

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. To facilitate inquiries about a particular product, a Reader Service Card is attached inside the back cover of the magazine.

FOCUS ON POWER SUPPLIES

Power Supplies and Amplifiers for Photomultipliers

Advanced Research Instruments has made available several components intended for use with photomultiplier tubes, electron multipliers and similar devices. The PMT-2000 is a high-voltage bias supply with a noise level of less than 100 μ V peak-to-peak at an output voltage of 2 kV. Output is regulated to within 0.0001% for a 10% line-voltage change and to 0.007% for a 10% load change; temperature stability is 100 parts per million per $^{\circ}$ C in the range 0–50 $^{\circ}$ C. The power supply can be configured by the company to have a maximum output voltage of ± 2 kV, ± 5 kV or ± 7.5 kV.

The PMT-4, PMT-5, and PMT-5R are low-level current amplifiers for photomultiplier tubes and photo cells. The PMT-4 is a current-to-voltage converter that accepts input currents from 10^{-7} to 10^{-5} amperes, while the PMT-5 accepts input currents from 10^{-7} to 10^{-5} amperes. The PMT-5R has a remote-controlled gain that can be set by three transistor-to-transistor logic lines. The amplifiers are recommended for spectroscopy and low light level detection. *Advanced Research Instruments, 2434 30th Street, Boulder, CO 80301*

►Circle number 180 on Reader Service Card

High-Voltage Power Supply for Insulator Testing

The Model 248 from Keithley Instruments is a compact (half-rack) 5 kV power supply intended for applications requiring rapid, sensitive resistance or resistivity measurements, such as insulator testing. The device supplies voltages accurate to within $\pm (0.01\%$ of setting plus 0.05% of range); it displays



the set voltage to within ± 1 V and holds the set value within 0.001% for a line-voltage change of 10% (0.005% for a 100% line-voltage change). The maximum output current is 5 mA throughout the 5 kV voltage range, and current and voltage limiters ensure the safety of the device and its operators.

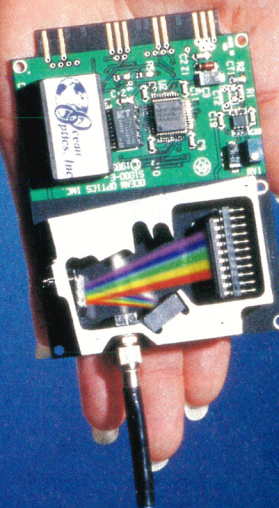
The Model 248 can be controlled from its front-panel or from a computer over an IEEE-488 interface. Voltages can also be set with an analog voltage input. The user may select among three filtering options that affect the noise level of the output. With no filter, ripple for signals from 10 to 100 000 Hz is limited to 0.002% of the full-scale rms voltage. Filter 1 limits the output voltage to 3 kV, the current to 5 mA and the maximum noise to 3.5 mV. Filter 2 supplies output voltages up to 5 kV and currents up to 3 mA with noise levels less than 5 mV rms. *Keithley Instruments, 28775 Aurora Road, Cleveland, OH 44139*

►Circle number 181 on Reader Service Card

High Voltage Capacitor Charging Supplies for Pulsed Lasers

Electronics Measurements Inc. has introduced a new line of high-voltage capacitor charging units for pulsed lasers. The new models—500A, 102A and 152A—are available in 12 different maximum voltage levels, from 1 kV to

Still The World's First Miniature Fiber Optic Spectrometer



**First in innovation.
First in performance.
First in affordability.**

**Low-cost Custom Systems
for UV, VIS and
Shortwave NIR Applications**

- High sensitivity
- Remarkable flexibility
- Modular hardware and software
- Unmatched applications support

**Our newest innovation is here!
Ask about the high-sensitivity
S2000 spectrometer
for low light level applications!**



Ocean Optics, Inc.

Tel: (813) 733-2447

Fax: (813) 733-3962

E-Mail: info@OceanOptics.com

www.OceanOptics.com

Ocean Optics Europe

Tel: 31-313-651-978

Fax: 31-313-655-783

E-Mail: 73131.150@compuserve.com

Circle number 63 on Reader Service Card

Materials Processes Far from Equilibrium

Aug. 17-22, 1997, Kimball Union, NH

Session Topics

- Implantation
- Defect formation
- Defect/Dopant Modeling
- Phase formation
- Surface stimulation
- Future challenges
- Poster sessions

Conference chairs:

Eric Chason

Sandia National Lab., Albuquerque, NM
ph: 505-844-8951; echason@sandia.gov

Tomas Diaz de la Rubia

Lawrence Livermore National Lab.
ph: 510-422-6714; delarubia@llnl.gov

For more information, contact:

Gordon Research Center

Univ. of Rhode Island, P.O. Box 984
West Kingston, RI 02892-0984
phone: 401-783-4011
FAX: 401-783-7644

E-MAIL: GRC@GRCMAIL.GRC.URI.EDU

Circle number 64 on Reader Service Card

40 kV. Output power capability ranges from 500 J/sec for the model 500A to 1500 J/sec for the model 152A.

All three models incorporate a new proprietary parallel-series inverter design that is claimed to lower cost and improve performance. It provides 0.1% repeatability at repetition rates up to 300 Hz, and close to that up to 2 kHz. The 1500 J/sec output of the model 152A from a 220 V, 13 amp line is made possible by the instrument's power-factor correction.

All the assemblies are board-level tested with proprietary EMI test equipment. High-voltage pulsed-power laser applications include CO₂ and YAG lasers, excimer and dye lasers and nitrogen gas lasers. *Electronic measurements Inc., ALE Systems, 405 Essex Road, Neptune, NJ 07753*

►Circle number 182 on Reader Service Card

Low-Noise, DC-Stable, High-Voltage Power Amplifier

Trek's Model 609D-6 is a high-voltage power amplifier designed to control bipolar output voltages from 0 to ± 4 kV (dc or peak ac) with output currents up to ± 20 mA. The amplifier's solid-state design is said to provide a high slew rate (100 V/ μ s), wide bandwidth and low noise (80 mV rms) in inverting, noninverting or differential-amplifier configurations. The device features a four-quadrant active output stage that ensures accurate output response for reactive and resistive loads. Output is said to be stable to better than 100 parts per million per hour and 350 ppm per °C. The dc voltage gain is accurate to 0.1% of full scale, and the output has a settling time of 150 μ s. The 609D-6 can be operated remotely, and it is protected against over-voltage and over-current conditions. For monitoring purposes, the device provides low-voltage replicas of its high-voltage output. *Trek, P.O. Box 728, 3932 Salt Works Road, Medina, NY 14103*

►Circle number 183 on Reader Service Card

quency amplifier that supplies 100 W of continuous-wave power from 1 MHz to 1 GHz, with a minimum measured output power of 60 W at the 1-decibel gain compression point. At the maximum setting, the amplifier supplies at least 50 dB of gain, and it will supply its full rated power without foldback into loads with a voltage standing-wave ratio (VSWR) of up to 6:1. The front panel allows the user to select among standby, operate, pulsed, cw and automatic-level-control modes of operation, and the front panel's analog meter displays forward and reflected power up to 150 W.

The 25S1G4 and 20T4G18 are intended for moderate-gain rf immunity testing in the bandwidths 0.8–4.2 and 4.2–18 GHz, respectively. The 25S1G4 is a solid-state amplifier that provides a minimum of 25 W of power, at least 99% of which is in the fundamental frequency. The 20T4G18 is a traveling-wave tube (TWT) amplifier that provides at least 20 W of power over its full bandwidth. Both are said to withstand even worst-case VSWR ratios.

The 500T1G2, 500T2G8 and 500T8G18 are TWT microwave amplifiers that supply a minimum of 500 W into the frequency bands 1–2, 2–8 and 8–18 GHz, respectively. Under severe load mismatches, the amplifiers reduce output; when the mismatch is eased, they resume full power output. Additional features include IEEE-488 interfaces, gain control, VSWR protection, rf sample output port and front-panel digital displays that show forward and reflected output. *Amplifier Research, 160 School House Road, Souderton, PA 18964-9990*

►Circle number 184 on Reader Service Card

Internally Compensated Miniature High-Voltage Divider

Emco's V1G is a precise, low-drift, high-voltage divider designed to provide low-voltage outputs from input voltages up to 25 kV. The 1000:1 resistive divider has a ratio tolerance of 1% and is internally compensated for the 10 M Ω input impedance of the



RF and Microwave Amplifiers for Electromagnetic Testing

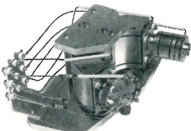
Amplifier Research has made available several amplifiers for testing the electromagnetic compatibility of antennas and other components. The model 100W1000 is a solid-state radio-fre-

Electrostatic Energy Analyzers

comstock

Electrostatic Energy Analyzers

- Double Focusing
- High Resolution
- Atomic and Molecular Physics
- Surface Science



We Work with You



TOF Mass Spectrometers

- Linear & Reflectrons
- Laser Desorption Ionization
- MALDI with Delayed Pulse Extraction
- High Resolution: High Mass Range

comstock

1005 Alvin Weinberg Drive • Oak Ridge, TN 37830 USA
Phone: 423/483-7690 • Fax: 423/481-3884
e-mail: salesinfo@comstockinc.com
Internet: http://www.comstockinc.com

Time-of-Flight Mass Spectrometers

Circle number 65 on Reader Service Card

user's multimeter. Temperature drift is said to be 50 parts per million. The high-voltage connection is made through a 30 kV silicone wire, and the device is protected against dust and moisture. Measuring $3'' \times 1'' \times 0.5''$ and weighing 1 ounce, the device can be mounted on personal computer circuit boards and is recommended for control-loop feedback and component testing. *Emco High Voltage, 11126 Ridge Road, Sutter Creek, CA 95685*
 ▶Circle number 185 on Reader Service Card

High-Gain Amplifier for Multiwire Proportional Chambers

LeCroy's MQS104A integrates a bipolar monolithic four-channel preamplifier with a four-pole shaping amplifier. The combined system provides an output pulse that is said to be a good match for typical proportional chambers. The 28-pin plastic leadless chip carrier package is designed to preamplify signals from 3000 to 200 000 electrons with a gain of $4.3 \mu\text{V}$ per electron. Multipole shaping and tail cancellation circuitry typically return the signal back to baseline levels within 80 ns, allowing input rates of several MHz. Because the device accepts both positive and negative inputs, it can be used for both electron- and ion-sensitive detectors. An optional demonstration circuit board can be used for evaluation or operation of the chip. *LeCroy, 700 Chestnut Ridge Road, Chestnut Ridge, NY 10977*

▶Circle number 186 on Reader Service Card

Windows-Based Lock-In Amplifier Software Package

EG&G Instruments has made available a package of Windows-compatible software routines for use with the company's lock-in amplifiers. The software allows the user to control the amplifier, generate and receive trigger signals and integrate the lock-in amplifier with the rest of the experimental apparatus. The software functions in two modes. In the first, the user selects from a series of virtual front-panel displays and menus to set the amplifier's operational parameters and the data to be displayed on the computer. In the second mode, the user defines the outputs to be recorded as a function of time, frequency, trigger event or other independent parameters. Data can be displayed, routed to a printer,

stored on disk (along with the experimental setup) and exported as an ASCII text file to other applications. The package also includes a context-sensitive help facility. *EG&G Instruments, Sorbus House, Mulberry Business Park, Wokingham RG41 2GY, UK*

▶Circle number 187 on Reader Service Card

50 kV Modular Power Supply for X-Ray Applications

The HW50/1.5 power supply from Applied Kilovolts measures $25 \times 14 \times 6$ cm and delivers 1.5 mA at voltages up to 50 kV to x-ray sources. It is intended for high-resolution microfocus applications. Powered by a 24 V dc source, the unit uses a high-frequency switch-mode field-effect transistor and a ferrite step-up transformer to attain its high-voltage output. Output is stable to within 0.1% against load and line variations, and to temperature changes to a level of 300 parts per million per $^{\circ}\text{C}$; peak-to-peak ripple is less than 0.5%. The device can be controlled by means of internal or external potentiometers or a computer-generated 0–10 V analog signal. All high-voltage components are encapsulated in silicon rubber, and the unit is protected against arcing and short circuits. *Applied Kilovolts, 38/40 Eastbrook Road, Portslade, Sussex BN41 4PB, UK*

▶Circle number 188 on Reader Service Card

High Voltage Power Supply with Four Separate Outputs

Bertan High Voltage is offering its new MPS series of multi-output power supply systems. These 19-inch, rack mounted instruments are compact assemblies of as many as four separate high-voltage power supplies specified by the buyer. This is intended to eliminate clutter and dispersion in facilities that require several different power supplies simultaneously. The systems can be configured with 4 different outputs up to 10 W each, or two outputs up to 30 W each.

The MPS series instruments provide independent control and monitoring of each output. Controls can be local or remote. Output voltages range up to 30 kV for inputs of 115/230 V ac $\pm 10\%$ at 50–60 Hz. Ripple is claimed to be less than 0.01% up to 30 kV. *Bertan High Voltage, 121 New South Road, Hicksville, NY 11801*

▶Circle number 189 on Reader Service Card

OPTICAL RAY TRACERS

Now: FOUR platforms!

NEW!

Windows
PC-DOS
Macintosh
PowerMac

BEAM TWO \$89

- + for students & educators
- + traces coaxial system
- + lenses, mirrors, irises
- + exact 3-D monochromatic trace
- + 2-D on-screen layouts
- + diagnostic ray plots
- + least squares optimizer
- + Monte Carlo ray generator

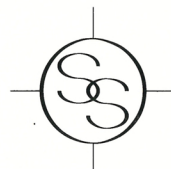
BEAM THREE \$289

- + for engineering applications
- + all BEAM TWO functions, plus:
- + 3-D optics placement
- + tilts and decenters
- + cylinders and torics
- + polynomial surfaces
- + 3-D layout views
- + glass tables

BEAM FOUR \$889

- + for advanced professional work
- + all BEAM THREE functions, plus:
- + big tables: 99 surfaces
- + full CAD support: output to DXF, plotter, PostScript
- + point spread function
- + modulation transfer function
- + wavefront display too

Write, phone, or fax us for further information.



STELLAR SOFTWARE

P.O. BOX 10183
BERKELEY, CA 94709 USA
PHONE (510) 845-8405
FAX (510) 845-2139

Circle number 66 on Reader Service Card