# 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.

## High-speed, high-resolution analog-to-digital converter

Preston Scientific has introduced a new high-speed, multichannel analog-to-digital conversion system designed for high-accuracy conversion of wide-band analog signals in data-acquisition systems. The model GMAD1A-15B is a rack-mounted system available for both single-channel and multichannel applications that require a full complement of digital input and output interface signals.

Equipped with a sample-and-hold amplifier that provides an aperture time as short as 1 nanosecond, the GMAD1A-15B can be ordered with as many as 8 simultaneous sample-and-hold channels in a single chassis or up to 128 such channels in multiple-chassis systems. These instruments can include from 16 to 128 channels of single-ended differential analog signal multiplexing. The maximum full-scale input voltage level is 10.24 volts, and the dc crosstalk between channels is held to less than $\pm$ 0.005% of full scale. Additional signal conditioning amplifiers and anti-aliasing, filtering modules can be provided in a separate, rack-mounted chassis. *Preston Scientific, 805 East Cerritos Avenue, Anaheim, California 92805*

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## Hybrid photomultiplier for high-energy physics

The new Hamamatsu R1911-01 photomultiplier tube uses a hybrid-design dynode structure, combining a box-and-grid front end for good energy resolution with a mesh-type series of final stages for good pulse linearity. The pulse linearity is claimed to be less than 2% deviation at 50 mA and 1500 V, significantly better, we are told, than one gets from photomultipliers with standard dynodes.

Good energy resolution and high quantum efficiency are said to make this tube suitable for a wide range of high-energy-physics and medical-diagnostic applications because of its reduced length. This three-inch-diameter detector employs a bialkali photocathode with a spectral response of 300–650 nm. Its quantum efficiency is 28% at 390 nm. *Hamamatsu, 420 South Avenue, Middlesex, New Jersey 08846*

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## Microprocessor-controlled arbitrary function generators

Wavetek has introduced two new 12-MHz function generators, models 273 and 275, that feature, respectively, capabilities for arbitrary sweeps and arbitrary waveforms. Model 273, a swept-frequency function generator, has an arbitrary waveform memory that permits a programmable frequency sweep versus time. Typical sweep shapes are linear, log, haversine, noise, filter and square wave. The memory is 12 bits $\times$ 1000 pts. The user-defined waveform or sweep function is loaded on a GPIB bus using a bus controller, letting users program any sweep shape they wish. Three markers are available with digital frequency readout. Sweep memory, with two sections, can be preset or defined by the user, with 2 K of memory, half for each section. The stored setting memory is separate from sweep memory.

The Model 275, an arbitrary waveform function generator, provides 12

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bits of vertical resolution and 2 K points of horizontal memory, with an optional 8 K points of horizontal memory. The arbitrary waveform can be set from 267 ns to 267 s per step. Furthermore, the autoline allows interpolation of a straight line between any two points. The arbitrary monitor key displays the address of any point and the level of long waveforms, at least several seconds in length. The user can call from any segment of memory. One can also store more than one waveform and link contiguous waveforms. Several custom waveforms can be stored and called for at will. *Wavetek, 9045 Balboa Avenue, San Diego, California 92123*

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## Measurement of optical beam widths

Photon Technology has introduced the Beam Scan, an instrument designed to measure and display optical beam size digitally. The instrument employs a scanning slit that passes between a formed optical beam and a fixed silicon detector. Two slits are standard; they are electronically selectable with stock sizes of 2.5 and 25 microns. Other slit sizes and pinholes are also offered as options.

One of the major features of this instrument, we are told, is its compact two-inch-diameter cylindrical scan head, which mounts easily to the user's lens bench holders. The Beam Scan employs phase-locked-loop technology to make the measurement independent of motor speed. The smallest frequency count is spatially equal to 0.2 micron. The instrument can measure non-pulsed optical beams from 10 to 3000 microns in diameter. Options are available to extend this measurement range. Over four orders of magnitude of beam power can be accommodated. The instrument is intended for use with optical beams from sources such as CRTs, LEDs, incoherent sources, lasers and fiber optics. The manufacturer describes the Beam Scan as "an optical oscilloscope." *Photon Technology, 1191 Nikette Way, PO Box 20154, San Jose, California 95160*

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## Ferrous metals inspection device

A new materials inspection device employing a magneto-optic thin-film sensor has been developed by Spectron. The instrument produces visual images of near-surface material flaws, but it can also be used to image existing surface magnetic fields or to map fields associated with complex coil configurations. In some cases, it may be used as a replacement for conventional flaw-detection techniques such as magnetic-

particle, flux-leakage or dye-penetrant techniques.

The active element in the device is a 3-inch-diameter magneto-optic thin-film sensor with a switching field of approximately 3 gauss. The film is protected by a 5-mil-thick phosphor bronze shim in an ABS black plastic housing. Internal means are provided for magnetically biasing the test specimen.

The device weighs 4.5 pounds, including fluorescent light source, power supply, cables and electronics. The dimensions of the hand-held viewer are $9.5 \times 4.5 \times 4.0$ inches. The illustrations show the instrument and the image of an inch-long electro-discharge machined slot in mild steel, 0.1 inch deep by 0.01 inch wide. *Spectron Development Laboratories, 3303 Harbor Blvd, Costa Mesa, California 92626*

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## Four-channel digital boxcar averager

The model 4420/4402 digital boxcar from EG&G Princeton is a modular, microprocessor-based system designed to detect and analyze up to four simultaneous signals. The 4420 boxcar averager mainframe houses up to four gated-integrator modules. The 4402 signal processor maintains control over the 4420 and its modules and receives raw, digitized data from the modules via a local digital link. The 4402 contains a 68000 microprocessor, CRT display, front-panel keyboard, $5\frac{1}{4}$" floppy disk drive, and IEEE-488 and RS232 interfaces.

The 4420/4402 design, we are told, stresses versatility, general-purpose signal recovery and analysis, and the integration of boxcar functions with useful features of multipoint digital signal averagers and powerful data-acquisition systems. With a time resolution to 100 ps and a choice of exponential or linear signal averaging modes, this system can handle fast signals even in the presence of strong noise interferences, we are told. Results are stored in variable-length

memory arrays with a total of 8K data points. A built-in CRT offers annotated display of up to four curves simultaneously. The 4420 also performs as a high-speed sampling oscilloscope with full-scale sensitivity from $\pm 20$ mV to $\pm 5$ V.

Live signal-acquisition modes include waveform recovery, static gate, histogram and correlation. Post-acquisition processing modes include fast Fourier transforms, curve fitting, *n*-point smoothing, differentiation, integration, risetime computations and calculator-like manipulations. One can use the 4420 without the 4402 by interfacing the boxcar mainframe to a lab computer. An optional IEEE-488 card is available to broaden the list of compatible computers. Prices range from $8500 for a 4420 with one signal channel module to $17 000 for a comprehensive single-channel 4420/4402 system. *EG&G Princeton Applied Research, PO Box 2565, Princeton, New Jersey 08540*

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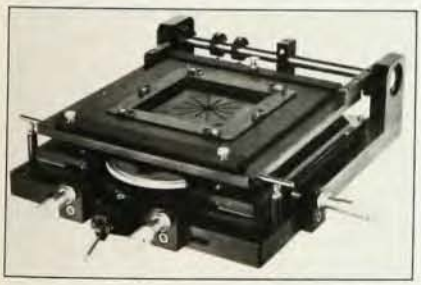
## Mask alignment for thin films

The Oriel 83210 is a photolithographic mask-alignment fixture designed for developmental and low-volume production use in microwave, hybrid and thin-film applications. Capable of handling up to 6-inch substrates and 7-inch masks, the 83210 can print in vacuum contact and proximity. A single vertical-motion thumbwheel sets the proximity between the mask and substrate.



For large-area substrates, a novel three-step alignment procedure is said to produce quicker registration than conventional aligners. *Oriel Corporation, 250 Long Beach Blvd, PO Box 872, Stratford, Connecticut 06497-0872*

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## Microinterferometer for optical fiber endfaces

Low-loss optical fiber connectors, splices, and input–output couplers all require mirror-flat fiber end faces perpendicular to the fiber axis. Newport's model F-IMI Fiber Micro-Interferometer is designed to facilitate the measurement of the cleave angle and surface quality of both single and multimode optical fiber end faces.

The instrument consists of a miniature Michelson interferometer with long-working-distance viewing optics. One simply places the bare or cabled fiber in the alignment and clamp assembly and brings the end face into focus to get fringes. These constitute a contour map of the fiber end surface. There is no damage to the fiber with this measurement technique because it requires no physical contact with the end face. Cleave angles can be measured to an accuracy of better than 5 milliradians for a 125 micron diameter fiber. The instrument can also be used like a microscope to view the fiber end face directly.

The model F-IMI is also available with adaptors for remote viewing with a video camera and for use in evaluation of connectorized fiber ends. The price for the basic unit is $4250. *Newport Corporation, 18235 Mt. Baldy Circle, Fountain Valley, California 92708*

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## Helium mass spectrometer leak detector

The new Ultratest F/TMP leak detector from Leybold-Heraeus is a helium mass spectrometer designed for leak-detection applications requiring minimal backstreaming or where an absolute minimum presence of hydrocarbon vapor at the test port is essential. This cabinet model utilizes a TMP150 rather than the standard diffusion pump. Options include autorange changer/computer interface and manual gross-leak bypass. Sensitivity for helium at full pumping speed is $2\times10^{-11}$ cm$^3$/sec (atmospheric). The response time to reach 63% of final leak reading, we are told, is 1.5 seconds. Filaments are resistant to dual burnout. *Leybold-Heraeus Vacuum Products, 5700 Mellon Road, Export Pennsylvania 15632* □

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