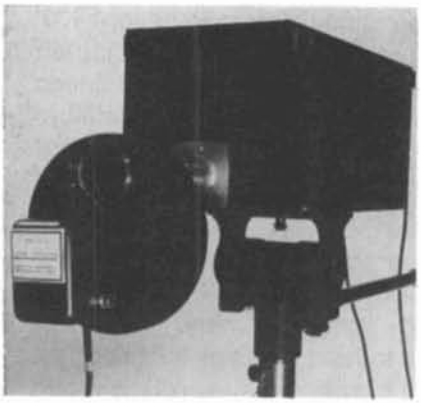
new products

(and developments)

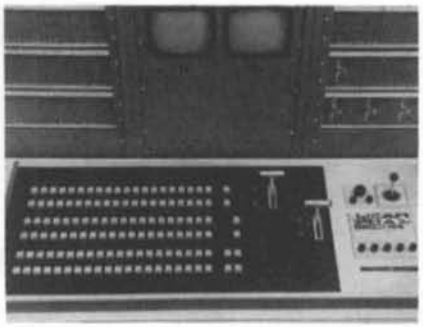
Further information about these items can be obtained direct from the addresses given. As in the case of technical papers, the Society is not responsible for manufacturers' statements, and publication of these items does not constitute endorsement of the products or services.



Industrial black-and-white television sets can be converted to color by means of an Electronic Color Kit for closed-circuit TV introduced by Color-Tel Corp., 13720 Riverside Drive, Sherman Oaks, CA 91403. The kit consists of a Color Translator, which can be installed on the lens of any closed-circuit camera, and a Compensating Filter, which is placed in front of the television monitor. With the addition of these two optical devices the scene is reproduced in color on the receiving screen.

The process, developed by James F. Butterfield, a television engineer, now President of Color-Tel Corp., was reported in the *Journal* ("Subjective (Induced) Color Television" by James F. Butterfield, *Journal*, pp. 1025–1028, Oct. 1968). The eye normally reacts to light by sending an electronic signal via the optic nerve to the cortex of the brain. According to Mr. Butterfield's theory, the signal contains a Morse-type of color code which tells the brain what color of light is striking a particular area of the eye. During more than a decade of research, Mr. Butterfield deciphered the codes for the colors red, green and blue and then developed a process which, synthetically, causes the eye to send the color codes for the primaries when it is stimulated by specific impulses of white light.

The Color Translator analyzes the scene into primary colors and codes these primaries with the appropriate light and dark pulses. The black-and-white TV system operates in normal fashion transmitting the sequences of light and dark. At the monitor the black-and-white impulses trigger the viewer's eye to see the scene reproduced in color. The Compensating Filter in front of the monitor's cathode-ray tube compensates for the excess blue in the ordinary black-and-white TV screen to give the picture truer color.

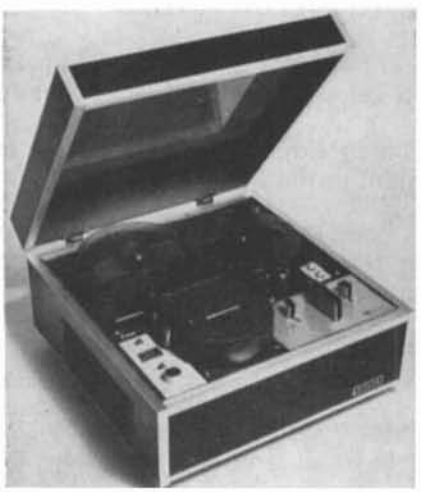


The TS-300-A Production Switcher introduced by General Electric's Visual Communications Products Dept., Syracuse, NY 13201, is an all-solid-state system consisting of modularized print-wire building blocks to make up a system with up to 40 inputs. Most interconnections are made by vertical printed circuit boards and flat multiconductor cable. Crosspoints are set up on a binary-coded decimal basis. The control panel has integrated circuit on-air tally lights on all inputs. Complete provisions for special effects are included. The system is built on an individual basis to customer specifications.

A new line of stop-action, slow-motion, magnetic disc recorders for color TV broadcasting and closed-circuit use has been announced by Data Memory Inc., 1255 Terra Bella Ave., Mountain View, CA 94040. The new series is called the Videodisc line and includes the VDR-222-J. The unit provides 25 seconds of color recording with stop-action and slow or reverse motion in playback. It is priced at $69,500. Among other models is the VDR-222-S monochrome disc recorder for industrial, x-ray and other applications which do not require critical stability. It is priced at $24,500.

All models of the new line incorporate a drive system that positions the head on the track and compensates automatically for head oscillation or blacklash during high-speed sweeps. The angular velocity of the rotating disc is maintained by means of a closed-loop speed and phase control servo system featuring a printed circuit dc motor. A remote control unit provides 25 individually selectable cue positions, visual location of the head position and 15 selectable record and playback modes.

A slow-motion color video disc recorder has been developed by Victor Company of Japan, Ltd., 12, 3-chrome Moriyacho, Kanagawa-Ku, Yokohama, 221, Japan. The recorder can select and reproduce the color television picture being recorded in slow motion, still, reverse and high-speed playbacks. The machine records constantly the input video signal and can play back any desired scene for 50 seconds to enable analysis. The recorder can switch sequentially from slow to still to normal speed. The recording system is described as "concentric circle endless recording." The disc is a Mylar base magnetic sheet 19.7 in. in diameter. It turns at a speed of 3,600 r/m. The machine is priced at about $90,000.



A portable color video-tape recorder has been announced by Victor Company of Japan, 12, 3-chome, Moriyacho, Kana-

gawa-ku, Yokohama, 221, Japan. The recorder uses what is called the DFC System (Direct FM Combine) in which the video signal is divided into two frequency bands, low and high. The FM wave modulated by the low-frequency component is combined with the high-frequency component and the combination is recorded on the tape. In playback, the combination is divided into two, demodulated and again combined to return to the original signal. The machine used ½-in tape. It is priced at about $2,000.

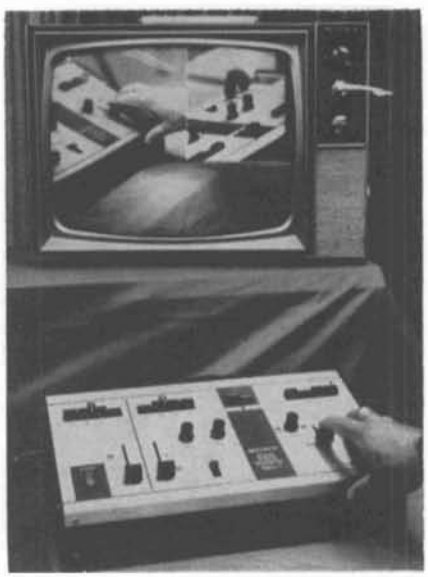
A new random access tape controller designed for automatic synchronized search, cue and playback of one or more broadcast video-tape recorders has been announced by Ampex Corp., 401 Broadway, Redwood City, CA 94063. The system, called Model RA-4000, is intended for use by stations, networks and television production houses in automatic playback on air or for editing and assembly of video tapes. A rehearsal button permits editing of a program or commercial to be rehearsed in its entirety without actually recording. An operator may choose edit points which may be confirmed or adjusted automatically on a single recorder by cutting to or from station black at the edit point. Any one of five control modes may be used for random access programming, switching or editing of recorders with a digital time code recorded on the cue track by a time code generator. Consecutive hours, minutes, seconds and frame numbering are provided by the time code generator. The random access system includes the control console in conjunction with one or more VR-2000s equipped with Mark III electronic tape editor and the time code generator. One time code generator may be used for several systems. Price of the RA-4000 begins at $17,500. The time code generator is priced at $3,450.

The IVC-300, a three-Plumbicon color television camera, designated "The Maverick," has been announced by International Video Corp., 675 Almanor Ave., Sunnyvale, CA 94086. Features include a 9-in viewfinder with built-in extendable hood for outdoor operation, a Varotal XX

10:1 zoom lens with local or remote servo-driven iris, modular plug-in circuit boards and a built-in filter wheel providing a selection of neutral density and color correction filters. Video signal is corrected for cable lengths up to 2,000 ft. The camera is priced at $29,500.

The firm also announced the IVC/EMI Model 2001-C, a three-Plumbicon color broadcast camera priced at $72,000, and the IVC/EMI Model 2001-B, a four-Plumbicon camera priced at $76,000. Both cameras are manufactured by Electrical and Musical Industries, Ltd. (EMI), Great Britain, and were developed specifically for the North American market (*Journal*, p. 202, Mar. 1969).

The TA-8000 series of VHF transmitters has been announced by Ampex Corp., 401 Broadway, Redwood City, CA 94063. The transmitters employ solid-state RF circuits up to 75-W level with a solid-state modulator. The transmitter is capable of remote-control operation if it should be authorized by the FCC. Components are of modular design. Cabinets have front access only. Three basic amplifiers are available, using 1.5-kW, 6-kW and 18-kW tubes. Standard features include FCC frequency tolerance in the visual oscillator, precipitrons in the air supply to amplifiers, automatic control power circuits and automatic differential phase and gain correction. The 1.5-kW amplifier is 71 in long, 39 in wide and 83 in high. The 6-kW and 18-kW amplifiers are 48 in long, 38 in wide and 83 in high. Price range is from $50,000 to $300,000.



A special effects generator (Model SEG-1) with facilities for switching fading, superimposing and wiping two video signals has been announced by Sony Corp. of America, 47–47 Van Dam St., Long Island City, NY 11101. The generator can accept inputs of up to four video cameras and can monitor the output of each camera. One channel can be inverted, if desired, to produce a negative picture. An internal sync generator supplies 2:1 interlace sync, or sync can be supplied from an external source. The SEG-1 weighs 8½ lb. It is 5¼ in high, 15½ in wide and 10 in deep. Power consumption is 7 W. It can be used

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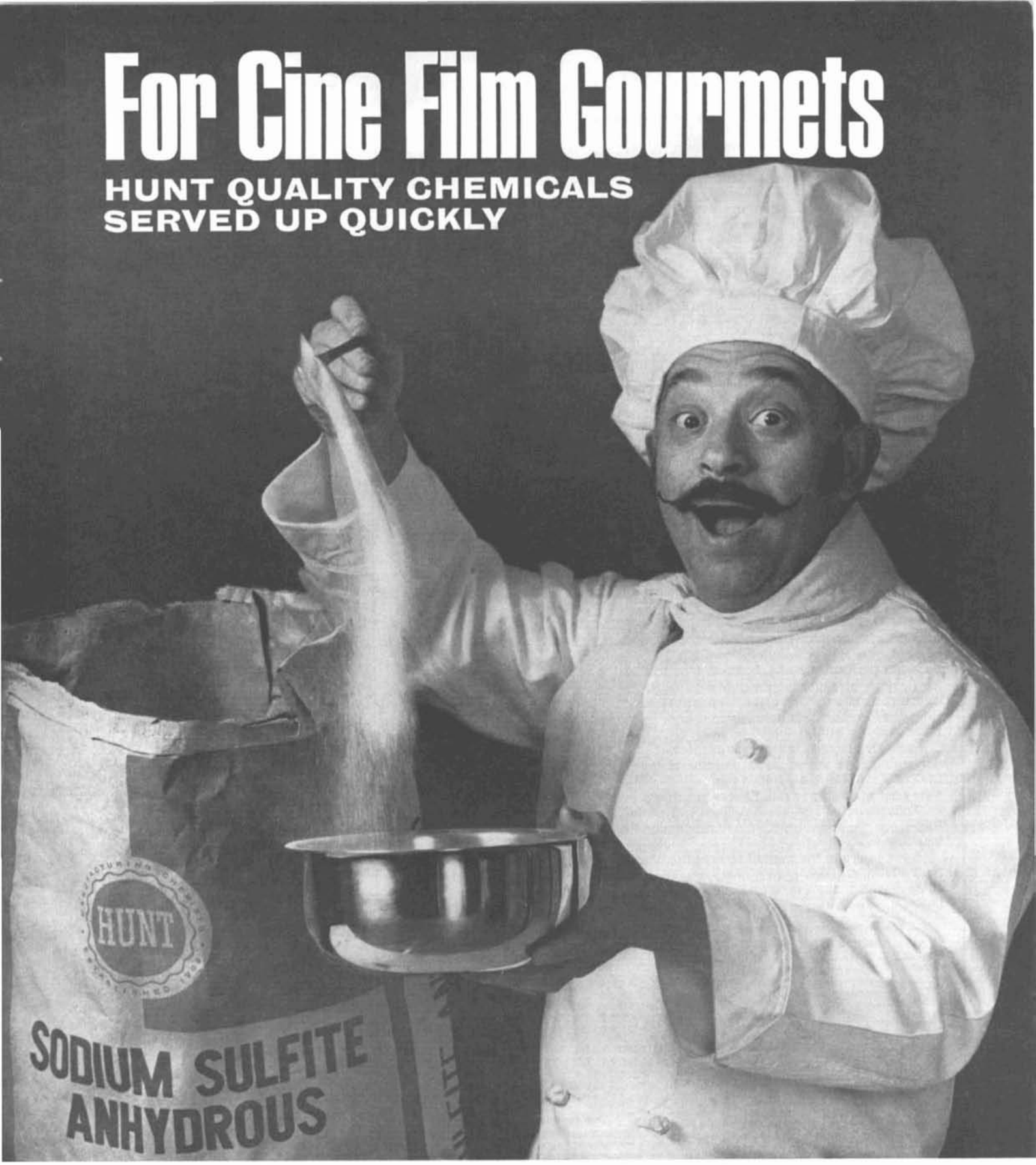

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with any Sony video camera or any other video camera with external sync input. It is priced at about $595.

A system for recording and playing back TV programming from video-tape cartridges has been introduced by RCA. The new equipment records and automatically reproduces program materials on small tape cartridges, each capable of up to three minutes playing time. A single machine can reproduce up to 18 short programs without reloading. The system is designed to operate in conjunction with an RCA high-band color TV tape recorder (type TR-60 or TR-70). Its recording capabilities include taping a live televised scene or duplicating program material from a master tape. In operation, 18 cartridges are cued up and reproduced in a predetermined sequence, either singly or in multiples, according to instructions given to the machine. A small digital computer is built into the cartridge system where it serves to analyze the status of the electronic and mechanical subsystems and to make decisions required for automated operation. The cartridge system is priced in the $70,000 to $80,000 range, depending upon configuration. This includes parts needed to integrate the cartridge system with the existing RCA tape recorder to be used with it.

A new 2-in magnetic video recording tape called "Scotch" brand 400 has been announced by 3M Company, 3M Center, St. Paul, MN 55101. The new tape, said to be virtually scratch resistant, is designed to eliminate such problems as windowing and cinching, scratching, capstan slippage and dust-generated dropouts.

An improved VGM-200 tripod has been announced by Birns & Sawyer, Inc., 1026 N. Highland Ave., Hollywood, CA 90038. The new tripod, designed for medium-weight cameras which often use long lenses, has thicker, wider ferrules of stainless steel and single-knob leg lock with heavier thread. For less leg twist and more solidity, die-cast tripod shoes are an inch wider at the base with stainless-steel shoe points. Prices range $135 to $180.

An optical/magnetic 16mm motion-picture projector called Kalart/Victor Model 82-25 MPR has been announced by Kalart Company, Plainville, CT 06062. A newly designed combination magnetic-optical sound drum assembly provides for reproduction of either standard photographic soundtrack or magnetically striped film by switching. The projector incorporates a full-power 25-W rms solid-state amplifier with matching circuitry for the soundhead. Magnetic recording and playback facilities are in a self-contained unit. A sound level meter provides for visual setting of level controls and a separate earphone jack permits monitoring of the recording input. The projector is priced at $975 with a door-mounted speaker and $1,050 with a separately cased speaker.

The firm also announced a new combination 16mm suitcase-type, self-contained rear screen repeater/standard projector. The projector, called Kalart/Victor Model STM-18MC3, features MARC 300 high-intensity light system and special power pack to permit showing films in brightly lighted areas. Films can be projected repetitively to the built-in TV-type screen by means of a repeater magazine which eliminates threading and rewinding.

A new line of 16mm sound motion-picture projectors called Kalart/Victor Series 75MC3 has been announced by Kalart Company, Plainville, CT 06062. Features include the MARC 300 high-intensity light system and special power pack. Each projector in the series has a built-in special preamplifier and has an interchangeable soundhead which permits

projection of prerecorded magnetically striped film. A rear-screen adaptation allows use of a short focal length $\frac{5}{8}$-in lens in combination with rear-projection cabinets or a side projection mirror attachment. Price range is from $1,290 to $1,540.

A 10,000-W tungsten-halogen lamp for studio lighting in television and motion pictures has been announced by Sylvania Electric Products Inc., 730 Third Ave., New York, NY 10017. The lamp has an overall length of 15 in. It is available as the DTY (3,2000° K; average rated life, 300 h) and the DTZ (3,350° K; average rated life, 150 h). The lamp is interchangeable with the G96 10,000-W standard incandescent lamp. It is priced at $235.

A socket for silicon controlled rectifiers (SCR) has been announced by Amphenol Industrial Div., Bunker-Ramo Corp., 1830 S. 54 Ave., Chicago, IL 60650. The sockets, which accept GE C106 or equivalent flat pack SCR's are molded from zytel nylon to ensure maximum high-current performance to 5 A at varying voltage levels (to 500 V rms). The sockets are equipped with contact tails for either solderless wrap or printed circuit board mounting. In quantities of 1,000, the sockets are priced at about 10 cents each.

A new inductance meter which uses a resonance circuit technique for measuring inductance, resonant frequency, self capacitance and Q, has been announced by Rohde & Schwarz, 111 Lexington Ave., Passaic, NJ. The meter, designated Type LRT, is all solid-state and is used for measurement of all types of coils, inductors and transformers. It is priced at $575.

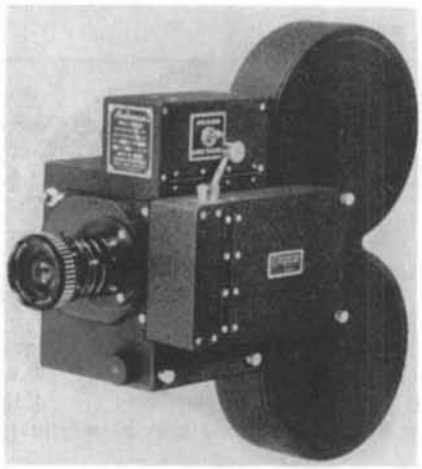
The new high-voltage, medium-power rectifier modules have been announced by Solitron Devices, Inc., 256 Oak Tree Rd., Tappan, NY 10983. The devices, models J531 and J532, dissipate 10 W and 20 W, respectively, in free air (25° C). The modules feature integral heat sinks and are self-sufficient.

A new logarithmic voltage-controlled amplifier (Model 316) has been announced by Ithaco Inc., 413 Taughannock Blvd., Ithaca, NY 14850. Model 316 is a wideband ac amplifier with logarithmic gain control capability. Amplifier gain may be slewed at rates exceeding 10^6 dB/s by a gain control voltage in the 0- to +5-V range. Log conversion occurs with high feedback gain, as output signal amplitude is held constant, the control signal amplitude is proportional to both amplifier gain (dB) and input signal level (dBV). The instrument is priced at $825.

U-Design is a "do-it-yourself" design program devised by Molecular Electronics Div., Westinghouse Electric Corp., Box 7377, Elkridge, Md. 21227, to enable users to tailor integrated circuits to their needs. Based on a set of Westinghouse standardized integrated circuit manufacturing processes, the program enables users to prepare designs compatible with the processes. The program is intended to enable avoidance of long development times and to offset lack

of experience and lack of proprietary knowledge. The program includes a continuously updated U-Design manual and training of customer engineers by Westinghouse experts.

A professional recorder/reproducer which is convertible to 1-in, 8-track or to 2-in, 16-track configurations has been announced by 3M Company, 3M Center, St. Paul, MN 55101. The Model 401 2-in, 16-track console can be provided with a 1-in, 8-track head stack assembly for converting it to a 1-in, 8-track recorder/reproducer. Model 401 1-in, 8-track recorder/reproducer can be converted to 2-in, 16-track. The new 2-in, 16-track recorder/reproducer is smaller than the average 4-track recorder/reproducer. It has adjustable azimuth heads and includes a remote overdub control.



The Automax 35mm Model G-2 cine/-pulse recording camera with auxiliary data box has been announced by Instrumentation Marketing Corp., 820 South Mariposa St., Burbank, CA 91506. The data box contains a panel which can accommodate a variety of clocks, counters, etc. An auxiliary optical system photographs the data panel instruments simultaneously with the primary image being transmitted with the camera objective lens. Pulse speeds up to 10 frames/s and cine speeds up to 16 frames/s are within the camera's capabilities.

The Adtrol Model BCD-9 Photocorder, an instrument used to record time on motion-picture film on each frame up to 2500 frames/s, has been announced by Instrumentation Marketing Corp., 820 South Mariposa St., Burbank, CA 91506. The instrument presents time in BCD format at the same instant the event is photographed. Information is presented in parallel form, allowing a complete word to be written at once. Consequently, by looking anywhere on the film, time can be read to that point with no reference to any other point on the film. The BCD-9 records nine digits of time to 23 h, 59 min, 59.999 s, translated from IRIG "B" format. The basic instrument is priced at $5,000.

A digital frequency meter designed to allow almost immediate on-site checking of transmitter frequency by means of a fast warm-up internal frequency has been

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OCLI's High Efficiency Antireflection (HEA®) coatings can greatly increase image brightness over MgF_2 coating, depending on the number of elements in the optical system.

But very often the most striking difference is the marked improvement in contrast.

These scenes of the Golden Gate Bridge were photographed under identical conditions with a Honeywell Pentax camera using a 15 element zoom lens. For the photograph on the left, the zoom lens was coated with a single layer MgF_2 antireflection coating. For the photograph on the right the zoom lens was HEA-coated. These photographs were taken at night, and all exposures were made at f/4.5 on Kodak Tri-X film. Car headlights produced the glare source near the bottom of the field of view, contributing to the intensity and number of stray images.

The reduction of stray light and improved contrast shown in the HEA photograph is obvious. Contrast can be improved even further than shown here depending on the lighting conditions and the particular type and number of elements coated.

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announced by Racal Instrument Ltd., Dukes Ride, Crowthorne, Berkshire, England. The temperature-controlled crystal oscillator has a warm-up time of about three minutes and an aging factor of two parts in 100 million in 24 h. The instrument can operate at temperatures between −10°C and +55°C. The instrument provides indication of signal level on an edge meter on the front panel and has an 8-digit latched display with fast store transfer. It has a sensitivity of 100 mV with 50-Ω input impedance. Gate times are 1 or 10 s. The instrument is priced at $2,595.

A 50-MHz universal counter-timer designed to give an accurate measurement of "period" by using a connected oscilloscope to indicate the exact points on the waveform between which measurement is being made is manufactured by Racal Instruments Ltd., Dukes Ride, Crowthorne, Bershire, England. It is available in the United States from Edwin Industries Corp., 11933 Tech Road, Silver Spring, Md. 20904. Designated Type 815, the instrument has three input channels and can measure frequency, frequency ratio, time interval (on one or two channels), period and period average, timing, and totaling and scaling. Frequency is measured on one of the three channels with a sensitivity of 10 mV and 1 MΩ/15-pf input impedance. The other two channels are provided with monitored level selection circuits with ranges of ±0.1 V to ±100 V. They represent impedances of 100 kΩ to signals from 10 MHz down to dc. The internal frequency standard is a fast warm-up unit which attains a stability of 1 part in 10 million within three minutes of switching on. The instrument is priced at $2,295.

A new mode of microwave power generation in avalanche diodes has been identified at Bell Telephone Laboratories; for the first time, continuous wave power has been obtained from avalanche diodes operating in the new high-efficiency mode. Germanium avalanche diodes have converted direct current to both pulsed and cw power at room temperature with an efficiency of 43%, more than triple the efficiency obtained with the Impatt (Impact Avalanche Transit-Time) reported by Bell Telephone in 1965. The new mode has been named the Trapatt (Trapped Plasma Avalanche Triggered Transit). When operating in the new mode, the germanium diodes produced 5.3 W of cw power at 450 MHz and 7.5 of pulsed power at 3 GHz. The new mode of operation resembles the Impatt mode during part of a cycle, but long delays due to "trapped" carriers occur during the rest of the cycle.

High efficiencies were observed at Bell Laboratories early in 1968 during studies of a wide variety of Impatt diodes. The formation of new modes of oscillation in these diodes depended critically on the external circuit conditions.

Several computer programs were developed to simulate the new modes of oscillation. Precise measurements of experimental circuit and diode parameters provided the input data for the simulations. Computer-generated motion pictures were made to show how certain interdependent physical and electrical parameters within the diode vary as a function of time. It was discovered that, essentially, the high efficiencies were the result of an alternate cycling of the diode between a zero-voltage, high-current state (the "trapped plasma") and an Impatt period, which is a high-voltage, low-current state.

Shown above are frames from a computer-generated movie showing what happens when an avalanche diode operates in the Trapatt mode. The electric field (solid line), hold concentration (+) and electron concentration (−) vs. position in the depletion region are shown for four points during a Trapatt cycle. The figure at the upper left of each frame is a phase plot of oscillation with a 3- and 6-GHz spectrum. The charge-carrier distribution in each frame corresponds to the marked point on the phase plot. The sequence shows: (1) a Trapatt cycle starting with an Impatt period; (2) beginning of another avalanche with a higher voltage across the diode; (3) an extended avalanche zone sweeping through the diode; and (4) a "trapped plasma" state, formed because the electric field rises in front of the avalanche zone as it drops behind it.

An infrared radiation detector with a useful range including the near to far infrared regions has been constructed at Bell Telephone Laboratories. The detector uses a recently developed material — a single crystal of strontium barium niobate (SBN) — which belongs to a class of crystals having pyroelectric properties. Such crystals develop currents through them when

heated by some means such as radiation, the currents being proportional to the rates of temperature change. Pyroelectric detectors, such as SBN, operate at room temperature and do not have to be cooled to the temperature of liquid helium. Because the electrical properties of SBN are unaffected by long exposure to changing atmospheric conditions, it does not require protective housing. SBN can respond to a laser beam modulated at over 100 MHz and can be useful for positioning laser beams or for image reproduction, for example, in the study of laser light scattered by crystals.

Development of a greatly improved photomultiplier using a new materials technology has been announced by RCA. The new technology involves replacement of the material presently used for the first photomultiplier dynode with a gallium phosphide layer deposited from hot vapors by a process known as vapor phase growth. The first dynode of the 10 to 12 dynodes used in a standard photomultiplier receives the weak electric signals generated by light coming into the device from the outside and amplifies them by means of the process of secondary emission. It was discovered at RCA that gallium phosphide is a better secondary emitter than any materials used previously. For example, for an applied field of 600 V, gallium phosphide will multiply one primary electron into an average of 30 secondary electrons while other materials produce only five or so secondary electrons. Also, increasing the voltage will raise the ratio still further in the case of gallium phosphide. It is believed that the new device may be of scientific importance in the study of nuclear, astronomical and biological events.

A new Rotex silver-recovery unit, Model 234, has been announced by W. B. Snook Mfg. Co., 751 Loma Verde Ave., Palo Alto, CA 94303. The improved model has been designed for use with the latest x-ray and photographic equipment. A molded glass fiber cabinet replaces the stainless-steel cabinet. The Rotex machines, including Model 234, utilize the firm's patented rotary cathode system for the electrolytic recovery of silver from spent hypo of film solutions. Model 234 can remove 1 troy oz of silver per hour. Prices begin at $1,130.

A new scanning spectroradiometer (Model 3000) which operates automatically has been announced by Gamma Scientific Inc., 2165 Kurtz St., San Diego, CA 92110. Spectral analysis of light sources from 380 to 700 nm can be conducted either automatically or manually. Scanning mode is selected by a panel control. The automatic scanning rate can be varied continuously over a 10 to 1 range, permitting selection of minimum scan time for any desired resolution. The instrument is direct reading and can be supplied calibrated in either absolute power or quantum units. Price for the basic system is under $4,500.

The FS High Efficiency Electrical Conductive Coating is a proprietary process performed at Fish-Schurman Corp.'s High Vacuum Coating Laboratory, 70 Portman Rd., New Rochelle, NY 10802. The coating has a light transmission of more than 85% in the visible and infrared regions. The cutoff depends on the substrate to which it is applied. The coating has a resistivity of about 5,000 to 20,000 Ω per square, but it can be supplied with 700 Ω per square with the same high light transmissions. The coating is used to protect optical systems and sensors from EMI interference and can also be used to heat an optical surface to prevent condensation without interfering with the optical resolution of the system. The coating is applied on substrates supplied to the laboratory, such as fiber optic faceplates, quartz, vycor or glass, including infrared transmitting filters.