekhanik,* 16–19, Dec. 1961.

Silicon Rectifiers for Motion-Picture Arc Power Supplies (in Russian), Harrow Abstracts, 1962. V. Il'in, I. Oskolkov and L. Sazhin, *Kinomekhanik,* 20–24, Dec. 1961.

A Photoelectric Brightness Meter (in Russian), S. A. Drukker, *Svetotekhnika, 1:* No. 7, 10, 1961.

The general principles of construction of objective brightness meters, optical systems of brightness meters, radiation receivers and photocurrent amplifiers are discussed. The main points of the YaKP-1 brightness meter made by NIKFI, designed for the measurement of the brightness of motion-picture screens, are discussed.—S.C.G.

Eliminating Rewinding (in Russian), A. Bodrov, V. Petrov and L. Fonar', *Kinomekhanik,* 35–38, Oct. 1961.

In the system of motion-picture projection described, rewinding of the film after showing is avoided by means of a new type of film spool. The film is not wound onto a central core but onto a removable spring hoop on a flat disk plate. When the spool is used in the feed position it is placed on a horizontal turntable on top of the projector, the central hoop is removed and the film is withdrawn from the center of the spool. It is taken up on a spool of the same type and is ready for immediate re-use without rewinding.—S.C.G.

The Uniformity of Illumination of Screens and the Useful Light Flux of a Motion-Picture Projector. (Notes on the Gost Draft Standard on Motion-Picture Projectors for 35 and 70mm Films) (in Russian), E. M. Goldovskiĭ, *Tekh. Kino i Televideniya, 5:* 70–72, Oct. 1961.

Variations in screen illumination due to horizontal and vertical angles of projection and to screen curvature are analyzed. In the draft standard it is stated that the useful light flux is taken as the product of the average illumination of the screen and its area. This is true only for a flat screen. The case of the curved screen is treated mathematically.—S.C.G.

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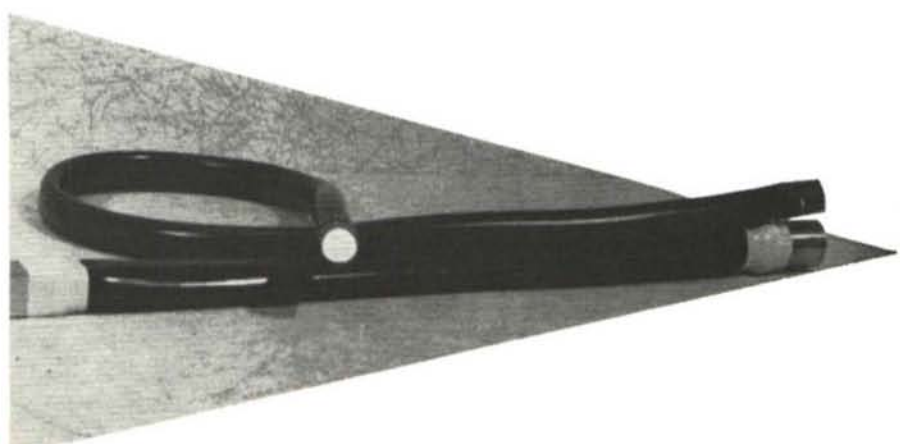

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The Fusion of Flicker in Motion-Picture Projection (in Russian), E. Goldovskiĭ, *Kinomekhanik*, 21–29, Sept. 1961.

The conditions under which flicker due to periodically interrupted illumination of a surface becomes noticeable to the viewer are discussed. The influence of the interruption on the apparent brightness, the critical frequency for the disappearance of flicker, the influence of shutter design on critical frequency, the critical frequency, in different types of projection and methods of increasing shutter frequency are dealt with.—S.C.G.

The Problem of the Tolerances in Vertical Parallax in the Viewing of Stereo Motion-Picture Films (in Russian), A. N. Shatskaya, *Tekh. Kino i Televideniya 5:* 57-65, Oct. 1961.

An analysis is made of the factors causing vertical parallax in cinematography and projection, the limits of their influence are determined, methods and results of an experimental determination of the tolerances in the value of the vertical parallaxes and their differences in observation of the stereo image on the screen are described and ways of preventing the development of intolerable values of parallax are mentioned —S.C.G.

The Czechoslovak AM-8 Amateur 8mm Motion-Picture Projector with Automatic Loading, J. Stanek, *Tekh. Kino i Televidemya, 5:* 85–87, Oct. 1961.

The AM-8 camera made by the Meopta Factory is described. A special feature is the automatic loading, and a synchronizer for a tape-recorder is provided as accessory. A magnetic-tape instrument, made especially for use with the projector, is available. In use it fits under the projector. —S.C.G.

New 8mm Motion-Picture Projectors (in Russian), V. G. Pell', *Tekh. Kino i Televideniya, 5:* 81–85, Oct. 1961.

A review of recent 8mm motion-picture projectors is based on publications concerning the Photokino Exhibition of 1960.—S.C.G.

Automaton Device for Motion-Picture Projection (in Russian), *Kinomekhanik*, No. 8, 30–34, 1961.

A device is used for either conventional or wide-screen systems, but the film magazines and projection lamps are inserted manually.

SENSITOMETRY AND IMAGE STRUCTURE

Dependence of the Quality of a Motion-Picture Image on the Process by which It Has Been Obtained (in Russian), I. B. Blyumberg, T. M. Zyazina and G. I. Teregulov, *Tech. Kino i Televideniya, 5:* 19–24, Nov. 1961.

In earlier papers changes in picture quality were studied by means of a series of optical or contact prints. The techniques have now been applied to evaluate the changes in picture quality (graininess and sharpness) as a picture goes through the several stages by which a release print is obtained. A number of different routes are possible in practice, and several of these are analyzed, the values of the picture quality parameters being tabulated for each stage.—S.C.G.

Electron Optical Transducers and Image Intensifiers in Cinematography (in Russian), N. I. Tel'nov, *Tekh. Kino i Televideniya, 5:* 74–82, Sept. 1961.

Foreign (i.e., non-Soviet) literature on electronic image intensifiers is reviewed. (33 references).—S.C.G.

SOUND RECORDING AND REPRODUCTION

An Adhesive Tape for Editing Magnetic Sound Tracks and Wide-Screen Film Prints (in Russian), A. P. Pletnev and S. Kh. Nazarov, *Tech. Kino i Televideniya, 5:* 65–68, Nov. 1961.

A new adhesive tape for quickly splicing together magnetic soundtracks or wide-screen film prints in editing has been made by the chemical factory at Shostka, U.S.S.R. The results of laboratory tests on the physical properties of the film are set out.—S.C.G.

The "Sinkrofon" Apparatus for Synchronized Projection of 8mm Sound Motion-Picture Films (in Russian), L. B. Neronskiĭ, *Tekh. Kino i Televideniya, 5:* 64–73, Sept. 1961.

A description of the circuit and details

of construction of an apparatus for synchronizing a soundtrack on magnetic tape with an 8-mm projector. Control is afforded by signals on a second track of the tape.—S.C.G.

Improvement of the Method of Separate Processing of Soundtracks on Color Motion-Picture Films (in Russian), S. E. Tikhonovich and L. S. Sevast'yanova, *Tekh. Kino i Televideniya, 5:* 18–21, Oct. 1961.

Improved formulas have been worked out for viscous developers for the separate development of soundtracks on color motion-picture film. With smaller concentrations of Metol and hydroquinone than in an earlier formula, they have better keeping properties. In one of them ethylenediamine is used to replace the alcohol in the original formula.—S.C.G.

Magnetic Tape Type 6-35 (in Russian), S. Kh. Nazarov, N. G. Korzhukov, A. P. Pletnev and O. N. Yakovlev, *Tekh. Kino i Televideniya, 5:* 7–11, Oct. 1961.

Type 6-35 is a new Soviet 35mm magnetic tape made to replace earlier types which had poor demagnetization properties, thus limiting their repeated use. The new tape has better recording properties and its magnetic properties are less sensitive to temperature changes.—S.C.G.

The Directional Characteristics of Sound Sources in Sound Reproduction (in Russian), B. F. Natarov. *Tekh. Kino i Televideniya, 5:* 32–34, Dec. 1961.

Negative Feedback in Amplifiers for the Sound Cinema (in Russian), A. Sukhev, *Kinomekhanik*, 38–42, Sept. 1961.

Apparatus and Methods of Synchronization of an Unperforated Sound Carrier. Analysis of Existing Methods of Synchronization of an Unperforated Sound Carrier (in Russian), Yu. G. Chizhevskiĭ, *Tekh. Kino i Televideniya, 5:* 5–13, Nov. 1961.

To increase the reliability of the control channel and also to improve the quality of the main recording, it is advantageous to use the counterphase method of recording the control signal. In working with unsynchronized cameras, the emitter of the control signal should preferably be placed on the sound recorder and synchronization should be made on the camera. This gives the possibility of raising the quality of recording the control signal and of working with a number of cameras. From the point of view of economy, convenience and reliability, the system of synchronized copying of magnetic soundtracks from 6.25mm tape onto perforated film is preferably carried out on the principle of the closed tracking system, using tracking either by phase or by frequency—S.C.G.

Apparatus and Methods of Synchronization of an Unperforated Sound Carrier (in Russian), Yu. G. Chizhevskiĭ, *Tekh. Kino i Televideniya, 5:* 22–29, Oct. 1961.

Devices used in cinematography and television for the synchronization of an unperforated sound carrier are considered; methods of recording the control signal and synchronized copying with a 6.25mm carrier on unperforated tape are analyzed; and recommendations are given for the construction of synchronization systems.—S.C.G.

The Dynamic Range of Photographic Soundtracks (in Russian), A. A. Yur'ev, *Tekh. Kino i Televideniya, 5:* 28–30, Sept. 1961.

An earlier formula for the calculation of the dynamic range of a photographic soundtrack is criticized, and a more accurate expression for the "possible" dynamic range is derived; this is compared with the "real" dynamic range. The effect of noiseless recording on the real dynamic range of a soundtrack is considered. It is concluded that for a new variable-area soundtrack the real dynamic range lies in the range of 30 to 35 db and depends only a little on the degree of noise reduction, which with the aid of the usual noiseless recording systems can easily reach 45 to 50 db. However, from this it does not follow that the noise elimination on the soundtrack need only be slight. During use the track will pick up a considerable amount of noise which begins to have an effect if the degree of sound elimination is insufficient. With a poor noiseless-recording level, the noise of a used film can increase to such a degree that it will decrease the real dynamic range of a track which even without it would be insufficient. Hence the noise elimination in making the soundtrack should be as great as possible, leading to a degree of noise reduction of 55 to 65 db.—S.C.G.

TELEVISION

Design of a Group of Plug-In Television Studio Amplifiers, K. J. Austin, *BBC Engineering Div. Monograph*, No. 41, Apr. 1962.

The monograph considers the basic operational requirements of some of the amplifiers which are used in large numbers in the television broadcasting studios and transmission network. The mechanical form of the amplifiers, which use a plug-in arrangement, is described in detail. The electrical design of the most commonly used amplifier, the video distribution amplifier, is fully described, and details of its performance, together with that of two other amplifiers are given.

A Test of Video Tape to Film in Educational TV

By REID H. RAY, JOSEPH T. McDERMOTT and WAYNE A. MAYER

Educational TV stations have a problem of economically producing program material available within their area. This paper briefly outlines the methods used to produce, with portable-type equipment, three half-hour programs and the transfer of the edited video-tape material to 16mm projection prints.

EDUCATIONAL television stations operate on extremely small budgets in comparison to their commercial brothers; therefore, cost is an important factor in producing programs. These programs are made available to the other educational stations throughout the United States. As one of the 57 educational television stations, KTCA-TV, Twin City Area Educational Television Corp., St. Paul, Minn., desired to produce several programs featuring the world-renowned St. Olaf College Choir.

Dr. Olaf C. Christiansen, the choir's Director, was eager to cooperate but was concerned as to the recording location, since acoustical excellence was an important factor. The Chapel on the campus of St. Olaf College, 40 miles from the studios of KTCA-TV, seemed an ideal choice. Other recordings and live broadcasts had already originated from this Chapel.

As is the case with many educational stations, no motion-picture cameras are owned by KTCA-TV; however, a truck equipped for remote pickups, complete with camera chains, audio equipment and accessories, is a part of the station's equipment. At the time, early 1961, KTCA-TV did not yet own a portable video-tape recorder; therefore an arrangement was worked out with WTCN-TV, one of the commercial stations in the Minneapolis-St. Paul area, for the loan of a mobile Ampex Videotape Recorder and truck.

Two trucks with the portable video-tape recorder, television cameras and lighting equipment were driven to the location early in the morning. The temperature was about 10° F, so there was some concern over dimensional changes in the video tape. However, by

Presented on October 6, 1961, at the Society's Convention at Lake Placid, N.Y., by Reid H. Ray (who presented the paper), Reid H. Ray Film Industries, 2269 Ford Pkwy, St. Paul 16, Minn., and Joseph T. McDermott and Wayne A. Mayer, KTCA-TV, St. Paul, Minn.
(This paper was received on July 11, 1962.)