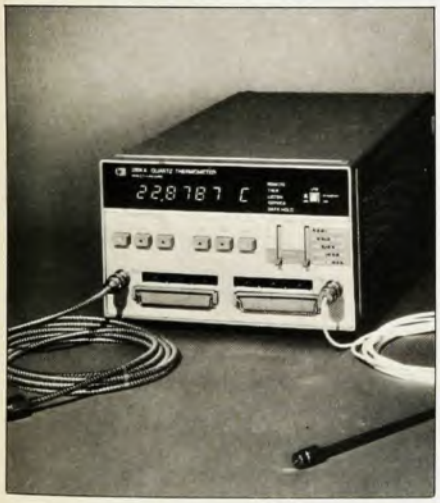
new products

The items listed have been selected from among those appearing concurrently in "New Instruments" or "New Materials and Components" in *Review of Scientific Instruments*. We gratefully acknowledge the cooperation of the editor of *RSI*, J. B. Horner Kuper, the associate editor for New Instruments, Joshua Stern, and the associate editor for New Materials and Components, R. K. Eby.

These descriptions are based on information supplied by the manufacturer and in some cases from independent sources. Neither *Review of Scientific Instruments* nor PHYSICS TODAY assume responsibility for their correctness.

Quartz digital thermometer

The model 2804 thermometer measures in the range −80 to 250 °C with 0.0001 °C useable resolution. Two probe inputs provide for differential measurements. Absolute accuracy is ±0.040 °C from −50° to 150 °C, and ±0.075 °C from −80° to 250 °C, traceable to IPTS-68. The quartz sensors



convert temperature into frequency signals, so that the instrument is relatively free of noise pickup problems and long cables, ground loops, and proximity to electrical noise sources do not affect it. The seven-digit readout makes bridge balancing or reference to voltage or resistance versus temperature tables or curves unnecessary. External equipment, such as a reference junction, is not required. Pushbuttons select measurements from either quartz probe or the difference between the two. Display resolution can be set at 0.01°, 0.001°, or 0.0001 °C, and readout can be changed to °F by an internal switch. The quartz sensors are individually calibrated; the calibration data are provided in a calibration module supplied with each probe. In operation, the calibration module is inserted and the instrument microprocessor computes the temperature being measured. Checking calibration is accomplished with an ice bath for 0 °C; no other check point is necessary. Five full-scale ranges from 0.01° to 250 °C can be selected for the analog output. An IEEE-488 bus output option permits use of a computing calculator, for example to compute heat transfer rate from temperature measurements.—*Hewlett-Packard Company, 1507 Page Mill Rd., Palo Alto, California 94304.*

Circle No. 140 on Reader Service Card

High-current silicon power devices

These new devices have a heat pipe bonded directly to the silicon wafer within the unit. This cooling technique permits devices capable of handling hundres of watts of power, yet 75% smaller and 85% lighter than existing solid state devices with conventional heat-dissipation fins that are not integral to the wafers. Each pipe contains a tube filled with water. When the transcalent device is operating, the water absorbs the heat from the wafer. The heat pipe extends from the surface of the water through the case. Circular fins mounted on the external part of the pipe radiate the heat. For test and evaluation purposes, three versions of the devices are available: a 250-A rectifier with blocking voltages to 1200 V, a 100-A NPN transistor, and a 400-A thyristor (silicon-controlled

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rectifier) with blocking voltages to 1200 V.—*RCA Solid State Div., Somerville, NJ 08876.*

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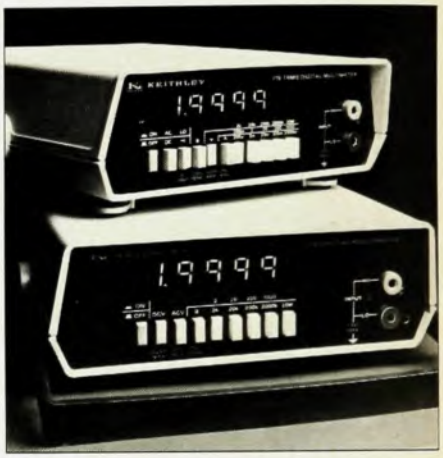
Multimeters

The models 178 and 179 4½-digit multimeters, featuring low cost, offer full 20 000 count display. The model 178 measures 100 μV to 1200 V dc, 100 μV to 1000 V ac, and 0.1 Ω to 20 MΩ resistance measurement. The 179 adds 10 μV ac and dc sensitivity, true rms measurement, both ac and dc



current measurement, and Hi–Lo resistance range. Complete overload protection is provided, including 1000 V on resistance range. It measures 10 nA to 2 A ac and dc. Basic voltage and resistance accuracy is 0.04% +1 digit. Polarity indication is automatic and the decimal point is positioned appropriately when range is selected. Overload is indicated by a flashing display. An optional rechargeable battery pack provides 6-h operation from a full charge. Accessories include a 40-kV high-voltage probe, clamp-on 200 A ac current probe, 100-MHz rf probe, and various test lead sets.—*Keithley Instruments, Inc., 28775 Aurora Rd., Cleveland, OH 44139.*

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Digital tester

The 851 digital tester combines many of the functions of a digital multimeter, counter, timer, logic probe, thermometer, and an oscilloscope in a single package weighing 6 kg. The 22 functions of the instrument include eleven that measure time, two that register plus and minus peak voltage, three that carry out digital multimeter measurements through separate leads, and one that reads line voltage at the outlet. Another function enables temperature readings with an

optional temperature probe. The tester also makes four self-measurements to adjust correctly each of its four input thresholds to the logic levels of the equipment under examination. The 22 functions of the instrument are designed to permit measurement of system parameters, check for signal activity, correction of synchronization problems in electromechanical subsystems, identification of boards or component parts in need of replacement.—*Tektronix, Inc., Box 500, Beaverton, OR 97077.*

Circle No. 143 on Reader Service Card

Electrically conductive bags

Electrically conductive nylon bags designed for packaging static sensitive components. The CP 302 Statfree bags are nonwoven nylon and are reusable. They have a tear strength in excess of 3000 gm/mil and a tensile strength in excess of 7500 PSI. Standard sizes range from 5 × 8–10 × 18 in.—*Charleswater Products, Inc., George R. Berbeco, Marketing, 3 Walnut Park, Wellesley, MA 02181.*

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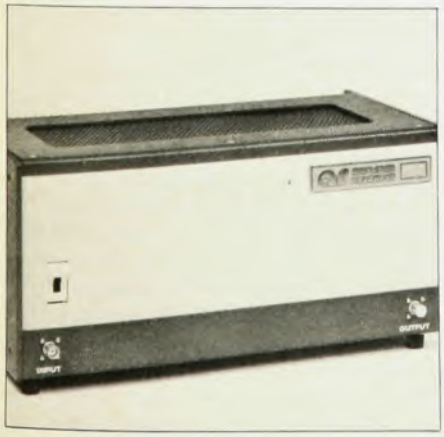
Graded glass seals

A new line of 39 standard seals is available. The line has the following combinations: Pyrex-to-Kovar, quartz-to-Kovar, quartz-to-Pyrex, and Pyrex-to-soft glass. There are 12 standard Pyrex-to-Kovar connectors ranging from ⅛ to 2 in. o.d., 12 standard quartz-to-Kovar combinations, 10 standard quartz-to-Pyrex seals ranging from 5 to 51 mm O.D., and 5 standard Pyrex-to-soft glass connections in 6 to 25 mm O.D.—*Aremco Products, Inc., P.O. Box 429, Ossining, NY 10562.*

Circle No. 145 on Reader Service Card

Amplifier

The model 4W1000 is an ultrawideband, solid state power amplifier designed to deliver 4 W of swept power



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output from 1 to 1000 MHz instantaneously. The amplifier provides up to 6.0 W of power with a minimum of 4 W of linear power at less than 1-dB gain compression. It has a fixed power gain of 36 dB minimum and is flat to within 1.5 dB maximum. A laboratory signal generator, sweep generator, or synthesizer can be used to drive the amplifier. In the linear mode, harmonics in the output are at least 20 dB below the fundamental frequency. The third order intercept point for intermodulation distortion is typically 47 dBm. Impedances are matched for 50 Ω at both the input and output terminals with a maximum input VSWR of less than 2:1. The amplifier is unconditionally stable and will operate without damage or oscillation, regardless of the phase, and magnitude of source and load impedance.—*Amplifier Research, 160 School House Rd., Souderton, Pennsylvania 18964.*

Circle No. 146 on Reader Service Card

Standard film for oxygen transmission

Standard Reference Material 1470, Polyester Plastic Film for Oxygen Gas Transmission, is intended for calibrating systems for the measurement of oxygen gas transmission rates through flexible barrier materials. It is composed of 15 sheets of polyester plastic film approximately 23-cm square. It is intended for use in the measurement of the oxygen gas transmission rate using a volumetric method (ASTM D1434), manometric method (ASTM D1434 or ISO 2556), or coulometric method of measurement. The oxygen gas transmission rate is 0.325 pmol m^{-2} s^{-1} PA^{-1} at 296.16 K and 0.1013 MPA.—*Office of Standard Reference Materials, National Bureau of Standards, Washington, D.C. 20234.*

Circle No. 147 on Reader Service Card

Time–amplitude test set

The model 6125C time and amplitude test set, a four-in-one instrument package, can check and calibrate oscilloscopes rated to 500 MHz. It can also be used to test and calibrate frequency counters and timers, multimeters, panel meters, signal generators, and spectrum analyzers. It provides the capability of a voltage or amplitude calibrator, a sweep and delay time calibrator, a rise time calibrator, and an error indicator. The operator can program all front panel functions such as ranges, divisions of vertical amplitude, marker frequency and number of markers displayed, deviation in terms

of direct percentage of error in decimal presentation, and repetition rate of the fast square wave used for rise time checks. An optional tunnel diode accessory provides 200-ps rise time for checking fast sampling oscilloscopes. An IEEE 488 bus interface card will be available in the future.—*Ballantine Laboratories, Inc., Box 97, Boonton, NJ 07005.*

Circle No. 148 on Reader Service Card

New Literature

Amplifiers—A 6-pp. brochure features a new series of rf ultrawideband, solid state linear amplifiers that provide rf power over more than three decades of bandwidth. A 10-pp. guide to interpreting and applying broadband amplifier specifications defines and explains the characteristics of broadband power amplifiers and discusses various technical characteristics and measurement parameters. A 3-pp bulletin describes noise blanking circuitry available as an option with broadband amplifiers ranging in power from 30 to 500 W and covering the frequency range 1 to 250 MHz.—*Amplifier Research, 160 School House Rd., Souderton, PA 18964.*

Ultraviolet spectroscopy—Four application studies in ultraviolet spectroscopy are offered: ADS-101 describes the use of the model 57 scattered transmission accessory to problems encountered in most scattering samples; ADS-102 deals with the measurement of film thickness of silicon dioxide layers using an ultraviolet-visible spectrophotometer; ADS-103 and ADS-104 provide an introduction to first and second derivative spectroscopy, including practical examples.—*Perkin-Elmer Corporation, Main Avenue, Mail Station 82, Norwalk, CT 06856.*

Black-and-white film—Pamphlet No. P-255 discusses a new, improved negative film that provides contrast enhancement of photomicrography specimens and improved images in other applications. Technical pan film (Estar-AH base) SO-115 has extended red panchromatic sensitivity, fine grain, and high resolving power. For photomicrography, contrast enhancement is most noticeable in specimens that are colorless, faintly stained, or intended for phase contrast or Nomarski interference contrast (such as chromosomal or karyotyping studies). In solar disk recording, the new film images solar phenomena occurring throughout the green wavelengths as well as at the H-alpha line.—*Dept. 412L-517, Eastman Kodak Co., 343 State St., Rochester, NY 14650.* □