wafers; (4) diffusion of the wafer with a gas of certain chemical characteristics in a 2000 F oven; (5) metal evaporated onto the wafer and then onto a photo-etching process; (6) soldering to the header; (7) attaching of the leads to the active members of the transistors; (8) cleaning and capping.

The group was well impressed with the extreme caution and quality control that is used by Fairchild in its products.—Frank Mansfield, *Secretary-Treasurer*, 57 Stoneyford Ave., San Francisco 24.

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 *Kodak Monthly Abstract Bulletin.*

The subject areas are grouped below:

Color Photography and Color Development
Film and Its Properties
Film Processing Apparatus and Chemicals
Projection
Sensitometry and Image Structure
Sound Recording and Reproduction
Television

COLOR PHOTOGRAPHY AND COLOR DEVELOPMENT

Russian Pat. 113,492. Method of Processing Multilayer Photographic Materials With Color Development, V. K. Miloslavov. Filed Mar. 21, 1957. Abstracted in *Tekh. Kino i Televideniya, 4:* 89, Mar. 1960.

After fixing, the soundtrack is coated separately from the remainder of the film with a viscous solution of a hypo-destroyer, e.g., an aqueous solution of iodine and potassium iodide, saturated with Tylose [methylcellulose], after which it is immersed in a bleaching bath, and further separate processing of the soundtrack and the color image is carried out by one of the known methods. To eliminate the last hypo solution, materials provided with a filter layer of metallic silver are coated following a short immersion of the film in a bleaching bath, after which the film is again immersed in the bleaching bath so as to finish the bleaching process. It is shown that, if the film is processed by the method described in Russian Pat. 82,276, the optical density of the silver remaining in the soundtrack does not exceed 0.5; on processing by the proposed method, the optical density of the soundtrack reaches 1.25.—S. C. G. (Translated from *Tekh. Kino i Televideniya.*)

Russian Pat. 113,021. Method of Preparing the Receptive Layer of Matrix Film for the Imbibition Process of Printing Color Films, S. M. Levi, S. E. Tikhonovich, O. K. Smirnov, N. S. Spasokukotskiĭ and E. D. Korneva. Filed Aug. 13, 1957. Abstracted in *Tekh. Kino i Televideniva, 4:* 89, Mar. 1960.

A method of preparing the receptive surface of matrix film is described which does not need supplementary hardening

before the imbibition transfer and also ensures a high-quality image. The method consists in introducing into the silver halide emulsion, before coating the receptive surface, a mixture of the simple esters of methylolmelamine with formaldehyde (from 1 to 4% based on the weight of methylolmelamine) in the form of a 10% aqueous solution in quantities not less than 4% based on the weight of the gelatin, instead of the usual tanning agent. It is claimed that color images obtained on matrix film with the receptive surface described are equivalent to color images obtained by the best of the known methods, and are superior to them in the uniformity of the dye imbibed.—S. C. G. (Translated from *Tekh. Kino i Televideniya.*)

FILM AND ITS PROPERTIES

Use of Ultrasonics in the Manufacture of Photographic Emulsions (in Russian), S. A. Neduzhiĭ, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 28, 133–147, 1959.

A review is given of papers devoted to the applications of ultrasonics in the manufacture of photographic emulsions.—S. C. G. (Translated from *Tekh. Kino i Televideniya.*)

The Elaboration and Study of a Contact Method of Measuring the Dimensions of Motion-Picture Film (in Russian), L. K. Kutaĭ, A. Ya. Galnykin and V. S. Stepanov, *Trudy Leningrad. Inst. Kinoinzhener*, No. 5, 116–122, 1959.

The problems encountered in a contact method of measuring the geometrical dimensions of film are considered, particularly the pitch and height of perforations. A description is given of the design and construction of the original Soviet PKP-2 apparatus developed in the institute of the authors of this article. From laboratory and practical tests of the PKP-2 apparatus, the advantages of the contact method of controlling motion-picture film were determined and recommendations are given for the development of a continuously working apparatus which would make it possible to control the geometrical dimensions of the film during production.—S. C. G. (Translated from *Tekh. Kino i Televideniya.*)

Some New Motion-Picture Films (in Russian), V. L. Abritalin, *Tekh. Kino i Televideniya, 4:* 74–83, Apr. 1960.

Data on a number of foreign (i.e., non-Soviet) motion-picture films are collected from the literature, and the results of a large number of comparative tests are reproduced. These include physical, structural, chemical, sensitometric and resolution characteristics.—S. C. G.

FILM PROCESSING APPARATUS AND CHEMICALS

Standard Specifications for Silver Recovery, I. V. Blyumberg, S. G. Gurevich, F. S. Matison and T. A. Novatskaya. *Trudy Leningrad. Inst. Kinoinzhener*, No. 5, 210–218, 1959.

For specifying a standard for the recovery of silver, the following were determined experimentally: silver-coating weights for black-and-white and color emulsions from different factories, the silver content in images on black-and-white and color positives, and the loss of silver in the machine and in the fixing and bleaching solutions. On the basis of the results, calculations have been made for a suggested standard for silver recovery which is higher than the standard in operation since 1948.—S. C. G. (Translated from *Tekh. Kino i Televideniya.*)

A Study of the Fundamental Parameters in the Jet Processing of Black-and-White Motion-Picture Film, B. V. Valuĭskiĭ, *Tekh. Kino i Televideniya, 4:* 44–51, May 1960.

A theoretical hydrodynamic analysis is made of the development and fixing of moving motion-picture film by means of jets, the jets being applied vertically to a horizontal film, and confirmatory experiments are described. The major factors are the rate of application of the jets and the degree of overlapping of the streams on the film surface. The effect of temperature in this type of processing is similar to that of temperature in processing in tanks with agitation. Application normal to the surface of the film was found to be more effective than tangential application.—S. C. G.

The Film-Advance Speed Stabilizer of the 25KTK-1 Printing Machine (in Russian), A. M. Melik-Stepanyan. *Informatsionno-Tekh. Byull. TsKB Minist. Kultury S.S.S.R.*, No. 1 (20), 19–29, 1959; *Tekh. Kino i Televideniya, 4:* 93, Apr. 1960.

PROJECTION

Russian Pat. *114,146.* Film Gate for Motion-Picture Projectors (in Russian), A. M. Bolokhovskiĭ. Filed April 23, 1952. Abstracted in *Tekh. Kino i Televideniya, 4:* 88, Mar. 1960.

To eliminate possible damage to the picture on a motion-picture film from dirt building up in the gate and from products of war of the film causing pressure, the film gate is made in the form of two separate flanges of angular cross section, one of which is fixed and the other is supported on springs. The gate is curved, which eliminates squeezing of the film on the side toward the center of curvature of the gate, both while the film is moving and while it is stationary.—S. C. G. (Translated from *Tekh. Kino i Televideniya.*)

Stereo Screens With Reflecting Surfaces and Diaphragms (in Russian), B. T. Ivanov and E. N. Bushueva. *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 31, 122–133, 1959.

Basic Parameters for the Calculation of Stereoscopic Projection Without the Use of Spectacles (in Russian), B. T. Ivanov and S. A. Panina. *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 31, 45–71, 1959.

The Geometrical Laws of Taking and Projecting Stereo Films (in Russian), A. G. Boltyanskii and N. A. Ovsyannikova. *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 31, 4–28, 1959.

The Experimental Grounds for the Magnitude of the "Infinity" Parallax in the Stereo Cinema (in Russian), N. I. Gol'tsman, E. M. Belostotskii and E. N. Semenovskaya, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 31, 29–44, 1959.

Measurement of Forces in a Motion-Picture Projector (in Russian), A. Bodrov, *Kinomekhanik*, 24–8, Jan. 1960.

A dynamometer is described for the measurement of forces, both of tension and compression, acting on film passing through a projector and on the parts of the projector itself. Forces acting at a number of selected points in Soviet cameras are tabulated.—S. C. G.

Automatization of the Screening of Films (in Russian), V. Mun'kin, *Kinomekhanik*, 20–23, Jan. 1960.

Consideration is given to the technical requirements of systems for the automatic change-over from projector to projector during a film show, based on experience in Soviet theaters and at the NIKFI laboratories.—S. C. G.

Cinematograph Projection by the Two-Objective System (in Russian), N. D. Bernshteĭn, D. R. Khanukaev and G. V. Mering. *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 31, 88–101, 1959.

A description is given of a stereoscopic motion-picture projector for projection by the two-objective system. It is shown that this system of taking and projecting stereo films gives a better-quality reproduction of spatial relations than earlier systems did. The stereo projector and adjustments during stereo projection are considered.—S. C. G. (Translated from *Tekh. Kino i Televideniya.*)

Method of Determining the Basic Parameters of Stereoscopic Cinematograph Projection With a Grid (in Russian), L. V. Akimakina, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 31, 83–87, 1959.

It is shown that the coefficient of separation is not the only important magnitude affecting the quality of stereoscopic projection on a grid screen. The shape and dimensions of the working area of the zone of stereo viewing must also be taken into account. The parameters of the zone of stereo viewing and the magnitude of the working area determine the degree of comfort of the viewers in the perception of the stereo image on the grid screen.—S. C. G. (Translated from *Tekh. Kino i Televideniya.*)

A Sighting Device for Grid Stereoscopic Projection (In Russian), N. I. Gol'tsman and V. S. Shchekochikhin, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 31, 102–107, 1959.

A sighting device is described which allows the viewer at any moment during the showing of a stereo film to find, quickly and accurately, the correct position in relation to the zone of stereoscopic viewing. It is shown that the use of the sighting device decreases the fatigue of the viewers and improves the conditions of observation of the stereoscopic image.—S. C. G. (Translated from *Tekh. Kino i Televideniya.*)

Auditorium Parameters of Giant Cinemas, E. M. Goldovskii, *Tekh. Kino i Televideniya, 4:* 25–36, May 1960.

The problem of the shape and dimensions of auditoriums in giant motion-picture theaters is considered. Starting from the conditions under which the screen is viewed, relations are established to allow the choice of the basic parameters of auditoriums for the screening of normal, wide-screen, wide-format and panoramic films. It is shown that an auditorium shape can be found which is satisfactory for all types of exhibition. Formulas necessary for the calculation of auditorium dimensions and the choice of projection equipment are given.— S. C. G. (Translation of Author's Abstract.)

The KSS-35 Motion-Picture Projector (in Russian), V. Petrov and I. Fonar', *Kinomekhanik*, 35–42, Jan. 1960.

The NIKFI laboratories, in collaboration with industry, have produced a new type of stationary projector in two forms: one for theaters seating 400 persons and another for those seating up to 200. The difference between the two lies in the lighting system: a xenon lamp for the higher power, and a tungsten lamp for the lower. The mechanical and optical systems are described.—S. C. G.

Lighting Systems for Stereo Cine Projectors (in Russian), T. V. Derbisher, *Trudy*

Vsesoyuz. Nauch.-Issled. Kinofotoinst., No. 31, 72–82, 1959.

On the basis of the analysis of different lighting systems for stereo motion-picture projectors, two types of systems are suggested: (a) a compound mirror and (b) a honeycomb condenser. It is shown that, although systems with the honeycomb condenser are less economical (in comparison with systems with a compound mirror), they must be recognized as more convenient for illuminating the gate of a stereo projector.—S. C. G. (Translated from *Tekh. Kino i Televideniya.*)

SENSITOMETRY AND IMAGE STRUCTURE

Russian Pat. 113,884 Method of Establishing a Development Schedule and a Device for Realizing the Method, S. M. Khazan. Filed July 10, 1953. Abstracted in *Tekh. Kino i Televideniya, 4:* 89, Mar. 1960.

Two different densities lying on the straight-line portion of the characteristic curve and obtained with a constant exposure interval previously chosen are printed onto a positive material, the greater density being printed directly and the smaller through a continuous wedge. After development, a point is found on the print of the wedge, for which the sum of the densities of the wedge and the smaller density of the photographic material under test is equal to the greater density of the same material. From the value of the wedge density which it is necessary to add in order that the greater and smaller densities should be equal, the amount of development is reckoned.—S. C. G. (Translated from *Tekh. Kino i Televideniya.*)

Influence of the Rate of Development on the Reproduction of Picture Detail by a Photographic Material (in Russian), G. V. Derstuganov, *Tekh. Kino i Televideniya, 4:* 53–57, Apr. 1960.

The "Photographic Information Volume" of Kardas (*Phot. Eng., 5:* 91, 1954; *6:* 190, 1955) is not suitable in its original form for the study of the reproduction of detail at low contrast. An index of the performance of a photographic material at a given contrast has therefore been obtained by taking the area of the cross section of the volume at a given contrast of the test object. This corresponds to taking the area under the curve $R' = f(\log E)$ at a given constant contrast. A further refinement is to take the "useful" area lying above the ordinate $R' = 5\ \text{mm}^{-1}$, R' being the resolving power in lines per millimeter. This characteristic has been given the symbol U_p. Experiments were carried out by exposing a photographic material to a test object and studying the effect of time of development U_p and sensitometric characteristics. It was found that increasing the rate of development, either by increasing the concentration of the developing agent or by raising the temperature, produced a deterioration in the rendition of low-contrast detail, which was expressed quantitatively be a decrease in U_p. At the same time, the properties of the photographic material markedly affected the decrease in U_p. When three different types of material were tested in Metol-hydroquinone developers, an increase in the rate of development produced a relatively greater fall in U_p for a high-speed, coarse-grain film than for a slow-speed, fine-grain film. For any given case, the decrease in U_p was greater, the smaller the detail contrast.—S. C. G.

SOUND RECORDING AND REPRODUCTION

Dynamic Range Compression in Film Re-Recording (in Russian), E. V. Nikul'skiĭ, *Tekh. Kino i Televideniya, 4:* 66–67, Apr. 1960.

Evaluation of Distortions Caused by Different Noise-Reduction Systems in Variable-Area Photographic Recording (in Russian), A. A. Yur'ev, *Tekh. Kino i Televideniya, 4:* 31–38, Apr. 1960.

The Number of Sound-Reproducing Channels Required for Stereophonic Motion-Picture Films, N. Z. Vysotskiĭ, *Tekh. Kino i Televideniya, 4:* 37–42, May 1960.

The requirements of stereophonic sound for wide-screen and panoramic systems are considered. It is concluded that three to five channels will give a satisfactory stereophonic effect for wide-screen systems and panoramic systems with an angle not greater than 180°. Larger panoramic systems require as many as ten channels, and future systems may require more. However, the difficulties of mass production of prints bearing a large number of channels and other considerations suggest that the number of channels should be restricted to six.—S. C. G.

TELEVISION

The Quality of the Motion-Picture Television Image in the Production of Films by the Electronic Method, V. A. Burgov, *Tekh. Kino i Televideniya, 4:* 4–12, May 1960.

By the electronic method of filming is meant the coverage of the scene with a television camera and the subsequent photography of the kinescope image. An analysis is made of the resolving power of the photographic material as a function of frequencies in the image, and on this basis, the reproduction of the frequencies occurring in the television image are discussed. Maximum reproducible frequencies for various types and formats of motion-picture film are worked out. The combined influence of the television and motion-picture reproduction on the quality of the image is discussed, and, finally, consideration is given to possibilities of improving the quality of pictures made by this method.—S. C. G.

An Investigation of the Brightness Distribution Law in a Transmitted Image on a Probability Basis, N. N. Krasil'nikov, *Tekh Kino i Televideniya, 4:* 21–24, May 1960.

A law of brightness distribution in the transmitted image and a law of amplitude distribution in the television signal are put forward. They have been found experi-

mentally, and a method of carrying out the experiments is also described. On the basis of the results so obtained, a function has been found which gives a good approximation to the law of brightness distribution in the image.

Examples of the use of the results are given; in particular, it is shown that the use of positive modulation in the television transmitter is more suitable and makes possible a decrease in the average oscillatory power of the latter, for example, by 1.82 times, in comparison with negative modulation.—S. C. G. (Translation of Author's Abstract.)

An Electronic Switch for Photography From the Kinescope Screen (in Russian), B. P. Khromoĭ, *Tekh. Kino i Televideniya, 4:* 71–73, May 1960.

The electronic circuit described operates the shutter of a camera so that a single complete frame of a television picture can be recorded.—S. C. G.

Anglo-French Microwave System

Microwave (SHF) radio systems have taken their place beside coaxial cable and other long established carrier line systems as a reliable medium for high quality, long distance communications. Installations are presently operating in Austria, Canada, Great Britain, Brazil, Japan, Spain, Switzerland and Malaya.—*International TV Technical Review, 1:* 18–21, May 1960.

A Common Carrier Multi-Channel Television Wire Broadcasting System

The factors governing the choice and design of a television relay system and the history and background of the development of various systems are surveyed. The basic technical features of a system carrying four television and four radio programs are discussed. Information is given regarding the various types of cable and their specifications. Network jointing and matching fittings are described and the method of using the system characteristics to plan a network is explained with examples and an indication of the sort of coverage that can be obtained. Various types of subscriber installations can be provided and their characteristics are defined and typical examples given of subscribers equipment. The operation of the main receiving station and repeater equipment is explained in some detail and finally test methods and test equipment are described.—K. A. Russell and F. Sanchez, *Jour. Brit. IRE, 20:* 497–512, July 1960.

Flying-Spot Scanners for Colour Television

Flying-spot scanners for colour television are of interest chiefly because, in principle their signals are completely free from errors of superposition or "register." Two types of flying spot scanner have rendered valuable service in development work on colour television at Philips. One is suitable for colour slides, the other for opaque objects (colour prints, drawings, small objects, etc.) Both types probably have a useful part to play in colour television broadcasts.—H. van Ginkel, *Philips Technical Review, 21:* 234–250, June 1960.

Microwave Valves: A Survey of Evolution, Principles of Operation and Basic Characteristics

After a brief description of the evolution of the different classes of microwave valves, the principle modern types are discussed under the headings of their mode of operation: "O" type interaction, "M" type (crossed field), variable reactance amplifiers, and the maser. A brief survey of the performances obtained are given. Included are 89 references.—C. H. Dix and W. E. Willshaw, *Jour. Brit. IRE, 20:* 577–609, Aug. 1960.

The Power Gain of Multi-Tiered VHF Transmitting Aerials

Transmitting aerials for VHF broadcasting usually consist of a number of similar groups or tiers of radiating element, spaced at intervals along a supporting mast. The power gain of such an arrangement depends on the number of tiers, on the spacing between them, and also on the vertical radiation pattern of each individual tier. A method of calculating the gain is described. Results computed for a comprehensive range of variables are presented in the form of tables.—P. Knight and G. D. Monteath, *BBC Engineering Division Monograph, No. 31:* July 1960.

Some Aspects of Vidicon Performance

The performance of the 1-in. vidicon is discussed, particularly the effect of various operating conditions on transfer characteristics, lag, resolution and geometry. When target voltage and dark current are high, maximum sensitivity is obtained, but this is at the expense of the other parameters. In the E.M.I. (Electric and Musical Industries) vidicon, the optimum performance as regards γ and lag is obtained for signal currents of 0.2 to 0.3 μA and dark currents of 0.01 to 0.03 μA. Methods of measuring sensitivity, γ and lag are described and possible sources of error indicated. The effect of bias illumination on γ, lag and resolution is analyzed. Improvements in geometry are described together with a method of improving resolution. Infrared and ultraviolet sensitive tubes are mentioned—H. G. Lubszynski, S. Taylor and J. Wardley, *Jour. Brit. IRE, 20:* 323–334, May 1960.

The Stratoscope I Television System

Stratoscope I is a balloon-borne astronomical telescope designed for solar photography. When aloft, the telescope is remotely operated by radio command signals transmitted from a control station on the ground. A special television system has been developed to assist in aiming and focusing Stratoscope I. This equipment comprises a camera and transmitter on the telescope and a ground receiver driving several monitors. It permits the astronomers at the ground control station to visually aim and focus the telescope by inspection of the television monitors. The use of this technique has significantly increased the yield of useful photographs obtained with Stratoscope I.—L. E. Flory, G. W. Gray, J. M. Morgan and W. S. Pike, *RCA Review, 21:* 151–169, June 1960.