The Documentary Tradition: From Nanook to Woodstock

By Lewis Jacobs. Published (1972) by Hopkinson and Blake, 329 Fifth Ave., New York, NY 10016. 530 pp. + Preface, Table of Contents. Illus. 6 by 9 in. Paperbound. Price $5.50. (Clothbound edition, Price $10.00).

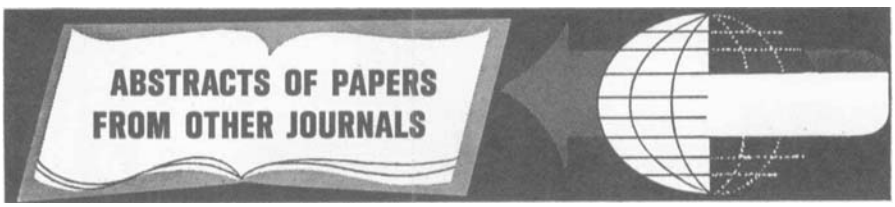
The writings (reviews, essays, selections from books, interviews, program notes and evaluations of 91 directors and critics) have been selected and arranged chronologically by Lewis Jacobs for a remarkable survey of the development of the documentary film. Mr. Lewis has provided a Preface, an introductory essay and an introduction to each of the five sections into which the book is divided. In the introductory essay ("Precursors and Prototypes (1894–1922")) he notes that "The earliest hint of the character of the documentary was evident in the very first motion pictures projected on a screen, W. K. L. Dickson's *Record of a Sneeze* (1894) . . ." Frames of the *Record of a Sneeze* (which is exactly that—the record of the sneeze, from beginning to end, of a mustachioed middle-aged Victorian type, is used a frontispiece. In an odd sort of way it is remindful of some of the Andy Warhol "documentaries."

The five sections of the book and the introductions by Mr. Jacobs are: 1922–1930, "The Feel of a New Genre"; 1930–1940, "From Innovation to Involvement"; 1940–1950, "The Military Experience and After"; 1950–1960, "The Turn Toward Conservatism" and 1960–1970, "Documentary becomes Engaged and Vérité."

The study of the development and influence of the documentary genre depends for its effectiveness (and "vérité") on selection — selection of the reviews and criticisms contemporary with the release of the films under discussion. Each piece of writing in the anthology provides insight not only into the particular film or films under discussion but into a particular culture — a particular time and place in history.

Some of the pieces are as short as three paragraphs (e.g., Judith Crist's review of *To Die in Madrid*) and some as long as 20 pages (e.g., "Thirty Years of Social Inquiry," an interview with Willard Van Dyke (one of America's leading documentary filmmakers) reported by Harrison Engle.)

The selection of these writings to provide a coherent picture of the development of the documentary film and its relation to the cultural and social changes taking place in this country includes a wide range of material, some of it from privately published pamphlets and from little magazines long out of print. A selected list of documentary films made during the particular period is given at the end of each section. A selected Bibliography and a list of principal producers of documentary films are given at the end of the book.—*Edit.*



Abstracts of papers appearing in other journals chosen for their importance and possible value to researchers, as well as those of timely interest, are published in the *Journal* from time to time. Many translations of abstracts from foreign journals, chiefly those of the USSR, are made available to the *Journal* by the Research Laboratories of the Eastman Kodak Company. As a rule, translations are made of the abstracts and not of the papers. The journals in which the papers appear can be consulted at some libraries. Current issues of *Tekhinika kino i Telvidinya* can be consulted at, or borrowed from the Society's Headquarters Office.

Those requiring definitive and thorough searches of current literature and patents are referred to *Abstracts of Photographic Science & Engineering Literature* (*APSE*), produced by the Graphic Arts Research Center, College of Graphic Arts and Photography, Rochester Institute of Technology, Rochester, NY 14623, with the editorial cooperation of the Society of Photographic Sciences & Engineers.

The subject areas are grouped below:

Holography
Light Sources
Optics
Photographic Theory and Materials
Projectors
Sound Recording and Reproduction
Special Applications
Television

HOLOGRAPHY

The influence of the properties of a photographic material on the quality of an image reconstructed from a hologram (in Russian), V. N. Sintsov. *Zh. Nauch. i Prikl. Fotogr. i Kinematogr., 15:* 379–386, No. 5, Sept./Oct. 1970.

A review of the effect of the photographic properties of the recording material on the quality of picture reconstructed from a hologram is based on a survey of the literature. (Bibliography of 63 references.)—S.C.G.

Statistical distribution of irradiance in the creation of a hologram, David Vilkomerson, *Jour. Opt. Soc. Am., 61:* 929–941, July 1971.

The distribution of irradiance on the hologram plane during the creation of holograms of physical objects (toy trains, etc.) is shown to be described by the noncentral chi-squared distribution. The method of calculation of the irradiance distribution from the ratio of reference-beam to object-beam powers is presented, and irradiance distributions for several different beam ratios are shown. From these distributions, the relation between nonlinearity of recording and holographic efficiency can be deduced, given the response characteristics of the hologram-recording material.

LIGHT SOURCES

Apparatus with quartz-halogen lamps for motion-picture lighting (in Russian), V. E. Sokolova, G. A. Golostenov and G. L. Irskiĭ. *Tekh. Kino i Televideniya, 14:* 34–40, Sept. 1970.

The advantages of quartz-halogen (tungsten-halogen) lighting for motion-picture studio work are discussed and an account is given of Soviet-made apparatus using lamps of this type.—S.C.G.

An explosion lamp (in Russian), A. E. Boĭtenko, E. P. Matochkin, and A. F. Fedulov. *Priborȳ i Tekh. Eksp.*, 201–203, No. 2, 1970; *Ref. Zh., Fotokinotekhnika*, Abstract No. 7.46.75, 1970.

A plasma light-source of the explosion type is described. It has a temperature of 2×10^4°K, it illuminates an area of about 300 cm², and the duration of the light is about 40 ms. The working gas is air. The explosion lamp is intended for the high-speed photography of rapid nonluminous processes.—S.C.G. (Translated from *Ref. Zh., Fotokinotekhnika*)

OPTICS

More about optical systems for production of large color separation negatives from small transparencies-optical illumination systems, Wakimoto Zenji. *Asian Printer, 9:* 25–30, No. 3, 1969, *Ref. Zh., Fotokinotekhnika*, Abstract No. 7.46.145, 1970.

Large magnifications from a small original may show objectionable grain. Of the three forms of illumination, condensed, diffuse-condensed, and diffuse, the last gives the least noticeable grain and also reproduces the widest density range. However it requires a larger exposure.—S.C.G. (Abridged from *Ref. Zh., Fotokinotekhnika*

A positive approach to the scratch and dig problem, Nathan T. Wilcox and Arthur F. Woodrow, *Image Technology, 12:* 23–25, Oct./Nov. 1970.

It has become apparent to the optical industry that current methods of scratch and dig evaluation are unsatisfactory. This situation is due, primarily, to (1) the subjectivity of procedures relying on unaided visual comparison and (2) standards that cannot be certified due to instability factors. We have developed a system of testing in which stable, standard reticles are employed. Certification of these reticles is traceable to the National Bureau of Standards. These reticles, as components in a hand comparator, can be utilized in a simple and reliable test.

Optimization of the thickness of the separate glasses of a wide-band correction filter (in Czech), L. Dabergerova. *Jemna Mechanika a optika, 15:* 40–42, No. 2, 1970; *Tekh, Kino i Televideniya, 14:* 78, Aug. 1970.

A least-squares method is described for the calculation of the thicknesses of the separate glasses constituting a correction filter. The method allows a color-correct-

ing filter with given spectral characteristics to be designed without laborious empirical tests.—S.C.G. (Translated from *Tekh. Kino i Televideniya*)

The calculation of the parameters of a focusing objective system (in Russian), G. V. Denisyuk. *Optiko-mekhanicheskaya Prom.*, 27–30, No. 12, 1969; *Tekh. Kino i Televideniya, 14:* 79, August 1970.

It is shown that the majority of systems of automatic focusing determine the best image plane of the objective by means of the deep scanning of the image of a subject with a fine-structured screen. The method of calculating the MTF of an optical system with a circular aperture is discussed, with reference to low spatial frequencies and large defocusing.—S.C.G. (Translated from *Tekh. Kino i Televideniya*)

A new GOST standard on anamorphotic motion-picture taking systems and attachments (in Russian), F. S. Novik. *Tekh. Kino i Televideniya, 14:* 67–68, July 1970.

The main provisions of the new Russian standard, GOST 9040-69, for anamorphotic lenses and attachments for motion-picture cameras, coming into force on July 1, 1970, are discussed.—S.C.G.

Depth of focus of objectives for the projection of 35mm motion-picture films (in Czech), M. Smejkal, *Jemnà mechanika a optika 15:* 1–4, No. 1, 1970.

As an example of the study of the depth of focus of two "Meostigmat" projection lenses by means of the modulation transfer function, it is shown that the use of this method for giving an objective criterion of the quality of an optical system requires the correct choice of frequencies for which the measurement is carried out. It is shown that complicated relations hold between the spherical aberration curve of the objective, in the calculation of which it is also necessary to choose the frequencies for studying the depth of focus.—S.C.G. (translated from *Tekh. Kino i Televideniya, 14:* 86, July 1970)

Light constructs an optical system (in Russian), A. N. Tikhonov. *Priroda*, 81–82, No. 9, 1970.

After a short explanation of the formation of tanned reliefs by the exposure of gelatin to light, a description is given of the formation of micro-lenses by this method.—S.C.G.

PHOTOGRAPHIC THEORY AND MATERIALS

Some photographic and physical-chemical properties of *2-* and *5-n*-alkyl homologues of *4*-oxo-*6*-methyl-*1,2,4*-triazolo-(*2,3a*)-pyrimidine (in Russian), V. M. Gorokhovskiĭ, Ya. A. Levin, I. P. Sotnikova, N. F. Rakova, V. V. Karunina and A. M. Galimova. *Usp. Nauch. Fotogr., 14:* 24–29, 1970.

A study has been made of the photographic and physical-chemical properties of 2- and 5-*n*-alkylderivatives of sta-salt (4-oxo - 6 - methyl - 1,2,4, - triazolo - (2,3a)-pyrimidine) with substitutents up to C_7H_{15} in the 2, and up to C_9H_{19} in the 5 position. All these compounds shortened the ripening of emulsions. Their stabilizing action decreased with concentration, but was still noticeable at a dilution which was greater the longer the alkyl radical. The action of the substances studied on an emulsion at the moment of addition varied; both an increase and a decrease in speed or fog were encountered, but as the length of the substituent was increased desensitization accompanied by suppression of fog became the predominant action, a property absent from sta-salt. A study of the adsorption of sta-salt homologues on a mercury electrode by oscillographic polarography showed that unlike sta-salt, which does not have oxidation-reduction peaks and steps in the capacity current in the region bounded by the anode wave of oxidation of Hg and reduction of the base solution, the homologues give desorption peaks in the region, the height of which grows with increase in the length of the substituent and correlates well with their desensitizing action. Such a correlation is evidence that deactivation of sensitivity centers is greater the stronger the adsorption of the substances. Determination of the acid dissociation constants of the homologues of sta-salt, and of the solubility products of their silver salts showed that both quantities decreased with increase in the length of the substituents, and the latter should also lead to progressive desensitization.—S.C.G. (Translated from *Usp. Nauch. Fotogr*).

The processes of aging and stabilization of photographic materials (in Russian), V. I. Sheberstov. *Usp. Nauch. Fotogr., 14:* 84–89, 1970.

A review is based on the author's work and data from the literature. It discusses some properties of organic stabilizers (structure, solubility constants of their silver salts and their adsorption of silver halides) and present hypotheses concerning the mechanism of the action of stabilizers and their depressing action on speed. Further consideration is given to the different types of aging of photographic emulsion layers, their kinetics and mechanism, and their dependence on a number of emulsion factors.—S.C.G. (Translated from *Usp. Nauch. Fotogr.*)

The synthesis of tetrazoles, triazoles, triazenes, and azo-compounds, and a study of their use as additiives in silver halide photographic emulsions. I. Synthesis, structure, chemical properties and photographic activity (in Russian), L. F. Avramenko, Yu. B. Vilenskiĭ, B. M. Ivanov, I. A. Ol'shevskaya, V. Ya. Pochinok, L. I. Skripnik, L. N. Fedorova, I. P. Fedorova. *Usp. Nauch. Fotogr., 14:* 5–11, 1970.

Over 300 organic compounds have been synthesized for testing as stabilizing and anti-fogging and also speed-depressing agents in silver-halide emulsions, and the results are summarized. Differences in the behaviour of the tetrazoles is ascribed to the presence of azido-tetrazole tautomerism, the azido form being adsorbed to the grain surface. A considerable number of stabilizers was observed among the triazoles. Several of these can be converted into cyanine dyes combining stabilizing and optical sensitizing properties. It was found that stabilizers must have three nitrogen atoms in a row, all in a ring, a condition fulfilled by the triazoles. Some triazenes are sensitizers for silver-chloride emulsions. These compounds are at the same time optical sensitizers, anti-foggants and depressants. In silver-bromide emulsions they show only the last two properties. Of the azo-compounds, only those with an asymmetrical structure with heterocyclic residues showed photographic activity.—S.C.G.

The synthesis of tetrazoles, triazoles, triazenes, and azo-compounds, and a study of their use as additives in silver-halide photographic emulsions. II. Photographic study of the compounds (in Russian), L. F. Avramenko, Yu. B. Vilenskiĭ, B. M. Ivanov, I. V. Kudryavskaya, I. A. Ol'shevskaya, V. Ya. Pochinok, L. I. Skripnik, L. N. Fedorova, I. P. Fedorova. *Usp. Nauch. Fotogr., 14:* 12–23, 1970.

Indices of stabilizing (St), anti-fogging (Af) and speed-depressing (Dp) activity were determined for the compounds discussed in Part I. (ibid. pp. 5–11). In addition, studies were also made on the kinetics of adsorption of the substances to the silver halide in silver chloride and silver iodobromide emulsions. For the condensed tetrazoles, a correlation was found between St and the irreversible adsorption, and between Af and Dp and the reversible adsorption. For complete stabilization irreversible adsorption needs to take place only on an insignificant portion of the silver-halide surface (probably the sensitivity centers or other points of increased adsorption potentials). Similar conclusions were reached in the case of stabilization by triazenes. Depression of fog is almost always connected with a retardation of the development of reversible adsorption, but in several cases it was accompanied by desensitization or restraint of ripening. Some correlations between molecular structure and the photographic activity of these classes of compound are discussed.—S.C.G.

The relation between the sign of the effect of an electric field and the contrast of a photographic emulsion (in Russian), Yu. F. Pevchev, *Zh. Nauch. i Prikl. Fotogr. i Kinematogr., 15:* 360–361, No. 5, Sept./Oct. 1970.

Previous work had shown that a pulsed electric field applied to an emulsion during exposure to light, either increased (positive effect) or decreased (negative effect) the developed density. This effect has been studied for a number of films of different types with contrasts ranging from <1 to 6. All films with a contrast of $\leqq 3$ gave the negative effect while those with a contrast of $\geqq 4$ gave the positive effect, in agreement with the supposition that the sign of the effect is conditioned by the density of sensitivity centres at the grain surfaces. One type of film, Mikrat Positive (a Soviet positive microfilm material), did not show the effect in either direction. No explanation has been found.—S.C.G.

The role of the electric field in the reversal effect in the photography or electric discharges at surfaces (in Russian) Yu. P. Danilov and S. A. Nenakhov, *Zh. Nauch. i Prikl. Fotogr. i Kinematogr., 15:* 365–367, Sept./Oct. 1970.

From experiments on single and repeated pulse discharges in the formation of

Lichtenberg figures on photographic emulsions, it is concluded that the photographic reversal observed in such figures is not influenced by the electric field, but is caused by the light produced by the discharge.—S.C.G.

The principal components of the characteristic curves of photographic materials. I. A study of the differences in characteristic curves (in Russian), V. V. Gavrik and I. M. Davȳdkin. *Zh. Nauch. i Prikl. Fotogr. i Kinematogr. 15:* 353–359, No. 5, Sept./-Oct. 1970.

The method of principal components has been used to study the different shapes of about 500 characteristic curves of domestic (i.e. Soviet) and foreign motion-picture materials of 70 types under processing in 20 developers, standard or recommended by the manufacturers, over a wide range of development times. It was found that the number of principal components describing the independent changes in shape of the characteristic curves of the materials in different groupings is equal to three. The sets of principal components so obtained are accurately equal with respect to linear transformation. Hence, taking into account the fundamental properties of the method, it follows that changes in the shape of the characteristic curves arise in all cases from the same causes. It was also found that the deduction of the values of the optical densities of fog and of the support from all the coordinates of each characteristic curve reduces the number of principal components to unity. It was possible to obtain universal principal components suitable for the description of practically any characteristic curve with the accuracy of their experimental measurement.—S.C.G. (Translated from *Zh. Nauch. i Prikl. Fotogr. i Kinematogr.*)

High-speed raster motion-picture cameras with high light-gathering power (in Russian), O. F. Grebennikov. *Zh. Nauch. i Prikl. Fotogr. i Kinematogr. 15:* 328–334, No. 5, Sept./Oct. 1970.

Methods are proposed for calculating the effective exposure, taking into account the diffraction and scattering of light in a light-sensitive emulsion. Recommendations are given for the choice of the optimal dimensions of the elements of a raster image which will give high light-gathering power with sufficiently large optical capacity and time resolving power.—S.C.G. (Translated from *Zh. Nauch. i Prikl. Fotogr. i Kinematogr.*).

The SFR high-speed unit for work in the visible and ultraviolet regions of the spectrum for raster, stereoscopic, and spectral photography (in Russian), A. S. Garnov. *Zh. Nauch. i Prikl. Fotogr. i Kinematogr. 15:* 346–350, No. 5, Sept./Oct. 1970.

The SFR unit is intended for the photographic recording of rapid processes in the visible region of the spectrum, operating as a high-speed camera with a speed of 2.5 million frames/s or as a streak camera with a time resolution of 2×10^{-8} s. Modifications have been carried out enabling photography to be performed at the same speeds in UV with wavelengths down to 200 mμ. A stereoscopic attachment allows

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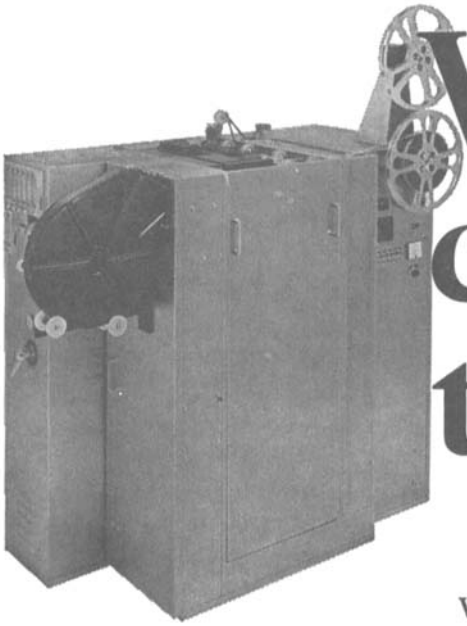

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stereo pairs to be obtained at speeds up to 1,250 frames/s with an optical base of 50 to 800 mm. Two spectroscopic attachments permit streak photography with simultaneous recording of the spectral composition of the radiation, with a time resolution of 2 $\times 10^{-8}$ s and a linear dispersion of up to 19 Å/mm. The spectrum of a phenomenon can also be recorded frame-wise at a frequency of 825,000 frames/s. A raster variant of the apparatus is a high-speed photomicrographic unit operating with frequencies up to 100,000,000 frames/s with magnifications of 1 to 100 ×.—S.C.G.

The measurement of the energy spectrum and the root mean square deviation of density of photographic layers (in Russian), V. G. Gimpel'son, A. I. Veitsman, and K. V. Vendrovskii. *Zh. Nauch. i Prikl. Fotogr. i Kinematogr., 15:* 387–394, No. 5, Sept./Oct. 1970.

A mathematical analysis of the energy spectrum and the root mean square deviation of density is based on the literature. It covers the effect of the measuring apparatus on the density fluctuation and the energy spectra; the measurement of the energy spectrum of the density fluctuations; the root mean square deviation of density and the energy spectrum; and errors in the measurements. (Bibliography of 17 references).—S.C.G.

The photography of 2.36 μ radiation with thin ferromagnetic films (in Russian), T. M. Murina, I. A. Pan'shin, B. M. Stepanov, and V. A. Fabrikov. *Zh. Nauch. i Prikl. Photogr. i Kinematogr., 15:* 376–377, No. 5, Sept./Oct. 1970.

Laser light with a wavelength of 2.36 μ can be recorded on thin ferromagnetic film with band domains, for purposes of determining the distribution of energy in the beam.—S.C.G.

The problem of the classification of electron-optical image converters (in Russian), I. V. Venatovskiĭ. *Zh. Nauch. i Prikl. Fotogr. i Kinematogr. 15:* 339–341, No. 5, Sept./Oct. 1970.

Image converters for use in the recording of rapid events can be classified according to the following criteria: (1) the number of multiplying cascades; (2) the mode of switching the accelerating potential; (3) the focusing of the electron flux; (4) the deflection and spreading of the photoelectrons; (5) the mode of operation (single-frame exposure, etc.) (6) method of fixing the information obtained (photographic, magnetic). The groupings obtained by the application of these criteria are described.—S.C.G.

Errors in the parameters of automatic cameras determining the densities of exposed frames (in Russian), R. Ya. Gorelik. *Zh. Nauch. i Prikl. Fotogr. i Kinematogr., 15:* 398, No. 5, Sept./Oct. 1970. (Abstract only. Full paper is deposited with All-Union Inst. of Scientific and Technical Information as No. 1871–70 Dep of 10.VII.1970).

Errors in the coefficient K of the exposure formula in cameras fall outside the tolerance limits. A method of calculating these errors has been developed, and upper and lower limits are set to the scatter of the coefficient K about its mean value. To a significant extent large errors in K are explained by lack of symmetry in the logarithmic scale of the tolerances on the magnitudes entering the exposure formula. It is proposed that the tolerance field should be shifted relative to the nominal value, without changing their values, so that the scatter field of the coefficient K should become symmetric with regard to its nominal value. Calculation shows that the probability of obtaining a coefficient K outside the limits in this case is reduced approximately from 17 to 1.5%.—S.C.G. (Translated from *Zh. Nauch. i Prikl. Fotogr. i Kinematogr.*)

The microphotometric graininess (granularity) of photographic materials exposed to ultraviolet radiation (in Russian), I. I. Breĭdo and K. P. Ermoshina. *Zh. Nauch. i Prikl. Fotogr. i Kinematogr., 15:* 370–372, No. 5, Sept./Oct. 1970.

In order to study the effect of the depth of penetration of the radiation on the granularity of a photographic material, a comparison has been made of the granularity produced by ultraviolet radiation, which is completely absorbed in the surface, and white light, which penetrates the whole of the emulsion layer. For the same processing conditions the ultraviolet exposures gave a lower granularity, but γ was also reduced. The same effect could be obtained with a white light exposure by reducing the time of development.—S.C.G.

The testing of color films with masks in the layers (in Russian), L. F. Arytushin, S. A. Bongard, N. F. Semenova and L. V. Grechko, *Tekh. Kino i Televideniya, 14:* 19–24, Sept. 1970.

The most complete color reproduction characteristics of a negative-positive process are obtained by "overall" color-separation testing (in which a test-object is printed onto the positive material *via* the negative). It allows the effectiveness of masking to eliminate color distortions to be evaluated in both the negative and positive stages of the process. For testing the processing of films intended for duping, and for determining the optimal conditions of processing and exposure, densitometric methods of comparative color-separation testing may be used. The simple method of measuring the ratio of the unwanted to wanted absorptions, by exposing through separate filters, is reliable and is recommended for the testing of the comparative characteristics of masking couplers. This method remains a necessary complement to the overall method—S.C.G.

Modulation transfer functions, R. Welch, *Photogrammetric Eng., 37:* pp. 247–259, March 1971.

The subject of modulation transfer functions (MTF's) of photogrammetric camera systems has received very little attention to date because of the complexity of undertaking the required measurements and the largely undemonstrated value of MTF's to the practical photogrammetrist. However, MTF analysis is used extensively in camera system design and can be expected to play an important role in the development of future photogrammetric camera systems. Consequently, in order to judge the improvements in image quality likely to result from new designs, it is first important to establish the MTF's of photogrammetric camera systems in current use and the relation of these MTF's to image quality. The practical considerations in determining MTF's include the design of targets, specification of photographic parameters and evaluation equipment, and the method of evaluation. Each of these considerations is discussed with particular emphasis given to an inexpensive but accurate graphical digital method of MTF analysis of the images of edge targets.

Measuring the high-speed single-shot capability of an oscilloscope/camera, R. A. Bell. *Electron Prod., 12:* 128–131, No. 8, 1969; *Ref. Zh., Fotokinotekhnika,* Abstract No. 7.46.219, 1970.

A criterion of the efficiency of the oscilloscope-camera-film system in the recording of rapidly occurring processes is needed if it is to be possible to measure the velocity of displacement of the light spot. This property of the system depends on the oscilloscope data (structure of the electron beam, type of screen coating, after-glow intensity, focusing, spot size, electron beam density), camera data (relative aperture of the objective, and its resolving power, subject distance, focal length), and film data (time of preparation, speed, fog density, temperature and time of exposure). Hence in ascertaining the recording speed it is necessary to start with the concrete situation, the type of oscilloscope, camera, and film. For determining the writing speed of the system, the photography of constant and decaying sinusoidal oscillations, single pulses and triangular (saw-toothed) oscillations have been recommended. Formulae are derived for the calculation of the recording speed for all forms of photography, and nomograms are given to simplify the calculations. The simplest method is to photograph decaying sinusoidal oscillations, since the change in amplitude of the signal within the limits of one photograph allows the number of necessary exposures to be reduced, and also saves the time spent on them.—S.C.G. (Translated from *Ref. Zh., Fotokinotekhnika*).

Stereo-scan and Fax-film pictures on the surface of cast-iron motor cylinders (in German), H. Brosinsky. *Tech. ZentBl. Prakt. Metallbearb., 64:* 6–10, No. 1, 1970; *Ref. Zh., Fotokinotekhnika,* Abstract No. 7.46.213, 1970.

A comparative analysis has been made of microphotographs of the internal surface of the cylinder of internal-combustion engines, made on Fax film by the usual method and by a stereoscopic scanning method (in both cases with magnification of 130, 1300, and 3900 times). Two series of pictures were made for engines classed as good and bad during the mutual working-in of the cylinder and piston. In the good cylinder the dark lines on the normal photograph, and the corresponding bright lines on the stereo-scan pictures, were short and lay across the honing lines. In the bad cylinder these lines were of some length and lay along the honing lines.—S.C.G. (Translated from *Ref. Zh., Fotokinotekhnika*)

Infrared photography, Anon., *Test. Instrum. Controls, 6:* 9–13, No. 10, 1969; *Ref.*

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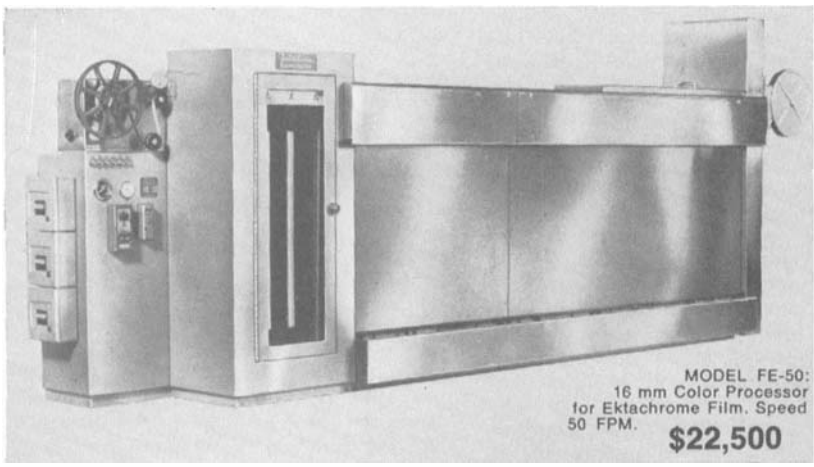

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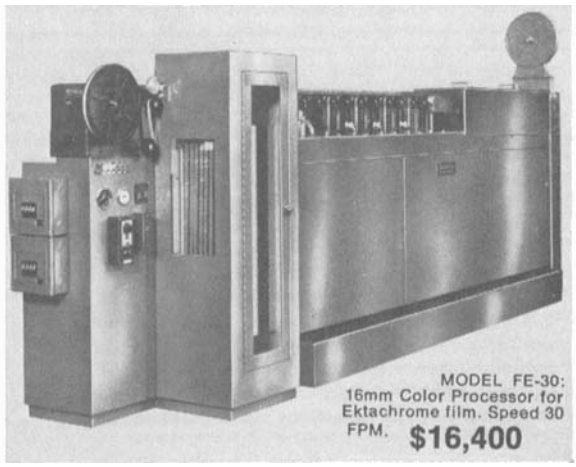

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Zh., Fotokinotekhnika, Abstract, No. 7.46.227, 1970.

Methods and equipment are described for infrared photography for the testing of thermal insulation of structures without dismantling them. Photography is carried out with an ordinary camera and special film or with a Polaroid type material sensitive to the infrared in the region of 0.7–0.86 μm. More recent methods such as thermography with a scanning radiometer are also described.—S.C.G. (Abridged from *Ref. Zh., Fotokinotekhnika*)

Increased application potential for stroboscopes, Anon., *Prod. Des. Engng, 9:* 36–40, 1970; *Ref. Zh. Fotokinotekhnika*. Abstract No. 7.46.76, 1970.

The recent growth in the importance of stroboscopic investigations is noted, and a report is given on a number of news troboscopes designed by Strobe Automation. Simple in construction, the model 6P has a frequency of 6000 flashes/min, with an accuracy of ±2%. In model 15K a 10-W xenon lamp is used, working with a frequency of 15,000 flashes/min. At frequencies up to 6000 flashes/min the accuracy of measurement by means of a special device is 0.2%. Powerful stroboscope lamps working up to 40 W, special stroboscopes containing four lamps with light energies of 50 J, and also a 4-lamp stroboscope with 20-W lamps have been designed. The light energy available in each flash is determined by the capacity of discharging condensors, by the magnitude of the charging voltage, and also by the frequency and duration of the sparks. The most important characteristics of the stroboscopes are given, including curves for the change in energy of the flashes in relation to the frequency of the latter. Possibilities in the use of stroboscopes for streak photography and cinematographic methods for the solution of scientific and technical problems are pointed out.—S.C.G. (Translated from *Ref. Zh. Fotokinotekhnika*)

A sensitometer for measurement of reciprocity failure in vacuum and gaseous mixtures with controlled temperature and humidity, T. A. Babcock, W. C. Lewis and T. H. James, *Phot. Sci. and Eng., 15:* pp. 75–81, Jan./Feb. 1971.

A sensitometer has been constructed which allows complete control of the environment during a photographic exposure. The reciprocity characteristics of photographic films can be examined largely free from complicating atmospheric factors such as oxygen and water. Gaseous mixtures and water can be added or the temperature modified in order to study the individual or combined effects of these variables. The main parts of the sensitometer are the vacuum system, the gas inlet system, and the "sensitometer head." The latter consists of a sample holder which can be moved into contact with a step table, for exposure, then rotated to a new sample position, and the procedure repeated. Up to 18 16mm film strips can be exposed in any given run with control of temperature, relative humidity, and gas composition of the environment. Typical reciprocity curves are reproduced to illustrate the usefulness of this apparatus in examining latent-image formation.

Data processing for automatic printer control, L. B. Happé, *British Kinemat. Sound and TV, 52:* 92–97, April 1970.

In any cinematograph film printing process it is necessary to make changes in the printing conditions at specific positions along the length of the reel. The most common example of this is the requirement to alter the printing light at each scene change to correct for the variations of negative density from scene to scene so as to produce a uniformly graded copy, an operation which is basic to all laboratory processing. Where a number of release prints are to be made from the same reel of negative with the same series of printer light changes it is obviously most desirable to be able to set up a fixed program for that negative so that copies can be made rapidly and efficiently.

A comparison of optical and electronic correlation techniques, Daniel C. Kowalski, *SPIE, 8:* 47–55, Jan. 1970.

Present automatic stereocompilation instruments use electronic correlation techniques to match conjugate image areas in stereo photographs. Recent studies have demonstrated the possibility of performing the same task by means of coherent optical processing. This paper compares the merits and constraints of the two approaches. Each correlator system is described with particular emphasis on how control signals for precise automatic image registration and deformation correction can be generated and applied in the optical correlation system. It is concluded tht automatic optical image correlation offers advantages over its electronic counterpart in simplification of the correlation computer and the ability to handle high photographic density. However, further work is needed to achieve optically the flexibility available with the electric correlator.

Resfilm '70, Michael S. E. Downing, *British Kinemat. Sound and TV, 52:* 374–377, Dec. 1970.

The use of strobelighting in the optical analysis of oil—the problem methods and results achieved when presented with an oil slick 16-thousandths of an inch in diameter and 50 microinches thick.

Modulation transfer function of achromat and apochromat lenses of the type of the Tair-3 and Apotair-1. R. A. Kraskovskiĭ. *Optiko-mekh. Prom.*, 77–78, No. 1, 1970.

Modulation transfer functions are given for an ideal objective, an achromat and an apochromat, and also for the compound system of lens and film, showing the influence of chromatic correction on the quality of the photographic image. It is concluded that an apochromat can be used both in all regions of the spectrum (for colour photography) and for separate spectral regions; in the latter case it replaces several achromats, each corrected for an appropriate part of the spectrum. This may be of positive value for color television, since it allows a single objective to be used in all three channels.—S.C.G. (Translated from *Tekh. Kino i Televideniya, 14:* 87, July 1970)

A study of image quality in continuous optical printing (in Russian), I. S. Golod. *Tekh. Kino i Televideniya, 14:* 36–41, July 1970.

The factors affecting the image quality in the continuous optical printing of motion-picture films are analyzed by means of the modulation transfer function. The main influence of the MTF is the motion of the image, which is proportional to the difference in shrinkage of the films, the height of the printing gate and the magnification of the printing lens. The image obtained with continuous contact printing is considerably better than that from continuous optical printing when the magnification is equal to unity, but optical printing is better when the magnification is less than unity, with optimum results at a magnification of 0.25. Loss of image quality due to differences in the shrinkage of the films was less in the case of optical printing.—S.C.G.

Some points in the stabilization of neutral highly dispersed emulsions (in Russian), K. S. Lyalikov, N. N. Yaroslavskaya, and L. P. Govorkov. *Usp. Nauch. Fotogr., 14:* 97–103, 1970.

In working on a uniform, ultra-high dispersion, neutral emulsion of the high-resolution type (average grain diameter about 0.03 μ) the question of its stabilization arose. The basic difficulty in the stabilization of such an emulsion consists in the prevention of recrystallization of the emulsion with the appearance of bidispersity of the grains. It was found that in the absence of sta-salt [4-oxo-6-methyl-1,2,4-thiazolo-(2,3a)-pyrimidine] a very insiginificant concentration of bromide (pBr = 6.4) was sufficient to produce bidispersity in a thermostatically aged emulsion, together with a sharp change in the photographic properties (a fall in gamma and an increase in speed). The introduction of 2.61×10^{-5} mole of sta-salt per litre of emulsion completely stopped recrystallization, even with considerable concentrations of bromide. A concentration of KBr of 2×10^{-3} mole/-litre was optimal from the point of view of the keeping properties of the emulsion with the above-mentioned concentration of sta-salt, the final pBr of the emulsion being 3.8–4.0; the same values also hold for a panchromatically sensitized variant of the emulsion under study. A study was also made in the latter of the stabilizing action of antioxidants (pyrocathechol, α-naphthol), which, however, gave negative results.—S.C.G. (Translated from *Usp. Nauch. Fotogr.*).

The synthesis of photographic emulsions with high values of pBr, in order to increase their stability (in Russian), N. V. Makarov and A. V. Nobedinskaya. *Usp. Nauch. Fotogr., 14:* 90–96, 1970.

An increase in the storage life of photographic materials, especially those for the infrared region of the spectrum, is connected with an increase in their pBr, the best results being given by emulsions in which the increase in pBr is brought about not in the emulsion making, but before the beginning of second ripening (digestion). However, a number of special conditions are required in carrying out the digestion. Three of these have been studied in the present paper: the concentration of thiosulphate, sulphite and thiocyanate. It was found that the influence

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of the first on emulsion speed is complicated as the concentration of thiosulphate increases S_{max} increases at first and then decreases, while to obtain a high value of S_{max} needs a smaller concentration of thiosulphate the higher the pBr of the emulsion. However, even a raised concentration of thiosulphate can give a high value of S if sulphite is introduced into the emulsion (before or after digestion), although at the optimum concentration of thiosulphate the introduction of thiosulphite does not give such an effect and only accelerates digestion, the final speed remaining unaltered. It was found that the presence of thiocyanate is also of significance for raising S, and its concentration should be smaller the higher the pBr.—S.C.G. (Translated from *Usp. Nauch. Fotogr.*)

The theory of the photographic reproduction of colors (in Russian), L. F. Artushin and N. S. Ovechkis. *Usp. Nauch. Fotogr., 15:* 244–256, 1970.

This is the first review in the literature of Soviet studies in the theory of the photographic reproduction of color. Methods of testing color separation and gradation, and of spectral and colorimetric research, and problems in the theory of color correction in photography and telecinematography are discussed. Consideration is given to the psychological aspect of the theory of color reproduction and color correction. Bibliography of 71 references.—S.C.G. (Translated from *Usp. Nauch. Fotogr.*).

PROJECTORS

An amateur projector for two film formats (in Russian), V. N. Misnikevich, *Tekh. Kino i Televideniya, 14:* 69–70, Sept. 1970.

A description is given of the "Rus'" motion-picture projector which is intended to take both normal 8mm and super-8 films during the interim period while the latter is being introduced into the USSR.—S.C.G.

Semi-automatic and universal shutters for motion-picture projectors (in Russian), V. B. Mun'kin and R. A. Kumantseva *Tekh. Kino i Televideniya, 14:* 19–24, July 1970.

The optimum characteristics for the electrical drive of a shutter for the automation of transfer from one projector to another are discussed. A description is given of a shutter for use with automated film exhibition systems.—S.C.G.

SOUND RECORDING AND REPRODUCTION

Features of multitrack recording consoles, D. Swettenham, *Brit. Kinemat. Sound and Telev., 53:* 148, 153–154, May 1971.

Multitrack recording has been developed so that by the simultaneous recording of separate sections of an orchestra on individual tracks it is possible to re-combine them later in any desired manner. The sound console designer aims at the greatest possible flexibility without unreasonably complication.

This is where practical mixing experience is of great value, in order to incorporate desirable features but, at the same time, to avoid undue multiplication of facilities some of which may never be used.

A wideband miniature microphone, Mead C. Killion and Elmer V. Carlson, *Jour. Audio Eng. Soc., 18:* 631–635, Dec. 1970.

Microphones intended for speech communication systems have traditionally had a response which was purposely limited to the speech frequencies. Although such a response may maximize speech perception under adverse conditions, it does not sound "natural." A new microphone small and rugged enough to be used in headworn hearing aids has been designed with a smooth response from 50 Hz to 8kHz.

A mechanical disc recording and reproducing system with high storage density and high rate of transmission, Gerhard Dickopp, Hans-Joachim Klemp, Horst Redlich, and Eduard Schueller, *Jour. Audio Eng. Soc., 18:* 618–623, Dec. 1970.

A record is described with a storage density 100 times greater than that of the usual stereo LP record. The new reproducing process enables the mechanical replay of signals within the MHz range. The system can be used for the transfer of television programs or multichannel sound recordings.

Design of a probe-tube adapter for use with a 1-in condenser microphone, Alfred B. Copeland and David Hill, *Jour. Acoustical Soc. Am., 48:* 1036–1039, Nov. 1970.

A probe-tube adapter for use with a 1-in condenser microphone has been developed. The greater sensitivity of the 1-in condenser microphone provides a means for measuring the sound-pressure level of pure tones generated in the human ear canal by application to the cranium of bone-conducted tones. The greater sensitivity is particularly useful in the frequency range below 300 Hz.

The standardization of sound reproduction in cinemas and control rooms (in Russian), L. Ljungberg. *Tekh. Kino i Televideniya, 14:* 25–34, July 1970.

(Russian version of a paper which appeared in *Jour. SMPTE, 78:* (1046–1053, Dec. 1969)

Console unit for the re-recording of monophonic soundtracks with 10 inputs (in Russian), T. P. Chernȳsheva, *Tekh. Kino i Televideniya, 14:* 15–19, July 1970.

A description is given of a re-recording console intended for use in Soviet motion-picture studios.—S.C.G.

SPECIAL APPLICATIONS

The planning and commissioning of a communications satellite earth station and its integration with existing telecommunications systems, N. Wheatley, *Radio and Electronic Eng., 40:* 241–254, Nov. 1970.

The growth of the INTELSAT system of satellite communications is recalled and the considerations for on-site planning are discussed in the context of the construction of the earth station at Bahrain, Abrabian Gulf, in 1969. The relationship of other wideband systems in the Gulf is described, along with the resultant growth of traffic in an area where the demand had been suppressed due to the limitations of narrow-band high-frequency outlets.

TELEVISION

B.B.C. Test chart 57, a new gray-scale reflectance chart for color cameras, S. J. Lent, *Radio and Electronic Eng., 41:* 206–212, May 1971.

The design considerations and use of a new gray-scale reflectance chart for color cameras are discussed in relation to some of the parameters of a color television system. The construction of a prototype chart based on the new design specification is described.

Application of insertion test signal techniques to television transmission chain operation, D. C. Savage and D. A. Carter, *Radio and Electronic Eng., 41:* 183–191, Apr. 1971.

This paper discusses the advantages to be obtained from insertion test signal techniques. Consideration is given to the types of distortion which need to be measured and the consequent requirements of the test signal waveform. Methods of measurement are discussed and typical results obtained in practice are shown. Probable accuracy of measurement is considered and the paper concludes with a suggestion of some possible future developments.

A new equipment for the measurement of video noise, F. H. Wise, *Radio and Electronic Eng., 41:* 237–240, May 1971.

Describes a video noise measuring equipment which has been developed to meet the needs of a television broadcasting organization. The various measuring techniques available for this purpose are reviewed and the chosen mehod, which employs a sampling technique, is fully described. Details are then given of the practical design together with some remarks on its use.

Horizontal aperture equalization, A. N. Thiele, *Radio and Electronic Eng., 40:* 193–212, Oct. 1970.

An electrically symmetrical compensating response is necessary to restore fine detail lost in television scanning processes, due to the spot or slit not being infinitely small. Several types of aperture equalizer are described, one of which, by using a linear-phase low-pass filter to simulate a delay line, is claimed to make possible a high degree of precision.

Solid-state television receivers — a pattern of second generation design for monochrome and color, P. L. Mothersole, *Radio and Electronic Eng., 40:* 5–13, July 1970.

Semiconductor technology has now reached a point where high voltage transistors, integrated circuits and thristors may be used with confidence in consumer equipment. In this paper solid-state monochrome and color receivers are described that exploit the latest semiconductor devices to provide receivers of a high performance standard.

For horizontal deflection, high-voltage transistors are used and regulation is obtained by the use of a thristor employed as a phase-controlled rectifier in the power supply. Integrated circuits are extensively employed in both receivers, typical applications being for sound amplification, in the video signal processing sections and in the RGB matrixing and demodulator circuits of the color receiver.