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.

Electron microscope

The Super III scanning electron microscope offers 60 Å guaranteed resolution in its secondary electron mode and features a high brightness electron source and an ion vacuum pump. Accelerating voltage is selectable at 5, 10, 15, 20, and 25 kV, and magnification range is 10–160 000. Other features include a gun airlock; a universal stage capable of examining the entire surface of a 3 by 1 in. thick specimen through X–Y, Z, tilt, and rotation controls; gamma control for highlight-dark level suppression or enhancement; 2000 line resolution record cathode ray tube; 8 in. visual cathode ray tube; built-in TV scanning; and dynamic focusing. The instrument is designed for interfacing with energy dispersive x-ray systems. Standard

x-ray modes include spot with X–Y control, line, line profile with Y control, and an external mode for x-ray mapping. All modes are pushbutton selectable.—*International Scientific Instruments, Inc., 1400 Stierlin Rd., Mountain View, California 94043.*

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Signal generator

The model 6011A, 11 MHz signal generator allows the user to set and recall nine different frequencies and amplitude settings by operation of nine pushbuttons on a keyboard. In addition to storing and recalling seven-digit frequencies in MHz, kHz, or Hz, and four-digit amplitudes in V, mV, or dB, the user can edit, limit, and modulate the output. Voltage and frequency deviations can be programmed about a

desired reference. Frequency can be set to 10^8/day accuracy; level to within 0.05 dB +0.0. Range is 10 Hz–11 MHz. Maximum open circuit output voltage is 28.28 V p-p. Frequency response is flat to within ±0.025 dB from 100 Hz to 5 MHz.—*John Fluke Mfg. Co., Inc., Box 43210, Mountlake Ter., Washington 98043.*

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Distribution analyzer

The model 920 distribution analyzer, designed to characterize and accumulate parameters of bursts of data, quantifies each burst or event, pulse width, amplitude, or time. It then updates its 100 segment memory at the appropriate value of the parameter so that, at the conclusion of the test or at a selected test increment, the exact distribution of events over the range of the parameter will be known. It will also permit selection or discrimination of events based upon the selected parameter. A data window permits concentration on events in the range of interest. A time distribution feature permits similar discrimination on the basis of time of arrival or rise time. Data are presented on the screen of an oscillo-

INTO THE HEART OF THE COMPUTER AND OUT TO THE FARTHEST REACHES OF SPACE

USING COMPUTERS IN PHYSICS
John R. Merrill
Florida State University
About 384 pages, paper.
February 1976.
$6.50 (tentative).
Based on project "COEXIST" and used extensively with "CONDUIT," both funded by the National Science Foundation, this text approaches computation from the physics point of view and suggests ways in which the computer can increase students' intuitive understanding of physics. All problems can be programmed in both BASIC and FORTRAN.

BLACK HOLES, QUASARS, AND THE UNIVERSE
Henry L. Shipman
University of Delaware
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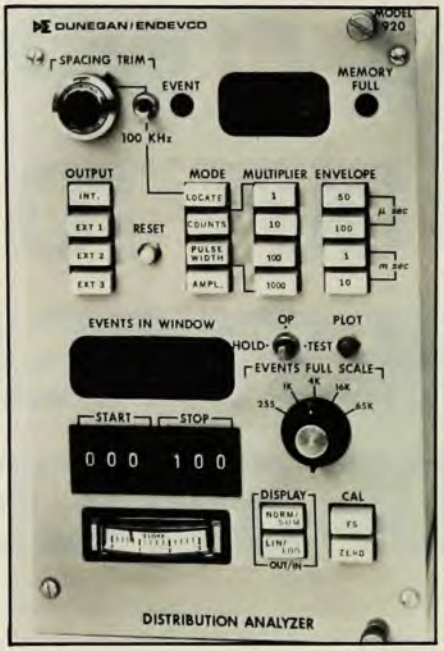
scope or they can be plotted on an $x-y$ recorder. Either the raw data or the sum of each segment added to the



higher segments can be observed. Vertical scales can be either linear or logarithmic.—*Dunegan/Endevco, Rancho Viejo Rd., San Juan Capistrano, California 92675.*

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Logrithmic amplifiers

Two amplifiers designated as models ICLT375 and ICLT450, operate over the 250–500-MHz and 300–600-MHz octaves with less than 10-nsec rise times. The following specifications are common to both models: dynamic range, 60 dB; linearity, ±1.5 dB; video out, 1.25 into 93 Ω; rise time, less than 10 nsec; input impedance, 50 Ω; input range, −65 to −5 dB; power, ±12 V at 80 mA; size, $3^{25}/_{32} \times 1\frac{1}{2} \times {}^{15}/_{32}$ in.; and weight, less than 4 oz.—*RHG Electronics Laboratory, Inc., 161 E. Industry Court, Deer Park, New York 11729.*

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Frequency translator

The model SAI-506 translator provides increased resolution and extended frequency coverage for the manufacturer's series 50 real time spectrum analyzers. It features up to four selectable plug-in frequency windows from 20 Hz to 50 kHz, maximum frequency coverage to 250 kHz, a built-in frequency synthesizer, and central frequency selection in 10 Hz steps. With an optional external synthesizer, center frequency can be selected in 1 Hz steps. The self-contained translator allows the standard frequency ranges of the spectrum analyzer to be translated from a selectable point of interest in the spectrum to base band. Standard frequency ranges 20, 50, and 200 Hz can be translated from 90 kHz, and the ranges between 50 Hz and 50 kHz can be translated from 250 kHz.—*Signal Analysis Operation, Honeywell, Inc., 595 Old Willets Path, Hauppauge, New York 11787.*

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Instrument interface

The D202 interface accepts parallel data and translates them into serial form for recording, printing, or transmission. The basic configuration comprises a digital multiplexer with control and a code converter driver, each on its own printed circuit card. The cards are housed in a cabinet that also contains the required power supplies, control switches, and function indicators. The instrument accepts up to seven digits of data or format characters from the external digital source, automatically scans the input data upon receipt of a record command, and generates a hold command to the inputting instrument during the record period to prevent input data from changing before it has been recorded. The code converter driver card accepts the BCD data input from the multiplexer and converts it to ASCII format. A digital multiplex expander card, an add-on option, provides digital multiplexing for up to eight additional digits beyond the seven digits of the basic instrument. Up to nine expander cards can be accommodated to add up to 72 digits. An optional alpha converter card provides for the generation of up to 11 nondigital characters. Input logic is TTI compatible and positive true. Operating speed is 110, 300, or 1200 baud, switch selectable.—*Datacap Inc., 732 South Federal St., Chicago, Illinois 60605.*

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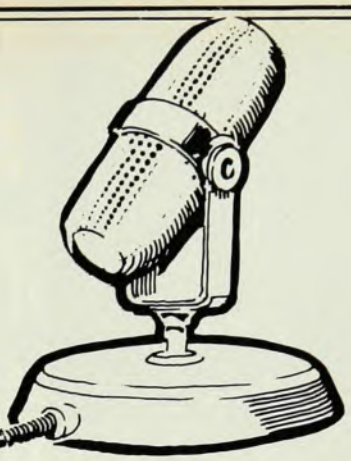
Gas chromatograph

The model 5831A/option 825 chromatograph permits carbon monoxide, methane, and total hydrocarbons to be determined directly in a single injection of an air sample. The instrument comprises two modules: a gas chromatograph with dual flame ionization detector, and a keyboard terminal that also functions as the printer–plotter, generating chromatograms, reports of retention times, and amounts of calibrated components on ready-to-file sheets. All temperatures, detector signal selection, integration parameters, and time control for auto baseline

And now for a few words about physics texts...



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rezero and valve actuation are entered through the terminal. The instrument may be automated for continuous analysis and up to 16 air-monitoring stations may be located as far as 150 m

from the gas chromatograph. Analysis is performed in 7 min or less with better than 0.1 ppm sensitivity. In the instrument, which is processor controlled, individual response factors are calculated, stored, and used for each component calculation, eliminating calculation errors caused by assuming equal response for methane and C_2 hydrocarbons. A chromatogram and integration of area for the components is automatically presented and computed by the preprogrammed processor.—*Hewlett-Packard Co., Route 41, Avondale, Pennsylvania 19311.*

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Photodiode/amplifier

A high-speed, high-sensitivity, integrated photodiode/amplifier series is optimized for the central wavelength of GaAs and YAG lasers. Designated the MHz Serires, these units feature an electro-optical bandwidth of 35 MHz total rise times (10%–90%) of less than 10 nsec, responsivities of greater than 2.5×10^4 V/W, full-bandwidth noise voltage of less than 2.5 mV rms and an output impedance of 50 Ω. Packaged in a modified dip package with either a 5-mm² or 13-mm² light sensing area, the MHz units are suited to applications involving optical communications, radiometry, and laser pulse detection.—*EG&G, Inc., Electro-Optics Div., 35 Congress St., Salem, Massachusetts 01970.*

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High-purity columbium

Columbium (niobium) in purities up to 99.95% is available in strip, sheet, tubing, wire, and powder forms. The strips and sheets are available in thicknesses from 0.001 to 0.070 in. and widths up to 36 in. The tubing is seamless ranging in o.d. from 0.040 to 1.00 in. with wall thicknesses ranging from 0.002 to 0.100 in. Wire products are available from 0.010 to 0.125-in. diameter. Rods range in diameter from 0.125 to 0.625 in. coiled or straight. Straight length rods are also available up to 3-in. diameter. Columbium powder is also offered in 20 mesh to 325 mesh size.—*Aremco Products, Inc., P.O. Box 429, Ossining, New York, 10562.*

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New Literature

Centrifugation—A 40 pp. booklet describes some of the current techniques of preparative and density gradient unltracentrifugation, including the use of zonal and continuous flow separations. Two of five sections cover theory of centrifugation, methods of molecular separation in the preparative ultracentrifuge, and applications. The third section discusses fixed-angle and swinging-bucket rotors. The last two sections cover zonal and continuous flow rotors.—*Beckman Instruments, Inc., Spinco Div., 1117 California Ave., Palo Alto, California 94304.*

Vibration measurement—Application Note 9, 16 pp., titled "Understanding Vibration Measurements," reviews the six classic mechanical transfer functions, their measurement, presentation, and interpretation. Methods are presented for measuring resonant frequency, mass, stiffness, damping, and mode shapes. The modal analysis of a cantilever beam, using impulsive input, is discussed in detail.—*Nicolet Scientific Corp., 245 Livingston St., Northvale, New Jersey 07647.*

Microscope—Bulletin 581-A, 4 pp., describes the modular Toolscope a monocular alignment type microscope available as a coordinate, completely self-contained unit or as a basic unit with or without one or more of several separate components: mounting bracket, ring illuminator with transformer, X–Y stage, and stand with substage illuminator.—*Titan Tool Supply Co., Inc., 68 Comet Ave., Box 1682, Buffalo, New York 14216.*

Sulfur monitor—A 4 pp. brochure describes the model 8450 FPD-type sulfur analyzer with digital readout, 2 ppb detection limit, autoranging which switches the instrument between the 100 and the 1000 ppb ranges, and other options including integral calibration valves and timer.—*Monitor Labs, Inc., 4202 Sorrento Valley Blvd., San Diego, California 92121.* □