

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.

TTL and Sinusoidal Frequency Dividers

Avtech's new model AVX-FD2-PS frequency divider divides the pulse-repetition frequency of an input TTL pulse train by a specified factor that is variable from 2 to 255. The division factor is controlled by means of thumbwheel switches. The model AVX-FD2-PS will accommodate input-pulse repetition frequencies from 1 Hz to 100 MHz, and it provides a TTL level output that can drive 50 ohms. The output pulse width is controlled by a three-position range switch and a one-turn control. It is variable from 5 nsec to 5 μ sec.

With the -IP option, the unit will accept pulse or sine-wave inputs from 0.1 to 5 volts, peak to peak. A companion model, the AVX-FD1-PS, operates in the frequency range from 1 Hz to 10 MHz. It offers a division factor variable from 2 to 999.

Both models are housed in a 4 $\times$ 8 $\times$ 12-inch chassis with BNC connectors requiring 120/240 volts, 50-60 Hz prime power. The price is 995 US dollars. *Avtech Electrosystems, PO Box 5120, Stn. F. Ottawa, Canada K2C 3H4*

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Cyclotron-Resonance Microwave Plasma Source

Wavemat has introduced a new 25-cm electron-cyclotron-resonance microwave plasma source, the Model MPDR 325i. The design of this proprietary plasma source seeks to eliminate problems inherent in conventional divergent-field ECR plasma sources. Its magnet configuration produces very low fields outside the plasma source, and it permits internal tuning of the resonant cavity so that one need not tune a waveguide. Permanent magnets obviate electro-magnet power supplies, and a quartz



plasma chamber reduces secondary wall recombination and sputter contamination of the substrate.

The resulting output, we are told, is an easily controlled, highly dense and extremely uniform plasma at low energy levels. Applications include low-damage etching or cleaning of photoresists and other polymers, processing of silicon and group III-V materials, and plasma-enhanced vapor deposition of SiO₂, Si₃N₄ and similar materials.

The plasma source is self-contained. It can be installed on any vacuum chamber with a mating flange. The source is suitable for processing substrates up to 8 inches in diameter in both production and research. *Wavemat, 44191 Plymouth Oaks Boulevard, Suite 100, Plymouth, Michigan 48170*

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High-Energy Pulse Magnet System Exceeds 30 Tesla

Oxford Instruments is offering a new high-energy pulse magnet system that provides an extremely intense magnetic field pulse for short durations. This lets one do experiments that are not otherwise possible with commercially available hybrid-magnet technology. The system was de-

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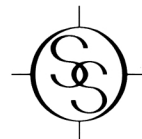
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veloped in a collaboration between Oxford Instruments, the high-field magnet laboratory in Leuven, Belgium, and Robert Clark of the University of New South Wales in Australia.

The system's source stores up to a megajoule for sudden release into a magnet. Oxford Instruments has achieved a 32.5-tesla pulse of 1-second duration with the first solenoid. Pulse magnet designs should provide fields up to 40 tesla. These designs use the same Magnabond technology with which a field of 20.7 tesla was reached last year using a commercially available superconducting solenoid.

The new pulse magnet system may be supplied with a variety of inserts for the temperature regime from 10 millikelvin to room temperature. Computer control facilities are provided, making possible a wide range of pulse shapes. The system has extensive safety features. The high-energy pulse-magnet system delivered to Clark forms the basis of a new Australian high-field magnet facility. *Oxford Instruments, Scientific Research Division, Research Instruments, Old Station Way, Oxford OX8 1TL England*

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Photon Tunneling Microscope

Dyer Energy Systems is distributing the new Pegasus 1010 "photon tunneling" microscope developed by Polaroid. The microscope provides real-time three-dimensional imaging and profilometry of homogeneous dielectric samples—even opaque ones—with a vertical resolution that is subnanometer over a vertical range of about 0.35 microns and a lateral resolution better than 0.16 microns. The observation point can be changed continuously in real time, to any direction and elevation, without moving the sample. No sample preparation is required, and measurements are made at atmospheric conditions.

Observations with the Pegasus 1010 are not affected by vibration.



There are no damaging electrons or scanning probes. The sample need not be cross-sectioned or coated. It remains dry.

Applications include the evaluation of thin-film microroughness, the measurement of pit depth in optical storage media, evaluation of magnetic media, characterization of polymer surfaces and polished optical surfaces, and imaging of porous silicon structures. Results can be recorded on Polaroid film, VCR or computer disc. *Dyer Energy Systems, 141 Middlesex Road, Tyngsboro, Massachusetts 01879*

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Coated Beryllium Foil for X-Ray Windows

DuraBeryllium is Moxtek's name for the beryllium foil or sheet it makes for x-ray windows. It is coated with a proprietary refractory material to make it leak-tight and resistant to moisture, abrasion and chemicals. The x-ray transmission of DuraBeryllium is virtually identical to that of bare beryllium, because the coating is very thin—usually between 0.5 and 2 microns—and it contains only elements below sodium in the periodic table. DuraBeryllium foils as thin as 8 microns are standard.

DuraBeryllium can be used for x-ray detectors, sources and process-control windows. Because it is cleanable, a DuraBeryllium window can increase the consistency and reliability of x-ray instruments and reduce the possibility of environmental beryllium contamination. *Moxtek, 7070 University Station, Provo, Utah 84602*

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8-Channel Time-To-Digital Camac Converter

Highland Technology's Model M680 is an eight-channel time-to-digital converter designed to record time of occurrence of eight independent electrical pulse inputs, each measured relative to a single common reference-event input. Each input channel can time its event with one-nanosecond resolution and 28-bit dynamic range. The module has provisions for adjustable input-logic levels and selectable edge-polarity. One can also combine channels to perform multihit event measurements.

The M680's highly linear time resolution requires a minimum of adjust-

ment. It is easily maintained and it employs standard bipolar and CMOS logic elements. All options are switch-selectable, including the ability to select standard (24-bit) operating modes. The single-width M680 meets IEEE 583-1982 CAMAC specifications. There is one common reference channel pulse-input plus eight individual event inputs and one event-veto input (for channels 1 through 8). There is one common-veto input (for the reference channel), one end-of-window logic-level input, one clear logic-level input and one external clock input. *Highland Technologies, 320 Judah Street, San Francisco, California 94122*

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Liquid Crystal Tunable Spectral Filter

Cambridge Research & Instrumentation has introduced the VariSpec, a new tunable spectral filter based on liquid crystals. The VariSpec is an electronically tunable light filter that uses liquid crystal elements for precise wavelength selection. It provides random wavelength access at video rates over a free spectral range of several hundred nanometers. The system consists of a compact optics module (82 mm × 62 mm) and an electronics module with an embedded microprocessor. The VariSpec is claimed to have significant advantages in aperture size (20 mm), field of view (10°) and operating convenience over other tunable light filters. Coupled with a CCD or film camera, it is suitable for imaging at wavelengths selected by the user.

The VariSpec provides much faster random access than a filter wheel, we are told, and it has no moving parts. In applications that do not require high image quality, the standard VariSpec provides an inexpensive, compact and rugged monochromator suitable for laboratory use or process control. *Cambridge Research and Instrumentation, 21 Erie Street, Cambridge, Massachusetts 02139*

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Wavelength-Dispersive X-Ray Fluorescence

The Siemens Model SRS 3000 wavelength-dispersive x-ray fluorescence spectrometer introduces some new sample-handling techniques. It has a robot-arm sample changer that is

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claimed to make it faster and more flexible than chain-drive sample-changing systems. The direct-access sample changer can also insert and remove uniformly sized samples from a single sample cup.

A new graphics-oriented user interface has been added to the software. The SRS 3000 can do a wide range of chemical analyses, including the determination of trace levels of light elements down to parts per million. *Siemens Analytical X-Ray Instruments, 6300 Enterprise Lane, Madison, Wisconsin 53719, or Siemens AG, Analytical Systems AUT V371, PO Box 21 1262, D7500 Karlsruhe 21, Germany*

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Fast Monolithic Sampling Amplifier

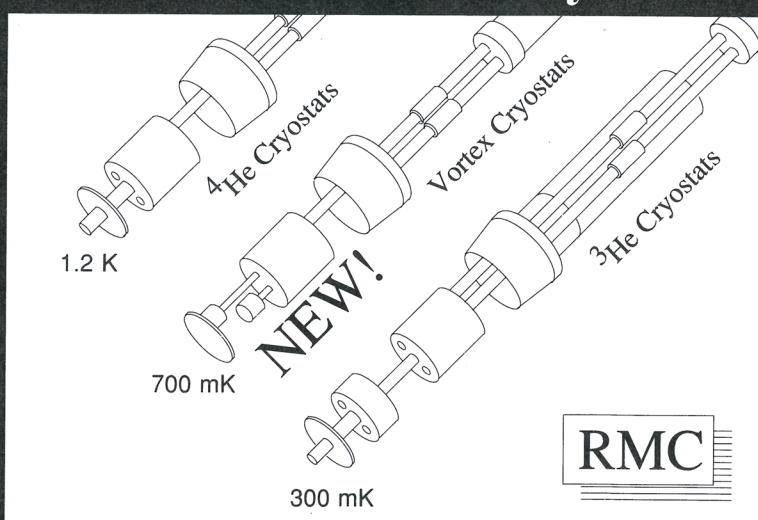
Analog Devices describes its new Model AD9101 Sampler as "the industry's fastest monolithic sampling amplifier." It consists of a track-and-hold amplifier followed by a fourfold amplifier. This innovative architecture, we are told, offers an unprecedented range of frequency vs. resolution performance characteristics: For 8 bits, the acquisition time is 5 nsec, and for 12 bits the acquisition time is 11 ns.

The unit price is \$33 for quantities over 100. The sampling amplifiers can be used in digital oscilloscopes, high-definition television cameras, spectrum analyzers and DAC de-glitchers, and for direct intermediate-frequency sampling. The instrument's architecture allows the front-end sampler to operate at relatively low signal amplitudes. This, we are told, yields dramatic reduction of distortion. The spectral noise in the track mode is typically only 3.3 nV/Hz^{1/2}, while the hold-mode harmonic distortion is typically -75 dBFS at 23 MHz. The output amplifier has a fast settling-time linearity characteristic. The resultant output is transparent to the low-signal-level distortion of the sampler. Output distortion levels reflect only the performance of the sampler.

Flash converters and analog-to-digital converters can benefit by having a Sampler at the input. The AD9101 can take highly accurate samples at input frequencies much higher than could previous track-and-hold amplifiers. It can hold these inputs to accuracies as high as 12 bits. *Analog Devices, Computer Labs Division, 7910 Triad Center Drive, Greensboro, North Carolina 27409*

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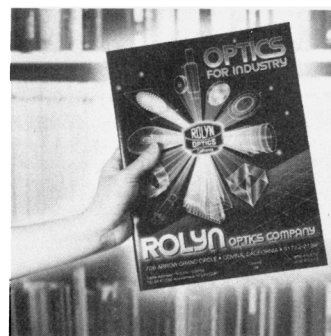
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