

Frank Lewin's song cycle *Innocence and Experience* (noted in the *Journal*, p. 300, Apr. 1961), a musical arrangement of nine poems by William Blake had its first New York performance May 8 in Carnegie Recital Hall. The obvious difficulties of creating a musical accompaniment for the poems (especially the one beginning "I saw a chapel . . ." with its strange and (to some readers) repellent Freudian imagery) were magnificently solved. The same idea, developed by a less sensitive composer could well have resulted in pleasant music entirely unrelated to Blake—more suitable for Wordsworth. Fortunately, Mr. Lewin's music enhanced rather than detracted from the poet's quality and imagery. The voice of Helen Boatright, accompanied by an ensemble conducted by Loren Glickman was entirely adequate to the demands made upon it. Mr. Lewin, who is widely known as a composer of film and theater music, is the author of the SMPTE publication *The Soundtrack in Nontheatrical Motion Pictures* which was first published in installments in the March, June and July 1959 *Journals*.

Aubrey Harris has been appointed Senior Engineer for Ampex Electronics, Ltd., Reading, Berkshire, England. He has been associated with the parent organization, Ampex Corp., Redwood City, Calif., since 1958. Previous affiliations included British Post Office Research Station; Marconi's Wireless Telegraph Co., and Station ZBM-TV in Bermuda where he was Chief Engineer.

Abstracts

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

The subject areas are grouped below

Aerial Photography
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
Sensitometry and Image Structure
Television

AERIAL PHOTOGRAPHY

Technical Improvements at the LTTs (Leningrad Television Center) (in Russian), *Tekh. Kino i Televideniya*, 4: 76, June 1960.

Brief descriptions are given of a telecine machine which is capable of transmitting 8mm films, a magnetic sound-reproduction unit for use with a 16mm telecine machine and other pieces of apparatus recently produced in the Leningrad Television Center.—S.C.G.

CAMERAS AND EQUIPMENT (Except High-Speed)

The Spectrovisor, M. M. Gurevich and K. I. Kolyadin, *Optics and Spectroscopy* (transl. ed. of *Optika i Spektroskopiya*), 9: 131-133, No. 2, Aug. 1960.

The author describes a fast spectrophotometer for the visible part of the spectrum, which traces the transmission coefficient-vs.-wavelength curves of the sample and a standard on the screen of a cathode-ray tube. Each of the curves is traced in 0.01 sec. A motion-picture camera takes 12 photographs of the screen per second, thus making it possible to record the optical aspect of the kinetics of some chemical reactions. (Authors' Abstract.)

COLOR PHOTOGRAPHY AND COLOR DEVELOPMENT

Color Reproduction with Fuji Color Negative Film. 1. The Effect of the Ultraviolet-Sensitivity of the Reproduction (in Japanese, with abstract and figure legends in English), S. Fujisawa, S. Yamaguchi and S. Watanabe, *J. Soc. Sci. Phot. Japan*, 22: 198-201, No. 4, Dec. 1959.

Since a color film is very sensitive to ultraviolet radiation, and the human eye is not, and since daylight or any artificial light contains ultraviolet radiation, the use of a filter which absorbs radiation shorter than 410 $m\mu$ is suitable for any color film. The filter gives especially good results when used in photographing greenish or yellowish objects. (Authors' Abstract.)

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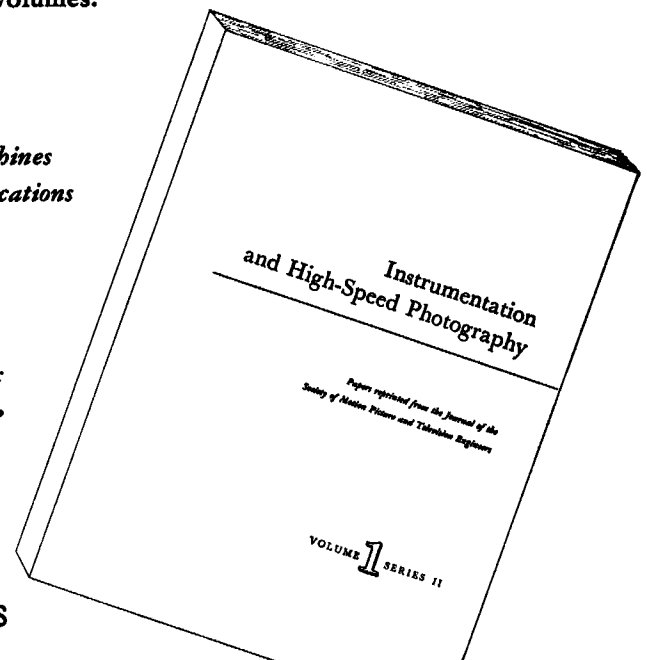
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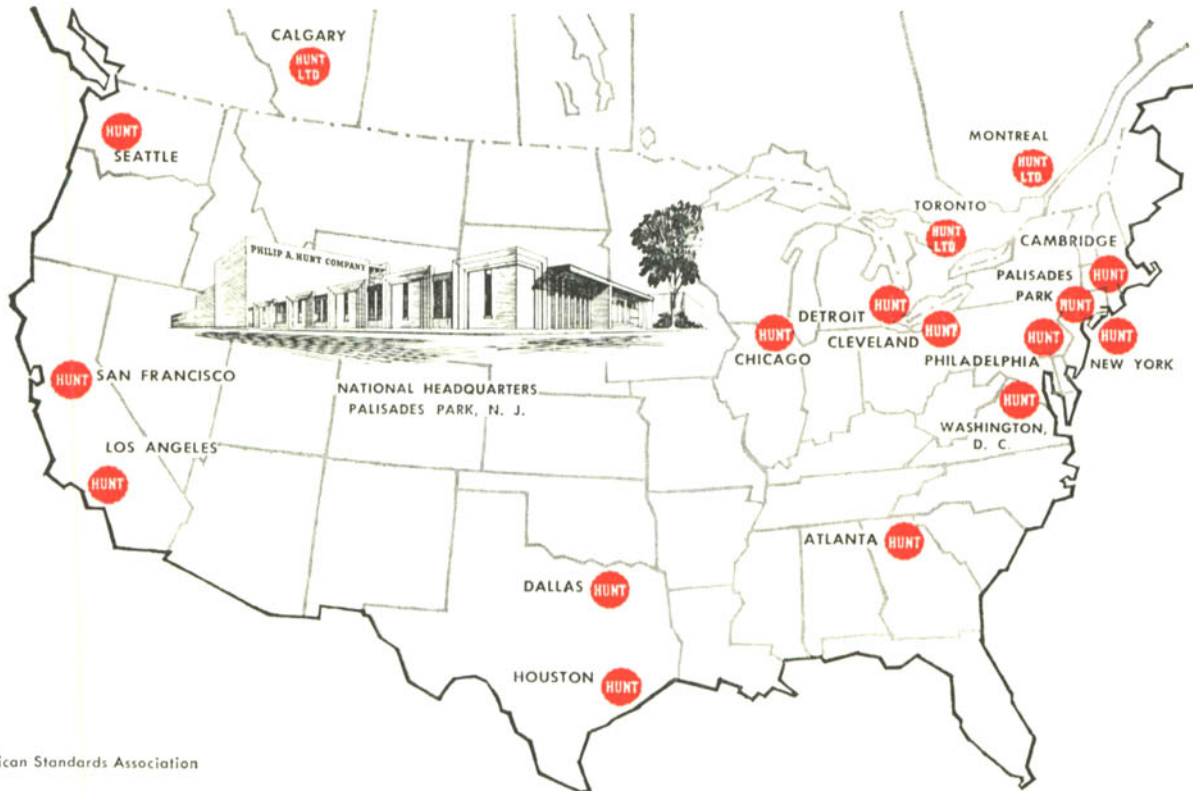


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Use of Different Fixing Solutions in the NIKFI Processes (in Russian), N. I. Kirillov, A. M. Voitsekhovskaya and N. E. Kirillova, *Uspekhi Nauch. Fotografii*, 7: 236-239, 1960.

A number of weakly acid fixing baths have been studied for their suitability in the NIKFI processes for the processing of multilayer color film. A wide choice of fixing solutions is available. The acid content, depending upon the content of sulfite and the acidifying substance used, may vary within wide limits, provided the pH is kept constant.—S.C.G.

A Study of the Stability of the Working Bleaching Solutions Used in the NIKFI Process (in Russian), N. I. Kirillov, A. M.

Voitsekhovskaya and N. E. Kirillova, *Uspekhi Nauch. Fotografii*, 7: 230-235, 1960.

A bleach bath containing potassium ferricyanide and sodium thiosulfate is used in the NIKFI process for processing multilayer color films (*Uspekhi Nauch. Fotografii*, 4: 269, 1955). Experiments have been carried out on the chemical reactions occurring during storage of the bleaching solution, and it has been shown possible to increase the stability by adding ammonia or potassium carbonate. Buffered bleaching solutions and the use of countercurrent bleaching of color films are also recommended.—S.C.G.

A Study of Incubation Aging of the Color Image on Multilayer Film Processed by

Different Methods (in Russian), N. I. Kirillov, A. M. Voitsekhovskaya and N. E. Kirillova, *Uspekhi Nauch. Fotografii*, 7: 240-245, 1960.

An experimental study has shown that the character of incubation aging of a color positive image obtained on processing a color positive film by the original Agfa process (with a phosphate stop bath), by the process with two fixing baths and by the NIKFI process is practically the same. The different changes in optical density and gamma of the different layers of the film which take place during aging put the image out of color balance and produce a marked fall in its quality, which can be perceived visually. Hardening significantly decreases thermostatic aging. Unlike hardening in potassium alum solutions, hardening in formalin, in comparison with control samples, brings about an increase in the formation of new dye substances (reddish-yellow fog) in the film.—S.C.G. (Translation of Authors' Abstract.)

The Problem of the Completion of Development of Multilayer Color Negative Film (in Russian), T. S. Arnol'd, *Uspekhi Nauch. Fotografii*, 7: 246-252, 1960.

In attempts to speed up the NIKFI method of negative color processing for multilayer films, the results were not reproducible, owing to the different degrees of "afterdevelopment" (continuation of development during washing) produced by inconstancy in the conditions of washing the film. The kinetics of afterdevelopment have now been studied in a number of solutions of salts of mineral acids and mixtures of them. Afterdevelopment was found to proceed satisfactorily in these salts over a wide range of pH value (e.g., 9.0-3.0). The author recommends that the water wash should be replaced by an afterdevelopment bath consisting of a 0.2% metabisulfate solution at a pH of 4.5. This is to be used after the diethylparaphenylenediamine developer in the NIKFI-3 process or in the ethylhydroxyethylparaphenylenediamine developer in the NIKFI-4 process. This modified processing gives a somewhat lower film speed (about 20-30%), but the color fog is approximately halved, compared with that of normal processing.—S.C.G.

FILM AND ITS PROPERTIES

Means of Raising the Stability of Hypersensitized Infrared Films (in Russian), S. M. Solov'ev and N. M. Parfenova, *Uspekhi Nauch. Fotografii*, 7: 210-218, 1960.

5-Methyl-7-hydroxy-2,3,4-tri-azaindoline will effectively stabilize infrared films hypersensitized by means of the bath described by S. M. Solov'ev (*Uspekhi Nauch. Fotografii*, 7: 200, 1960). Treatment remains effective 20-22 days, after which fog begins to form and there is some lowering of the effective speed. The film after hypersensitization, as in Solov'ev's paper, is rinsed in water 1 min and then treated 4 min in a bath consisting of 5-8 ml (depending on the degree of fogging of the film) of stabilizer (1% aqueous solution) and water to make 1 liter. The film is then rinsed in 70% alcohol and quickly dried.—S.C.G.

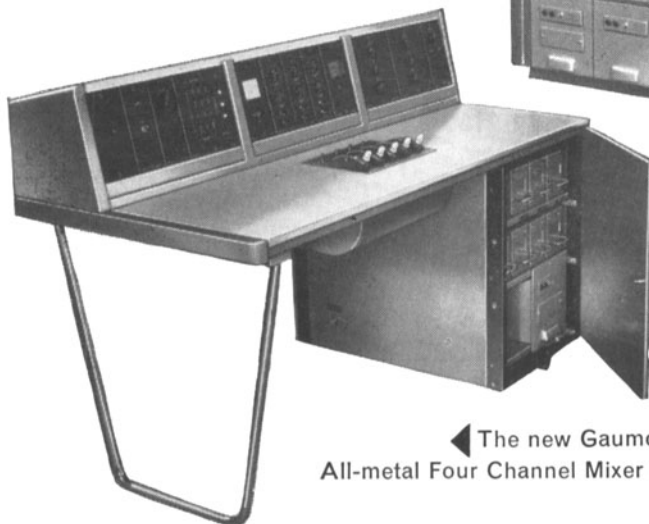
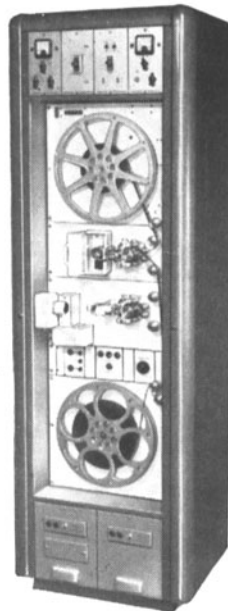
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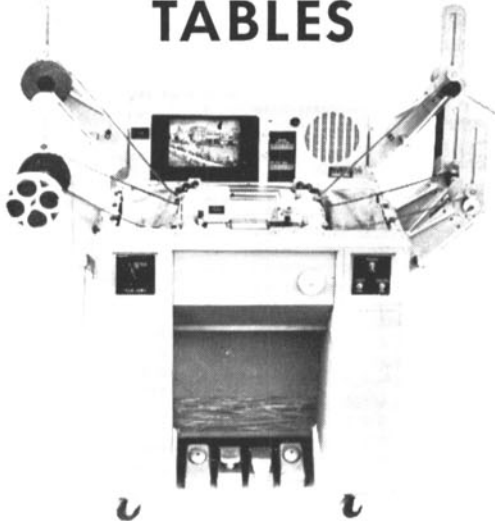
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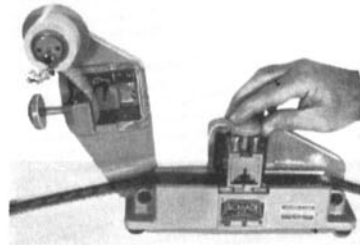
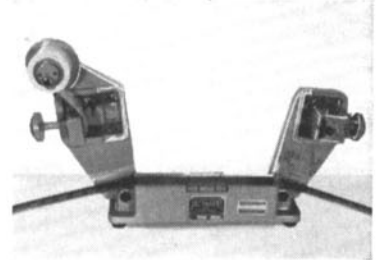
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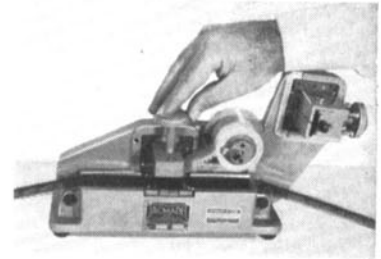
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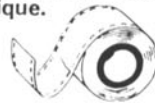
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**FILM PROCESSING
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Study of Local Effects in Development and Their Influence on the Quality of the Motion-Picture Image (in Russian), Yu. I. Bukin, *Uspekhi Nauch. Fotografii*, 7: 219-229, 1960.

Local development effects have been studied in repeated intermediate printings (as many as ten times), the printings being carried out so as to keep two reference densities (a black and a white) constant. The increase in grain was shown to be due to an increase in the contrast between the grains and the background due to local development effects. A distortion of the

gradation was produced, the intermediate densities tending to approximate the reference densities, so producing a stepped curve with the disappearance of intermediate tones. Fine-grain films show the effects less, a larger number of repetitions being required to give the same degree of distortion, although dry-collodion layers gave very poor results.

The effects were worsened when development was carried out without agitation, but greater agitation than the normal showed no improvement. The composition of the developer solutions was without effect, except in the case of a tanning developer based on pyrogallol, in which the local effects were enhanced.

Bromide streaks were studied by means of "effectograms," in which square patches of density were superimposed on a continuous density wedge. The effectograms were developed in a vertical position so as to allow formation of bromide streaks under the patches. The difference, ΔD , between the density of the background with and without the bromide streak was plotted against gamma. The greatest ΔD found was produced by hydroquinone with caustic alkali, giving very large fog. The quantity of potassium bromide in the developer had little influence on the effect in Amidol and in hydroquinone with sodium carbonate, but had a strong influence in hydroquinone with caustic alkali, which gives a very large fog without potassium bromide and less when the bromide is present. The effect is ascribed to the slowing down of development by the bromide and not to solution of the silver halide.—S.C.G.

**HIGH-SPEED PHOTOGRAPHY
AND INSTRUMENTATION**

The Second All-Union Conference on High-Speed Photography and Cinematography (in Russian), E. M. Goldovskii, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii*, 5: 396, No. 5, Sept.-Oct. 1960.

The Conference, organized by the Commission for Scientific Photography and Cinematography of the Academy of Sciences of the Soviet Union, the Moscow State University, and NIKFI, was held in Moscow May 22-26, 1960. Seven hundred delegates took part and about sixty papers were read. Brief notes on some of the outstanding contributions are presented.—S.C.G.

High-Speed Stereoscopic Cinematography and Projection (in Russian), V. V. Garnov and A. S. Dubovik, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii*, 5: 356-360, No. 5, Sept.-Oct. 1960.

A brief description is given of the stereoscopic attachment which has been devised in the Institute of Chemical Physics of the Academy of Sciences of the Soviet Union for use with the SFR high-speed camera. The picture so obtained can be used for stereoscopic projection. A frame frequency of 1,250,000/sec is claimed.—S.C.G.

Experience in Photographic Nebulae Using an Electronic Telescope, P. V. Shcheglov, *Astron. J. Soviet Union* (transl. ed. of *Astron. Zhur.*), 4: 556-558, No. 3, Nov.-Dec. 1960.

Plates of nebulae obtained in $H\alpha$ light through narrow-bandwidth, multilayered interference filters, with the aid of an electronic telescope using a photocontact tube, are described. Two response curves and one plate are reproduced. (Author's Abstract.)

Stellar Photography Using an Electronic Telescope, V. F. Esipov, *Astron. J. Soviet Union* (transl. ed. of *Astron. Zhur.*), 4: 558-561, No. 3, Nov.-Dec. 1960.

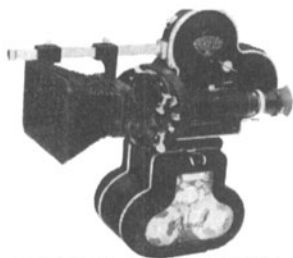
Plates were obtained by means of an electronic telescope employing a photocontact image-intensifier tube. The gain was 30 to 40 times. (Author's Abstract.)



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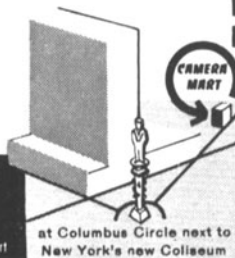
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Application of Mirror-Lens Objectives in Photographing Artificial Earth Satellites, N. V. Yakolev, *Astron. J. Soviet Union* (transl. ed. of *Astron. Zhur.*), 4: 523-527, No. 3, Nov.-Dec. 1960.

Brief dimensional data and the main optical characteristics of a high-speed mirror-lens objective are given. The objective makes possible the photographing of artificial earth satellites of the sixth magnitude on film with a sensitivity of about $500 \text{ lux}^{-1} \text{ sec}^{-1}$. (Author's Abstract.)

The Work of the Camera Section at the Second All-Union Conference on High-Speed Photography and Cinematography (in Russian), A. S. Dubovik and A. B. Granigg, *Zhur. Nauch. i Priklad. Fotografii*

Kinematografi, 5: 396-400, No. 5, Sept.-Oct. 1960.

The papers presented to the Camera Section are reviewed.—S.C.G.

An Equipment for Automatically Processing Time Multiplexed Telemetry Data, N. Purnell and T. T. Walters, *Jour. Brit. IRE*, 21: 257-274, Mar. 1961.

An equipment is described for processing magnetic tape recordings of frequency-modulated time-multiplexed telemetry data. Details are given of the way in which the input signals are derived and the method by which the recordings are made. The equipment produces two forms of output: analog graphs on paper film and

digital records on punched cards. The performance achieved and the methods of checking this performance are detailed.

SENSITOMETRY AND IMAGE STRUCTURE

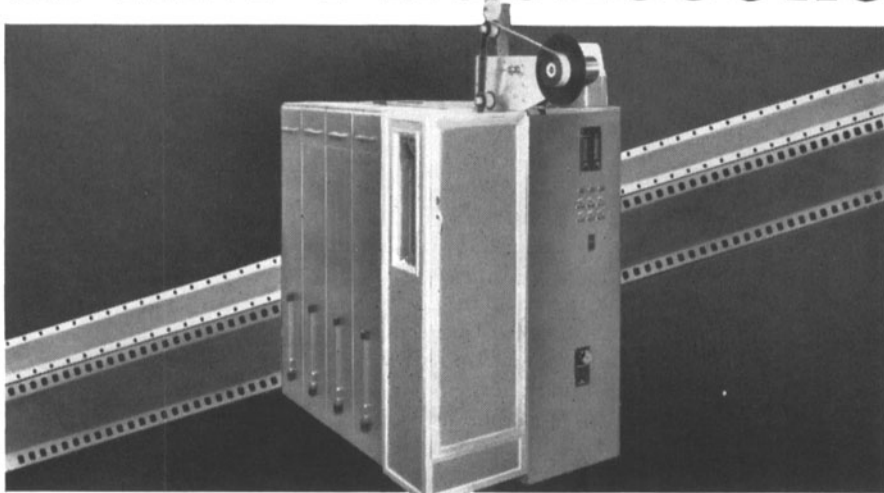
Studies on Graininess and Granularity. I. A New Granularity-Measuring Instrument (in Japanese), S. Ooue, *J. Soc. Sci. Phot. Japan*, 23: 7-10, No. 1, Mar. 1960.

A new instrument for measuring granularity of photographic materials is described. It consists of four parts: a high-speed-scanning microphotometer which scans a photographic film at the rate of 100 mm/sec; a d-c amplifier; a frequency analyzer with 20 narrow bandpass filters, which analyzes the waveform to its power spectrum; and a meter which indicates the root-mean-square value of the current. The scanning aperture, on which the magnified image of grain structure is projected by a microscope optical system, can be replaced by a revolving disc. Measurement of the power spectrum of grain structure and also measurements of the granularity-density function can be made with this instrument. Numerical values of granularity, determined with the diameter of the scanning aperture selected so that its spatial frequency character corresponds to the response function of the eye, correlate well with graininess evaluations. The correlation coefficient, for granularity measured with a scanning aperture of 10μ and graininess evaluated from 14X enlargements, was 0.90.—T.H.J.

A Photographic Method for Measuring Light Fluxes (in Russian), V. N. Adrianov and G. L. Polyak, *Problemy energetiki*, Acad. Sci. U.S.S.R., Moscow, 1959, pp. 470-482; *Referat. Zhur., Fiz.*, Abstract No. 25052, Sept. 1960.

Some problems in photographic photometry are studied in connection with the measurement of a light field in light models of a radiating hot body. Theoretical consideration is given to the relative error in the determination of the absolute illuminance by photographic photometry as a result of nonuniformity of the emulsion layer, its development and the measurement. Curves are constructed showing the relation between the relative error and the density and contrast of the photographic layer; the error is a minimum at a density of ~ 0.4 and diminishes with increase in gamma, reaching $\sim 2\%$ in the best cases. Characteristic curves have been determined for the [Soviet-made] MZ film with different angles of incidence of the light flux (from 0 to $83^\circ 15'$) under a constant exposure. As the angle is increased, a decrease is seen in the speed of the film as a result of a parallel displacement of the characteristic curve, which is small up to angles of $40-45^\circ$ and then increases. This fall in sensitivity is brought about, in the first place, by the increase in the coefficient of reflection of the surface of the photographic layer as the angle of incidence is increased, and in the second place, by a change in the light-scattering characteristics of the emulsion. A selenium cell under analogous conditions exhibits a change in properties only at angles $> 60^\circ$. A parallel study of a single field both by

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photographic photometry and by the photoelectric method showed good agreement in the values of illuminance obtained. The photographic method is considered quite adequate for the task in hand.—S.C.G. (Translated from *Referat. Zhur., Fiz.*)

TELEVISION

Training for Operating and Maintaining Television Studio Broadcasting Equipment

The B.B.C.'s pioneering work in the training of staff for operating and maintaining television studio equipment is described. A general discussion on training

policy and recruitment is followed by an outline of the training schedule and training techniques. A detailed survey is given of the methods used for training technical assistants and technical operators in the B.B.C. Television Service. The standard which must be reached by the new recruit if he is to continue in the Corporation's service is indicated, and courses provided for technical assistants and operators worthy of promotion are described.—K. R. Sturley and A. E. Robertson, *Jour. Brit. IRE*, 20: 821-839, Nov. 1960.

Henri de France Colour Television System

The paper describes the work done by

the Cie Française de Télévision (C.F.T.) on the Henri de France system of colour television. First it defines the objectives of the team of research workers who have carried out this development. It then stresses the fundamental aspects and the special features of the system and describes the encoding and decoding units. Finally, it gives the practical results and theoretical aspects on the ease of transmission of the coded signals.—R. Chaste and P. Cassagne, *Proc. Inst. Electrical Engineers*, 107: 499-511, Nov. 1960.

Propagation Measurements at 3480 and 9640 Mc/s Beyond the Radio Horizon

The paper gives an account of scatter-propagation measurements made at S- and X-band during the period May, 1957 to May, 1959. The work at S-band continued throughout the whole of this time, while the X-band measurements were made during the period of a year from June, 1958 to May, 1959. The S-band transmitter, using a 3.480 Gc/s c.w. magnetron with a power output of 500 watts, was established at Start Point in Devon. Receiving terminals were set up at Wembley, Middlesex, and Winesham, Suffolk, at distances of 173 and 247 statute miles, respectively, from the transmitter, the former being maintained in operation throughout the whole of the experimental period and the latter for a period of nine months from September, 1957 to June, 1958. Diurnal and seasonal variations in the median level of the received signal are discussed and a comparison is made of measurements taken simultaneously at Wembley and Winesham. The distribution of the S-band fading rate as a function of level is studied and a limited amount of work concerned with the distribution of the duration of fades below a given level and the power spectrum of the detected signal is described. The transmission path for the X-band system, which used a pulsed magnetron at a frequency of 9.640 Gc/s, also lies between Start Point and Wembley; the pulse length was 2 microsec and the pulse-repetition frequency 500 c/s, the peak power in the pulses being 180 kW. The X- and S-band links were operated together whenever possible, and a comparison is made of the median level and fading rate of the signals received simultaneously at the two frequencies over the same propagation path. In addition, a series of measurements to investigate the aerial coupling loss of the X-band system are described.—G. V. Geiger, N. D. La Frenais and W. J. Lucas, *Proc. Inst. Electrical Engineers*, 107: 531-546, Nov. 1960.

The Use of a High-Gain Television Transmitting Aerial in a Populous Area

The paper is concerned with the provision of satisfactory signals to viewers in the immediate vicinity of the Crystal Palace television station, where an 8-tier aerial is sited in an urban area. The problem was complicated by differences between the halves of the aerial, but a satisfactory performance was ultimately obtained. The only serious discrepancy between theoretical and experimental results could be removed by taking account of reflection at the ground, ignoring the

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effect of buildings. In order to provide continuity of service in spite of any single breakdown, the halves of the aerial were originally supplied from separate transmitters; this arrangement had to be abandoned, since it proved impossible to provide undistorted signals at receiving points where the contributions from the transmitters were in phase opposition.—G. D. Monteath, G. H. Millard and D. J. Whythe, *Proc. Inst. Electrical Engineers*, 108: 65-74, Jan. 1961.

The Perception of Reproduction Colors in Color Television (in Japanese, with abstract and figure legends in English), I. Soma, *Studies of Color*, 7: 29-39, No. 2, 1960.

The author, with the assistance of sixty observers, sought to establish the visible limits of color reproduction in color television, and subsequently, the limits of color names and memory colors. A comparison was made, under standard illumination, between colors reproduced by color television and color chips in The Guide to the Color Standard. Six familiar color names and the memory colors of eight familiar objects were determined from an array of 983 recommended Munsell color chips. The results show that (1) colors of high and low values are not well reproduced; (2) hues shift either to blue or green; (3) colors of high chroma are apt to be reproduced a little low; (4) the aberration of yellow is the greatest; and (5) blue, green and purple

stay within the limit of the color names, with yellow deviating the most. Several diagrams show the variance of the colors examined. (Author's Abstract.)

A Mobile Laboratory for UHF and VHF Television Surveys, E. W. Taylor and L. C. Munn, *BBC Engineering Div. Monograph*, No. 34, Feb. 1961.

This report describes the mobile laboratory used by the BBC Research Department for assessing the reception conditions during the Band I/Band V comparison tests carried out in 1957-1958. The mobile laboratory was equipped for the measurement of vision field strength and test waveforms, and the subjective assessment of the picture quality resulting from the transmissions from Crystal Palace.

Tables of Horizontal Radiation Patterns of Dipoles Mounted on Cylinders, P. Knight and R. E. Davis, *BBC Engineering Div. Monograph*, No. 35, Feb. 1961.

This monograph contains tables of the horizontal radiation pattern (h.r.p.) of a dipole mounted on a cylindrical mast. The tables were calculated on a digital computer and this enabled a comprehensive range of mast sizes and dipole spacings to be covered. The tables should satisfy most requirements arising in the design of vhf aerial systems for transmitters. Although applicable to cylindrical masts, they may be used with little error for masts of square or triangular cross-section provided the widths of the mast faces do not exceed 0.5λ and 0.3λ respectively. The tables are intended not merely to give the pattern of a single dipole but also to simplify the calculation of the patterns of arrangements of more than one dipole spaced around a mast; this is achieved by appropriate addition of the contributions of each dipole and an analog computer has been developed in the BBC Research Department to facilitate this operation.

The Standardization of International Microwave Radio-Relay Systems, W. J. Bray, *Proc. Inst. Elec. Eng, Pt. B*: 180-200, Mar. 1961.

Microwave radio-relay systems using line-of-sight paths now form a substantial part of the international trunk network, both for multichannel telephony and for television. In order that such systems shall provide satisfactory transmission over long distances they must conform with certain minimum performance standards. Furthermore, in order to facilitate the interconnection of radio-relay systems with one another and with line systems, certain common characteristics are necessary. The establishment of links across national frontiers also requires the use of equipment with similar characteristics in each country. The paper outlines the work of the International Radio Consultative Committee (C.C.I.R.) and the International Telegraph and Telephone Consultative Committee (C.C.I.T.T.) in defining preferred characteristics for microwave radio-relay systems using line-of-sight paths, and discusses the technical and other reasons for the particular values adopted. The need for preferred characteristics for radio-relay systems using tropospheric-scatter propagation is also referred to.

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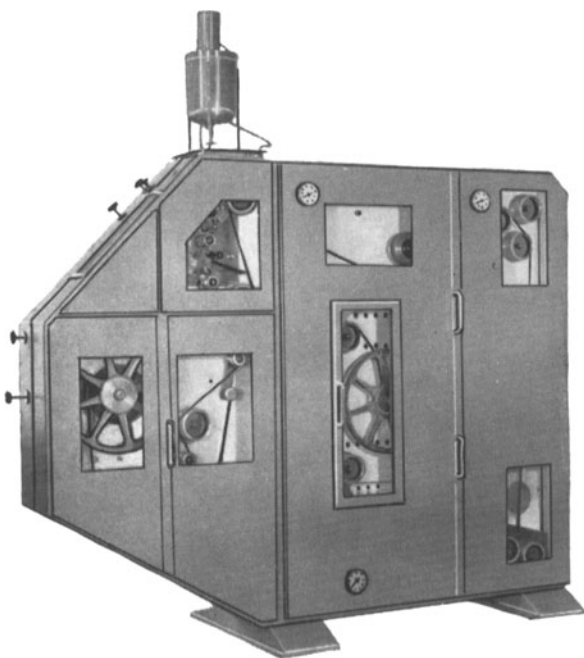
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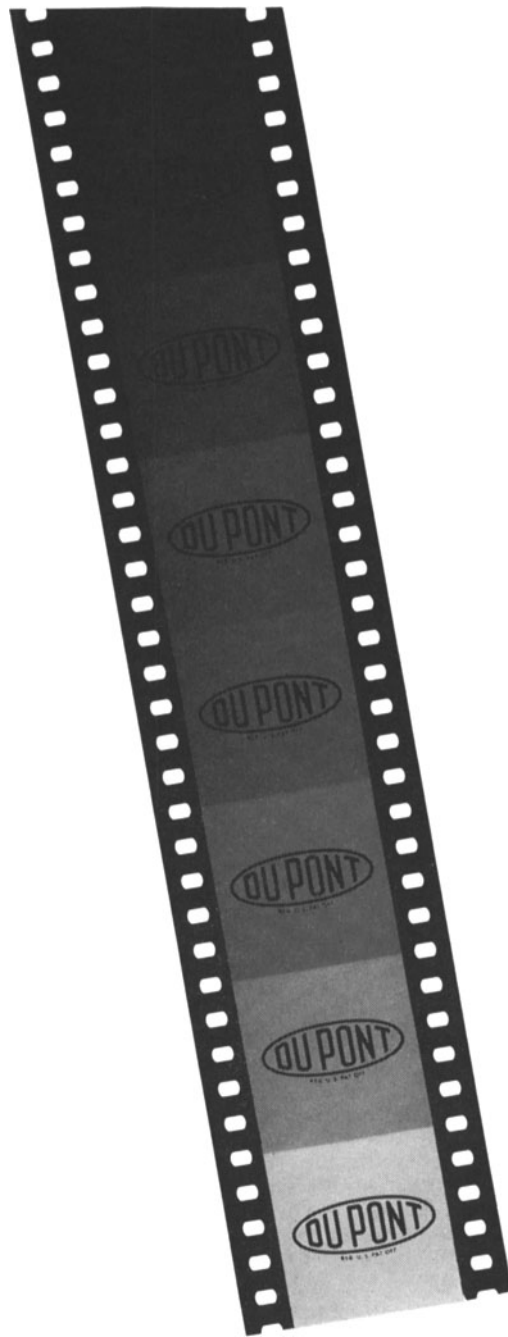
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