

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.

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Radiation hazard meter

The model 3 isotropic radiation hazard meter is a battery-operated power density meter designed to respond uniformly to potentially hazardous non-ionizing energy radiating or leaking from rf and microwave sources from any direction over the frequency range 0.3–18.0 GHz. Features include the



following: three 10-dB power ranges with full-scale readings 2, 20, and 200 mW/cm² with low noise and low drift; isotropy ± 0.5 dB; calibration accuracy ± 0.5 dB; and an output for recorder actuation. An extension cable interconnecting the sensing probe and the meter is furnished to permit remote operation.—General Microwave Corp., 155 Marine St., Farmingdale, NY 11735.

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LCR bridge

The model 4961A LCR bridge automatically selects the measurement range and equivalent circuit when the user has selected the function *L*, *C*, or *R*. In addition to producing 3½-digit LED readout in capacitance, inductance, and resistance, the bridge also

provides readouts in *D*, *C/D*, and *L/D* with accuracy typically 0.2% of reading at rates as high as 1 reading/sec. Measurement ranges are 0.1 pF to 1900 μ F and 0.1 μ H to 190 H at 1-kHz measurement frequency. Resistance is measured from 1 m Ω to 19 M Ω in eight ranges and dissipation factor from 0.001 to 1.900. At a measurement frequency of 120 Hz, capacitance can be measured from 1 pF to 19 mF in eight ranges and inductance from 1 μ H to 1900 H in eight ranges. Two test signal levels, 1 V and 50 mV, are available. Three internal bias voltages or external bias can be selected, as well as internal or external triggering. A range hold function can be used where a series of repetitive measurements must be made. In addition to autoranging, the instrument automatically selects the appropriate equivalent circuit depending upon the value of the component under test. However, a parallel or series equivalent circuit may be selected manually if desired. Measurements are made with the five-terminal method, convertible to four, three, or two terminals, depending upon the measurement requirement and the value of the device under test.—Hewlett-Packard Co., 1501 Page Mill Rd., Palo Alto, CA 94304.

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Photomultiplier tubes

Two new photomultiplier tubes, including a unique end-window design, are said to offer unprecedented low-dark-current combined with high-quantum-efficiency semiconductor photocathodes. They employ a 12-stage dynode system for signal amplification. Electron amplifications from 10^4 to 10^7 in intensity are achieved, and anode current capability is five to ten times more than standard PMTs. Quantum efficiencies of 21% at 530 nm and 1% at 1060 nm are reached. Spectral response is a function of photocathode material: 145–900 nm for GaAs and 145–1100 nm for InGaAsP

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LABORATORY Temperature Controller



Model 5301-E

With an input circuitry designed to accept resistance or voltage generating temperature sensors such as GaS-diodes, thermocouples, Ge & Pt Sensors, Carbon Resistors and Thermistors. The 5301-E, three mode controller offers temperature regulation to better than 0.01°K (or $^{\circ}\text{C}$) in Vacuum chambers, Cryogenic dewars, Optical ovens, Tensile strength test apparatus, etc. for physics, metallurgy, chemistry and other scientific fields where the control and temperature range requirements are broad or change frequently. Set point readout is either directly in mV or Ohms (4-terminal measurement), with unlimited temperature range. Proportional, rate and reset modes are all internally adjustable, allowing to tune the controller to the thermal time constants of the process. 100 Watts, DC output or up to 5KW with Model 2202.

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POWER MODULE



Model 2202

To regulate an AC-line connected load by means of a small DC signal from an automatic control instrument. It supplies large amounts of power for control of resistive heaters, thermo-electric elements, light sources, etc. in temperature controlled ovens, vacuum deposition equipment, infrared heat sources, temperature baths and other applications. The instrument features a pulse-width-modulated zero crossing - fires TRIAC circuit to minimize RF Interference, electronic protection against current overloads and voltage transient, and provides linear control to a AC power line up to 25 Amp. (110 V or 220 V).

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new products

(uv to ir). The end-window VPM-163 and VPM-164 and the side-window VPM-158 and VPM-159 PMTs employ state-of-the-art solid-state photocathodes made of III-V valence compounds: gallium arsenide (GaAs) in the 158 and 163 tubes, and indium gallium arsenide phosphide (InGaAsP) in the 159 and 164 tubes. The tubes are constructed on ceramics and metal with sapphire windows, all brazed together, and employ no fragile glass elements. A smooth characteristic of dark current versus temperature allows designers to lower the dark current to desired levels by employing the appropriate cooling system. Anode dark currents lower than 10^{-15} can be achieved with the tubes by utilization of a liquid nitrogen cooling system. Preliminary VPM-164's have exhibited less than $\frac{1}{2}$ dark counts per second at -100°C . VPM-158 and -159 PMTs have 0.5-in.-diam side windows, while the very-low-noise VPM-163 and -164 models employ 0.75-in. end windows. Both types employ sapphire windows, but special window materials having a spectral cutoff of 112-nm are available.—*Varian LSE, 601 California Ave., Palo Alto, CA 94304.*

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Power transistors

A new series of 15-A NPN silicon power transistors have voltage ratings up to 600 V. The units are identified as SDM 6000 (400 V), SDM 6001 (450 V), SDM 6002 (500 V), SDM 6003 (550 V), and SDM 6004 (600 V). All are packaged in a steel-version two-lead TO-3 case. These Darlington transistors are designed for high-power switching applications, switching regulators, convertors/inverters, and motor controls. An internal diode provides rapid device turn-off.—*Solitron Devices, Inc., 1177 Blue Heron Blvd., Riviera Beach, FL 33404.*

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Pulse generator

The model 110C pulse generator features 20-V output amplitude with a 5-nsec rise time. The output amplifier has independent controls for rise time, fall time, and voltage upper and lower levels, which may be set independently between +20 V and -20 V. Output impedance is switchable to 50 or 1000 Ω , and operation may be in a normal or complement mode. The complement mode allows negative pulses to be produced or simulation of pulses with duty cycles approaching 100%. Repetition rate is adjustable from 0.5

Hz to 50 MHz, and delay and width from 10 nsec to 1 sec. Additional controls include external trigger, ex-

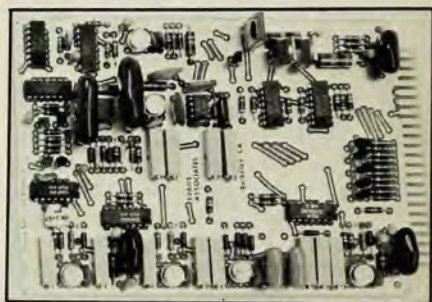


ternal drive, manual trigger, synchronous gating, asynchronous gating, square wave, and double pulse.—*Systron-Donner Corp., 10 Systron Dr., Concord, CA 94518.*

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Lock-in amplifier

The model 4110 module provides lock-in amplifier circuit functions for the 0.01 Hz to 1 MHz range. It will operate directly from many sensors, including detectors used in pulsed laser or modulated light schemes. Input-to-output sensitivity ranges from 10^{-5} to 10^{-1} in decade steps. Selection



is accomplished by grounding appropriate program inputs with external jumpers, switches, or logic. Also programmable in the same way are the insertion of a preconversion bandpass filter and an interstage capacitor bypass for direct coupling in low-frequency measurements. The analog output is compatible with most indicating and processing circuits. The time constant can be changed or switched, as required, with external capacitors, by using pin connections reserved for that purpose. The module will interface with other of the manufacturer's functional modules, including a phase control unit.—*Evans Associates, Box 5055, Berkeley, CA 94705.*

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Multimeter

The model 21 hand-held, digital multimeter measures capacitance as well as ac volts, dc volts, and resistance. The instrument has four dc-voltage ranges with 1-mV resolution, four ac voltage ranges with 1-mV resolution,

four resistance ranges with 1 Ω resolution, and four capacitance ranges with 1-pF resolution. It is powered by four rechargeable NiCd batteries; a converter for line operation is available. A single PC board carries all circuitry. A push-to-read button is provided on the side of the case to conserve battery charge life. For continuous operation, as in bench operation, the switch can be locked into the "on" position.



A push-to-read probe is available as an option.—*Penril Corp.*, 2700 South Fairview St., Santa Ana, CA 92704.

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Miniature arc lamp

A compact and powerful miniature arc lamp produces more than 500 000 peak beam candlepower while consuming only 300 W. Measuring about 2.25 in.³, the VIX-300 xenon illuminator produces a brilliant white light similar to sunlight. It is three to four times more efficient than competing light-source designs. The rugged lamp offers a convenient source of high-intensity, broad-band illumination covering the ultraviolet (uv), visible, and infrared (ir) regions of the spectrum. The new lamp has been operated safely in tests for more than 2000 h. Maximum operating temperature is 150°C. It is cooled with forced air. The lamp is offered with or without a compact, compatible power supply and lamp housing. The unit produces up to 2 W of uv (200–400 nm) output, 4000 lm or 16 W of visible radiation (6000 K color temperature), and more than 30 W of ir (800–2100 nm) illumination.—*Varian EIMAC Div.*, 301 Industrial Way, San Carlos, CA 94070.

Circle No. 147 on Reader Service Card

Curved x-ray crystals

Two types of curvatures with x-ray crystals are now offered for x-ray analysis applications. In semifocused (Johann) and fully focused (Johanson)

geometries, the crystals are used in microbeam analysis, ion-atom collision studies, hot plasma diagnostics, and x-ray astronomy. Although Johann and Johanson curvatures are most often specified, convex, doubly, conically, and logarithmically bent shapes have also been produced and delivered. In general, the limitations on crystal shape depend upon the crystal material, dimensions, available curving techniques, and the desired curvature. Typical x-ray crystals which are available in the Johann and Johanson techniques include lead stearate, TIAP, RbAP, KAP, ADP, gypsum, PET, EdDT, Ge, and LiF. Bending radius as small as 2 in. can be achieved for some crystals.—*Quartz Products Corp.*, 688 Somerset St., Plainfield, NJ 07061.

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New Literature

Fused quartz rod and ribbon—Catalog 7715, 6 pp., presents information on type 214 rod and type 211 ribbon, 99.99% silicon dioxide materials used primarily in fabricating quartzware for semiconductor processing. The catalog includes a description of the products and information on their applications. Washing and cleaning instructions for the rod and ribbon are also provided. Nine tables provide data on the types and uses of the products, their physical properties, and sizes and tolerances available. Data on transmission properties of type 211 ribbon and chemical analyses for both types are also provided.—*General Electric Co.*, Lamp Parts and Equipment Sales Operation, 21800 Tungsten Rd., Cleveland, OH 44117.

"High voltage power supplies"—A 12-page short-form catalog describes the RHR line of regulated high-voltage power supplies, which covers power up to 400 W.—*Spellman High Voltage Electronics Corp.*, 1930 Adeo Ave., Bronx, NY 10469.

Flameless soldering—Bulletin 7000, 4 pp., includes a complete description and specifications of the Accu-Heat 7000 flameless soldering equipment.—*Aremco Products, Inc.*, P.O. Box 429, Ossining, NY 10562.

Nitrogen lasers—A 4-pp. brochure discusses selection criteria important for pumping tunable dye lasers, such as peak power, pulse energy, pulse width, repetition rate, and thyatron switching, and compares the performance of four nitrogen lasers ranging from 50 kW to 1 MW in peak power.—*Molelectron Corp.*, 177 N. Wolfe Rd., Sunnyvale, CA 94086. □

COMPUTER PLOTTING



Model 1653

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