Equipments exhibited by Marconi's Wireless Telegraph Co. at the Second Industrial and Television Exhibition, held in London in November, included the Marconi-Siebe, Gorman underwater television camera. There was also a selection of closed-circuit television units and accessories. The underwater camera is designed to be handheld and can be buoyancy-adjusted for virtual weightlessness under water. Overall dimensions are 3 ft by 2 ft, 3 in. The closed-circuit equipment exhibited included a camera Type 4339A, lens turret, weatherproof housing and an industrial synchronizing generator.

Biographical Note

Fred E. Altman

Retirement of Fred E. Altman, Assistant Director of Optical Design for the Apparatus and Optical Division of Eastman Kodak Co., has been announced.

Widely known as an authority on optical design, he is a Fellow of the Society and his interests during his 45-year career with Kodak have been reflected in papers published in the *Journal*. He presently holds more than 40 U.S. Patents in the field of optical design. As early as 1934 he was engaged in the development of a lens for the "the so-called wide film...70mm" ("A Revolving Lens for Panoramic Pictures," by F. Altman, *Jour. SMPE, 24:* 383–394, May 1935).

With the Kodak Lens Design Department during World War I, Mr. Altman was engaged in designing optics for gunsights and for the new field of aerial photography. During World War II, with the same department, he again worked on military optics, participating in the development of a telescopic tank sight in the short space of three weeks. Among Mr. Atlman's inventions and the developments on which he worked is the $f/1.9$ Cine lens which has been continuously manufactured for 35 years.

Other interests of Mr. Altman's described in *Journal* papers include "An Optical System for the Reproduction of Sound From 35mm Film (co-author, J. H. McLeod), *Jour., 31:* 36–45, July, 1938, and "35mm to 16mm Sound Reductions printer," (co-authors, C. W. Clutz and J. G. Streiffert) *Jour., 52:* 669–675, June 1949.

Mr. Altman's retirement plans include further studies in optics, and a number of recreational activities including golf, woodworking, mountain hiking and photography.

Abstracts

Abstracts from other Journals, chosen for importance and timeliness, are published in the *Journal* from time to time. The greater numbers of these abstracts are translations, chiefly from the U.S.S.R., and made available by the *Kodak Monthly Abstract Bulletin*

The subject areas are grouped below

HIGH-SPEED PHOTOGRAPHY AND INSTRUMENTATION

Light Sources and Shutters for High-Speed Photography and Cinematography. (in Russian), V. G. Pell', *Tekh. Kino i Televideniya, 4:* 79–86, June 1960.

Western developments in spark, flash and discharge lamps and in Kerr-cell, Faraday and other high-speed shutters are reviewed.—S.C.G.

New Flash Lamps (in Russian), I. S. Marshak, V. I. Vasil'ev, A. I. Mironova, V. P. Ivanov and R. G. Vdovchenko, *Uspekhi Nauch. Fotografii, 6:* 43–52, 1959.

The characteristics of a number of flash-discharge tubes now being produced in the Soviet Union are described, and an attempt is made to classify them.—S.C.G.

Physical Mechanism of the Discharge in Tubular Electronic Flashlamps and Their Loading Limits (in Russian), I. S. Marshak, *Uspekhi Nauch. Fotografii, 6:* 16–26, 1959.

An analysis is made of the conditions during the quasistationary state of the discharge in an electronic flashtube when a large current is flowing. The theory of the striking of the discharge by the application of the small, high-frequency pulse is discussed. Formulas are worked out for the limiting loads set by the incipient destruction of the glass or quartz envelope.—S.C.G.

Study of the Brightness of a Flash-Discharge Channel (in Russian), K. S. Vul'fson and F. A. Charnaya, *Uspekhi Nauch. Fotografii, 6:* 27–30, 1959.

The variation of the maximum brightness of the discharge in an electronic flashlamp filled with different gases, as the pressure and electrical parameters are varied, is studied experimentally.—S.C.G.

Spectral Characteristics of Electronic Flashtubes (in Russian), B. M. Vodovatov and M. I. Epshtein, *Uspekhi Nauch. Fotografii, 6:* 35–42, 1959.

The method of testing of a number of Soviet-produced electronic flashlamps is described. The relative spectral-energy densities of the lamps are tabulated, and, for one of the lamps, a table gives the variation of the relative spectral-energy

density with different power supplies.—S.C.G.

Image Movement in Time Magnification With Image Compensation (in Russian), A. S. Dubovik, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii, 5:* 209–217, No. 3, May–June 1960.

A mathematical analysis of image movement in time magnification with image compensation leads to the following conclusions: (1) The center of reflection of the scanning lens in systems with image compensation changes its position relative to the intermediate image in the time of exposure of one frame, leading to movement of the image. In choosing the general center of reflection (scanning), it is necessary to take into account the magnitude of image motion for different parts of the working angle of the camera. (2) Image shift in depth has no influence on the photographic quality of the picture. (3) The movement of the image on exposure of a frame is proportional to the speed of the camera lens and, to a large degree, is determined by the distance of the reflecting plane of the mirror from its axis of rotation. (4) Movement of the image for a given lens speed is proportional to the size of the intermediate image (size of the mirror). The present investigation makes it possible to take image movement into account in correctly choosing an optical system for constructing a high-speed camera with image compensation.—S.C.G. (Adapted from Author's Abstract.)

Camera RKS-1 for High-Speed Cinematography, S. M. Provornov and O. F. Grebennikov, *Instruments and Experimental Techniques* (transl. ed. of *Pribory i Tekh. Eksper.*), 961–964, No. 6, Nov.–Dec. 1959.

A high-speed, raster rotating-mirror Soviet camera, RKS-1, designed for research cinematography at a frequency of more than 10^8 frames/sec is described. Some of the motion-picture frames are reproduced. (Authors' Abstract.)

A Light Source for a High-Speed Motion-Picture Camera (in Russian), N. N. Ogurtsova and I. V. Podmoshenskiĭ, *Uspekhi Nauch. Fotografii, 6:* 58–61, 1959.

The light source described is a spark gap in which the spark is rendered more uniform by confining it in a channel of 2-mm diameter cut in a plate of Textolite (a resin-impregnated, laminated cloth). The power source is a bank of four capacitors and inductances. Current, voltage, light output, and spectral characteristics of the source have been recorded.—S.C.G.

Image-Converter Tubes for the Study of Ultrarapid Processes (in Russian), M. M. Butslov, *Uspekhi Nauch. Fotografii, 6:* 76–83, 1959.

Two Soviet-made impulse image-converters are described that are suitable for obtaining a series of frames of an ultrarapid event. They are the PIM-3 and the smaller PIM-4.—S.C.G.

High-Voltage Ceramic Condensers for Electronic Flash (in Russian), K. E. Medvedev, *Uspekhi Nauch. Fotografii, 6:* 75, 1959.

A Power-Supply Circuit for Electronic Flashlamps Under Conditions of Rapidly Repeated Flashing (in Russian), V. P. Ivanov, A. L. Vasserman, A. A. Bukareva and V. P. Zhil'tsov, *Uspekhi Nauch. Fotografii, 6:* 62–63, 1959.

Only a summary of the original paper is given. The general problem of the design of power-supply circuits for rapidly repeating flashlamps was discussed and individual circuits were described.—S.C.G.

On the Use of Accumulators as a Power Supply for Flashlamps (in Russian), M. G. Feĭgenbaum, *Uspekhi Nauch. Fotografii, 6:* 64–67, 1959.

Two types of acid accumulator and one type of alkaline silver-zinc accumulator, both Soviet-made, were studied for use in the power pack of an electronic flashlamp, instead of the usual battery of condensers. The data obtained are tabulated.—S.C.G.

Electrolytic Condensers for Electronic Flash Equipment (in Russian), G. M. Gracheva, L. N. Zakgeĭm and V. F Safonov, *Uspekhi Nauch. Fotografii, 6:* 72–74, 1959.

Methods of Practical Preparation of Optical Grids for High-Speed Photog-

raphy, (in Russian), L. V. Akimakina, *Uspekhi Nauch. Fotografii, 6:* 152–154, 1959.

Optical grids decomposing an image into elements are required for a number of purposes, including high-speed cinematography and stereophotography. They may be made by mechanical methods involving casting or stamping from a metal matrix, or by photomechanical methods. A number of methods are briefly outlined. The paper is only a summary of the original lecture.—S.C.G.

A Raster Method of High-Speed Cinematography (in Russian), O. F. Grebennikov, *Uspekhi Nauch. Fotografii, 6:* 144–151, 1959.

The principles of image dissection in high-speed photography by means of a line or a point grid are outlined. The advantages of a point grid are discussed. Since 1954 a study has been made of the possibilities of using a point grid, consisting of a glass plate with an array of embossed spherical lenses, together with a system of rotating mirrors and a moving film. The necessary characteristics of such a camera required to give the maximum information content are analyzed in relation to the resolving power of the optical system and the photographic material.—S.C.G.

An Image-Converter Method of Photographing Ultrarapid Processes (in Russian), M. M. Butslov, E. K. Zavoĭskiĭ, A. G. Plakhov, G. E. Smolkin and S. D. Fanchenko, *Uspekhi Nauch. Fotografii, 6:* 84–89, 1959.

An image-converter tube is adapted for producing streak records of a small light source by introducing deflecting plates, as in the ordinary television tube. The applied deflecting voltages spread out the image into a circular arc. Time resolutions of the order of 10^{-12} sec can be obtained. Some experimental applications of such a tube are mentioned.—S.C.G.

PRINTING AND OPTICS

Study of the Change of Quality of a Photographic Image During Printing (in Russian), I. B. Blyumberg, T. M. Zyazina and G. I. Teregulov, *Tekh. Kino i Televideniya, 4:* 10–18, July 1960.

To study the photographic image during printing, a positive was obtained from an original negative with the insertion of two intermediate positives and two internegatives into the printing series. The quality of the image obtained at each stage was examined. With good contact during printing, the quality was independent of the use of diffuse or direct lighting. Poor contact was much more important when diffuse lighting was used than when the lighting was direct. During the printing series, picture sharpness did not fall as much as resolution. The graininess of a positive image obtained by printing was higher than the graininess of the negative if $\gamma_{pos} \gg 1.0$; and it was less if $\gamma_{pos} \ll 1.0$. There is a connection between the change in graininess on printing and changes in resolution and sharpness. The greater the fall in resolution and sharpness, the smaller will be the growth in graininess, and vice versa.—S.C.G.

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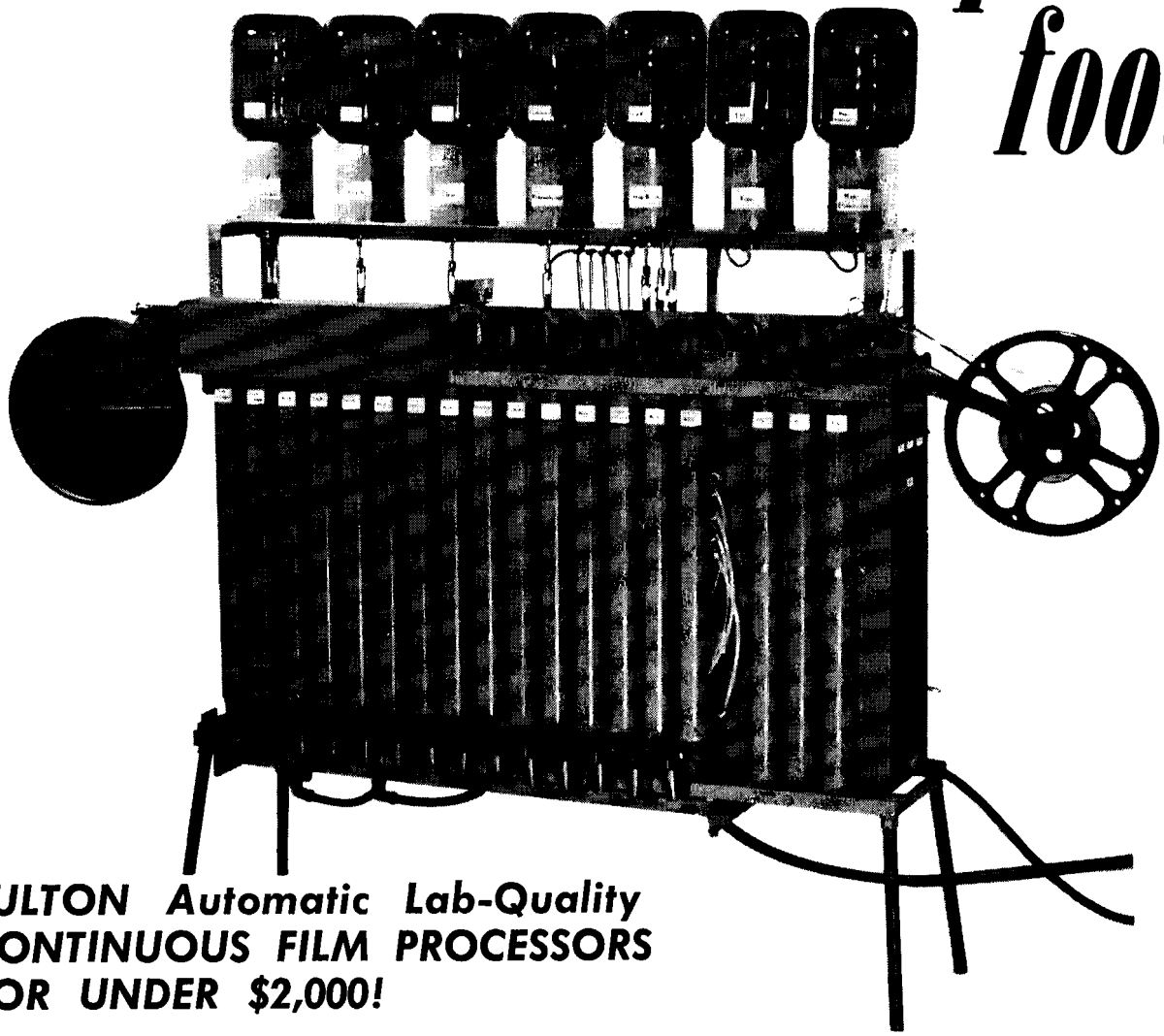

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Properties of a Single-Element Light Amplifier Using Sintered Cadmium Selenide Photoconductive Material

The use of photoconductive sintered cadmium selenide as the control element in a light amplifier offers the possibility of improved gain and speed of response. Such a single-element light amplifier has been made and tested. The results show that moderate gains with high output luminance are possible with speeds in a range suitable for moving pictures. Very high gains are possible if slow response can be tolerated.

Measurements were made over a range of operating frequencies and for various input levels. Data on rise time, decay time, and gain for tungsten-light input are given in curve form. From these curves the operating range and input-output light levels for useful picture reproduction can be determined.—F. H. Nicoll, *RCA Review*, *20:* 658–669, Dec. 1959.

Solid-State Image Intensifier Under Dynamic Operation

This paper describes the performance of photoconductor-electroluminescent-phosphor image intensifiers under dynamic conditions of operation. Both experimental data and theory are presented. The theory is based on some simplifying assumptions which allow easy analysis and permit an insight into the importance of the various parameters. The experimental data, however, confirm the applicability of the analysis. Some suggestions concerning the possible improvement of intensifier performance are made.—C. P. Hadley and R. W. Christensen, *RCA Review*, *20:* 670–681, Dec. 1959.

Solid-State Optoelectronics

A discussion of the harnessing of photoelectric and luminescent phenomena is preceded by a brief classification and explanation. This is followed by a description of optoelectronic modulators and amplifiers, i.e., devices which have mixed optical and electrical signal and power access. The technology of assembling image-transmitting, image-storing, and picture-reproducing panels from optoelectronic elements is reviewed.

The functioning of various optoelectronic logic nets and computer components is treated in detail. Finally, a synthesis of panel technology and logic circuitry into novel picture-processing panels and computer systems is proposed. The similarity between the organizational structure of such parallel processing systems and that of the neutron network of vertebrate retinas is pointed out.—E. E. Loebner, *RCA Review*, *20:* 715–743, Dec. 1959.

Optical Feedback Type Storage Light Intensifiers

Three designs of storage light intensifiers were evaluated by building samples. One design uses a Fotoform glass structure to support the photoconductor and electroluminor and to provide optical isolation of cells. Another uses a transparent (glass or plastic) multiple pedestal structure to provide light paths through the photoconductor and support the active materials. The photoconductor itself provides the optical isolation. The third design uses a flat glass plate as a support, the active materials and optical isolation being built up in layer fashion. Devices of the last type worked best. Typical operation provided optical trigger of 0.1 foot-candle second, half-hour storage and 0.1 second erasure in a 12 inch square panel with 250,000 storage cells. With suitable operating conditions, half-tone pictures could be displayed for one minute or longer.—H. O. Hook, *RCA Review*, *20:* 744–752, Dec. 1959

PROJECTION

The Conditions for Perception of Films in Theaters in Relation to the Future Development of New Types of Cinematography. (in Russian), V. G. Komar, *Tekh. Kino i Televideniva*, *4:* 28–37, June 1960.

Study of a 35mm Motion-Picture Projector with Optical Equalization of the Discontinuous Motion of the Film (in Russian), L. G. Tarasenko, *Tekh. Kino i Televideniya*, *4:* 40–47, July 1960.

Results are given of a study of one of the mechanisms of optical equalization of the discontinuous motion of the film in relation to picture quality (stability, sharpness, brightness and flicker). It is shown that this method of motion-picture projection has a number of important advantages over the existing form.—S.C.G. (Translation of Author's Abstract.)

A Universal Motion-Picture Projector (in Russian), *Tekh. Kino i Televideniya, 4:* 47–48, July 1960.

A brief description is given of the Type TKPU-1 projector, made in the Kinap factory of Odessa. It is intended for the screening of 35mm film with photographic soundtrack; 35mm film with anamorphic image, photographic soundtrack and four magnetic soundtracks; and 70mm film with six magnetic soundtracks.—S.C.G.

The Problem of Stereoscopic Motion-Picture Projection in Polarized Light (in Russian).

A method of stereoscopic motion-picture projection using polarized light and the technical means of carrying it out are described. The following problems are considered: polarizing light-filters; the screen for polarized projection; the stereo projector; polarizing spectacles; and future developments.—S.C.G.

[Translated from *Tekh. Kino i Televideniya*] A. I. Levington and V. S. Shchekochikhin. *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, pp. 108-21, No. 31, 1959.

Yellow-Flame, High-Intensity Carbons With a Current Intensity of 225 A

Results are given of an experimental investigation of the construction of a powerful lamp with yellow-flame carbons for the shooting of color films on stock balanced for a color temperature of 3300 °K.

The article considers the following problems: the requirements for new carbons; the chemical composition and geometrical variables of the carbon; characteristics of high-intensity yellow-flame carbons; and the spectral characteristics of high-intensity yellow-flame carbons. (S. C. G.)—[Translated from *Tekh. Kino i Televideniya*] T. V. Derbisher, L. F. Kabanova, and N. K. Zanina. *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, pp. 26–35, No. 30, 1959.

SENSITOMETRY AND IMAGE STRUCTURE

Some Points in the Production of Sharp Screen Images on Filming Fast-Moving Subjects (in Russian), M. P. Dolukhanov, *Tekh. Kino i Televideniya, 4:* 77–78, June 1960.

The exposure time for one frame of motion-picture film required to give a sharp image of a moving object is calculated. The actual exposure time obtainable with an 8mm camera is longer than this, but the resulting lack of sharpness is not noticeable. An explanation of this phenomenon is given in terms of information theory. Although a single frame may appear unsharp, the succession of slightly different images reduces the ambiguity and an impression of sharpness is obtained. —S.C.G.

SOUND RECORDING AND REPRODUCTION

The Problem of the Quality of Stereophonic Sound in Motion-Picture Theaters (in Russian), B. F. Natarov, *Tekh. Kino i Televideniya, 4:* 45–48, June 1960.

Feedback as a Method of Correction of the Frequency Characteristics of Electromechanical Light Modulators (in Russian), Yu. G. Zarenin, *Tekh. Kino i Televideniya, 4:* 38–44, June 1960.

A Reading System "with Back Scanning" (in Russian), L. Belyaeva, *Kinomekhanik*, 42–44, Jan. 1960.

In the usual form of reading of a soundtrack in a motion-picture projector, called in the article "with forward scanning," the image of a mechanical slit is formed on the soundtrack and the light passing through is received on a photocell. In the system described, "with back scanning," an image of the soundtrack is formed on the mechanical slit and the light passing through is received on the photocell. It is claimed that, with this system, more even illumination can be obtained and adjustment is easier. It has been incorporated in the KSS-35 projector.—S.C.G.

The Number of Stereophonic Sound-Reproducing Channels in Wide-Format Cinematography (in Russian), B. F. Natarov, *Tekh. Kino i Televideniya, 4:* 49–51, July 1960.

The author describes his experiences with a five-channel stereophonic system with one soundtrack for sound effects.—S.C.G.

TELEVISION

New Measurements on the Transfer Properties of Objectives from the Standpoint of Television Techniques (in German), D. Frenzel, *Hausmitteilungen, Jos. Schneider and Co. Optische Werke, 12:* 64–72, 90–96 and 111–112, Nos. 5/6, 7/8 and 9/10, 1960.

A method of measuring the line spread of lenses is sketched in which the test

object is rotated, and a cathode-ray oscilloscope displays the attenuation curve as a function of frequency. Graphs for several lenses are shown in which the attenuation in decibels for a line interval of 0.7 mm is plotted against field angle.—F.H.P. (Reprinted from *Rundfunktech. Mitteilungen, 3:* 235–241, 1959.)

A High-grade Industrial Television Channel with Reference to Infra-red Operation

The range and scope of the uses of television for industrial purposes are indicated to give some of the design requirements and to show broadly how they have been met with reference to a particular television channel employing a vidicon camera tube. In addition, two special applications are described, namely the use of this channel with infra-red and ultra-violet light.—J. H. Taylor, *Jour. Brit I.R.E., 20:* 77–85, Jan. 1960.

The Equipment of the BBC Television Film Studios at Ealing

BBC film production facilities for the Television Service are based at the Television Film Studios, Ealing Green, London, W.5.

This monograph describes the operations which are involved and the facilities provided. Descriptions of the technical equipment and areas are included, together with some discussion on the differences between cinema film production methods and television film operations.—N. F. Chapman, BBC Engineering Div. Monograph No. 27, Jan. 1960: BBC Publications, 35 Marylebone High St., London, W.1.

Reduction of Television Bandwidth by Frequency-Interlace

A method analogous to the N.T.S.C. colour television system is used to obtain a bandwidth reduction of a black-and-white video signal by a factor of approximately 2:1. The normal signal is split into two frequency bands, nominally zero to 1.5 mc/s and 1.5 to 3.0 mc/s. The latter is used to amplitude-modulate a sub-carrier, whose frequency is an odd multiple of half the line scanning rate. The lower sideband of the modulator output is selected and combined with the original zero-to-1.5 mc/s band, so that the spectra of the two signals interleave. The combined signal may now be sent over a channel of 1.5 mc/s nominal bandwidth. At the receiving end of the channel the composite signal is applied to a synchronous demodulator, fed also with sub-carrier of the same frequency as at the transmitter. The lower sideband of this demodulator is taken and combined with the received signal, to yield a "normal" video signal extending from zero to approximately 3 mc/s, together with an "interleaved" signal. The interleaved signal is such as to give an interference pattern on the display which in a stationary picture should optically cancel after four successive frame scans. However, the pattern is built up in such a way as to give rise to a "crawling" motion which is very noticeable at close viewing distances. Photographs of typical pictures obtained with and experimental apparatus are given, showing various interference effects produced.—E. A. Howson and D. A. Bell, *Jour. Brit. I.R.E. 20:* 127–136, Feb. 1960.

Microwave Television Mobile Relay for Outside Broadcasting

A brief account is given of the principal qualities required in mobile links. These include transmission of picture and sound without degradation of the quality and stability in time of the technical performances, and ease of operation as regards transport, installation, monitoring and maintenance. The essential causes of distortion introduced in the transmission by a microwave link are reviewed and the problem of crosstalk between the picture and the sound channels and the transmission of a colour television programme are dealt with in some detail. A short description is given of an equipment operating in the band 6400–6900 mc/s.—J. Polonsky, *Jour. Brit. I.R.E. 20:* 91–102, Feb. 1960.

The Combined Television-Radio Receiver and its Problems

The large number of frequency allocations in and around Band II compared with Bands I and III causes a serious selectivity problem in domestic combined receivers for television and f.m. sound broadcasts. The sound bandwidth of a television receiver is usually of the order of 500–1000 kc/s and since the frequency allocations of commercial radio transmitters are liable to be

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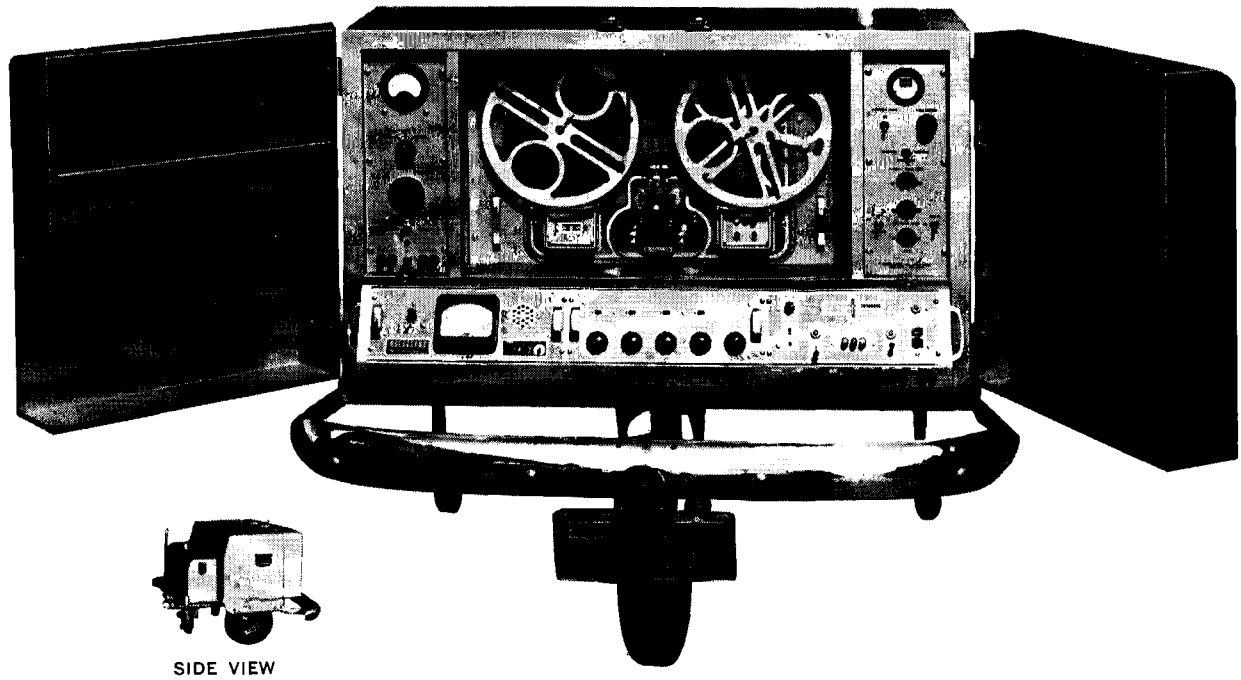

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within 500 kc/s of the BBC transmitters, interference can occur. Interference can also occur between the various BBC regional transmitters whose frequency separation is usually 400 kc/s, but may be as little as 200 kc/s. The problem and a number of different solutions are discussed in detail. The circuit details of a commercially available combined receiver are then described. The sound i.f. circuits incorporate a double superheterodyne system, and the frequency of its r.f. oscillator is stabilized in Band II by means of an inexpensive a.f.c. system. Methods are described for measuring accurately the selectivity of a Band II receiver.—R. S. Hildersley, *Jour. Brit. I.R.E., 20:* 155–166, Feb. 1960.

Automation of Television Programme Switching

The paper outlines a complete system under which nearly all the operations in programme switching are controlled by a punched paper tape derived directly from the preparation of the programme schedule. Simplified manual control facilities are provided for non-schedule operation. The term "Programmation has been coined to describe this field.—G. E. Partington, *Jour. Brit. I.R.E., 20:* 181–196, Mar. 1960.

Waveform Distortion in Television Links

The linear transmission performance of television links is now measured and specified in terms of their response to certain standardized test waveforms. The aim of the paper is to provide a simple non-mathematical introduction to the basic ideas connected with the measurement of waveform distortion. A number of examples of simple waveform distortions are given to illustrate the advantages of waveform measurements and their connection with the more familiar steady-state responses. The application of tolerance limits to waveform responses is then considered and an outline is given of the routine-and-acceptance-test methods of determining the rating factor of a link. Finally a brief introduction is given to the basic ideas of the correction of waveform distortion without reference to the conventional steady-state measurement and equalization techniques. —I. F. Macdiarmid, *Jour. Brit. I.R.E., 20:* 201–216, Mar. 1960.

The Application of Closed-circuit Television in the Nuclear Industry

This paper reviews briefly the historical development of industrial television systems, and the applications of conventional equipment in the many branches of industry which depend upon nuclear processes. Special systems must be designed for use in the intense radiation fields and high ambient temperatures and pressures which occur in a nuclear reactor. The possible ambient conditions and their influences upon television camera design are discussed, with indications of the ways in which specific problems may be solved. An assessment of future trends suggests that television equipment will be called upon to operate in increasingly unfavourable environments; simultaneously, standard television systems will be used extensively for remote observation and display.—P. Barratt and I. M. Waters, *Jour. Brit. I.R.E., 20:* 225–241, Mar. 1960.

within 500 kc/s of the BBC transmitters, interference can occur. Interference can also occur between the various BBC regional transmitters whose frequency separation is usually 400 kc/s, but may be as little as 200 kc/s. The problem and a number of different solutions are discussed in detail. The circuit details of a commercially available combined receiver are then described. The sound i.f. circuits incorporate a double superheterodyne system, and the frequency of its r.f. oscillator is stabilized in Band II by means of an inexpensive a.f.c. system. Methods are described for measuring accurately the selectivity of a Band II receiver.—R. S. Hildersley, *Jour. Brit. I.R.E., 20:* 155–166, Feb. 1960.

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The paper outlines a complete system under which nearly all the operations in programme switching are controlled by a punched paper tape derived directly from the preparation of the programme schedule. Simplified manual control facilities are provided for non-schedule operation. The term "Programmation has been coined to describe this field.—G. E. Partington, *Jour. Brit. I.R.E., 20:* 181–196, Mar. 1960.

Waveform Distortion in Television Links

The linear transmission performance of television links is now measured and specified in terms of their response to certain standardized test waveforms. The aim of the paper is to provide a simple non-mathematical introduction to the basic ideas connected with the measurement of waveform distortion. A number of examples of simple waveform distortions are given to illustrate the advantages of waveform measurements and their connection with the more familiar steady-state responses. The application of tolerance limits to waveform responses is then considered and an outline is given of the routine-and-acceptance-test methods of determining the rating factor of a link. Finally a brief introduction is given to the basic ideas of the correction of waveform distortion without reference to the conventional steady-state measurement and equalization techniques. —I. F. Macdiarmid, *Jour. Brit. I.R.E., 20:* 201–216, Mar. 1960.

The Application of Closed-circuit Television in the Nuclear Industry

This paper reviews briefly the historical development of industrial television systems, and the applications of conventional equipment in the many branches of industry which depend upon nuclear processes. Special systems must be designed for use in the intense radiation fields and high ambient temperatures and pressures which occur in a nuclear reactor. The possible ambient conditions and their influences upon television camera design are discussed, with indications of the ways in which specific problems may be solved. An assessment of future trends suggests that television equipment will be called upon to operate in increasingly unfavourable environments; simultaneously, standard television systems will be used extensively for remote observation and display.—P. Barratt and I. M. Waters, *Jour. Brit. I.R.E., 20:* 225–241, Mar. 1960.

New Members

The following members have been added to the Society's rolls since the April 1960 *Directory* and those listed in the September and November *Journals*. Also listed are those regretfully reported as deceased since the September listing. The designations of grades are the same as those used in the Directory. An up-to-date list of the Sustaining Members appears on the outside back cover of each month's *Journal*.

Fellow (F) Active (M) Associate (A) Student (S)

Deceased

Fred J. DeJaeger (A)
A. C Downes
Robert Duggan (A)
Glen Glenn (M)
Hal Huff (A)
Lloyd Thompson (F)

Anerine, Peter J., Mot.-Pic. Cameraman, U.S. Naval Photographic Center, MPP Dept., Washington, D.C. (A)
Arakawa, Mitsuo, Eng., Far East Labs., Inc., 1-393 Gotanda, Shinagawa-Ku, Tokyo, Japan. (A)
Astradiningrat, R. Padma T., Studio Manager, Natonal Film Studios, Indonesia. Mail: Dept. of Cinema, Univ. So. Calif., University Pk., Los Angeles 7. (A)
Awad, Babiker Mohamed, Lab. Asst., Min. of Inform. & Labour, Sudan. Mail: Dept. of Cinema, University of Southern California, University Pk., Los Angeles 7. (A)

Beiser, Leo, Staff Eng., Tech. Prod. Div., Radio Receptor Co. Mail: 169-24 21 Rd., Flushing Manor 57, N.Y. (M)
Benwell, George D., Tech. Dir., CJCH-TV. Mail: 44 Springvale Ave., Armdale, Halifax County, N.S., Can. (M)
Biondo, G. A., Executive, International Recording, S.P.A. Mail: Via C. Balbo, 5, Rome, Italy. (M)
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Brown, Peter S., Miami Univ. Mail: 3622 S.W. 22 Terrace, Miami 45, Fla. (S)
Burt, William M., Dir., Film & Equip. Exch., U.S. Army, Valley Forge Gen. Hospital. Mail: Hares Hill Rd., Box 274, Kimberton, Pa. (A)
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Chladek, James J., Pres., Crest Films. Mail: 3547 N. 14 St., Milwaukee 6, Wis. (M)
Coleman, Leonard F., Mot.-Pic. Eng., Eastman Kodak Co. Mail: 544 Countryside La., Webster, N.Y. (M)
Collier, Roger A., Sr. TV Techn., Columbia Broadcasting System. Mail: 217 Niagara St., Winnipeg, Manit., Can. (A)
Collins, Jacques Antoine, Film Cameraman, Canadian Broadcasting Corp. Mail: 390 Rielle, Apt. 17, Verdun 19, Que., Can. (A)
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Curtis, J. R., Techn., Canadian Marconi, CECF-TV. Mail: 72 Clermont Blvd., Laval des Rapide, Que., Can. (A)

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Doust, John, Lab. Techn., Vice-Pres., Cinelaboratorios Caribe C.A., Prados del Este, Caracas, Venezuela. (M)
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Dudley, Leslie P., Stereoscopy Cons., Leslie P. Dudley, Inc. Mail: Westwood Glen Apts., Apt. 4, 10740 Wilshire Blvd., Los Angeles 24. (M)

Engle, Morris A., Photo. Supvr., The Martin Co. Mail: 366 Clermont Pkwy., Denver 20, Colo. (A)

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Lover, Anthony, City Col. N.Y. Inst. Film Technique. Mail: 20-66 35 St., Queens 5, N.Y. (S)

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Wilhelm, Michael J., TV Tech. Dir., Univ. Detroit. Mail: 16852 Asbury Pk., Detroit 35. (A)
Williams, John Scott, Univ. So. Calif. Mail: 3133 Flower St., Huntington Park, Calif. (S)
Wystup, Zbigniew J., Mgr. Stand. Dept., FODU Mot.-Pic. Research Center. Mail: Warsaw 31, Nowolipki 21B m.23, Poland. (A)

Xander, Walter G., Mot.-Pic. Producer, Army Pict. Center. Mail: 420 Main Blvd., Allentown, Pa. (A)

Yarnes, Donald C., TV & Film Rec. Systems Eng., Radio Corp. of America. Mail: 3801 Woodcliff Rd., Sherman Oaks, Calif. (M)
Yavitz, Eric A., Eng., Eastman Kodak Co., Bldg. 35, Kodak Pk., Rochester 4, N.Y. (A)

Zielinski, Waleryan W., Supt. of Mfg., Bell & Howell Canada. Mail: 264 Calvington Dr., Downsview, Ont., Can. (M)

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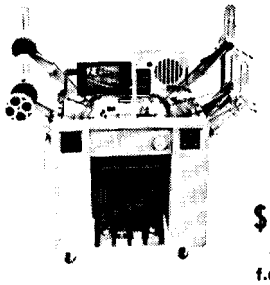

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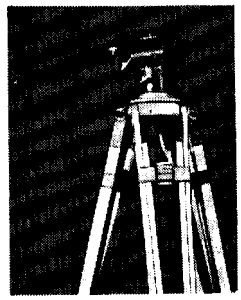

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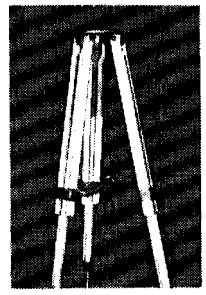

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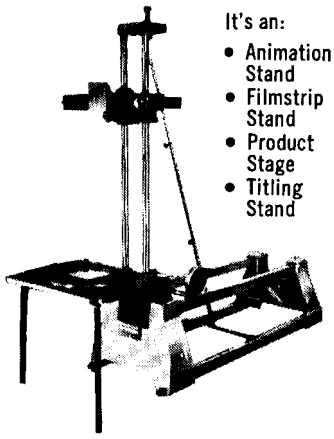

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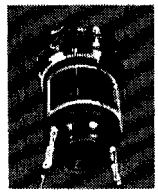

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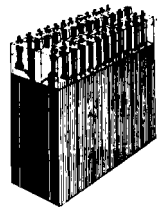

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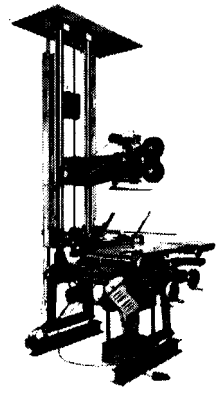

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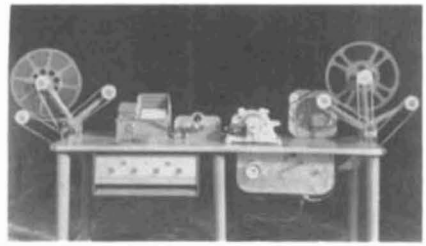
number of possible applications have been suggested including the accurate measurement of distances of many miles.

A booklet available without charge from H. W. Mattson, Bell Telephone Laboratories, Murray Hill, N.J., contains a detailed description of the optical maser at each stage of development.

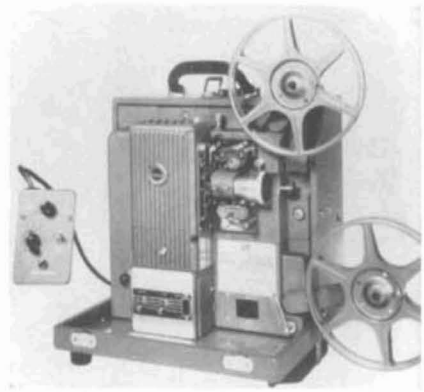
An optical maser, called a laser (from Light Amplification by Stimulated Emission of Radiation) has been developed in the laboratories of Hughes Aircraft Co., Culver City, Calif. The laser is constructed around a synthetic ruby crystal which is irradiated by a light source, such as a powerful flashtube lamp. The optical energy excites the atoms to a higher energy state from which the energy is reradiated in a narrow band of frequencies. The excited atoms are coupled to an atomic resonator and stimulated to emit the radiation together. According to the inventor, Theodore H. Maiman, the laser generates an almost perfectly parallel beam which, theoretically, could be directed at the moon, illuminating a lunar area less than 10 miles wide. The laser emits a sharp coherent light beam in the extremely high frequencies of optics — about 500,000 billion cycles/sec — where electromagnetic waves become light. Possible applications suggested by Dr. Maiman included use of the concentration of light energy to vaporize individual parts of bacteria, small plants and particles. It was also suggested that laser beam's light and heat could be used to induce chemical or metallurgical changes in biological, medical or industrial applications.

Experiments with ruby rods in the construction of optical masers are presently being conducted at Bell Telephone Laboratories.

An improved transistorized Filmagnetic sound recording system for use in Auricon cameras has been announced by Bach Auricon, Inc., 6950 Romaine St., Hollywood 38. The new Model MA-11 amplifier weighs only 5 lb and is designed for portability and dependability. The circuitry employs 14 transistors for amplifier frequency response to 12,000 cycles. New impedance matching techniques are used to eliminate heavy output transformers. The amplifier operates from a self-contained permanent rechargeable battery, or directly from 115-v house current for continuous operation. Three inputs (two microphone and one phono), with switch-operated compensation for speech or music, operate in conjunction with a visual recording-level indicator, with three individual input controls. Prices begin at $960.



A 3-channel 16mm Editing Table has been announced by Palmer Editors, 73-40 Vleigh Place, Flushing 67, N.Y. The unit is power driven by a reversible synchronous motor. Two speeds are provided through a belt shift — sound speed for normal viewing and high speed for quick inspection. Instant stopping is provided for. The drive is through timing belts and a clutch is provided so that the film can be moved by hand in either direction. For convenience in operation, the sound slit is 26 frames away from the synchronizer index and the picture aperture is 60 frames from it.



The L-W Photo-Optical Data Analyzer is a 16mm projector designed for data reduction of instrumentation film. The Analyzer is produced by L-W Photo Products Co., P.O. Box 147, Northridge, Calif. Variable-speed viewing from "still" to 24 frames/sec is reported to be accomplished without flicker. Remote control of all operating speeds permits pushbutton single-frame projection as well as automatic projection at previously selected speeds. Direction change to forward or reverse may also be remotely controlled. The machine also incorporates a daylight viewer. The unit is 12½ in. long, 14½ in. high and 10¾ in. wide. It weighs 26 lb.

A 35,000-w VHF high-channel amplifier, said to have a driving power requirement of less than 5000 w has been developed by General Electric Co's Technical Products Operation, Communication Products Dept., Lynchburg, Va. Outlined in the announcement were such features as d-c filaments for improved signal-to-noise ratio; a triplex cavity with three parallel tubes; double-stub loading control to permit the exact degree of output loading required by the amplifier; and a built-in electronic r-f sweep generator to simplify tuning. The amplifier incorporates a semiconductor bias power supply which is basically a three-phase bridge circuit, the output of which is filtered for reduction of the 360-cycle component. Both the aural and visual amplifiers use a common power supply. The aural bias has self-bias adjustable resistors in each grid feed.

A six-camera closed-circuit television system built by General Electric Co. has been installed at Cape Canaveral so that missile launching can be observed by personnel stationed in a blockhouse at a distance of 1000 ft from the launching pad. One of the cameras is mounted directly over the flame bucket. This camera watches the proceedings during the four seconds between engine firing and missile launching. If a defect or malfunction is apparent to the observers in the blockhouse, the test can be halted in time to save the missile. One camera is mounted on the blockhouse to observe the missile during launching and in flight. The others are placed around the launching pad. The cameras are operated from a control console in the blockhouse and a permanent film record of the launchings is maintained.

The RCA Bi-Directional Distribution Systems, developed by Radio Corp. of America primarily for closed-circuit educational television, makes it possible to send signals in two directions simultaneously over the entire cable system without the use of parallel cable runs or switching methods. Each outlet on the distribution system serves a dual function. When a standard receiver is connected to the outlet, all r-f signals on the system can be seen. R-F signals fed into the outlet are then available at all other outlets. The output of the program originating equipment is in the form of a standard r-f TV signal. Off-the-air signals are fed into the main amplifier, are amplified, then passed through the mixer, distribution transformer and down the risers to the receivers. The signals from the closed-circuit program originating equipment are fed into the room outlet, go up the riser, pass through the distribution transformer and into the mixer. The mixer removes the r-f camera signal channel and feeds it to the convertor where it is converted to another channel. The converted signal is fed into the amplifier where it is mixed with off-the-air signals and fed out over the system. The output of the camera equipment is fed to a video modulator that provides an r-f signal. The output frequency may be a standard TV channel or below the standard VHF channels. In this way, only one channel is required for distribution. The camera channel is returned to the system amplifier so that proper operating levels can be established.

The system is based on a special "hybrid" distribution performer. Using this device, signals fed into the input will appear at any of the outputs, and signals fed into an output will appear at the input but not at the other outputs.

The Amphicon 108, announced by Dalto Electronics Corp., Oak St., Norwood, N.J., is a portable TV projector which projects an image of up to 9 by 12-ft on a motion-picture screen or a wall. The design is based on a flat-faced direct projection video tube. At a distance of 16 ft from the screen it projects a 9 by 12-ft picture. As the projection head is moved closer to the screen, the picture becomes smaller. The unit, which is self-contained, includes high-fidelity audio. It uses any type of antenna and operates on standard house current. The projection head may be separated from the tuning control, and the sound unit may be used in conjunction with existing sound systems. The complete unit weighs 95 lb.

The Zoomar Mark VI remote controlled ITV Lens has been announced by Zoomar, Inc., 55 Sea Cliff Ave., Glen Cove, L.I., N.Y., as audio and r-f noiseless due to the use of a newly developed miniature d-c motor designed to eliminate noise and electrical interference. Principle features of the new design are a novel copper armature, a miniature commutator made of five white gold wires, and spring-loaded brushes of the same material to assure spark-free contact. The entire armature is sealed with a plastic cover which prevents dust from entering and also renders it explosion-proof. The new lens, priced at $1350, is in full production and experiments, leading to the application of the same principle to the Mark IV lens are being conducted.

The firm has also announced availability of five conversion lenses for use with its Zoomar Service Collimator when a finite, rather than an infinite, target is desirable. An internal holder accepts conversion lenses which move the test target into a finite position. Target distances are 500 yd, 1000 yd, 2000 yd, 4000 yd and 8000 yd. The collimator with the five lenses is priced at $5500 with Standard Air Force Target. Lenses for any desired distance are available on special order.

Achromat lenses providing high resolution in the 8–14 micron range are now being manufactured by the Servo Corp. of America, 111 New South Road, Hicksville, L.I., N.Y. These are in addition to achromats for 1–6 micron applications, according to a recent announcement. The firm has also announced a new computer program in its Optical Laboratory. The new program is expected to advance design and manufacturing operations in the production of Servacon lenses. The firm specializes in the manufacture of all types of infrared lenses and optical devices.

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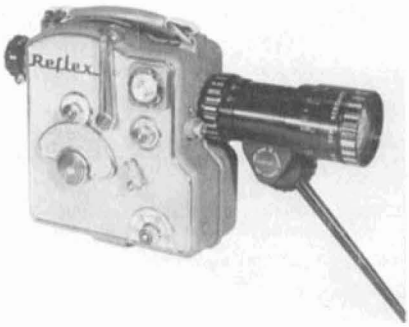
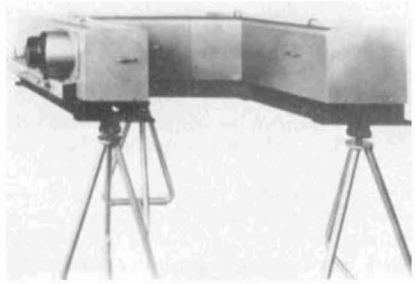


A new varifocal lens for the Camex-Reflex 8mm single-lens camera has been announced by Karl Heitz, Inc., 480 Lexington Ave., New York 17. Designated the Pan-Cinor 8–40mm, the $f/1.9$ lens is said to provide a continuous zoom range of up to 5× magnification. Available with 3-in. or 1-in. zoom lever, it focuses down to 3 ft, (with close-up lens to 1.5 ft). The lens is priced at $189. A lever and scale to set the diaphragm while filming are also available.

A new ColorTran Converter, the Cinemaster Chief Mark II, designed for economy and efficiency, especially when used in rugged location work with portable power generators, has been announced by Natural Lighting Corp., 630 South Flower St., Burbank, Calif. Six outlets are provided, each independently controlled by color-coded and numbered pushbutton switches. Exact color temperatures can be monitored and intensities may be selected and varied for each lamp or group on any outlet. The new unit also features a wider range input voltage control which allows compensation for line variations — 100/120 or 200/240 a-c. It is priced at $309.



The Schardin-Mach-Zehnder Interferometer has been introduced in the United States by Zoomar, Inc., 55 Sea Cliff Ave., Glen Cove, L.I., N.Y. Developed from the original Mach-Zehnder Interferometer, the new instrument is designed for flexibility to permit use in either a vertical or horizontal position. Applications include interferometric, schlieren and shadow methods of photography in various areas of research.

An electronic device to improve the acoustics of churches and auditoriums has been announced by Westrex Corp., a Division of Litton Industries, 6601 Romaine St., Hollywood 38. Called the Westrex 1400 Distributed Reverberation System, the device is for use in auditoriums where the natural reverberation time has been established primarily for voice sounds, and is thus too short for satisfactory reproduction of music. The system creates for each sound a complex train of repetitions in continuously diminishing volume from various parts of the auditorium. The sounds are repeated by recording them on magnetic tape and passing the tape over a succession of reproducing heads. Frequency of repetition is determined by tape speed and head spacing and can be adjusted to the requirements of the particular auditorium. The illusion of sound passing from front to back with successive reflections and diminishing volume is achieved by connecting each reproducing head to an individual pair of loudspeakers, distributed from front to back on opposite sides of the auditorium. Three groups of equipments are included in the basic system: tape transport, including erase, record and reproduce heads; distributed reverberation assembly, including recording and reproducing circuits; and an amplifier cabinet containing 60-w amplifiers for each speaker.

A tape head demagnetizer, featuring a special plastic sleeve on the tip of the probe to prevent accidental scratches, has been announced by Robins Industries Corp., Flushing 54, N.Y. Called the Model HD-3, it is designed mainly for amateur users of tape. It is priced at $5.95. The firm also offers the Model HD-6, a professional unit priced at $10.

A demagnetizer for bulk sound recording designed to serve the dual purpose of completely erasing the tape on the reel without rewinding, and demagnetizing record-playback and erase heads is manufactured by Amplifier Corp. of America, 398 Broadway, New York 13. The device, called the Magneraser, is available in two models, the 200C for 100 to 300 v, and the 220C for 200 to 260 v. Both models are priced at $24.

Tin-A-Lum, a low-temperature fluxless solder, has been introduced in the United States by Metals for Industry, Inc., 299 Pavonia Ave., Jersey City, N.J. The solder melts at extremely low temperatures, thus eliminating the danger of metal destruction under heat. It is used on aluminum and its alloys, zinc, tin, pewter, magnesium and other metals as well as castings. It can be polished and chromium plated and is said to be an excellent conductor of heat and electricity.

The PW-2, a 2-w power wire-wound resistor, has been announced by International Resistance Co., 401 Broad St., Philadelphia 8. The firm also manufactures 3-, 5-, 7-, 10-, 15- and 20-w sizes. Resistance elements of the new unit are wound on glass fiber cores. Tinned copper leads are secured to the element and the element-lead assembly is sealed in a rectangular ceramic case, providing a mechanical protective bond linking the resistance element, terminals and case. The resistance range is from 0.24 to 8200 ohms, and standard tolerances of ±5% and ±10% are available. The price of the PW-2 is $52 per thousand for the 10% tolerance unit.

employment service

These notices are published for the service of the membership and the field. They are inserted three months, at no charge to the member. The Society's address cannot be used for replies.

Positions Wanted

Film and AV Executive. Presently Audio Visual Manager for major corporation. Extensive overseas experience writing, directing and producing educational, documentary, public relation films. Experienced in almost all fields of film production and AV media preparation and production. Seeking position with challenge and future. Age 36, Married, M.A. in Cinema. Write: John H. Humphrey, 72-10 41st Ave., Jackson Hts. 77, N.Y.

Cameraman-Director. Available for forthcoming Confederate Centennial assignments throughout the entire central and deep south. Located near actual battlefields and areas where Centennial will be staged. Also available for assignments to Smoky Mts., Blue Ridge Mts., Cumberlands, Mississippi Delta and Okefenokee areas. Twenty years experience in high budget documentary film production. John O. Evans, 2313-B Starmount Cir., S.W., Huntsville, Ala.

Engineer-Administrator. Have designed, set up and managed motion-picture laboratories in color and black-and-white. Familiar with full range of operations and equipment in a laboratory. Graduate M.I.T.: M.S. in Chemical Engineering, B.S. in Business and Engineering Administration. Several languages. Desire challenging position. Apt. 2J, 130 Orient Way, Rutherford, N.J. WEbster 3-3238.

Representative. Graduate student working towards doctorate in Educational Television, receiving M.A. in motion pictures June 1961, B.A. in theater television, will be touring Latin America covering 64 cities in 20 countries and contacting over 100 television stations and 200 producers of newsreel, documentary, educational, television and feature films. Tour will be repeated each summer for three years. Also background three yrs electrical engineering and four yrs sales. Will represent your company and translate brochures into Spanish or Portuguese. Don Stewart, 2005 Sixth St., Santa Monica, Calif. EX 9-6795

Positions Available

Color Negative Printer Control Man. Photographic background, with color printing experience. Flexible hours. Paid benefits. New York City. CIrcle 6-5606. Mrs. Goldenberg.

Equipment Maintenance Men. Experienced in service and repair of one or more of the following types of equipment: Moviolas, sound projectors, Mitchell, Bell & Howell and Arriflex cameras, lens testing and calibration, audio and electronics for magnetic recorders and amplifiers, lighting and electrical equipment, machine shop. Write fully—experience and salary required. A. Florman, Florman & Babb, 68 West 45 St., New York 36.

Film Production Aide. The New York State Department of Civil Service will conduct an examination for Film Production Aide on April 29, 1961. Salary $3500 to $4350 in five annual increases. Open only to New York State residents. A Film Production Aide assists in preparations for shooting of motion picture film. Requires one year of paid experience in motion picture or television work and either one year of experience in operation of motion picture projector or one year of training in photography or television production or equivalent training and experience. For details contact the Recruitment Unit, Box 84-A, New York State Department of Civil Service, The State Campus, Albany 1, N.Y.

Soundman. Motion-picture recording studio requires alert soundman for staff. Must know all phases of sound recording including RCA equipment. Send resume to 446 East 86 St., Att: Monahan, Rm. 6-C, New York 27.

Film Processor. Motion-picture recording studio requires man for developing film in laboratory. Experience. Permanent. Write particulars to Mrs. M. Monahan, 446 East 86 St., Rm 6-C, New York 28.

Journals Wanted

These notices are published as a service to expedite disposal and acquisition of out-of-print Journals. Please write direct to the persons and addresses listed.

Complete set of Journals from January 1934 through June 1960. Excellent condition. For sale only as a set. Write: Don Norwood, 1470 San Pasqual St., Pasadena, Calif.

Complete file, Vol. I No. 1 through Dec. 1959 with indexes. Fine condition: $500. James G. Barrick, 15726 Fernway Ave., N. W., Cleveland 11, Ohio.

Complete set of Transactions, except Nos. 6 and 9, and all Journals published to date, including indexes. All in good condition. Price $500. Also extra copies of Transactions Nos. 21, 31, 32. W. W. Hennessey, RFD #2, Pound Ridge, N. Y.

Complete set of Journals from May 1937 to June 1954, including special volumes and membership directories, excellent condition; also Mar., May 1934 and July 1935 issues. Write: Harry R. Lubcke, 2443 Creston Way, Hollywood 28, Calif. HO 9-3266.

Jan-Dec. 1950; Jan., Feb., Apr.-Dec. 1951; Jan-Mar. 1952. Also available are vols. 6 and 7 of The Television Society (British) covering the period Jan. 1950 through Sept. 1955. Write: Andrew N. McClellan, 65 Hillside Drive, Toronto 6, Ont., Canada.

Dec. 1946, Feb.-Dec. 1947, 1948-1955 complete. All copies in perfect condition; for sale as entire lot only. Write: Joseph W. MacDonald, 2414 Sullivant Ave., Columbus 4, Ohio.

Jan. 1947 to Dec. 1957 complete and in perfect condition. For sale only as a set. Write: Charles J. Marshall, 2816 Royalston Ave., Kettering 19, Ohio.

Complete set of Journals Jan. 1949 to Dec. 1958. Perfect condition. What offers? Write: J. G. Jackson, 210 Kingsway South, Port Alberni, B. C., Canada.

Complete set of Journals, perfect condition, including special parts, directories, high-speed, etc. from Jan. 1949 to Dec. 1960 inclusive. write: Leslie Helhena, P.O. Box 643, Burbank, Calif.

Selección y características de Pantallas de Proyección por transparencia

PETRO VLAHOS [89]

Se examinan detalladamente las características de la pantalla de proyección por transparencia. Se suministran constantes numéricas que definen estas características para pantallas practicas, y se dan las conversiones de bujias-pié a lamberts-pié. Se dá un procedimiento mediante el cual se pueden obtener las especificaciones de una pantalla óptima para una aplicación determinada. Se contemplan los factores humanos y se dan los valores numéricos para la luminosidad y el contraste, para varios tipos de material proyectado.

Nuevos aspectos de las Técnicas de grabación ambulante independiente

JACK J. CLINK [96]

La grabación ambulante independiente (definida como la grabación que se hace con un canal de grabación completamente independiente que puede llevarse de un sitio a otro) es objeto del mayor interés para el productor independiente. Se exponen métodos de grabación concebidos para utilizar en la mejor forma posible los canales de grabación magnética de que se dispone al presente. Se hacen sugerencias acerca de como producir mejor un material de calidad uniformemente alta para el transpaso final de la pista sonora de una película a otra.

Control de ruidos exteriores en estudios de grabación

DONALD P. LOYE [98]

Recientemente se han perforado pozos de petroleo en terrenos de propiedad de estudios de grabación, lo que ha creado nuevos problemas de ruido y vibración. La solución de estos problemas comprende la localización adecuada de cada sitio de perforación teniendo en cuenta las actividades de los estudios; aislamiento acústico de torres de perforación y otras instalaciones, y el montaje de la maquinaria sobre aisladores de vibración. Estos y otros problemas de ruido y vibración relacionados con carreteras, aeroplanos y plantas de energía eléctrica se describen en este artículo.

Regulación de destellos de xenon de gran potencia por interrupción mágnetica

E. J. G. BEESON [101]

La descarga del arco de xenon es muy suceptible a la influencia de un campo magético; el arco peude ser desviado hasta su extinción. De este doble: emitir radiación luminosa durante su funcionamiento, y a la vez servir como su propio interruptor automático. Las investigaciones han girado en torno del diseño de una lámpara de xenon de fuente-compacta de 2 kilovatios, con gas a presiones crecientes y corrientes hasta de 1.000 ampérios. Mediante el empleo de un campo magnético para extinguir el arco, y por consiguiente interrumpir la corriente de la lámpara, se obtie nen considerables impulsos luminosos de onda rectangular en la zona de los 10 a los 100 µseg. Con estas altas corrientes de la lámpara, para las cuales el acumlador de plomo consti tuye una fuente satisfactoria de energía eléctrica, y con destellos luminosos de hasta 50 kilovatios, se han estudiado las características de arco y la eficiencia luminosa de salida. Se hacen también comparaciones con los anteriores disenos de lámparas de descarga, las que son de especial interes en fotografía de alta velocidad.

La interrupción magnética del arco se está empleando ya con éxito para proveer de una luz de ocultaciones al faro Dungeness. Mayores potencias de destello se interrumpen con menores intervalos permitiendo la operación de cámaras de mayor velocidad, con lo que se entra en un campo en el que las cámaras de espejo rotativo requieren aún mayores intensidades luminosas.

Técnicas de cámara de borrosidad

T. P. LIDDIARD, JR. y B. E. DRIMMER [106]

En el Laboratorio de Armas Navales y otros se han desarrollado varias técnicas que aumentan enormemente la utilidad de la cámara de borrosidad de espejo rotativo. Caundo no hay suficiente autoluminosidad, se emplean varios métodos para mejorar la iluminación, por ejemplo, cinta Scotch sobre superficies explosivas, intervalos de aire o de argon, una capa de microbalones, etc. Cuando se necesita luz exterior, se obtiene con alambres explosivos, lámparas instantaneas explosivas, etc. La luz reflejada sobre superficies de materiales opacos se emplea para registrar la llegada de ondas de choque a una superficie. Cuando la reflectividad de la superficie a prueba es baja, una película muy delgada de Mylar aluminizado indica claramente el tiempo de llegada de las ondas de choque. Empleando el método estrioscópico con luz reflejada o transmitida se observan perturbaciones muy débiles. Sistemas de múltiples ranureas, o rejillas de varias configuraciones, pueden usarse para aumentar la cantidad de información registrada. Pueden usarse "tubos de luz" de filamentos de vidrio para transmitir señales luminosas desde puntos inaccesibles a la observación directa hasta posiciones que quedan en linea con una ranura, o hasta otras configuraciones convenientes. Se describen otras técnicas, tales como la de sincronización de velocidad, la de verificación óptica de perfiles por reflexión Scotch-Lite, la del empleo de película de colores y la de espectroscopia en función del tiempo.