at this time since its publication in the SMPTE *Journal* has been temporarily withheld, pending completion of the research work.

Papers #2 and #3 deal with a special Electron Beam Magnetic Reproducing Head which eliminates the low-frequency loss inherently present in conventional magnetic heads, and which makes it possible to reproduce low frequencies down to d-c without equalization.

Papers #4 and #5 deal with a magnetostatic reproducing head which at present is of interest principally for instrumentation work.

Paper #6 describes research work on the development of transistor amplifier circuits for use in playback equipment.

Paper #8 deals with every detail of the design of the tape transport system, from the feed reel to the fully wound take-up reel, including flutter, head contact, and fast forward and re-wind problems.

Paper #9 discusses the factors involved in recording machine performance with respect to flutter, constancy, and amplitude uniformity, as dictated by tape coatings, backings and reel design.

Papers #10 and #11 are of special interest to the field of data recording.

Papers #12 through #18 inclusive, all deal in detail with the general problems of standardization of frequency characteristics, methods of producing standard reference tapes, and using such tapes in the evaluation of commercial tapes and recorders.

Following is a Table of Contents of the Proceedings:

#1. "Ferrite-core heads for magnetic recording" by R. J. Youngquist and W. W. Wetzel

#2. "A vacuum tube for an electron-beam magnetic reproducing head" by L. E. Loveridge

#3. "Core structures for the electron-beam magnetic reproducing head" by J. W. Gratian

#4. "A magnetostatic reading head" by S. M. Rubens and A. B. Bergh

#5. "Performance characteristics of magnetostatic reproducing equipment" by W. R. Boenning

#6 "Playback of magnetic recordings through transistor amplifiers" by C. E. Williams

#7. "Components and mechanical considerations for magnetic sound on 35mm film" by John G. Frayne

#8. "Basic mechanical considerations for tape transport systems" by O. C. Bixler

#9. "Mechanical factors governing tape coatings, backings, and reel design" by J. E. Johnston

#10. "Magnetic recorders for data recording under adverse environments" by G. L. Davies

#11. "Improved performance of magnetic recording system for precision data" by Walter T. Selsted

#12. "Present status of a 16mm standardized reproduction characteristic" by E. W. D'Arcy

#13. "Magnetic tape testing on a comparison basis" by Walter H. Erikson

#14. "Characteristics of recent commercial ¼-inch magnetic tapes — effects of trends on Navy tape standardization" by F. Comerci, S. Wilpon and R. Schwartz

#15. "Some notes on problems encountered in the use of the standard reference tape" by Frank Radocy

#16. "A standard magnetic tape recording for standardizing the characteristics of Navy recorder-reproducers" by F. Comerci, S. Wilpon and R. Schwartz

#17. "Equalization of magnetic tape recorders and general recorder performance tests" by Frank G. Lennert

#18. "Methods of measuring surface induction of magnetic tape" by J. D. Bick

Copies of the Proceedings are being made available to Government and industry groups who are actively engaged in research and development, manufacturing, or direct application of magnetic recording techniques to Department of Defense problems and applications.

Inquiries for copies, with some information on the "need to know" should be directed to: ASTIA Document Service Center, Knott Bldg., Dayton 2, Ohio.— *George Lewin.*

Biographical Note

John George Capstaff has retired after more than 40 years of service in the Kodak Research Laboratories. Mr. Capstaff, head of the Special Photographic Department of the Laboratories, is an outstanding pioneer in photography, a noted inventor, an able experimenter, a meticulous instructor of neophyte photographers, and a well-known technical counselor to the motion-picture industry. He has received numerous awards in recognition of his many outstanding contributions to photographic technology and practice.

In a manner of speaking, Mr. Capstaff joined the Kodak Research Laboratories before they were organized. As a young man in England and in his spare time from his portrait studio, he experimented with photography, inventing several modifications of the photographic process. In 1912, learning from friends that Dr. C. E. K. Mees had been asked by Mr. George Eastman to organize a research laboratory for the Eastman Kodak Co., Mr. Capstaff applied for a position. He was engaged by Dr. Mees to work at Wratten and Wainwright to learn the technique of making color filters to prepare him to come to Rochester to take charge of the production of filters and the experimental work related to them.

Mr. Capstaff had not been long in Rochester before he began experimental work in several fields of photography. By 1914 he was working on processes of color photography, and a two-color portrait process was worked out by him and exhibited at the World's Fair in San Francisco in 1915. It was called the Kodachrome process but is related in name only to the Kodachrome process and materials currently in use. The process was also adapted to motion-picture photography by printing the two color images in register onto opposite sides of double-coated film by means of an optical printer.

Mr. Capstaff's outstanding contribution to photography is his invention of a practical method of making motion pictures for home use. Before 1914, much work had been done in this field by others and while the design of apparatus had progressed satisfactorily, the usual method in photography of making prints from negatives was, for the amateur motion-picture enthusiast, both expensive and complex. In 1914, Mr. Capstaff applied the reversal process to amateur motion pictures and became convinced that this method would be successful commercially where other methods had failed. He felt that the reversal process, which eliminates the need of additional film for the positive print and the printing operation, would reduce greatly the excessive cost of pictures for the motion-picture amateur. Then by making easy-to-use, low-cost equipment, a method would be available to do for the potential motion-picture amateur what roll film and the snapshot camera had done for the amateur still photographer.

The reversal process paved the way for inexpensive home movies, but with the film available at that time provided only limited camera exposure latitude, and the quality of the pictures was adversely affected by the unevenness in the emulsion coating. These difficulties were overcome by Mr. Capstaff by the use of a controlled second exposure which partly compensated for the effects produced by variations in emulsion thickness and, by partially correcting for improper camera exposures, effectively increased the exposure latitude. This improved reversal process gave much better results than could be obtained without the control of the second exposure and led to commercial success. The process was announced in January 1923, and the film and apparatus were introduced in June of that same year.

Mr. Capstaff continued his experiments, and many improvements in the equipment used for exposing, processing, and projecting the film were devised by him. In 1932, "Cine 8" film and apparatus were introduced, the film being processed in the same manner as the 16mm film.

In 1925, he began work on a three-color additive process of color photography which had been developed in principle by French inventors, the rights having been secured by the Eastman Kodak Co. in that year for application in the 16mm Cine Kodak program. This process, in which lenticulated film is used, the lenticules forming images of filters fitted in the lens, was introduced commercially in 1928. Research work on a 35mm lenticular process was carried on

subsequently in collaboration with motion-picture production companies.

During Mr. Capstaff's early work on the Kodachrome process he discovered that the addition of a yellow dye to the emulsion provided a useful method of controlling the depth of the exposure and also had the effect of increasing the resolving power of the emulsion, thus greatly extending the latitude and lowering the maximum contrast. From this and other innovations, he devised special films which have contributed greatly to the technical excellence of modern motion pictures in black-and-white and in color, notably films for the production of duplicate negatives.

In 1927, he established the formula of a developer especially suitable for the production of fine-grained images on negative film. This formula, D-76, met with ready acceptance and is used very widely by amateur and professional photographers for all classes of work.

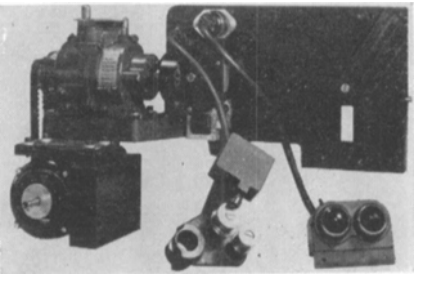
No account of Mr. Capstaff's work would be complete without some mention of the training which he has given through the years to his associates and assistants. Many men in the organization of the Eastman Kodak Co. are proud to acknowledge with gratitude their obligation to him. This feeling is also shared by many motion-picture engineers throughout the industry, many of whom have been helped by his wide knowledge and ready invention.

For his key inventions which are the basis of amateur movies, Mr. Capstaff received the Modern Pioneers Award of the National Association of Manufacturers in 1940. He was awarded an honorary fellowship in the Royal Photographic Society in 1944 and received its Progress Medal in 1946. In 1950, the Photographic Society of America awarded him an honorary fellowship. The design of a processing machine incorporating several new principles brought him an honorary mention from the Academy of Motion Picture Arts and Sciences in 1943. The Society of Motion Picture and Television Engineers awarded him its Progress Medal in 1944.

Mr. Capstaff has published a number of papers on his work in photography (most recently, "An experimental 35mm multilayer stripping negative film," in the April 1950 *Journal*) and has been granted over 75 patents. His work has been fruitful, and the high technical excellence of motion pictures today owes much to his pioneering efforts.—*R. G. Tarkington.*

New Products

Further information about these items can be obtained direct from the addresses given. As in the case of technical papers, the Society is not responsible for manufacturers' statements, and publication of these items does not constitute endorsement of the products.



An automatic fade attachment for use with Models D and J Bell & Howell Continuous Contact Printers is being made by the Motion Picture Printing Equipment Co., Skokie, Ill. In the fade attachment, the shutter blades are driven by a mechanical clutch which is connected to a variable-speed transmission whereby the fade lengths can be varied. Fades of from 10 to 100 frames can be obtained. The mechanical clutch is operated with a breaker box, which operates from a standard film notch placed in the negative on the soundtrack side of the negative. The attachment is provided with an indicator light unit which indicates when the shutter blades are opened and when closed. Two 4-w, 120-v lamps are mounted in this housing and are operated by a microswitch inside the fade attachment. For Model J the attachment costs $695.00 f.o.b. the plant; and for Model D, $745.00.

A slide rule calculator for estimating the relationship between running time, footage and cost of 16mm and 35mm films will be sent by Sidney P. Solow, Resident Manager, Consolidated Film Industries, 959 Seward St., Hollywood 38, to any Society member who sends him a self-addressed 9-in. envelope bearing 6¢ postage. Given the unit price per foot of film and either the running time in minutes or the footage, the total cost and either the footage or the running time are shown.