

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.

Pulse generator for high-speed gating

Princeton Instruments have introduced the Model FG-100 gate-pulse generator, primarily designed to provide high-speed gating of proximity-focused microchannel plate image intensifiers, although it is also useful for other applications requiring high-voltage pulses with rise times from a few nanoseconds up to a few microseconds. Among the features included in the system are a sensitive trigger detector for the detection of low-level (0.1 to 2V) external trigger pulses, either positive or negative, at frequency rates up to 5 KHz; a delay control, variable in three ranges from 20 nsec to 1800 nsec; a pulse monitor; a variable pulse width from 20 to 2000 nsec and a fixed pulse width of 3 to 5 nsec; and a repetition internal trigger pulse generator, 30 to 2000 Hz, with capability to trigger two separate devices at different times. *Princeton Instruments, P.O. Box 2318, Princeton, New Jersey 08540*

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Peak-reading portable Hall-effect gaussmeter

A new, general purpose peak-reading portable Hall-effect gaussmeter has been introduced by Walker Scientific. The model MG-5DP provides dc and ac magnetic field readings ranging from ± 100 milligauss to ± 19.99 kilogauss with true RMS readings from 3 Hz to 20 KHz. Featuring three full-scale bipolar ranges of ± 100.0 gauss, ± 1000 gauss and ± 10.00 kilogauss with 100% over-range and 0.05% resolution, it displays measured values on a $3\frac{1}{2}$ digit bipolar liquid crystal display. In peak mode, the MG-5DP will either detect the peak value when the field is bipolar or it can be set to exclusively detect either the positive peak or the negative peak of a varying field. It is

claimed that, because of the "unique" digital circuit design, there is no field decay in the peak mode.

Operating on ac or battery power, the instrument can be furnished with a wide selection of precalibrated interchangeable transverse and axial Hall probes (some capable of extending field readings to 150.0 kilogauss). In addition, analog outputs are also provided for simultaneous external monitoring



of both the instantaneous field level and the peak field level.

The Walker MG-5DP with probe is priced at approximately \$1400. *Walker Scientific, Rockdale Street, Worcester, Massachusetts 01616*

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Very high-speed supercomputer for matrix operations

Floating Point Systems have announced the newest member of the FPS-164 Scientific Computer Family, the FPS-164/MAX, a special-purpose supercomputer for certain key matrix operations, which is claimed to perform as rapidly as supercomputers priced 10 to 20 times higher.

Applications areas include structural analysis, computational physics and chemistry, semiconductor physics, and electromagnetic modeling. The MAX hardware is especially suited for high-speed performance of key matrix operations, such as dot products, matrix-matrix multiplication, and matrix factoring. The FPS-164/MAX configu-



PEARSON Wide Band, Precision CURRENT MONITOR

With a Pearson current monitor and an oscilloscope, you can measure pulse or ac currents from milliamperes to kil- oamperes, in any conductor or beam of charged particles, including those at very high voltage levels.

This monitor is physically isolated from the circuit. It is a terminated current transformer whose output voltage precisely follows the current amplitude and waveshape. A typical model gives an amplitude accuracy of $\pm 1\%$, -0% , 20 nanosecond rise time, droop of 0.5% per millisecond, and a 3 db bandwidth of 1 Hz to 35 MHz. Other models feature 2 nanosecond rise time, or a droop as low as 1% per second.

Whether you wish to measure current in a conductor, an electron device, or a particle accelerator, it is likely that one of our off-the-shelf models (ranging from $\frac{1}{8}$ " to 10 $\frac{3}{4}$ " ID) will do the job. We also provide custom designs to meet individual specifications.

Contact us and we will send you engineering data.

PEARSON ELECTRONICS, INC.

1860 Embarcadero Road
Palo Alto, Calif. 94303, U.S.A.
Telephone (415) 494-6444
Telex 171-412

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The Performers

DEPENDABLE

The 8075
A proven high performance ADC adaptable to virtually any application.

The 8075

- Full 8192 channel conversion gain and range
- Synchronized, crystal controlled 100 MHz clock rate
- Stability better than $\pm 0.009\%$ of full scale/ $^{\circ}\text{C}$
- Pulse pileup rejection input
- Pulse height analysis using either automatic peak detection or delayed triggering
- Analog sampling voltage analysis



CANBERRA

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One State Street
Meriden, Connecticut 06450
(203) 238-2351

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new products

ration is able to compute up to 124 vector operations at one time, allowing a fully configured 164/MAX to factor a 1000×1000 matrix in about 1 second, and to multiply two $10\,000 \times 10\,000$ matrices in less than one hour. The MAX offers high performance in matrix operations by incorporating VLSI chips into a highly parallel computer architecture. The FPS-164/MAX has all the scalar capability of the original FPS-164, a parallel-pipelined machine designed to run FORTRAN at high speed. A typical FPS-164/MAX system is priced at about \$450 000. *Floating Point Systems, PO Box 23489, Portland, Oregon 97223*

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Closed-cycle quarter-watt refrigerator for 4.5 kelvin

Cryosystems has announced its Model 4.2-025 close-cycle refrigerator system which provides $\frac{1}{4}$ watt of cooling power at 4.5 kelvin without consuming helium.

Optional features for the Model 4.2-025 include variable temperature, remote control and display of system parameters. The system is available in a variety of standard configurations for research on the Hall effect, Mössbauer spectroscopy and others. System prices begin at \$24 000. *Cryosystems, 190 Heatherdown Drive, Westerville, Ohio 43081*

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Computer-controlled automatic ellipsometer

Rudolph Research has announced its new Model 2000 FT automatic ellipsometer, especially suited for measurements of expanded film thickness and surface optical constants. Designed around the Rudolph dual-rail optical system, the 2000 FT is controlled by a full-function 16-bit computer for ease of use, rapid data collection, powerful data processing and future system expansion. Delta and psi precision of 0.001 degree is possible with signal averaging, whereas a precision of 0.01



degree is typical at a data rate of one measurement per second. Accessories include a proprietary autocollimating telescope for sample and instrument alignment, and auxiliary optical benches for attachment to high-vacuum systems. The basic ellipsometer is usable over a wavelength range of 250 to 2500 nm. Sources and detectors are currently available to cover the range from 350 to 750 nm. *Rudolph Research, 1 Rudolph Road, Flanders, New Jersey 07836*

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Beam expanders for multimode lasers

A new line of beam expanders designed primarily for multimode lasers has been introduced by Apollo Lasers. These optical systems can be used for decreasing the divergence of a laser beam that must either travel long distances or be focused to a minimum spot size; and for expanding the beam diameter to illuminate an object larger than the raw beam, to match it to the aperture of subsequent amplifier stages or decrease the power density within the beam.

Apollo's beam expanders are designed specifically with the larger beam diameters and beam divergences of multimode lasers in mind. These requirements greatly affect the design approach: One uses faster lenses and pays more attention to off-axis aberrations.

Apollo offers a choice of six models with expansion factors ranging from 2 to 6 and with entrance apertures up to $\frac{3}{4}$ inch. All use the Galilean design, which minimizes length and eliminates laser-induced air breakdown. *Apollo Lasers, 9201 Independence Avenue, Chatsworth, California 91311*

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Pressure transducer with optical sensor

Heise has introduced the Model 620 pressure transducer, whose optical sensor allows pressure measurement without mechanical contact with the pressure element. It is claimed that the sensor, with either a diaphragm or a Bourdon tube pressure element, provides accuracy within $\pm 0.15\%$ of span, including linearity and hysteresis. The repeatability is better than $\pm 0.005\%$ of span and stability is within $\pm 0.2\%$ of span over 12 months.

The simple design of the transducer offers calibration stability in pressure ranges from 0 to 50 inch water and 0 to 30 000 psi. Voltage outputs of 0 to 5 or 0

to 10 V dc are available, and voltage inputs and outputs are isolated to eliminate potential ground-loop problems in complex applications.

The transducer is contained in an aluminum housing with an epoxy finish and is equipped with either 1/4" NPT female or 1/2" male connections; a sealed housing is optional. *Heise, Dresser Industries, Route 25, Newton, Connecticut 06470*

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Programmable cryogenic thermometer and controller

Palm Beach Cryophysics announce their new Model 4025 and 4075 Cryogenic Thermometer-Controller. Both



units are designed with totally digital front ends and are available with many optional interfaces. The front panel utilizes touch-control switches that provide simulated digital computer signals for all active input and output parameters. A part substitution allows interfacing to computers (both micro and mini) through an IEEE-488 digital board. Four sensor inputs are available, and both internal and remote programming are possible. The operational range is 1.5-800 K. Both units are designed for use with closed-cycle refrigerators. One can control the system well by using the thermometer in conjunction with liquid-cryogen cryostats. *Palm Beach Cryophysics, Box 2786, West Palm Beach, Florida 33402*

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FORTRAN scientific subroutines for microcomputers

Wiley has published a FORTRAN Scientific Subroutine Library (by Peerles Engineering Service) consisting of 114 pretested and precompiled subroutines that can be put to use immediately.

The programs are designed for the IBM PC, IBM XT or any compatible computer. A minimum RAM of 128 K is required, as well as 2 double-sided disk drives. The programs require PC DOS or a version of MS DOS compatible with the FORTRAN compiler (Microsoft's FORTRAN 77 compiler, version 3.13 or later, or any similar IBM product). The Intel 8087 numeric coprocessor is optional.

The subroutines in the library cover, for example, formulas for general statistics, probability distributions, re-

gressions, matrices, polynomials, integrations, fast Fourier transforms, roots of biquadratic equations and cross tabulations.

The programs are said to have been "completely and thoroughly pretested for fault-free performance, and each is precompiled so that no preparation or re-keying is necessary." The source code for the subroutines is supplied in the documentation and on a diskette, so the programs can be easily compiled on a different system.

Because the subroutines are already compiled and included in a standard Microsoft library module, any call made to one of the routines from a user-written program will automatically be considered during linking, as will all underlying calls from within called routines.

A 400-page manual describes the methodology and provides examples of all subroutines. The FORTRAN Scientific Subroutine Library is priced at \$175.00 and comes complete with three diskettes—one contains the source code, one the subroutine library and one the test programs. *John Wiley and Sons, 605 Third Avenue, New York, New York 10158*

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New literature

RF testing accessories—Amplifier Research presents its complete line of rf testing accessories in an 11-page brochure that covers broadband antennas, transverse electric mode cells, field-sensor systems, leveling preamplifiers, fiber-optic telemetry systems, directional couplers, power combiners and dividers, matching transformers, computer-interface modules and system assembly kits. *Amplifier Research, 160 School House Road, Sounderton, Pennsylvania 18964-9990*

Vacuum components and pumps—A 20-page brochure from Leybold-Heraeus features a complete line of vacuum components and pumping systems, including cryopumps, rotary vane pumps, turbomolecular pumps and Roots pumps. *Leybold-Heraeus Vacuum Products, 5700 Mellon Road, Export, Pennsylvania 15632*

Arc lamp sources—Oriel's new 40-page catalog introduces a line of high-pressure xenon, mercury and mercury-xenon arc lamp sources. Included in this catalog are new housings for lamps from 75 to 1000 watts with built-in low r.f. arc lamp ignitors, low optical centerlines, condensing optics, compact xenon illuminators, and a wide range of accessories such as filter holders, folding mirrors, shutters, irises and secondary focusing lenses. *Oriel Corporation, 250 Long Beach Boulevard, Stratford, Connecticut 06497*

The Performers

INCOMPARABLE

The 8077

An ultra-fast
450 MHz
Wilkinson ADC
providing optimum
resolution at
high count rates



The 8077

- 450 MHz synchronized, crystal controlled clock rate
- Full 16,384 channel conversion gain and range
- Differential non-linearity typically less than $\pm 0.7\%$ over top 99.5% of range
- Stability better than $\pm 0.009\%$ of full scale/ $^{\circ}\text{C}$
- Digital stabilization option for both zero and gain.
- Pulse pile-up rejection input

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