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.

Picoammeter

The model 480 picoammeter, featuring low cost, measures current in seven ranges from 1 pA to 2 mA to cover the full span of low-current measurements. Resolution is stable at 1 pA and input voltage drop is less than 0.2 mV. High normal mode rejection keeps line frequency from affecting the measurement and high common mode rejection and an isolated input permit in-circuit measurement. Other features include a built in analog output and a battery option that permits total isolation from line as well as portability. —*Keithley Instruments, Inc., 28775 Aurora Rd., Cleveland, OH 44139.*

Circle No. 140 on Reader Service Card

Flow controller

The type 254 flow-ratio/pressure controller is designed to control three or more gases in ratio while maintaining constant system pressure. It is compatible with most flow monitors and vacuum gages including the manufacturer's Baratron series. Digital readout is provided for pressure and for each flow channel. Flow can be controlled from 0.03 to 5000 standard cm^3/min and pressure from 10^{-4} to 2500 Torr with 0.25% accuracy. The instrument will operate any combination of three different flow control valves.—*MKS Instruments, Inc., 22 Third Ave., Burlington, MA 01803.*

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High voltage measuring system

The model 710 system uses fiber optics and digital FM carrier modulation to enable measurement of high voltage without electrical connection to the meter. The voltage probe is a separate self-contained unit connected to the meter unit by 100 ft of fiber optic cable. With its isolated probe, the instrument enables measurement of the differential voltage between two "hot" terminals, either ac or dc. Ambiguities usually caused by ground plane currents and ground loops are eliminated. The system can also be used with an appropriate oscilloscope, not included, to measure transient voltages with rise time as short as 200 μs, and to observe waveform present on power lines up to the 30th harmonic. Because digital data transmission is used, results are insensitive to variations in the light level transmitted by the fiber optics; accuracy is not affected, for example, by exchanging the cable or by reversing it end for end.—*Pulsar Associates, Inc., 11491 Sorrento Valley Rd., San Diego, CA 92121.*

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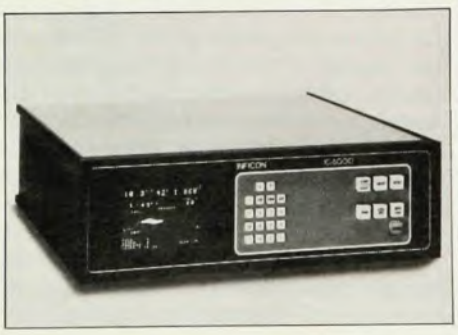
Vacuum deposition controller

The IC 6000 thin-film vacuum deposition controller uses two integral crystals that switch automatically in the event one fails. The instrument monitors



new products

crystal performance continuously during depositions and graphically displays rate deviations in real time. When a crystal fails, or is about to fail, the second crystal takes up rate and thickness control exactly where the just failed crystal left off, without interruption of the process. Up to six complete and independent thin film programs are stored, each with 37 programmable functions, including three-mode loop control, rate ramp, and source replenish control. For multiprocess coating systems, three processes are permitted, each of which may be programmed for automatic sequencing of up to 32 separate layers. Up to four sources can be controlled with four separate crystals. A fail-safe memory protects against line power or battery failure and a digital lock code provides direct, tamper proof access, without mechanical keys.—*Inficon Leybold-Heraeus, 6500 Fly Rd., East Syracuse, NY 13057.*

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Printer-plotter

The model PP-101 accepts numerical data directly from digital voltmeters, frequency counters, and other binary-coded-decimal or bianary sources, prints 5 × 7 dot matrix characters, and plots in a variety of graphic formats. The user selects the display format and other parameters by grounding appropriate terminals on an interface connector, using wires, switches, or external logic control. An outboard microcomputer provides all necessary interface and control functions including self-strobing for automatic data logging.—*B-G Instruments, Box 67, Alta Loma, CA 91701.*

Circle No. 144 on Reader Service Card

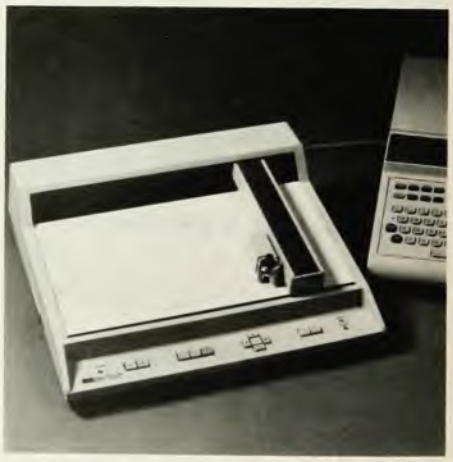
Leak detector

The model 936-40 helium mass spectrometer leak detector features compactness and simplicity of operation. The instrument measures 8 × 13½ × 19½ in. and weighs 55 lb. Need for water, compressed air, or liquid nitrogen for operation has been eliminated. Gases and contamination are removed by taking advantage of the differences in maximum pressure ratio produced by the diffusion pump for gases of different molecular weight. Helium, with a very low maximum pressure ratio diffuses through the pump to reach the spectrometer tube where it is detected as a leak in the normal manner. Other gases with larger molecular weight and higher pressure ratio are trapped and filtered out by the diffusion pump. The pump also acts as a buffer, protecting the spectrometer tube from pressure bursts, so that the system is capable of operating at pressures up to several hundred millitorr. The entire stainless-steel spectrometer tube is heated at all times to prevent condensation of contaminants. The tube, including the pole pieces, is demountable to permit access to the tube interior for inspection and cleaning. The ion filament source is a replaceable throwaway unit. Helium can be detected to at least the mid 10^{-10} atm. cm^3/s range when the system is used with a 5 ft^3/min mechanical pump. Response time for helium is 2 s.—*Varian Lexington Vacuum Division, 121 Hartwell Ave., Lexington, MA 02173.*

Circle No. 145 on Reader Service Card

Graphics system

The model 7225A graphics plotter provides publication quality plots by drawing clean continuous ink lines. The plotter draws stepless straight line segments, of any length and angle, given only the end point coordinate pair. It is designed to produce graphs on paper sizes up to ISO A4, or 8½ × 11 in. Addressable microsteps of 0.032 mm provide visually continuous



lines. Fast continuous plotting is provided by drawing between points at 250 mm/s. Text can be drawn at speeds up to three characters per second for annotation. A modular interface system allows change between various interfaces. The mechanical system is based on a linear stepper mechanism.—*Hewlett-Packard Company, 1507 Page Mill Rd., Palo Alto, CA 94304.*

Circle No. 146 on Reader Service Card

Voltage reference

The model 1030A transportable dc voltage reference may also be used as a stable source. It provides output ranging from ±0.01 μV to ±1100 V dc

with current compliance up to 50 mA. All ranges are resolved to 0.1 ppm (7 decades). Calibration accuracy is stated to be ±(0.002% of setting +0.0005% of range +5 μV). Warmup time is less than 30 s. A front panel indicator warns of short circuit or overload conditions. Dimensions are 5.22 × 17 × 14.5 in. and weight is 13 lb.—*Electronic Development Corporation, 11 Hamlin St., Boston, MA 02127.*

Circle No. 147 on Reader Service Card

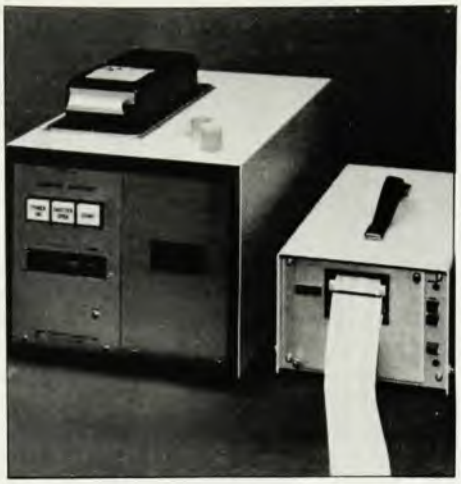
Time base corrector

The model 1000 single channel digital time base corrector is a 2-MHz bandwidth system designed to be compatible with a wide range of standard recorders. Each instrument is configured for a given IRIG recording mode. Stock models are configured for direct record (wide band—2MHz) and FM record (wide-band Group II). They can operate with recorders in any of six IRIG standard speeds. Correction is accomplished by substituting a crystal oscillator reference for tape speed as the basic time base reference, and by performing the final correction in the digital domain where a buffer absorbs signal jitter normally lying outside the correction bandwidth of the recorder electromechanical tape speed and tension servos. In record mode, the time base oscillator is used to derive a timing pilot signal that is mixed with the analog input signal and recorded just above the normal recording band. The recorded signal and pilot are reproduced by the recorder and filtered to separate the pilot from the signal. A variable oscillator is phase locked to the recovered pilot to provide clock pulses at a multiple of the pilot frequency. The clock pulses strobe the 8-bit analog-to-digital converter and memory buffer input. The signal data are clocked out of the buffer using clock pulses derived from the oscillator, restoring the original time base to both the pilot and the accompanying signal. Finally, the signal is restored to analog format and a band pass filter eliminates the pilot.—*Bancomm Corporation, 1121 San Antonio Rd., Palo Alto, CA 94303.*

Circle No. 148 on Reader Service Card

Uranium analyzer

The PGT uranium analyzer is a modular, bench top instrument that provides pushbutton, non destructive, x-ray fluorescence measurement of uranium in solution, in the range 0.1 to 7 g/l. It can provide readout in approximately one minute with precision 0.1 g/l at the lower range limit and 0.05 g/l at the upper range limit. Uranium content of other matrices, such as phosphoric acid, sulfuric acid, and organic solutions, can also be measured. In operation, the solution is poured into a disposable polypropylene cup



and the open end sealed with a 6-μm polyester film. The sample is placed, film side down, over the window of the probe head located on top of the instrument. With the shield of the probe head closed, the sample is exposed to x rays from an encapsulated Cd-109 radioisotope source contained in the instrument head. The resulting fluorescence x rays are analyzed by energy dispersive detection and analysis.—*Princeton Gamma-Tech, Box 641, Princeton, N.J. 08540.*

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New Literature

Pyrometer—A 6-pp. brochure describes the Digicon II handheld, rechargeable digital thermometer featuring 1840 °F range with ±1° accuracy and subzero capability and fahrenheit–celsius conversion.—*Alnor Instrument Company, 7301 N. Caldwell Ave., Niles, IL 60648.*

Oscilloscopes—"How to Use an Oscilloscope" is a color videotape program designed to provide a basic education in the theory and operation of waveform measurement with oscilloscopes. The three videotape program has a total running time of 76 min.—*Hewlett-Packard Company, 1507 Page Mill Rd., Palo Alto, CA 94304.*

Thermometer—A 2-pp. brochure describes the model 1900 digital combination direct reading, calibrating thermometer that uses an internal cold junction reference and electronic calculation to measure temperature from −100° to 1999°F with accuracy said to be 0.1% of reading.—*Extech International Corporation, 114 State St., Boston, MA 02109.* □