

Equipment

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■ **CROSSBAR SCANNER** is capable of scanning 500 pairs of input connections at a rate of 50 per second, connecting the selected pair to a set of output terminals. Dwell time at each selected pair is 5 msec. Higher repetition rates are possible with corresponding decrease in dwell time. Stepping is initiated by a positive pulse of 25-v amplitude or greater, a rise time between 0.02 and 1 μ sec, and duration greater than 0.1 μ sec. Contact characteristics are said to be such that extremely low signal level will be faithfully reproduced. (James Cunningham Son and Co., Inc., Dept. 153)

■ **DIGITAL VOLTMETER** provides accuracy of ± 0.01 percent ± 1 digit. Range is 0.0001 to 100.00 v. Input impedance is 1000 megohm on the 10 v scale and 11 megohm on other scales. Ranging, polarity indication, and calibration are automatic. The instrument is transistorized. (Electro Instruments Inc., Dept. 145)

■ **CIRCULATION PUMP** provides pumping action by pressure of rollers against a flexible tube. The pump is self-priming, and pressure is constant. Available sizes provide pumping rates from 1 ml/min to 1 ml/24 hr. Tubing size is $\frac{1}{8}$ in. inside diameter. Access to the ends of the tube is not necessary for installation or removal of the pump. (Electro-Mechanical Development Co., Dept. 150)

■ **TRANSISTOR TESTER** measures I_{cbo} , gain, leakage and shorts on *p-n-p* or *n-p-n* transistors. Five ranges cover low-, medium-, and high-power transistors. Collecting potentials from 0.5 to 100 v d-c are available in 17 steps. (Precision Apparatus Co., Inc., Dept. 155)

■ **ELECTRONIC VOLTMETER** provides accuracy of 0.25 percent of measured value. Measuring range is 100 μ v to 1 kv. Input impedance is 6 megohm on low ranges and 60 megohm from 1 v up. Measurements are made by automatic comparison with calibration signals taken from a 1-kv d-c supply controlled by a standard cell. If the unknown signal differs from the calibrated voltage, the indicator needle pulses. Pulsation ceases when balance has been achieved. Indication is read from a four-digit potentiometer of better than 0.01-percent linearity. The calibration signal of the instrument can be used externally, and the instrument can be used as a conventional electronic voltmeter of 3-percent accuracy. (Millivac Instruments, Dept. 160)

■ **COLORIMETER AND ABRIDGED SPECTROPHOTOMETER** is based on the flicker-photometer principle. Illumination is provided by an incandescent source within an integrating sphere. Reflectance transmission measurements may be made on liquids or solids. Source filters permit comparison under standardized incandescent and daylight illumination. The instrument utilizes three solid-glass tristimulus filters and presents, on a meter, numerical values expressing difference between the sample and a reference standard. When it is used as an abridged spectrophotometer, the instrument divides the visible spectrum into ten bands.

Visual inspection of the sample as seen by the instrument is also provided. Comparison sensitivity is 0.1 percent. (Instrument Development Laboratory, Inc., Dept. 169)

■ **STRIP-CHART RECORDER** records frequencies from d-c to 100 cy/sec. Direct-coupled amplifiers give sensitivity of 2 mv/mm. Stylus deflection on each of two channels is 40 mm. Accuracy is ± 2 percent. The record is made on electro-sensitive paper. (Mandrel Industrial Instruments, Dept. 166)

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