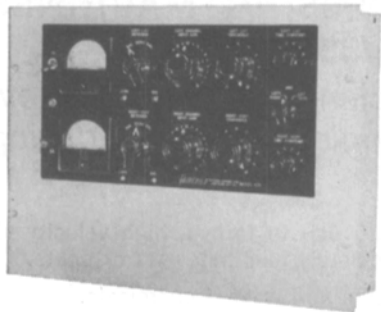


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- Cameras and Equipment (Except High-Speed)
- Color Photography and Color Development
- Film and Its Properties
- Film Processing (Apparatus and Chemicals)
- High-Speed Photography and Instrumentation
- Printing and Optics
- Projection
- Sensitometry (Apparatus and Chemicals)
- Sound Recording and Reproduction
- Television

### CAMERAS AND EQUIPMENT (Except High-Speed)

**A Determination of the Angular Dimensions of Plane Mirror Shutters for Motion-Picture Cameras** (in Russian), G. V. Mering, *Tekh. Kino i Televideniya*, 5: 45-49, Aug. 1961.

**Some of the Scientific and Technical Work of the Lenfil'm Motion-Picture Studios** (in Russian), I. N. Aleksander, *Tekh. Kino i Televideniya*, 5: 55-60, July 1961.

New equipment and methods worked out in the Lenfil'm Studios are reviewed.

**Remote-Controlled Motion-Picture Camera**, L. Skobennikov, *IUn. tekhn.*, 5: No. 1, 78, Jan. 1961. *MIRA* 14 (5).

**Objectives for Cinematography on 16mm Motion-Picture Film** (in Russian), F. F. Novik, *Tekh. Kino i Televideniya*, 5: 77-83, June 1961.

A number of foreign (i.e., non-Soviet) objectives for 16mm cameras are reviewed.

**Using Only One Narrow-Film Camera and Projector for Making Panoramic Motion Pictures**, *IUn. tekhn.*, 5: No. 1, 8, Jan. 1961. *MIRA* 14 (5).

**Exposure Calculations in Cinematography** (in Russian), F. S. Pyatnitskii,

semantics, linguistics, logic and information theory will also be within the editorial scope of the periodical. There are two annual subscription rates, Rate A at \$20 to libraries, universities, government agencies, and industrial organizations, etc., and Rate B at \$10 for individuals who order directly from the publisher and certify that the journal is for personal use only.

*Tekh. Kino i Televideniya*, 5: 71-75, July 1961.

The principles of the calculation of exposures from exposure-meter readings are outlined for the camera man, the amateur in particular.

**The Depth of Focus of an Objective and the New Forms of Cinematography** (in Russian), A. A. Lapouri, *Tekh. Kino i Televideniya*, 5: 10-20, July 1961.

A mathematical analysis is made of the concept of depth of focus under the particular conditions of cinematography. It is pointed out that the usual theory is correct only when a picture is viewed from a point corresponding to the center of perspective, and an evaluation of depth of field based on the hyperfocal distance is developed. The theory is extended to wide-screen, anamorphic systems and to wide-film systems of cinematography. Means of increasing the depth of field are discussed, including the Americal IR system and the Garutso objective, which offers four alternative channels, focused on different planes, through the single lens system.

**An Experimental Study of the Natural Oscillations of a Motion-Picture Film** (in Russian), P. Olendzki, *Tekh. Kino i Televideniya*, 5: 39-45, Aug. 1961.

Elasticities and internal damping coefficients were derived from natural oscillations, longitudinal and transverse, of a 16mm motion-picture film under tension, in lengths ranging from 206 to 900 mm. Damping is slow under these conditions but is much more rapid in the film gate of a camera. This effect is ascribed to friction. By dimensional analysis the damping coefficient is related to the other elastic properties of the film.

**The Use of a Modified Yu-16 Lux-Meter in Cinematography** (in Russian), B. A. Petrov and M. M. Shcheglov, *Tekh. Kino i Televideniya*, 5: 68-70, June 1961.

Of the home-produced and foreign exposure meters used in the USSR, none is considered completely suitable for the special purposes of cinematography. The Soviet-produced Yu-16 lux-meter is considered to be the most appropriate, and modifications are described to make it more suitable for cinematography.

**Remote Control of Motion-Picture Cameras** (in Russian), Ya. L. Butovskii, and L. J. Gol'shtein *Tekh. Kino i Televideniya*, 5: 30-38, Aug. 1961.

Basic requirements of a remote-control

system for motion-picture cameras include visual control using a television link as viewfinder; panning, focusing, and stopping-down control; the design of the control desk; and applications of remote-control systems.

**The Quality of Spools for Amateur Motion-Picture Cameras** (in Russian), V. A. Yazhgunovich, *Tekh. Kino i Televideniya*, 5: 75, June 1961.

The mechanical properties of a number of motion-picture spools, Soviet and foreign are surveyed briefly, and it is concluded that Soviet materials are capable of providing quite satisfactory spools.

### COLOR PHOTOGRAPHY AND COLOR DEVELOPMENT

**Results of a Comparative Sensitometric Test of Black-and-White and Color Motion-Picture Films in Different Countries** (in Russian), E. Ozherel'eva, *Tekh. Kino i Televideniya*, 5: 21-25, July 1961.

A set of standardized step wedges on Agfa (Wolfen) black-and-white and color motion-picture films were made in Bulgaria, and densities were measured on different types of densitometer in different countries. Step wedges prepared by sensitometers in those countries were also compared. It was found that disagreement between the densitometers could cause differences of 50% in the sensitometric values of black-and-white film and of 100% in the values of color film. Provided that the light sources were carefully standardized, results obtained with the different sensitometers agreed reasonably well. On the whole, owing to differences in processing and measurement, sensitometric results obtained in the different countries varied sufficiently to make it impossible to compare results. The numerical results of the test are tabulated.

**The Relation Between the Fundamental Sensitometric Indices of the Properties of Photographic Emulsions in Color Development** (in Russian), T. V. Abramova and V. S. Chel'tsov, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 29, 33-42, 1959; *Referat. Zhur., Fiz.*, Abstract No. 8G268, 1961.

The relation between the sensitometric properties of emulsions for multilayer color photographic materials in black-and-white and in color development has been studied. It is shown that the relation between the coefficient of contrast of the silver image developed by a metol-hydroquinone developer and the dye image in color development depends on the graininess of the emulsion and the covering power of the silver in black-and-white development. The values of the contrast coefficient and the speed numbers of the silver and dye images in color development are referred, like the monochromatic densities of the dyes, to the optical densities of the silver image. No definite relation between the magnitude of the speed of the silver image on color and on black-and-white development in a metol-hydroquinone developer was established.

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**The Influence of the Absorption of Light by a Layer of Matrix Film on the Gradation of a Relief Photographic Image** (in Russian), A. Bongard, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 29, 81-91, 1959; *Referat. Zhur., Fiz.*, Abstract No. 8G254, 1961.

A study has been made of the influence of the spectral sensitivity of emulsions, the light absorption of an emulsion layer (spectral transmission of the dye, introduced into that layer) and the spectral composition of the printing light, on the gradation properties of a relief matrix image. It is shown that changing each of these factors leads to a considerable change in the sensitometric characteristics of the relief images. A relation between the gamma of the matrix film and the concentrations of the filter dyes in the emulsion and the spectral composition of the light in printing was established, and it was shown that the use of different light filters in printing makes it possible to control the sensitometric properties of the matrix film within quite wide limits.

**Ratio of Optical Densities of Color and Silver Images When a Color-Positive Film is Processed by Various Methods** (in Russian), N. I. Kirillov, *Zhur., Nauch. i Priklad. Fot. i Kinemat.*, 6: No. 4, 296-298, 1961.

It was found that increasing the development time of a positive color film did not lead to an appreciable increase in the density of silver as compared with the densities of color images. Increasing the bleaching time of a color positive during processing makes it possible to control the content of residual silver in a color image. At the same time, silver can be eliminated almost completely from regions of low density but left in sufficient quantities in regions of high density.

A study of cross sections of sensitometric strips showed that when the bleaching time of a film was increased, silver was dissolved gradually, beginning from the top layer. Therefore, the residual silver image remains mostly in the bottom and middle layers and mainly decreases the saturation of high densities of blues and purples without affecting the low image densities.

**The Influence of the Yellow Light-Filtering Layer on the Resolving Power and Effective Sensitivity of the Layers of a Color Film** (in Russian), I. M. Kilinskii and A. N. Iordanskii, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 29, 59-61, 1959; *Referat. Zhur., Fiz.*, Abstract No. 8G261, 1961.

The yellow filtering layer of colloidal silver is shown to have practically no influence on the resolving power of the middle and lower layers of a multilayer film. The fall in resolving power of these layers, in comparison with that of the corresponding single-layer coating, occurs basically as the result of the scattering of light by the silver halide of the upper layers. The effective speed of the middle layer is decreased by the filter layer by a factor of almost two, and the lower by 20%. It is therefore advisable to exchange the filter layer of colloidal silver for one with a sharper cutoff to the absorption band.

**Processing of Color Photographic Materials with Black-and-White Developers** (in Russian), A. Ya. Smirnov, *Zhur. Nauch. i Priklad. Fot. i Kinemat.*, 6: No. 4, 259-263, July-Aug. 1961.

Changes in sensitometric characteristics of multilayer color photographic materials processed separately in black-and-white and color developers were investigated. The DS-2, Agfacolor V, LN-2 and an experimental sample of a color positive with tartrazine were used for the experiments. Both the Chibisov black-and-white metol-hydroquinone developer and a color developer containing T-32 of ordinary composition were used at 18 C for 8-min and 10-min development, respectively.

This method of processing color photographic materials, which increases the photographic speed considerably, can be used on the existing photographic materials to a limited extent only. However, if the ratio between the speed and the contrast in emulsions to be used for black-and-white development is changed when the emulsion is manufactured, and if the concentration of color couplers is increased in the emulsion, then regardless of the prolongation of processing, this method is of interest for some photographic applications.

**A Study of the Processing of Color Negative Film** (in Russian), Ts. S. Arnol'd, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 29, 43-58, 1959; *Referat. Zhur., Fiz.*, Abstract No. 8G264, 1961.

The influence of different processing treatments for a color negative film on the constancy of its sensitometric characteristics has been studied. It is shown that the fundamental cause of poor reproducibility of the photographic indices is the lack of constancy in the conditions of washing. Two variations of the process with controlled after-development have been worked out: NIFKI-3 (development by diethyl-p-phenylenediamine) and NIFKI-4 (development by ethylethoxy-p-phenylenediamine). The optimum solution for post-development was a 0.2% solution of sodium metabisulfite. This process makes it possible to restrict the maximum departure from the optical sensitometric characteristics to a value approximately half that of other processes, with a smaller fog density and the same speed.

**Zonal Matrix Films for the Imbibition Process** (in Russian), S. A. Bongard, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 29, 73-80, 1959; *Referat. Zhur., Fiz.*, Abstract No. 8G258, 1961.

A set of zonal matrix films is described for printing imbibition matrices directly from a color multilayer negative. Data are given on the spectral sensitivity of the films of the set, the structure of light filters for the secondary color separation and the spectral characteristics of the dyes introduced into the film for forming the relief. The sensitometric characteristics of the films of the set are described. The effective resolving power of the zonal matrix films is considerably higher than of such color-separating matrices on M-2 film obtained in the normal practice of imbibition printing.

**The Influence of Double Exposure on the Shape of the Characteristic Curve of Matrix Film** (in Russian), D. K. Balabukha, *Tekh. Kino i Televideniya*, 5: 6-12, June 1961. Harrow Abstracts, 1961.

Auxiliary exposures have been studied as a means of altering the shape of the characteristic curve of the matrix film used in imbibition printing of color films. A preliminary exposure through the base to light of the same spectral composition as that used in the main exposure, but of low intensity, was ineffective, but the same type of exposure made through the base after the main exposure altered the shape of the characteristic curve in the sense of subproportional intensification. The gradient at the toe of the curve was increased, but in general  $\gamma$  fell somewhat. Pre-exposure through the emulsion side increased effective speed and raised the gradient at the toe of the curve. A combination of pre-exposure through the emulsion side and post-exposure through the base should give a characteristic curve very suitable for correct color reproduction by matrix film.

**The Characterization of the Reactivity of Nondiffusing Couplers by the Magnitude of the Energy of Activation of the Color-Development Process** (in Russian), S. P. Sharlandzhiev and V. S. Chel'tsov, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 29, 24-32, 1959; *Referat. Zhur., Fiz.*, Abstract No. 8G265, 1961.

The law of Arrhenius, according to which the activity of components can be characterized by the calculation of the magnitude of the energy of activation, can be applied to the process of color development. Energies of activation of color development have been determined for couplers in multilayer color photographic materials and different developing agents which are derivatives of p-phenylenediamine. The values for the energy of activation so obtained are in good agreement with the results obtained by photographic methods. The activity of couplers in relation to the primary products of oxidation of the developing agent strongly influences the change in the energy of activation of the reaction of reduction of silver halide. The energy of activation of the development of fog is higher than the energy of activation of the development of the image.

**A Study of the Process of Color Development** (in Russian), A. S. Khefman and V. S. Chel'tsov, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst.*, No. 29, 5-15, 1959; *Referat. Zhur., Fiz.*, Abstract No. 8G263, 1961.

The conditions of the formation of the leuco bases of two azomethin dyes (the p-diethylaminoanil of 1-phenyl-3-methylpyrazolindi-4, 5-one and its o-methyl derivative) have been investigated and the properties of these bases have been studied. A method has been worked out for quantitative determination of the leuco bases of azomethin dyes, based on the potentiometric titration with iodine of an aqueous-alcoholic solution of the leuco base stabilized with an inorganic acid. It is shown that the oxidation of the leuco base into the dye by semiquinone proceeds both in

acid and in alkaline media. The products of oxidation of the developing agent by silver bromide oxidize the leuco base even after 24 hr standing in 3% solution of sodium carbonate; i.e., oxidizing properties are shown not only by the diamine itself but also by its polymerization products, an excess of diamine not interfering with the reaction. At low pH the leuco base is a better reducing agent than the coupler, as a consequence of which the condensation process proceeds practically to finality.

**Some Points in the Exposure and Processing of DS-5 Color Negative Film** (in Russian), A. Moskvina and A. Val, *Tekh. Kino i Televideniya*, 5: 13-17, June 1961. Harrow Abstracts, 1961.

The new Soviet DS-5 color negative film (balanced for daylight) was used by the Lenfilm studios in 1960 to make the first two films on that stock. Their experiences in changing over to the new film are described, including the adaptation of the processing equipment and procedure, changes in exposure techniques and the working sensitometric characteristics of the film. In general the DS-5 film, which has integral masking, is accepted as a considerable improvement on those it has replaced.

#### FILM AND ITS PROPERTIES

**Relationship Between the Resolving Power and Thickness of Emulsions** (in Russian), I. R. Protas and P. Kh. Pruss, *Zhur. Nauch. i Priklad. Fot. i Kinemat.*, 6: No. 4, 294-296, 1961.

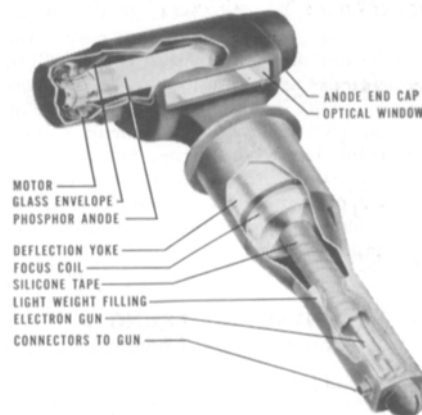
The relationship between the resolving power  $R$  and the thickness  $h$  of the emulsion layer was studied at various concentrations of AgHa. An unsensitized low-dispersion negative silver iodobromide emulsion, coated on an antihalation support, was used. The emulsion was exposed in a sensitometer and a resolving-power camera.

The values of gamma and diffuse optical density, which are the characteristic indications of the properties of the emulsion as a whole, cannot determine the values of acutance and resolving power. These are determined by the nature of the single-stage scattering of light in the emulsion, that is, the scattering by individual grains, as well as by the characteristics of the weakening of scattered light in the emulsion layer.

At a constant surface concentration of silver halide in the emulsion, the gamma was only slightly changed when the thickness of the emulsion was increased, while at a constant volume concentration of silver halide, the gamma increased. Furthermore, change in the amount of scattered light followed approximately the same law with a change in the thickness of the emulsion layer as the amount of absorbed light changes.

The resolving power decreased when the thickness of the emulsion layer was increased, the surface concentration of silver halide remaining constant, but it changed slightly when the concentration of silver halide in the volume of the emulsion remained constant.

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**Standardization of the Basic Dimensions of Wide-Format Cinematography** (in Russian), S. K., *Tekh. Kino i Televideniya*, 5: 64-66, Aug. 1961.

An account is given of the standardization of 70mm motion-picture film in the Soviet Union. The provisions set out in the appropriate Soviet standards (NORM-KINO 2-61, 22-61, 23-61, 24-61, 25-61, 26-60) are outlined. They cover the dimensions of stock for wide-format films, dimensions and position of the image space, width and position of magnetic soundtracks on prints, magnetic sound-recording and reproducing heads (width and position) and numbering of the tracks, projectors for wide-format films, and film-gate dimensions, shape and position.

#### FILM PROCESSING (Apparatus and Chemicals)

**Kinetics of the Process of Fixation of Photographic Materials**, I. B. Blyumberg, V. G. Ivanova, A. E. Neiman and M. Ya. Pikus, *Zhur. Nauch. i Priklad. Fot. i Kinemat.* 6, No. 1, 39-49, 1961; cf. *ibid.*, 5, 90, 1960.

This was studied in the case of fixing baths containing various concentrations of  $\text{Na}_2\text{S}_2\text{O}_3$ ,  $\text{NH}_4\text{Cl}$ ,  $\text{KBr}$  and  $\text{KI}$ . Data are tabulated and plotted. Disintegration of the boundary layer is important at low  $\text{Na}_2\text{S}_2\text{O}_3$  concentrations but not at high; the effect of accelerators of Ag

halide solution is important at high  $\text{Na}_2\text{S}_2\text{O}_3$  concentrations but not at low. In most photographic materials the fixation kinetics is mixed, being approximately diffusion-type for thick emulsions in baths with low solvent concentrations and approximately chemical for thin emulsions with low Ag halide content in baths with medium or high solvent concentrations. The curve of decrease in the optical density of the emulsion with fixation time has the same character as the kinetic curves for development and washing.  $\text{NH}_4\text{Cl}$  does not accelerate the solution of  $\text{AgBr}$  in aqueous  $\text{Na}_2\text{S}_2\text{O}_3$  or diffusion of the latter through the emulsion.

**Tests of Some Developers Recommended for Increasing Emulsion Speed** (in Russian), V. L. Abritalin and K. I. Markhilevich, *Zhur. Nauch. i Priklad. Fot. i Kinemat.*, 6, No. 4, 251-255, 1961.

Some developers recommended for increasing the photographic speed were tested sensitometrically. Tables showing the composition of nine developers and the sensitometric characteristics of films after the use of various developers are included. The majority of these developers gave negative results with Russian MZ, AM and V films. As compared with control developers 1 and 2, metol developers 3 and 4, diluted in ratios of 1:6 and 1:16 at low gamma showed an appreciable increase in the speed of the emulsion. One developer (3B in the table) almost doubled the speed as compared with another (1

in the table) at a gamma of approximately 0.65. Metol developers diluted in ratios of 1:6 and 1:16 can be recommended as media for increasing the speed if the emulsion is developed to a gamma of 0.5 to 0.65.

**Processing of Color Photographic Materials with Black-and-White Developers** (in Russian). (See under heading "Color Photography and Color Development.")

#### HIGH-SPEED PHOTOGRAPHY AND INSTRUMENTATION

**Device for High-Speed Spark Photography** (in Russian), G. D. Salamandra and I. K. Sevast'yanova, *Inzhener.-Fiz. Zhur.*, 3: No. 9, 31-36, 1960; *Referat. Zhur., Fiz.*, Abstract No. 6G231, 1961.

A device for the high-speed shadow cinematography of processes of the explosion type is described. The maximum frequency of taking is 1000,000 frames/sec with minimum exposure time of  $5 \times 10^{-7}$  sec. The apparatus consists of a high-voltage rectifier, an oscillating circuit, a detachable electronic flashtube, a photographic recording apparatus and a synchronizing unit. The oscillating circuit consists of a battery of condensers with an overall capacity of 1.25  $\mu\text{f}$  to which a triggering impulse is applied, and an electronic flashtube supplied by the condensers. The size of the spark gap is so chosen that the fall in potential across it is close to the sparkover potential. On the application of the triggering impulse, as the spark gap is crossed, the condensers feeding the electronic flashtube discharge to the potential exceeding the sparkover potential, and the lamp ignites. The flashing frequency depends on the values of the oscillating circuit and is easily controlled. The detachable electronic flashtube has the following characteristics: filling, hydrogen at 1 atmos. pressure; interelectrode distance, 24 mm; static sparkover potential, 18 kv; energy of single flash, 0.8 joule; duration of flash,  $5 \times 10^{-7}$  sec. For larger durations the flashtube may be filled with helium at a pressure of 4 to 5 atmos. The photographic unit is of the drum type. In the drum is placed 1 m of motion-picture film with the sensitized layer on the inside. The linear speed of the film is 185 m/sec. The image of the object being photographed is projected onto the film with the aid of an objective with a focal length of 180 mm and an aperture of  $f/3.5$ , and prisms. For synchronizing the light source with the phenomenon to be studied, a special shutter of the blind type has been made with synchronizing contacts.

**In the World of the Microsecond Modern High-Speed Photography** (in Japanese), Uemura Tsuneyoshi, *Shizen*, 15: No. 10, 51-53, 1960; *Referat. Zhur., Fiz.*, Abstract No. 9G298, 1961.

A camera for high-speed photography is described. The image of the object is formed by the main objective and is projected with the aid of plane mirrors onto a rotating four-sided mirror prism. The axis of rotation of the prism coincides with the axis of rotation of a drum, on the

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surface of which is stretched a motion-picture film. Twenty-two single supplementary objectives with plane mirrors, set inside the drum, serve for transferring the image to the film. On rotation of the prisms the reflected beams pass successively through each of the supplementary objectives and form on the film a number of images of the object corresponding to uniform moments of time. At the moment approaching the repetition of the fall of the light beam on the same objective, the drum with the film is shifted by the height of one frame, and as a result, the image falls on the unexposed part of the film. The rate of rotation of the mirror prism is 80,000 rpm; the relative aperture of the optical system is 1:8; the frame frequency is 6,000 to 120,000 frames/sec; dimensions of frame are 5 by 24 mm; the number of exposures is 200 or 400, depending on the frame frequency; and the maximum operating time is  $\frac{1}{15}$  sec.

**Application of Super-High-Speed Motion-Picture Exposure by the Photoelasticity Method for Studying Stresses Formed in Solids During Explosions** (in Russian), F. A. Belaenko, Yu. V. Gaek and M. F. Drukovanyi, *Zhur. Nauch. i Priklad. Fot. i Kinemat.*, 6: No. 4, 286-288, 1961.

A schematic diagram of synchronization of the explosion with the flash of the lamp and the operation of the motion-picture camera is given. The method and optical diagram of the arrangement are also presented. Isochromic patterns were obtained in glass, Plexiglas and celluloid during the explosion of single and several charges. The method can be used successfully for studying dynamic stress areas, crack-formation processes, role of reflected waves and other phenomena occurring in a mountain mass, when explosives are used.

**The Control Desk of the RKS-11 Image-Dissection Camera** (in Russian), O. F. Grebennikov, V. P. Gusev and S. M. Provornov, *Tekh. Kino i Televideniya*, 5: 48-53, June 1961.

The control desk designed for the RKS-11 high-speed camera is described. It controls the moment and duration of the shutter, the operation of the electronic flash source and also the taking speed of the camera. It can be used to trigger the operation of the camera by the event to be photographed and vice versa.

**Photographic Observations of Artificial Earth Satellites at the Main Astronomical Observatory of the Academy of Sciences of Ukrainian S.S.R.**, M. S. Fedchun and R. D. Legeida, *Izvest. Glav. Astron. Observ. AN URSSR*, 3: No. 2, 151-153, 1961. MIRA 14 (5).

**Using High-Speed Motion-Picture Photography for Studying the Impact Action on Rocks**, N. I. Kulichikhin et al., *Izvest. Vysshikh. Ucheb. Zavedeniy, Geol. i Razvedka*, 4: No. 4, 128-129, Apr. 1961. MIRA 14 (6).

**Temperature Conditions of Luminescent Screens of Kinescopes and Cathode-Ray Tubes of High Brightness** (in Russian, with summary in English), S. A. Tikin,

*Ukrain. Fiz. Zhur.*, 6: No. 1, 93-104 Jan.-Feb. 1961. MIRA 14 (6).

**Using High-Speed Motion-Picture Photography for Investigating the Performance of Agricultural Machinery**, V. I. Formin, B. I. Zhuravlev and E. I. Bazhenov, *Traktorg. i Sel'khoz mashiny*, 31: No. 6, 35-36, June 1961. MIRA 14 (6).

#### PRINTING AND OPTICS

**The Preparation of Dupe Inserts in Black-and-White Negative Film** (in Russian), I. I. Tregubova, *Tekh. Kino i Televideniya*, 5: 18-27, June 1961. Harrow Abstracts, 1961.

One of the difficulties of inserting lengths of dupe negative into an original motion-picture negative is that of matching the tonal characteristics. A method is described in which, given the characteristics of the materials and the conditions of printing, the processing of the dupe negatives can be specified by the application of graphical methods.

#### PROJECTION

**The RS-35 Stand Projector for Demonstration Films** (in Russian), S. Verlinskiy and L. Kirnos, *Kinomekhanik*, 5: 32-34, May 1961.

The stand projector described consists of a projector provided with a continuously operating cassette taking 200 to 250 m of film, a mirror system, and a polyvinyl-chloride screen of dimensions 575 by 430 mm. The construction of the unit is briefly described.

#### SENSITOMETRY

(Apparatus and Chemicals)

**A Recording Microphotometer with Automatic Conversion of Negative Densities into the Corresponding Intensities** (in Russian), L. M. Kotlyar, *Astron. Zhur.*, 37: 888-896, No. 5, 1960; *Referat. Zhur., Fiz.*, Abstract No. 6G221, 1961.

This apparatus measures photographic density and transforms the value so obtained into intensity with the aid of the characteristic curve of the photographic layer, introduced previously into the apparatus. The basis of the instrument is a nonrecording MF-2 microphotometer in which the light receiver is exchanged for a photoelectric cell and the carriage shift is operated by a synchronous motor. For measuring photocurrents, transforming, and recording them, the automatic electronic recorder EPPV-51 is used. The action of this is based on the compensation of the measured current with the aid of the automatic displacement of a precision slide wire. Since under normal conditions the uniformity of the scale of recorder is given by a linear law for the voltage distribution along the wire, the transformation of the scale into a nonuniform one with a law of variation corresponding to the given characteristic curve is obtained simply by changing the given slide wire

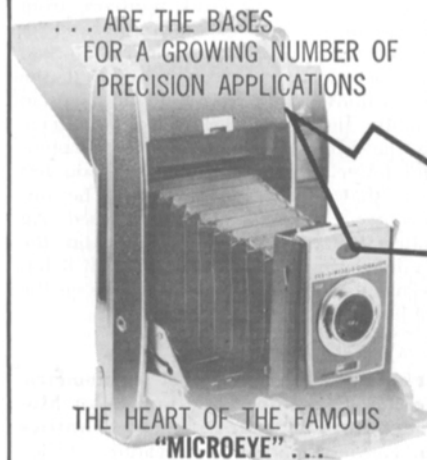
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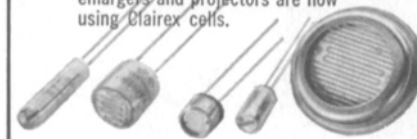
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for another with a different potential distribution law. The interchangeable slide wire consists of 20 portions with controlled resistances (by switching interchangeable resistances into parallel with each of them); thus the characteristic curve approximates to a broken line in the form of a collection of a number of straight-line portions. Examples are given of records of density and intensity so obtained.

**The Problem of the Quality of Motion-Picture Images** (in Russian), I. B. Blyumberg, T. M. Zyazina, T. A. Kïller and G. I. Teregulov, *Tekh. Kino i Televideniya*, 5: 25-29, Aug. 1961.

Tests have been made on the quality of a series of motion-picture positives, from the point of view of sharpness and of graininess, critical values being worked out for each. It is concluded that the Soviet films studied were quite adequate in quality. Increasing the size of the image on the screen calls for greater sharpness and lower graininess, but in a ratio less than that of the enlargement. The importance of these factors is discussed. An editorial note casts some doubt on the findings of this paper but states that it has been published to arouse discussion on the subject.

**Results of a Comparative Sensitometric Test of Black-and-White and Color Motion-Picture Films in Different Countries** (in Russian). (See under heading "Color Photography and Color Development.")

## SOUND RECORDING AND REPRODUCTION

**Deformation of the Symmetrical Transversals in the Sound-Recording Process** (in Hungarian), Barma Jamas, *Képes Hang. Technik*, 6: 129, 1960.

The deformation of the symmetrical transversals of the sound-recording process in relation to the properties of raw materials used in the photosensitive product, and the parameters selected for obtaining photographs are discussed. Experimental data determines that the vector model, in which a degree of error in the values  $a_0$ , and  $a$ , and in cases in which the correlation for relative values of sharpness corresponds to  $1.00 A_p/A \geq 0.80$ , is in conformity with the effect. The higher harmonic components exhibit a qualitative conformity with the model. The vector model stands on the basis of the geometric form of signal which is proportional to the measurable (photometric) signal and is readily convertible. Although the model in certain cases deteriorates from the effect, still the vector model turns out to be better than A. Narath's screen model. An important qualitative deduction can be abstracted with its assistance.

## TELEVISION

**Sensitometric Testing of Motion-Picture Films Under the Conditions of Recording Television Pictures from the Kinescope**

Screen (in Russian), A. A. Gol'din, *Tekh. Kino i Televideniya*, 5: 34-37, June 1961.

The method of testing motion-picture films for kinescope recording by photographing the image of a step wedge formed on the kinescope screen is not reliable, and a method of sensitometry is suggested in which an optical step wedge is placed over the screen of a kinescope operating with an unmodulated beam to form a sensitometric test object. The results of tests on a number of Soviet kinescopes and films by this method are discussed.

**A New Motion-Picture Projector with Optical Compensation for Television Transmission of Color Films** (in Russian), A. N. Tarasov, *Tekh. Kino i Televideniya*, 5: 43-50, July 1961.

The circuit and constructional details of the KNT-10 Soviet-made motion-picture projector with optical compensation, for television transmission of color films, are discussed. It is a development of the earlier KNT-5 Projector (*Tekh. Kino i Televideniya*, 11-23, May 1958.)

**Color Television Projection Receivers** (in Russian), L. L. Shvernîk, *Tekh. Kino i Televideniya*, 5: 15-24, Aug. 1961.

Descriptions are given of the design and performance of projection-type color television receivers for domestic and public use, made in the research institute of the Ministry of Communications of the U.S.S.R.

**Diversity Effects in Spaced-Antenna Reception of Tropospheric Scatter Waves** M. Hirai, *Jour. Radio Research Labs*, 8: Nos. 38/39, 301-329, Sept. 1961.

This paper describes theoretical considerations about amplitude correlation between signals received on spaced antennas in tropospheric scatter propagation beyond the horizon and shows that the above theoretical values coincide fairly well with the experimental data. Relating to this theoretical consideration, a new general formula expressing the received signal power in tropospheric scatter propagation is derived taking the directivities of both transmitting and receiving antennas into consideration, and also the correlation of angle-diversity reception in tropospheric scatter propagation is discussed theoretically as a byproduct.

**Results of Long Experiments on Long-Distance (1,100 km) Propagation in VHF Bands** K. Tao, J. Asai, A. Sakurazawa, K. Sawaji and M. Yamaoka, *Jour. Radio Research Labs*, 8: Nos. 38/39, 331-349, Sept. 1961.

In connection with the IGY, with the cooperation of the NBS Boulder Laboratories, U.S., experiments were carried out on the emission  $A_0$  49.68 mc/s transmitted from Okinawa and received at Yonago (distance: 1,100 km) from December, 1957, through September, 1959. This paper reports the results of statistical adjustment of the long-period data on seasonal and diurnal variations of signal intensities, and the relation of  $f_oE_s$  with the sporadic -E propagation wave, etc.

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