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ABSTRACTS OF PAPERS FROM OTHER JOURNALS

Abstracts of papers appearing in other journals chosen for their importance and possible value to researchers as well as those of timely interest, are published in the *Journal* from time to time. Many translations of abstracts from foreign journals, chiefly those of the USSR, are made available to the *Journal* by the Research Laboratories of the Eastman Kodak Company. As a rule, translations are made of the abstracts and not of the papers. The journals in which the papers appear can be consulted at some libraries. Current issues of *Tekhnika kino i Televidinya* can be consulted at, or borrowed from the Society's Headquarters Office.

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

Aerial Photography
Data Recording and Processing
General
Holography
Lasers
Photographic Theory and Materials
Television

AERIAL PHOTOGRAPHY

Metric tests of color photography, Gary W. Schallock, *Photogrammetric Eng.*, 34: 1063-1070, Oct. 1968.

The metric qualities of color aerial photography compare favorably with black-and-white aerial photography. Tests were conducted on a Zeiss PSK Stereocomparator and a Zeiss C-8 Stereoplanigraph. The measurement results are evaluated and presented in tabular form for comparison. The tests indicate that all of the types of color aerial photography tested are suitable for photogrammetric mapping.

Developments in aerial color photography for terrain analysis, Abraham Anson, *Photogrammetric Eng.*, 34: 1048-1057, Oct. 1968.

Progress is being made in the development of aerial cameras, filters, high-speed sensitive color emulsions, and rapid-processing equipment for the employment of aerial color photography for the extraction of terrain information. Some recent aerial color photography tests employed color films and false color films with attendant results. Loss of color detail from small-scale aerial color photography is often balanced by the overview of the terrain's tectonic structure, where dominant terrain hues aid in information extraction. Needs indicated are for government aerial color photography testing programs, in which all agencies participate.

DATA RECORDING AND PROCESSING

Optical processing in the earth sciences, M. B. Dobrin, *IEEE Spectrum*, 5: 59-66, Sept. 1968.

This review of how optical processing has been applied effectively in the earth and space sciences shows that information in pictorial form may be best handled by optical data-handling systems.

GENERAL

Computation of correlated color temperature and distribution temperature, A. R. Robertson, *Jour. Opt. Soc. Am.*, 58: 1528-1535, Nov. 1968.

Methods by which the correlated color temperature and the distribution temperature of a light source may be calculated from a knowledge of the spectral power distribution of the source are described. Digital-computer programs have been written to perform the calculations; these programs are described, with the results of some tests for a number of sources. The two temperatures are significantly different for some sources. A new concept, "daylight distribution temperature" is also introduced and some examples are given.

Stereoscope for strips, Kalevi Eranti, *Photogrammetric Eng.*, 34: 1044-1047, Oct. 1968.

The disadvantage of the conventional mirror stereoscope — that only one stereopair can be observed at a time — led to the concept of a new type of stereoscope which can be used to scan a properly oriented strip of photographs.

How images are detected, R. Clark Jones, *Scientific American*, 219: 111-117, Sept. 1968.

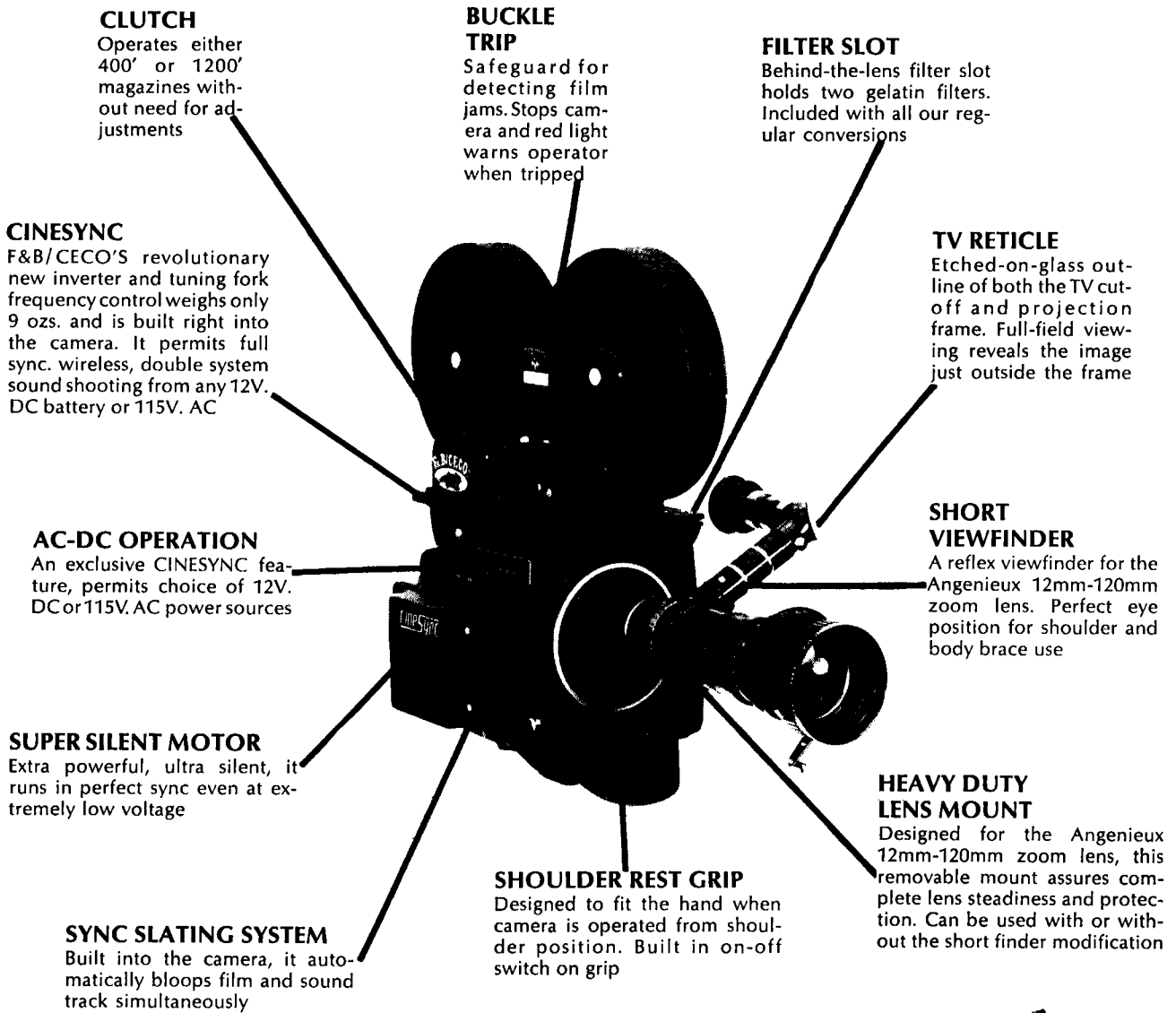
The most versatile detector of light images is the visual system of vertebrates. Nonetheless, photographic emulsions and electronic image detectors improve on biological systems in significant ways.

HOLOGRAPHY

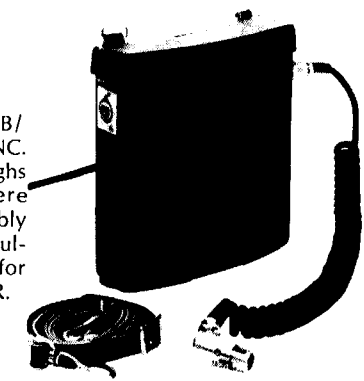
Acoustic imaging and holography, Adrianus Korpel, *IEEE Spectrum*, 5: 45-52, Oct. 1968.

Applications of active and passive devices employing the characteristics of sound to obtain results have been known to investigators for many years. However, in addition to these sonar or pulse-echo methods of analysis, there exist a variety of techniques in which a sound image is obtained in a way more analogous to optics. This analogy has, in the last few years, been extended to include holographic techniques, and has led to the inception of a new discipline—acoustic holography.

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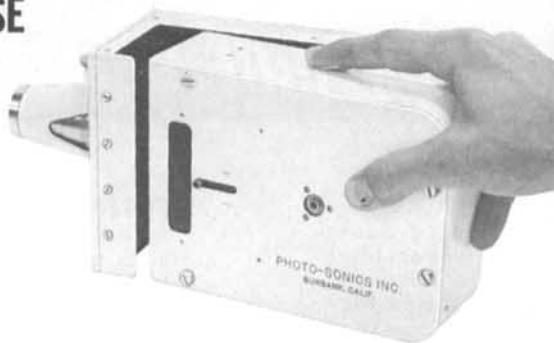
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In this article, we trace the development of this new field as it originated from a fusion between "conventional" acoustic imaging and optical holography; and we see how, in the few years of its existence, it has already generated its own unique methods and problems.

Optical filter synthesis by holographic methods, Henri Arsenault and Alberic Boivin, *Jour. Opt. Soc. Am.*, 58: 1490-1493, Nov. 1968.

By use of a recently developed formulation of scalar diffraction theory, any complex amplitude filter can be considered as a generalized zone plate. By placing sources having suitable amplitude and phase characteristics at the foci, we can reconstruct the filter function in the pupil plane. The amplitudes of the sources are related in a simple way to the Fourier-series expansion of the pupil function. The techniques of holography can be used to record complex-amplitude filters on photographic film. If three-beam holography is used and if the filter function is real, only real sources are needed.

LASERS

Coherent interactions between optical waveguides and lasers, N. S. Kapany, J. J. Burke, K. L. Frame and R. E. Wilcox, *Jour. Opt. Soc. Am.*, 58: 1176-1183, Sept. 1968.

Theoretical and experimental studies of the electromagnetic coupling between parallel, passive, glass-fiber waveguides and active (Nd³⁺-doped laser) resonators are reported. Predicted evanescent-wave coupling strengths are verified to within a factor of two. Far-field interference patterns of these phase-locked, optical lasers is also demonstrated through common-cavity end-mirror reflectors; a high-frequency self-Q-switching action is found when the fiber ends are not rigidly mounted.

Applications of laser light, Donald R. Herriott, *Scientific American*, 219: 141-156, Sept. 1968.

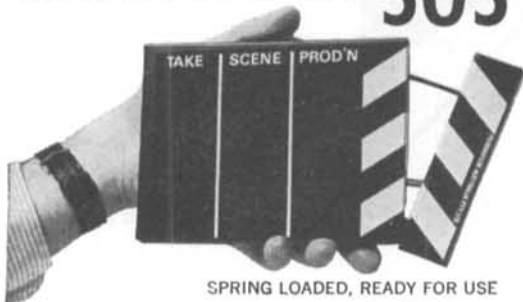
Applications of laser light range from the straightforward (such as surveying and welding) to the sophisticated (such as optical communication and holography), and it may be that more interesting applications are still to come.

PHOTOGRAPHIC THEORY AND MATERIALS

Determination of the modulation transfer function of photographic emulsions from physical measurements, R. N. Wolfe, E. W. Marchand and J. J. DePalma, *Jour. Optical Soc. Am.*, 58: 1245-1259 Sept. 1968.

The modulation transfer function (MTF) of a photographic layer is customarily determined by means of photographic photometry. It is difficult to obtain the true function because of the interference of adjacency effects. De Belder, et al., have recently presented a method of obtaining the MTF from physical measurements parameters, including the absorption and scattering coefficients. Data from these coefficients, which De Belder lacked, have been obtained from measurement of the volume reflectance and volume transmittance of

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the layers by the technique developed by Wolfe, DePalma and Saunders. The coefficients were calculated by using the Schuster, Kubelka-Munk two-flux, radiative-transfer theory. After the necessary parameters had been measured for several fine-grain silver bromide photographic layers varying in thickness from 3 to 33 μ , the MTF of each of these layers was calculated. These values were compared with the MTF of the layers measured by photographic photometry, when they were developed under conditions giving minimal adjacency effects.

Good agreement was obtained between the results of these two methods; the calculated physical values, however, were consistently somewhat higher than the photographic values. At least part of this lack of agreement is caused by halation in the photographic layers from the base-air interfaces.

Factors influencing the growth of small photographic images, H. F. Gilmore, *Jour. Optical Soc. Am.*, 58: 1375-1377, Oct. 1968.

The effect of the photographic emulsion and the lens and camera on the growth of small photographic images of distant point sources is discussed in terms of the relationship between the image growth and the point spread functions. Under some conditions, the optical system makes a major contribution to image growth.

SOUND RECORDING AND REPRODUCTION

Electret condenser microphones of high quality and reliability, Preston V. Murphy and Freeman W. Fraim, *Jour. Audio Eng. Soc.*, 16: 450-462, Oct. 1968.

A final step in the evolution of condenser microphones from bulky, expensive laboratory standards to small, self-contained units is the development of a reliable electret for high voltage biasing. Pertinent electret properties are described, and recent progress and problems related to electret microphones are noted. Advances in materials and cartridge design are reported, and the resulting improvements in reliability and performance described.

A self-contained condenser microphone with improved transient response, Alan Dauger and Charles F. Swisher, *Jour. Audio Eng. Soc.*, 16: 464-470, Oct. 1968.

A small battery-operated cardioid condenser microphone is described in which polarization voltage is provided by a solid-electrolyte battery with a lifetime of 20 years. The remarkable transient response obtained is discussed, along with the low-noise FET preamplifier.

TELEVISION

Image processing by digital systems, Edward Efron, *Photogrammetric Eng.*, 34: 1058-1062, Oct. 1968.

A technique by which television pictures can be stored, processed, and pictorially displayed by use of a digital computer system is designed to aid the photointerpreter (user) in diagnosing an image in an on-line, multiprogramming, man-computer conversational and time-sharing mode. The photoboard, and a typewriter to ask

questions and make requests. In addition, the stored computer programs may enhance the image to a superior level of clarity and detail. The paper details the Image Processing System as well as the numerous space and medical applications:

Digital methods applied to television, A. V. Lord, *The Royal Television Society Journal*, 12: 27-37, Summer 1968.

Digital methods of transmitting information offer many advantages over conventional analog methods as is evidenced by the growing importance of p.c.m. The basis of this is discussed in a general way followed by a detailed investigation of how these techniques could be applied to television. It is concluded that digital techniques could be introduced in the near future with the advantages of greater reliability and consistency of picture quality.

The Gemini System, M. J. Faithfull, *Brit. Kinemat. Sound and Telev.*, 49: 274-279, Dec. 1968.

This paper discusses the technical and financial reasons for the use of a 16mm TV aided filming system, using multicamera techniques for the production of color programs for international television distribution, and describes with diagrams and examples the problems and advantages of such a system.

A description of the studio, the television camera and the film camera and method of operating is given with some regard to the special techniques involved in the programs. The advantages and disadvantages are listed, including the more obvious advantage of the TV picture to the director, designer, lighting director, etc., continuity of production with continuous takes of up to half an hour.

Simplicity of editing techniques, speed of production of final program via video tape or direct transmission from reversal film is examined and a description is given of a typical program operation for a 15-min program produced in one day.

Color temperature: with reference to color film for television, Ray E. Knight, *British Kinemat. Sound and Telev.*, 50: 62-78, March 1968.

This paper pays attention to the interesting life of Lord Kelvin, whose name the absolute scale of thermometry bears. Color temperature is dealt with in some detail, leading to the color balance of negative-positive color film. An objective method of color balance control is proposed for negative-positive color film, tight enough to satisfy the requirements of broadcasting color film over color television. Three appendixes follow: A Leader Gray-Scale to Control the Color Balance of Film and Telecine; Additive and Subtractive Color Systems and their Primary Colors; Metamerism and Color Matching.

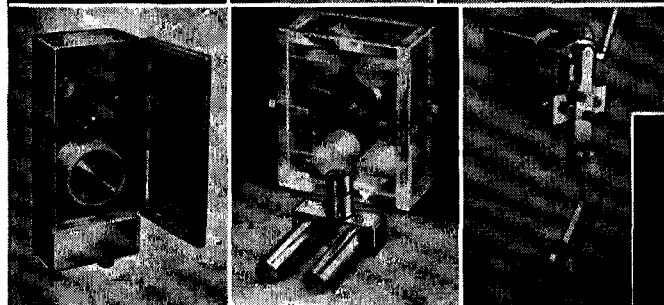
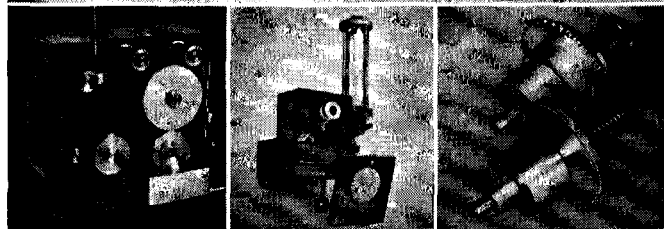
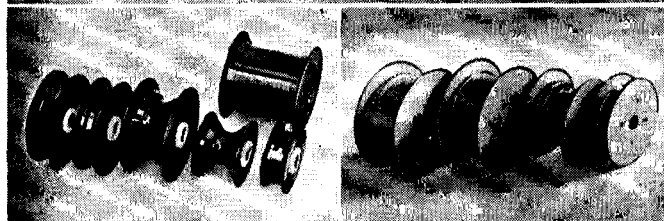
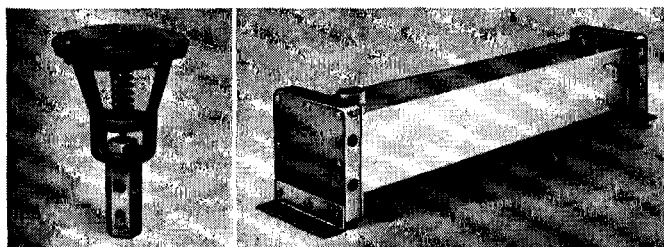
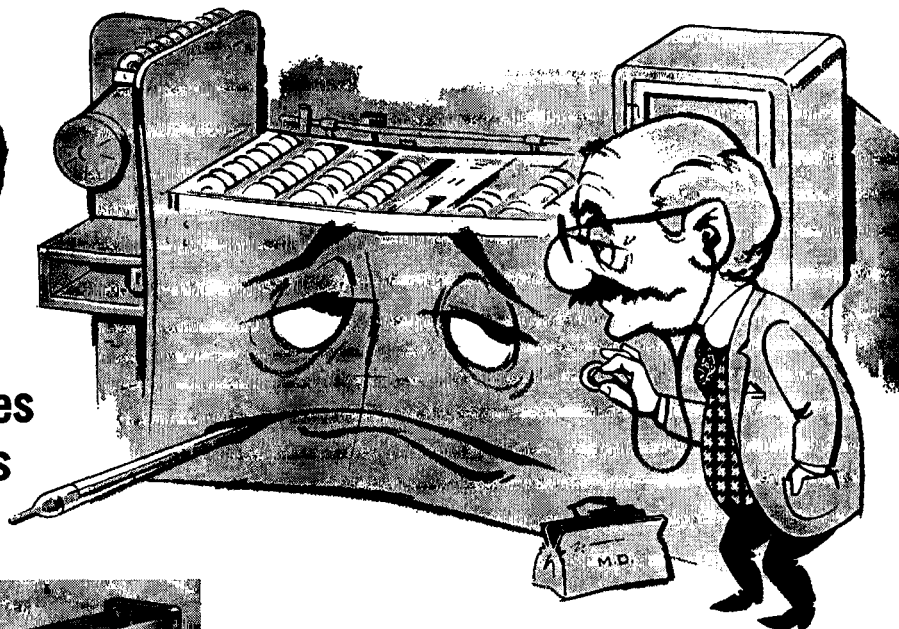
Visnews' lead with color newsfilm, Eric Edwards, *British Kinemat. Sound and Telev.*, 50: 149-151, May 1968.

All over the world 16mm film is the main method of pictorial coverage for television news and current affairs. Until recently it was all black-and-white but now color film is increasingly in demand — and adding to the difficulties.

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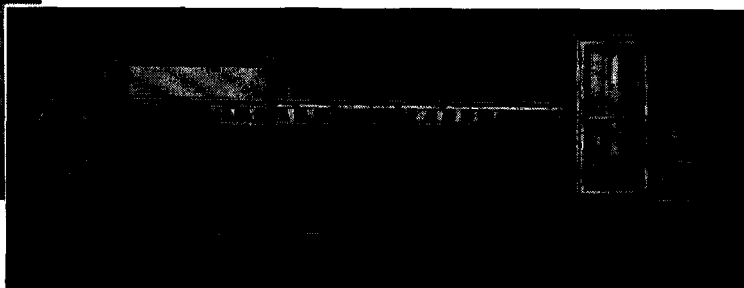


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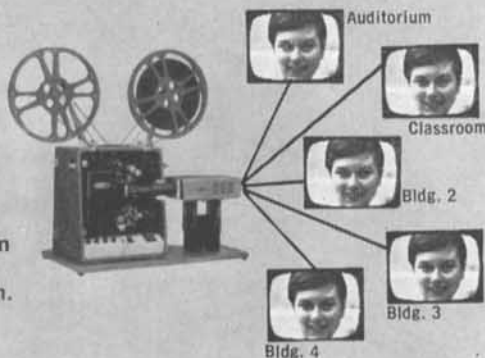


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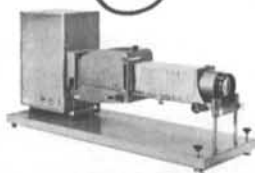
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A solid-state low-noise preamplifier and picture-tube drive amplifier for a 60-MHz video system, Otto H. Schade, Sr., *RCA Review*, 29: 3-21, Mar. 1968.

The development of MOS transistors with transconductances of 10 to 15 millimhos makes possible the design of wide-band video preamplifiers providing lower noise levels than preamplifiers using nuvistor tubes. The low-noise input stage of the transistor preamplifier is a cascode circuit composed of two dual-gate transistors. The large frequency-proportional gain correction made in the third stage depresses the 1/f noise of the transistors below their high-frequency noise level and compensates for the capacitive input load of the preamplifier. Thus, the noise spectrum becomes proportional to frequency and appears as a fine-grain random structure of low visibility on the picture-tube screen. Aperture correction and low-pass filters are used to vary the frequency response and video pass band. The 50-V video-signal output developed by two 2N3866 planar transistors in a cascode circuit and driven from a 90-ohm line is adequate to modulate a high-definition picture tube.

Color television standards for Region 2, Charles J. Hirsch, *IEEE Spectrum*, 5: 63-67, Feb. 1968.

Color television systems are rapidly gaining worldwide popularity; but each country seems to have a different system. Latin America is now approaching the same problem, hopefully with a regionally compatible solution.

Better color film for color television, Rodger J. Ross, *Am. Cinemat.*, 49: 506-509, July 1968.

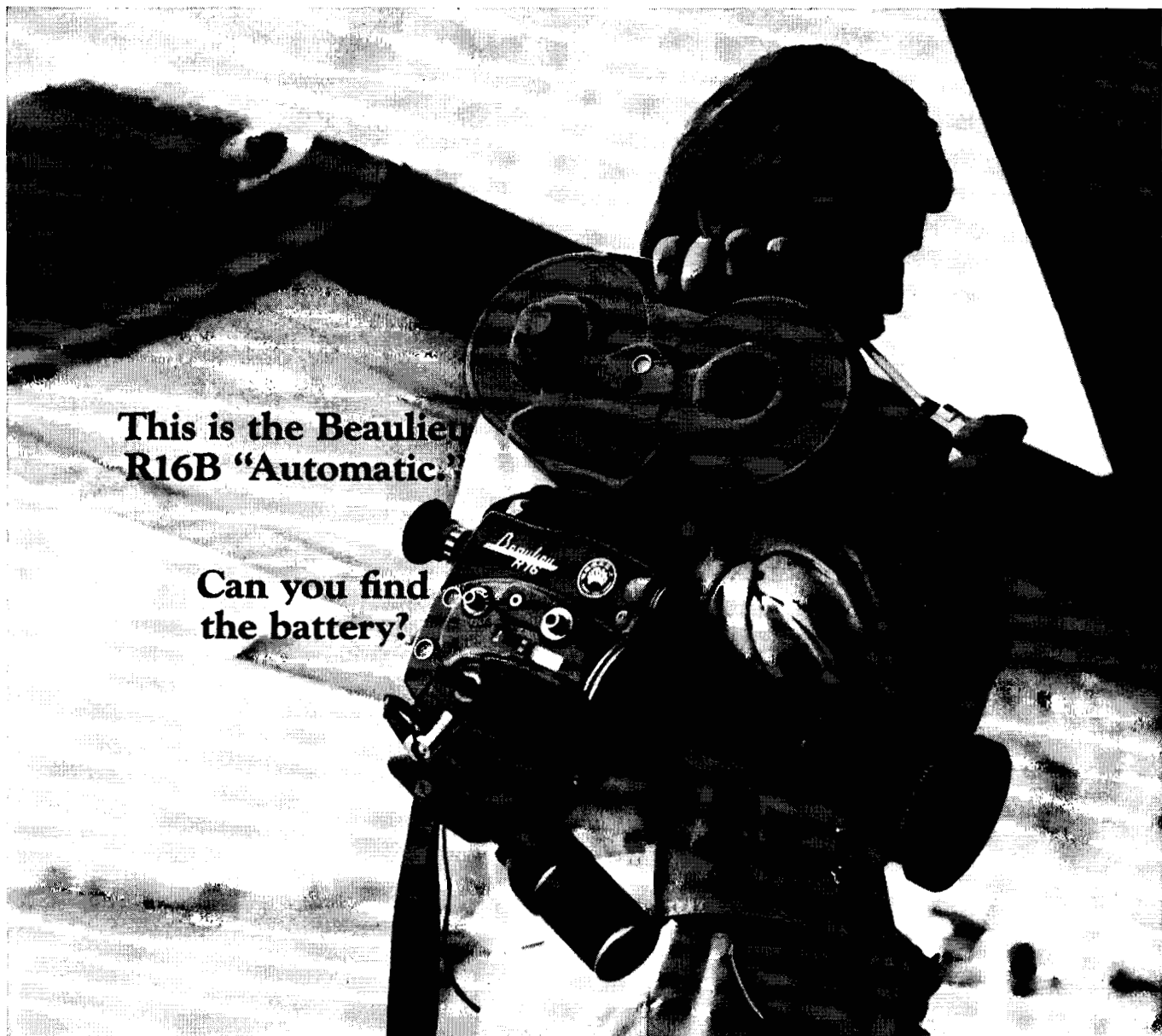
How well a color film "comes across" on the television receiver depends largely upon the skill of the cameraman and his technical comprehension of the telecine system.

X radiation from color television receivers, Marcelino Eleccion, *IEEE Spectrum*, 5: 95-104, July 1968.

During a recent conference, the basis for a common understanding of definitions and measurement procedures in determining the extent of a potential hazard was outlined. Whether this groundwork will lead to a final solution still remains unsettled.

Electron beam 16mm television film recorder, John W. Reeds, Jr., *Brit. Kinemat. Sound and Telev.*, 50: 178-183, June 1968.

This paper describes basic concepts of electron beam recording and indicates advantages and disadvantages compared to conventional kinescoping. Specific problems such as introducing film into a vacuum system and avoiding electrostatic charging of the film are discussed. Details are given of a complete recorder capable of 1,000 line resolution for producing 16mm motion-picture films from television signals of either 625 line, 50 Hz or 525 line, 60 Hz. Frame rate conversion and suppressed field recording are discussed. The film transport, including a novel dynamic vacuum seal is described. The electron-optical system and methods of controlling and focusing the electron beam are covered in some detail. Gamma correction (non-linear electron beam modulation) makes it



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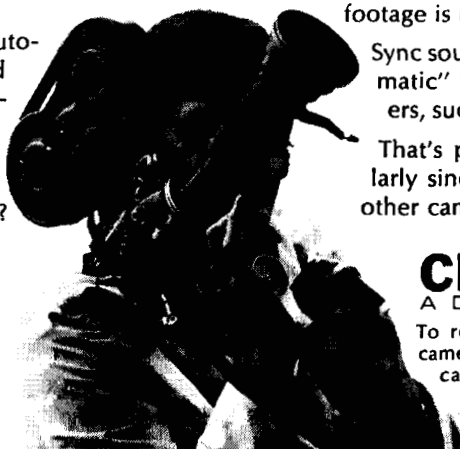
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possible to record both direct positives and negatives on the same positive release film stock.

Shadow mask picture tube convergence techniques, B. J. Rogers, *Radio and Electronic Eng.*, 34: 353-368, Dec. 1967.

The problems of shadow mask display tube convergence are described for both triangular and in-line configuration of the three beams and various solutions to these problems are discussed. The merits of various circuits are compared and the adjustment procedure is outlined.

Interference to television reception in the UHF bands, A. S. McLachlan, *Royal TV Soc. Jour.*, 11: 242-252, Autumn 1967.

The subject is introduced by a brief survey of the factors affecting television reception in all bands. Interference characteristics of reception in the UHF bands are then compared with those of the VHF bands and an attempt is made to forecast the types of interference which will be of importance in the UHF band as the service becomes more widespread. Methods adopted to minimize interference in the UHF bands are described and the paper concludes with a brief description of the vehicle and apparatus used by the G.P.O. for tracing and measuring interference.

Television network switching at the post office tower in London, R. W. Fenton, H. F. Lloyd, H. Mirzwiniski, R. G. Moore, E. D. Probert, and J. G. Thomasson, *Radio and Electronic Eng.*, 35: 329-341, June 1968.

Television network switching equipment is concerned principally with setting up

vision and sound routes between various sources and destinations. Due to the growth of the network system this equipment has developed from the simplicity of patch-panels to a complexity requiring a certain amount of automation.

In the equipment recently installed at the Post Office Tower in London and also in three provincial centers, provision is made for storing two patterns of connections and their switching times. Presetting of information is carried out manually but the actual switching operations are under the control of a clock system driven pulses derived from the speaking-clock TIM. Provision is made for overriding the clock or changing the stored information when last-minute schedule changes occur. The equipment is designed for 625-line color operation.

An improved version of Electronic CAM for the recording of television programs, A. M. Spooner, G. A. Pryke and V. A. Gardner, *Royal Telev. Soc. Jour.*, 12: 17-19, Spring 1968.

This paper describes an improved version of the Electronic-CAM system in which a television camera is combined with each of the film cameras in a multi-camera studio, for viewfinding purposes. In the improved version a Plumbicon is used instead of a Vidicon in each of the television cameras, together with improved circuits, so that the television pictures give a faithful reproduction of the pictures recorded by the film cameras. Television production methods are used in which the cameramen focus and frame the pictures on television viewfinders, the lighting director uses picture

monitors to balance lighting levels and continuous filming is achieved under the control of a director working from a normal production control room.

Electronic conversion between European and North American television standards, E. R. Rout, *Royal Telev. Soc. Jour.*, 12: 12-16, Spring 1968.

In this article the problems encountered in a standards converter designed to operate between two color systems having different field frequencies are considered. The solutions adopted in a simpler and a more complex design are described.

A first step for a communications network, Kenneth L. Warren and John R. Shepherd, *Educational Broadcasting Rev.*, 2: 32-37, Aug. 1968.

This study evolved from the NAEB's Educational Communications System (ECS) project. It focusses on one aspect of this project, the intrastate use of electronic media. The authors report here on the media needs and preferences of personnel in the Oregon higher educational system.

University teaching by television, C. Wilson, *Brit. Kinemat. Sound and Telev.*, 50: 234-235, Aug. 1968.

Television has been incorporated into teaching, initially to solve the problem of increased numbers beyond the range of normal lecture room capacity, and now that its full potential has been realized, it is used in four main ways: (1) teaching overflow classes; (2) demonstration of detail; (3) recording on film or tape lectures to be repeated; (4) bringing remote objects or experiments into the lecture room.

Care and rehabilitation of magnetically coated tapes, R. N. Haig, *Brit. Kinemat. Sound and Telev.*, 50: 236-238.

A considerable amount of work has been done during the past few years to determine the many causes of signal "dropouts" which are experienced in connection with the operation of magnetic tapes.

European color television standards — The SECAM system, J. L. Delaitre and R. A. Redard, *Electrical Communication*, 43: 169-172, Number 2 — 1968.

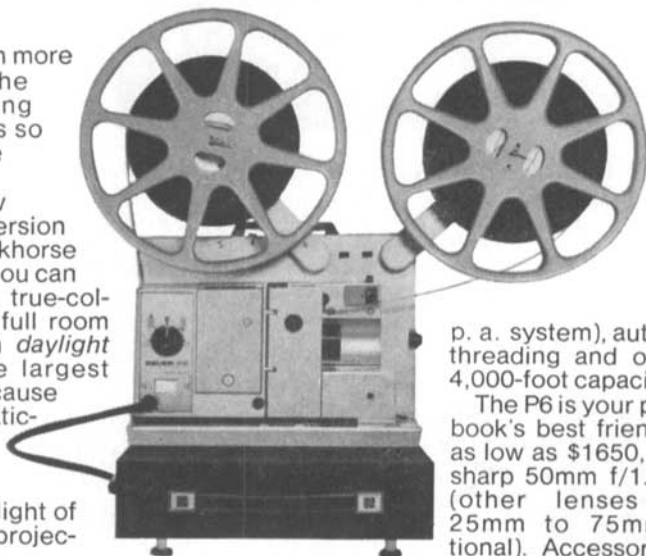
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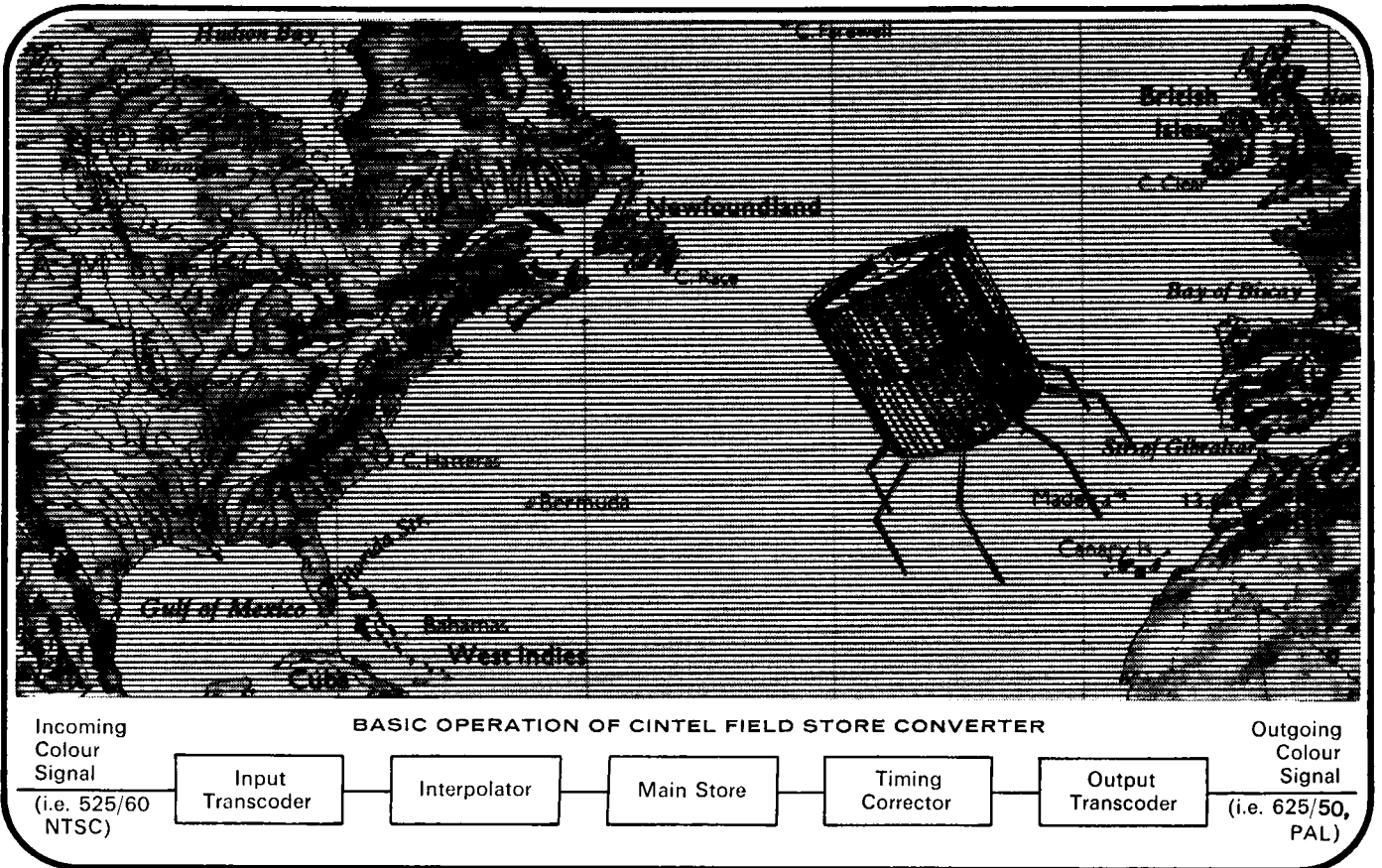
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