

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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Gonio-microreflectometer

The models 2900JR and 2400JR systems, designed to measure the spectral reflectance of small areas of surface from 400 to 800 nm, comprise a double goniomicroscope head, adjustable sample stage, scanning monochromator, photomultiplier detector, and digital photometer with X-Y recorder. The microscope head has adjustable illuminating and collection microscopes so that the angles of the two may be adjusted relative to the surface being measured. This permits goniomeasurements to be made to characterize the specular-diffuse characteristics of the surface being



analyzed, while also allowing measurement of the specular/diffuse ratio, for example with 45° - 0° - 45° geometry. The adjustable stage accommodates samples of various thickness, as well as prisms and curved surfaces. The measuring head itself, with the microscopes, can be removed from the stage for measurement of large surfaces. Small polished feet rest on the surface to be measured and locate the microscope properly. If the surface cannot be touched, an arm can suspend the measuring head above the surface without contact. A 3 ft, flexible, fiber-optic probe couples the collector microscope to the monochromator. A circle-to-slit configuration of input to output ends of the probe provides coupling between the microscope eyepiece and the entrance slit of the $f/3.5$ monochromator. The recorder permits a relative plot to be made in less than 30 sec, and a pushbutton programmer allows direct

percentage reflectance measurements to be made at any six selectable wavelengths. The model 2900JR features autoranging; BCD output on both sensitivity and range channels; and automatic dark current cancellation. The model 2400JR has neither of the automatic features.—*Gamma Scientific, Inc.*, 3777 Ruffin Rd., San Diego, California 92123.

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Photon counter

The model 1109 photon counter features 100 MHz count rate when used with the compatible model 1121 amplifier-discriminator; eight-digit LED display; automatic background subtraction; computer interface capability; built-in 10:1 prescaler; optional built-in high voltage supply; ABORT mode selectable in preset count operation; and optional serial or autoranging analog output. The model 1121 amplifier-discriminator provides true 100 MHz operation, 50 microvolt to 210 millivolt dual level discriminator; built-in pulse-height analyzer; three-mode operation: single, window, or pile-up correct; built-in prescaler; and optional modular high voltage supply.—*Princeton Applied Research Corp.*, Box 2565, Princeton, New Jersey 08540.

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Particle size analyzer

An automatic system for analyzing holograms of aerosols provides information on the size, shape, and location of particles more than a few microns in diameter in up to one liter of aerosol. The system uses a technique of lensless holography developed at the Chemical Defence Establishment, Porton Down, England. The system is fully automatic, and once the hologram has been loaded it does not require manual intervention until the analysis is complete. A beam of coherent laser light diverging from a pinhole is used for recording and reconstructing the hologram. The geometry of the beam can give a magnifica-

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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

tion up to 200 without lenses. The hologram is made with a pulsed ruby laser; a 30 nsec pulse will effectively freeze the motion of particles traveling up to 100 m/sec. By double pulsing the laser, velocity information can be obtained. The technique does not require a reference beam, which simplifies its use in situations of difficult access. For analysis, the hologram is mounted on an automatic stage and reconstructed with a continuous He-Ne laser. The image formed is allowed to fall directly on the faceplate of the system's television scanner. As the hologram is moved, successive slices through the image are in focus on the faceplate. The instrument determines when a particle is in focus. It also controls the stage so that the hologram is moved rapidly until particles are found, and then more slowly as each particle is individually focused. Measurements can be processed in real time in a programmable calculator or minicomputer. —Image Analyzing Computers, Inc., 40 Robert Pitt Dr., Monsey, New York 10952.

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Absorptive switches

The DM186BH, DM189H, and DM190H models are broad-band and high-speed absorptive SPST PIN diode switches with integrated drivers. The switches operate over the frequency range from 0.2 to 18 GHz and exhibit nominal isolation characteristics of 45, 65, and 35 dB, respectively. Switching speed from ON to OFF is 20 nsec and OFF to ON is 30 nsec. The integrated drivers, controlled by TTL signals, provide the proper switching currents and simultaneously maintain a 50 ohm bilateral impedance match at insertion loss and at maximum isolation. Power handling for all models is 2 W maximum. Optional models have higher isolation characteristics. All units are designed to meet MIL-STD environmental specifications. —General Microwave Corp., 155 Marine St., Farmingdale, New York 11735.

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uv image converter

Ultraviolet image converter F4122 can be optically coupled to TV camera tubes, viewed directly, or directly coupled to film to provide nonvisible to visible conversion. The low gain device can be supplied with either a 4 cm diam, solar blind CsTe photocathode or one of several uv-visible sensitive photocathodes. The photocathode is formed on a magnesium fluoride input

window. The aluminized phosphor deposited on the fiber-optic output window has an antireflective coating. The tube is of metal-ceramic construction. It offers low voltage operation, compact size, and minimal weight. —Electro-Optical Products Div., Tube and Sensor Laboratories, 3700 E. Pontiac St., Fort Wayne, Indiana 46803.

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Laser

The model 41-75-01 helium-neon gas laser, designed for use in teaching principles of optics, generates a low-power, monochromatic beam at 6328 Å that is suited for classroom experiments, such as making and reconstructing holograms. It is designed to work with the manufacturer's laser experiment kit, an assembly of optical components that can be arranged to perform a number



of optical experiments from simple laws of reflection to holography. The laser is designed to be the subordinate player in the experiments, and is simple to operate, requiring no adjustment. Its low power beam meets 1976 safety regulations and cannot be used to burn or drill holes. The unit weighs less than 5 lb and will operate from any position. —Bausch & Lomb, Rochester, New York 14601.

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Logic analyzer

The LA 501 logic analyzer provides 4096 bits of data storage for display on any monitor or oscilloscope with x-y capability and at least 500 kHz bandwidth. Data are displayed in the form of a logic timing diagram. The data storage can be formatted as four channels by 1024 words, eight channels by 512 words, or 16 channels by 256 words. A choice of pretrigger, center trigger, or posttrigger modes allows the operator to select where the displayed block of data falls with respect to a trigger taken from his system. In the pretrigger mode, 94% of the displayed data occurs before the trigger. For the center trigger mode, 50% of the displayed data occurs before the trigger. Posttrigger provides a display with 94%

of the data occurring after the trigger, similar to conventional oscilloscope display. A choice of internal or external clock permits synchronous or asynchronous sampling. Sampling rate is 100 MHz in the four channel by 1024 word mode. A front panel selector switch provides compatibility with TTL or



ECL logic, and a third switch position provides an adjustable threshold from -10 to +10 V to accommodate other logic families. A position control allows any one channel of the display to be selected and moved vertically for comparison with other channels.—*Tektronix, Inc., Box 500, Beaverton, Oregon 97077.*

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Interference objectives

Two interference objectives for thin-film thickness measurements can be used with almost any microscope. They have a built-in two-beam interferometer that measures the thickness of layers, coatings, platings, etc., within 200 angstroms and 2 microns without contact of specimen. The use of these objectives with most available microscopes requires no special adaptation.—*Hacker Instruments Inc., P. O. Box 646, Fairfield, New Jersey 07006.*

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Thermocouple signal amplifier

The Omni-Amp I is self-powered, completely self-contained, and able to boost any millivolt signal from unity to 100 times that value. It eliminates the need for thermocouple and meter impedance matching when lead lengths are limited by impedance matching requirements. It is suited for use with very fine gauge thermocouples having a fast response but high resistance. This small amplifier can be employed in a thermocouple circuit either at the thermocouple or at a readout device having 1000 ohms or greater input impedance. Driven by two mercury batteries, the unit is plugged directly into a thermocouple circuit. A choice of seven fixed gains: 1, 2, 5, 25, 50, and 100 plus a variable gain is available. All are set by means of an externally accessible rotary selector switch; the eighth switch position

connects a self-contained potentiometer for continuously variable gains between 5 and 100. The frequency response is from dc to 100 Hz at a gain setting of 100, with higher frequency response at lower gain settings. The unit weighs less than 8 oz. The integrated circuit used in the system features a feedback gain control, precision metal film resistors, gold contact switching, and a battery test indicator.—*Omega Engineering Inc., Box 4047, Stamford, Connecticut 06907.*

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Coaxial adapters

Standard coaxial cable connectors, normally used for RG 58 and RG 59 cable, can be converted to coaxitube rigid cable connectors. The user replaces the braid clamp of the standard connector with the "Coaxitube" adapter. The new adapters are available in two sizes, one, A-19-22-2, for 0.085 in. coaxitube, and the other, A-51-05-11, for the 0.140 in. coaxitube. Samples will be furnished upon request.—*Kings Electronics Co., Inc., 40 Marbledale Rd., Tuckahoe, New York 10707.*

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New Literature

"Polarization and lasers"—Technical bulletin No. 7, 10 pp., reviews the basic principles of polarization as they relate to interfacing lasers with optical elements. Intended to aid system designers in applying the polarization phenomenon to optical problems, the bulletin covers polarization states of electromagnetic waves, polarization sensitivity of optical elements, polarization by reflection, and polarization by double refraction.—*Laser Products Div., Spectra-Physics, Inc., 1250 W. Middlefield Rd., Mountain View, California 94042.*

Conductive adhesive—Data sheet 556 describes Aremco-Bond 556, a silver-filled epoxy. The data given include volume resistivity, tensile shear strength, shelf life, pot life, thermal conductivity, and operating temperature range.—*Aremco Products, Inc., P. O. Box 429, Ossining, New York 10562.*

"ASTM publications"—The 1975-1976 list is available. This book is revised annually, and the current issue contains 30 pp. and lists more than 600 ASTM publications dealing with the standardization of methods of test and specifications for materials, the knowledge of materials, and materials evaluation. (letterhead request).—*ASTM, 1916 Race St., Philadelphia, Pennsylvania 19103.* □

COMPUTER PLOTTING



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