

## 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.

### Color-center lasers

A new wavelength range of color-center lasers is available from Burleigh. Since 1978 Burleigh has produced the FCL color-center lasers for infrared spectroscopy. The systems are broadly tunable over the 2.3–3.3 micron region; they offer narrow linewidth, high output power and low beam divergence. The active medium has been either  $F_A(II)$  or  $F_B(II)$  alkali-halide crystals. A new class of defect-perturbed metal-atom color centers has now been discovered, allowing for highly stable cw and cw mode-locked laser action in the 1.4–1.73 micron region. In contrast to most  $F_2^+$  type systems, no decay in output power is observed under prolonged operation. The thermal stability of the defects at room temperature is excellent, we are told, permitting easy handling and storage of the crystals.

The standard Burleigh FCL has been modified to permit the use of crystals of  $KCl:Tl$  and  $KBr:Tl$  as the lasing medium. The only changes in the cavity are a different beamsplitter and grating, thus permitting retrofit to existing FCLs. The  $KCl:Tl$  crystal has produced several hundred milliwatts of multimode power with about 10% external efficiency when pumped by a Nd laser at 1.06 microns. Single frequency performance is said to be good, with up to 70% of the multimode output being condensable to a single mode. *Burleigh Instruments, Burleigh Park, Fishers, New York 14453*

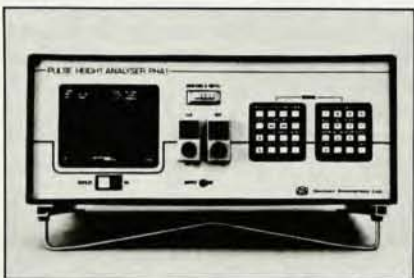
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### 1024-channel analyzer

Model PHA1 from Nuclear Enterprises Ltd is a compact, lightweight 1024-channel analyzer for nuclear spectrometry. It is said to "combine good performance characteristics with ease of use" in a Eurocard-based modular format. The new analyzer includes preamplifier, amplifier and high-voltage supply for direct connection of a scintillation detector to provide a complete radi-

ation measurement system.

A built-in raster-scanned monitor presents spectral and alphanumeric data. It is driven by a composite video signal brought to a rear-panel socket, enabling remote television monitors to be driven by a single coaxial cable. Alternatively, displayed information may be reproduced on hard copy by a



video printer connected to this socket. An RS232/29mA serial data port allows connection of a matrix printer for listing counts and integrated values over a region of interest. The serial port also permits the use of a digital cassette recorder to store and retrieve spectral data.

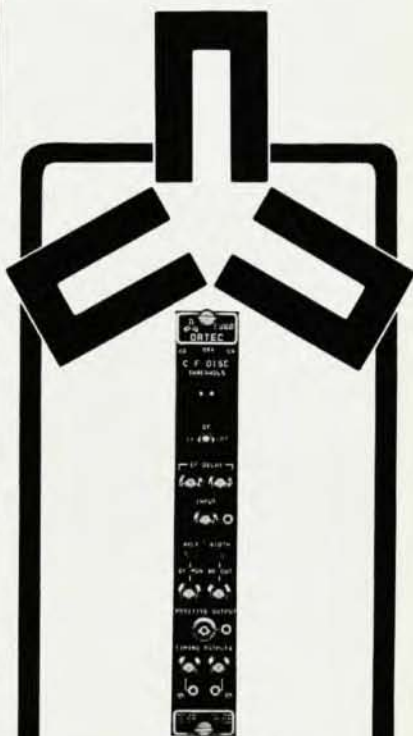
The PHA1's activity profile mode allows sequential storage of counts integrated over a region of interest to build up a profile of activity with time. PHA1's count capacity per channel exceeds 16 million; its adc differential nonlinearity is less than 0.8%; and the high-voltage supply goes up to 2500V. *Nuclear Enterprises Ltd, Bath Road, Beenham, Reading RG7 5PR, England*

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### AC load protector

MCG Electronics' series-900 ac power-load protector offers protection against overvoltages occurring when a heavy load drops off the line. When such drops last for seconds or minutes they can cause semiconductors to fail and electric machinery to burn out. The 900 also protects against microsecond spikes caused by lightning, switching surges, relays, solenoids and the like,

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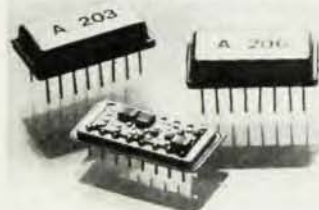
## NEW PRODUCT CHARGE SENSITIVE PREAMPLIFIERS



Models A-101 and A-111 are charge sensitive preamplifier-discriminators developed especially for instrumentation employing photomultiplier tubes, channel electron multipliers (CEM), microchannel plates (MCP), channel electron multiplier arrays (CEMA) and other charge producing detectors in the pulse counting mode.



Models A-203 and A-206 are a Charge Sensitive Preamplifier/Shaping Amplifier and a matching Voltage Amplifier/Low Level Discriminator developed especially for instrumentation employing solid state detectors, proportional counters, photomultipliers or any charge producing detectors in the pulse height analysis or pulse counting mode of operation.



### FEATURING

- Thin film hybrid technology
- Small size (TO-8, DIP)
- Low power (5-18 milliwatts)
- Low noise
- Single supply voltage
- 168 hours of burn-in time
- MIL-STD-883B
- One year warranty

### APPLICATIONS

- Aerospace
- Portable instrumentation
- Mass spectrometers
- Particle detection
- Imaging
- Research experiments
- Medical and nuclear electronics
- Electro-optical systems



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## new products

which can damage semiconductors cumulatively, causing random, unexplained failures. Spikes can also cause computers and microprocessor-controlled equipment to lose data and generate errors.

In protecting against sustained over-voltages, the 900 monitors the line voltage. When it senses a rise of 15 volts it disconnects the load from the line within 8 milliseconds. Standard models reapply line power automatically, but manual resetting is available as an option. A lighted indicator on the front panel indicates when load (output) ac voltage is present. It is extinguished whenever the unit operates to protect the load, or when ac input power is removed. The unit reacts to spikes in less than 15 nanoseconds, automatically resetting when the spike has passed. The unit is housed in a NEMA-12 enclosure, which is impervious to oil, dirt, dust, and bad weather. Models in the 900 Series are available for 120 and 240 V ac and for 10, 20, and 40 amps. Prices range from \$275 to \$725. MCG Electronics, 160 Brook Avenue, Deer Park, New York 11729

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## Reflectometer

The model 5500XF from Photodyne is claimed to be the first commercially available optical time-domain reflectometer that performs an active search and automatic reporting of discontinuities in fiber-optic cables. This reflectometer is microprocessor-controlled, with capability to measure fiber lengths up to 20 kilometers. Separate models are available for 50- and 100-micron-core fibers. A choice of connector interfaces is available: SMA-type, Deutsch, AMP, or bare fiber. A 200 mW laser at 830 nm with selectable



pulse widths from 20 to 100 ns gives a one-way dynamic range of 25 dB.

The instrument prompts the user to enter various operating parameters: index of refraction, a feet/meter option, and the required pulse width. A 16-character alphanumeric lcd readout displays the distance to the discontinuity and its magnitude in percent. If there are several discontinuities, the display will scroll, reading each discontinuity in sequence for a total of 99 reports. As a stand-alone unit, the 5500XF will measure length of fiber cable and distances to defects, connectors and splices with a resolution of one meter. When connected to an external oscilloscope, the instrument measures attenuation in the fiber plus the attenuation caused by splices and connectors, and reads it out directly in dB.

Model 5500XF is portable, with internal, rechargeable, long-life sealed lead-acid batteries. It is housed in a sealed carrying case. The unit measures 11 x 11 x 7 inches and weighs about 17 lbs. Prices are \$5850 and \$6200, depending on connector type. Photodyne, 948 Tourmaline Drive, Newbury Park, California 91320

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## Photomultiplier

The Hamamatsu R1294X tandem-microchannel-plate photomultiplier tube is a lightweight, easy-to-handle, two-dimensional image-intensification detector with high gain and a fast time response. It is claimed to be particularly well suited to high-energy-physics applications. The unit is designed to be less sensitive to magnetic field environments, and it provides immunity to after-pulsing.

The spectral response of the R1294X ranges from 300 to 650 nm. The rise time is 350 picoseconds at 3000 V. It has a quantum efficiency of 14% at 400 nm, we are told. The current amplification at 3000 V is  $10^6$ , with a peak radiant wavelength of 440 nm. The window material is borosilicate glass. Besides high-energy physics, microchannel-plate photomultiplier tubes have found wide application in image intensification, x-ray and ultraviolet detection, charged-particle detection and mass spectroscopy. Hamamatsu, 420 South Avenue, Middlesex, New Jersey 08846

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## Amplified photodetectors

The new series AD100 amplified photodetectors from Opto-Electronics are high-sensitivity, high-speed photodetector systems capable of detecting and



time-resolving the waveforms of weak, high-frequency cw or high-speed pulsed light in the visible or near infrared. Light input to the detector head is by way of an optical fiber, or directly from the radiation source. The signal output from the detector head can be displayed on any high-speed oscilloscope. The detector head is connected to either a line-operated or battery power supply, the latter making the AD100 portable for field work.

The specifications of the series AD100 are: bandwidth 500 MHz; pulse response, risetime 0.6 nsec and fwhm 1.0 nsec; flux responsibility 18 A/W; minimum detectable optical power 5 microwatts; and dynamic range 340:1. Two models are available—the AD110 and the AD120, employing large area Si and Ge photodiodes respectively. The diodes are coupled to a system of specially designed microwave amplifiers. The spectral response range of the AD110 is 300 to 1100 nm, and that of the AD120 is 500 to 1800 nm. The manufacturer stresses the high sensitivity, high speed, wide dynamic range, low temperature and voltage sensitivity and easy optical alignment of these detectors. Prices start at \$2400 for the AD110 and \$3900 for the AD120. *Opto-Electronics Ltd., Unit 9, 2538 Speers Road, Oakville, Ontario L6L 5K9, Canada*

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## Oceanographic monitor

Sea Data has introduced a self-contained data recorder that measures sub-surface internal wave activity for oceanographic research and off-shore drilling applications. The model 650-6IW wave monitor incorporates a high-capacity cassette recorder that stores 960 000 measurements. The 14-level sensor has a response time of ten seconds. Recording data at one-minute

intervals, it provides a detailed account of the size and location of internal wave activity over a 40-day period.

The 650-6IW employs a quartz clock and provides 10 switch-selectable scanning rates ranging from 1 per second to 1 per hour. It is powered by an internal battery pack. In-line mooring is provided by a Kevlar strain member with load capacity up to 2000 lbs. Sensor chain lengths up to 100 meters are available. The model 650-6IW internal wave monitor is priced from \$15 000, depending on configuration. *Sea Data Corporation, 153 California Street, Newton, Mass. 02158*

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## Cesium ion source

A new cesium ion source from Kimbal Physics can deliver a 5-microamp Cs<sup>+</sup> beam over a wide range of energies. The model IGS-4 UHV is intended for use in mass spectrometry, surface physics and accelerator physics. Cesium is generated *in situ* by a solid-solid chemical reaction, and it is surface ionized with a very low spread in beam energy. Beam divergence and alignment are both controllable by using a built-in electrostatic condenser lens and electrostatic deflection plates.

The source is not damaged by repeated exposure to atmospheric gases or water vapor while cold. All the safety hazards normally associated with dealing with cesium are claimed to have been eliminated. The source is 12.5 cm long; it is mounted on a standard 70-mm conflat flange. It can be run in vacuums from 10<sup>-4</sup> to 10<sup>-9</sup> torr; differential pumping is not required. By substitution of different user-replaceable source-firing units, alkali ion beams other than cesium can be generated. The beams can be generated down to low energies and very low currents. Power supplies are available. *Kimball Physics, Kimball Hill Road, Wilton, New Hampshire 03086*

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## New literature

The Powder Diffraction File, the standard reference source for powder diffraction analysis, has added a new set this year. Set 32 contains 1500 inorganic patterns and 500 organic and organo-metallic patterns. The file is available on cards, microfiche, tape, disk and computer time sharing. A descriptive brochure is available from JCPDS, International Center for Diffraction Data, 1601 Park Lane, Swarthmore, Pennsylvania 19081.

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