

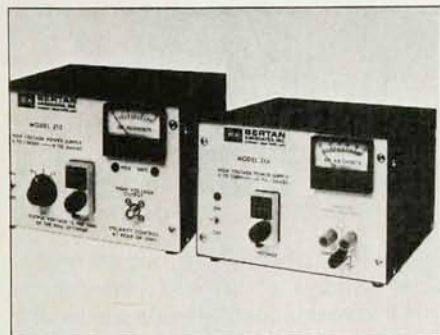
new products

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.

Power supplies

The Bertan model 214 and 215 bench-top high-voltage power supplies are intended for precision laboratory applications such as photomultipliers, sensitive nuclear detectors, lasers, ultrasonic transducers or deflection amplifiers. The model 214 is bipolar, with an output of 0 to 1000 V at 15 mA. The model 215 has a polarity switch with LED polarity indicators. Its output is 0 to ± 3000 V at 5 mA. Both models are priced at \$405.

Bertan claims unusually accurate and stable high-voltage output. The voltage controls are digital, with a resolution of



200 mV. Regulation and ripple are 0.001%. Both models are fully solid state, with plug-in printed circuit boards and encapsulated high-voltage circuitry. Bertan Assoc., Inc. 3 Aerial Way, Syosset, N.Y. 11721

Circle No. 140 on Reader Service Card

Pulse discriminator

Recent improvements in photomultiplier rise times have created a need for a high-speed pulse discriminator in photon-counting applications. Pacific Precision Instruments have introduced the model 3470/AD6 high-speed pulse discriminator, with a rise time of 2.5 nanoseconds. The discriminator is mounted in a thermoelectrically cooled photomultiplier-tube housing. This obviates the use of signal cables and connector interfaces, which would degrade pulse fidelity.

With 50-ohm input impedance, the discriminator will detect single-photon

events with a resolution of 6 nanoseconds, from photomultiplier tubes having a minimum gain of 2.5×10^5 . The thermo-electric cooling lowers the cathode temperature of the photomultiplier to -30°C for improved dark-count performance. Double-pane evacuated quartz windows eliminate fog while maintaining ultraviolet transmission. The 3470/AD6 will accommodate most 2-inch-diameter photomultiplier tubes. The price is \$1220. Pacific Precision Instruments, 1040C Shary Court, Concord, Calif. 94518

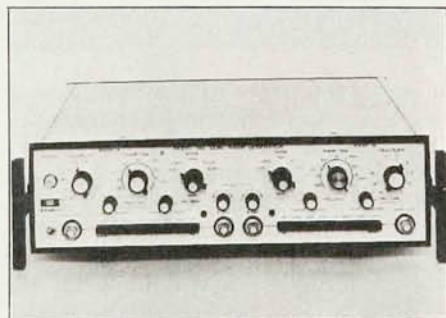
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Ramp generator

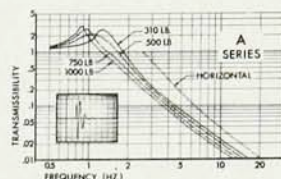
Exact Electronics model 180 contains two independent ramp generators with ramp times ranging from 1 microsecond to 1000 seconds. The two generators can be operated independently, or they can be synchronized for 1:1, 2:1 and 4:1 interlace. With these interlace ratios one can easily generate rasters.

Two independent power amplifiers can provide ± 10 V of variable dc offset, 80 dB step attenuation in 10-dB steps, and 20-dB continuous variability between steps. Independent single-shot and burst operation can be triggered by an external gate or trigger, or from the control panel. In the pulse or burst mode one ramp can be internally triggered or gated by the other.

Each ramp generator has separate variable fall times from 5% to 100% of the ramp time. In the pulse mode, generator A is delayed by the ramp time of generator B. If then generator B is externally triggered, one can have synchronized

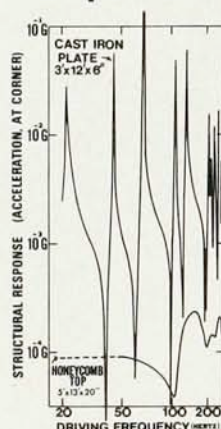


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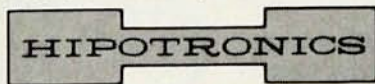
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Metered Power Packs

Same miniature power packs available with simplified or deluxe controls for rack-mounting. Short circuit current limit option makes these ideal for cap charging applications.

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outputs with calibrated delay time. Various waveforms can be generated, with ramp linearity claimed to be better than 99%. This dual ramp/raster generator is priced at \$995. *Exact Electronics, Inc., Box 347, Tillamook, Oregon, 97141*

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KrF lasers

Lumonics Ltd have introduced the TE-860 series of high-average-power rare-gas-halide lasers. They are claimed to be the most powerful such lasers commercially available. The thyatron-switched model TE-861 puts out 10 watts at 70 Hz; the spark-gap switched model TE-861S puts out 5 watts at 35 Hz. It is claimed that the passivation characteristics of the discharge-cavity materials result in a highly reproducible, stable output, with unusual gas longevity.

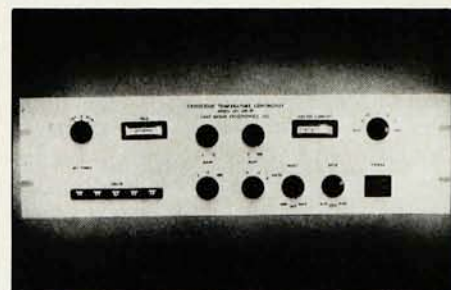
All components are contained in one RF-shielded cabinet. These include valves and gauges for mixing gases, gas recirculator, triggering electronics and programmable, electronically switched 40-kV power supply. The TE-861 costs \$29 900 US, and the TE-861S is priced at \$22 900 US. *Lumonics Research Ltd, 105 Schneider Rd., Kanata (Ottawa), Ontario, Canada K2K143.*

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Cryogenic temperature controller

The Lake-Shore model DTC-500SP is advertised as an ultra-stable precision cryogenic temperature indicator/controller for demanding laboratory applications. It utilizes a three-mode analog control circuit, for precise, closed-loop control in the proportional, integral and derivative modes.

In its standard analog remote set-point mode, the DTC-500SP can be controlled by a variety of analog programmers. A BCD input/output option allows it to be



interfaced directly with a computer or data-acquisition system. The manufacturer claims that ultra-stable current sources and reference voltages permit temperature control of ± 0.0005 kelvin from 1 to 28 K, and ± 0.005 up to 400 K. With output power up to 40 watts and switch-selectable power limiting, the DTC-500SP is suited for precision control

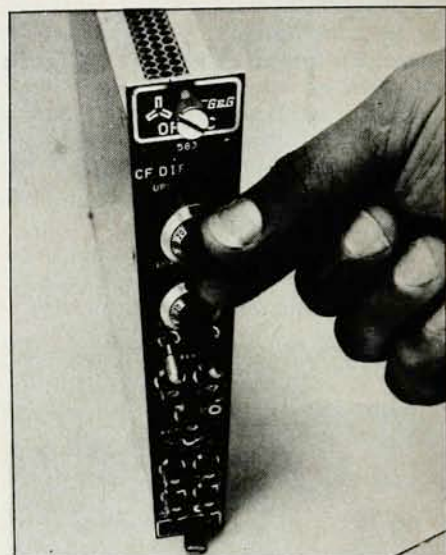
of cryostats, liquid-cryogen transfer systems and closed-cycle refrigerators. *Lake Shore Cryotronics Inc., 64 East Walnut St., Westerville, Ohio 43081*

Circle No. 144 on Reader Service Card

Timing discriminator

The EG&G Ortec model 583 is claimed to be the first commercially available constant-fraction differential discriminator that measures both energy level and time of occurrence of nuclear events. This NIM package, for use primarily in scintillators and photomultipliers, eliminates the need for an energy-selection side channel of linear instrumentation when using fast scintillators.

Time walk in the model 583 has been reduced to less than ± 100 picoseconds in the 100:1 dynamic range. Upper- and



lower-level discriminators isolate the energy window of interest. Because energy-selection and coincidence decisions are made before the time-to-amplitude conversion, these conversions occur at the true coincidence rate rather than at the higher singles rate, which reduces problems due to high counting rates. *EG&G Ortec, Physical Sciences Division, 100 Midland Rd, Oak Ridge, Tenn. 37830*

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Transient waveform recorder

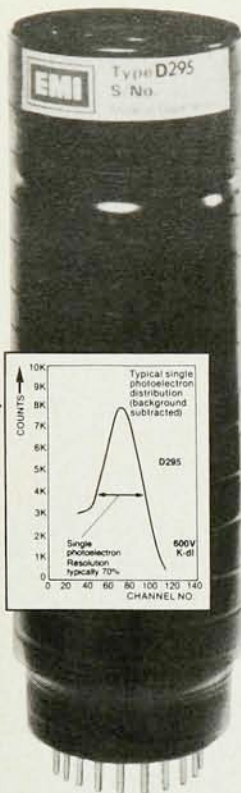
Physical Data Inc. claim that their model-523A transient waveform recorder can sample or digitally capture almost any kind of short-lived phenomenon, and reproduce the waveform in desired form, at rates up to 10 MHz. High-speed analog signals are digitally recorded for later playback in digital or analog form to an oscilloscope, computer, teletype, strip-chart recorder, or other device.

The 523A system is intended for use in nuclear physics, materials studies, electronics, medicine and other fields involving short-lived waveform phenomena. It has a four-thousand word memory with



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Photon Counting

New
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from EMI

A new range of tubes designed specifically for photon counting.

Types 9862 and 9863, with trialkali photocathodes, are particularly suitable for fast photon correlation, where very low afterpulsing is an essential tube characteristic. Pulse rise times are of the order of 2 ns; pulse duration about 4 ns; dark count 40 c.p.s.; and typical peak quantum efficiency about 22% with gains of 10^7 and up to 10^8 . The FACT-50 cooled housing may be used to significantly reduce the dark count in these tube types.

Where photoelectron resolution is important, the D295 and D299 give a single photoelectron resolution of about 70% (f.w.h.m.), with first dynode gain of typically 22 and dark count of about 300 c.p.s. This high gain is achieved without the use of III-V compounds.



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ten-bit words, adjustable trigger delay and dual timebase facilities. Playback rates can be expanded or compressed, and controller/interfacing options include GPIB Bus IEEE 488-1975 and RS 232. The amplitude resolution is claimed to be 0.1%. *Physical Data, Inc., Dept. 218, 8200 SW Nimbus Ave., Beaverton, Oregon 97005*

Circle No. 146 on Reader Service Card

Charge-to-pulse ADC's

LeCroy has introduced two 15-bit, integrating analog-to-digital converters. Both are 24-pin dual-inline-package hybrid circuits. The model QD100 and QD101 ADC's are claimed to have resolutions of 20 and 50 femto-coulombs respectively. The QD100 has a discrete gain of 3 or 1, depending on the selection of an external capacitor, and responds linearly to signal risetimes as fast as 60 nanoseconds. The gain of the QD101 is programmed by selecting an external voltage; it responds linearly down to 20 nanoseconds.

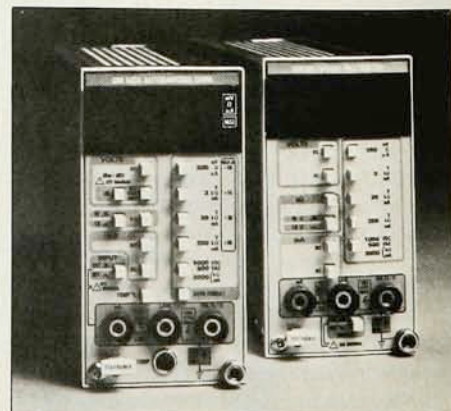
The converter output is a direct measure of the input charge, that is, the area under the input waveform. Thus for dc input, the output is simply proportional to the product of the input and the sampling time. Nominal sensitivity is selectable at 600 or 1500 pico-coulombs full scale, with $\pm 0.10\%$ integral linearity. The integrating capacitor can be cleared in 2 microseconds. Similar units are available in 12-bit versions. The price is \$100 for single units, \$63 in quantity. *LeCroy Microcircuits, 700 S. Main St., Spring Valley, N.Y. 10977*

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Digital multimeter

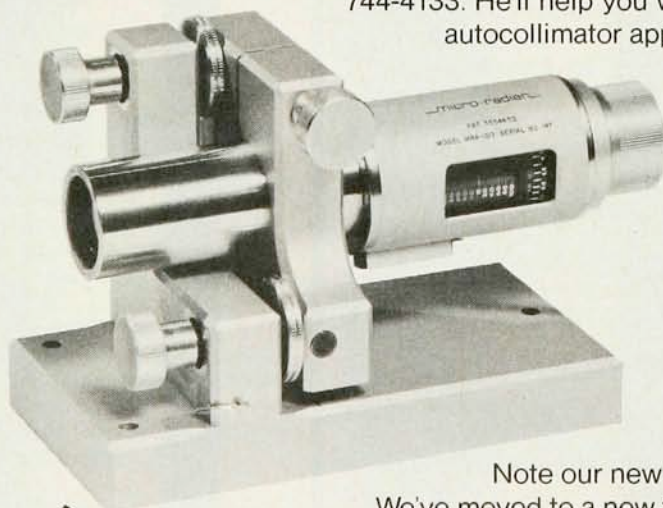
Tektronix has introduced the model DM-502A $3\frac{1}{2}$ -digit multimeter. With seven measurement functions, the DM 502A is claimed to be the most complete $3\frac{1}{2}$ -digit digital multimeter available on the market. The meter offers dc and ac voltage and current metering, and high/low resistance measurement.

In addition to these basic functions, the DM 502A offers dBV, dBm and tem-



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perature measurement, true rms readings, and autoranging for volts, ohms and decibel measurement. A low resistance setting is for in-circuit measurement where it is important not to forward bias diode junctions. The high setting is used for measurements on diode junctions. Temperature measurement range at the probe tip is -55 to $+200^{\circ}\text{C}$. The platinum-film sensing element offers low thermal mass and intimate sensor contact. The complete DM 502A is priced at \$520 (\$395 without temperature probe). All functions and ranges are easily selected by pushbutton. *Tektronix Inc., Box 500, Beaverton, Oregon 97077*

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Microwave leakage detector

Although new domestic microwave ovens are asserted to be virtually leakproof, microwave leakage can develop over time through misuse, damage or extended wear. With more than ten million microwave ovens in use in this country, the Vexilar Corporation claims that there is a serious and growing need for low-cost leakage detectors. Vexilar has just put on the market a microwave leakage detection device priced at under \$20.

The hand-held detector contains an LED which glows red on contact with microwave radiation in excess of 5 milliwatts, the standard maximum level allowed by the Food and Drug Administration. The device was developed by an agency (CSIRO) of the Australian government. With no moving parts or batteries, its operational life is claimed to exceed 5000 hours of constant use. The detector can also monitor industrial, scientific and medical microwave heaters operating around 2450 MHz. *Vexilar, 9345 Penn Ave. So., Minneapolis, Minn. 55431*

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New literature

Nuclear instrumentation—Canberra Industries announce the availability of their 1979-80 product catalog. This 400 page publication describes a broad range of nuclear instrumentation: detectors, NIM'S, small and large multichannel analysers, and software. *Canberra Industries, Inc., Dept. 995, 45 Gracey Ave., Meriden, Conn. 06450*

Logic design—This 15-page application note (APN-14) from Interdesign describes useful techniques for integrated-circuit logic design with CMOS and NMOS monochip gate arrays. It points out many general ways to transform standard logic into monochip-compatible logic using equivalent gates. *Interdesign, Inc., 1255 Reamwood Ave., Sunnyvale, Calif., 94086*

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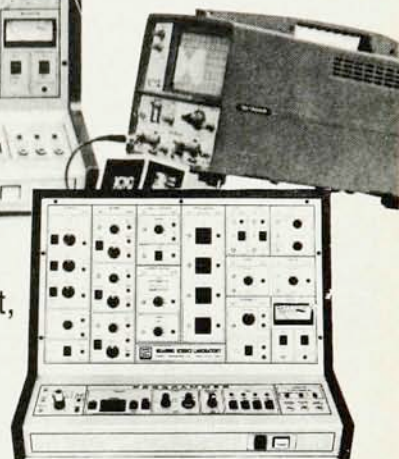
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