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.

Multichannel Alpha-Particle Spectrometry

EG&G Ortec is offering a new alpha-particle spectrometry system. The new Octete system connects to any multichannel analyzer to provide eight independent, high-resolution channels of alpha spectrometry. The internal vacuum manifold needs only a single vacuum connection. Vacuum integrity is ensured by an advanced sealing design and nickel-plated brass chambers. The instrument's front panel displays system parameters such as chamber vacuum, detector, bias and leakage current.

The Octete is compatible with any multichannel analyzer: stand-alone, PC-based or VAX-based. A companion product, the Octete-PC, includes a multichannel analyzer. Octete's detector elements can be either ion-implanted-silicon or silicon-surface-barrier charged-particle detectors. The detectors and the nickel chambers are easy to clean, we are told. *EG&G Ortec, 100 Midland Road, Oak Ridge, Tennessee 37831-0895*

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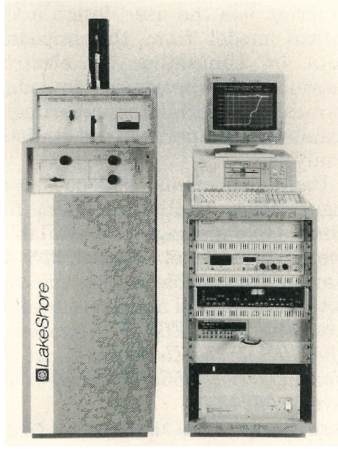
AC Susceptometer and DC Magnetometer

Lake Shore's new Model 7229 9-tesla susceptometer–magnetometer measures ac susceptiblity as a function of temperature, field amplitude and frequency. Providing low-field ac measurement sensitivity better than 2×10^{-8} emu, the Model 7229 is suitable for the determination of magnetic ground states and microstructures and for the study of magnetodynamics. The instrument also performs ac measurements in conjunction with dc bias fields up to 9 tesla for the study of field-induced transitions and the like.



In the dc moment measurement mode, the Model 7229 offers sensitivity up to 5×10^{-5} emu, with an effective dynamic range extending beyond 10^3 emu. As with all the Series 7000 instruments, the Model 7229 has data acquisition, control and analysis software for automated, unattended operation, and it is fully calibrated. With options for measurement of harmonic susceptibilities and ac and dc resistance, the Model 7229 is a multipurpose system for the study of transport properties. *Lake Shore Cryotronics, 64 East Walnut Street, Westerville, Ohio 43081-2399*

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Electrochemical Impedance Software

EG&G PARC has introduced its new electrochemical impedance software, Model 398. Among the new system's features are real-time on-screen plotting and single-sine measurement over an entire frequency range. The new software supports high-resolution hard-copy output to Postscript, HP laser printers, plotters and other devices. The software comes complete with the equivalent-circuit modeling program.

Real-time plotting lets the user

view an autoscaled Bose or Nyquist representation of the impedance data as it is collected. The software permits both single-sine and multisine techniques. Single-sine measurements can be performed from 1 MHz down to 50 μHz. To avoid long measurement times for a series of slow single-sine measurements in very low-frequency experiments, one can use the multisine technique. This allows experiments in the range from 50 μHz to 10 Hz to run in approximately half the time required by the single-sine technique, we are told.

The equivalent-circuit modeling program lets the user design a theoretical model from the impedance data by simulating an electronic network. A theoretical impedance plot can be overlaid on experimental results for comparison and statistical analysis.

Pull-down menus and pop-up dialogue boxes facilitate system functions. Help messages are available at every menu level. Model 398 software is compatible with a variety of potentiostats and analyzers available from the firm. *EG&G Princeton Applied Research, Electrochemical Division, PO Box 2565, Princeton, New Jersey 08543*

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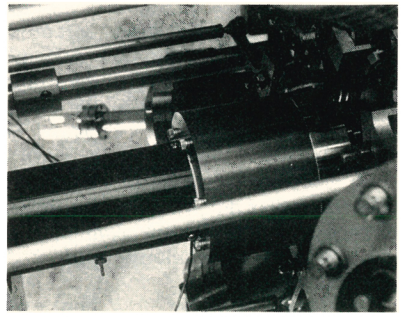
Ultrahigh-Vacuum Heated-Window Assembly

Intevac is offering a new ultrahigh-vacuum heated-window assembly, a high-temperature optical port window for visible and infrared transmissions, surrounded by a heated enclosure. The window heater design allows line-of-sight viewing into any ultrahigh-vacuum apparatus without incurring deposits of semiconducting material on the inner window surface. The heated-window assembly was originally designed for Intevac's MBE equipment line, but it can be used for any optical application requiring a heated view port.



the window heater design to provide feedback to a temperature controller. A user-settable controller can maintain the temperature of the window at any specified setting from room temperature up to 400 °C. The heated-window assembly is easily fitted onto any vacuum chamber with a standard 2.75-inch conflat flange. A small tabletop controller can be placed nearby and connected to the assembly with cables. *Intevac, MBE Equipment Division, 3560 Bassett Street, Santa Clara, California 95054-2704*

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Nested High-Voltage DC Accelerator

The NHVG nested high-voltage generator from PracSys is a dc accelerator capable of operating in the single-ended or tandem mode. It can generate electron, proton, heavy-ion and neutron beams for various applications.

Traditional dc accelerators consist of many high-voltage electrodes installed in a tank of high-pressure gas that serves as the electrical insulation. The NHVG, by contrast, uses a nested Faraday-cage arrangement to isolate and distribute voltages. Radiation-resistant plastics do the insulating that isolates the electrodes. This results in better mechanical and electrical stability, we are told, and it prevents transient electrical spikes or surges from causing the typical cascade breakdown common to dc accelerators.

The use of plastic insulators instead of gas insulation lets accelerating electrodes maintain higher voltages at closer spacing. Reductions in overall insulator thickness can be achieved if the insulator can be subdivided into a number of thinner sections with the voltage equally divided among the sections. The NHVG can be thought of as a series of nested, isolated conducting shells or electrical nodes with individual voltage sources between the nodes. This design results in a significant reduction in the size of the accelerator because each node can be isolated with a minimal thickness of insulator.

Power transmission to the NHVG accelerating electrodes is accomplished by transformer coupling. Individual electrode stages maintain a preset fraction of the total voltage developed across the accelerator. Thus the NHVG can continue to operate even if several stages fail. There is no risk of further damage to the machine. Servicing can be done with minimum disruption. Typically,

failed modular stages can be replaced in a day.

In the tandem mode, the NHVG can be designed as a MeV, 1.0-mA medical accelerator less than 10 feet long and weighing less than a ton. PracSys sells this configuration for making isotopes to produce medical diagnostic imaging systems. The NHVG thus replaces a 22-ton clinical cyclotron. The NHVG can also be used for ion implantation, to reduce the "footprint" of water-fabrication devices, electron beam or ion beam lithography, and analytic techniques such as RBS and PIXE. It can also serve as a high-power microwave generator. *PracSys, 400 West Cummings Park, Suite 6650, Woburn, Massachusetts 01801*

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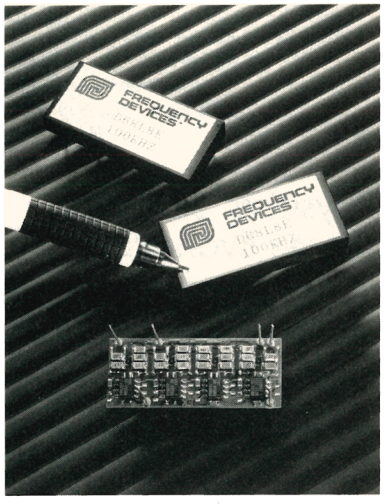
Linear-Active Multipole Frequency Filter

To complement its D70 line of DIP fixed-frequency linear-active filters, Frequency Devices has introduced the D68, a more sophisticated alternative for particularly demanding applications. The D68 has a broader frequency range, a wider choice of filter transfer functions and tighter tolerances than the D70, in a somewhat larger package. Like its smaller predecessor, the D68 requires no external components, clock signals or additional filtering. Low-pass and high-pass options let the user construct bandpass and notch filters with a minimum of board space. The D68 also retains the 0.3″ component height of the D70 to accommodate stacked-board system configurations.

For applications where filtered signal shape is more important than the steepness of the attenuation curve, D68 Bessel and Butterworth models keep harmonic distortion below -100 dB, with a theoretically unlimited attenuation floor. Filters with constant delay furnish more linear phase response, we are told, than Butterworth filters, as well as faster attenuation than Bessel filters, with an attenuation floor of better than -80 dB. Typical $\pm 1°$ phase matching from unit to unit permits precise signal comparisons between several filter channels.

Other applications require the "brick-wall" frequency response of a Cauer elliptic transfer function. The D68 is claimed to meet this need with its harmonic distortion of less than -100 dB and standard attenuation floor of better than -80 dB. Phase



matching of about $\pm 2°$ is sufficient for some tracking applications when an unexpected phase difference between two signals can mean inaccurate distance and position calculations. Higher-performance parts are available by special order. *Frequency Devices, 25 Locust Street, Haverhill, Massachusetts 01832*

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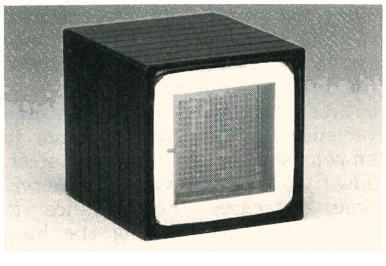
Photomultiplier Array for High-Energy Physics

Hamamatsu has introduced the H4140-20, a position-sensitive, 16×16 matrix array multianode photomultiplier assembly designed for high-energy particle detection. The H4140-20 is extremely stable in magnetic fields of more than 1.5 tesla, and it suffers crosstalk of less than 2%. The tube has a 3-inch-square bialkali photocathode and a proximity fine-mesh dynode with 16 stages. The quantum efficiency of the device is 20% at 400 nm, and its luminous cathode sensitivity is typically 60 μA per lumen.



The H4140-20 has a multipin connector output and a built-in voltage divider circuit. *Hamamatsu, 360 Foothill Road, Bridgewater, New Jersey 08807-0910* ■

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