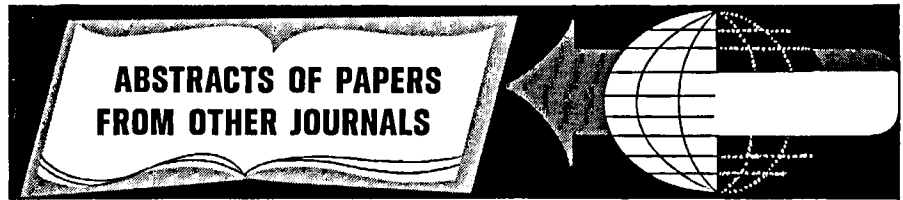


pertaining to mechanical and electrical engineering. It is more a practical guide than a textbook on the subject — a small handbook of 127 pages with some 50 illustrations and two dozen tables concerned with fundamentals in the four main fields of heating, plumbing, electric power including lighting, and vertical transportation.

The book is a reprint of four chapters taken without change from the book *Building Construction Handbook*, (2nd ed.), edited by the same author, in which each chapter was written by an expert in his field. The authors of these chapters are: Tyler G. Hicks (Plumbing and Sprinkler Systems), Frederick S. Merritt (Vertical Transportation), Ralph Torop (Heating and Air-Conditioning) and Charles J. Wurmfeld (Electric Power and Lighting).

Architects and engineers connected with the design of radio, television and motion-picture buildings may be disappointed in not finding in the book any mention of noise and vibration control. The proper functioning of such buildings depends not only on the provision of interior climatic comfort but also on the establishment of satisfactory acoustic conditions, that is, quietude and absence of objectionable mechanical vibrations — *Michael Rettinger*, Consultant on Acoustics, 5007 Haskell Ave., Encino, Calif. 91316.



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 *Tekhnika Kino i Televidinya* 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 Engineering Index, Inc., 345 E. 47 St., New York, N.Y. 10017, with the editorial cooperation of the Society of Photographic Scientists & Engineers. The subject areas are grouped below:

Aerial Photography
Cameras

Cinematography
Film and Its Properties
General
Instrumentation and High-Speed
Photography
Laboratory Practice
Optics
Photographic Theory and Materials
Sound Recording and Reproduction
Special Applications
Television

AERIAL PHOTOGRAPHY

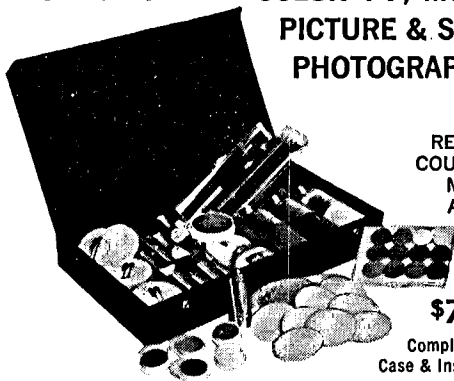
Multispectral color aerial photography, Prof. Edward F. Yost and Sondra Wenderoth, *Photogrammetric Eng.*, 33: 1020-1040, Sept., 1967.

A camera has been constructed to obtain multispectral photography in four bands in the 360 to 980 nm. portion of the spectrum. Photointerpretation is accomplished on a companion viewer which presents a composite color rendition of the four photographs by additive color techniques. This camera-viewer system combines spectro-

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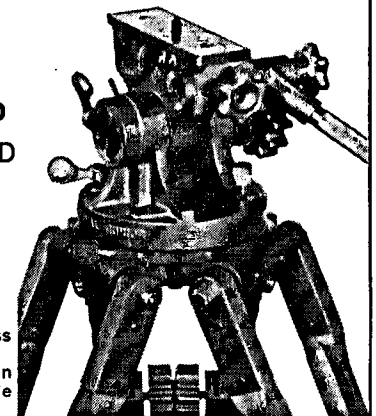


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KODAK Film	Color Sensitivity	Applications and Special Properties	Base Thickness and Type	Backing	Photo-recording Sensitivity and ASA Speed
2490 RAR (ESTAR Base)	Blue	For oscillography (mercury, xenon); modulated glow-tube (argon) recording; seismic recording (variable area or density); and CRT recording with blue-emitting phosphors (P5, P11, P16).	4-mil polyester	Dyed gel	64
2492 RAR (ESTAR Base)	Ortho	For oscillography (tungsten); fluoroscopy; hydrogen-bubble chamber photography; high-speed photography; and CRT recording with green-emitting phosphors (P1, P2, P15, P24, P31).	4-mil polyester	Clear gel	160
2479 RAR (ESTAR-AH Base)	Ext. Red Pan	For outdoor and artificial-light (all sources) photorecording; oscillography (all sources); modulated glow-tube (neon) recording and CRT recording with all types of phosphors.	4-mil polyester	Clear, fast-drying	650 (ASA 400)
2496 RAR (ESTAR-AH Base)	Reversal Processing	For artificial-light (all sources) and outdoor photorecording; cloud-chamber photography; modulated glow-tube (neon) recording; and CRT recording with all types of phosphors (especially white and orange—P4, P7, P12, P14, P20, P22).	4-mil polyester	Clear, fast-drying	160
	Negative Processing				125 (ASA 80)
2498 RAR (ESTAR-AH Base) (5498 RAR)	Reversal Processing	High speed for photorecording with all types of light sources (daylight, artificial light, electronic flash) especially when the illumination level is low. Reversal-processed films have very good projection quality. 2498 RAR Film has an antihalation coating under the emulsion to enhance sharpness and minimize halation. 5498 RAR Film has medium resolving power, extremely fine granularity, and very high acutance.	4-mil polyester (5498: 5¼-mil triacetate)	Clear, fast-drying	320 (5498: 250)
	Negative Processing				250 (ASA 250)
LINAGRAPH Recording (ESTAR Base and ESTAR Thin Base)	Blue	For oscillography (mercury, xenon); seismic and modulated glow-tube (argon) recording; well logging; and CRT recording (P5, P11, P16). Thin base for maximum footage per load.	2½- and 4-mil polyester	Dyed gel	32
LINAGRAPH Drift Survey	Ortho	For drift-survey cameras and photoclinometers. Will withstand 300 F temperature for up to 2 hours during the exposure run.	5¼-mil triacetate	None	6
LINAGRAPH Ortho	Ortho	For oscillography (tungsten); fluoroscopy; hydrogen-bubble-chamber photography and CRT recording with green-emitting phosphors (P1, P2, P15, P24, P31). Also available on gray base.	5¼-mil triacetate	None	400
LINAGRAPH SHELLBURST (ESTAR-AH Base)	Ext. Red Pan	For cinetheodolite photography of aerial objects against a blue- or white-sky background and for cloud-chamber and hydrogen-bubble-chamber photography.	4-mil polyester	Clear, fast-drying	200
2475 Recording (ESTAR-AH Base)	Ext. Red Pan	For all types of photorecording and police science photography when weak illumination, extremely short exposure times, or high writing speeds require an extremely high-speed film.	4-mil polyester	Clear, fast-drying	1000 (ASA 800)
2485 High Speed Recording Film	Ext. Red Pan	Extremely fast film for all types of photorecording and police science photography. Film speeds and contrasts can be varied over a wide range by selecting the proper developer-time-temperature condition for a particular situation.	4-mil polyester	Clear gel	2500
High Speed Infrared	IR	For all types of recording between 700 and 900 m μ , such as thermography, infrared luminescence, and high-speed photography. Requires a WRAT-TEN Filter No. 25, 29, 70, 87, 87C, 88A, or 89B.	5¼-mil triacetate	None	320 (ASA 160; No. 25 filter)

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photometric sensing with principles of colorimetry to enable detection of subtle reflectance differences on the ground. Numerous experiments have been performed using models of equipment based on these techniques. The promising results obtained indicate potential applications of this system to agriculture, forestry, water pollution, soil analysis, determination of shallow water depths, as well as to military problems of target acquisition and camouflage detection. The successful application of multispectral technology under great variations of photographic conditions encountered in practical remote sensing depends on precision of the techniques used. Accurate photographic processing is essential for repeatable results.

Principles of aerial color photography, Allan L. Sorem, *Photogrammetric Eng.*, 33: 1008-1018, Sept., 1967.

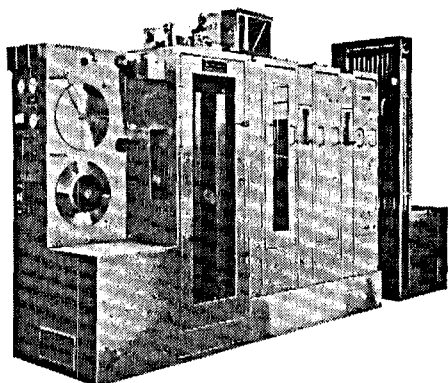
The addition and subtraction of the three primary colors are basic concepts in the design and use of color photographic materials. A reproduction need not, and almost never does, have the same spectral characteristics as the original scene. Color-negative materials may offer significant advantages of flexibility over color-reversal types. Color diapositive plates are used successfully in stereoscopic mapping. An exposure computer is available to aid the aerial photographer, and the proper use of filters may require difficult decisions, whereas color processing may impose no

real difficulty. The color characteristic of the viewing light may limit the amount of information retrievable from a system.

Color photos and the southern pine beetle, W. M. Ciesla, J. C. Bell, Jr. and J. W. Curlin, *Photogrammetric Eng.*, 33: 883-888, Aug., 1967.

Fifty-acre plots superimposed on color aerial photographs taken at a scale of 1:3960 were evaluated as a sampling unit for estimating the level of southern pine beetle infestations. Two color films were evaluated: Anscochrome D200, and Ektachrome Infrared Aero. Data from the photographs and subsequent field checks were analyzed in accordance with procedures developed for analyzing equivalent data taken from operation recorder surveys. This provided estimates of the number of infested areas and number of trees actively infested by the southern pine beetle with 90 per cent confidence limits. Ektachrome Infrared Aero film was superior to Anscochrome D200 because it was capable of discriminating between pines and hardwoods and had the ability to penetrate haze, resulting in clearer imagery.

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R-60S	Rev. & Neg/Pos.	B&W	16mm	60-100FPM
NP36	Neg/Pos.	B&W	16mm	90FPM
S-150	Neg/Pos.	B&W Spray	16/35	160FPM
FE-30	Ektachrome	Color	16mm	30FPM
FE-50	Ektachrome	Color	16mm	50FPM
FE-100	Ektachrome	Color	16 or 16/35	100FPM
FEC-100	Eastman Neg/Pos.	Color	16 or 16/35	100FPM
FEC-150	Eastman Neg/Pos.	Color	16 or 16/35	150FPM
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CAMERAS

A photoelectric frame counter for the SKS-1 camera (in Russian), G. G. Shelukhin and V. O. Yudin (Leningrad Mechan. Inst.), *Tekh. Kino i Televideniya*, 11: 67, June, 1967.

A photoelectric frame counter for the SKS-1 high-speed motion-picture camera is based on the modulation of a beam of light from an incandescent lamp by means of the rotation of the compensating prism. The output signal can be shown on a cathode-ray tube and can be used for synchronizing illumination, etc.—S.C.G.

CINEMATOGRAPHY

A new system of varioscopic cinematography, (in Russian), V. G. Komar, A. G. Boltyanski, N. D. Bernshteyn, and G. L. Irski, *Tekh. Kino i Televideniya*, 11: 10-23, June, 1967.

In a new system of cinematography worked out in NIKFI, in collaboration with other Soviet establishments, the vertical dimension of the negative frame on the film is greater than usual, the dimensions being 48.5 X 46mm on 70mm film, and 21.2 X 18.1mm on 35mm film. In printing, the format of the frame is controlled by a combination of masking and anamorphic printing, both being varied according to the final aspect ratio and dimensions required on the screen. The experimental camera and projector are described, and the image quality obtained is discussed.—S.C.G.

FILM AND ITS PROPERTIES

The neutralization of static charges in the production of motion-picture film (in Russian), L. G. Gross, Yu. A. Petrov, G. A. Fadeeva, and R. A. Sushentsova, *Tekh. Kino i Televideniya*, 11: 30-38, May, 1967.

An examination has been carried out of the charges on films in coating and other

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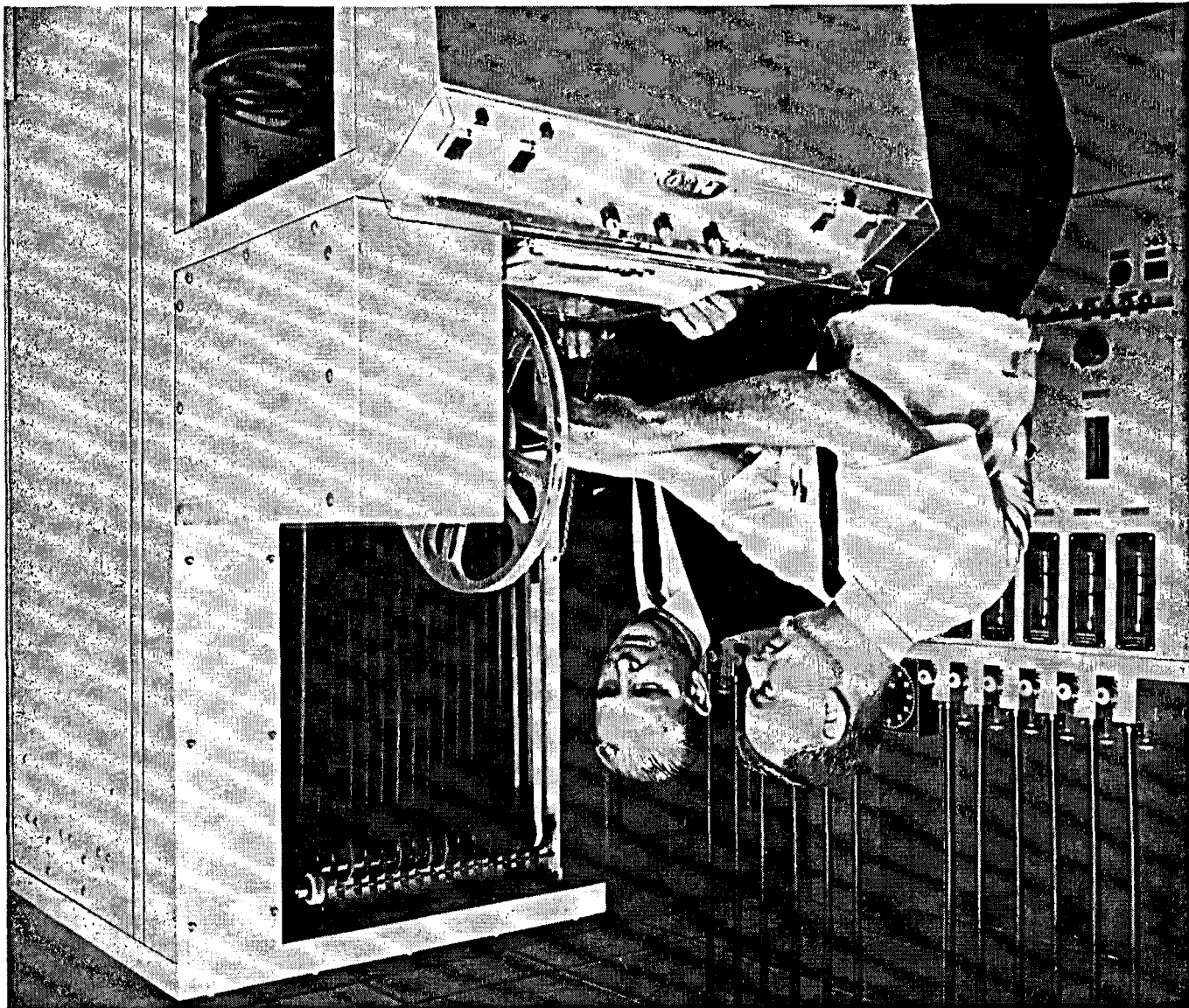
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machines in film base making plants. First it was found that under atmospheric conditions triacetate base having an uncontaminated surface becomes negatively electrified in the machines, like nitro and other kinds of base. After contamination of the surface by sorbed layers, the sign of the charge generated in the machine becomes unstable, and this sometimes enables the charge density to be reduced.

In some cases the surface charge densities reach values close to the maximum possible. A case is made for the suitability of bipolar radioactive neutralizers in base manufacturing plants. A study has been made of the characteristics of the tritium isotope neutralizer, and its properties are dealt with from a physical point of view.

An investigation has been carried out on machines with ionizing needles and tritium isotope neutralizers. This has made it possible to give practical confirmation of the effectiveness of the action of neutralizers and to show a number of features of the phenomenon of charge neutralization on film in relation to the positioning of the neutralizer.

Recommendations are given regarding units for machines and the optimum use of the tritium isotope neutralizer, the application of which must be considered to be the most reasonable in the manufacture of film base at the present time.—S.C.G. (Translation of Authors' conclusions).

GENERAL

Computer recognition of connected

speech, D. R. Reddy, *Jour. Acoustical Soc. Am.*, 42: 329-347, Aug., 1967.

A system for obtaining a phonemic transcription from a connected speech sample entered into the computer by a microphone and an analog-to-digital converter is described. A feature-extraction program divides the speech utterance into segments approximately corresponding to phonemes, determines pitch periods of those segments where pitch analysis is appropriate, and computes a list of parameters for each segment. A classification program assigns a phoneme-group label (vowel-like segment, fricative-like segment, etc.) to each segment, determines whether a segment should be classified as a phoneme or whether it represents a phoneme boundary between two phonemes, and then assigns a phoneme label to each segment that is not rejected as being a phoneme boundary. About 30 utterances to 1 to 2 s duration were analyzed using the above programs on an interconnected IBM 7090-PDP1 system. Correct identification of many vowel and consonantal phonemes was achieved for a single speaker using the same speech material that was used for developing the recognition procedure. The time for analysis of each utterance was about 40 times real time.

The program of the VI Session of ISO/TC 36 (in Russian), I. D. Bernshtein, V. K. Kushnarev, V. V. Rakovskii, and F. A. Rozentel', *Tekh. Kino i Televideniya*, 11: 67-73, May, 1967.

Technical Committee 36 of ISO is the

committee responsible for international standards in cinematography. The problems on the agenda for its meeting in Moscow in July 1967 are discussed.—S.C.G.

Reflection from a dielectric-coated moving mirror, C. Yeh, *J. Opt. Soc. Am.*, 57: 657-661, No. 5, May, 1967.

The effects of a dielectric coating on a moving mirror upon the characteristics of the reflected wave are investigated. Both polarizations of incident plane waves are considered. Two cases of the movement are assumed: (a) the coated mirror moves parallel to the interface; (b) the coated mirror moves perpendicular to the interface. Various interesting features concerning the variation of the reflection coefficient, angle of reflection, the phase shift and the frequency of the reflected wave, as a function of the velocity of the moving coated mirror, are discussed.

The multiple scan correlator, James Wharry, *SPIE Jour.*, 5: 202-204, No. 5, June/July, 1967.

A contract was awarded by the Naval Air Development Center to design and build a multiple scan correlator. Essentially a radar amplifier, the multiple scan correlator embodies a camera, rapid film processor, and rear screen projector. The film that is exposed during the 10-s scan of the radar is processed while the next frame is being exposed. On the next scan of the radar, the exposed developed frame is projected on the screen. Image correlation



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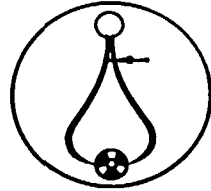
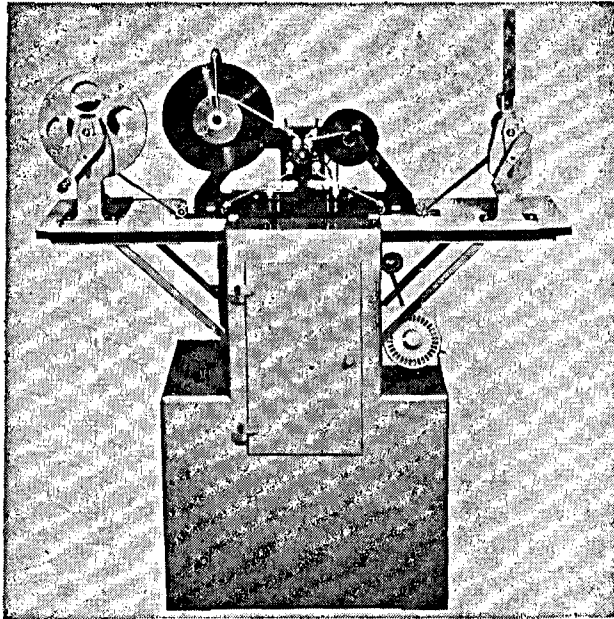
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INSTRUMENTATION AND HIGH-SPEED PHOTOGRAPHY

Laser-schlieren photography of air flow in an air-blast circuit-breaker during the arcing period, J. R. Baghsaw and D. Fitton, *Jour. Photo. Sci.*, 15: 197-199, No. 4, July/Aug., 1967.

A schlieren system having a Q switched ruby laser as a light source in conjunction

with a selective filter arrangement has been used to obtain pictures of the flow of hot gas in the interrupter head of an air-blast circuit-breaker during the arcing period.

High-speed photography of vehicle impact tests at the Road Research Laboratory, A. E. Daniels, K. D. Lidbetter, *Brit. Jour. Phot.*, 14: 656-661, Aug. 4, 1967.

High-speed cinematography has proved a reliable and flexible method, at the Road Research Laboratory, of recording information from experimental collisions. A number of cameras of different types with various lenses are used to record each type of collision and diagrams are given showing their positions. Mainly mono-

chrome film is used with some Ektachrome.—B.A.J.

The sensitivity of a black and white single-mirror schlieren apparatus, W. L. Murray, *Jour. Photo. Sci.*, 15: 191-196, No. 4, July/Aug., 1967.

An expression is derived for the sensitivity of a black and white single-mirror schlieren system; this expression relates the change that would be produced in the density of the film of the camera recording the event with the total angular deflection of light caused by the disturbance being studied in terms of the optical parameters of the system. The expression was verified and the sensitivity determined making use of soap bubbles filled with carbon dioxide to produce the required small deflections of light.

LABORATORY PRACTICE

Contactless control of film-processing conditions (in Russian), E. L. Kovarskaya, *Tekh. Kino i Televideniya*, 11: 24-29, June, 1967.

A transistor circuit is described for the automatic control of the temperature of processing solutions and drying air. It has been applied to a Soviet processing machine.—S.C.G.

OPTICS

Pinhole imagery, Kazuo Sayanagi, *Jour. Optical Soc. Am.*, 57: 1091-1099, Sept., 1967.

Pinhole imagery is discussed by using modulation transfer functions. The optimum condition between the size of the pinhole and the focus position is understood as the balance of the diffraction caused by the aperture size and the geometrical-optical aberration given by the aperture size and focus position. Field characteristics, chromatic characteristics and relations with receptor systems are discussed easily in the spatial-frequency domain.

Effect of chromatic aberration on the resolving power of photographic objectives, Francis E. Washer, *J. Opt. Soc. Am.*, 57: 625-629, No. 5, May, 1967.

An empirical method for estimation of probable resolving power of a lens affected by longitudinal chromatic aberration is discussed. Values of the resolving power at a series of values of the f -number are calculated for selected values of longitudinal chromatic aberration, d_c . The variation of resolving power with f -number is presented graphically for selected values of longitudinal chromatic aberration and relative contrast. Indication is given of a critical aperture for which the resolving power is a maximum for a given set of values of chromatic aberration and relative contrast. The variation of relative contrast with resolving power is presented graphically for several values of the f -number for a lens having selected amounts of longitudinal chromatic aberration. A method for predicting the resolving power of a given lens-film combination is also indicated.

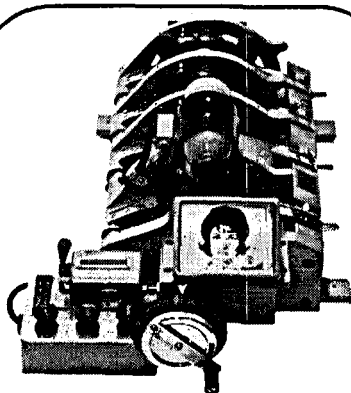
Gabor's theorem and energy transfer through lenses, A. Walther, *J. Opt. Soc. Am.*, 57: 639-644, No. 5, May, 1967.

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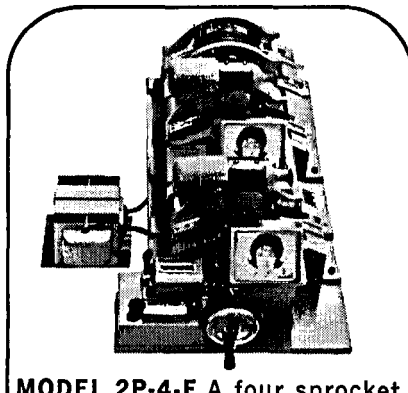
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PHOTOGRAPHIC THEORY AND MATERIALS

Seminar on the structural properties of aerial and motion-picture photographic materials (in Russian), G. A. Istomin. *Zh. Nauch. i Prikl. Fot. i Kinemat.*, 12: 235, No. 3, May-June, 1967.

A brief summary is given of a seminar organized by the Commission for the Chemistry of Photographic Processes of the Academy of Sciences of the USSR, and held on October 26-27, 1966.—S.C.G.

Rapid-access processing of cathode-ray-tube recording film, J. C. Barnes, J. R. Moran and R. C. Salsich, *SPIE Jour.*, 5: 181-187, No. 5, June/July, 1967.

Investigation of the factors involved in rapid processing at elevated temperatures has led to new films and chemical solutions which are specially designed for very rapid processing of cathode-ray tube recordings. An experimental, laboratory model of a complete, rapid processing system was constructed in order to study various aspects

of the problem. By using special cathode-ray-tube recording films, together with specially formulated developer and fixer, it was possible to demonstrate useful development in less than 2s at 130 F, and clearing in less than 2s at the same temperature. With rinsing and drying requiring 2s each, a processing system is shown to produce rinsed, dried film of high quality in a total time of less than 8s.

A study of the shapes of the characteristic curves of motion-picture and photographic materials (in Russian), G. S. Baranov and E. I. Klyuenkova, *Tekh. Kino i Televideniya*, 11: 61-65, May, 1967.

The normal characteristic curve of photographic materials can be represented by three simple equations corresponding to the three parts of the curve. For the

lower part the equation is $\frac{D - D_0}{\gamma} =$

$b \frac{E}{E_1} - a$; for the middle section, $\frac{D - D_0}{\gamma} =$

$\log \frac{E}{E_1}$; and for the upper part, $\frac{D - D_0}{\gamma} =$

$b \frac{E_1}{E} + c$; where a , b , c , and d , are constants.

Experimental results from the study of a number of different types of film are analyzed and it is shown that the shapes of the lower and middle parts of their characteristic curves are identical, while there are differences in the upper parts.—S.C.G.

SOUND RECORDING AND REPRODUCTION

Recent studies in artificial reverberation at NHK Technical Research Laboratories, H. Date, J. Uzihara and Y. Tozuka, *NHK Laboratories Note*, No. 110, Mar., 1967.

An artificial reverberator, which has been developed in the Laboratories, can control maximum value of reverberation time, reverberation time-frequency characteristics, transmission characteristics and size of room, simulated independently and freely. The specifications are

(1) Amplitude-frequency characteristics within ± 1 dB, 50Hz to 10KHz.

(2) Reverberation-time is adjustable between (maximum) 4.5s, and (minimum) 0.5s.

(3) Four types of reverberation-frequency characteristics are available. Characteristics frequencies are:

f_1 : 1, 1.4, 2, 2.8, 4 KHz

f_2 : 2, 2.8, 4, 5.6, 8 KHz

f_3 : 0.25, 0.35, 0.5, 0.7, 1 KHz

f_4 : 0.063, 0.087, 0.125, 0.175, 0.25 KHz

T_M can be made up to 4.5 s and T_M down to 0.5s

(4) Room to be simulated: standard volume: A: 9400m³, B: 3270 m³. The volume can be changed between (1.5)³ times and (0.75)³ times of the standard value.

(5) Delays: Standard delay time: 100, 75, 60, 52, 42, 36, 30, 20.4, 13.7, 6.7ms. Delays less than 30ms are used as diffusers. Dynamic range is more than 74dB.

Unification of motion-picture sound-recording technology (in Russian), A. M. Býchkova and T. Yu. Rozinkina, *Tekh. Kino i Televideniya*, 11: 30-36, June, 1967.

The question of the unification of the methods of sound recording in Soviet motion-picture studios is discussed in the light of the experience of the Mosfilm Studios, where recording is carried out on 6.25mm magnetic tape with pilot-tone synchronization by means of transistorized equipment.—S.C.G.

SPECIAL APPLICATIONS

Holography with achromatic-fringe systems, E. N. Leith and J. Upatnieks, *J. Opt. Soc. Am.*, 57: 975-980, Aug., 1967.

Spatial and temporal coherence requirements for off-axis reference-beam holograms are reduced to those for in-line holograms by using interferometer arrangements producing achromatic fringes. Using this technique, we have produced high-quality holograms of back-lighted objects, using a high-pressure mercury-arc lamp.

TELEVISION

A camera tube head amplifier, P. Rainger, *Royal TV Soc. Jour.*, 11: 230-231, No. 10, Summer, 1967.

A theoretical study is made and a practical circuit is given for a television camera head amplifier. The amplifier uses transistors throughout, with f.e.t.'s in the input stage.

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