

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.

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Electron microscopes

The H-500 transmission electron microscope offers guaranteed resolution 1.4 Å, crystal lattice, and 3 Å, point to point. Accelerating voltage is selectable from 10 to 125 kV in six steps. Magnification range is 100–800 000. A zoom lens system maintains focus when magnification is changed. Very

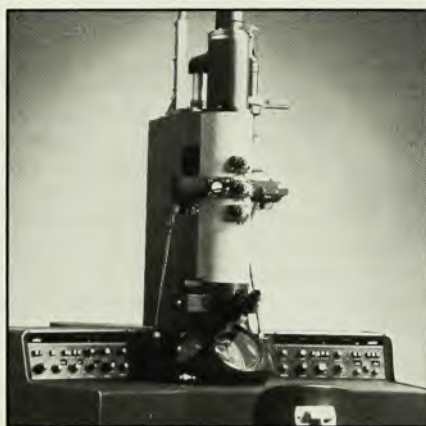


low magnification, from 50 to 3000, can be obtained with the addition of an optional specimen survey holder. The microscope is available with either top or side entry specimen loading using a common yoke, so that it is not necessary to take the entire column apart to change from one method to another. The instrument reaches maximum stability ($2 \times 10^{-6}/\text{min}$) in approximately 20 min. A beam detecting exposure meter, an automatic camera system, a pneumatically driven specimen holder, and an automated evacuation system are standard features. A scanning electron image accessory, available as an option, allows use of the instrument as a scanning electron microscope with routine resolution 70 Å, or as a scanning transmission electron microscope with guaranteed resolution 30 Å.—Perkin-Elmer Corp. 411 Clyde Ave., Mountain View, California 94043.

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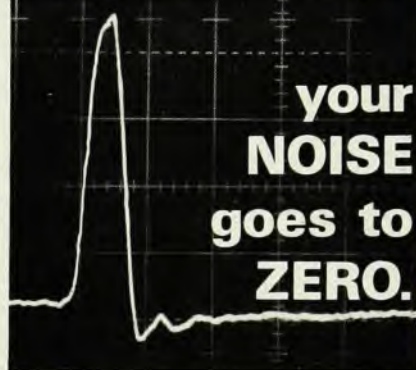
The EM400 research electron microscope features a computer-memory controlled seven-lens optical system, accelerating voltage selection between 20 and 120 kV, and resolution of 1.4 Å

possible under normal laboratory conditions. Protection of the specimen against contamination and erosion is provided by a high vacuum system pumped to 10^{-7} Torr or better in the specimen area by means of an ion-getter pump. The oil free vacuum circuit, including the ion pump and the column, are separated from the auxiliary vacuum system by a 200 micrometer differential aperture plate in the second projector lens at the base of the column. Five imaging lenses are used in the optical system to obtain a number of standard operating ranges. At each of 39 magnification steps in the main magnification range from 50 to 800 000, the five lenses are programmed to produce an image of maximum area with minimal radial and spiral distortion and minimum curvature of field, with reproducibility of magnification within 1.5%, less than 800 Å change of focus between successive steps in the high magnification values, and with minimal image rotation. The use of programmable read-only memories allows



the range to be controlled by a single 39-step switch. Changes in optics required in the range occur automatically. Other optical programs can be chosen in the future without any hardware changes. The system is open to external control or analog or digital readout. A eucentric goniometer stage available in two versions makes resolution to 2 Å possible with 30° tilt and

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LABORATORY Temperature Controller



Model 5301-E

With an input circuitry designed to accept resistance or voltage generating temperature sensors such as GaS-diodes, thermocouples, Ge & Pt Sensors, Carbon Resistors and Thermistors. The 5301-E, three mode controller offers temperature regulation to better than 0.01°K (or $^{\circ}\text{C}$) in Vacuum chambers, Cryogenic dewars, Optical ovens, Tensile strength test apparatus, etc. for physics, metallurgy, chemistry and other scientific fields where the control and temperature range requirements are broad or change frequently. Set point readout is either directly in mV or Ohms (4-terminal measurement), with unlimited temperature range. Proportional, rate and reset modes are all internally adjustable, allowing to tune the controller to the thermal time constants of the process. 100 Watts, DC output or up to 5KW with Model 2202.

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POWER MODULE



Model 2202

To regulate an AC-line connected load by means of a small DC signal from an automatic control instrument. It supplies large amounts of power for control of resistive heaters, thermo-electric elements, light sources, etc. in temperature controlled ovens, vacuum deposition equipment, infrared heat sources, temperature baths and other applications. The instrument features a pulse-width-modulated zero crossing - fires TRIAC circuit to minimize RF interference, electronic protection against current overloads and voltage transient, and provides linear control to a AC power line up to 25 Amp. (110 V or 220 V).

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new products

440 000 magnification, or $3.4 \text{ \AA}$ with 60° tilt and 300 000 magnification.—*Philips Electronic Instruments, Inc., 750 South Fulton Ave., Mount Vernon, New York 10550.*

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Positron lifetime system

Sodium 22 is used as the source of positrons for the nondestructive testing of defected and disordered materials using this positron lifetime measurement system. When a positron penetrates a metal, it combines in a matter of a few picoseconds with an electron and annihilates into gamma rays. Positrons are attached to the core of dislocations or vacancies formed in the areas of fatigue or disorientation because of localized negative charges in these areas. The mean life of positrons is longer in materials containing such defects. The purpose of the system is to determine the lifetime of a positron before it annihilates with an electron. At annihilation two gammas of 0.511 MeV and approximately opposite direction are generated. This doublet production is the event of interest. ^{22}Na decays by giving off a 1.28 MeV gamma and producing ^{22}Ne in 1-2 psec, with release of a positron. The 1.28 MeV gamma production is used as the reference time for the lifetime measurement. The system then detects the annihilation which produces the doublet. In the lifetime system, all signals from the start detector and the stop detector are fed to the constant fraction timing discriminators. The start discriminator is fed directly to the start input of a time-to-amplitude converter, while the stop discriminator is routed through a fixed delay before being fed to the stop input of the converter. The fixed delay allows the converter enough time for the conversion. The system can be supplied in the form of components or as a completely checked out and documented system installed in the purchaser's laboratory.—*Ortec, Inc., 100 Midland Rd., Oak Ridge, Tennessee 37830.*

Circle No. 142 on Reader Service Card

Electro-optical system

The model 5611, multipurpose system for noncontact detection and measurement of single axis or biaxial displacement, differential displacement, dimensional measurement, and extensometry, uses electronic servo tracking to capture and lock onto optical discontinuities. These are projected through a lens system onto the face of a

photosensitive image dissector tube. Motion is detected by electromagnetic multiplexing between each edge of the object under observation, which provides a dc analog voltage as a function of the motion. A wide selection of lens systems is available to accommodate various working distances and displacement ranges, typically from 0.002 in. to infinity. System response is dc to 25 kHz in the single axis mode. Displacement data for the two axes are displayed simultaneously by separate front panel



meters. Analog signals are provided for recording.—*Universal Technology, Inc., 30 Hazel Ter., Woodbridge, Connecticut 06525.*

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Low-reflectance filters

Plastic sheet materials designed to be used as filters with LED, liquid crystal, plasma discharge, and incandescence displays and readouts are available. They have an integral low-glare finish which is part of the material and will not rub off and can be supplied in grades which resist abrasion, chemical attack, or heat distortion. The sheets are available clear or can be colored to meet the rating of any readout display specified. In addition, neutral-density filter sheets can be supplied in any transmission range. Thicknesses available are $\frac{1}{32}$ through $\frac{1}{2}$ in. Sheets can be ordered in sizes up to 33×45 in.—*SGL Homalite, 11 Brookside Dr., Wilmington, Delaware 19804.*

Circle No. 144 on Reader Service Card

Inert valve

A miniature valve has a teflon body. The Model 2X valve provides flow control for laboratory handling of ultrapure or highly corrosive fluids. It is available in 2, 3, 4, and 5-way configurations, and is leakproof up to 100 psi. A spring-loaded rotor plug on the valve maintains constant pressure for even distribution of liquids or gases through the terminal holes. The round plastic body is 1 in. high and $1\frac{1}{4}$ in. in diameter. Porting holes in the body are 0.090 in. in diameter. Body terminal holes are female $\frac{1}{4}$ in. $\times$ 28 threads with a flat sealing face which accepts inert fittings of teflon, nylon, or any suitable material. A threaded stem extension on the

valve allows it to be mounted on panels or permanently mounted on a deck. Valves may be ordered with specific terminal or porting hole configurations. —Hamilton Co., P.O. Box 10030, Reno, Nevada 89510.

Circle No. 145 on Reader Service Card

Recorder

The model MSY-26 data tape recorder is designed for use with chromatograph type equipment to provide means for gathering, storing, and reproducing chromatograph signals. Data can be recorded at a remote location and played back through a computerized data reduction center. A voice interrupt feature allows data identification on the tape. The recorder contains a low level differential preamplifier, a VCO module, a cassette tape recorder-reproducer, a discriminator, and a filter amplifier. The high level output can be



utilized directly by analysis equipment, while the low level output is directly compatible with the usual chromatogram plotter. Input sensitivity is adjustable from 0.5 to 50 mV full scale, and input impedance is 48 kilohms. System signal-to-noise ratio is greater than 45 dB rms, and bandwidth is 40 Hz. The recorder operates either from batteries or from a 115 V ac power line. —Dallas Instruments, Inc., Box 38189, Dallas, Texas 75238.

Circle No. 146 on Reader Service Card

Frequency counters

The models 1920A, 1920A-13, and 1920-14 portable frequency counters, to measure to 520, 1000, and 1250 MHz, respectively, feature an optional, re-



chargeable, built-in battery pack, nine-digit LED display, burst or cw measurement, sensitivity to 15 mV with AGC

standard, and an optional resolution multiplier for low frequency signals. The last coherently multiplies audio tone signals by 1000 to provide 0.001 Hz resolution in 1 sec. A rapid access gate feature eliminates measurement delays. An auto-reset circuit initiates a new measurement on every front panel throw, so that the first measurement is correct. A burst function switch permits measurement of rf bursts of 2 msec or greater duration. Displays are automatically reset to zero when the burst width is less than the gate time selected. Direct and prescaled inputs are color coded to match corresponding function switches. The displays incorporate full leading zero suppression, automatic annunciation, overflow, and a self-check mode to light all digit segments. —John Fluke Mfg. Co., Inc., Box 43210, Mountlake Ter., Washington 98043.

Circle No. 147 on Reader Service Card

Long-range IR control

Model 7070 Series Optoswitch is a modular IR control. It has a range of more than 61 m outdoors and in strong sunlight. Low-voltage cables (12–15 V dc to sensors may be as long as 152.5 m to transmitters and 61 m to receivers. A number of sensors may be terminated at a single-control module with a wide variety of power supply options and standard plug-in control and output options. The sealed sensor heads are packaged in an anodized aluminum enclosure measuring 3.6 × 3.8 × 8.3 cm. Solid-state components and sealing permit the unit to be used in harsh environments where vibration, shock, and moisture are encountered. Power for the standard control is available from any 2.5-W input from 12 V dc to 240 V ac. The control card and power supply are enclosed in a 16 gauge steel NEMA 4, 5, and 12 JIC box. A visible LED indicator is provided on the cover. Standard plug-in cards include latches, time delays, one-shots, computer logic signals, predetermined count, etc. —Scientific Technology Inc., 1201 San Antonio Rd., Mountain View, California 94043.

Circle No. 148 on Reader Service Card

Polymer body p_H electrodes

A wide variety of glass and combination p_H electrodes feature polymer bodies with recessed sensor tips which make them virtually unbreakable in normal use. The electrodes can be supplied with connectors that are compatible with most p_H meters. —Sensorex, 17502 Armstrong Ave., Irvine, California 92705. □

Circle No. 149 on Reader Service Card

COMPUTER PLOTTING



Model 1653

A high speed, 22 inch recorder designed to operate on-line to scientific and general purpose computers in graphic output applications.

- Plug-to-plug compatibility (hardware and software) with all standard 300 steps/sec. plotters used in the computer field (CALCOMP and COMPTON).
- Z-fold paper (367 ft. long) folding conveniently into notebook size.
- 0.01 inch step (0.25 mm optional) with 300 steps/sec. operation.
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