NEW PRODUCTS

The descriptions of the new products listed in this section are based on information supplied to us by the manufacturers, and in some cases by independent sources. PHYSICS TODAY can assume no responsibility for their accuracy. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

Control Electronics for Scanning Tunneling Microscopy

RHK Technology has introduced the STM 100, a self-contained controller incorporating all the circuitry necessary for the operation of any type of scanning tunneling microscope. The STM 100 can be used as a stand-alone device, or it can be interfaced with a computer.

In the computer mode, the STM 100 allows a computer to control data acquisition and storage. The addition of the firm's accompanying software allows the computer to perform image processing and display functions. In the stand-alone mode, the STM 100 will display images on a chart recorder or storage oscilloscope. The controller's electronics allow images to be taken at constant current or, alternatively, constant height. In addition to topographic images, z-position and bias-modulation inputs are provided so that one can produce local-barrier-height and spectroscopic images. *RHK Technology, 1750 West Hamlin Road, Rochester Hills, Michigan 48063*

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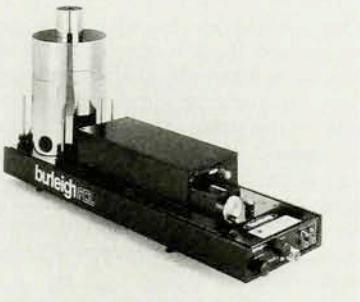
High-Power Tunable Infrared Color-Center Lasers

Burleigh Instruments offers a new series of color-center lasers. Newly developed NaCl crystals provide up to 350 milliwatts of TEM_{00} output power. These tunable infrared lasers offer continuous tuning from 1.50 to 1.70 microns. This new FCL-200 series is available in three configurations, offering single-frequency, multimode and synch-pumped mode-locked operation. The mode-locked version yields 200 mW of average power with pulse lengths of 15 picoseconds. The high output power and



broad tuning range of this new series of NaCl crystal lasers make them particularly useful for optical fiber research and spectroscopy, we are told. *Burleigh Instruments, Burleigh Park, Fishers, New York 14453*

Circle number 141 on Reader Service Card

Scanning Tunneling Microscope

Digital Instruments' Nanoscope II scanning tunneling microscope produces atomic-resolution images of conductor and semiconductor surfaces in air or under liquids. The microscope maintains angstrom vertical resolution while allowing lateral scans up to 9×9 microns.

The microscope's digital tracking system maps the topography of a sample by raster-scanning a tip across the surface and maintaining a constant tunneling current between the tip and the sample, with the tip typically staying a few angstroms above the surface. The z-axis feedback control, raster scan and all other instrument functions are generated by software on a dedicated digital signal processor.

With its 80386-based workstation, the Nanoscope II provides an extensive set of image processing tools: Top views, three-dimensional surface plots and line plots let one choose displays that enhance horizontal or vertical surface features. The system offers a complete set of data filters,

including convolution filters and Fourier-transform filters with a spectrum editor. The filter function is entered graphically and shown superimposed on the spatial frequency distribution of the image. Spectroscopic dI/dz and dI/dV measurement capacity will eventually be added to the Nanoscope II, we are told. *Digital Instruments, 135 Nogal Drive, Santa Barbara, California 93110*

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Fourier-Transform Raman Spectroscopy

Spex Industries is offering a new automated Raman spectrometry system with Fourier-transform capabilities. Fourier-transform Raman analysis in the near infrared with interferometric techniques can be used for numerous applications where background fluorescence and low spectral intensity had made conventional Raman spectroscopy virtually impossible.

The new Spex system incorporates a continuous-wave Nd:YAG laser for sample excitation, a near-infrared version of the Bomem Michelson 100 interferometer and a PC–AT-compatible control system. The system is designed to acquire spectra without the sample fluorescence problems typical of Raman spectroscopy with visible excitation. The system is claimed to provide wavelength accuracy an order of magnitude better than what one gets with conventional instruments. *Spex Industries, 3880 Park Avenue, Edison, New Jersey 08820*

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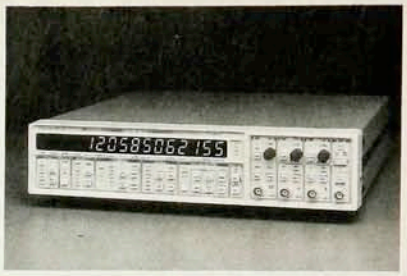
Counter and Timer with 4-Picosecond Resolution

The new SR620 from Stanford Research Systems is a reciprocal, interpolating counter–timer with 4-picosecond single-shot resolution for time intervals, and 11 digits of resolution for 1-second measurements of frequency. It can measure time interval, period, phase, pulse width, rise time and fall time, and frequency up to 1.3 GHz.

In addition to presenting data on the 16-digit LED display, the instrument provides an xy driver to an oscilloscope for displaying histograms and trends. Hard copy can be obtained through a printer port or on a plotter. Analog outputs allow strip-chart recorders to plot mean and



deviation; RS-232 and GPIB ports are included. Statistical functions programmed into the instrument calculate the mean, extrema, standard deviation and variance for up to 1 million samples. Two digital-voltmeter inputs and two digital–analog outputs can be set by the computer.

Options include a high-stability crystal time base and PC-compatible software for instrument control and data acquisition. The price of the SR620 is $3850. *Stanford Research Systems, 1290D Reamwood Avenue, Sunnyvale, California 94089*

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Faster Checking of Standard Resistors

A novel resistance scanner developed by Measurements International lets one check values of standard resistors without having to deal with leads held in a constant-temperature oil bath. This Model 4010M is described as a "true four-terminal resistance scanner." It is a switching device that provides an interface between a current comparator resistance bridge and the resistors being compared. The scanner offers unprecedented speed and convenience, we are told, without any trade-off in accuracy.

Normally in comparing standard resistors by substitution, one measures the resistance of one standard resistor against a primary standard, and then connects the second resistor in place of the first and repeats the measurement. When exchanging resistors, one must protect the bridge by reducing its current and galvanometer sensitivity to a minimum, and by turning off the bridge power. These steps, coupled with the need for physical reconnection of resistor leads and the subsequent warmup period, make for a rather tedious resistance measurement process, we are told.

Using the scanner, one avoids all this tedium. One need only turn down the bridge current and galvanometer sensitivity, switch the scanner to any one of ten resistors under measurement, and reset the bridge for sensitive balance indication at the

appropriate current. A model handling up to 20 resistors is also offered. *Measurements International, 955 Industrial Road, Prescott, Ontario, Canada K0E 1T0*

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Workstation for Surface Analysis System

Perkin–Elmer offers its new 32-bit Apollo workstation for surface analysis. Either of two Apollo workstation models, the DN 3000 or DN 4000, can be selected, depending on the application.

The Apollo workstation, combined with Perkin–Elmer's PHI software, is claimed to provide "a new performance benchmark for state-of-the-art surface analysis computer systems." The Apollo DN 4000 completes surface analysis software routines 7 to 60 times faster, we are told, than a 16-bit computer. Its 15-inch color monitor provides high-resolution display of menus, spectral data and graphics. A mouse or trackball control is provided to speed command and parameter entry.

PHI software packages for the Apollo computer are now available for various Perkin–Elmer SAM, ESCA and SIMS systems. All PHI surface analysis systems presently equipped with Perkin–Elmer 7000 series computers can be upgraded with the Apollo computer. Data conversion routines are also available to update existing data to the Apollo format. *Perkin–Elmer, Physical Electronics Division, 6509 Flying Cloud Drive, Eden Prairie, Minnesota 55344*

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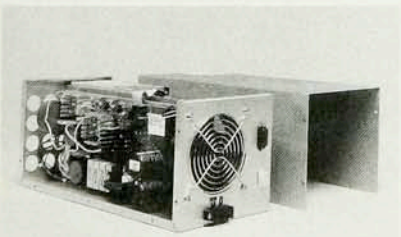
High-Voltage CO_2 Laser Power Supply

A. L. E. Systems offers a new high-voltage power supply for 20–100-watt CO_2 lasers. The new power supply



offers higher strike and operating voltages. It is available in several power ranges, offering "ballastless" operation to increase system efficiency and decrease heat loss.

The new A. L. E. supply offers higher output voltages than previously available, including strike levels of 20 kV or 40 kV per laser discharge section. The higher output voltages are intended for laser tubes of greater length or higher pressure, both of which generally increase laser output power.

These new power supply models—the CO2-125, CO2-250 and CO2-500—have current-controlled outputs from zero to full scale for stable operation over the laser input power ranges of 125 W, 250 W and 500 W, respectively. The user can control the output current in the laser discharge. Output voltage is automatically adjusted by the power supply's internal control network to achieve the current setting. Typically the output voltage is in the 6–12-kV and 12–24-kV ranges for the 20- and 40-kV strike units, respectively. *A. L. E. Systems, 150 Homer Avenue, Ashland, Massachusetts 01721*

Circle number 147 on Reader Service Card

Universal Rheometer System for Liquids and Pastes

The Rheotron-Comp from the German firm Brabender is a universal rheometer system for measuring rheological properties of liquid or pasty materials. The system employs a number of measuring methods, of which steady shear, oscillating shear and normal-force measurements are the most important. The system measures all rheological properties in absolute values, including normal force and viscoelastic behavior. It consists of the actual rheometer, a controller interface and an IBM PC Model 50 with peripheral units. The measuring process, storage and evaluation of the measured values are controlled by software.

The measuring systems make use of the Couette principle. The inner cylinder measures the transferred torque; the outer cylinder rotates at rates up to 1000 per minute or oscillates at rates up to 13 Hz. Rotational and oscillatory measurements, taken together, complete the rheological characterization of a material. *Brabender OHG, Kulturstrasse 51, Postfach 350162, D-4100 Duisburg 1, West Germany* ■

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