

new products

The items listed have been selected from among those appearing concurrently in "New Instruments" or "New Materials and Components" in *Review of Scientific Instruments*. We gratefully acknowledge the cooperation of the editor of *RSI*, J. B. Horner Kuper, the associate editor for New Instruments, Joshua Stern, and the associate editor for New Materials and Components, R. K. Eby.

These descriptions are based on information supplied by the manufacturer and in some cases from independent sources. Neither *Review of Scientific Instruments* nor PHYSICS TODAY assume responsibility for their correctness.

Graphical digitizer

The E241 digitizer system for extracting coordinate and other position-dependent information from graphs, photographs, maps, and strip charts, is pressure sensitive, and is activated by touching the point to be digitized with a pencil or a ball-point pen. No special stylus or connecting cord is required. Interfaces integrated into the digitizer permit the unit to be



plugged directly into terminals, card punches, calculators, and minicomputers for accumulating and processing data, so that geometric parameters such as areas under curves, areas within irregular boundaries, and lengths of curved line segments can be readily calculated.—*Elographics, Inc.*, 1976 Oak Ridge Turnpike, Oak Ridge, TN 37830.

Circle No. 140 on Reader Service Card

Laser beam expanders

Computer-matched pairs of input-output lenses provide expansion ratios of 5 $\times$, 10 $\times$, 25 $\times$, and 50 $\times$ over a wide wavelength range. The smaller three are Keplerian and therefore allow spatial filtering to be performed; the

larger is Galilean to reduce the tube length to a usable size. All will accept input beam diameters up to 2 mm. The throughput at 2-mm beam diameter is 86%; at 1-mm beam diameter it is 99.8%. These lenses are made of high-index optical flint to help reduce the far-field angular beam radius. All are antireflection coated and available from stock. Sets consisting of a common input lens and various output expansion lenses are also available.—*Melles Griot*, 1770 Kettering St., Irvine, CA 92714.

Circle No. 141 on Reader Service Card

Digital signal analyzer

The NS-570A is a fixed program, multi-purpose digital signal analyzer capable of performing single-input, dual-input, X-Y, high-speed, and artifact reject signal averaging, pulse counting, time interval distribution, time interval trend, frequency distribution, and pulse height analysis measurements. The system also provides a library of data processing functions, including bidirectional additive transfer, integration with trial mode, differentiation, three-point curve smoothing, constant add-subtract, auto baseline restoration, X-axis data shift, and spectrum normalization. These processing operations may be applied sequentially to accumulated data. Processed data may be output to optional peripheral equipment individually or sequentially. An auto program mode permits successive data accumulation, readout, and data erasure sequences to be performed automatically. The oscilloscope displays during accumulation and for readout of accumulated data. Alphanumeric indicating accumulated count level, address location, and number of sweeps performed are



It's Duck Soup...

**TO RECOVER
NANOSECOND
SIGNALS with
PARC's Model 162
Boxcar Averager and
Model 163 Fast
Sampler Plug-in
Module.**

The Model 163 offers

- Sampling Resolution selectable from 100 picoseconds to 1 nanosecond
- Flexible dual sampling gates for signal baseline drift compensation or for comparing two separate portions of the same signal
- Wide range of averaging time constants for optimizing trade-off of measurement time and desired signal to noise improvement
- High performance even at low repetition rates
- Reliability, low cost and ease of operation



We also have the Model 164 Plug-in for slower signals. Write or call for our FREE Signal Averager brochure. Princeton Applied Research Corporation, P.O. Box 2565, Princeton, NJ 08540; Phone: 609/452-2111.



**PRINCETON
APPLIED
RESEARCH**

Circle No. 53 For Information
Circle No. 54 For Salesman to Call
PHYSICS TODAY / JUNE 1977

PREAMP- AMP- DISC



Model 509
\$265.00



- Charge Gain - 12 Volts per Picocoulomb
- Integral Linearity -0.1% to +10 Volts
- Variable Discriminator Threshold - - 100 Millivolts to 10 Volts

Mech-Tronics

NUCLEAR

430A Kay Ave., Addison, IL 60101

**For more information
WRITE OR CALL COLLECT
(312) 543-9304**

Circle No. 55 on Reader Service Card

new products

dynamically displayed during both acquisition and readout. An address select control moves an intensified cursor to a desired data point, reading out the address number and accumulated data within the address. Data may



be stored in full memory or in quarters or halves of the memory. A digitally controlled spectral overlay feature permits direct comparison of spectra contained in different memory groups.—*Tracor Northern, Inc., 2551 West Beltline Hwy., Middleton, WI 53562.*

Circle No. 143 on Reader Service Card

High-frequency probe

A new probe conveniently converts dc voltmeters into high-frequency ac voltmeters by producing a dc output voltage equal to the rms value of a sine wave input. The new P6420 probe measures high-frequency ac voltage from 10 kHz to 1 GHz. Because of the flat frequency response of the probe, the output flatness of a sine wave generator can be measured easily. Designed to be used with digital multimeters which have 10-M Ω inputs, the P6420 is compatible with the Tektronix DM 44, DM 501, DM 502, and 7D12/M1. When used with oscilloscopes which have 1-M Ω inputs and other types of dc-sensing instruments with input resistance other than 10 M Ω , the dc reading will be directly proportional to the sine wave input but not equal to the rms value.—*Tektronix, Inc., P.O. Box 500, Beaverton, OR 97077.*

Circle No. 144 on Reader Service Card

Spectrum analyzer

Designed for analysis of sources of noise and vibration, the model 444 fast Fourier transform analyzer combines ten capabilities in one portable unit: spectrum analyzer, oscilloscope, transient recorder, range translator (optional), $\frac{1}{2}$ octave analyzer (optional), computer, computer interface (optional), A-weighting network, digital

voltmeter, and logic tester (optional). By means of its built-in microprocessor, it can compute the following: calibration in linear engineering units, V, V², dBV, or dBR; ratio and difference comparisons of spectra stored in dual memories; $\frac{1}{3}$ or $\frac{1}{2}$ octaves in two additional memories; A-weighted sound spectrum; total signal rms energy; readings in cpm; harmonically related frequencies; and do-it-yourself logic troubleshooting. Basic performance includes 400-line resolution, increased by a factor as great as 2000 with an optional built-in expander, and ranges from 0–1 Hz to 0–100 000 Hz.—*Nicolet Scientific Corp., 245 Livingston St., Northvale, NJ 07647.*

Circle No. 145 on Reader Service Card

uv laser

The 150 XR uv excimer laser can be operated in three distinct regions of the ultraviolet spectrum by appropriate choice of optics and lasing medium. With a mixture of xenon, fluorine, and helium, output can be obtained on several lines between 348 and 353 nm. Total multimode energy is typically 60 mJ in a 20-nsec pulse, giving a peak power of 3 MW. When the xenon is replaced with krypton, 100-mJ, 4-MW pulses are obtained near 249 nm. Using a mixture of argon, fluorine, and helium, 50 mJ has been achieved at 193 nm. Some degree of wavelength



tuning can be obtained in each case by substituting a diffraction grating for the totally reflecting rear mirror supplied. The optimum gas mix is different for each case; typically, only 0.2% F₂ is used, so that corrosion and venting are not serious problems. In order to obtain constant output, a slow flow of gas is necessary. Closed off operation is also possible, but with the output energy decreasing about 0.1% per shot. A recirculating gas system is planned as an accessory to reduce operating costs. The instrument is packaged with self-contained power supply and EMI shielding.—*Tachisto Inc., 13 Highland Circle, Needham, MA 02194.*

Circle No. 146 on Reader Service Card

Digital panel meter

The AN2570 $3\frac{1}{2}$ -digit panel instrument features low cost, accuracy $\pm 0.05\%$ of reading ± 1 count, bipolar differential input, a built-in input signal enhancement filter, and input protection to

± 300 V dc or ac rms. Bias current is 50 pA, input resistance is greater than 1000 M Ω , range temperature coefficient is ± 35 ppm of reading per $^{\circ}\text{C}$, and maximum zero drift is held to 1 $\mu\text{V}/^{\circ}\text{C}$. Operating temperature range is -10 to $+65^{\circ}\text{C}$. A choice of ± 1.999 or ± 199.9 mV full scale is offered, and four power options are available. Standard display and conversion control signals include hold, blank, display test, EOC, and overload. Also standard are automatic zero, automatic overrange indication, automatic polarity, three-



four-wire ratiometric operation, and externally programmable decimal point. A latched and buffered parallel BCD output for driving long data lines is available as an option.—*Analogic, Audubon Rd., Wakefield, MA 01880.*

Circle No. 147 on Reader Service Card

High-temperature valves

A 1½ in. pneumatic polyimide-sealed valve is available. It has high radiation tolerance and is designed for applications requiring higher bakeout temperatures and lower permeability than those possible with Viton seals. A manual model is also available. Both models are right-angle designs with a conductance rating of 42 l/sec. Vacuum range is from atmosphere to below 1×10^{-9} Torr.—*Varian Palo Alto Vacuum Div., 611 Hansen Way, Palo Alto, CA 94303.*

Circle No. 148 on Reader Service Card

Waveform recorder

The model 6500 waveform recorder resolves input signals to 1 part in 64, with selective sample rates from dc to 500 MHz. Input bandwidth extends from dc to 100 MHz for dc coupling in all ranges. Internal sample rates are selectable from 2 nsec to 1 sec per sample. The recorder can be configured to capture information prior to a selected trigger event, around the trigger event, or at a selected interval downstream from that event. The rate at which samples are stored into the solid state memory is determined by

the time base selection. Once data have been stored, they may be viewed on a variety of monitors or oscilloscopes. Stored data are reconstructed by means of a digital-to-analog converter at 1-MHz rate, repetitively for flicker-free presentation, or at a 100-kHz rate for input to a signal averager or analyzer. The information may also be provided at a slow rate compatible with an X-Y or stripchart recorder. Digital access to the memory via a bit parallel, word serial, handshake data exchange allows transfer of the data to a digital memory, calculator, or computer.—*Biomation, 10411 Bubb Rd., Cupertino, CA 95014.*

Circle No. 149 on Reader Service Card

New Literature

"Thermocouple Wire"—An 8-pp. catalog describes thermocouple and thermocouple extension wire in many different combinations and types of insulations. Also included are descriptions, temperature ranges, and other application information for each type of insulation. Both thermocouple and extension wire are available in J, K, T, E, S, and R calibrations in standard B&S wire gauge sizes. Tables on thermocouple wire resistance and limits of error are provided, as is a discussion on calibrating, checking and tagging of West thermocouples, thermocouple wire and extension wire. Additional information is presented on the fabrication of multipair extension cable from the more common extension wire types.—*Measurement and Control Systems Div., Gulton Industries, Inc., East Greenwich, RI 02818.*

"Crystal Selection Guide"—A 12-pp. brochure discusses how to select transmission crystals for infrared spectroscopy. It covers the transmission range, chemical properties, and physical characteristics of virtually all the crystals used as transmission windows in ir spectrophotometers. Detailed information is included on the following materials: sodium and silver chlorides; potassium, cesium, and silver bromides; calcium and barium fluorides; cesium iodide; thallium bromide iodide; Irtran-2, -4, -6; polyethylene; sapphire; quartz; germanium; and silicon. For each of the materials, information is given on refractive index, reflection losses, maximum useful temperature in air, water solubility, additional solubility, relative hardness, transmission range, and general applications. In addition, comparative ir transmission spectra are included for each of the materials described.—*Barnes Engineering Co., 30 Commerce Rd., Stamford, CT 06904.*

NEW GENERATION PHOTON COUNTING

Princeton Applied Research's new generation of photon counting instruments lets you amplify, discriminate, power, count, and synchronously detect your low light level signals better than ever before.



Model 1109 Photon Counter

- 100 MHz count rate capability (with Model 1121 Amplifier-Discriminator)
- Computer interfacing
- Automatic background subtraction



Model 1121 Amplifier-Discriminator

- Dual discriminator (50 μV -210 mV levels)
- Built-in high voltage supply option
- Remote amplifier-discriminator
- Built-in pulse height spectrum analyzer
- Single level, Window & Correction modes



Model 1112 Photon Counter/Processor

- 100 MHz counting speed
- Wide-range source compensation
- 6 operational modes
- Synchronous sampling & "Real Time" background subtraction



SEND
FOR
FREE
CATALOG

Don't you owe it to your experiment to find out more about these new photon counting instruments? Write or call us today at one of the addresses listed below.



Princeton Applied Research Corporation
P. O. Box 2565 • Princeton, New Jersey 08540 • U.S.A.
Telephone: 609/452-2111 • Telex: 84-3409

In Europe—contact Princeton Applied Research GmbH,
D8034 Unterpfaffenhofen, Waldstrasse 2, West Germany.

Circle No. 56 For Information