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.

Lock-in amplifiers

EG&G Princeton offers two new lock-in amplifiers for low-level signal processing—the single-phase model 5205 and the two-phase model 5206. The manufacturer stresses the "unparalled . . . ability of these lock-ins to function under the complete control of a computer." Computer-controllable functions include sensitivity ranges, time constants, phase shifts, frequencies, zero offset, dynamic reserve and display modes. An optional digital interface renders either model totally programmable and capable of talk–listen operation with other devices on an IEEE bus.

Both models have built-in microprocessors. These "sine-wave responding" lock-in amplifiers are said to be particularly useful for the measurement of signal intensities and phase shifts in the presence of noise. In the two-phase model 5206, the two mixer channels allow simultaneous readout of in-phase (x) and quadrature (y) components, or of the resultant magnitude and phase angle. Full-scale sensitivities range from 100 nV to 5 V (rms), and operating frequencies extend from 0.2 Hz to 200 kHz. *EG&G Princeton Applied Research, PO Box* 2565, *Princeton, New Jersey* 08540

Circle number 140 on Reader Service Card

Spectrum analyzer

Wavetek Rockland's model 5820A is a cross-channel (or dual-channel) spectrum analyzer. It is claimed to offer

real-time spectrum analysis and transfer-function measurements for frequencies up to 50 kHz, with "unparalleled convenience, flexibility and accuracy." The instrument displays any two of the following function simultaneously on its CRT: power spectrum A or B, phase A or B, time A or B, transfer function magnitude or phase, coherence function and coherent output power. Functions can be stored and compared with one another (difference or ratio). One can also edit the transfer function. To facilitate identification, measurements may be displayed in split-screeen fashion. Axes may be linear or logarithmic.

The 5820A has a built-in IEEE-488 interface, analog-recorder interface and digital-plotter interface, letting the user make fully annotated four-color plots without an external computing controller. "Unprecedented accuracy and resolution" are said to be made possible by self-correcting algorisms in the instrument. For example, when the phase of a transfer function of an external device is being measured, the 5820A continuously monitors and removes from the measurement the phase mismatch of its own input channels. The list price is $11 250. *Wavetek Rockland, Rockleigh Industrial Park, Rockleigh, New Jersey 07647*

Circle number 141 on Reader Service Card

Pulse generators

Avtech's new AVR-A series of high-voltage, high repetition-frequency pulse generators is intended for applications requiring nanosecond rise times and output amplitudes up to 200 volts. Model AVR-A-1 provides up to 200 volts with a 10 ns risetime and pulse width variable from 50 ns to a microsecond. The pulse repetition frequency is variable up to 100 kHz, with a maximum output duty cycle (pulse width over period) of 5%. The output repetition frequency equals that of the externally applied TTL trigger signal. The output amplitude (0 to 200 V into 50 ohms) is varied continuously by means of a one-turn control. Standard units require a +24-volt dc prime power supply, but a line-powered op-

new products

tion if available.

Model AVR-A-2 has a maximum output of 50 volts, and its pulse repetition frequency only goes up to 10 MHz. The risetime of this second model is 5 ns. The output pulse width is nominally equal to that of the trigger pulse. Each model is priced at $990 (US), and mounted in a $4.3 \times 2.6 \times 1.7$-inch chassis with SMA connectors. *Avtech Electrosystems Ltd, PO Box 5611, Station F, Ottawa, Ontario K2C 3M1, Canada*

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Ultraviolet flashtube

The model FX-265 from EG&E Electro-optics is a bulb-type ultraviolet flashtube developed especially for application that require uv output at wavelengths below 190 nanometers. The glass-encapsulated xenon flashtube has a quartz window for short wavelength transmission. We are told that the flashtube is probe-stabilized, producing precise, nonwandering arcs.

The arc discharge length in 3 millimeters. With an operating voltage range from 300 to 1500 volts dc, the maximum energy per flash in 5 joules. EG&G's Lite-pac trigger module (model FY-506) provides the high-voltage trigger pulses required to operate the flashtube. *EG&G Electro-optics, 35 Congress street, Salem Mass 01970*

Circle number 143 on Reader Service Card

Photoelectron counting

The EMI Gencom digital photoelectron counting system consists of a remote amplifier/discriminator, digital display unit and a 10-foot interconnecting cable. Compatible with any EMI Gencom ambient or cooled housing, or any other photomultiplier/housing combination capable of operating in the single photoelectron mode, the system is claimed to offer photomultiplier tube users the advantages of a photoelectron counting system at unusually low cost.

The amplifier discriminator unit (Model AD100) is packaged within a small remote unit to allow mounting close to the photomultiplier tube housing. A photomultiplier output signal pulse of 20 microamps (1 mV threshold voltage) or greater will cause the AD100 to put out a 50-nanosecond differential ECL pulse to the counting unit. The counter unit (model C10) has an 8-digit LED display, and TTL and analog outputs. It can be interfaced to a microcomputer system for automated control and data reduction. For digital users, the C10 has two basic modes of operation: In the gate mode, the user can preselect counting time intervals of 10, 1, 0.1 or 0.01 seconds, at the end of which interval the accumulated counts are displayed. In the unit count mode, counts are continuously updated to the LED display. The user can gate the counter manually or by external microcomputer control. For analog users, a

post-discriminator analog signal is available on the rear panel. The current selling price is $975. *EMI Gencom, 80 Express Street, Plainview, New York 11803*

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X-ray source

Minuteman Laboratories have succeeded in producing a bright x-ray source for the wavelength region 8–67 Å, with absolute calibration accuracy of 2% and brightnesses of better than 10^{11} photons $s^{-1}sr^{-1}$ for some K lines. We are told that a small absolute-calibration source at these wavelengths has been a much-sought-after goal. Minuteman is offering two models—a single-beam and a double-beam version—for less than $4500. The units are compact and bakeable, using Conflat hardware; most parts are standard.

The dual-beam source, we are told, is particularly well suited for calibrating x-ray instruments such as grazing monochromators, detectors, windows and filters. These sources can also be used with a beta spectrometer for photoemission or photoelectron spectroscopy at core levels. K lines from Al, Mg, N, O, C and B can be generated with intensities of about 10^{10} to 10^{11} photons $s^{-1}sr^{-1}$. The manufacturer suggests that these sources should be especially useful for small research labs wishing to avoid the expense of going to large synchrotrons. *Minuteman Laboratories, 916 Main Street, Acton, Mass. 01720*

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Infrared photodiode

Eltek is offering a new high-speed infrared photodiode manufactured by the French firm SAT (Société Anonyme de Télécommunications). This type-4011 542, class L, HgCdTe photodiode has been developed particularly for direct detection applications requiring that both the signal detectivity and the cutoff frequency be very high. SAT, it

is claimed, achieves these simultaneous goals by keeping the overall capacitance of the device extremely low. With an overall capacitance of less than 9 picofarads, the photodiode has a cutoff frequency, with bias, of greater than 100 MHz(− 3dB). The quantum efficiency of the detector, we are told, exceeds 40%.

One has a choice of sensitive areas (round) of 0.1 or 0.2 millimeters diameter. The smaller area has a capacitance of only 6 pF. The photodiode is normally furnished with a glass dewar suitable for interfacing with open-cycle JT coolers. Other options are available. The price of the glass-dewar version is $6545, *Eltek, 7 Wooland Avenue, Larchmont, New York 10538*

Circle number 146 on Reader Service Card

Ion beam etching

The Technics MIM TLA 20-M system is designed for the ion beam etching of photo and electron-beam masks. As submicron features become common in photomasks, we are told, conventional wet etchants cannot maintain the tolerances required. Anisotropic etch techniques are a necessity if the capabilities of modern lithography systems are not to be lost during the etching of the mask material. The new Technics system can process masks up to 7×7 inches. It employs the standard TLA 20 ion gun, a controller, a high-speed diffusion pump or cryogenic pump, and a water-cooled substrate station that provides sufficient cooling to permit operation at maximum power density. The unit can also perform reactive ion-beam etching with such gases as Cl_2, CCl_4, CF_4 and CHF_3.

Etch uniformity is claimed to be ± 5%, and typical throughput is four plates per hour. Processes have been developed that permit anistrotropic etching of chrome, chrome-oxide, iron-oxide and silicon masks. The TLA 20-M permits totally dry processing of conventional positive and negative photoresists, as well as electron beam resists such as PMMA, COP, PBS and iodinated polystyrene. *Technics IMF, 7950 Cluny Court, Springfield, Virginia 22153*

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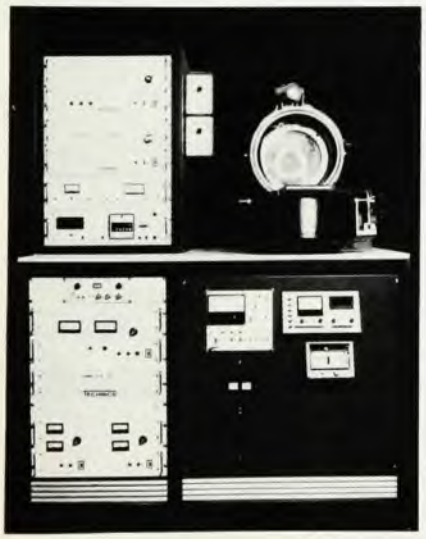

Fiber-optic couplers

NSG America, a subsidiary of Nippon Sheet Glass, is offering two series of new fiber-optic coupling devices incorporating the Selfoc Micro lens. The Selfoc is fiber-optic lens with a graded index of refraction that is said to provide optical characterists not available with conventional optical components.

The Selfoc optical collimator series (OPCL) is a line of compact optical devices in which the optical axis of a fiber is aligned with that of a Selfoc Micro lens. This coupling scheme is said to simplify the design and fabrications of low-loss optical couplers. Typical insertion loss is less than 2 dB for lens separations up to 2 centimeters. (The OPCL 5G series has insertion loss of 4 dB at 5-cm separation). The OPCL is available with graded-index or step-index fibers. Numerical apertures run from 0.19 to 0.5, with divergence angles from 1 to 5°.

The Selfoc electrical-to-optical converter (OPCV) consists of an LED and a step-index fiber. Six models offer a variety of power levels and terminations. We are told that one can achieve extremely high-power optical beams with the OPCV. Typical output power ranges from 80 microwatts to a milliwatt. An 80-page Selfoc handbook is available for $10. *NSG America, 136 Central Ave, Clark, New Jersey 07066*

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New literature

Fiber optics—A new applications note from Fotec, *A Practical Guide to Testing Fiber Optic Systems*, offers advice on testing and characterizing fiber-optic communications systems. Testing of transmitters, receivers, repeaters, couplers and connectors is covered, as well as the more usual discussion of fiber and cable testing. *Fotec, PO Box 246, Boston, Mass 02129*

Ion gauges—MKS offers a 12-page *Practical Guide to Ion Gauges*. Basic concepts and mathematics of ion gauges are discussed, as well as the capabilities, limitation and problem areas of such devices. *MKS instruments, 34 Third Avenue, Burlington, Mass 01803*