Audio Controls Division
Altec Lansing Corporation

Art Davis, leading studio equipment design engineer and manufacturer, recently joined Altec to head the newly created Audio Controls Division. A Fellow of the Audio Engineering Society, Davis holds many audio equipment patents and last year received the John Potts medal for his contributions. This column on broadcast and recording is his first in a series.

To my friends in the industry, the move to Altec will come as no surprise. Personally, I know of no other firm which so deserves its place of honor as a trusted supplier to the recording and broadcast industries. Already we are busy designing and building what we hope will be superior attenuators, equalizers, filters, networks, switches, all-transistor limiter, monitor and preamplifiers, and power supplies. We are making these devices (and others) expressly for your industry, with our combined know-how and ability behind them.

NEW SOLID STATE PREAMP ONE OF FIRST ITEMS

For example, we've just finished designing a new solid state preamplifier, the 470A. Use it as a preamp or line, booster, and program amp; no internal changes needed! Here's the way it came about: First we decided to find out what you really wanted. So we took a survey among hundreds of recording and broadcast engineers. Guided by the results, we built the 470A to provide the size and capabilities for which most of you asked.

DESIGNED TO YOUR REQUIREMENTS

For instance, most of you felt that miniaturization had gone *too* far. So the 470A is a little larger than some "subminiature" models; however, you'll still get 8 in a 19" panel and occupy only 3½" height. That size difference will help with the age-old heat problem and all the attendant damages. Another thing, the 470A has larger "plug-in" connectors to simplify wiring and circuit tracing; easier to solder and cement. Sensible size also makes it easier to maintain and service the 470A.

It's important to note the 470A has a lower noise level than any tube amplifier designed for this function and is free of characteristics, or personality of its own. It excels in patching applications because it's unaffected by length of transmission lines (over 100 feet fore and aft!)

Specs? We think you'll like them, too: gain, 44 db; power output (max.), 29dbm, 20-20,000 cps; frequency response, —0.25 db, 20-20,000 cps; less than 1% THD, 20-20,000 cps; less than .2% THD, 50-20,000 cps (both at rated output).

Perhaps you see what we mean when we say the 470A solid state preamplifier is designed for you. It's just what we mean. And that applies to everything we're going to make. That's why we would like to hear from you. To find out what you need and perhaps come up with something for you. So give me a call, or drop me a line. I'll be happy to hear from you and send you the latest on our products.

Art Davis

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Audio Controls Division • Altec Lansing Corporation • Anaheim, California

Abstracts

Abstracts of papers appearing in other journals, chosen for their importance and timeliness, are published in the *Journal* from time to time. Most of these abstracts are translations, chiefly from the U.S.S.R., and are made available to the *Journal* by the Research Laboratories of the Eastman Kodak Company. As a rule, translations are made of the foreign language abstracts, not of the paper itself. The respective complete original texts can be consulted at some libraries. Current issues of *Tekh. Kino i Telev.* can be consulted at, or borrowed from, the Society's Headquarters Office; also of possible interest to some readers may be three papers which have been translated from the Russian and are available as manuscripts on loan from Society Headquarters:

(1) L. G. Golshstein, I. Ya. Levin and T. I. Maksinrov, "Optical printer," *Tekhnika kino i telev., 3,* No. 10, 58–62, (1959).

(2) M. M. Lisogor, "The 'Rossiya' Universal Cine Theater," *Tekhnika kino i telev., 6,* No. 5, 1–8, (1962).

(3) I. B. Gordiichuk, "The present state of the manufacture of cine apparatus in the USSR," *Tekhnika kino i telev., 6,* No. 5, 3–19, (1962).

Those requiring definitive and thorough searches of current literature and patents are referred to *ABSTRACTS of Photographic Science & Engineering Literature* (*APSE*), published monthly by the Engineering Index, Inc., 345 East 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
Color Processes
Copying
Copying Equipment
Data Recording
Filters
General, History, Training, Bibliography
Graphic Arts, Photomechanical Processes
High-Speed Photography
Lenses and Shutters
Light Sources
Miscellaneous Apparatus
Motion Pictures
Photographic Theory and Materials
Photomicrography
Physics and Chemistry
Printing Equipment, Enlargers
Processing Equipment
Projectors and Viewers
Sound Recording and Reproduction
Special Applications

CAMERAS

The construction, penetrating power and internal accuracy of the Pulkova camera with moving film (in Russian), L. A. Tanaiotov, *Byul. st. optich. nablyudeniya iskusstv. sputnikov. Zemli,* 12–17, No. 29, 1962; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 9.46.64.

A description is given of the construction of the KPT-II Camera designed and made at Pulkova in 1961 for the systematic photographic observation of artificial earth satellites. An estimation of its penetrating power and internal accuracy is based on a year's study of its operation. Its advantages over the cameras of 1959 and other devices for photographing artificial earth satellites are listed.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

Precise hi-speed cameras, E. E. Halmos, *Ground Support Equip. 5:* No. 1, 24–26, 1963; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 11.46.45, 1963.

The tendencies in automation of modern aerial photographic cameras put out by Maurer and a number of other companies in the United States are indicated. The cameras automatically determine the exposure, are automatically switched on and off, carry out resetting of the timer and repeat exposures and give high definition of the images. The mechanical, electronic and optical components of these cameras are outstanding for their small dimensions and complexity of construction. A unit of this kind used in space flights has dimensions of 203 by 203 by 303 mm. The image compensation mechanism and the pneumatic film-flattening are described. Objectives with diameters up to 660 mm are used for photography from a height of 25 to 160 km above the earth. Photographic materials for these cameras are preferably coated on the Mylar type of bases, which have better elastic properties and are less sensitive to atmospheric action than cellulose ester bases. The Maurer Company also produces testing and adjusting apparatus, and motion-picture and still cameras used in rocket launching and tracking, including the Gorgon guidance system. The cameras are fitted with 30-mm cassettes and small high-speed developing apparatus.—S.C.G. (Abridged from *Referativnyĭ Zhur., Fotokinotekhnika.*)

An automatic instrument for the photography of artificial earth satellites (in Russian), L. Vol'feĭl', *Byul. St. Optich. Nablyudeniya Iskusstv. Sputnikov Zemli,* 51–54, Special Issue, 1962; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 11.46.48, 1963.

The instrument described for the photographic observation of artificial earth satellites consists of three cameras fastened to a common parallactic mounting with a clockwork mechanism. Before each objective (*f*/4.5, 13.5 cm) is placed a shutter attached to the spindle of a miniature motor. The camera records the track of a satellite over an arc of its trajectory comprising about 160°. During the passage of the satellite, photographic plates are exposed for several uniform intervals of time (from 2 to 15 sec), so that the trajectory of the satellite is broken up on the plate into a series of equal sections, the length of which corresponds to the exposure given. The method of making the observations is explained.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

A triaxial automatic camera for the observation of artificial satellites (in Russian), M. K. Abele, *Byul. St. Optich. Nablyudeniya Iskusstv. Sputnikov Zemli,* 55–61, Special Issue, 1962; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 11.46.47, 1963. (Title only.)

A new camera for high-speed photography (in Russian), G. L. Shnirman, A. S. Dubovik, P. V. Kevlishvili, A. B. Granigg and I. A. Korolev, *Vestnik Akad. Nauk SSSR*, 73–75, No. 5, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.46, 1963.

A description is given of the development and manufacture by the Institute of Chemical Physics of the Academy of Sciences USSR of a ZhLV-1 high-speed camera, which differs from the original model in a new type of mirror scanning. The camera can be used as a high-speed framing camera with frequencies of 45 thousand to 4.2 million frames/sec and as a streak camera with slit scanning with a time resolution of up to 2×10^{-8} sec. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

HIMAC type 16HB Hitachi high-speed motion-analysis camera (in English), Anon., *Hitachi Rev. 11:* 55, No. 4, 1962; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.47, 1963.

A short report is given on the Himac 16HB high-speed camera with a rotating prism compensator and a taking frequency of up to 10,000 frames/sec. The camera possesses the following features: (1) A timer works together with the synchronizing mechanism; (2) with the aid of a special device the length of unused film is reduced to a minimum; (3) the taking speed can be set within the range 500 to 10,000 frames/sec without altering the motor, the start-up of the camera taking place with only a small loss of film; (4) a high-quality Nikkor-auto objective is used in the camera; (5) there is a taking speed and zero time indicator.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

The industrial photographic and television exhibition, Anon., *Amateur Photographer, 126:* 854–856, Dec. 4, 1963.

This exhibition of equipment for the professional photographer was mostly concerned with ciné photography. A review is given of the cameras, projectors, accessories and lighting equipment on display.—N.W.

A simple variation of the underwater automatic camera (in Russian), D. V. Radakov and D. E. Nikolaev, *Okeanologiya, 3:* 517–522, No. 3, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.49, 1963.

A description is given of an automatic camera which has been designed by the Laboratory of Ichthyology of the A. N. Severtsova Institute of Animal Morphology of the Academy of Sciences USSR. The automatic camera can be made in any workshop. Fitted with a flashlamp, it allows 12 to 15 frames to be exposed under water at depths down to 150 m. The taking frequency is controlled and may range from 1 exposure in 7 sec to 1 exposure in 60 sec. A detailed discussion is given of the construction of the basic units of the automatic camera and the routine for preparing the apparatus for operation.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

Multiple pinhole camera for microelectronics, T. E. Price, *Ind. Electronics, 2:* 85–88, Feb. 1964.

Experiments on the production of an array of images by multiple pinholes are described. Unlike other proposals for employment of pinholes to produce masks for microelectronics, the present paper suggests their use only at an intermediate stage of reduction. The array of images was finally reduced another 10 diam with a lens.—G.W.W.S.

Multiple exposures on one frame (in Russian), O. Litinskiĭ, *Sov. Foto, 36:* No. 3, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 9.46.25.

The modernization of the Zenit Camera is discussed, as a result of which it is possible to use the camera for both ordinary photography and combination work (trick photography and technical purposes).—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

Canon Reflex Zoom cine camera, (I.C.P. Test Report), P. Bernard, *Ind. Com. Photographer, 3:* 41, No. 43, Feb. 1964.

The Canon Reflex Zoom 8.3 8mm ciné camera has a Canon Zoom lens with a 5 to 1 zoom ratio giving focal lengths from 8.5mm to 42.5mm, with good picture quality. The correct lens aperture (from $f/1.4$ to $f/22$) is selected by rotating the aperture scale ring to a point where the automatic exposure indicator needle seen in the top of the viewfinder settles between the tolerance marks. The camera has a split-image rangefinder and a spring motor giving a range of seven speeds from 8 to 64 ft/sec. Single frames can be exposed.—N.W.

Predictions of lens-camera efficiency by analytical methods. Parts 1–4, J. H. Ellinger. *Brit. J. Phot., 111:* 42–46, Jan. 17; 78–83, Jan. 31; 124–130, Feb. 14; 158–162, Feb. 28, 1964.

The methods of analysis described are intended to help the buyer or manufacturer of expensive photographic equipment to select a good fundamental design, or to make the best of an unsatisfactory design. Subjects discussed in detail include the lens system, the viewing system, and movements of lens and film planes.—N.W.

Unusual cameras and optics (in German), L. A. Mannheim, *Monatl. fototechn. Mitt. 11:* 141–142, 144, No. 3, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 11.46.8, 1963. (Title only).

Mamiya C3 (camera test), N. Maude, *Amateur Photographer, 127:* 316–321, Feb. 26, 1964.

The C3 twin-lens reflex camera, with $2\frac{1}{4}$-in square format, is a modified version of the C2 camera and has the same range of lenses and accessories. A full description of each lens in a range of five interchangeable lenses (from the 65mm $f/3.5$ Sekor to the 180mm $f/4.5$ Mamiya Sekor), is given. Each lens has its own Seikosha shutter with speeds from 1 to $\frac{1}{500}$ sec. The Mamiyaflex viewfinder has a separate Fresnel screen and matte glass. Direct viewing and focusing are possible with the Porroflex mirror attachment. For work on a tripod the Paramender device, which is mounted between camera and tripod, gives exact compensation for parallax. The taking lens is moved into the position of the viewing lens when required.—N.W.

Praktisix 2¼-in. square SLR camera and Novoflex follow-focus unit (I.C.P. Test Report No. 44), J. Hughes. *Ind. Com. Photographer, 3:* 42–45, Feb. 1964.

The Praktisix is a 2¼-in. square single-lens reflex camera from Eastern Germany, giving 12 exposures on 120 roll film, with a focal-plane shutter speeded from bulb to 1/1000 sec and a range of interchangeable lenses, some with an automatic iris diaphragm. A pentaprism viewfinder can be fitted. Two automatic lenses, the 65mm Flektogon and 80mm Tessar, are reviewed.

The Novoflex follow-focus pistol-grip unit enables rapid changes of focus to be made by applying pressure to the trigger. The front rim actuates the click-stop iris diaphragm and the rear of the mount is threaded for screw-on filters. The performance of the unit, fitted with the 240mm *f*/5.6 Noflexar, is described.— N.W.

Golf swing camera, Anon., *Engineering, 197:* 400, Mar. 13, 1964.

The American Graph-Check 400 sequence camera is used for producing a set of "instant prints" of a movement in sport, i.e., a golf swing. Eight pictures are exposed on 4 by 5 in. Polaroid film at an exposure of $\frac{1}{250}$ sec and a total period varying from $\frac{1}{10}$ sec to 10 sec. British agents for the camera are Gordon Cameras Ltd.— M.D.G.

The Minolta system (camera review), G. W. Crawley, *Brit. J. Phot., 111:* 60–63, Jan. 24, and 84–87, Jan. 31, 1964.

The latest version of the Minolta SRI single-lens reflex camera is reviewed and compared with the Minolta SR7 single-lens reflex camera (reviewed in *Brit. J. Phot., 110:* Feb. 8, 1963). Accessories from the Minolta system for use on these cameras are described. Four lenses and accessories for macro- and microphotography are reviewed in detail.— N.W.

Photographic camera (British Pat. 949,489), K. Kromer and W. Hahn; assigned to Veb Kamera- und Kinowerke Dresden, filed Sept. 19, 1961; 3 pp., 2 plates.

The camera described has a coupled exposure and focusing control. As the focus distance, indicated by symbols, is decreased, the exposure time is reduced. The controlling ring may be rotated beyond the distant-scene symbol to one of a running figure. This does not change the focus but reduces the exposure time. In addition, there are sets of contacts for electronic flash and flash bulbs. The type of flash being used is denoted by the setting of the control ring.— R.A.W.

The Bolex Zoom Reflex Automatic Kl double-eight camera (in German), Anon., *Tech. Rundschau, 55.* 25, No. 14, 1963; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 10.46.174, 1963.

A description is given of the Bolex Zoom Reflex Automatic Kl camera made by the firm of Paillard in Switzerland for photography on 2 by 8mm film with frame frequencies of 12, 18 and 40/sec.— S.C.G. (Abridged from *Referativnyĭ Zhur., Fotokinotekhnika.*)

COLOR PROCESSES

The preparation of contact screens on an electronic color corrector (in Russian), K. R. Yanson, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii, 8:* 465–467, No. 6, Nov.–Dec. 1963.

An electronic color-correcting machine has been used for preparing copies of a contact screen, the characteristics of the copies being made to differ from those of the original as required.— S.C.G.

Processing Adox Colour C18, E. C. Gehret, *Brit. J. Phot., 111:* 144, Feb. 21, 1964.

Revised formulas and working instructions are given for those who wish to process their own films. The processing time has been reduced considerably by raising the processing temperature from 20 to 24°C.— J.A.C.

COPYING

A study of the influence of immersion on the quality of the photographic image (in Russian), L. P. Mel'nikova, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst,* 84–93, No. 50, 1962; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 10.46.162, 1963.

A detailed study has been carried out on the influence of immersion copying on the quality of prints printed from both damaged and undamaged negatives. Quantitative and qualitative characteristics are given for the improvement of a picture on projection printing with immersion. On the basis of the experimental results it is recommended that immersion copying should be widely introduced into the motion-picture industry, and especially in microfilming with both projection and contact printing. —S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

A rational shape for the characteristic curve of materials for microreproduction (in Russian), E. A. Bukatin, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii, 8:* 468–470, No. 6, Nov.–Dec. 1963.

Reasons are given for believing that the characteristic curve of materials intended for microcopying should be different in shape from that normally used. It is suggested that the ideal shape is a curve with maximum gradient in the region of small densities, decreasing as the image density increases. An approximation to the ideal shape is to be obtained by modification of the whole photographic process, and not only by alteration of the characteristic of the material itself.—S.C.G.

COPYING EQUIPMENT

Ilfoprinter Model 950 C, *O and M Bull., 19:* 27, Feb. 1964.

The Ilford Ilfoprinter 950 C for reflex copying incorporates a two-bath activator-stabilizer processing unit. Documents up to 8½ by 13 in. in area may be handled.— M.D.G.

Apparatus for exposing light-sensitive sheets and/or webs (British Pat. 950,158), E. F. Hurin and J. R. Miles; assigned to Charles Bruning Co. Inc., filed June 18, 1962; 6 pp., 3 plates.

A projection exposing device is disclosed

Inspect every foot before it leaves your plant with the HFC High Speed Heavy Duty Inspection Projectors -- 16mm & 35mm models now available.

NEW

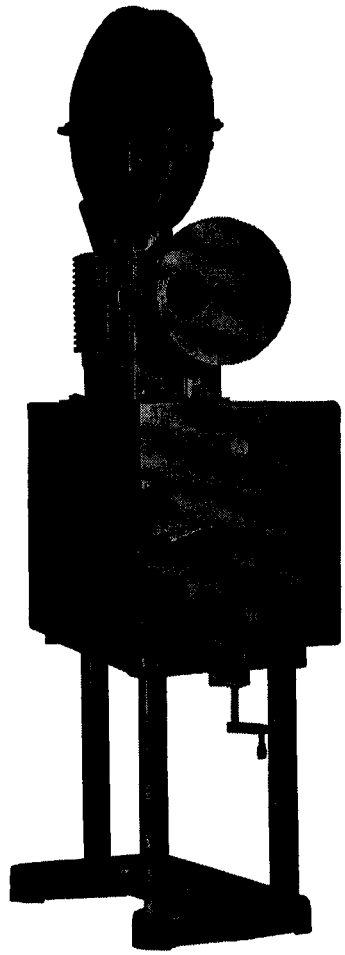
The projector is a converted front shutter Simplex with a two pin intermittent. 16mm or 35/32 film runs at a speed of 144 ft. per minute while 35mm film runs at a speed of 165 ft. per minute.

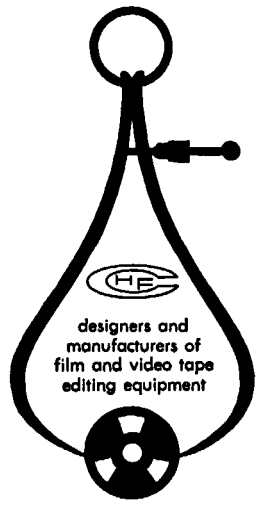
1. A variac controls the light intensity.
2. A 500 watt lamp is used for 16mm and a 1,000 watt for 35mm (a blower is used to cool the lamphouse).
3. A 2½ inch projection lens is furnished with each unit.
4. A start-stop lever controls the power to the lamp and motor.
5. The magazine and take up core takes up to 3,000 ft. of film.
6. Upper guide rollers are made to handle the film from either direction of the feed reel.
7. A free wheeling take off flange is provided in the magazine.
8. A lamp near the takeup reel permits hand inspection of the film prior to takeup.

NOUVEAU

Le projecteur contient un obturateur Simplex anterieur transformé avec deux clavettes intermittent. Les films de 16mm ou 35/32 tournent avec une vitesse de 144 pieds à la minute, tandis que les films de 35mm tournent avec une vitesse de 165 pieds á la minute.

1. Le regulateur de voltage d'intensité d'eclairage.
2. La lampe de 500 watt est nécessaire pour les films de 16mm, et de 1000 watt, pour les films de 35mm (un ventilateur est mise pour rafraichir la chambre de la lampe).
3. L'objectif de 2½ est instalé.
4. La manette de mise en marche et d'arret controle en meme temps la lampe et le moteur.
5. La boite de films avec noyau peut contenir 3000 pieds du films.
6. La roue supérieure est construite de manière de recevoir le film dans les deux directions, nourrie par la bobine centrale.
7. Une roue est instalée pour libérer rapidement le film de la boite.
8. La lampe se trouve pres de la bobine recepteuse, et donne toute facilité pour inspecter le film a main dans le projecteur.





NUOVO

Questi proiettori sono Simplex transformati, otturatore al fronte, meccanismo di scatto di due punte. La velocitá di proiezione in 16 o 35/32mm e di 144 piedi per minuto, e in 35mm, di 165 piedi per minuto.

1. Controllo manuale della luminositá della lampada.
2. Lampada di 500 watt per 16mm e di 1000 watt per 35mm.
3. Obbiettivo di proiezione di 2½".
4. Maniglia per controllo di motore e lampada di proiezione.
5. La cassetta porta pellicola puo contenere 3000 piedi.
6. I rulli superiori di guida sono construiti per operare con film provenente di ambi lati della bobina svolgitrice.
7. Disco con montatura sporgente nel magazzino.
8. Una lampadina illumina la bobina avvolgitrice, permettendo l'ispezione manuale del film prima che si avvolga nel proiettore.

NUEVO

Esta máquina es un proyector simplex convertido, obturador al frente y movimiento intermitente a doble grifa. Para 16mm o 35/32mm, la velocidad fija de proyección es de 144 pies por minuto, para 35mm es de 165 pies por minuto.

1. Un reostato controla la intensidad de la lampara de proyección.
2. Para 16mm se usa una lampara de 500 watt, y una de 1000 watt para 35mm (un chorro de aire ventila las lámparas en ambos casos).
3. Cada unidad está provista de un lente de proyección de 2 pulgadas y media.
4. Una palanca de control opera el motor y la lampara simultáneamente.
5. Capacidad de proyección: rollos de hasta 3000'.
6. Los rodillos de guía superiores operan con la película en ambas direcciones.
7. La tapa de la bobina de carga es desenroscable.
8. Una lámpara ubicada junto a la bobina de toma permite la inspección manual de la película antes que se rebobine en la bobina superior del proyector.

HOLLYWOOD FILM COMPANY

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which uses the same pairs of rollers to transport both the original and the copy, side by side, in the same direction, ensuring synchronization of the original and copy. The area of the moving original projected is limited by a slit and is imaged through an optical system, consisting of a lens and three plane mirrors, onto the moving copy paper.—T.G.

Improvements in or relating to photocopying machines (British Pat. 946,818), assigned to the Horsfall Engineering Company Limited. Filed Jan. 8, 1959, 6 pp., 4 plates.

A transparent cylinder, free to revolve about an extended light source, is held in position by two rollers and an apron consisting of a number of endless bands. Documents and copying paper are fed into the nip between the cylinder and the apron. A constant-speed motor drives one of the rollers via a crank and a unidirectional clutch, so that a stepwise motion is produced. The speed is controlled by varying the length of throw.—M.L.

Photocopying machines (British Pat. 949,590), W. Longden and K. P. Farrell; assigned to J. Halden & Co. Ltd., filed June 6, 1961, 3 pp., 1 plate.

A photocopying machine is disclosed in which the feed table is fitted with a suction system such that a paper sheet placed manually upon the table is retained in position. This facilitates the arrangement and accurate registering of large-size sheets prior to feeding into the entrance nip rollers of the machine.—E.T.S.

DATA RECORDING

A device for the automatic photography of cathode-ray oscillograph traces (in Russian), V. M. Kirpichnikov, *Trudy Ural'skogo Politekh. Inst.*, 124–126, No. 119, 1962; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.50, 1963. (Title only.)

The electron beam oscillogram photographically recorded (in German), H. W. Fricke, *VDI Nachr., 17:* No. 11, 14, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 11.46.239, 1963.

As oscillographs have been improved, so have the techniques of photographic recording. Thus, at first the cathode-ray tube was used without a scanning generator and recording was carried out on moving film. As the frequency of recording the signal increased, the quality of requirements of the recording apparatus also increased markedly. With the use of a scanning generator this difficulty was overcome by using a framing camera. Frame-by-frame photography is particularly convenient in the recording of periodic phenomena. For this type of photography 1- or 2-objective reflex cameras are recommended. If it is necessary to obtain a finished print rapidly, the Polaroid camera may be used. A process lasting minutes, hours or days is preferably recorded on continuously moving film. In recording short-time processes it is necessary to raise the speed displacement of the film. The maximum speed is determined by the breaking strength of the film. An increase in speed is obtained by using a special cassette.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

FILTERS

Glass light filters for sensitometric light sources (in Russian), V. P. Baranova and Yu. N. Gorokhovskiĭ, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii, 8:* 437–446, No. 6, Nov.–Dec. 1963.

The spectral absorptions of light filters made from the present range of Soviet-made colored optical glasses are discussed with reference to the requirements of the Soviet standards on sensitometry.—S.C.G.

GENERAL, HISTORY, TRAINING, BIBLIOGRAPHY

Zeiss Ikon—Stuttgart, G. W. Crawley, *Brit. J. Phot., 111;* 114–17, Feb. 14, 1964 and 136–139, Feb. 21, 1964.

A history of the present Zeiss Ikon Company is given. The Zeiss organization is described, with particular attention to the Stuttgart factory, the manufacture of cameras together with methods of inspection and checking for faults, the designing of cameras and the welfare services for the workers.—N.W.

Ercsam-Pathé-Cinéric (in French), Anon., *Mécan.-Élec. 47:* 64–69, No. 162, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.6, 1963.

A short review is given of the activities of the three French concerns forming part of the Ercsam-Pathé-Cineric (EPC) Company and specializing in the field of development and design of apparatus for motion-picture amateurs. Among the motion-picture cameras made by the company are the Camex R1 and Webo M 9.5; the fully automated Auto-Camex 8mm camera; the 9.5 Rio-Phot with instantaneous daylight loading; and the Webo Reflex which is a professional camera with a revolver head, a controlled shutter and magazine accommodating 120 m of film. For motion-picture projection the REX projector is marketed with automatic loading, a single-frame projection device, slow and reverse motion and synchronization with magnetic sound. Also, 16mm sound projectors are being produced with optical and magnetic sound reproduction, notable for their portability and firmness of construction. It is observed that the EPC firm was the first to supply a xenon arc lamp with 8mm projectors, in particular the Sonoclub 8 projector. The use of EPC motion-picture cameras in various fields is discussed: in advertising, personnel training, rationalization of production processes and for scientific and research purposes.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

Survey of the British photographic industry, Anon., *Photographic Retailer*, 39, Feb. 1964.

A survey conducted by the British Photographic Manufacturers' Association discloses a production value of £52 million during 1962. Figures for exports and imports are also quoted for the years 1960 to 1962.—M.D.G.

F. L. Burmistrov (on his 75th birthday) (in Russian), Yu. N. Gorokhovskiĭ and A. N. Tikhonov, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii, 8:* 475, No. 6, Nov.–Dec. 1963.

. . . that's **Flash-O-Graph® Fixer.** Highly concentrated, this ultra-fast fixer provides rapid fixation of photographic material in nearly every process. You get longer tray life, and more negatives and prints per tray of fixer because **Flash-O-Graph** contains special buffering agents to extend its working life. Rigidly controlled manufacturing techniques and the use of only the finest chemicals assure you of a consistent and reliable fixer . . . always ready for instant use. Flash-O-Graph Fixer is available in **convenient** cartons of four 1 gallon bottles with hardener and in **economical** 5 gallon poly Cubitainers. Flash-O-Graph® Hardener is available in cartons of eight 64-ounce poly bottles.

HUNT

PHILIP A. HUNT CHEMICAL CORPORATION, Palisades Park, N. J., Branches in Principal Cities, PHILIP A. HUNT COMPANY (CANADA) LTD., Toronto

A brief biographical note is given on Feoktist Lavrent'evich Burmistrov, a well-known Soviet authority on photography and photogravure.—S.C.G.

GRAPHIC ARTS, PHOTOMECHANICAL PROCESSES

Method of making polarized slides (British Pat. 947,980), R. F. Beliveau and J. W. Coffman; assigned to Tecnifax Corp., filed June 29, 1962; 4 pp., 2 plates.

A pentagonal template, of which two neighboring angles are 90° and three are obtuse and different, enable several different orientations to be chosen when cutting out "Cellophane" overlays. These overlays when bound up with transparencies enable differential lightness effects to be obtained when the slides are arranged between a polarizer and analyzer for projection.—E.W.H.S.

Improvements in the photographic production of justified lines of type matter (British Pat. 949,457), J. H. Lemche; assigned to Cartoprint A/S, filed Feb. 9, 1959; 6 pp., 1 plate.

Apparatus for producing justified lines of type from an unjustified original by projection comprises a variably anamorphotic projection system mechanically coupled to a photoelectric sensing system. Each line of the original is scanned by the photoelectric system, which is arranged to trigger an electronic flashlamp when it encounters a mark printed at the end of the line. The coupling between the sensing and anamorphotic systems is such that, when the flash is fired, the projected image of the line is of the correct length.—M.C.L.

Improvements in or relating to photographic setup machines (British Pat. 946,755), J. H. Lemche; assigned to Cartoprint A/S, filed Sept. 22, 1959; 4 pp., 1 plate.

Improvements in machines used for the photographic setting up of columns of type matter, such as telephone directories, are claimed. Variable spacing of optically projected images of columns of text is achieved by means of a number of preset potentiometers which control a pattern of successive advances of the photosensitive material used in the preparation of a printing plate.—J.L.

The development of new photographic materials for the graphic arts, H. M. Cartwright, *Visual, 1:* 26–31, No. 2, Dec. 1963.

A brief review of the development of the halftone process is followed by a description of the photographic products which Ilford makes for the graphic arts industry, including the new range of Formolith materials. [*Abstractor's Note:* The claim that the new Ilford Separation Film of "Medium Contrast" is capable of giving a range of contrasts from 0.6 to 2.0 is of interest, and so is the claim that Formolith Fixer allows dot images to be etched in Farmer's reducer without the formation of a stain, thus obviating the need to add thiourea to the reducer.]—F.P.

HIGH-SPEED PHOTOGRAPHY

Method of determining boundary-layer thickness from Schlieren photographs, D. H. Grubman, *ARS Jour., 32:* 1296–1297, No. 8, 1962; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 10.46.242, 1963. (Title only.)

The analysis of function and faults of high-quality mechanisms by means of high-speed cinematography (in German), H. G. Patzke, *Feinwertechnik, 67:* 93–99, No. 3. 1963; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 10.46.264, 1963.

This article reviews different types of rapid and high-speed photography and discusses the basic characteristics of the cameras used, including the Fairchild motion-picture camera, the Strobokin high-frequency lighting unit, drum cameras of the Strobodrum type, and Barr and Stroud camera, the S.T.L., etc.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

The use of high-speed cinematography in the study of a short-jet fitting with a deflector cone (in Russian), N. A. Grigoryan, *Trudy Vsesoyuz. Nauch.-Issled. Inst. Gidrotekh. i Melior., 42:* 123–32, 1963; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 10.46.266, 1963.

An account is given of research carried out for determining the energetic characteristics of a short-jet fixing used as a sprinkler on watering machines and for studying the formation of drops. The method is described and the results are set out.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

LENSES AND SHUTTERS

Ultrafast objectives and the limits of their use (in German), *Jenaer Jahrb. 1962,* Jena, 1962, pp. 63-73; *Referativnyĭ Zhur; Fotokinotekhnika.* Abstract No. 9.46,85, 1963.

In a number of cases, for example in photography from x-ray screens or oscillograph screens, it is necessary to use objectives with relative apertures of $f/1$ and higher, called "ultrafast" objectives by the author. Characteristic features of such objectives are decrease in the tolerances of longitudinal aberrations, a large change in the spherical aberrations with changes in the image scale and rigid requirements for the positioning of the film in the camera. The possibility is discussed of compensating for the alteration in spherical aberration by altering the air spaces between the separate components (by using correcting mountings). For fixing the position of the film it is recommended that a spring pressure plate be used. A Schmidt lens, used for correcting the image curvature which occurs with many objectives of the type under consideration, can be used as the pressure plate. On the basis of a comparison of the resolving power of the Bauers catadioptric objective with a relative aperture of $f/0.63$ and the dioptric objective of the Carl Zeiss nationalized undertaking with a relative aperture $f/0.85$, it is concluded that dioptric systems using the Schmidt lens are suitable. It is noted that ultrafast objectives can be used either in special cameras or in amateur cinematography with 8mm film.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

"Rubber lenses" for tele-observation and tele-control (in German), J. Eggert, *VDI-Nachr., 17:* No. 11, 15, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 11.46.62, 1963.

Depending on the method of keeping the image plane in position, variable focus objectives are divided into mechanically and optically compensated systems. In the first system the lens facing the subject is fixed and the rear lens is displaced within small limits according to a complicated law, while the element between them has an almost linear motion. In the second system two rigidly joined components move linearly relative to two fixed components; greater expenditure in the optical part considerably simplifies the construction of the mountings. In narrow-gage motion-picture cameras variable focus objectives are everywhere supplanting the revolving turret; systems have also appeared for the standard frame size, for example the Zeeman $f/2.8$, 36 to 82mm objective with optical compensation; its minimum value of f corresponds to a 52° angle of field (instead of 40° with the objectives for narrow-gage film). Objectives with variable focal length are widely used in photo recording and industrial television. The Voigtländer Mark VI $f/3.5$, 25 to 150mm objectives, for telephoto cameras has automatic diaphragm control and variable image scale. For these purposes it contains in the mounting three electric motors, a photocell and a stop-setting device, which uses 10% of the light passing through the objective.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

The correct objectives for every camera (in German), Anon., *Feingerätetechnik, 12:* 121–126, No. 3, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.65, 1963.

Technical data are given for objective for cameras and amateur cine camera made in the German Democratic Republic

A fast catadioptric $f/4$, 500mm objective is made by Carl Zeiss Jena for cameras with a frame size of 24 by 36 mm. The distance of the front lens from the plane of the film is 238 mm, which is 47% of the focal length. The objective has no diaphragm. For accurate exposure in color photography, a neutral gray light filter with 25% absorption is used. The objective is provided with a rotating filter holder and has a removable device for attaching it to different cameras. The angle of field of the image is 5°. An $f/5.6$, 1,000mm catadioptric objective is made by Carl Zeiss Jena for mirror cameras with frame sizes of 60 by 60 mm and 24 by 36 mm. The angle of field of the image is 5° for a frame size of 60 by 60 mm and 2.5° for a frame size of 24 by 36 mm. The objective does not have a diaphragm and is provided with a rotating filter holder.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

A national standard on motion-picture projection objectives (in Russian), L. N. Delyaeva, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst*, 3–7, No. 49, 1962; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 9.46.79, 1963.

The main alterations that have been made in GOST 3840-51 "Objectives for motion-picture projection" are listed. The alterations concern the optical properties of the objective and the quality of the image formed by it.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

LIGHT SOURCES

Working with the xenon light source of the "Sibir'" motion-picture projector (in Russian), V. Krivtsun, *Kinomekhanik*, 33–36, Apr. 1963.

The constructional details of the xenon-arc light source of the Sibir' motion-picture projector are discussed. Recommendations are given for the adjustment of the light source and the reflector. A description is given of the power supply.—S.C.G.

Modern light sources for motion-picture projection (in Russian), G. Irskiĭ, *Kinomekhanik*, 25–32, Mar. 1963.

A review is given of modern types of arc lamp, including the xenon arc, and of new types of incandescent lamp with mirror envelopes.—S.C.G.

The manufacture of photographic lamps, S. F. Bowler, *Brit. J. Phot., 111:* 74–76, Jan. 31, 1964.

A new factory for manufacture of specialized photographic lamps has been opened at Tottenham, in North London, by Atlas Lighting Ltd. Manufacturing methods, in particular the control of the quality of raw materials, are described.—N.W.

MISCELLANEOUS APPARATUS

Improvements in or relating to spools (British Pat. 948,510), F. G. Hughes; assigned to Magnesium Elektron Ltd., filed June 15, 1961; 3 pp, 1 plate.

The accuracy required in spools for films, magnetic tapes, etc., particularly when designed for use on computers, is usually obtained by screwing flanges onto a rebated central hub. This construction is slow and expensive in manufacture. The invention claims a spool made in two parts, each part comprising one flange formed integrally with a hub. One such hub is slightly less in diameter than the other and can be slid into it when heated. On cooling, a complete, two-flange spool is formed. The normal stoving temperature required for paints is adequate to achieve a good shrink fit.—A.K.S.

MOTION PICTURES

The electronic cam method of exposing motion-picture films. A progress report. A. Jetter, *Brit. Kinematog. 44:* No. 1, 4–14, Jan. 1964.

Bavaria Atelier GmbH, Arnold & Richter, Fernseh GmbH and Siemens & Halske have jointly produced a system for the use of 35mm cine cameras in television-style shooting of motion pictures with a central console controlling the action of several cameras. Arriflex cameras are adapted so that, during the advance of the film, the image beam is deflected by the mirror reflex shutter into a vidicon. An optical marking system is used on the soundtrack area to permit subsequent matching of the various parts of the film in accordance with the electronic editing sequence. Sound and camera control markings are recorded on twin-track 17.5mm magnetic film. Equipment and direct labor for the new system cost three times as much as for traditional single-camera shooting, but production time is greatly reduced.—G.I.P.L.

The "Kristall" universal cinema at Perm (in Russian), D. Ya. Rudnik and F. N. Sondik, *Tekh. Kino i Telev., 7:* 1–5, Nov. 1963.

The first "universal" cinema (i.e., a cinema fitted for the exhibition of all kinds of film: wide-screen, panoramic, stereophonic, etc.) in Siberia has been built at Perm in the Ural region. The construction and fittings of the cinema are described.—S.C.G.

A method of calculating the reflector of a motion-picture lighting system with an extended light source (in Polish), W. Grądzki, *Pomiary, automat. kontrola., 9:* 218–219, No. 5, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.217, 1963.—(Title only.)

A model for testing motion-picture films (in Russian), S. M. Solov'ev, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii, 8:* 460–461, No. 6, Nov.–Dec. 1963.

In order to get a quick idea of the way in which features in natural scenes will reproduce on different types of photographic materials, a model is proposed consisting of a surface divided up into compartments containing a number of representative types of soil and rock, foliage and a wedge-shaped trough filled with water of different depths.—S.C.G.

Arguments concerning "A system of rational exposure measurement" (in

Russian), R. Gardony, *Tekh. Kino i Telev.*, *7:* 24–27, Nov. 1963.

An article by M. M. Shcheglov (*Tekh. Kino i Telev. 7:* 16–21, May 1963) is criticized on the grounds that in practice the cameraman does not choose his lighting conditions in order to obtain definite negative densities, as the original article implied. In any case, exposures should be adjusted so as to produce a good positive: the negative densities are not of immediate importance. An alternative, more practical, system is suggested.—S.C.G.

Wide-film cinematographic techniques for panoramic vision (in French), F. Lafay, *Rev. Son.*, 75–78, No. 118, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.192, 1963.

A comparative discussion of wide-film systems in current use is given.—S.C.G. (Abridged from *Referativnyĭ Zhur., Fotokinotekhnika.*)

Methods of measuring the geometrical parameters of motion-picture film and some precision parts of motion-picture cameras (in Russian), A. K. Kutaĭ, I. I. Balonkina and A. Ya. Galnykin, *Tekh. Kino. i Telev., 7:* 6–15, Nov. 1963.

The Leningrad Institute of Motion-Picture Engineers has made a survey of the performance required of apparatus for measuring the linear dimensions of film and the angular dimensions of precision parts of cameras, such as Maltese cross mechanisms and sprocket drums, with the accuracy required in production. Some apparatus designed by the Institute for these measurements is described.—S.C.G.

PHOTOGRAPHIC THEORY AND MATERIALS

Improvements in color photography (British Pat. 945,542), J. A. Carter, H. M. Wagner and M. V. Mijovic; assigned to Kodak Limited. Filed Mar. 17, 1959, 6 pp.

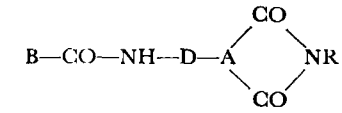
The apparent stain level of color-print materials can be reduced by the use of one or more incorporated couplers having a substituent which renders the coupler fluorescent. This substituent is attached to the coupler molecule at the coupling position by a group which is attacked by oxidized color developer, so that the fluorescent substituent is split off where coupling takes place. Fluorescence can therefore occur only in areas containing unreacted coupler, and not in areas of high dye formation, thus giving an effective reduction in stain without loss of maximum density.—J.A.C.

Pyrazolone color coupler and process of preparing it (British Pat. 950,676); assigned to Kodak Ltd., filed Aug. 9, 1961 (patent of addition to No. 886,723, dated Jan. 22, 1958); 2 pp.

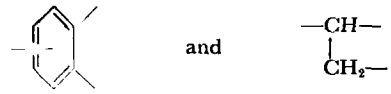
The process of preparing 1-(2,4,6-trichlorophenyl) - 3 - (4 - nitrophenylamino)-5-pyrazolone, by the alkaline hydrolysis of 1-(2,4,6-trichlorophenyl)-3-(4-nitrophenoxyacetylamino)-5-pyrazolone in the absence of a color developing agent, is claimed.—J.B.

Amide color couplers (British Pat. 949,944), C. W. Greenhalgh; assigned to Ilford Ltd., filed Aug. 29, 1960; 9 pp.

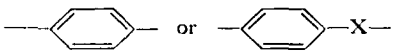
Color couplers of the following general formula are claimed:

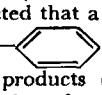


wherein A is a radical selected from



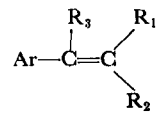
D is a direct linkage, or



where X is —S— or —CO—NH—, and R is a hydrocarbon group such as alkyl, aryl, aralkyl or cycloalkyl. B, a color coupler residue, is so selected that a compound such as B—CONH—  will react with the oxidation products of N,N-diethyl-*p*-phenylenediamine, formed during development of a silver salt image with that compound, to yield a quinone-imine or azamethine dyestuff.—J.B.

Method of protecting material from ultraviolet light (British Pat. 949,181), D. Lauerer, M. Pestemer, M. Colner and G. Buchwald; assigned to Farbenfabriken Bayer Akt., filed May 18, 1960; 3 pp., 1 plate.

Compounds of the general formula



where Ar is a phenyl group containing one or more substituents, usually hydroxy or alkoxy, R_1 is nitrile, carboxylic acid, ester or amide, R_2 is hydrogen, aryl group, carboxylic acid or amide, and R_3 is hydrogen or an alkyl group containing up to 12 carbon atoms, have an ultraviolet absorption in the range 330 to 400 mμ and may be used to protect materials, including photographic film, from deterioration under the action of ultraviolet light.—D.A.T.

Establishment of the relation between the technical state of negatives and the degree of their surface wear (in Russian), L. T. Mel'nikova, *Trudy Vsesoyuz. Nauch.-Issled. Kinofotoinst*, 94–102, No. 50, 1962; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.208, 1963.

Results are set out for the experimental determination of the qualitative interconnection between the evaluation of the technical quality of negatives and one of the fundamental objective indices of the wear of the negatives—the area of the frame occupied by mechanical damage. A curve constructed from the results of the working up of the statistical material shows that the evaluation of negative quality is connected with the area occupied by scratches, in the following way: With increase in the area of scratches approximately twice as many negatives are evaluated in a lower category.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

Improvement in photographic materials (British Pat. 946,476), D. R. Douglas and G. F. Duffin; assigned to Ilford Limited. Filed Apr. 21, 1961, 4 pp.

The patent claims the addition to a "lith" type of emulsion of a cadmium salt and of a desensitizing compound of the dipyridilium type. The combined effect is to leave the speed of the coated material virtually unaffected in a "lith" developer at 2-min development, while appreciably reducing the speed at 3 min, thereby enabling speed growth to be more easily controlled by inspection. A further effect of these combined additions is an increase in toe contrast.—F.P.

The problem of the unification of processing color and black-and-white motion-picture film (in Russian), N. T. Trofimemko and S. E. Tikhonovich, *Tekh. Kino i Telev., 7:* 63–64, Nov. 1963.

Sensitometric variations due to differences in processing at different processing stations in the USSR are discussed.—S.C.G.

The development properties of some complex polyhydroxybenzene esters (in Russian), M. S. Khaĭkin, D. B. Shamil'skaya and L. G. Fedorina, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii, 8:* 461–463, No. 6, Nov.–Dec., 1963.

Alkali-sulphite solutions of the acetic esters of pyrocatechin, hydroquinone and pyrogallol reduce the silver halide of photographic materials selectively. This selectivity is greater than that of the corresponding polyhydroxybenzenes and can give a higher film speed with less fog. The esters of propionic and monochloroacetic acids do not show the effects so markedly. On keeping, the esters lose their specific development properties and become identical in this respect with the parent hydroxybenzenes. The properties of the acetic esters are tabulated.—S.C.G.

Reciprocity failure in the region of the quartz ultraviolet (in Russian), V. M. Uvarova and M. R. Shpol'skiĭ, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii 8:* 446–449, No. 6, Nov.–Dec., 1963.

Reciprocity failure has been studied over the wavelength range 2,500 to 4,500 Å on four photographic materials used for recording ultraviolet radiation. It is concluded that reciprocity failure is independent of the wavelength of the radiation.—S.C.G.

The effect of length of exposure on the sharpness of the photographic image (in Russian), G. I. Belinskaya and M. S. Gus'kova, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii, 8:* 463–465, No. 6, Nov.–Dec., 1963.

Quantitative tests have been carried out which confirm the supposition that a short exposure (10^{-6} sec) gives a sharper picture than a longer exposure (6×10^{-2} sec).—S.C.G.

PHOTOMICROGRAPHY

The Institute for Cinematic Cell Research, S. W. Bowler, *Brit. J. Phot., 111:* 155–156, 169, Feb. 28, 1964.

Ciné micrographic equipment developed and used in the Institute, which is part of the Johann Wolfgang Goethe University

at Frankfurt am Main, is described. Principal items are a Leitz Panphot microscope associated with a 35mm Askania-2 ciné camera; a Leitz Ortholux II microscope with a 16mm Arriflex camera and a plotting device for tracing out cell movements from a film, taking one frame at a time.—N.W.

Electronic flash for photomicrography in the field, F. Bode, *Med. and Biol. Ill., XIV:* 22–26, Jan. 1964.

The Zeiss microscope electronic flash equipment is connected to the Braun battery-operated power pack so that the entire equipment is independent of the main power supply. Optical considerations and exposure of black-and-white and color film stock are also discussed. This combination has the following additional advantages: reduced weight linked with high level of precision; ability to record at reasonable magnifications, including dark ground and phase contrast; use of miniature film or roll film; true Kohler illumination; and enhanced exposure latitude.—(Author's Abstract.)

A method of high-speed *in vivo* **pulmonary microcinematography under physiologic conditions,** W. E. De Alva and W. G. Rainer, *Angiology, 14:* 160–164, No. 4, 1963; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 10.46.252, 1963. (Title only.)

The Polaroid process and its applications in microphotography (in French), P. Guex, *Mesures et controle industr., 28:* 213–220, 337–342, 511–520, Nos. 309, 310, 311, 1963; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstracts No. 11.46.235 to 11.46.237, 1963.

A list of cameras using photographic materials made by the Polaroid Land Corp. is given and details of the cameras are set forth. The basic characteristics of three types of Polaroid emulsion now available are discussed.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

PHYSICS AND CHEMISTRY

Polarography of thallous ion in the presence of gelatin, G. Russell, *Nature, 201:* 920–921, Feb. 29, 1964.

The effect of a deionized, high-grade, lime-processed gelatin on the polarographic behavior of thallous ion is examined with a linear sweep cathode-ray instrument. A progressive decrease in peak current is obtained as the gelatin concentration is increased up to 0.025% (w/v) but the current then remains constant with further increases in gelatin concentration. These results are independent of pH and therefore cannot be due to complexing of the thallium with side-chain groups ionized over the pH range used. However, the drop time also falls steadily with increasing gelatin concentration up to 0.025% (w/v) and then remains constant, indicating an adsorption effect. In contrast to the small effect observed with thallous ion, the diffusion current of other metals, for example lead, cadmium, zinc and copper, may be reduced almost to zero by the presence of gelatin over an appropriate pH range.—D.R.N.

Some problems in obtaining silver layers with a fine structure in the absorption spectrum (in Russian), A. N. Latyshav, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii, 8:* 454–459, No. 6, Nov.–Dec., 1963.

In order to test the reproducibility of the fine structure in the absorption spectrum of thin silver film, films were made by vacuum deposition on fused quartz under strictly controlled conditions, and absorption spectra were plotted with the aid of a differential spectrophotometer The degree to which the fine structure was apparent varied markedly from sample to sample and from place to place on a given sample, although the positions of the maxima were unchanged within the experimental error. Cleaning the surface of the substrate by heating in a high vacuum facilitated the formation of a silver layer with fine structure in its spectrum. Deposition onto an oxidized layer also leads to an increase in the degree to which the structure is apparent. Oil vapor in the chamber is apparently without influence on the formation of a layer with fine structure. It is concluded that the differences in the degree to which a fine structure is observed is due to differences in the cleanliness of the surface of the substrate.—S.C.G.

Double photoconductive layers with a large dark relaxation time of the surface charge (in Russian), I. A. Limantov and Yu. A. Cherkasov, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii, 8:* 449–454, No. 6, Nov.–Dec., 1963.

Double layers have been formed consisting of a lower light-sensitive semiconductor with a relatively low resistivity and an upper layer of a substance with a high resistivity. Antimony trisulfide (Sb_2S_3), arsenic selenide (As_2Se_3), crystalline selenium and other materials have been used for the lower layer and polystyrene and amorphous selenium for the upper. Such double layers on a conducting base have a time of relaxation of surface charge of up to 10^3 min. On exposure to light such materials do not lose their surface charge, but electron-hole pairs are created in the surface of the under layer. The charge of the same sign as the surface charge leaks to the base, while the charge of opposite sign remains at the interface. The image is therefore formed not as a difference in charge but as a difference in thickness of the electrical double layer.— S.C.G.

The use of the tandem principle in the construction of optics for copying (in German), H. Leipold, *Jenaer Jahrb. 1962,* Jena, 1962, pp. 101–116; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 11.46.180, 1963. (Title only.)

PRINTING EQUIPMENT, ENLARGERS

The Pawo Colotron 112, A. Stephenson, *Graphic Technology,* 40–42, Sept.–Oct., 1963.

This process enlarger is equipped with a control desk on which the operator may set up in advance eight different programs for typical color-separation jobs, involving different types of original, sensitive material, etc. Programs are modified for each job by setting the scale of reproduction and other details on a dial. Exposures are

then automatically controlled, with compensation for all variables including reciprocity failure.– M.L.

PROCESSING EQUIPMENT

Improvements in or relating to photographic film processing apparatus (British Pat. 945,900), A. Branson; assigned to British Broadcasting Corp. Filed June 30, 1961, 4 pp., 5 plates.

A small continuous processing machine for 35mm film is adapted for use with 16mm film by making double-diabolo assemblies to fit in each tank so that two loops can be processed per tank. A chicken-feed replenisher system is also claimed.– *G.I.P.L.*

The "Arri" developing machine (in Russian), V. M. Bondarchuk, *Tekh. Kino i Telev., 7:* 71–81, Nov. 1963.

A description is given of the design and construction of the Arri developing machine for motion-picture film and auxiliary equipment made in Western Germany. It is considered to be an improvement over competitive machines in several respects.—S.C.G.

Apparatus for standard development in photographic photometry (in Bulgarian), R. Andreĭchin, A. Ivanov and T. Kekhlibarov, *Izvest. Inst. s "ANEB," 10:* 81–86, No. 2, 1962; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.117, 1963.

The apparatus described is intended for rapid and accurate thermostating, uniform and continuous stirring of the solution and rapid and accurate fixing of the beginning and end of development. The apparatus can be used in all cases where it is necessary to develop films or plates under standard conditions.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

PROJECTORS AND VIEWERS

Lighting and optical systems of motion-picture projectors (in Russian), Anon., *Kinomekhanik*, 21–26, May 1963.

The principles of the design of the optics of lighting systems for motion-picture projectors are discussed with particular reference to Soviet projectors.—S.C.G.

Optical projection apparatus (British Pat. 946,416); assigned to B. E. Lloyd and E. A. Lloyd. Filed Apr. 17, 1961, 3 pp, 1 plate.

A portable back-projection slide viewer is in the form of a flat box, the lid of which can be propped open by a screen hinged to either the lid or the base. The base contains a conventional projection system with a slide changer, the projected image being reflected onto the screen by a mirror. —A.S.C.

Performance of 16mm portable sound-and-picture cinematograph projectors (B. S. 3675: 1963), *B.S.I. News*, 27, Dec. 1963.

Specifies certain requirements for 16mm portable cinematograph projectors with optical and/or magnetic sound reproduction, such as are used for audiences up to 200 people. It does not deal with the details of mechanical and electrical design except in so far as these may affect performance or

convenience in use. It specifies such requirements, and prescribes such tests, as will ensure a satisfactory picture and sound performance, safety and film life.—(Abstract in *B.S.I. News.*)

Gamma-stereo apparatus, (in Russian), B. B. Akabirov and B. S. Mazitov, *Radioizotopn. Metodÿ Automat. Kontrolya. T.1,* Frunze, Acad. Sci. Kirghiz SSR, 1963, pp. 240–243; *Referativnÿĭ Zhur., Fotokinotekhnika,* Abstract No. 11.46.228, 1963.

A summary is made of the principles of gamma-stereoscopy, based on the ellipse method and consisting of the projection of two coordinated images of a stereo pair alternately on a flat screen. The design of an apparatus for gamma rays is described. Its advantages over stereo apparatus for observation of detail by x-rays are discussed.—S.C.G. (Translated from *Referativnÿĭ Zhur., Fotokinotekhnika.*)

Motion-picture projector for 70- and 35mm film (in Czech), B. Hendrych, *Jemná mech. a opt., 8:* No. 4, 101–106, 1963; *Referativnÿĭ Zhur., Fotokinotekhnika,* Abstract No. 11.46.187, 1963.

A description is given of the UM 70/35 motion-picture projector made by the Meopta nationalized undertaking of Czechoslovakia. It is designed for medium-sized and large cinemas and can show normal and wide-screen films on 35mm stock and wide format films on 70mm stock. Sound reproduction is photographic and magnetic (1, 4, and 6 channels). Constructional and operating details of the projector are given.—S.C.G. (Abridged from *Referativnÿĭ Zhur., Fotokinotekhnika.*)

A multipurpose perceptual device, I. Goldiamond, *J. Exp. Analysis Behav., 6:* No. 2, 291–292, 1963; *Referativnÿĭ Zhur., Fotokinotekhnika,* Abstract No. 11.46.205, 1963.

A description is given of a special reversible 16mm projector with remote control, intended for showing both motion-picture films and slides. The remote control can be used for the projection of films and slides with a variable frequency of projection from 1 to 24 frames/sec. Two film bands, one in the form of a loop and the other in the form of a spool, can be shown simultaneously or separately. It is also possible to advance one band according to the program of the other and to stop the bands at any frame. With the aid of the apparatus a study has been made of the processes of perception in normal and mentally retarded children. The addition of a special shutter converts the apparatus into a remote controlled tachistoscope (apparatus for the study of the processes of perception and attention).—S.C.G. (Translated from *Referativnÿĭ Zhur., Fotokinotekhnika.*)

Foreign equipment for the automation of cinema projection (in Polish), W. Dybczynski and A. Kolasa. *Kinotechnik, 16:* 3836–3839, No. 177, 1963; *Referativnÿĭ Zhur., Fotokinotekhnika,* Abstract No. 11.46.201, 1963.

A short description is given of currently produced equipment for the automation of cinema projection: the Ernemat (Zeiss Ikon, Federal German Republic), Euromat (Siemens, Federal German Republic), Pyrcomat (German Democratic Republic), and equipment undergoing development in the U.S.S.R. and Czechoslovakia. It is shown that in all cases the first consideration is the automation of the switch from projector to projector and operations connected with the beginning and end of the performance. Other operations (control of the sound track, pick-up, still projector, bell, etc.) are automated by supplementary equipment.—S.C.G. (Translated from *Referativnÿĭ Zhur., Fotokinotekhnika.*)

Rexina-8 projector (A.C.W. Test Report), *Amat. Cine World, 7:* 181–182, Feb. 6, 1964.

The Rexina 8mm ciné projector has forward and reverse running, still-picture projection, a variable-speed motor and an 8-v, 50-w lamp. The *f*/1.5 zoom lens has a focal-length range of 15 to 25 mm. The projector is made in Japan and distributed in Great Britain by Headquarter & General Supplies Ltd.; the cost is approximately £20.—N.W.

The Color-master (Projector Test), N. Maude, *Amat. Photographer, 127:* 386, Mar. 11, 1964.

This inexpensive slide projector has an 85mm *f*/2.8 coated lens and an Atlas 250-v, 150-w Al/167 lamp. Slide changing is by a simple push-pull mechanism, a main switch is fitted and a small screen is provided in the lid. The projector is made in Australia, and distributed in Great Britain by Boots Ltd.; the cost is approximately £7.—N.W.

Meopta AM8, N. Dyer, *Amat. Photographer, 127:* 329–330, Feb. 26, 1963.

The Meopta AM8 self-threading 8mm ciné projector is compact, lightweight and well-built. It has a Meopta RO 20mm *f*/1.5 lens, and a Phillips 8-v, 50-w mirror-condenser lamp. An electric motor gives speeds of 16 or 24 frames/sec through a belt drive. Rapid rewind and sound-coupling are possible. The projector is made in Czechoslovakia by Meopta and costs approximately £28 with tool kit, in Great Britain.—N.W.

Long life and reliability of motion-picture projections (in Russian), I. Fonar', *Kinomekhanik,* 27–30, May 1963.

The factors affecting the life and reliability of the motion-picture projectors used in cinemas are discussed, with particular reference to Soviet conditions.—S.C.G.

The Consulmatic projector (ACW Test Report), Anon., *Amat. Cine World, 7:* 285–287, Feb. 27, 1964.

This inexpensive 8mm ciné projector is produced in two versions, the Consulmatic with automatic threading of the sprockets and gate, and the Consul, which is hand-threaded. Both models use an 8-v, 50-w integral lamp, but light output is lower than expected. The *f*/1.5 zoom lens has a focal length range of 15 to 25mm. Refinements include reverse running and still-picture projection.—N.W.

Look—no fingers! It threads itself. Bell and Howell 652 16mm sound projector (Test Report), *Film User, 206:* 641–643, Dec. 1963; see also *Amat. Cine World, 6:* 597–598, Oct. 10, 1963.—N.W.

SOUND RECORDING AND REPRODUCTION

A transistorized adaptor for the OP16 projector for magnetic sound recording (in Czech), L. Hrnčíř, *Filmovým objectivem, 2:* 232–233, No. 12, 1962; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 10.46.233, 1963.

The attachment described, made by Duopta in Czechoslovakia, allows magnetic and photographic soundtracks to be made, coats a magnetic track on a 16mm film and carries out magnetic sound recording. Technical details of the device are given.—S.C.G. (Abridged from *Referativnyĭ Zhur., Fotokinotekhnika.*)

A preamplifier for 16mm film with optical and magnetic tracks (in French), J. Faure, *Rev. son., 83:* No. 118, 1963; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 10.46.234, 1963. (Title only.)

SPECIAL APPLICATIONS

Laparoscopic photography with intra-abdominal electronic flash (in German), H. Henning and K. Müller, *Med. Markt, 11:* 61–62, 11, No. 2, 1962; *Referativnyĭ Zhur., Fotokinotekhnika,* Abstract No. 10.46.254, 1963.

A description is given of the use of photography for the diagnosis of disease of the abdominal cavity. The firm of R. Wolf has made the special photolaparoscope apparatus for photography with electronic flash lighting on color film, reversal or negative, at exposures of $\frac{1}{800}$ to $\frac{1}{1000}$ sec. The color temperature of the radiation from the lamp is 5000°K. The apparatus has an attachment for rapid change of objectives with focal lengths of 70, 95 and 110 mm. The objectives allow photographs of subjects to be obtained with diameters of 10.6, 14.4 and 17.3 mm, respectively.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

Photographic detection of bands in gel-diffusion precipitin tests with viruses, A. D. Thomson, *Nature, 201:* 422–423, Jan. 25, 1964.

Gel-diffusion tests are performed with agar gel layers in Petri dishes or on quartz slides. When a record is required the agar is stripped from the Petri dish and placed directly on the surface of contact photographic paper (Ilford C4) and photographed at about 15 cm from the source of ultraviolet light. The agar layers on quartz slides can be photographed without removing the layer, by the same method, which is easier to use and resolves the bands more clearly than other photographic methods.—N.W.

Some physical methods of infrared photography (in Russian), V. N. Sintsov, *Zhur. Nauch. i Priklad. Fotografii i Kinematografii, 8:* 471–474, No. 6, Nov.–Dec. 1963.

The literature on physical devices used in conjunction with photography for recording infrared radiation beyond the limits of the normal photographic process is reviewed.—S.C.G.

Carena Zoomex. Operation film—experiences with the Carena Zoomex (in German), Anon., *Med. Markt. 11:* 64, 11, No. 2, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.255, 1963.

A report is given on a successful test of photography of surgical operations with the aid of the amateur 8mm Carena Zoomex motion-picture camera with lighting from ordinary 500- and 750-w photographic lamps. In the opinion of Prof. K. Erhardt, it is possible to carry out cinematography on 8mm film under conditions of surgical operations, without the necessity for a complicated shooting technique, and to single out small details of the operation sufficiently well for demonstration in auditoriums of average dimensions.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

Camera and narrow-gage film—a system for clinical practice (in German), W. Gastinger, *Med. Markt. 11:* 97–99, No. 3, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.256, 1963.

Various forms of photography carried out in clinics are discussed: photography of the general view, close-ups, photomacrography and photomicrography. It is pointed out that the use of wide-angle objectives is not recommended, since they can give an incorrect representation of the subject. In photographing operations it is recommended that a camera should be used with easily changeable objectives and convenient and rapid focusing. It is suggested that the Leica camera be fitted with bellows and mirror attachment for sighting, so that with the Hektor objective with a focal length of 13.5 cm photography can be carried out at any scale. For photographing preparations the universal equipment provided by different firms is useful. Some authors recommend use of special stands, e.g., for dermatology or odontology. The size of the film is of considerable importance in motion-picture photography. The 8mm film finds its main use in endoscopy, 16mm film has wider applications. As all-purpose systems, the Kodak Reflex Special and Arriflex 16 motion-picture cameras are recommended. The Arriflex 35 camera can also be used for cineradiography.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

Photography through the fiber gastroscope, B. I. Hirschowitz, *Am. J. Digest. Diseases, 8:* No. 5, 389–395, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 11.46.240, 1963. (Title only.)

Photography in astronomical practice (in German), G. Roth, *Fotohändler, 14:* 552–554, No. 9, 1963; *Referativnyĭ Zhur., Fotokinotekhnika*, Abstract No. 10.46.258, 1963.

Some problems in the use of cameras and photographic materials in practical astronomy, amateur and professional, are discussed. It is pointed out that the range of photographic materials used by amateurs is small; professionals have at their disposal about 100 types of photographic plate with sensitization from 2,000 to 6,500 Å, which gives the possibility of recording stars up to the 22nd magnitude. Color astrophotography is coming into greater use.—S.C.G. (Translated from *Referativnyĭ Zhur., Fotokinotekhnika.*)

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