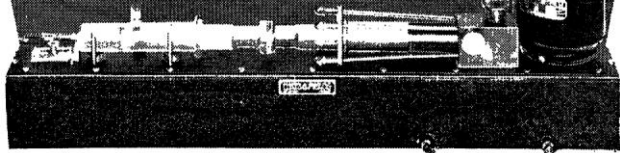


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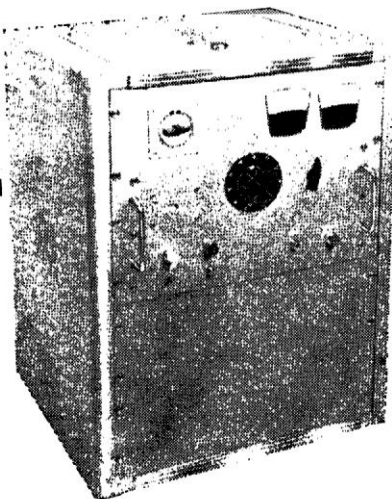


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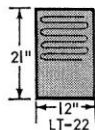
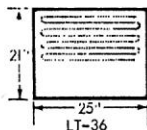
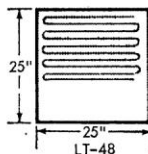
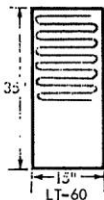
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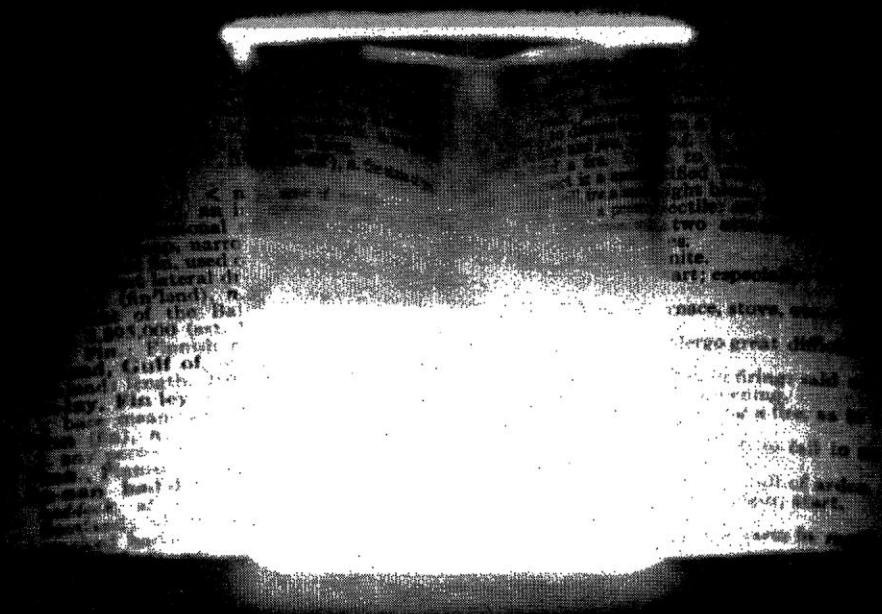
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Low temperature ashing is accomplished by a device (model LTA 500) in which organic samples are exposed to oxygen that is dissociated and ionized by an intense radio-frequency field. A wide variety of organic materials can be ashed at temperatures below 100°C at rates up to 1 g/hr. The ionized oxygen at low pressure is characterized by an intense light-blue glow. It flows through a 12-port manifold, containing the individual samples in their holders, and attacks hydrocarbons in them. The resultant gases are carried away in the exhaust manifold and may be trapped downstream. The low-temperature ashing procedure prevents the loss of relatively volatile elements and permits the handling of larger samples for trace elements without introducing traces from the apparatus. The instrument includes an FCC-approved 150-watt, 27-Mcy/sec oscillator.—R.L.B. (Tracerlab, Inc., 601 Trapelo Rd., Waltham 54, Mass.)

Circle 1 on Readers' Service card

Electro-optical scanning system is capable of scanning images at rates well above the human flicker threshold. The system consists of a lens that is focused on the subject, a fiber optic image converter, an analyzing aperture and a photocell. The image picked up by the lens is transmitted in segments through a large number of optical glass fibers. The remote ends of the fibers are spread in the desired order into a circular arrangement behind

The material in this section is prepared by the following contributing writers:

Robert L. Bowman (R.L.B.), Laboratory of Technical Development, National Heart Institute, Bethesda 14, Md. (medical electronics and biomedical laboratory equipment).

Joshua Stern (J.S.), Basic Instrumentation Section, National Bureau of Standards, Washington 25, D.C. (physics, computing, electronics, and nuclear equipment).

The information reported here is obtained from manufacturers and from other sources considered to be reliable. Neither *Science* nor the writers assume responsibility for the accuracy of the information. A Readers' Service card for use in mailing inquiries concerning the items listed is included on page 745. Circle the department number of the items in which you are interested on this card.

which a disk carrying one or more scanning apertures is revolved. As an aperture passes near the ends of the optical fibers, the light transmitted by each fiber falls in turn onto a stationary photocell. The elements of the image thus separated and scanned can be analyzed electronically and converted into signals that can be recorded, displayed, or used to control other equipment. Examples of application are measurements of length, position, area, or ratio of dark to light areas.—J.S. (Gulton Industries, Inc., 212 Durham Ave., Metuchen, N.J.)

Circle 2 on Readers' Service card

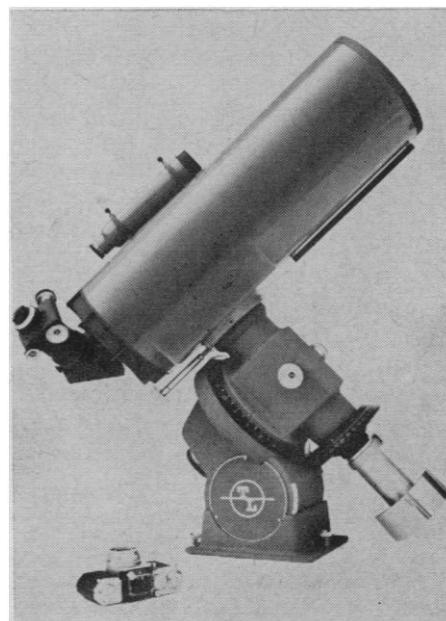
Liquid chromatography detector is a miniature detector for monitoring the effluent of liquid chromatography columns. Basically, the detector consists of a 2-inch glass tube mounted in a retaining block at the bottom of the column. A light beam from a standard light bulb mounted in the block is directed at the interface of the liquid stream in the tube and the glass wall of the tube. Light is reflected from this interface, and the intensity of the reflected light is a measure of the composition of the stream. Two miniature light-sensitive detectors are also mounted in the block. One detector measures the reflected light while the other is focused on the light source. These detectors form two arms of a Wheatstone bridge. The unbalance in the bridge is conducted to a remote-control unit containing a zero control and sensitivity switch. Output may be either 0 to 1 mamp or 0 to 100 mv. Inexpensive miniature recorders are sufficient with the milliamper output. Adjusting the zero controls facilitates the use of any liquid solvent from water to the aromatic hydrocarbons. Sensitivity is adjustable from fractions of a milligram to 1 to 2 mg for separation or purification studies. Price, \$525.—R.L.B. (Waters Associates, Inc., 45 Franklin St., Framingham, Mass.)

Circle 3 on Readers' Service card

Voltage-controlled crystal oscillator (model VB7500) is said to combine crystal-oscillator stability with the ability to deviate the oscillator frequency linearly and repeatably. The instrument generates 4 mw at 75 Mcy/sec with ± 50 kcy/sec deviation. Center deviation stability is better than ± 0.01 percent over the temperature range 0° to 85°C. Modulation harmonic distortion is not more than 2.5 percent with ± 45 kcy/sec deviation at modulation rates from d-c to 10 kcy/sec. Other models to become available will produce power outputs to 100 mw at 180 Mcy/sec and output frequencies down to 100 cy/sec through use of matching multiplier and mixer modules.—J.S. (Itek Corp., 75 Cambridge Parkway, Cambridge, Mass.)

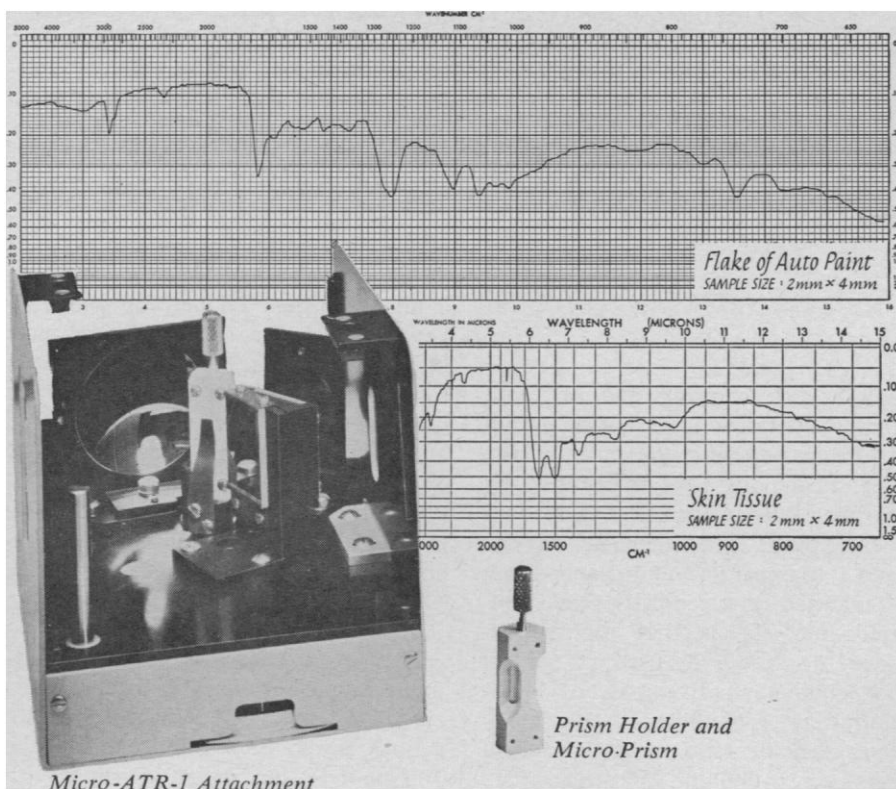
Circle 4 on Readers' Service card

Eight-inch telescope uses a Cassegrain optical system with primary mirror focal length of 32 inches. Magnifications up to 256 are provided. The 70.5-pound instrument includes a mount with base mounting plate, leveling screws, tube, tube aperture dust cover, zenith diagonal eyepiece, rack-and-pinion focusing, 10-power range finder, two observing eyepieces, electric siderial drive, and a 6-volt 12-amp battery power supply with charger. A



carrying case that doubles as a mounting pier has a shaped resilient-foam lining to cradle the instrument in transit. Optical surfaces are said to be tested within $\frac{1}{8}$ wavelength. Adapters will be available for all 35- and 16-mm cameras.—J.S. (Tinsley Laboratories, Inc., 2448 Sixth St., Berkeley, Calif.)

Circle 5 on Readers' Service card



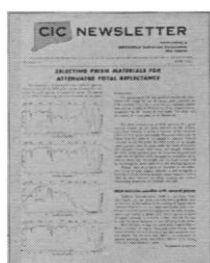
New Micro-ATR Attachment for Analysis of Small Samples

Attenuated Total Reflectance, a new infrared sampling technique, has been finding increased application in the infrared laboratory. The new technique permits the direct infrared analysis of such difficult samples as solids, coatings, dense liquids, plastics and the like, without special sample preparation. Now, the Micro-Attenuated Total Reflectance Attachment makes it possible to obtain spectra on minute samples — such as chemical residue, strands of fiber, and even tiny fragments of tissue as small as 1 mm wide by 4 mm long.

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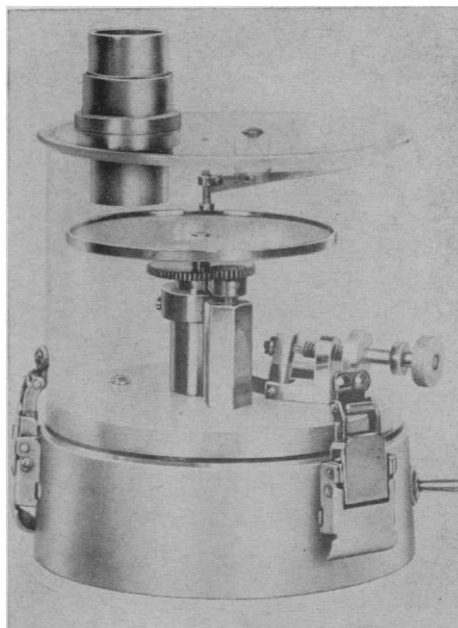
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Analytical balance (Model UM7) permits reading to 0.1 μg with $\pm 0.1\text{-}\mu\text{g}$ precision. Another model (UM6) is readable to 0.5 μg with $\pm 0.5\text{-}\mu\text{g}$ precision and offers direct digital readout through the last decimal place. Both types are read with the aid of a built-in microscope. Inaccuracies caused by temperature changes are eliminated by a triple-walled balance housing. Write for Bulletin No. 114A.—R.L.B. (Mettler Instrument Corp., 20 Nassau St., Princeton, N.J.)

Circle 6 on Readers' Service card

Particle slit sampler plots time-concentration relationship of airborne bacteria. The fixed slit is calibrated for air flow rate at 1 ft^3/min for a vacuum of 10 inches or more of mercury. A vacuum-operated sampler draws air



through a slit, and particles are impacted by rate of flow onto a rotating petri-dish surface. A clear plastic housing is removable for access to the turntable. A lever raises or lowers the petri dish to a guide line which indicates the distance from the culture medium surface to the slit. Rotating speed of dish platform is $\frac{1}{2}$ rev/min, and an extra set of gears is supplied for either $\frac{1}{3}$ or 3 times standard speed.—R.L.B. (Scientific Products, 1210 Leon Pl., Evanston, Ill.)

Circle 7 on Readers' Service card

The model 1001 automatic stabilizer for nuclear instrumentation systems is designed to correct automatically and continuously for spectrum shifting factors such as high-voltage instability, gain drift in amplifier and preamplifier, temperature characteristics

of scintillation materials, temperature characteristics of multiplier phototubes, and count-rate hysteresis effects in multiplier phototubes. The instrument includes a high-voltage supply that serves as the source to the radiation detector. Also contained in the instrument is a single-channel pulse-height analyzer, the window of which is adjusted to straddle a spectral peak upon which the system is then locked. A ratemeter section is included to tune the peak into the window. When the stabilizer is switched to automatic control operation, a combination of ratemeter, integration, wobbler, balancing, and control circuits senses the direction and magnitude of any shift of the locked peak on the energy axis. The high voltage to the detector is then automatically adjusted within the stabilizer to provide correction of the shift. The instrument can compensate for as much as a factor-of-2 drift in amplifier gain or up to approximately 150 v of high-voltage shift. In automatic-control mode, a front-panel meter indicates the magnitude and direction of correction that has been applied to the system. The stabilizer can accommodate either transistorized amplifiers with 0- to 10-v output or vacuum-tube amplifiers with 0- to 100-v output.—J.S. (Nuclear Industries, Inc., 99 W. Hawthorne Ave., Valley Stream, N.Y.)

Circle 8 on Readers' Service card

Electrode for $p\text{CO}_2$ incorporates the reference and glass electrode as one compact unit. This feature assures that the complete electrode is contained in the same environment. A 1-mil Teflon outer membrane and an 0.8-mil Cuprophane inner membrane permits 99 percent response in 1 minute. Stainless-steel cuvette with a volume of 0.05 cm^3 has a transparent window, which reduces the possibility of false readings caused by bubble trapping. The output of the electrode is a log function of pH. The relationship of pH to log $p\text{CO}_2$ is linear from 1 to 100 percent. The electrode can be used with conventional high input impedance (10^{11} ohms) pH meters. If a faster time response is required (15 seconds), the inner membrane can be powdered glass, glass wool, or #8 denier nylon. The $p\text{CO}_2$ electrode is supplied as a complete assembly consisting of the electrode, electrolyte chamber, and stainless-steel cuvette. Bulletin 128.—R.L.B. (Instrumentation Laboratory, Inc., 108 Cummington St., Boston, Mass.)

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9 NOVEMBER 1962



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High-capacity vacuum centrifuge (Vacu-Fuge model 25) provides speeds to 25,000 rev/min and forces up to 80,-000 grav. The unit has a temperature control range from -20° to $+20^{\circ}\text{C}$. It can accommodate seven different rotors with capacities from 112 to 3300 ml (16 by 7 ml to 6 by 550 ml). The solid-state electronic speed-control system is fully automatic; the rotor is automatically accelerated to a preset speed for the desired time period, then automatically decelerated to a smooth, fast stop. The belt-driven spindle is powered by a 1-hp. constant-speed, brushless motor. A refrigerated jacket encloses and cools the bearings to elim-

inate heat transfer to the rotor. The refrigeration system is powered by a $\frac{1}{2}$ -hp. hermetically sealed compressor with transistorized temperature control and uses a thermistor as the temperature sensor. By means of a large-capacity high-vacuum pump, the centrifuge chamber can be evacuated in 2 minutes or less. Other features include an automatic rotor imbalance switch, stainless-steel insulated cover 0- to 2-hour timer, circuit breakers, and a Formica cabinet with stainless-steel top. Unit sells for \$5600, less rotors.—R.L.B. (Lourdes Instrument Corp., 656-78 Montauk Ave., Brooklyn 8, N.Y.)

Circle 10 on Readers' Service card

Fibrometer coagulation timer is an electro-mechanical instrument that electronically senses the end-point for plasma coagulation determinations. The actual operation of the time is electro-mechanical duplication of the manual-loop technique used in many laboratories. This is accomplished by the use of two electrodes, one fixed electrode that remains constantly immersed in the plasma and thromboplastin reagent mixture, and a movable electrode that moves in a horizontal as well as a vertical plane. The horizontal movement of the probe in the mixture finds the first fibrin strand that appears. After the electrode lifts the strand out of the solution, an electrical system senses the presence of the fibrin strand when the conductivity exceeds a set minimum. The sensing device is actuated twice per second, and the determinations are run in a thermostatically controlled heart block.—R.L.B. (Baltimore Biological Laboratory, Division B-D Laboratories, Inc., 2201 Aisquith St., Baltimore, Md.)

Circle 11 on Readers' Service card

Spectrophotometer (model 350) covers the electro magnetic spectrum from 175 $\text{m}\mu$ in the far ultraviolet to 2.7 μ in the near infrared. This instrument is distinguished by a double monochromator for minimum stray light, integral ordinate scale expansion for the magnification of weak bands, and zero absorption line compensation for stability and photometric accuracy. Special coated optics, high-transparency prisms, and new end-on photomultiplier detectors contribute to the instrument's excellent optical characteristics. A brochure providing illustrative spectra and performance specifications and its wide assortment of accessories is available.—R.L.B. (Perkin-Elmer Corp., Norwalk, Conn.)

Circle 12 on Readers' Service card

Surface thermocouple assembly is said to be capable of detecting rapid surface-temperature changes of micro-second duration. The thermal junction of the thermocouple is at the exposed end of the plug and the end of an insulated wire that passes through it. The junction is formed by a metal plating that bridges the insulation on the wire to connect the end of the wire to the plug. The swaged assembly can be welded, silver brazed, or threaded into the wall of the test apparatus. It can be produced of common thermocouple materials such as chromel-

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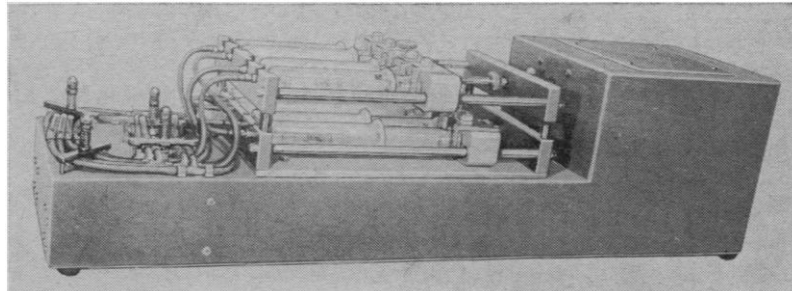
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Catalog No. 600-954

Model 600-954 is composed of the 600-000 Multispeed Transmission and two syringe holding mechanisms, each with a capacity of 4 syringes. The pump is designed to pump up to four separate channels of liquids with extreme accuracy. A channel consists of two syringes alternately filling and emptying. The valving mechanism consists of solenoid clamps acting on the outside of rubber or plastic tubing. Since the valves do not come in contact with the liquid, the entire system can be kept sterile. A microswitch activates the valves and reverses the direction of the motor.

When the pump is operating it is possible to continuously transfer four different liquids at accurate rates over extended periods of time, with a reproducibility of $\pm .5\%$. A total of 60 different rates are available by either shifting gears or using various size syringes.



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- All parts either stainless steel or nicked brass.
- Pump can also be used as four channel Infusion-Withdrawal pump.

\$875.00—f. o. b. Dover, Mass.

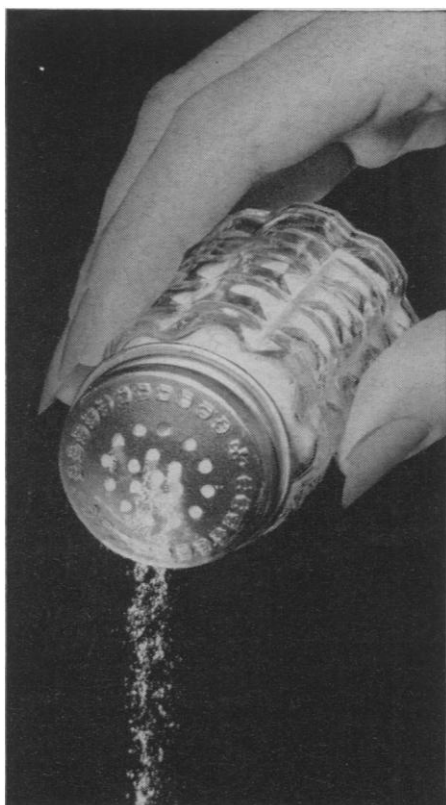
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alumel and platinum-platinum 10 percent rhodium or of more unusual materials. The thermocouple is said to make possible the measurement of transient surface temperatures during the condensation of liquid metal vapors.—J.S. (Mo-Re', Inc., P.O. Box 244, Bonner Springs, Kan.)

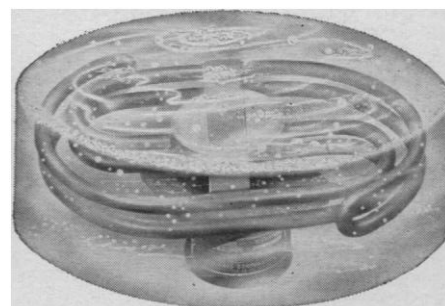
Circle 13 on Readers' Service card

Manometer is a combination of the positive closed end manometer and a micrometer having 20 turns to the inch, to give direct absolute and differential readings. Mercury may be used for both types of readings, and low-density manometric fluid may be used for higher-sensitivity differential readings. A stainless steel needle against a white background indicates the fluid level. For absolute readings, the system to be measured is attached to the high-pressure outlet while the low-pressure outlet is left unconnected. The micrometer is adjusted until the needle contacts the mercury surface. The reading on the micrometer is the absolute pressure in inches of mercury at ambient temperature. For differential readings the outlets are connected to the respective sources and the needle adjusted. The reading of the micrometer is the difference in inches of the manometric fluid at the ambient temperature. Each division of the sleeve corresponds to 0.002 inch, and one complete revolution corresponds to 0.1 inch with a total range of 2 inches in 20 turns.—R.L.B. (Roger Gilmont Instruments, Inc., 1 Great Neck Rd., Great Neck, N.Y.)

Circle 14 on Readers' Service card

Blood cell counter (Fisher Autocytometer) passes a specific volume of diluted blood through a microcounting chamber where the individual cells scatter light into a photomultiplier which converts the light flashes from each cell into pulses which are then counted electrically. In operation a 20- μ l whole blood sample is added to 5 ml of white cell diluent to give 1:250 dilution or is diluted twice with red cell diluent to give a dilution of 1:62,500. The prepared sample is then placed under the aspirator tube of the instrument, and 0.75 ml of the sample is automatically drawn through the instrument for counting. Scale selection provides 0 to 7.5 million red blood cells, 0 to 15,000 white blood cells, 0 to 30,000 white blood cells, and test cycle. The count is displayed on a conventional meter and is said to be accurate to 1.5 percent over its entire range.

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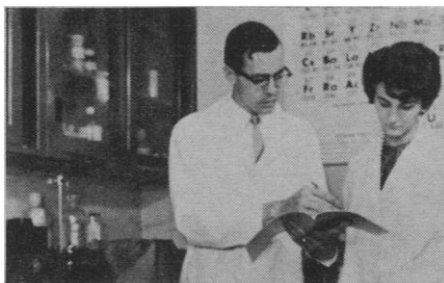
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SCIENCE, VOL. 138



Coincidence loss is compensated for on a statistical basis in the meter calibration. Other particles in the range of 1 to 50 μ can be counted, and a threshold control is provided to reject light flashes from smaller particles through those selected for counting. Total time per test is 35 seconds.—R.L.B. (Fisher Scientific Co., 415 Fisher Building, Pittsburgh 19, Pa.)

Circle 15 on Readers' Service card

Heartbeat totalizer provides a means of recording the total number of electrocardiographic impulses. A wrist watch whose balance wheel escape mechanism is replaced by a solenoid actuator records heartbeats as ticks, and the position of the hands can be converted to total number of events. The electrocardiograph impulses are picked up by lead foil electrodes strapped to the chest wall. The impulses are amplified and passed through a pulsing circuit which is a multivibrator with a period slightly shorter than the highest expected heart rate and will neglect any noise pulses prior to this period. It is claimed that this system will guard against false counts as a noise pulse falling slightly ahead of the true impulse will be counted and the true impulse rejected to preserve the count. It is presumed that the noise level will not be so high as to cause the system to count maximum rate without regard for the heart rate. Amplifier pack with batteries is 2½ by ¾ by ¾ inches and weighs ¾ ounce. Wrist watch indicator is ¾ by 1¼ inches in diameter. Total counts 108,000 (2½ ticks per indicated second).—R.L.B. (Waters Corp., P.O. Box 529, Rochester, Minn.)

Circle 16 on Readers' Service card

Dark-trace cathode-ray tube (type AS-17-21) retains an image for periods adjustable between a few seconds and several hours. Both high-speed nonrecurrent electrical transients and slow-speed recurrent phenomena can be displayed for examination and photography. The maximum writing rate is

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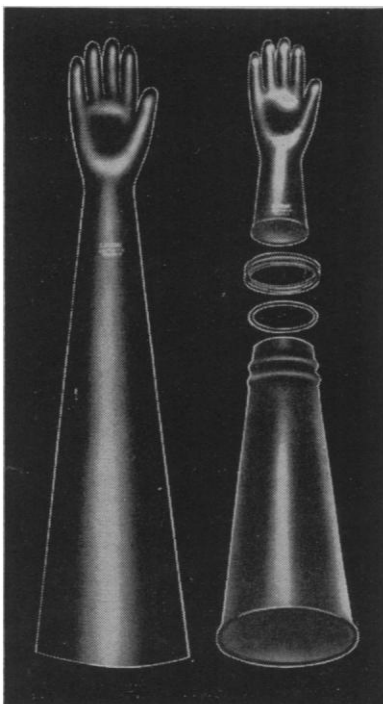
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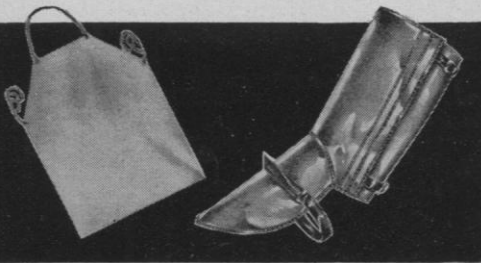
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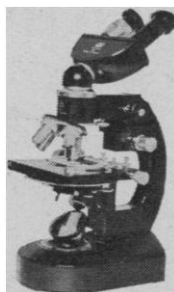
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Circle 17 on Readers' Service card

Stereostethoscope (model G/N) is a general-purpose, portable instrument intended for use in diagnosis as well as clinical studies and research. It is a fully transistorized, dual-channel, high-gain electronic stethoscope originally designed to listen to fetal heart-beat, but it is also useful in cardiology and other physiological studies. The stereo principle is said to give the user a feeling of depth and the ability to reinforce desired sounds and exclude unwanted noises. This is accomplished by proper tuning with the gain, tone, and sensitivity controls on each channel. Gains up to 120 db and good frequency response over the audible range are claimed. One output jack allows use with standard headsets while an auxiliary jack delivers a signal suitable for a high-impedance device such as an oscilloscope and tape recorder. The instrument is battery powered and small, measuring 3 by 6 by 9 inches. Price, \$450.—R.L.B. (Med Electronics, Inc., 1200 First St., Alexandria, Va.)

Circle 18 on Readers' Service card

Spectro-colorimeter (model 151) is designed for routine photometric work. As a spectrophotometer, the instrument uses a simplified monochromator which allows wavelength readings from 400 to 600 mμ. A narrow 15-mμ bandwidth is provided by a glass-wedge interference filter. Recalibration of the wavelength scale has been eliminated by constructing the interference filter and wavelength indicator as one unit. As a colorimeter, fixed wavelength colorimetry may be performed on samples from 0.1 to 3.5 ml. The flow-through microcuvette allows small samples to be measured in quick succession. After the measurement has been made, a built-in pump flushes the



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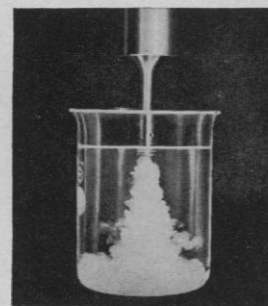
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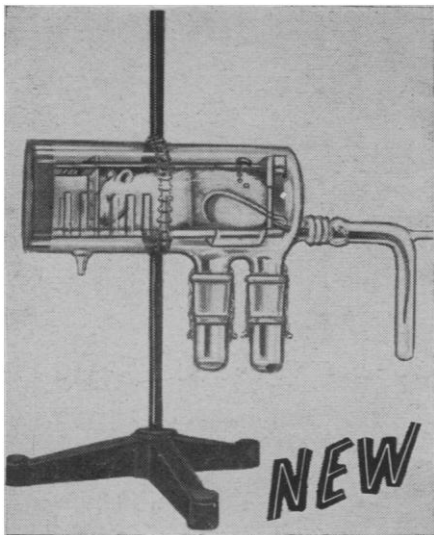


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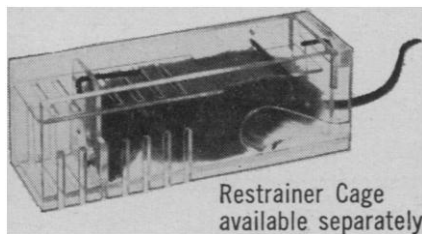


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Circle 19 on Readers' Service card

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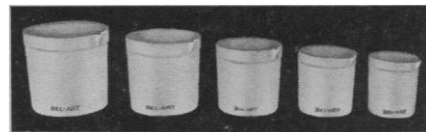
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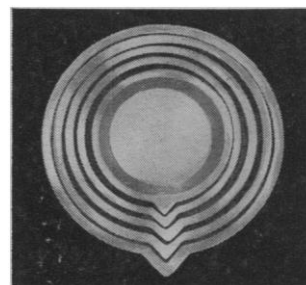
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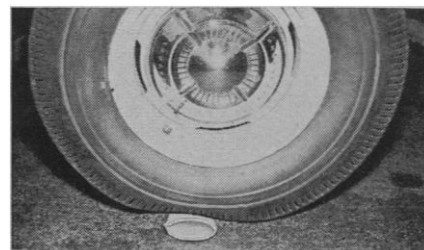
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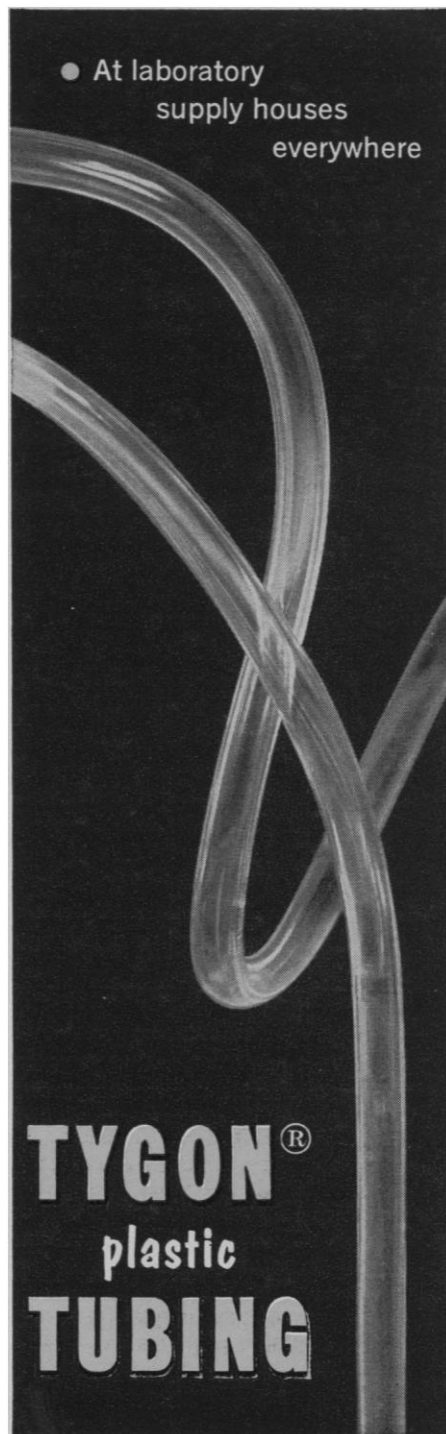
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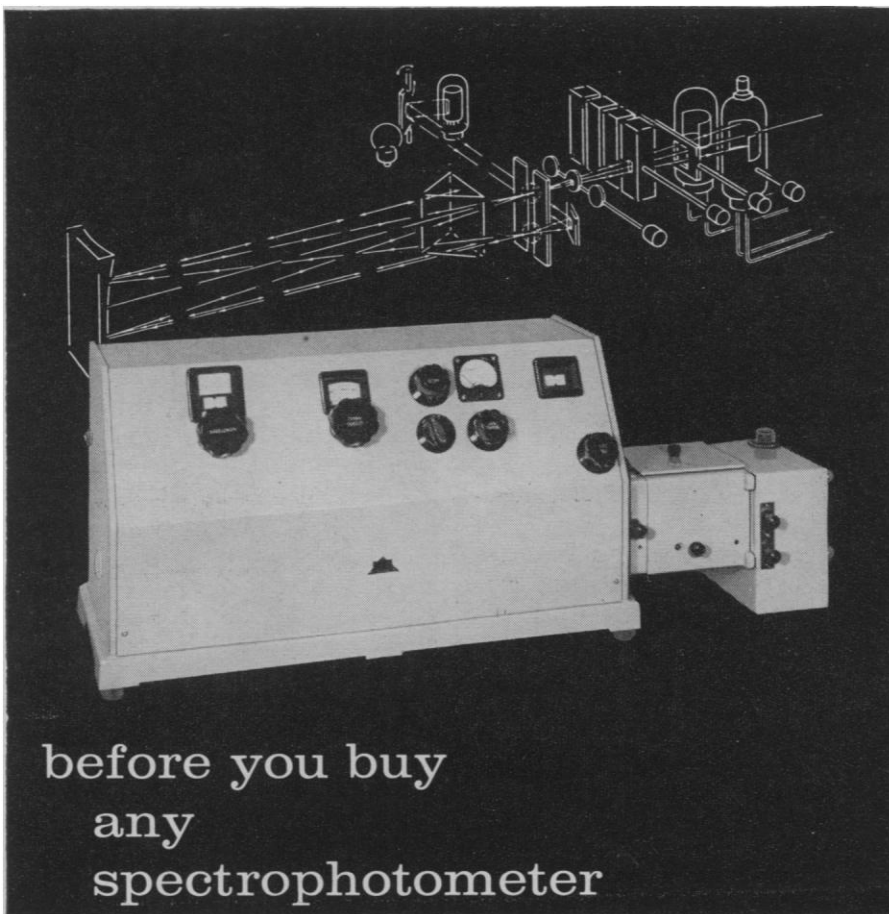
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Circle 24 on Readers' Service card

Stereomicroscope (model 500) gives the viewer a true three-dimensional image without the use of conventional dual eye pieces. Optically, the system places the viewer's eyes at the objective lens. The object being viewed is seen as a three-dimensional aerial image through a large 4-inch viewing port. The viewing port concept gives the viewer complete freedom from the critical head positioning normally associated with binocular microscopes. This microscope permits the viewer to move his head 12 inches or more from the viewing port and still see a stereo image. Thus, the user can work for hours with little or no eye strain. Fatigue from back bend and headaches due to constant change of eye accommodation are nonexistent since the viewer may



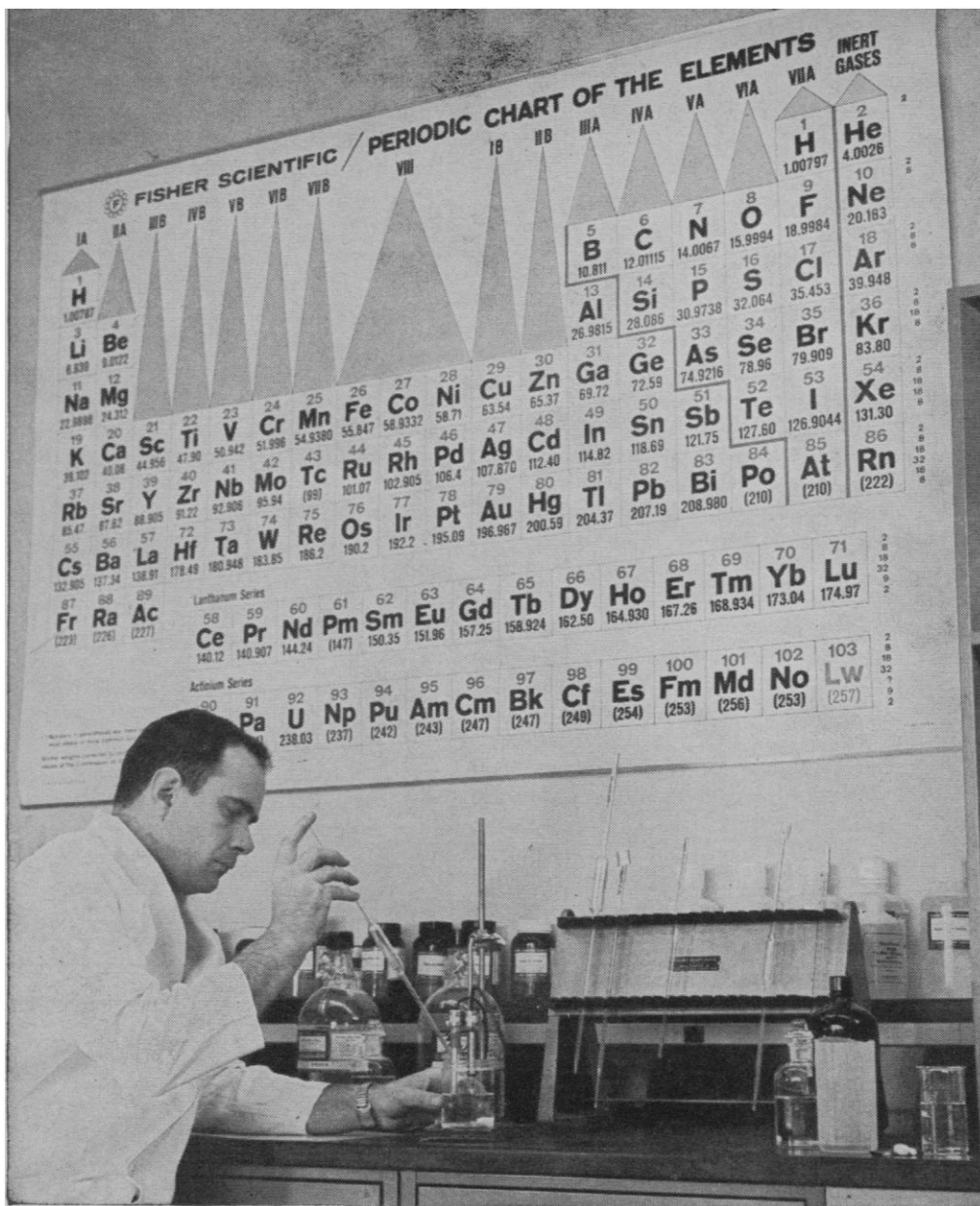
sit in a relaxed position and work in full daylight. The long eye relief (12 inches) permits the worker to wear eye glasses while using the instrument. A three-lens turret has 7 \times , 15 \times , and 30 \times objective lenses. The stereomicroscope is available either with a stand or in a bench-mount version.—R.L.B. (Technitron, Inc., 2444 Wilshire Blvd., Santa Monica, Calif.)

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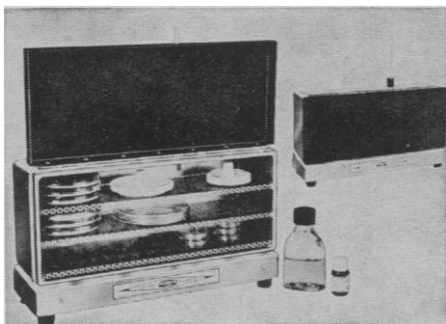
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Circle 27 on Readers' Service card

Five-channel laboratory programmer is actuated by an easily marked transparent 35-mm film loop. Up to five separate controls can be simultaneously programmed to function in synchronism up to 200 times per cycle of program tape. The programmer supplies up to 5 amp to each circuit. In addition, each channel has a pair of normally open and normally closed plug jacks for switching a-c or d-c circuits. The program is written by applying opaque tape to the transparent film. A dispenser allows the user to cut and apply accurate lengths of tape. Standard loop-cycle times from 1 minute to 6 days are available. Cycle time can be varied by plugging in interchangeable drive units—J.S. (Space Mechanisms, 639 Massachusetts Ave., Cambridge 39, Mass.)

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Variable frequency power converter operates from a 28-volt d-c source and produces 350-volt square half-wave output power. The converter frequency can be linearly adjusted by means of a low-level electrical signal over frequency ranges as great as 20 to 1.

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Circle 29 on Readers' Service card

Micromanipulator is designed for use in conjunction with microscopes where fine precise movement is required. It is used in the calibration of resistances and in the manufacture of transistors; it may be employed for the measurement of intercellular potentials. The instrument consists of a heavy base to which is attached a vertical pillar. A slide attached to this pillar provides the vertical adjustment, coarse movement being provided by a rack and pinion, fine movement by a vertical lever. Total range of vertical movement is 64 mm, with one revolution of the fine adjustment equalling 0.152 mm. Fixed to this vertical movement is the adjusting head which holds the probing accessory. This head uses rack and pinion to provide forward horizontal movement of 29 mm, and a worm gear to provide 64 mm of transverse movement. All three scales are fitted with verniers to allow readings of 0.1 mm. This Prior micromanipulator is available with either left- or right-hand controls.—R.L.B. (Eric Sobotka Co., Inc., 110 W. 40 St., New York 18, N.Y.)

Circle 30 on Readers' Service card

The model 1 **color tolerance computer** when used in conjunction with the manufacturer's differential colorimeter translates the readings of the latter into numerical visual judgment data in NBS units. Calculations are based on the modified Adams coordinate system. The computer indicates the difference between standard and batch in NBS units: $\Delta 1$, lightness-darkness; Δa , redness-greenness; and Δb , yellowishness-blueness.—J.S. (Manufacturers Engineering and Equipment Corp., 250 Titus Ave., Warrington, Pa.)

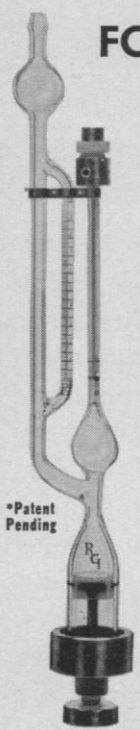
Circle 31 on Readers' Service card

The model MC-204A **admittance neutralizer** adapts instruments such as vacuum-tube voltmeters and oscilloscopes for very high input impedance. The device uses a selected field effect transistor in its impedance converting section. In addition, it has a low-gain post amplifier that supplies energy to

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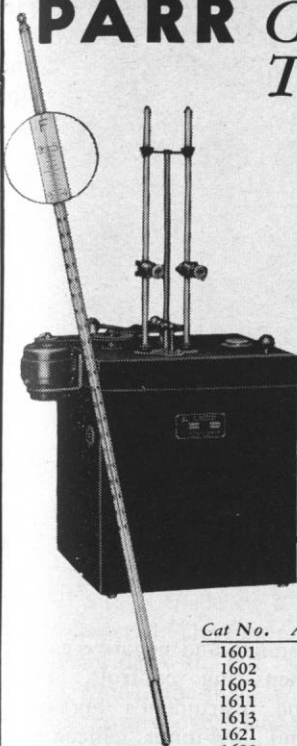
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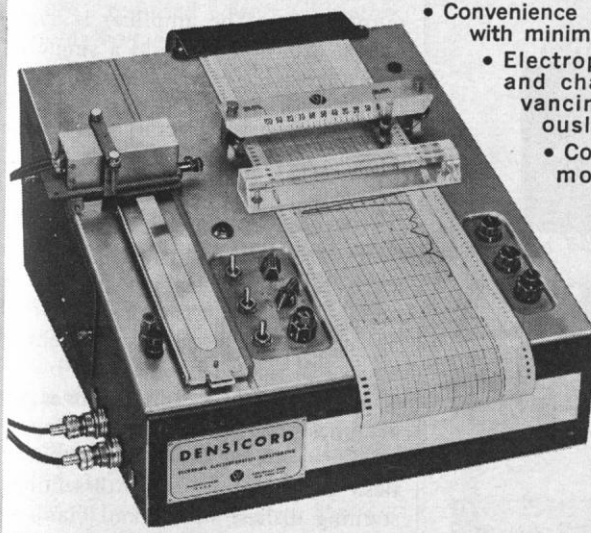
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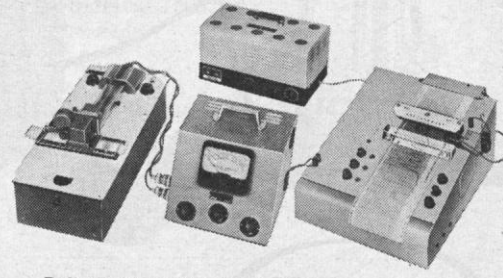
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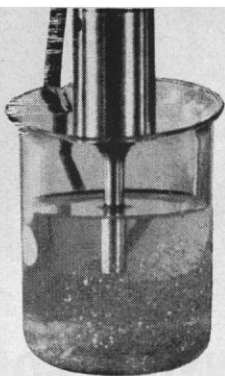
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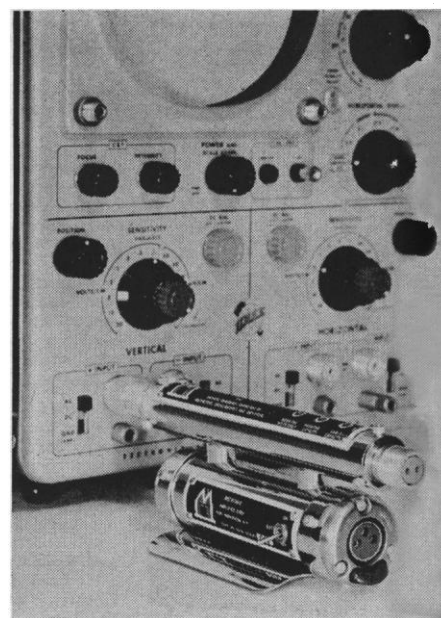
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negative resistance and negative capacitance compensating controls. These neutralize the instrument's high-input resistance and low-input capacitance. The post amplifier also supplies adjustable energy to a control that neutralizes the approximately 100-pf capacitance of the shielded input cable supplied with the instrument. Dynamic operating range is 1 volt r.m.s. and 10 cy/sec to 250 kcy/sec. Input impedance is adjustable from 100 megohm upwards and 4 pf downwards.—J.S. (Micronia Amplifier Corp., P.O. Box 269, Port Washington, N.Y.)

Circle 32 on Readers' Service card

The model 108 **high-gain amplifier** for nuclear counting applications has a gain of 70,000 with 0.1 percent linearity. It will accept 4000 times overload at its input without distortion of the output pulse. The amplifier is available with a discriminator and a single channel analyzer.—J.S. (General Nuclear Corp., 538 East Central Park Ave., Anaheim, Calif.)

Circle 33 on Readers' Service card

Microscope slide kit contains all the necessary instruments, reagents, chemicals, stains and dyes, and practice specimens to facilitate the making of slides by the science teacher or student. It is housed in a steel cabinet (20 by 14 by 5 inches) with a hinged cover which becomes the work area, holding a removable tray of labelled dropping bottles. The alcohol lamp, dissecting set, staining dishes, stains, and blank slides are organized into separate compartments. A number of completely and partially prepared plant and animal

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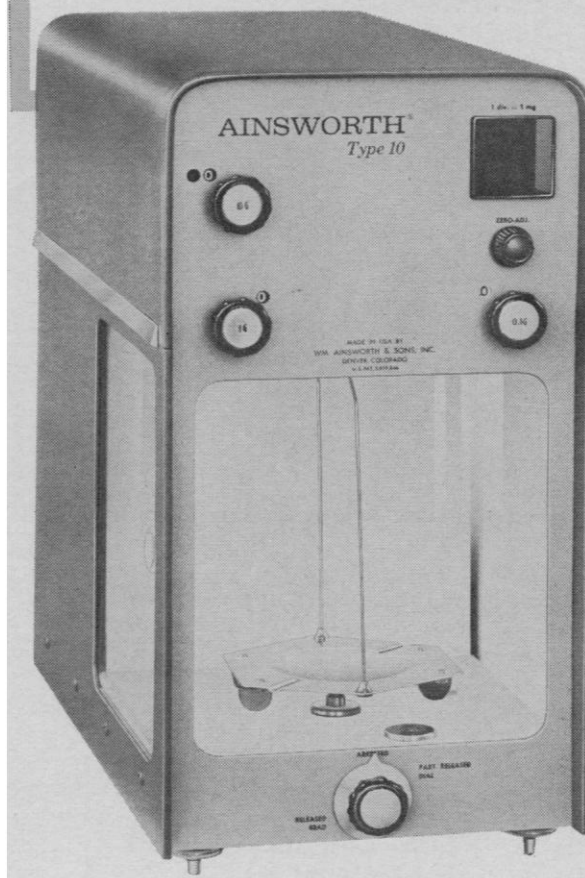
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The model EB-1 **transient voltage detector** senses, indicates, and records occurrence of transient voltages of short duration and of amplitudes above a preset level. Three voltage ranges are provided: 100 v, 1 kv, and 10 kv. The instrument is said to resolve transient voltages with a threshold accuracy of ± 1 percent for pulse rise times of 1 μsec or longer and ± 215 percent at 0.5 μsec . No external voltages are required for calibration. Threshold voltage is set directly on the instrument's dial. Input impedance is 10 megohm shunted by 1 pf on the 10-kv range and decreases proportionally with each decade step. Output is by actuation of a single pole, double throw relay. Automatic reset allows counting of random sequential transient events. Dead time in automatic reset operation is 10 msec.—J.S. (Halmar Electronics, Inc., 1550 West Mound St., Columbus 23, Ohio)

Circle 36 on Readers' Service card

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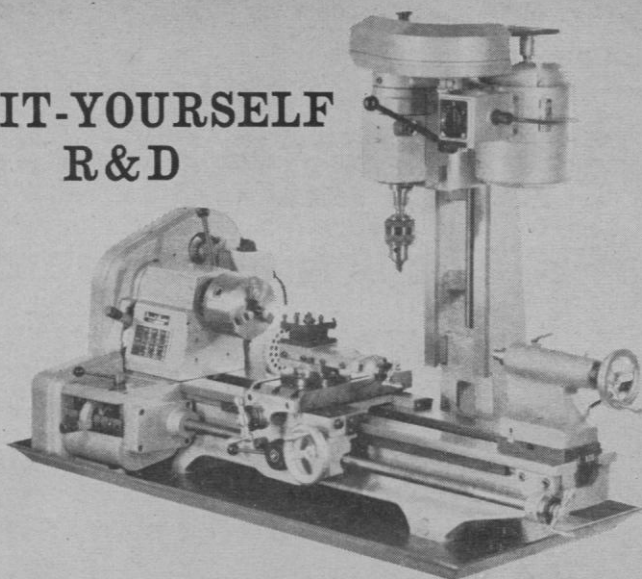
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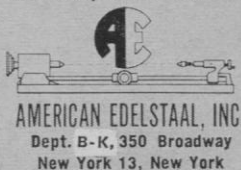
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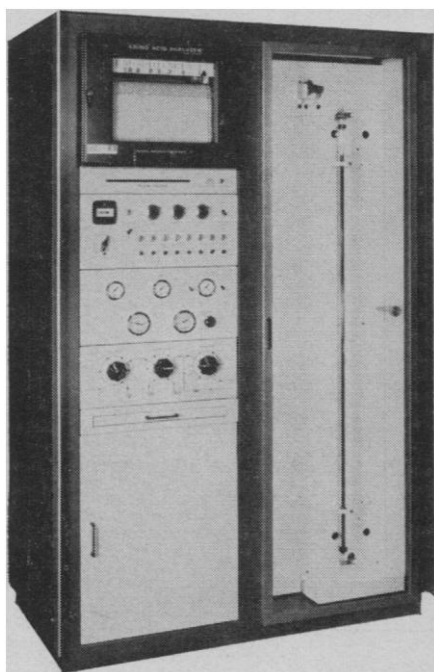


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The model 1131-A audio oscillator is a transistorized instrument said to be capable of supplying low-distortion signals stable in amplitude and frequency over a wide range of load impedance. The oscillator offers 11 switch-selected frequencies ranging from 50 to 10,000 cy/sec with frequency accuracy ± 1 percent. Other frequencies can be added by installation of two precise resistors. The oscillator is isolated from the load so that distortion is less than 0.5 percent under any load condition including short circuit. Open-circuit output voltage is continuously adjustable from 0 to 100 v. Power output to a matched load is 1 w and the output transformer is tapped to deliver over $\frac{1}{2}$ w into any resistive load between 80 mohm and 8000 ohms. Hum and noise are said to be less than 0.003 percent of maximum output.—J.S. (General Radio Co., West Concord, Mass.)

Circle 38 on Readers' Service card

The model JEM T-1 electron microscope, manufactured by Japan Electron Optics Laboratory Ltd., is designed for teaching and for research in which 50 Å resolution and 5000× magnification suffice. The microscope is a two-lens instrument with a self-biased electron gun operating under a 50-kv accelerating voltage, a specimen chamber, an objective lens, and a fluorescent viewing screen. The built-in camera takes a single cassette that holds two 65- by 90-mm plates. Reevacuation after the column vacuum is broken requires 3 minutes.—J.S. (Fisher Scientific Co., 405 Fisher Building, Pittsburgh 19, Pa.)

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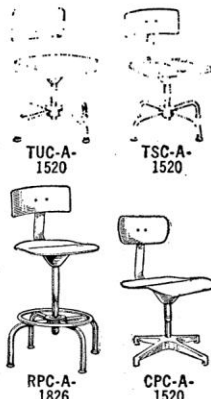
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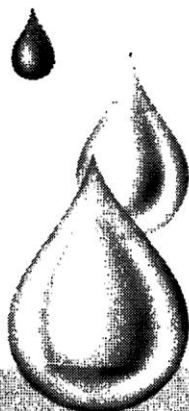
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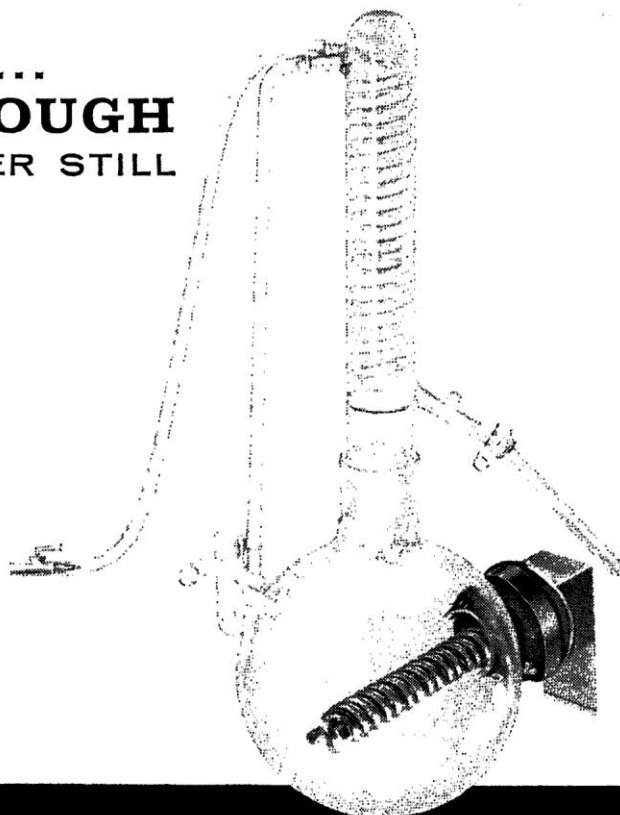


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BIOLOGIST

B.S. or M.S. to participate in program of chemotherapy of neoplastic and viral diseases. Strong background in either virology, tissue cell culture, or general microbiology desirable. Excellent benefits. Salary open. Equal opportunity employer. Send complete résumé to Personnel Director, **Bristol Laboratories, P.O. Box 657, Syracuse 1, New York.**

CHEMISTS

Challenging positions with large pharmaceutical firm located in suburban Philadelphia.

Ph.D. in BIOCHEMISTRY

Degree acquired while working in a medical school or medical research institute biochemistry department with courses in physiology and other biological sciences in addition to chemistry. Interest, and preferably post graduate experience, in the study of effects of drugs on intermediary metabolism and metabolic enzyme systems.

Ph.D. in ORGANIC CHEMISTRY

No experience or up to 2 years' experience post-doctoral to do research on steroids, natural products.

Write giving educational background and/or experience, indicating salary requirements, to Personnel Department.

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(a) **DVM/Pharmacologist**, background in research, marketing, administration, public contact; willing to travel; open. (b) **Ph.D./Histologist/Enzyme Chemist**, CNS research; East; to \$7500 start; (c) **Ph.D. Bacteriologist**, French speaking; faculty appointment; East. (d) **Pharmacologist/Toxicologist**; eastern pharmaceutical house. (e) **Clinical Bacteriologist**, experienced; central hospital; \$580 up. (f) **Ph.D. Biochemist**, protein, immunology experience; possible teaching appointment; Mideast medical research; to \$8000. (g) **Assistant Director of Research**, Ph.D. level, biological discipline, commercial drug experience; Mideast. (h) **Clinical Chemist**, B.S. degree; central health laboratory; \$6600. Please write Science Division, **The Medical Bureau, Inc., Burnice Larson, Chairman, 900 North Michigan Avenue, Chicago 11, Illinois.** X

Young Ph.D. with primary interest in C.N.S. wanted for section-head position in Pharmacology Department. Will initiate and implement unique research projects to discover new ethical drugs. Please submit résumé to

Donald G. Duncan, Personnel Mgr.
The Wm. S. Merrell Company
Division of Richardson-Merrell Inc.
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STATISTICIAN

Prominent East Coast pharmaceutical firm has opening for statistician to manage expanding bio-statistical group serving entire scientific staff. Pharmaceutical industry experience in drug evaluation or related fields preferred.

Write giving educational background and experience indicating salary requirements to:

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Personnel Department
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POSITIONS OPEN

CONSULTING MICROBIOLOGIST

The Communicable Disease Center, Public Health Service, has immediate openings in the career Civil Service for Consulting Microbiologists with Ph.D., Sc.D., or M.D. degrees, plus experience in a public health or medical laboratory. Incumbents will conduct consultation and maintain liaison with State and local public health agencies in implementing laboratory developmental programs. Positions located in Atlanta with travel in States and territories. Salaries \$11,150 to \$14,565, plus Civil Service benefits and opportunities for personal and professional growth. Please write or send application (SF-57) to:

Personnel Office
Communicable Disease Center
Atlanta 22, Georgia

MELPAR'S EXPANDING RESEARCH DIVISION

has created an immediate need for:

Biophysicist

To conduct research in the phenomena of surface activity of biologically active compounds. Ph.D. or equivalent experience desired.

Physical Chemist

To conduct research on biologically active compounds. Ph.D. or equivalent experience with biological materials.

Chemist

To conduct research in enzymology, organic synthesis, biophysical phenomena and psychoactive compounds. B.S. degree.

Immunochemist

To conduct research relating to the biochemistry of immune reactions. M.S. in biochemistry or immunology with experience in the other of these two areas.

Biochemist

To conduct research in the areas of enzyme mechanism and kinetics. Ph.D. or equivalent experience in enzymology desired.

Organic Chemist

To conduct basic research on inorganic polymers, coordination compounds, and organic semiconductors. M.S. or B.S. with equivalent experience desired.

Write in strictest confidence to:

John A. Haverfield
Manager - Professional
Placement

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POSITIONS OPEN

BIOCHEMIST-PHYSIOLOGIST

An expanding midwestern pharmaceutical company has opportunity for Ph.D. biochemist-physiologist to conduct fundamental research related to atherosclerosis and/or obesity. Postdoctoral experience preferred. An equal opportunity employer. Please send complete resume to

Technical Employment Coordinator
The Upjohn Company
Kalamazoo, Michigan

Biochemist (M.S.) to perform medical research experiments and studies in field of immunology. **Health Physicist** with degree in biology, chemistry, or physics and health physics training or experience to assist with all phases of radiation safety program. **Science Educators (B.S. or M.S.)** to conduct demonstration lectures on atomic energy at schools, fairs, etc. Extensive travel. **Science Administrator (Ph.D.)** with universities as well as other science-education activities. Demonstrated administrative ability essential. **Research Technicians (B.S. or M.S. in biology or chemistry).** For information and application write: Personnel Office, Oak Ridge Institute of Nuclear Studies, P.O. Box 117, Oak Ridge, Tennessee. An Equal Opportunity Employer. X

CLINICAL CHEMIST

320-bed hospital associated with well-known diagnostic clinic desires clinical chemist, preferably Ph.D. level, to supervise chemistry section of clinical laboratory, develop and introduce new procedures, and participate in teaching and research program. Salary open.

Box 224, SCIENCE

MELPAR'S

expanding Research Division has immediate need for Key Personnel to conduct research in the following areas:

- PHARMACOLOGY
- VIROLOGY
- TISSUE CULTURE
- MICROBIOLOGY

Current programs cover the challenging problems of the future. These problems are in the fields of Space Biology, Electrobiol-ogy, and Culture Biology.

Applicants with experience desired, but new graduates will be considered.

Write in strictest confidence to:
John Haverfield

Manager—Professional Placement



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POSITIONS OPEN

RESEARCH CHEMIST

Newly organized laboratory is initiating programs for scientific and engineering study of chemical, electrical and mechanical properties of metals and dielectrics. Ideal applicant should have achieved an advanced degree within past 5 years, be interested in interface phenomena including binding processes, ionic layers and adhesion and be capable of broad development from this starting point. Research-minded management ensures full support by major corporation. Resumes will receive personal attention of:

W. R. J. Brown, Director

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VACANCY 9/62/2905: PHYSIOLOGIST OR BIOCHEMIST, NEW ZEALAND DEPARTMENT OF AGRICULTURE—ANIMAL RESEARCH STATION, RUMINANT METABOLISM

A senior physiologist or biochemist is required to establish and lead a team to study metabolism in pasture-fed ruminants. The work is expected to touch on considerations of practical importance such as the study of certain metabolic disturbances of grazing animals and the frequent failure of young animals, both sheep and cattle, to thrive on lush pastures during the autumn period; but it will also be possible to undertake more fundamental work.

Opportunities for field and stall feeding work are particularly good and there are the usual laboratory facilities. In addition, a cow calorimeter is under construction and cold stores for large amounts of frozen herbage are to be provided. It is hoped that the appointee will participate in projected nutrition studies with these.

Salary up to £2300 a year according to qualifications and experience. Housing will be available to a suitable appointee. Payment of fares and expenses to New Zealand under standard conditions for the appointee and his family will be met. Appointee will be eligible to join the New Zealand Government Superannuation Fund. Applications should be sent to the New Zealand Embassy, 19 Observatory Circle, NW, Washington 8, D.C., to reach there by 16 December 1962.

ZOOLOGISTS, Ph.D. Experience preferred. Background in general zoology, anatomy, cytology, genetics and cytogenetics. Some graduate teaching: research. Roman Catholic University. New science building. Write and include résumé to Chairman, Department of Biology, Villanova University, Villanova, Pa.

FELLOWSHIPS

Chaim Weizmann Memorial Fellowships*
at
The Weizmann Institute of Science
Rehovoth, Israel
for the
Academic Year 1963-64

The Weizmann Memorial Foundation will shortly elect four fellows to spend a year in research in the natural sciences at the Weizmann Institute of Science, Rehovoth, Israel, beginning in the fall of 1963.

These fellowships, which are conferred annually are intended for scientists with several years of postdoctoral research experience. It is expected that the candidate will have worked in a field close to one of the subjects under investigation at the Weizmann Institute of Science so that he will be able to join an existing research team.

The stipend includes round-trip fare by air for the scientist and his family and an adequate living allowance in Israel in local currency.

Applications should reach the Academic Secretary, The Weizmann Institute of Science, Rehovoth, Israel, not later than 1 December 1962, on a form obtainable from the administrative offices of your institution. Further information may be obtained from the Academic Secretary, The Weizmann Institute of Science.

*Established in 1953 by Yad Chaim Weizmann, The Weizmann Memorial Foundation.

FELLOWSHIPS

The Department of Pharmacology of the School of Medicine, State University of New York at Buffalo, 15 The Circle, Buffalo 14, New York, offers a 4-year program of course work and research training leading to the Ph.D. degree. Research opportunities include the action of drugs on kidney, circulation, autonomic ganglia, connective tissue, behavior, metabolism, and ion transport. Annual stipends (U.S. citizen) of \$2400 plus tuition, plus \$500 for each dependent. Early application strongly advised for entrance September 1963. Detailed information on request from State University of New York at Buffalo. X

University of Western Ontario, Department of Botany (Head, Professor C. J. Hickman), invites applications for a National Research Council of Canada Postdoctorate Fellowship tenable from September 1963 in one of the following fields: Physiological Genetics, Physiology, Ultra-structure or Freshwater Algology. Stipend \$4000 (\$5000 for a male fellow who is married), tax-free. Travel grant provided. Applications should be made by 15 January 1963, to the Awards Office, National Research Council, Ottawa, Canada, where forms and further particulars may be obtained. 12/7

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