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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
Data Recording and
Processing
General and Historical
Holography

AERIAL PHOTOGRAPHY

Lenses and techniques for aerial color, Manfred Duddek, *Photogrammetric Eng.*, 36: 58-61, Jan. 1970.

The result of an aerial color photographic mission cannot easily be predicted without a good knowledge of the factors having an influence on the final result. This paper gives a short description of the characteristics of the taking lenses with respect to color photography, as well as information about the influences of the atmosphere, the choice of filters and the determination of correct exposure for different types of aerial color films. Recommendations are given for the choice of film for a given project.

CAMERAS

New trick-film camera from Czechoslovakia, Rudolf Kabourek, *Brit. Kinemat. Sound and TV*, 52: 206-207, July 1970.

Czechoslovak cinematography celebrated its 70th anniversary last year and during these seventy years has produced a whole series of outstanding films. Part of their success can be attributed to the equipment with which they were made, which was also produced in Czechoslovakia. Soon after the end of the First World War the first experiments were made in Czechoslovakia on the development of film cameras and their production. These attempts were fully successful and while other European film producers were still working with wooden case cameras, Czechoslovak

film makers were using the first metal cased ones. That was the beginning of the world-famous Slechta cameras, which were later exported throughout the world under Cinephon trade mark.

Visual exposure meters in photographic cameras (in Russian), G. V. Pankova, 62-65, No. 1, 1970; *Ref. Zh., Fotokinotekhnika*, Abstract No. 6.46.94, 1970.

Autonomous and built-in exposure meters are described. The working principles and construction of a photometric exposure meter, designed for cameras with semi-automatic exposure setting, are discussed. — S.C.G. (Translated from *Ref. Zh., Fotokinotekhnika*.)

DATA RECORDING AND PROCESSING

Effects of flutter on tape recorded data, Donald Savage, *Sound and Vibration*, 3: 18-24, Nov. 1969.

Magnetic tape recorder/reproducer flutter produces unwanted modulation of recorded signal frequencies. The effects on reproduced data include time base variations and increased noise level with a corresponding reduction in dynamic range. Error magnitudes in recorder/reproducer systems are based on peak-to-peak flutter and flutter frequency. Such errors may be particularly significant for applications involving narrow-band analysis of low-frequency data.

GENERAL AND HISTORICAL

Etching, engraving and photography: history of photomechanical reproduction, E. Ostroff, *Jour. Phot. Sci.*, 17: 65-80, May/June 1969.

The first system to reproduce images photomechanically was heliogravure, introduced in 1826 by Joseph Nicéphore Niepce of France. This was followed 13 years later with attempts by various experimenters to chemically etch daguerrotypes. Neither approach proved wholly satisfactory. In 1852 and 1858 William Henry Fox Talbot of England patented the first practicable photomechanical systems. These techniques were capable of converting continuous-tone images into ink images on paper using methods which established the foundation of photogravure as we know it today. Talbot's approaches relied heavily upon the positive photographic print, a feature which was part of the photographic negative-positive system introduced by him in 1839. Talbot's photomechanical innovations consisted of the bichromated gelatin emulsion; contact screens; photoaquatint; etching a metal plate through the light-exposed, selectively hardened emulsion; use of a relatively "safe" etchant and use of etchants of different concentrations to control tones. Apart from these contributions it is revealed



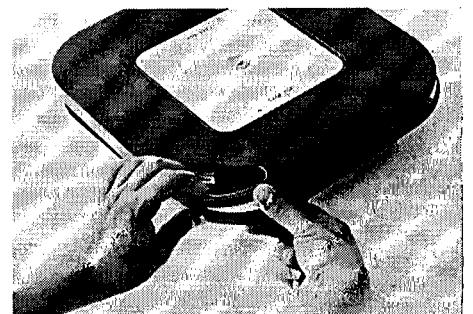
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that Mrs. Talbot was the first woman photographic laboratory technician and the first woman photographer.

The sixtieth birthday of I. B. Blyumberg (in Russian), Yu. N. Gorokhovskii and T. A. Novatskaya, *14*: 392-393, Sept.-Oct. 1969.

A brief biographical note is given on the Russian photographic scientist Il'ya Borisovich Blyumberg, whose main work has been in the field of the processing of photographic materials. — S.C.G.

8mm motion-picture projectors with magazine loading (in Russian), A. Ya. Kuperman and L. G. Tarasenko, *Tekhn. Kino i Televidinya*, *13*: 70-80, Oct. 1969.

Foreign (i.e. non-Soviet) 8mm motion-picture projectors with magazine loading are reviewed. The construction of the magazines and projectors for normal and for special types of 8mm film are mentioned. — S.C.G.

An institute for engineering and technical cadres in cinematography (in Russian), S. Z. Mandel', *Zh. Nauch. i Prikl. Fot. i Kinemat.*, *14*: 390-391, Sept.-Oct. 1969.

A note is given on the Leningrad Institute of Motion-Picture Engineers, which began in 1918 under the name of Higher Institute for Photography and Phototechniques. Its history is briefly recorded and its present structure is described. — S.C.G.

The design of film sprockets S. J. Gudgcon, *Brit. Kinemat. Sound and TV*, *51*: 394-401, Nov. 1969.

An historical survey is given of the development of film sprocket design from 1891 to the present day. The basic geometry of the various tooth forms and the method of machining them are described.

The "cinetronic" automatic film presentation equipment, N. W. Green, *Brit. Kinemat. Sound and TV*, *51*: 374-378, Nov. 1969.

In the early part of 1966, Associated British Cinemas asked the development group of ABC Television, now Thames Television Ltd., to investigate the problems which would arise in introducing a comprehensive system of automation into a cinema. This paper reports on the project to date and describes equipment which has been developed to automate many of the operations currently performed manually in the projection room.

An historical list of the world's chromogenic-processed color films, G. Koshof, K. Hübner and J. Florstedt, *Brit. Jour. Phot.*, *116*: 14-20, No. 5711, 1970.

In 1965 Koshof and Hübner published in the *British Journal of Photography* a list of nearly all reversal and negative color films (camera materials) manufactured during the period 1935-65. Meanwhile many changes in color films have occurred and J. Florstedt has been authorized by the original researchers to update and revise the work with this supplementary list. This list consists of 150 color films which have appeared since 1965 as well as corrections to the original list.

HOLOGRAPHY

Transmission of holograms through a television channel (in Russian), P. V. Shmakov, B. G. Zhebel', P. M. Kopylov, E. V. Medvedev, and A. N. Tachkov, *Tekhn. Kino i Televidinya*, *13*: 42-27, Oct. 1969.

Experiments have been carried out on the transformation of holograms into electrical signals by means of a flying-spot television system, transmission of the holographic information through a television channel, and reproduction of the picture from the hologram photographed from a television monitoring screen. — S.C.G.

Holography with evanescent waves, Olof Bryngdahl, *Jour. Optical Soc. Am.*, *12*: 1645-1650, Dec. 1969.

Information contained in evanescent wave fields was recorded by holographic techniques. Internal reflection within a highly refractive liquid was used to create evanescent surface waves in the emulsion of immersed high-resolution photographic plates. The holograms have unique properties. When reconstructed by an evanescent wave, two mirror images of the same kind were formed; however, two conjugate images were obtained by reversing the direction of the surface wave. Although the holograms are very thin with fringes confined to the surface of the emulsion, they reconstruct in white light and exhibit frequency-selection properties similar to thick holograms.

Effects of photographic gamma on hologram reconstructions, James C. Wyant and M. Parker Givens, *Jour. Opt. Soc. Am.*, *12*: 1650-1658, Dec. 1969.

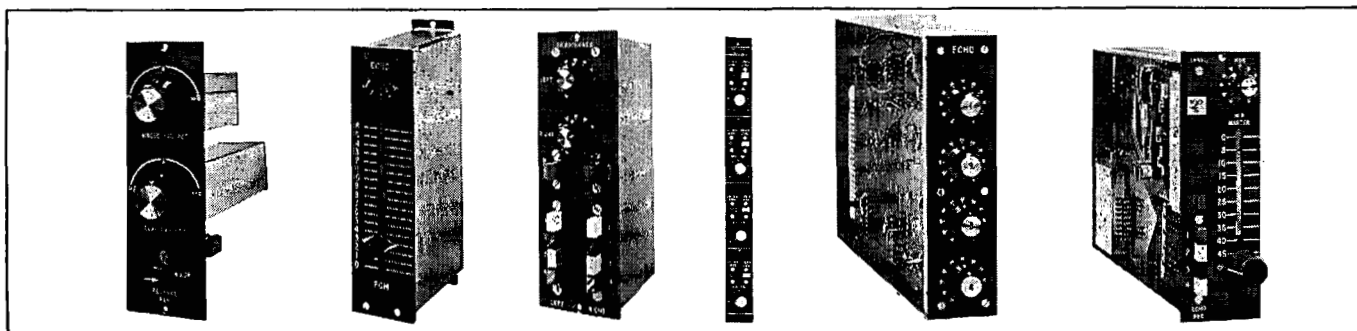
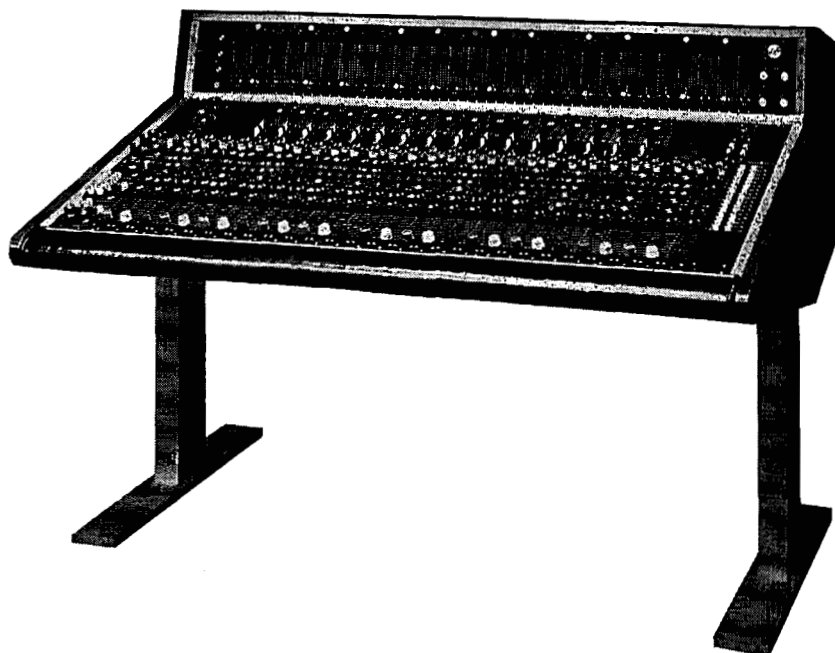
An expression derived for hologram exposures made along the straight-line portion of an H-D curve of a photographic plate gives the first-order transmittance of a hologram made of several object points exposed simultaneously (conventional holograms). This expression is compared with a similar expression derived previously for holograms made of several object points exposed sequentially (synthetic holograms). Theory and experiments show the effect of the nonlinearity of the photographic process on the contrast of the reconstruction of conventional holograms. Synthetic and conventional holograms are studied theoretically and experimentally to determine how the total amount of light in the reconstruction image depends upon the number of object points when the total amount of light in the object is constant. It is shown that the reconstructed image formed by a conventional hologram contains more light than the image formed by a synthetic hologram of the same number of object points. Both synthetic and conventional holograms are also studied to determine the ratio of reference-beam illuminance to object-beam illuminance that maximizes the amount of light in the reconstructed image.

Transmission of holograms (in Russian), P. V. Shmakov, P. M. Kopylov, E. V. Medvedev, A. N. Tachkov, and L. V. Gavrilev, *Tekhn. Kino i Televidinya*, *13*: 46-47, Sept. 1969.

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ile-type system with a low rate of scanning, for the transmission of holograms.—S. C. G.

Quality criteria of photographic materials for use in holography, M. De Belder, *Phot. Sci. and Eng.*, 13: 351-360, Nov.-Dec. 1969.

The brightness of the reconstructed image in holography is expressed as a function of the photographic and physical properties of the photographic material, both for the case of plane and thick holograms. General relations are derived for calculating the intensities of the different orders in thick holograms. These relations are applied for calculating the intensity variation of the first order as a function of emulsion shrinkage, and for proving that second order images can be generated even in the absence of second harmonics. The dependence of image contrast and graininess on film noise is discussed. In the appendix results of the harmonic analysis of the real part of the amplitude transmission of a line pattern, obtained on Scientia 8E70 holographic material, is calculated for different values of the input modulation. The results of these calculations are compared with experiments.

Holography and stereoscopy: the holographic stereogram, Nicholas George and J. T. McCrickered, *Phot. Sci. and Eng.*, 13: 342-350, Nov.-Dec. 1969.

The holographic stereogram (HS) consists of an ensemble of juxta-positioned transform-holograms made from photographic transparencies of a scene. The

viewer looks into the HS, as with a conventional hologram, and sees a virtual image reconstruction accurately rendering the object space. In this treatment the two basic types are reviewed: one using a single exposure with a fly's-eye lens and



BOSTON, Oct. 14—Stephan A. Kallis, Jr., Digital Equipment Corp., Maynard, Mass., discussed Computer Animation Techniques. He described the categories of computer use in animation and the history and development of each type. Discussion was very brisk from users of the techniques, and from a guest group of students from Wentworth Institute in Boston.—R. A. Rubenstein, *Secretary-Treasurer*.

CHICAGO, Oct. 20—A pre-meeting dinner in honor of our guest speaker was held in the Colony Room of the Allerton Hotel. Henry A. Coopmans, Photometric Development Engineer, Bell & Howell Co., spoke on the subject of lighting, from subminiature to large studio lighting. His vast background on lamps was acquired through many years of working hand in hand with the engineers of various lamp manufacturers.

We were shown high-speed movies taken in the Bell & Howell Engineering Labora-

the other a temporal sequence of photos. Their conceptual relationship to Lippmann's integral photograph and Gabor's hologram is explained. Analyses are presented of scaling and resolution for the sequential type of HS. We find a linear scale factor d'/d in planes parallel to the HS and s_r/d_r' ($s_r m d$) in the normal direction where d is the lattice spacing used in the photography, s_r is the lens-to-film distance, m is the magnification, and d_r' are similarly defined for the holography step. Thus, up and down scaling as well as vertical exaggeration can be controlled. Using a simple Gaussian beam analysis, we find a formula for the angular resolution of the HS; and this is compared to the results for a conventional hologram Auditorium, (2) brightness and blur in the overlapping region between component holograms, and (3) alignment of Orbiter V photographs in making a lunar stereogram.

Physical properties of holographic materials, H. Nassenstein, H. Dedden, H. J. Metz, H. E. Rieck and D. Schultze, *Phot. Sci. and Eng.*, 13: 194-199, July-Aug. 1969.

Physical properties including spectral sensitization curves, amplitude transmittance functions, reciprocity characteristics, and holographic efficiency curves (maximum obtainable ratio of reconstructed to incident beam intensity vs. spatial frequency) are given of some recently introduced photographic materials for holography with HeNe- and ruby lasers.

Transmission of holograms (in Russian), P. V. Shmakov, P. M. Kopylov, E. V. Medvedev, A. N. Tachkov, and L. V. Gavrilov, *Tech. Kino i Televidinya*, 13: 46-47, Sept. 1969.

A brief description is given of a facsimile-type system with a low rate of scanning, for the transmission of holograms.—S.C.G.

tory of gaseous bombardment within the Xenon lamp. Also through the use of an overhead projector, Coopmans was able to show the filament structure (greatly magnified) of various subminiature halogen lamps and explained each lamp in detail. He had a display of at least 30 different lamps used throughout the industry.

His "off the cuff" delivery and spontaneous response to the many questions asked held the attention of the audience every minute of the program.—Chuck Zichterman, *Secretary-Treasurer*.

HOLLYWOOD, Oct. 20—A pre-meeting dinner and cocktail hour gave members an opportunity to become acquainted with the speaker, Kenneth D. Gustafson, Western Regional Mgr., Phillips Broadcasting Equipment Div.

Gustafson described and illustrated with color slides the step-by-step construction of a mobile TV production van. His discussion covered not only the pre-construction