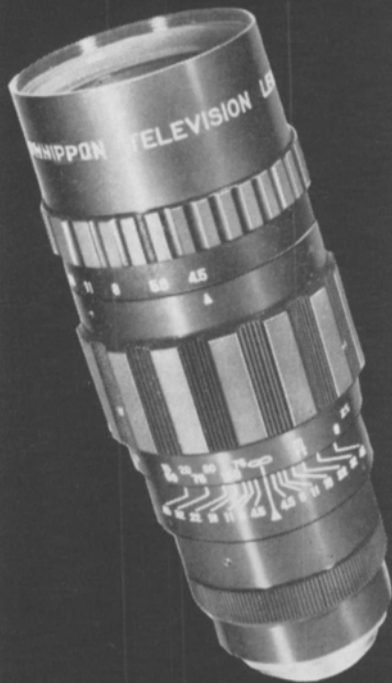


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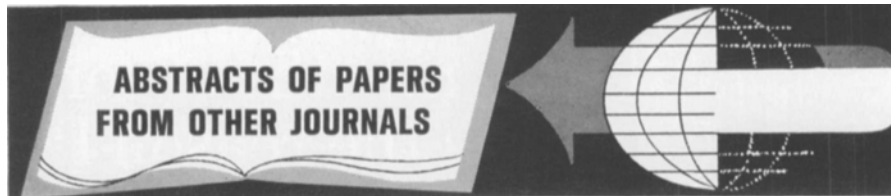
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Those requiring definitive and thorough searches of current literature and patents are referred to *Abstracts of Photographic Science & Engineering Literature (APSE)*, produced by the Engineering Index, Inc., 345 E. 47 St., New York, N.Y. 10017, with the editorial cooperation of the Society of Photographic Scientists & Engineers.

The subject areas are grouped below:

- Cameras
- Cinematography
- Film and Its Properties
- General
- Instrumentation and High-Speed Photography
- Lasers
- Light Sources
- Medical Photography
- Photographic Theory and Materials
- Television

**CAMERAS**

**Mechanisms for the semiautomatic setting of exposure in amateur cameras** (In Russian), K. R. Gol'din and A. P. Avdonin, *Optiko-Mekh. Prom.*, 39-43, No. 7, 1966; *Ref. Zh., Fotokinotekhnika*, Abstract No. 10.46.16, 1966.

A theoretical basis is given for the construction of mechanisms for the semiautomatic setting of exposure, prototypes are described, and results of tests on them are given.—S.C.G. (Translated from *Ref. Zh., Fotokinotekhnika*).

**CINEMATOGRAPHY**

**Cinematography with the aid of image converters for rapid transient luminous phenomena** (In French), C. Jacquot and P. Stevenin. *Bull. Inf. Sci. Tech. Commissar. Energie Atom.*, 91-93, No. 102, 1966; *Ref. Zh., Fotokinotekhnika*, Abstract No. 10.46.49, 1966.

A system has been worked out for the study of plasma radiation by high-speed photography, consisting of two electronic image converters combined in sequence with the aid of an objective. The first is used as a device to obtain a series of three

frames or a slit scanning of the phenomenon being studied, and the second as an intensifier. The exposure time of a separate frame can be altered from 20 ns to 100  $\mu$ s, the interval between frames from 80 ns to 1 ms, and the rate of scanning from 1 to 100 mm/ms. The gain in minimum recording brightness (equal to 0.6 nit at an exposure of 1 ms) in comparison with a photographic system using a film with a sensitivity of 1500 ASA, is  $5 \times 10^3$  with a resolution of 200 lines/frame. A general view of the system which has been worked out and photographs of time-scanned plasma are given.—S.C.G. (Translated from *Ref. Zh., Fotokinotekhnika*).

**Time-lapse kinematography for traffic research**, T. Constantine, A. P. Young and H. E. Larcombe, *Jour. Phot. Sci.*, 14: p. 303, Nov./Dec. 1966 (abstract only) full test in *Photo. Jour.*, 106, 311 (1966).

Time lapse kinematography is being increasingly used by research workers in the field of traffic engineering to define quantitatively the microscopic and macroscopic behaviour of traffic on the open highway and at channeled and signal-controlled interseptions. The information obtained is being used to confirm and extend traffic flow theories and to provide the necessary field data to enable traffic situations to be realistically simulated on the electronic digital computer. The success of the method depends to a large extent on the reliability of the equipment used and the ease with which the analysis can be carried out, since this part of the work can be extremely tedious. In this paper the authors describe in detail the equipment they have developed and used with success. The electronic time pulse unit which operates a standard Vinten Mark 3 16mm cine camera is portable and is powered by 12-V lead acid accumulators and nickel cadmium button cells. The unit which incorporates two multivibrator circuits, produces pulses of the required magnitude and duration to operate the camera at set speeds of 1, 2, or 4 pulse/s or a variable rate between 1 pulse/s and 1 pulse/8s with a maximum error in the order of 0.7%. The complete circuit diagram is given. The analysis unit incorporates a Specto Mk. 2 analysis projector with a  $32 \times 23$ -in rear projection screen. The projected image is reflected through  $180^\circ$  onto the screen, thus enabling the projector to be placed adjacent to the viewing position so that the operator can readily operate the projector and abstract data from the screen image. An accurate measuring device with 2 fiducial marks extending the full depth of the screen is incorporated.

**FILM AND ITS PROPERTIES**

**The improvement of the film recording systems: new recording film** (In English),

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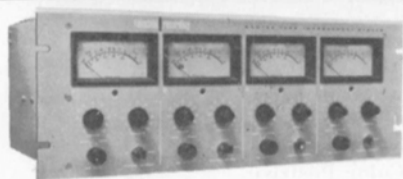
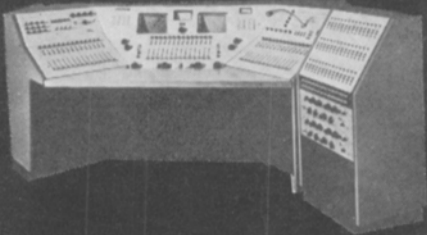
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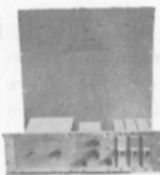


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Takagi Takushiro, Umezawa Tetsutaro, and Ieki Takeshi. *NHK Tech. Monogr.*, 55-58, No. 8, 1966; *Ref. Zh., Fotokinetikhnika*, Abstract No. 9.46.178, 1966.

A new motion-picture film is described for the recording of television programs from a kinescope. It is based on existing types but differs from them in its high contrast, good resolution and fine-grain emulsion. The spectral sensitivity has also been improved to correspond with the spectral characteristics of the radiation from the phosphor of a cathode-ray tube. The film is chemically sensitized to the region of 450  $\mu$ . Data on its spectral sensitivity are given. The mechanical characteristics of the new film are discussed in comparison with existing types: graininess, swelling, relative stretching in the wet state, hardness of the emulsion and the base, and solubility in concentrated solutions of alkali. A method has been worked out for processing the film with viscous solutions, and apparatus has been constructed for processing the film by diffusion transfer. The overall time for processing the film by the new method is 1 min.—S.C.G. (Translated from *Ref. Zh., Fotokinetikhnika*)

### GENERAL

**The ionosphere and the engineer,** Inaugural Address of J. A. Ratcliffe, President British Institution of Electrical Engineers, Delivered Oct. 6, 1966. *Internat. Broadcast Eng.*, No. 29, pp. 53-60, Feb. 1967.

### INSTRUMENTATION AND HIGH-SPEED PHOTOGRAPHY

**High-speed cinematography at the Hes-ton Laboratories of Atomic Power Construction Ltd.,** L. J. Hewitt. *Brit. J. Phot.*, 714: 170-174, Mar. 3, 1967.

It was decided that certain problems in the design of atomic reactors concerning the forces due to gas flow in reactor tubes were best studied by high-speed cinematography. The photographic aspects of the problems were passed over as a feasibility study of the School of Photography of the Harrow Technical College where they formed a project which was carried out by third-year Scientific and Technical students. The present paper forms a report of this collaboration between industry and a technical college.—S.C.G.

**A versatile photooptical system for the study of ballistic phenomena,** Stanley D. Tanenholtz, *SPIE Jour.* 5: 54-57, Dec. 1966/Jan. 1967.

A photooptical system has been developed for determining the velocity of a projectile after target penetration and the simultaneous observation of ballistic phenomena. This system provides a wide field of view and overcomes the difficulties introduced by light from the projectile-target impact and by the pre-triggering of velocity-measuring transducers by particles broken from the target.

This system enables the measurement of residual velocity with an error of only 1 to 2% and, at the same time, permits the observation of size, shape, distribution of

other particles and distortion of the projectile.

**Ultra-high-speed framing camera** (In English), Anon., *Sci. Technol. Japan* 1: 56-57, No. 1, 1966, *Ref. Zh., Fotokinetikhnika*, Abstract No. 11.46.198, 1966.

The firm of Nippon Kogaku K.K.K.K. (Japan) has marketed the UHF-500 Nikon-Uyemura Ultra-High-Speed Framing Camera, with which a rapidly occurring event can be photographed at a rate of 500,000 frames/s, making it possible to take an event lasting 0.1 ms on 50 consecutive frames. The primary image is formed by a system of a mirror and a condenser lens onto a rotating four-sided mirror set in the center of a rotating 77mm drum. On both sides of the rotating mirror are placed two symmetrical groups of 42 objectives in a circular arc, projecting separate images onto a 35mm light-sensitive film of 2000mm long, fixed on the inner surface of the drum. Behind the condenser and in front of the objectives is a rhombic diaphragm which also serves as a shutter. In a quarter of a turn of the rotating mirror an exposure is made of 40 frames of width 5mm with an interval of 25mm between frames, after which the drum rotates 5mm and photographs the following group of 40 frames. In this way each objective photographs 5 frames on a 25mm section of film. The usual number of frames in continuous photography is 200. The minimum exposure time is 0.2 s, and the dimensions of the image arc 15  $\times$  5 or 8  $\times$  5 mm. The resolving power of the objectives is 50 line/mm. The rotating mirror is driven by a pneumatic turbine, and the drum by an ac series electric motor. The size of the camera is 770  $\times$  760  $\times$  1000 mm, and its weight is 230 kg.—S.C.G. (Translated from *Ref. Zh., Fotokinetikhnika*)

**High-speed photography of fast moving particles,** N. Dombrowski and L. R. Tyley, *Jour. Photo. Sci.*, 15: 40-44, No. 1, Jan./Feb. 1967.

A system of high-speed photography has been designed to measure the size and velocity of particles whose diameters lie between 10 and 100  $\mu$ m, and whose velocities lie within the range of 500 to 1,000 ft/s. The principle employed is that of "panning," at known speed, the magnified optical image of a moving particle by means of an image converter tube, so that the electron image is held stationary on the screen phosphor while the actual particle moves across the illuminated field of view. Under these conditions, the exposure time can be made some thousand times greater than that required to take a "still" photograph of the original particle. Problems of adequately illuminating the particle during the longer period of exposure are correspondingly reduced, while picture quality is increased. In order to ensure that each photographic record contains an adequate number of images for ease of analysis, multiple exposures are made on a single film frame. In order to prevent inevitable degradation of each image by over-exposure, an inverted stage is included in the photographic system so that the sequence of exposures made in the camera results in a number of white images on a dark background.



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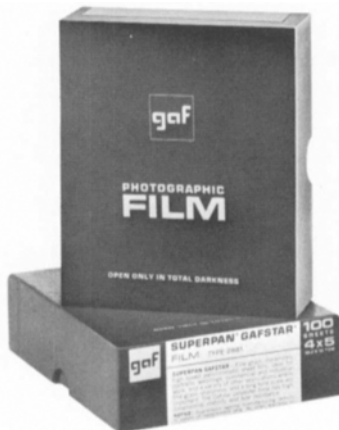
temperatures of 80 to 85 F. That's a capacity of more than 300 4 x 5-inch films per hour. And without cumbersome pre-threading.

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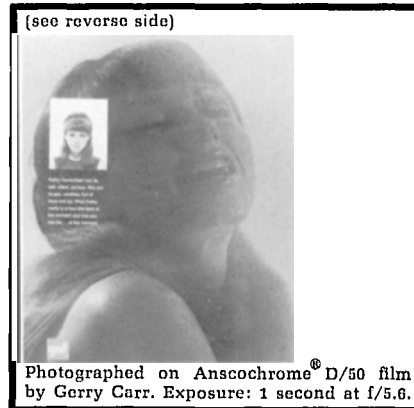


**"OK MACK, DROP THE KNIFE!"** Around the time that "Mack the Knife" was a popular song with the younger generation, photographers had developed knife etching of heavy base film to a fine art. The films in question were thick emulsion films designed and engineered in the 30's and 40's.



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### LASERS

**A digital laser rangefinder for data acquisition**, Dr. Julian L. Thompson and Thomas R. Stoner, *SPIE*, 5: 47-53, Dec. 1966/Jan. 1967.

A pulsed ruby laser rangefinder is installed on one of the test ranges at the U.S. Naval Ordnance Test Station, China Lake, California, and is being evaluated for use in data acquisition for determining trajectories of airborne targets. Pulse repetition frequencies up to 10/s for meaningful data from high speed targets, and digital range readout are considered important characteristics of this equipment. This paper presents some of the pertinent constructional details, performance goals, and some test data indicative of the degree to which these goals have been met. Certain operational difficulties are pointed out and analyzed and remedial steps proposed.

**Two-beam interferometer using a laser**, U. Grigull and H. Rottenkolber, *J. Opt. Soc. Am.*, 57: 149-155, Feb. 1967.

A new interferometer is described which is simple to set up, adjust, and operate. The instrument retains the desired properties of conventional Mach-Zehnder or Michelson interferometers. The application of the laser interferometer ranges from wind-tunnel research to quality control of surfaces.

### LIGHT SOURCES

**The design of incandescent lamps for kine and slide projection**, E. F. Edwards and R. Burgin, *Photo. Jour.*, 106: 319 (1966).

In spite of certain limitations the incandescent lamp has held its place as the most popular light source for kine and slide projection. Development of improved lamp types has been continuous and is now more active than ever before. The external demand for more light on the screen has created a trend towards extra low voltage lamps together with a tendency to build the condenser system into the lamp. A practical understanding of the "tungsten halogen" cycle has provided lamps which have a higher efficiency, higher color temperature and complete absence of light loss through life; these are steadily superseding conventional lamp types. By careful matching of lamp design and projection optics the new techniques have given levels of illumination which are in some cases only limited by the danger of overheating the film in the gate. This obstacle can be surmounted by embodying within the lamp system a dichroic mirror reflecting only the visible component of the radiated energy through the film. The recent emergence of a new 8mm film format has provided an opportunity for a re-thinking of lamp design in which each of these new technologies can play an important part.

### MEDICAL PHOTOGRAPHY

**Tone reproduction in medical radiography**, P. Kowaliski, *Jour. Photo. Sci.*, 14: 311-320, No. 6, Nov./Dec. 1966.

The concept of tone reproduction in visible-light photography can be extended, by analogy to medical radiography. First a correspondence between the luminance values of the intensifying screen, or the image intensifier, and the absorptions by the different anatomic details is established by photographic photometry on an equivalent Plexiglas step wedge. The method is then employed for the determination of the optimum characteristic of the photographic system when examining the skull, the lungs, the stomach, or for urography.

### PHOTOGRAPHIC THEORY AND MATERIALS

**Technological methods of obtaining motion-picture prints in different formats** (In Russian), N. D. Bernshteyn, M. Z. Vysotskiĭ, B. N. Konoplev, and V. A. Tarakanov, *Tekh. Kino i Televideniya*, 11: 11-21, Jan. 1967.

The Mosfil'm motion-picture studios and the NIKFI Research Institute have carried out an experimental and theoretical investigation of methods of making prints in different formats on a technological scale from 70mm and 35mm wide-screen negatives. The choice of a method for particular cases is discussed.—S.C.G.

**A new objective characterization of film image-structure**, Frank Scott, *Photo. Sci. Eng.*, 11: 7-10, No. 1, Jan./Feb. 1967.

An objective film image-structure characterization is described which relates the input, or exposure, to the output, or spatially varying transmittance. As a function of both spatial frequency and mean exposure, objective image quality is described by the ratio of the transmittance modulation resulting from a sine-wave image exposure, to the rms granularity for scanning aperture diameter sizes inversely proportional to spatial frequency. The resulting graphical image-structure description is useful in optimizing system design, selection of film/processing combinations, determining exposure latitude and depicting such effects as are due to image motion in such applications as aerial photography and data recording.

### TELEVISION

**Further development of apparatus for the measurement of particle tracks in nuclear emulsions by the television method** (In Russian), A. E. Voronkov, G. B. Zhdanov, L. V. Sukhov, M. F. Solov'eva, M. I. Tret'yakova, M. M. Chernyavskii. *Usp. Nauch. Fot.*, 12: 137-139, 1966.

A brief account is given of modifications made to the output system of a Soviet automatic microscope used with a television circuit for the measurement of scattering and ionization in particle tracks in a nuclear emulsions.—S.C.G.

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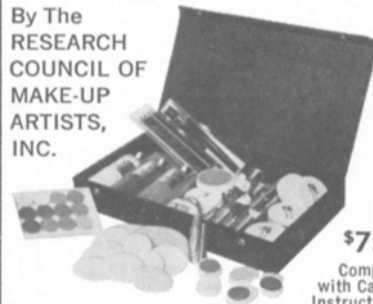
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