

Radio and Electronic Eng.

vol. 31, no. 3, Mar. 1966
The Performance of Backward Diodes as Mixers and Detectors at Microwave Frequencies (p. 181) *T. Oxley and F. Hilsden*

SPIE Journal vol. 4, no. 3, Feb./Mar. 1966
Laser Safety Standards (p. 111) *Norman A. Peppers*

Tekh. Kino i Televideniya vol. 9, Nov. 1965
Remote Control of the "Lenar" Objective in Animation Photography (in Russian) (p. 45) *E. V. Ksandrov and V. I. Sivkov*

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Pull-Down Mechanisms With Power Closure (in Russian) (p. 12) *A. M. Melik-Stepanyan*

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Optimization of the Characteristics of a Magnetic Tape Transport Assembly (in Russian) (p. 37) *I. V. Grigor'ev, D. G. Luarsabishvili and E. F. Nepomnyashchik*

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The Use of a 16mm Film in a Rural Professional Cinema Network (in Russian) (p. 18) *Yu. A. Kalistratov*



Silver Recovery for the Photographic Processor is a 12-page illustrated booklet available from E. I. du Pont de Nemours & Co., Photo Products Dept., Wilmington, Del. 19898, that describes in detail the economics of silver recovery and the type of equipment required. In simple, practical terms, the booklet explains what profits can reasonably be expected and provides guidance in selecting and using equipment and selling the recovered silver. It is pointed out that metallic replacement is the simplest and is best suited to the very small processor. Electrolysis is recommended for most other processors. It is pointed out that, in addition to the profits accruing from salvaging and selling silver, benefits of silver recovery include longer fixer life and a more stable photographic image. Also, the scarcity and high price of silver make its recovery from fixing baths important to the national economy. The booklet is illustrated with tables, charts and photographs of equipment. Included is a bibliography and a representative list of refiners and smelters that buy recovered silver. Contents include discussions of: Financial Return; Equipment Cost; Metallic Replacement; Replacement with Steel Wool; Replacement with Zinc Dust; Proprietary Replacement Systems; Chemical Precipitation; Electrolytic Recovery; Nonagitated Units; Agitated Units; Paddle Agitation; Moving Anode; Moving Cathode; External Pumping; Factors Influencing Plating; Chemical Savings From Electrolysis; and Fixer Analysis.

Production of Motion Pictures in Color Using Eastman Color Films, Appendix B, is an 8-page leaflet that lists the certification and sources of supply of the chemicals used in processing Eastman color films. The chemicals are divided into four groups: (1) chemicals manufactured by Eastman Kodak Co.; (2) chemicals which

can be obtained from various sources of supply but which should meet certain specifications; (3) chemicals which may be obtained from various sources of supply but are not covered by specifications; and (4) chemicals required for the preparation of the reagents used in chemical control tests. Appendix C (4 pages) gives formulas for processing solutions. Both leaflets are available from Motion Picture and Education Markets Div., Eastman Kodak Co., Rochester, N.Y. 14650.

A new Camera and Sound Log has been developed by WRS Motion Picture Laboratory, 210 Semple St., Pittsburgh, Pa. 15213. The form provides space for the pertinent information that should be recorded during filming and/or sound recording. Its three parts include an original for the producer, a laboratory copy and an editing or sound studio copy. A supply of the forms is available to accredited producers without charge upon request to the Laboratory.

The Palmer Television Film Recorder is described in literature available from Tele-Measurements Inc., 145 Main Ave., Clifton, N.J. 07014, which includes a reprint of "Novel Shutter and Intermittent for Video-Recording Camera," by W. A. Palmer, from the March 1962 issue of the *Journal*, plus two illustrated leaflets. One leaflet describes the console model and the portable model is described in the other leaflet. The leaflets include detailed specifications for each recorder.

A new 60-page operating and service manual is available from D. B. Milliken Co., 131 N. Fifth Ave., Arcadia, Calif. 91006. The manual contains instructions for Series C and D 16mm high-speed motion-picture cameras, Model F-26A 1,200-ft magazine and Model M-29A rackover. Photographs, diagrams, schematics and tables are included to clarify operating and service procedures. The manual is priced at \$12.50.

Pinhole Array Camera for Integrated Circuits is a 19-page report describing a camera developed by the Army Electronics Command for the fabrication of integrated circuits. The camera is said to be useful for the rapid production of new circuit patterns provided that line resolution smaller than 0.0005 in. is not required. The apparatus consists of an array of precisely positioned uniform diameter pinholes and a vacuum back to hold the film or plate. It is designed to replace the step-and-repeat camera method of producing multiple images. The report (AD-628 485) is available from Clearinghouse, U.S. Department of Commerce, Springfield, Va. 22151, at a price of \$1.00 (microfiche 50 cents).

Data sheets describing the Newtek Lens Analyser System are available from Traid Corp., 777 Flower St., Glendale, Calif. 91209. The sheets are illustrated and give the specifications of the system and its components. The system (LAS) is designed to measure automatically the sine wave modulation transfer function (MTF) of a

lens with a precision of $\pm 2\%$, producing in 4 min a continuous and complete curve that requires no interpolation. LAS will accept lenses with apertures from $f/1$ to $f/100$, focal lengths from 0.5 to 20 in., and provide MTF curves for any point in the field of the lens from 0° to 45° .

Extremely Low-Distortion Lenses for Precision Mapping and Imaging is the title of a 4-page illustrated folder available from Perkin-Elmer Corp., Electro-Optical Div., Main Avenue, Norwalk, Conn. The folder describes Ross-Perkin-Elmer mapping and imaging lenses for astronomy, ballistic cameras, and optical data processing.

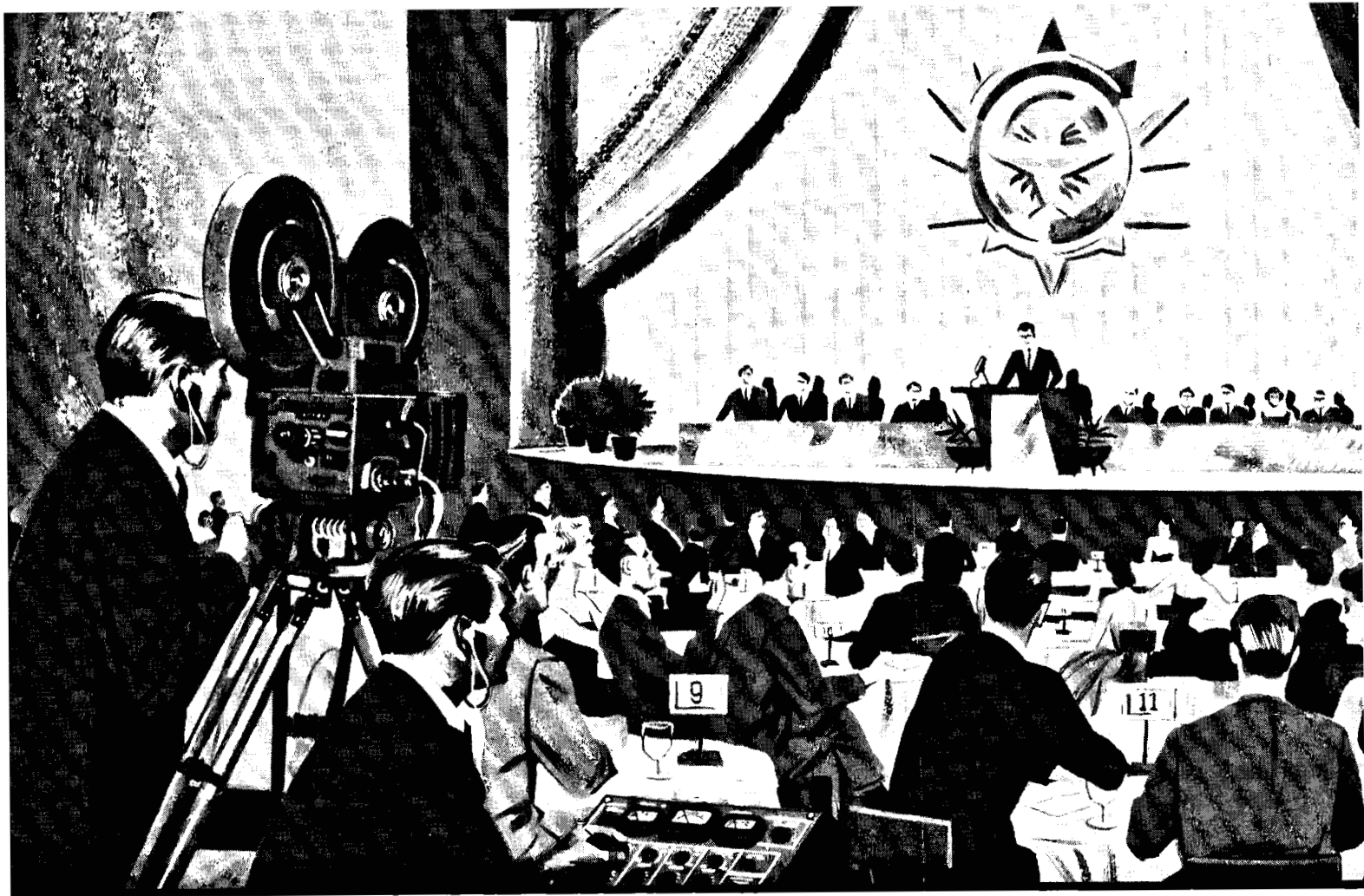
A 4-page illustrated booklet describing the Model 723 Modified Twyman-Green Interferometer used for optical component and subassembly inspection is available from Perkin-Elmer Corp., Astro-Optical Div., 2930 Bristol St., Costa Mesa, Calif. The unit is designed to check refractive inhomogeneities in glass, measure prism angles and surface flatness of plane parallel surfaced components and can be used in studies of other transparent media. A gas laser light source is available in place of the standard mercury vapor source for the study of thick or dense materials.

A 4-page illustrated folder describing the VI/SCAN III, AN/FSH-6 (XB-3), a magnetic tape data storage/analyzer system, is available from S. Himmelstein and Company, 2500 Estes Ave., Elk Grove Village, Ill. 60007. The folder lists various uses such as transient analysis, SNR enhancement, correlation analysis and speech compression. A general description of the equipment is presented, including systems specifications, scanning subsystem characteristics, standard headwheel parameters, scanning reproduced electronics specifications and data on the transport system.

Ampex Magnetic Tape Trends Bulletin No. 11, available from Ampex Corp., Mail Stop 7-14, 401 Broadway, Redwood City, Calif., gives information on tape reels for instrumentation, computer, video and audio recording. The bulletin is illustrated and gives dimensions and tolerances for various types of reels. The bulletin points out that, "the prime function of a reel is to protect the tape. This protection must be effective under shipping conditions, storage, use and 'normal' abuse. A reel is not designed to hold or control the tape pack, in fact flanges should never contact the tape."

Bulletin V-070, also available from Ampex, gives features and specifications of the VR-1200 high-band color video-tape recorder for broadcast use.

Interference Reduction Guide, Vol. 1 (AD 619 666N) and **Vol. 2** (AD 619 667N) are available from Clearinghouse, U.S. Department of Commerce, Springfield, Va. 22151. Vol. 1 is priced at \$7.00 and Vol. 2 at \$7.50. The 2-volume work is intended to provide the engineer with the necessary background and techniques to enable him to minimize the interference generation and interference susceptibility



**Use the Quiet Running AURICON
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Except for the red signal lights glowing on the Auricon Sound Camera, the audience has no way of knowing that the Camera is running. In fact, even the click of the on-off switch has been muted!

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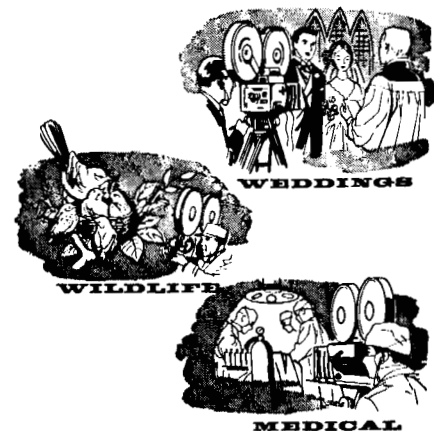
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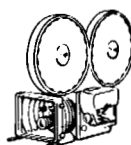

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Requires B.S., M.S. or Ph.D. in E.E. or Physics, with 3-5 years' experience in advanced system design for graphics. Must have familiarity with electronic tubes, A/D converters, function generators, video amplifiers, integrated analog circuits, encoder and logic design for digital computers. Background in EDP systems methodology is desirable.

If you would appreciate a professional affiliation where you can utilize your training, experience and education to the fullest, write in confidence, to:

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of communication-electronic equipment that he designs. Planned especially for design engineers with little or no interference reduction experience, the various types of interference are defined and illustrations presented, their generation on equipment is discussed and interference transfer media are discussed.

Among reports on research and development in the field of laser technology available from Clearinghouse, U.S. Department of Commerce, Springfield, Va. 22151, are: *Final Report on Research on the Adaptability of Lasers to Schlieren Systems* (AD-622 394) by Aircraft Armaments, Inc. for the Air Force, price, \$2.00; *Ultrasonic Laser Modulation Techniques* (AD-622 575) by United Aircraft Research Laboratories, for the Army, price \$4.00; *Laser Physics Conference* (AD-622 507), a report of a conference jointly sponsored in March 1965 by the Office of Naval Research and Advanced Research Projects Agency, price, \$3.00; *Pulse Laser Instrumentation* (AD 618 031N) Air Force Weapons Laboratory, price, \$3.00; and *Suppl 2, Masers and Lasers* (SB- 488N), a Clearinghouse selective bibliography on masers and lasers, available without charge.

Other reports in the field of optics available from the Clearinghouse include: *Infrared Transmittance of Optical Materials at Low Temperatures* (AD 618 744N), a report by the Navy Ordnance Test Station at China Lake, price \$1.00; *Computer Program for the Analysis of Visible Spectrometric Data: Chromaticity* (AD 620 295N), a report by the Naval Ammunition Depot at Crane, Ind., price, \$2.00; and *The Formation of Spectrum Lines, Proceedings, Second Harvard-Smithsonian Conference on Stellar Atmospheres* (PB 167 905N), price, \$7.00.

Two reports prepared by Sylvania Electronic Defense Laboratories for Army Electronics Command, *Varactor-Tuned Filters at Microwave Frequencies* (AD-629 631) and *Techniques for Microwave Components of Reduced Weight* (AD-629 930), are available from Clearinghouse, U.S. Department of Commerce, Springfield, Va. 22151. Each report is priced at \$2.00 (microfiche 50 cents). The report on varactor-tuned filters provides a detailed discussion of the filters at microwave frequencies and gives experimental results for one- and two-section bandpass filters that were built and tuned from 2.5 to 3.5 Gc. A single section filter was built which used the diode above self resonance and tuned from 6.5 to 7.3 Gc.

The report on reducing the weight of microwave components describes two design techniques for waveguide resonators. One using a lightweight Lucite structure as an external support for the conducting service yields better electrical performance. The weight saving is a factor of four. Using a polystyrene foam dielectric whose outer surface is conductively plated achieves a weight-saving factor of about 12. However, the device that was made using this technique exhibits a 3-dB insertion loss and a slight shift in frequency.

Professional microphones, accessories and audio reference devices are described and

illustrated in Professional Equipment Catalog 566 available from Electro-Voice, Inc., Buchanan, Mich. The catalog includes a brief explanation (with diagrams) of such terms as "frequency response," "directional characteristic" and "output level." Various types of omnidirectional and cardioid microphones are illustrated and described as well as the cardiline type designed specifically for long-reach action and selective pickup.

Professional loudspeakers and public address units are illustrated and described in Catalog 1070 E, which is available upon request from Technical Service Dept., Jensen Manufacturing Div./The Muter Co., 6601 S. Laramie Ave., Chicago, Ill. 60638. The 24-page catalog includes descriptions of the firm's recently announced products including weatherproof public address units, coaxial loudspeakers, theater/auditorium systems and the RK-62 speech master loudspeakers.

A Primer of Noise Measurement is a 36-page illustrated booklet available upon request from General Radio Co., West Concord, Mass. 01781. The booklet is intended for persons without experience in acoustics. It discusses the decibel, human response to noise, and the basic principles of soundlevel measurement.

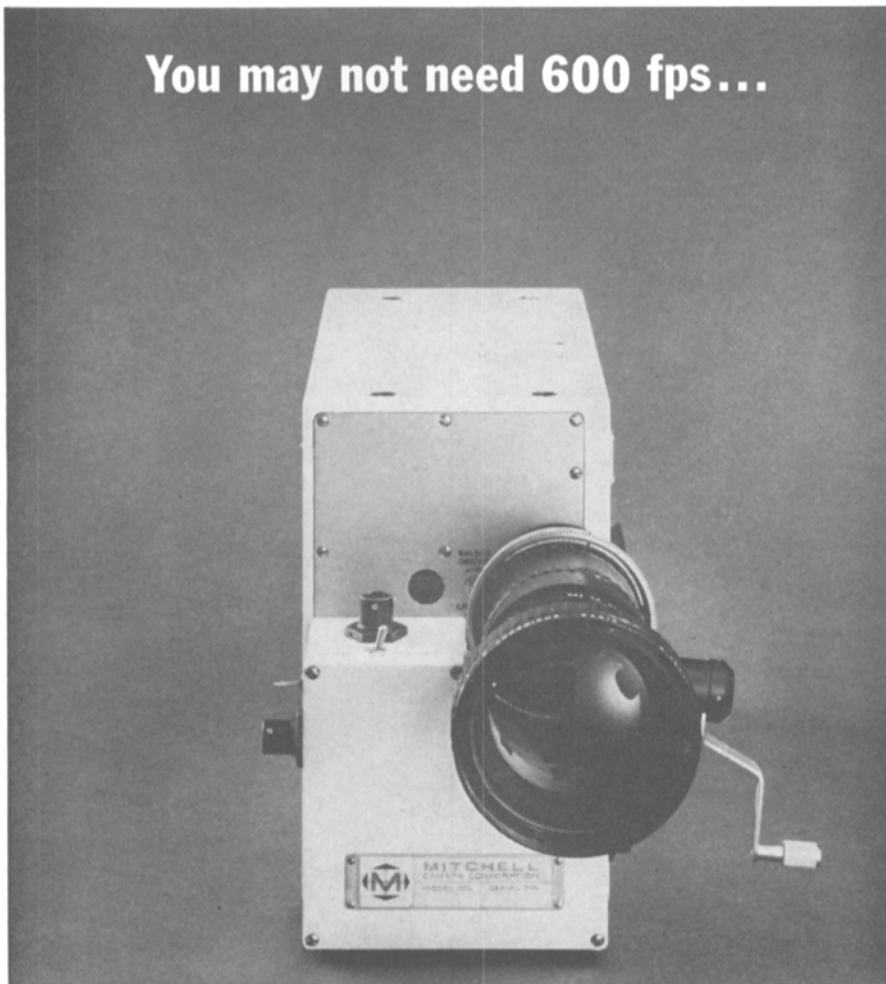
Sound Ways, the quarterly engineering journal of Gotham Audio Corp., 2 W. 46 St., New York, N.Y. 10036, is available upon request. The 4-page Winter 1965-6 issue contains technical information about Neumann and EMT products.

Stepper Motors and Step Servos is a 16-page illustrated booklet available from Muirhead Instruments Inc., Mountainside, N.J. The booklet describes the way in which permanent magnet stepper motors may be used in the design of step servo systems. Simple design methods are given to enable design engineers to calculate step servo parameters and insure optimum response and stability from their systems.

The Spring 1966 Rental Price List is available from Behrend's Inc., 161 E. Grand Ave., Chicago, Ill. 60611. Equipments for rent include 16mm and 35mm cameras and accessories, still cameras, editing equipments including Moviola machines, projectors, synchronizers, splicers, etc., audiovisual equipments, including motion-picture, filmstrip, and slide projectors, lighting systems and sound equipments. Also for rent is a truck and generator to provide the equivalent of studio lighting on location.

Source Directory of Prepared Transparencies is a 24-page booklet designed to provide information about publishers of prepared transparencies and related overhead projection materials. The booklet is available to educators and training specialists from: Advertising Manager, Grafex, Inc., 3750 Monroe Ave., Rochester, N.Y. 14603. The directory contains

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but the Mitchell Monitor 16mm* has other features that no photo instrumentation project should be without

A strong point in itself: frame rates up to 600 fps, variable in 1-frame increments during standstill or in operation, even by remote control or programming with $\pm 1\%$ regulation. But speed isn't everything — this camera excels other ways, too. Highest degree of steadiness is assured by **dual pin registration**, which keeps film perfectly aligned horizontally and vertically. The **universal** (commercial, military and international) motor operates on either 28 VDC or 120 VAC-DC, 50 to 1,000 cycles standard. Result: **no motor changing**, far less down-time. An integral reflex boresight system permits **through-the-lens viewing without removal of film**. Shutter also is integral and adjustable from 6° to 120° from **outside of camera**. Compact (only 4.7" W x 7.2" H x 10.3" L) and simple to operate, the standard Monitor has a 400-foot internal capacity, also takes 1,200-foot external magazine with **breakaway take-up chamber** for removing exposed footage only. Another option: Conex automatic iris system that controls exposure at all frame speeds, makes approximately **six f-stop changes** in a quarter-second. Send for full technical data.



*Formerly a product of Cinerama Camera Corporation



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The new Sony Videocorder[®] is a complete Home TV Studio[™]: a video tape recorder, built-in monitor, and optional camera outfit. Takes TV pictures and sound right off the air, and puts them on tape. And with the TV camera attached, and microphone plugged in, you can do the same with live action.

When you're done—presto, switcho, rewind, playback! And there, on the TV monitor screen, is the same picture with the same sound, as easy as operating an ordinary tape recorder.

First unit ever designed for the home.

There's nothing really new about taping sight and sound. TV stations have been doing it for years. But the equipment costs tens of thousands of dollars. That's a long way from home.

But, when you can bring the complete system—recorder and monitor—down to under \$1,000, plus an optional \$350 for the camera outfit, you're home. And that's exactly what Sony did. They achieved the most exciting home entertainment concept since television.

How did Sony do it? Know-how, that's how! The same imaginative know-how that has innovated all kinds of new things for people to enjoy: pocket transistor radios, incredibly small, personal TV sets, and high fidelity tape recorders—many of them memorable firsts.

Best known as a pioneer in transistor developments, Sony is also one of the foremost producers of tape heads, tape transports and the tape itself. Sony also manufactures TV picture and vidicon tubes. Sony drew from this specialized experience to create this all-new, all-Sony TV tape system for the home.

New recording/playback technique.

It was out of this same resourceful know-how that the ingenious idea of alter-

nate-field recording and repeat-field playback was conceived. Combining it with helical tracking, it made possible the development of a unit that would use standard 1/2-inch video tape at conventional 7 1/2 ips speed, yet capable of storing more than 60 minutes of program material on a 7-inch reel. The dream of a home TV tape recorder became a reality.

How it works. The Videocorder has a rotating 2-head assembly. Only one head is used for recording. It picks up every other field—30 fields per second. For "playback," both heads are used. As one head completes scanning a recorded field, the second takes over and rescans the same field. This reproduces 60 fields per second on the screen as completely interlaced 525-line pictures.

Similar to movie technique. The principle is very much the same as in movies, where the camera operates at, let us say, 24 frames per second. The movie projector also shows the film at 24 frames per second, but projects each frame twice. Thus, the observer receives 48 image impressions per second.

This is done to minimize "flicker" and enhance the illusion of smooth, uninterrupted motion. The Videocorder records 30 fields per second, and double-scans each field to produce 60 impressions each second.

Complete tape interchangeability. So precise are the sync constants provided by the circuitry and by the mechanical speed controls, that any tape recorded on one Sony Videocorder can be played back on any other Sony Videocorder.

The rotating heads are belt-driven by a hysteresis motor. The head assembly, in turn, is servo controlled to maintain locked-in 30 rps speed accuracy and correct angular orientation with relation to the recorded track.

The same motor also drives the tape capstan via a coupling idler wheel. The combined effects of the

capstan-mounted flywheel and the self-speed-regulating characteristics of the motor provide smooth, unvarying 7 1/2 ips tape movement.

Unlimited Applications. The Sony Home Videocorder adds a thrilling new dimension to home entertainment. Want to relive some telecast event? Watch a space launch again? A ball game? A presidential speech? Some selected program? Tape it with your Sony Home Videocorder.

You can even use a timer attachment to record a program while you're out. For, once it's on tape, you can watch it at any time. And you can erase the recorded material, and re-use the tape over and over again.

And with the optional camera outfit, you can also record picture and sound of live events—family functions, social shindigs, community activities—you name it. You can also apply it to your business or profession or your hobby interests.

Playback versatility. Moreover, you're not limited to watching playback on the built-in Sony 9-inch screen monitor. You can connect the Videocorder to any monitor, regardless of size. A competent TV technician can even adapt your Videocorder to work with your TV set.

Now available. Prices start at under \$1,000. The basic Sony Home Videocorder (model TCV 2010) is priced at \$995 complete with 9-inch screen monitor/receiver. A deluxe version (model TCV 2020) in oiled walnut cabinet, and equipped with built-in timer for taping programs in your absence, is priced at \$1150. Optional camera outfit including tripod, microphone and cable, is \$350. A 7-inch reel of tape, a full hour of recording, costs only \$39.95.

Visit your Sony dealer today for an unforgettable demonstration. For free booklet describing the many uses for your Sony Videocorder, write: Sony Corporation of America, 580 Fifth Ave., N.Y., N.Y. 10036

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- Fits perfectly on all turret cameras, including Doiflex 16, Eclair, Filmo, Bolex, Cine Special, Beaulieu, Maurer, etc.
- Highest quality optical design and manufacture, made from Japanese rare-earth elements.
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two general sections. The first provides the names of major sources of overhead transparencies. Companies are entered alphabetically according to the grade levels and subject matter their materials cover. The second section is provided for persons wishing to obtain more information from the producers of overhead transparencies. Company names and addresses are entered in this table along with information about the types of transparencies they provide. Categories indicate whether the company supplies text (keyed or unkeyed) with its transparencies and whether the company supplies color, black-and-white, mounted or unmounted transparencies. The booklet also includes an illustrated explanation on the principles of overhead projection.

The complete line of Selectroslide professional slide projectors is described and illustrated in a folder available upon request from Spindler & Sauppe, Inc., 1329 Grand Central Ave., Glendale, Calif. 91201. Models ranging from the basic manual projector through sophisticated speed dissolve system and random-access projectors are described. The accessory section lists a wide range of lenses, plus radio remote control and other attachments.

Motion Pictures Offer Better Visual Aids in Schools is a 15-page illustrated bulletin reprinted from *Bolex Reporter* and available from Paillard Inc., 1900 Lower Road, Linden, N.J. The bulletin consists of nine brief illustrated articles by authors experienced in the use of audio-visual aids. The use of films in teaching at vocational high schools, high schools, colleges, art and science departments and in sports is explored.

Skirpan solid state electronic dimmers are described in an illustrated folder available from Skirpan Electronics, Inc., 41-43 24th St., Long Island City, N.Y. 11101. In addition to illustrations of the equipment the folder shows typical wiring diagrams and charts showing output voltage vs. signal voltage and light output vs. control setting.

High Precision Machine Parts (Bulletin B-58) is available from La Vezzi Machine Works, 4635 West Lake St., Chicago, Ill. 60644. The 4-page illustrated brochure outlines special procedures involved in turning, drilling, broaching, milling, surface and cylindrical grinding, deburring, etc., on highly specialized equipment for precise multiple operations.

Principles Underlying the Color and Appearance of Coatings, a paper by E. I. Stearns presented at the Gordon Research Conference, June 19, 1952, and published in the *Official Digest*, January 1953, Federation of Paint and Varnish Production Clubs, has been reprinted in a 16-page booklet and is available from American Cyanamid Co., Dyes & Textile Chemicals Dept., Bound Brook, N.J. The booklet, which contains 19 illustrations, deals with the theoretical basis for much of the optical behavior of pigments.