

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.

Laser mode locker

The need for stable ultra-short tunable pulses for research lasers has led to the development of a new generation of ion laser mode lockers. Coherent's model CR-467-SE frequency-synthesizing mode locker produces trains of pulses of typical duration 150 picosec with standard argon and krypton ion lasers. This is useful for time-resolved spectroscopy, synchronous pumping of dye lasers and communications applications.

The manufacturer reports a resolution of 1 Hz, twenty times better than previously available systems for optimized,



mode-locked pulses. The device features a novel micropositioning stage to facilitate transducer alignment and wavelength changes. Coherent Inc. claims a drift stability of ± 10 Hz over 5°C temperature changes, and a diffraction efficiency of 20% at 38 MHz. Three models are available: for frequencies of 38, 48 and 58 MHz. The price is \$11 000. Coherent, 3210 Porter Drive, Palo Alto, Calif. 94304

Circle No. 140 on Reader Service Card

Vacuum gauge

The Hastings digital 1-800 torr vacuum gauge, model DNNV-800, is a new absolute pressure gauge, with linear range of 0-800 torr, utilizing a small LVDT-type gauge tube to sense pressure. The gauge is unaffected by gas composition, and re-

sponds in milliseconds, with a three-digit display from 1 torr to atmospheric pressure.

The manufacturers claim exceptional stability and accuracy. The gauge has built-in dual set points, with set-point pressure displayed on the meter. Extension cables are available for remote readout. Teledyne-Hastings-Raydist P.O. Box 1275, Hampton, VA. 23661

Circle No. 141 on Reader Service Card

Photon counter

The Hamamatsu C-1230 photon-counting system permits detection of very low light levels for astrophysics, scattering photometry and luminescence studies. The manufacturers claim that their system provides significantly better signal-to-noise ratio than one can attain with chopped or dc current methods. The C-1230 is a complete system, with a power-supply-adjustable discriminator, remote preamplifier, and a choice of photomultiplier tubes from $1\frac{1}{8}$ to 2 inches diameter. The system allows one to record the photomultiplier pulse-height distribution directly, thus optimizing the dynode voltage and the discriminator setting. The price is \$3495. Hamamatsu Corp., 420 South Ave., Middlesex, N.J. 08846

Circle No. 142 on Reader Service Card

Hybrid amplifier pair

The Amptek model A-203 is a charge-sensitive preamplifier/shaping amplifier. It is designed to be used together with the A-206 voltage amplifier/low-level discriminator. This matched pair of new hybrid amplifiers has been developed for use in instrumentation employing solid-state detectors, proportional counters, photomultipliers or any charge-producing detector in the pulse-height analysis or pulse-counting mode of operation. These hybrid integrated circuits (16 pin, dual in-line package) have a single supply voltage, pole-zero cancellation, unipolar and bipolar outputs and adjustable dis-

DON'T SETTLE,
SELECT!
from our

**SPECTROMETER
SAMPLER**
(new catalog)

of
MONOCHROMATORS
AND
SPECTROMETERS
from 0.22 - 1.26 m

SINGLE
DOUBLE } GRATING
TRIPLE }

EVACUABLE
SPECTROGRAPH
POLYCHROMATOR

MODULARIZED
ACCESSORIZED
RAMANIZED

ECONOMIZED
or
LUXURIZED

VERSATILE
and
DEPENDABLE

SPECIALISTS
in
SPECTROSCOPY

SPEX

INDUSTRIES INC. • (201) 549-7144
BOX 798 METUCHEN, N. J. 08840

Circle No. 46 on Reader Service Card

"This MCA Is
FANTASTIC!"

AND IT COSTS LESS THAN \$2000



Model 256 MULTICHANNEL ANALYZER

STANDARD

- Data Display
- Split Memory (128/128)
- Built-in Linear Amplifier
- Scope Output
- Marker Cursor
- Data Add, Subtract
- Multi-Scaling

OPTIONS

- 8080A, S-100 Data Processor
- Scope
- High Voltage
- Strip Chart Plot Output
- Printer Output
- Gated Input
- Peak Sum

Ask for FREE Brochure

the Nucleus INC.

P.O. Box R, Oak Ridge, TN 37830
615/482-4041, 615/483-0008

Circle No. 47 on Reader Service Card

SUPERCool

Thermoelectric PMT Chamber

AT LEAST 60°C COOLER

cathode operating temperature is provided by this new, water-cooled PMT housing. Temperature stability is $\pm 0.05^\circ\text{C}$. No bulky compressor means high reliability. Model TE-210 TSFR end-window tubes (and side-window version) provide fully wired socket assembly for all standard PMTs. Also — Front Mounting Adapter and 19" Relay Rack Controller. It accepts options offered for all standard PFR chambers.

Call (617) 774-3250
or write:



Ask about our new
21-pin Ceramic Socket for
cooling to dry ice temperatures.



Products for Research, Inc.

78 Hollen Street, Danvers, MA 01923
CABLE: PHOTOCool TELE: 94-0287

Circle No. 48 on Reader Service Card

new products

crimination level. The manufacturer claims low noise and power dissipation (18mW). They are intended to replace larger units in complex multi-detector systems where size and power dissipation are a problem. Each amplifier is priced at \$145. *Amptek Inc., 6 De Angelo Drive, Bedford, Mass. 01730*

Circle No. 143 on Reader Service Card

Digital electrometer

A new digital electrometer, the Keithley model 642, uses MOSFET technology to measure currents down to 10^{-17} amps. Unlike analog devices, whose resolution is limited to 1% of full scale, the digital format allows resolution down to 0.005% of the input signal. The 642 is used for



direct reading measurements of voltage, current or charge. Voltage measurements range from 10 microvolts to 10 volts with 10^{16} ohm input resistance.

At this level of sensitivity, the limitation in the direct-reading current mode is not the input amplifier but the random noise in a 10^{12} ohm resistor in the feedback. Therefore, the best measurement sensitivity is obtained in the charge mode. The 642 features a drift compensation that makes measurements less sensitive to variations in ambient temperature. All ranges are direct reading from the half-inch LED display on the mainframe. This is connected to a remote head, which contains the low-current MOSFET, the preamplifier and the feedback circuitry. The head is to be located close to the experiment. The price is \$3395. *Keithley Instruments Inc., 28775 Aurora Rd., Cleveland, Ohio 44739*

Circle No. 144 on Reader Service Card

Spectroscopy ADC

The LeCroy model 3511 is a high-speed high-resolution, ultralinear analog-to-digital converter for gamma and x-ray

spectroscopy applications. It offers 250 to 8000 channel conversion gains, with conversion time of only 5 microseconds for an 8000-channel conversion. Integral and differential non-linearities are better than $\pm 0.025\%$ and $\pm 0.75\%$ respectively.

The module operates in either peak detect mode, with coincidence gating, or strobed sampling mode for slowly varying signals. Inputs up to 8 volts can be accepted with risetimes of 6.25 to 100 microseconds. Discriminators and zero adjust are set by 22-turn potentiometers with settings read on an LED display. An ADC "busy" output is available for measuring deadtimes and enabling successive ADC's. Thus with several 3511's cascaded, deadtime of the analysis system can be effectively eliminated.

Model 3511 is a high-density single-width CAMAC Module, about one fifth the size of most NIM ADC's. *LeCroy Research Systems Corp., 700 S. Main St., Spring Valley, N.Y. 10977*

Circle No. 145 on Reader Service Card

Excimer laser

The newest of Tachisto's line of uv and ir TEA lasers is the multigas 100XR excimer laser. A new discharge configuration provides increased output and ease of operation. The laser operates on most known rare-gas-halogen lines as well as with F, N₂ and CO₂. The pulse rate ranges up to five pulses per second, with output per pulse (at 1 Hz) in excess of 270 mJ with KrF, with a pulse-to-pulse reproducibility of about $\pm 2\%$. The laser can be operated with pre-mixed gas fill or with Tachisto's gas mixing/circulating system. The price is \$11 900, complete with power supply and controls. *Tachisto Inc., 13 Highland Circle, Needham, Mass. 02194*

Circle No. 146 on Reader Service Card

Semiconductor lasers

Exxon's Optical Information Systems Division has introduced a new line of semiconductor lasers. These AlGaAs striped double-heterostructure lasers are all available at the elusive 800-nanometer wavelength as well as at 835 nm. Hybrid integrated feedback detectors for controlling the laser output are available with all models. These lasers are designed primarily for fiber-optics communications and data transmission. Modulation rates exceed 1 GHz. The OL series 4000 and 5000 lasers feature standard threaded optical connectors for "optical plugability," and the OL series 3000 and 4000 devices electronically plug into standard circuit boards, requiring no soldering. The OL 5000 series, designed especially for high-speed and long-distance fiber-optics transmission has standard integrated-circuit connectors and fiber-cable pigtails. It offers electro-optical linearity and fundamental transverse mode up to

18 milliwatts. Prices range from \$1000 to \$4000. *Optical Information Systems, 350 Executive Blvd., Elmsford, N.Y. 10523*

Circle No. 147 on Reader Service Card

Oscilloscope

The Tektronix model 7104 general-purpose plug-in oscilloscope features unusually broad bandwidth and fast writing rate. With a bandwidth of 1 GHz, it has a photographic writing speed of 20 cm/nanosecond. Tektronix claims that its brightness exceeds by two orders of magnitude that of previously available high-speed oscilloscopes, making it possible to observe very-high-speed single



event pulses in real time. The risetime is less than 350 picoseconds.

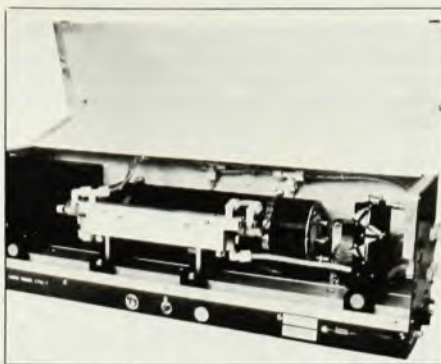
The oscilloscope incorporates a distributed horizontal deflection system, a meshless scan expansion lens and a micro-channel plate electron multiplier. These features have not previously appeared together in a production instrument. The base price is \$14 400. *Tektronix, P.O. Box 500, Beaverton, Oregon 97077*

Circle No. 148 on Reader Service Card

Tunable dye laser

The Candela LFDL-1 longitudinal-flow dye laser is a tunable high-average-power instrument, providing 1 to 2 watts at a repetition rate of 10 to 20 Hz. A built-in regulated 1 kW high-voltage switching supply makes energy input per pulse independent of repetition rate. A three-prism tuner eliminates the problem of tuner burning at full power.

The laser has a low-beam divergence of 3 to 5 mm-mR and amplitude jitter less than $\pm 5\%$. Thyatron switching keeps sync jitter below ± 10 nanosec. The flash lamp provides more than 10^6 shots, and dye life exceeds 10^6 joules/liter. The



built-in refrigeration system obviates an external cooling water supply. The LFDL-1 dye laser is priced from \$18 000. *Candela Corp., 96 South Ave., Natick, Mass. 01760*

Circle No. 149 on Reader Service Card

New literature

Computer—The new DEC modular laboratory computer system, "MINC" is described in a 12-page brochure. The brochure describes the "MINC BASIC" software, user-tailorable hardware configurations, and the possibilities for interfacing and using internal standard modules. Illustrations are provided of the graphics-oriented CRT, the floppy-disk storage drive and the MINC interfacing modules. *Digital Equipment Corp. Maynard, Mass. 01754*

Subroutine library—The seventh edition of the IMSL library of mathematical and statistical subroutines has just been released. The library consists of 458 Fortran subroutines useful in scientific programming. The expanded seventh edition is available for all popular American main frames and most minicomputers. Additions to the library include 38 basic linear-algebra codes. The documentation of routines has been substantially improved. *International Mathematical and Scientific Libraries Inc., 7500 Belaire Blvd, Houston, Texas 77036*

Digital-storage oscilloscopes—Two digital-storage oscilloscopes are described in a 6-page illustrated bulletin (#449-5) from Gould Inc. The scopes are claimed to offer flicker-free and fade-free viewing of long-term events and transients. Models OS4000 and OS4100 feature an 8-bit by 1024-word random-access memory, and simultaneous viewing of stored and real-time waveforms. *Gould Inc. 3631 Perkins Ave., Cleveland, Ohio 44114*

there is a difference

when it comes to CRYOGENIC INSTRUMENTATION, SENSORS & SYSTEMS

Only Lake Shore Cryotronics, Inc. provides state-of-the-art sensors, instrumentation and closed and open cycle refrigeration systems for virtually every cryogenic application.

INSTRUMENTATION

- Digital thermometers 1-400 kelvin
- Digital thermometer/controllers 1-400 kelvin
- Ultra stable precision controllers 1-400 kelvin
- High stability fixed and programmable current sources
- Liquid level readouts and controls
- Vacuum regulator valves



Model 329
Vacuum Regulator Valve

SENSORS

- Germanium resistors <0.05 K to 100 K
- Carbon glass resistors <1 K to 100 K (300 K)
- Silicon diode sensors 1 K to 400 K
- GaAs diode sensors 1 K to 400 K
- Platinum resistors 20 K to 900 K
- Capacitance sensors <1 K to 300 K
- Rhodium iron resistors
- Chromel-gold/iron thermocouples
- Hall generators

SYSTEMS

- LTS-21 closed cycle refrigerator systems
- ± 0.003 K to ± 0.5 K stability
- <10 K to 300 K temperature range
- State-of-the-art instrumentation
- Complete accessories
- CT-310-LHe continuous flow variable temperature cryogenic systems
- <2 K to 300 K temperature range
- State of the art instrumentation
- Complete accessories
- ± 0.003 K to ± 0.5 K stability

In Europe: Cryophysics

Oxford, England (865) 722824
Darmstadt, W. Germany (6151) 74081
Geneva, Switzerland (22) 329520
Versailles, France (1) 9506578

In North America:
Leave it to . . .



**LAKE SHORE
CRYOTRONICS, INC.**

64 East Walnut St. Westerville, Ohio 43081
(614) 891-2243 Telex: 24-5415 Cryotron WTVL

Circle No. 49 on Reader Service Card

PHYSICS TODAY / APRIL 1979