

# for design engineers— the Book of SPROCKETS

high precision,  
that is—  
for driving  
perforated

- TAPES
- FILMS
- CHARTS



Describes and illustrates many types of drive sprockets, small micro-machined parts, positive indexing devices, Geneva star wheels, drivers, assemblies, intermittent movements. Covers applications and specifications. Many dimensional drawings. 30 pages helpful to design and development engineers in many fields. Sent on request.

High precision sprockets since 1908

*LaVezzi*  
machine works, inc.

900 North Larch Ave.  
Elmhurst, Ill. 60126  
(312) 832-8990

← NEW ADDRESS!

**Robert Edmonds**, Chairman of the Motion Picture Dept. of Columbia College, 540 N. Lake Shore Dr., Chicago, IL 60611, has been selected to serve as the Midwest representative for the First International Animation Film Festival to be held in Zagreb, Yugoslavia, in June. In this capacity, Mr. Edmonds will screen all entries from filmmakers in the Midwest.

**Vernon B. Bushway, Jr.**, has been appointed Chief Engineer for Magnasync/Moviola Corp. in North Hollywood. Mr. Bushway was formerly with CBS, RCA's Commercial Electronics Systems Div. and Winston Research Div. of Fairchild Camera and Instrument Corp. In his new post he will oversee the engineering of motion-picture and TV studio editing equipment and government and municipalities logging recorders.

**Harold P. Bolton** has been appointed Assistant Vice-President and General Manager of the Technicolor Texas Operations at the Manned Spacecraft Center in Houston, it was announced by Richard M. Blanco, President of Technicolor Graphic Services, Inc. Mr. Bolton was formerly De-

puty Project Manager at Technicolor's Cape Kennedy installation and more recently he was Project Manager of the Technicolor facility at the Manned Spacecraft Center.

**Rupert F. Goodspeed** has been appointed National Manager of the new Fernseh division of the Robert Bosch Corp. He will direct marketing operations for the Fernseh line of professional television equipment made in Darmstadt, Germany, including the 3-tube KCU-40 TV camera system. Other products to be marketed by the U.S. Fernseh division will include telecine cameras, standards converters, special-effects equipment and video recording systems.

**Lee Shrou** has been appointed President of Producers Service Corp., 1200 Grand Central Ave., Glendale, CA 91201. He was formerly Director of Marketing for Ultronic Systems Corp. in Mount Laurel, N.J. Producers Service Corp. designs and manufactures special-effects optical film printing equipment and mechanical film drive and control systems. The firm is a subsidiary of Boothe Computer Corp. in San Francisco.

## books reviewed



some experimental considerations. The strong point of this book is its coverage of the experimental aspects of holography; an area which has been neglected in the holography literature. Chapter 8 on applications is mainly concerned with interferometry and a brief discussion on imaging systems and data storage. The text could use a larger bibliography to guide the uninformed reader through the maze of holography publications. The preface states that this book is for the man in the laboratory. With this intended reader in mind, the book achieves the objective of providing an elementary introduction to holography.—*John N. Latta*, Radar and Optics Div., Institute of Science and Technology, Univ. of Michigan, Ann Arbor, MI 48107.

### Holography: Technique and Practice

By Matt Lehmann. Published (1970) by Focal Press Ltd., 31 Fitzroy Sq., London, W.1, England. 148 pp. Illus. Diagrams. 7 by 9½ in. Price \$18.00.

This book is basically a digest of experimental methods. The material is largely intended for either the first-time holographer or his laboratory technician. Text is broken into nine chapters which cover (1) Introduction and History, (2) Basic Principles of Optics, (3) Principles of Holography, (4) The Practice of Holography, (5) Holographic Systems, (6) Devices and Instruments, (7) Special Techniques, (8) Applications, and (9) The Future of Holography. The overall tone of the text is one of considerable optimism about the future of holography. In certain sections (see Chapters 1 and 9), the writing becomes glamorized and popularized. Chapter 2 is a basic introduction to optics and seems out of place because this material is covered in many other texts. The principles and practice of holography in Chapters 3, 4 and 6 give a good basic outline of holography and

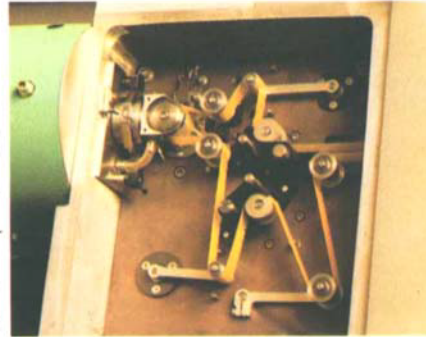
### Colour Television Theory: PAL- System Principles and Receiver Circuitry

By Geoffrey H. Hutson. Published (1971) by McGraw-Hill Publishing Co., Ltd., Shoppenhangers Rd., Maidenhead, Berkshire, England. 326 pp. + Preface, Table of Contents. Diagrams. 7 by 10 in. Price £3.85 (\$8.28).

Although this book deals primarily with the theory and application of the PAL color television system, much of the material is equally applicable to the NTSC system, which as Mr. Hutson notes in the preface, is the generic basis for all other color television systems currently in use.

There is a strong emphasis on PAL receiver technology, with extremely detailed explanations, and circuit diagrams, of typical color demodulator and signal processing circuits. The chapters dealing with receiver display devices and their associated circuitry covers the basic principles of the shadow mask display tube, with details of typical associated circuitry. Operating principles of the Chromotron

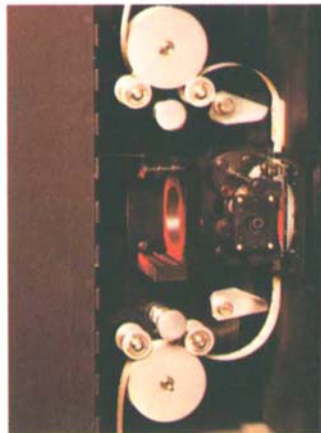
Now, for the first time, commercial equipment can produce video-to-film transfers of a quality formerly obtainable only in the laboratory.



That's the 3M Color EBR System — the result of 12 years of research and development by the company that pioneered electron beam recording.

## **The 3M Color Electron Beam Recording System.**

Field-proven and backed by an unmatched depth of expertise, the 3M Color EBR System brings new picture fidelity to the motion picture and television industries. Contact 3M for the full story.



**Tape-to-Film Transfer at Its Finest.**

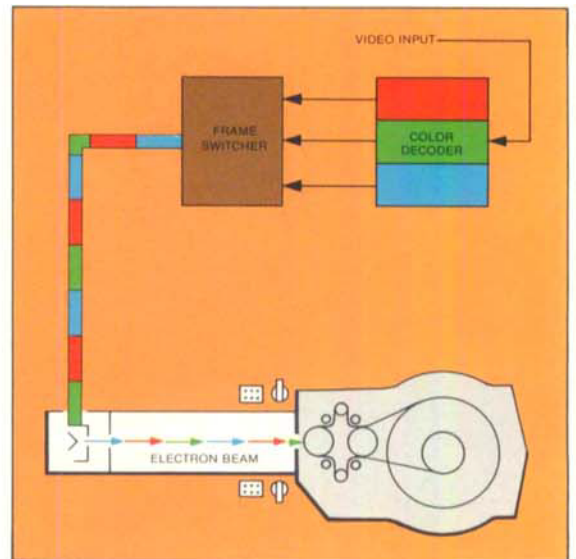
### Superior Film Transfers.

The 3M Color EBR System utilizes direct electron exposure to produce video-to-film transfers that are superior to those made with CRT/Optical recorders.

Working in real-time, our EBR System provides black-and-white film separation masters directly from the live or taped NTSC video signal in a single pass. There are no optics, phosphors or CRT faceplates to degrade image quality.

The resulting positive color prints or internegatives consistently exhibit true color saturation and freedom from "color crosstalk"; have accurate image registration, high resolution and low noise; and are free from mid-field splice, shutter bar and other frame rate conversion anomalies.

The 3M Color EBR System provides you with video-to-film transfers as close to perfect as is possible today.



### Electron Beam Recording.

3M's electron beam recording technology has been field-proven in many commercial and space imaging applications. It now brings true color fidelity to video-to-film transfers.

Color prints are produced by the three-color separation process, with the separation masters recorded on high-resolution black-and-white 16mm film.

The NTSC video signal — live or taped — is electronically decoded into its red, green and blue components. These are stored parallel on a video disc, then played back sequentially for recording.

The interlaced fields that make up a television frame are recorded during a single raster scan by deflecting the electron beam between two adjacent line positions at a 15 MHz rate and synchronously switching the video signal between the two interlaced fields. The image corresponding to each color signal is recorded on a separate frame of film by the successive frame color process, a process known for its superb color quality. A television monitor and



waveform monitor permit the operator to electronically make all necessary video adjustments and calibrations prior to recording.

Real-time operation is achieved in the 3M Color EBR System by recording on film moving continuously, rather than intermittently. A servo film drive gives registration accuracies of the separation images consistently better than 0.0001 inch (a fraction of a TV line on the 16mm format used). The film drive is designed to be the simplest and most reliable ever to be used for television recording.

Color registration is inherent in the EBR recording process because all images are recorded by the same electron beam on the same film. Any shift in the image position, whether due to the recording process or film shrinkage, affects all colors equally; it does not disturb their registration.

After the separation film is recorded, it is developed by normal black-and-white processing, then loaded into the step printer. A great deal of versatility is possible, because the separation film may be recorded as a positive or negative. The printer

camera may be loaded with any standard 16mm internegative or positive color stock. (35mm optional)

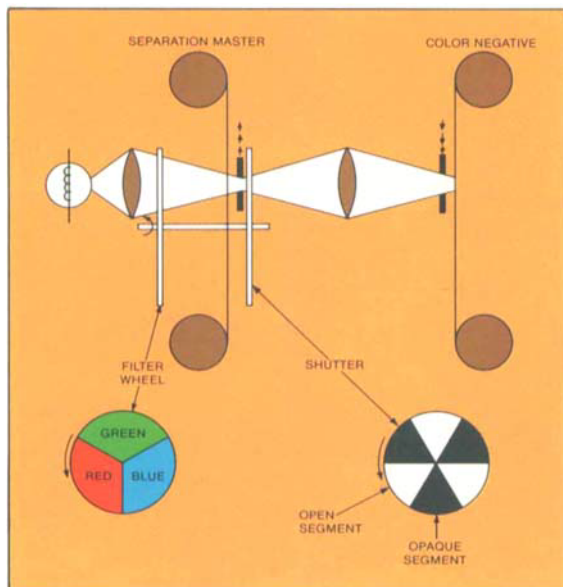
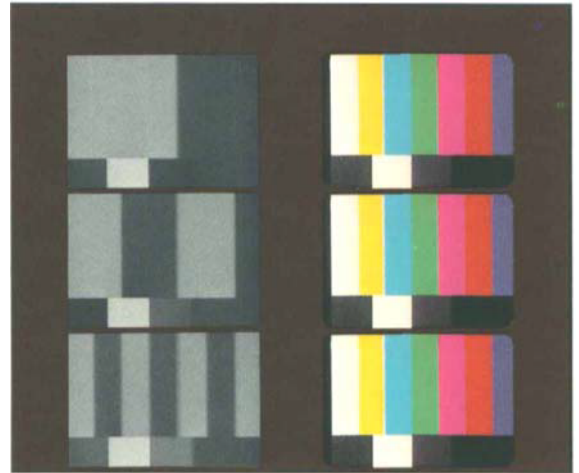
The printer automatically exposes each frame of the color film to the red, green and blue separation images through a rotating color filter. The three colors may be individually controlled, permitting optimum color balance in the final print.

For sound recording, a signal is available from the Color EBR System for synchronization of an external sound recorder. An electronic "sync mark" is recorded on the separation master film and on the sound negative.

The final film produced by the 3M Color EBR System has the color quality of the separation process plus the control and image excellence of electron beam recording.

### System Features.

- True saturated colors, no color crosstalk, no color fringing.
- Superior image quality.
- One-pass, real-time recording.
- Inherent color registration.
- Independent control of color balance.
- Precise operator control of separation exposures, focus, size and linearity without test films.
- Low cost film and processing.
- Archival separation master not subject to color dye fading.
- Perfect interlace assured by simultaneous even/odd field recording.



## General Specifications

### EBR Recorder.

**Film Transport:** Film magazine, film chamber and mechanism operated in vacuum. Continuous motion film drive locked to incoming TV sync. 72 frames/second.

**Film Magazine:** 3300' coaxial magazine contains both supply and take-up reels. Recording time: 30 min. (4.7 mil base).

**Vacuum System:** Fully interlocked for loss of power and film runout.



#### Electron Source:

Tungsten filament replaceable in approximately 10 min. (warranted life 300 hours).

#### Focus:

Electromagnetic; monitored by secondary emission direct

display of magnified test pattern surface.

**Beam Current Control (Exposure):** Servo-controlled at TV line rate and monitored by waveform monitor.

**Spot Wobble:** 15 MHz sampling rate.

**Input:** NTSC composite video or separate sync. 0.6 to 1.4 volts peak-to-peak.

**Dual Gamma Amplifier:** Independent set-up for positive or negative recordings. Adjustable break points for proper gray scale in the developed film.

### EBR Printer.

Projector Lamp: Type CTT, 1000 watts. Printing Speed: 4.2 frames color film/second.

Projector film capacity: 3300 ft. 16mm film. (4.7 mil base thickness).

Camera film capacity: 1200 ft. 16mm film. Optional interchangeable 35mm camera with 1200 foot capacity available.

### Support.

Ideally, the operator of a Color EBR System should be familiar with television recording techniques, experienced in op-

erating sophisticated electronic equipment and in photographic processing. If this combination of experience is not readily available, Mincom offers various training programs. Further information is available through any of our branch offices.

A planned maintenance program is available through the Mincom field service organization. The initial installation of the Color EBR System is made with a factory engineer and a field service engineer present. Informal training of the customer operators is given during the installation.

The Color EBR System is available on direct sale, lease or a conditional sale basis. For further technical and sales information contact one of our branch offices. Demonstration films are available.



### Sales/Service Facilities:

ELECTRON BEAM PRODUCTS  
MINCOM DIVISION, 3M COMPANY  
300 South Lewis Road  
Camarillo, California 93010  
Telephone (805) 482-1911

MINCOM DIVISION, 3M COMPANY  
4701 Lydell Avenue  
Cheverly Industrial Center  
Cheverly, Maryland 20681  
Telephone (301) 773-9033



ELECTRON BEAM PRODUCTS  
Mincom Division **3M**  
COMPANY

and the Trinitron tubes are also discussed and illustrated. Separate chapters are devoted to the principles of beam convergence techniques and to typical convergence and raster shape correction circuitry for shadow mask tubes.

The principles and theoretical derivation of color bar signals are discussed in detail. There is little coverage however of other forms and techniques of color signal generation, encoding and processing. This would suggest that the text is primarily intended for students and others who are concerned with the receiving end of the system and, with this qualification, it is recommended for its thorough treatment of the topic.—*Bruce M. Read, H. K. Davis & Assoc. Ltd., 160 Duncan Mill Rd., Don Mills, Ont., Canada.*

### The History of Photography (4th ed.)

By Beaumont Newhall. Published (1972) by the Museum of Modern Art, 11 W. 53 St., New York, NY 10019 (distributed by New York Graphic Soc., Greenwich, CT 06830). 216 pp. Illus. 8 by 11 in. Paperbound. Price \$6.95 (clothbound \$15.00).

This beautiful book, first published in 1937, has been recognized as a classic in the literature of photography. Now, as the fourth edition it has been extensively revised and brought up to date to include descriptions of recent trends and photographic styles as well as technical advances. It contains a vast amount of information succinctly put, beginning with the Renaissance, when Leonardo da Vinci described "the phenomenon of the *camera obscura* (literally 'dark room') . . . : light entering a minute hole in the wall of a darkened room forms on the opposite wall an inverted image of whatever lies outside." The author continues, "The first published account . . . appeared in Giovanni Battista della Prota's book, *Natural Magic*, of 1558." It is a short step from there to the experimenters in the early nineteenth century, mainly, of course, Niepce, Daguerre and Talbot.

Technical advances and chemical discoveries — some of them accidental — which have made possible modern photography are described in a highly readable, smooth-flowing text, though Mr. Newhall's exposition may not be as scientific as *Journal* readers might wish. Since *The History of Photography* was originally produced for the Museum of Modern Art in New York City, a large part of his emphasis is on the aesthetics of photography. Each of the 210 photographs illustrating the volume has been carefully chosen, and numerous anecdotes and apt quotations not only add to the reader's pleasure but also reveal careful research. The book can be read as social history and art history as well as a history of the techniques of photography. It contains good notes and bibliography and is well indexed.

The author, Beaumont Newhall, former Director of George Eastman House in Rochester, N.Y., and a distinguished historian, author, teacher and lecturer, is presently Visiting Professor of Art at the University of New Mexico. Among many other honors, he has recently received the Culture Prize from the German Photographic Society.—*Edit.*

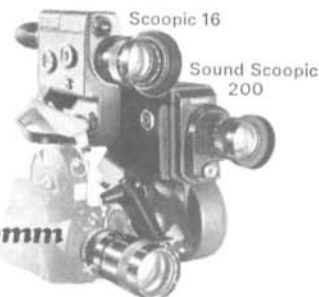


## One-man 16mm Action Pack: Sound Scoopic 200

Turns a lone wolf into a production team. 200 feet of continuous filming plus simultaneous sound recording. Its lightweight, compact 16mm portability is complemented by quick-shot EE aperture with manual override, TTL system, rechargeable battery pack. And that's just a part of the big Canon 16mm news:

When the going's rough, switch to the compact **Scoopic 16**. Its automatic Exposure Control tracks the action in any light, and years of world-wide testing have shown that the specially designed SLR viewfinder, semi-automatic loading and rechargeable battery pack work just as well at 68°F below zero!

We've got lots happening in lenses, too. The versatile **Canon Macro Zoom Lens C10 x 12 Fluorite** almost makes chromatic aberration a thing of the past, features macrophotography (down to 1mm) and multipoint focusing (lets you match focal point to focal length for exciting new possibilities). Comes with Arriflex mount (for 16ST, 16M, etc.) or optional universal C-mount.



Canon: big news in 16mm

# Canon

● CANON U.S.A., INC.: 10 Nevada Drive, Lake Success, Long Island, New York 11040, U.S.A. (Phone) 516-488-6700 ● CANON U.S.A., INC.: 457 Fullerton Ave., Elmhurst, Illinois 60126, U.S.A. (Phone) 312-833-3070 ● CANON OPTICS & BUSINESS MACHINES CO., INC.: 3113 Wilshire Blvd., Los Angeles, California 90005, U.S.A. ● CANON AMSTERDAM N.V.: Gebouw 70, Schiphol Oost, Holland ● CANON LATIN AMERICA, INC.: Apartado 7022, Panama 5, Panama ● CANON INC.: 9-9, Ginza 5-chome, Chuo-ku, Tokyo 104, Japan