over the pertinent parameters. As a result, the influence of critical factors could be specifically ascertained.

The influence of obstacle shape (crest and profile) and the effect of the orientation of the radiated electromagnetic fields (angles of incidence and polarization) on the received power, as well as various cross-polarization phenomena have been experimentally determined. Comparisons of diffraction by knife edge, wedge, cylindrical and conical obstacles have been made. For obstacles with sharp crests (e.g., knife edges) there is little distinction between vertically and horizontally polarized fields measured at some distance from the obstacle. Profound polarization effects occur for obstacles with large smooth crests, with vertically polarized fields producing more power at the receiver in all cases. The effect of oblique incidence of electromagnetic energy on an obstacle is equivalent to changing its radius of curvature. Some measurements on the effects of ground reflections, rough diffracting surfaces and surface conductivity have also been made.

Finally, a considerable bibliography on theories of diffraction of electromagnetic waves by various obstacles and on field measurements of "obstacle gain" is included.

Comparative Study of Low-VHF, High-VHF, and UHF Television Broadcasting in The New York City Area, Donald W. Peterson, *RCA Review*, 57–93, March 1963.

In 1961, the Federal Communications Commission placed a UHF system in operation in New York City for an extensive study aimed at providing a quantitative measure of the comparative merit of VHF and UHF television transmission in large cities. A comparison between the FCC UHF (Channel 31) transmission from the Empire State Building and existing VHF transmissions has also been made by RCA. A comparative evaluation of picture degradation from multipath propagation and of the availability of useful levels of signal strength in highly built-up parts of Manhattan were the principal objects of study. This was supplemented with similar comparisons in other areas where there was less variability. Surveys of comparative field strength were performed along the smoothest and the roughest available radial profiles.

TESTING AND CONTROL

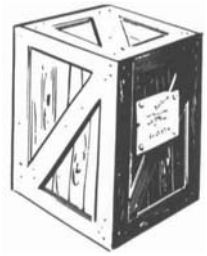
Technical Control in Motion-Picture Establishments (in Russian), *Kinomekhanik*, 22–24, Aug. 1962.

Technical problems requiring control in cinemas are discussed. The main topics are the testing of apparatus to avoid damage to the film, the control of the quality of the image on the screen, and the quality of the sound reproduction.—S.C.G.

THEATERS

Public Safety in the Cinema, H. E. Sully, *Brit. Kinemat., 42:* 4–15, January 1963.

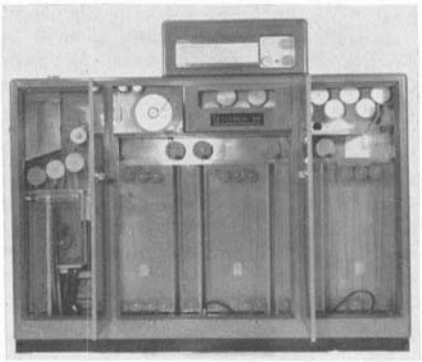
A review is given of the safety precautions required by law in British cinemas, with special reference to the Cinematograph Acts, the Home Office Regulations, and local provisions, such as those of the Middlesex County Council.—S.C.G.



new products

(and developments)

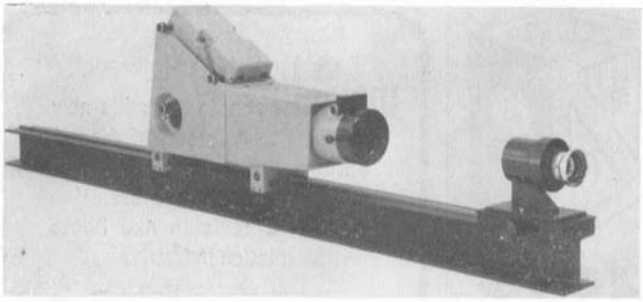
Further information about these items can be obtained direct from the addresses given. As in the case of technical papers, the Society is not responsible for manufacturers' statements, and publication of these items does not constitute endorsement of the products or services.

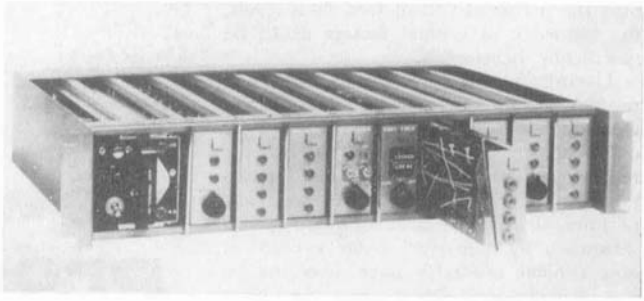


The Houston Fearless Levitron is a 35/70mm black-and-white film processor which uses air and liquid bearings instead of rollers. Announced by Houston Fearless Corp., Westwood Division, 11801 W. Olympic Blvd., Los Angeles 64, Calif., the Levitron was developed by the company's Canadian affiliate, Houston-Schmidt, Ltd. Operating without rollers, clutches, chain drives or elevators, the bearings are stationary cylinders through the sides of which water, air or chemical solutions are ejected at controlled velocities. The film is lifted away from the bearing, and at no time makes physical contact with the machine, thus preventing film scratch. Air bearings guide the film from one tank to the next, eliminating chance of scratches while minimizing liquid carry-over and solution contamination.

Liquid bearings in the chemical and wash tanks eject liquids at controlled velocities to provide a liquid cushion on which the film floats as it is guided through the tanks. This design produces constant agitation, recirculation, and high impingement, A single motor provides constant film speed and a sensing roller makes minor adjustments in speed to ensure that film tension does not exceed 3 oz.

Film speed is 2 to 30 ft/min. The machine is 83 in. long, 19 in. wide and 63 in. high. It weighs 800 lb. The Levitron is designed to process black-and-white, negative, perforated or unperforated, and thin- or thick-base films, including microfilm. The basic machine is priced at $7,500. The Levitron system was displayed and demonstrated at the Equipment Exhibit that was part of the 93rd SMPTE Convention at Atlantic City in April.





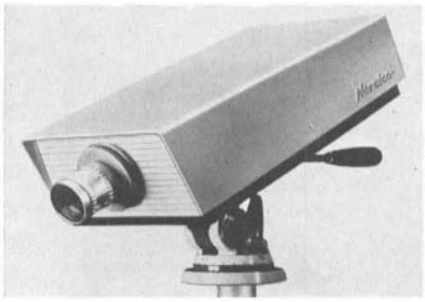
The Nanosecond Streak Camera, Model 770, a new synchronized streak camera that provides up to 3 nanosecond time resolution, has been announced by Beckman & Whitley Inc., San Carlos, Calif. The unit records 2 by 8-in. records on 70mm film at 10mm/μsec maximum and has an effective aperture at the film plane of //7.7. The Model 770 is a synchronized, rotating-mirror camera designed for the study of ultrafast events, which may be reliably initiated on the time scale. The control system includes Model 100 Camera Control which contains a switching unit, air control, power supply, and plug-in accommodation for either Type 10 Automatic Synchronization Unit or Type 11 Lissajous Synchronization unit. The unit employs a standard 3,000 rps turbine operating on compressed air. For maximum resolution at high rotational speeds, the precision turbine mirror is made of optically polished beryllium. Price of the camera, including the beryllium mirror turbine and 12-in. objective lens, is $21,200.

A six-speed transmission has been announced by D. B. Milliken Co., 131 N. Fifth Ave., Arcadia, Calif., as an optional feature of the DBM-5 16mm high-speed data camera to provide frame rates of 24, 48, 64, 128, 250 and 500 frames/sec without requiring gear sets or motor changes. A speed selection of 24, 40, 64, 128, 250 and 500 frames/sec is also available. A turn of a knob permits immediate switching from high-speed to documentary photography, and vice versa. A G-proof lock is used to keep the transmission from slipping out of gear, and a neutral gear position simplifies loading.

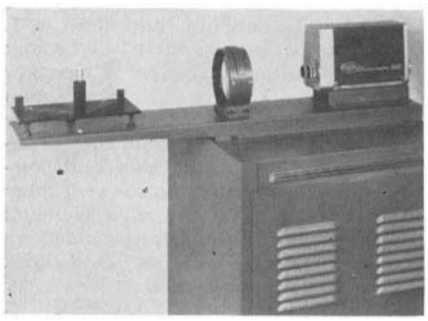
An all-transistor special effects generator designed to meet requirements of all video facilities — from the smallest to the most elaborate — has been announced by Riker Industries, Inc., 875 E. Jericho Turnpike, Huntington Station, N.Y. The special effects generator is comprised of modules which may be selected to provide the exact functions required by each video center; and the basic equipment may be expanded to include additional effects and facilities. For example, to a basic wipe generator with nine effects, by merely plugging in additional modules many more waveforms may be added, along with an insert keyer for montages, a "joy stick" positioner for moving or positioning effects, and a color keyer. Possible effects include wipes in such patterns as circles, squares, diamonds, diagonals, and others; montage; fades; and simultaneous wipes and inserts. The system mounts in a standard equipment rack. It is only 3½ in. high and requires 20 w of power. Specifications include: video insert key delay, 50 nanoseconds (delay line built-in); switching amplifier delay, 10 nanoseconds; gain, unity, adjustable ±3db; frequency response, 0.1 db to 9 mc, 0.5 db to 12 mc; 60-cycle/sec tilt, less than 0.5%; differential gain, less than 0.5%; differential phase, less than 0.3°; switching transition, less than 40 nanoseconds; switching transient, less than 3 units; gain stability, better than 1%. Price range is from $1,610 to $4,660.

A transistorized video tape recorder which weighs only 125 lb has been announced by the Victor Company of Japan, Ltd., 1-1, 4-Chome, Nihonbashi-Honcho, Chuo-Ku, Tokyo, Japan. Called the KV-2, the new recorder was designed especially for use in education, industry, sports events, etc. The KV-2 is a smaller version of the firm's previously announced KV-1 Two-Head Professional Video Tape Recorder. The KV-2 has pushbutton operation with remote control available. Video signal is the standard TV system (NTSC);

scanning line, 525 lines; field frequency, 60 cycles/sec; interlace scanning 2 : 1. Tape width is 1 in.; tape speed is 5.6 in./sec. Maximum running time is 1 hr with the tape wound on 7-in. reels. The picture signal-to-noise ratio is not less than 42 db, and the audio signal-to-noise ratio is not less than 40 db. The power source is 100 v, 50/60 cycles/sec. Dimensions are about 25 in. long, 15 in. wide and 12 in. high.



A self-contained, completely transistorized closed-circuit TV camera designated the EL8000/11, which is intended especially for surveillance of inaccessible or remote areas, has been announced by North American Philips Co., Commercial Sound Dept., 230 Duffy Ave., Hicksville, N.Y. Once the lens of the camera is focused, either manually or remotely, the camera adjusts itself to changing light intensities in the order of 1 : 15 and is said to produce a bright clear picture with light levels as low as 1 ft-c. The camera, which weighs only 11 lb and measures 13 by 7 by 4 in., generates virtually no heat (9.5-w power consumption). Since ventilation is not a factor, there is a wide range of choice as to where and how to mount the camera. The camera uses a vidicon tube, has a scanning system of 525 lines and a resolution of 5.5 mc (450 lines). The camera can operate with either a standard 16mm C mount or TV lens. An on-off indicator light shows when the camera is in use.



An educational TV film system said to eliminate need for darkened classrooms and special audio-visual viewing areas has been introduced by the Aerospace Group, General Precision, Inc., Pleasantville, N.Y. Called the GPL Precision 800 Film Chain, the small, compact system scans 16mm and 35mm films or slides and transmits the resultant pictures to remotely located TV receivers in any number of classrooms. By centrally locating the film chain, a particular presentation can be piped directly into the classroom, or classrooms, requesting the film. One advantage of the system is that it can be switched from motion pictures to slide presentation to film strips without changing equipment and with no time lost for adjustment of screens, focus or volume controls. Different audio-visual presentations can be shown simultaneously in different classrooms by adding the required number of film chains to the basic installation. The film chain is priced at $4,295. If required, a signal generator is available at a price of $1,875.

Installation of the Eidophor large-screen simultaneous color TV at Rome Air Development Center, Air Force Systems Command, Rome, N.Y., has been announced by Theatre Network Television Inc., 575 Madison Ave., New York 22. Operating on high-resolution standards for critical presentation of military visual displays in full color, the Eidophor is being used as part of a larger visual system under evaluation at RADC for Air Force application.

The Lasecon, announced by the Radio Corp. of America, is a phototube designed for use as a laser signal detector and converter. It is reported to combine high sensitivity and the extreme wide bandwidth qualities of a traveling-wave tube. Frequency bandwidth of the Lasecon exceeds 1,000 mc. The device is 18 in. in length and weighs 5 lb. In operation, the light to be demodulated passes through an optical window onto a semitransparent photocathode, The photoelectrons emitted by the cathode are bunched at the modulation frequency of the light. These electrons then pass through a helix, inducing an electrical wave in it that is taken out at an output coupler. The tube employs periodic permanent magnet focusing. The semitransparent photocathode can be made to provide either S-1 or S-20 spectral response. The nominal frequency range of the Lasecon with an L-band helix is from 1 to 2 gigacycles (Gc), but by using r-f mixing the tube can detect modulation from 0 to 4 Gc. Tubes can also be built with S-, C-, or X-band helices.

The Electrostore Recording Storage Tube System, Model 212, has been announced by Image Instruments Co., 2300 Washington St., Newton 62, Mass. The system consists of a transistorized scan converter which has a single-gun recording storage tube for performing instantaneous recording and readout of video signals for application in time, frequency, and scan conversion, integration and change detection. The wideband deflection system of Model 212 makes it suitable for high-speed deflection patterns such as 1000-line rasters, as well as aperiodic and the very slow-scan patterns required in computer output display. The 30-mc bandwidths of the input and output video circuitry permits wide range, high resolution storage and retrieval. Resolution of 1200 TV lines across the diameter and a gray-scale fidelity of six shades or better are achieved by the Raytheon single-gun Recording Storage Tube in the Model 212. Nondestructive readout permits storage for several

minutes, or complete erasure of stored information can be obtained in less than 150 msec. Dimensions are 19 in. wide, 19 in. deep, and 8¾ in. high, exclusive of power supplies. Weight is 75 lb. Power requirements are 600 w, 24 v regulated. It is priced at $19,000.

A TV camera tube, type WL-7293 field mesh image orthicon, has been announced Westinghouse Electronic Tube Division, Elmira, N.Y. Features include flat shading, good corner focus and uniform background. It is said to be especially suited for video-tape recording. Spectral response is between 4500 and 7500A. Minimum illumination for 500 television lines is 3 by 10^{-2} ft-c on the photocathode at 1/30 sec frame time.

The Division has also announced a new type 8417 beam power pentode tube capable of power outputs up to 100 w in push-pull circuits. The tube is a glass octal tube in a T-12 bulb with maximum seated height of 3⅞ in. It uses a special low-loss, high-voltage, high-temperature base. Tests reports are that when the 8417 is used in a push-pull class AB output circuit with 560-v d-c plate voltage, 300-v d-c screen voltage, −15-v bias and 4200 ohms plate-to-plate load, two 8417 tubes will give 100 w of audio power output at 2.5% total harmonic distortion with peak-to-peak drive of only 29 v.

The B&K Model 1612 1/3 and 1/1 Octave Band Filter Set and the B&K Model 2203/1613 Portable Sound Analyzer are among new products recently announced by B & K Instruments, Inc., 3044 West 106 St., Cleveland 11, Ohio. The Model 1612 Octave Band Filter provides contiguous filtering as an advantage over continuously turnable filters since it provides all data in terms of 33 standardized frequency bands. The Portable Noise Analyzer consists of the Model 2203 Sound Level Meter. Designed for stability and ±1 db accuracy, it is expected to be used for general industrial use in cities and states having rigid noise-control laws. The instrument is insensitive of magnetic fields and is said to be usable around any kind of electrical machinery or apparatus. It is priced at $1,070.

The firm has also announced the Model 2112 1/3 and 1/1 Octave Band Analyzer designed for analysis and linear measurements. It gives 1/3-octave band (1/10) decade analysis and also provides full-octave band analysis. It provides measurements of the root-mean-square, absolute average, or the instantaneous peak (half peak-to-peak) value of the input signal. Also announced is the Model 3930 Complex Modulus Apparatus and associated instrumentation for measurement of internal damping and dynamic elasticity of solid materials.

An instrumentation tape specifically designed for analog and telemetry recording has been announced by Audio Devices, Inc., 444 Madison Ave., New York. The tape has been designed to meet, and in some instances to exceed, government specifications MIL-T-21029A and MIL-T-22756A for B oxide instrumentation tape. Features include high-energy formula to permit thin-coat construction without loss of output or signal-to-noise ratio; special oxides with properties which allow a decrease of bias with resulting gain in short wavelength output while maintaining third harmonic distortion requirements; and new processing methods for reducing significantly the number of dropouts.

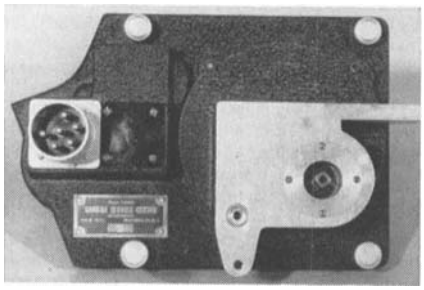
The Spectra Lighting Director, a device to enable precision control of lighting balances, is a product of Photo Research Corp., 837 N. Cahuenga Blvd., Hollywood 38. The Lighting Director is reported to measure a basic range of 0 to 300 ft-c, which is extended to 3,000 ft-c with an ×10 multiplier slide and on to 30,000 ft-c with an ×100 multiplier slide. The device has a large selenium cell micro-ammetered to a logarithmic response scale which is individually calibrated on an NBS-approved photobench. It is priced at $74.50.

A new 120mm Angenieux zoom lens is available for the Bolex H-16 camera, according to an announcement from Paillard Inc., Box 564, Linden, N.J. The lens, which comes with or without a reflex viewfinder, has a zooming range from 12 to 120mm — a ratio of 10 to 1. For fast zooms there is a short 1-in. handle; a gear and crank mechanism makes slow zooms possible. The lens features maximum diaphragm opening of *f*/2.2 over the entire zoom range and focuses from 5 ft to infinity. It accepts Series IX filters and close-up lenses. The version with the viewfinder is mounted with the aid of a C-mount adapter, and for turret cameras includes a locking plug that fits into the lower turret position. The price including viewfinder is $725; with the viewfinder it is $850.

The Variogon *f*/2.0 has been specially developed by Jos. Schneider & Co., Optische Werke Kreuznach, of Bad Kreuznach, Germany, as a lens of variable focal length for use in 16mm motion-picture cameras. The focal-lenth ranges from 16mm to 80mm. Described as a mechanically compensated Vario, it is a 10-element, 15-lens system, with a basic design consisting of a 4-element, 5-lens modified Taylor-type base lens with

anterior stop and a 6-element 10-lens variable component possessing four action groups. The path of the light rays between the two components is parallel and the iris diaphragm is mounted in this air space. The two cumulatively refractive front elements of the variable component are used for short-range focusing of the lens system. There is no separate adjustment of these two elements when the focal length of the system is varied. Cams are used for individually moving the next-following two diverging elements. This movement ensures the required focal-length variation and the constancy of the set focus. The front element of the variable system is of a 2-element, 3-lens design, while the rear component is a single-element, 2-lens system. The final element of the variable section is a single cemented lens of positive refraction which is the only lens of the variable system that does not move during use.

The Magneraser Senior is a heavy-duty professional bulk tape eraser recently introduced by the Amplifier Corp. of America, 398 Broadway, New York 13, N.Y. Designed for use with audio-computer, telemeter and machine-control tapes; and with 8, 16, and 35mm sound tapes, it is said to erase tapes on the reel completely with a once-around revolution of the reel. It is announced as capable of erasing the most severely overloaded tapes, thus eliminating need for running tape through the machine in "record" mode for complete erasure. The machine features an On-Off Rocker Switch which cannot be left on accidentally. It is $3\frac{3}{4}$ in. high, 7 in. in diameter, and weighs 10 lb.



A motor adapter door for the Mitchell Mark II 35mm Reflex Camera has been announced by Camera Service Center, Inc., 333 West 52 St., New York 19. The adapter door is designed to permit use of all Mitchell and Mitchell-type variable-speed a-c and d-c motors. The door is said to be easily installed without tools. Weighing less than 2 lb, its dimensions are $7\frac{3}{4}$ by $5\frac{1}{2}$ in. Maximum depth is $2\frac{1}{4}$ in. The door is priced at $149.

The new Polacolor Film for Polaroid Land photography is described in an illustrated boooklet on *Polacolor Film*, by Ansel Adams, reprinted from the Polaroid Land Photography Manual published by Morgan & Morgan, Inc., Publishers, 101 Park Ave., New York 17. The structure, limitations and capabilities of the film are described in detail. Developmental work on the film was based on two key concepts, one for the negative and one for the positive.

The first concept is the use of a preformed complete dye linked to a developer in a single molecule so the molecule can control its own transfer from the negative to the positive. This is, in effect, the heart of the negative in the new Polacolor Film. The second major concept is a new kind of positive structure which produces an unusually luminous color image and a picture which is stable when it comes out of the camera. The print is then finished and does not require coating or washing. The aim was to permit the developer reagent to remain alkaline long enough to develop the negative and form the positive image. Then, in a matter of seconds, it reduces the positive's surface toward a neutral or acid state so that oxidation will not muddy the image when the picture is lifted from the camera.

Three principal layers are used in the positive structure to create an ionic "hold-and-release" mechanism that holds an acid layer virtually inactive unitl the negative has been developed and the positive formed. Then toward the end of the 50-sec processing time, the acid layer captures sodium ions (alkali) which migrate to it, and generates water and circulates it through the image layer to wash out the remaining ions.

8mm movie cameras recently announced by Bell & Howell Co., 7100 McCormick Rd., Chicago 45, include the 418 Autoload, a cartridge camera which can be preloaded with standard 8 mm roll film; and the Canon Cine Canonet 8, which has a 10mm-25mm zoom lens, battery-driven film speeds of 12, 16 and 24 frames/sec, and a cadmium sulfide electric eye. The camera has an 11-element lens, with apertures from $f/1.8$ to $f/22$, color balanced for compatibility with all other Canon lenses. The Autoload is priced at less than $250 and the Cine Canonet is priced at less than $150. The firm has also announced availability of a 55mm–135mm Canonmatic zoom lens. The $f/3.5$ lens, which stops down to $f/22$, weighs 27 oz and is $5\frac{5}{8}$ in. long (measured from the camera seat) and $3\frac{3}{8}$ in. in diameter.

The Astrovision is a modified helicopter designed to permit vibration-free motion-picture photography from the air. A product of Photo Instrumentation Corp., 630 Ninth Ave., New York 36, the helicopter is a Bell-type whose rotors are maintained in dynamic balance to minimize vibration. The antivibratory camera mount is a two-piece unit consisting of a supporting base and an antivibratory platform. Inside the platform's aluminum housing is a network of resilient steel which can be dampened for antivibration according to the weight of the camera to be supported and the speed of the helicopter. Mounting the camera to the antivibratory mount is achieved with a fluid-type pan-and-tilt head which enables the cameraman to pan in a 125° arc from a point parallel with the line of flight to the rear and to tilt downward in a 75° arc.