PRINTOUT

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Services

Equipment Leasing

The rental or lease of electronic equipment allows laboratories with low budgets, or those in temporary need of a particular item, the use of sophisticated high-cost instrumentation for short-term projects. In addition, equipment obsolescence is avoided, delivery is fast, and the company generally assumes responsibility for calibration and maintenance. Basic rental rates are approximately 10% of original equipment cost; billing is monthly. Advertised rental rates hold over the first three or four months. Subsequent months are billed at discounts. Some companies offer the lessee an opportunity to buy the used equipment which may have been in his possession for some time. Typical monthly rental rates: Textronix spectrum analyzers, \$105 to \$197; electronic counters, \$90 to \$300; Tally paper tape reader, \$85; Brush six channel oscillograph, \$230.

Before entering into an agreement, it is advisable to contact the company manufacturing the instrument of interest; some may rent directly or through a subsidiary. A few of the many companies specializing in equipment leasing are:

Continental Leasing Company, Inc.
30 Park Avenue
Arlington, Mass. 02174
(617) 648-8620

Electro Rents
4131 Vanowen Place
Burbank, Calif. 91504
(213) 843-3131

Datacraft, Inc.
Department 67 P
15225 South Main Street
Gardena, Calif 90247

Chandler Leasing Corp.
69 Hickory Drive
Waltham, Mass. 02154
(617) 899-4010

Primate Research Service

Woodward Asiatic Corp. advertises a new primate research service for non-destructive investigations. Animals, laboratory space, and care are supplied; you provide the investigator to conduct or direct the experiment. A wide variety of species are offered along with operating rooms, cold storage, and deep freeze. Special instruments or equipment must be supplied by the experimenter. Woodward Asiatic Corp., P.O. Box 8125, International Airport, San Francisco, Calif 94128. (415) 697-3747.

Products

Shaft Encoders

DECITRAK system transforms a shaft rotation or an electrical signal from potentiometers, synchros, and analog voltages into digital format. A remotely located digital display shows rotation-degrees. Decitrak systems can be interfaced to digital computers, and offer digital outputs for motor control, sequencing, and data logging. Available in 3-digit and 6-digit units; decimal and BCD outputs for 3-digit system only. Hundreds of shaft encoders and solid-state digital modules are available as components or in customized systems; built-in diodes for multiplexing. Power supply required: 14 V dc, 250 mA, 5% max ripple. Theta Instrument Corp., 22 Spielman Road, Fairfield, N.J. 07006. (201) 227-1700.

Waterproof Switches

Miniature snap action switches, small, flat, and lightweight. Enclosed in low temperature neoprene to withstand temperatures from -65 deg F to 165 deg F; silicone is available on demand. Waterproof switch line includes momentary types normally open or normally closed, and stay-on, stay-off designs. Life expectancy is 5,000 cycles at full rated loads; 100,000 cycles at 115 V ac-5 A resistive, 2 A inductive, 2 A lamp. Electrical capacity at 28 V dc-15 A resistive, 7-1/2 A inductive, 7-1/2 A lamp; at 115 V dc, 1/3 hp motor load, 10 A resistive, 5 A lamp. Approximate sizes: 1-13/16 in. to 2 in. x 13/16 in. x 9/32 in. Control Products, Inc., 280 Ridgedale Avenue, East Hanover, N.J. 07936. (201) 887-9400.

Miniature Solenoid Actuators

Dependent upon the model, miniature solenoids range in weight from .05 to 1.2 oz. Maximum stroke ranges from 3/16 to 5/8 in. Standard voltages are 3, 6, 12, 24, 48, and 110; other voltages available at no extra cost. All models available in dc or ac versions, push or pull, back or end mount. Speed is affected by load, size, duty cycle, and stroke, but smaller units are faster and clapper type is fastest. Reasonable range of speeds is 2 ms to 20 ms. Electro-Mechanisms, Inc., 407 W. Chestnut Avenue, Monrovia, California 91016. (213) 358-2549.

Preset Counter-Time Interval Generator

The Hunter Model 1510 is a preset counter with an internal time base with applications for interval generation, pulse delay, timing, measuring, programming, and control. An internal 1 kHz time base, with two decade dividers, provides a 1-msec to 999.9 sec time interval generator. External time bases allow a range of 9999 counts. External input requires a positive signal from +1 to +10 V. Output: DPDT 2.5 A relay that can be pulsed or latched; positive .5 msec pulse at end of count period. Price: \$395.00.

Hunter Manufacturing Co., Inc., P.O. Box 6066, Coralville Branch, Iowa City, Iowa 52240. (319) 338-9211.

Microminiature Strain Gages

Wire grid strain gages with sizes as small as 1/16 in. x 1/16 in. (resistance tolerance % ± 0.3 , nominal gage factor ± 1.0). Resistance tolerance % for larger gages is approximately ± 1.5 . Price: \$3.00 each. Micro-Strain, Inc., Spring City, Pennsylvania 19475. (215) 948-4550.

Sequence Programmers

Sealectoswitch Programmer consists of a drum actuated series of contacts. The slug-type actuators are set in channels (grooves) on the drum and are individually spring-loaded permitting movement along the 60 dove-tailed grooves to an active, or inactive position under any set of contacts. Two types of actuators are available, camming (shorting) or point-to-point (no-shorting). Choice of drive depends on application requirements. Manual kits are supplied with or without detents. A synchronous timing motor drive allows an accurate time base to be established for automatic operation. Standard drive is 1-rpm providing a 1-sec increment per program. But other speed motors may be ordered. Sealectoswitch also offers stepping motor or solenoid drives. With the former, a set of contacts on the switch are employed to index positions commanded by an external pulse. The solenoid drive is used with a special gear box which provides 60 steps in each 360 deg rotation. Transfer time between positions is approximately 100 msec.

The standard Sealectoswitch has 60 positions or grooves around the drum but other sizes are available on special order. An easy changeover feature may be obtained at additional cost so that the programmed drum may be removed and replaced by another drum in less than 60 sec; spare drums may be used for building up a program library. Cascading units electrically provides virtually any number of program positions. Various actuator colors are available for easy program coding. Smallest size dimensions are 3-7/8 in. x 2-3/4 in. for timing and stepping motor drives with 10 contacts; the same models with 57 contacts are 14-9/16 in. in length. Maximum height is 3-5/16 in. for all types, and standard shaft extension is 1 in. Sealectro Corporation, 225 Hoyt Street, Mamaroneck, N.Y. 10543. (914) 698-5600.

Tenor Model 250 Stepping Drum Programmer has 30 steps which control outputs of either 16 or 31 switches, dependent on requirements. A wide variety of program capacities, output switch types, and drive options are available. The 250 consists of a drive unit, a programmable drum, and output switches. The drum advances one step when the drive unit is actuated. Plugs inserted in holes in the drum actuate the switches according to the predetermined program. You merely insert plugs in the drum wherever you want NO or NC switching to occur. Rearranging the plugs changes the program. The old drum may be removed and a new one inserted very quickly without tools or rewiring. Program charts are supplied to aid in planning the sequence of operation to be performed. Operating on the principle of end-point control, these programmers are pulse-actuated only in response to

predetermined pulse signals from external sources, e.g., remote sensors, counters, timers, or pushbuttons. Both electrical and pneumatic sequencing is available; programming plugs may be ordered in various colors. The basic Model 250 with F frame is priced at \$255.00. Included in the base is a 30-step drum assembly, 120 step/min drive, and a unidirectional step control package. The addition of 2 A switch option at \$65.00 brings the total package cost to \$426.00. The tap switch attaches to the free end of the drum shaft and allows for considerable enlargement of capabilities. The drum unit is 22-5/16 in. x 7 in. for the 31 switch model; the 16 switch model is 16-13/16 in. in length. Tenor Company, Inc., P.O. Box 2766, Milwaukee, Wisconsin 53219. (414) 782-3800.

Random Access Projector

Mast Development Co. advertises a random access 35 mm film loop projector with 100, 200, or 300 frame capacity. Choice of controls includes push buttons, dual dial, or computer. Any one of 100 frames may be projected in 3.5 sec maximum. A 10 in. x 15 in. rear projection daylight screen is provided. Mast Development Co., 1D-JA, 2212 East 12th Street, Davenport, Iowa 52803.

Biopotential Skin Electrodes

I. M. I. offers a new series of biopotential skin electrodes. Maximum offset voltage, 250 microV; polarization voltage (max/24 h) 5 microV; maximum electrode impedance 10 ohms; minimum electrode-to-skin impedance, 100 ohms; minimum electrode-to-skin offset voltage, 300 microV; weight, 2.0 g; diameter and thickness, 13.7 x 3.8 mm. Three electrode kit priced at \$57.00, including three electrodes, tube of EPI-GEL, 100 adhesive washers, bottle of skin cleaner, disinfectant, and a three electrode cable. Five electrode kit, \$103.00. Industrial/Medical Instruments, Inc., 4262 Campus Drive, Newport Beach, California 92660. (714) 546-0744.

Miniature Readouts

DIGIVAC is a 7-bar, segmented vacuum fluorescent readout, consisting of seven triodes with a common anode and cathode sealed into a glass envelope. Seated height is .800 in., diameter is 1.125 in., and the base has 12 pin connections. Character size is .400 x .600 in., slanting to the right at 15 deg. Brightness is sufficient for viewing under high ambient light conditions. Viewing angle is 150 deg, viewing distance 40 ft. Standard color is green (peak at 5200 Å); characters are alphanumeric, 0 to 9, plus A, C, E, F, G, H, J, L, P, U, Y. Logic and memory to be supplied by user. TUNG-SOL Division, Wagner Electric Corp., One Sumner Avenue, Newark, N.J. 07104. (201) 484-8500.

IEE offers vacuum tube readouts with a character height of 5/8 in., maximum number of characters 10 (0-9). The tube is 2.250 in. high and 1.135 in. wide with 12 pin connections. Normal brightness is 110 ft-L. Price per tube is \$20.00 in quantities of 1-9. Power supply capable of driving up to 10 vacuum tube readouts is \$15.00. Industrial Electronic Engineers, Inc., 7720 Lemona Avenue, Van Nuys, California 91405. (213) 787-0311.

Briefs

Signal Correlator

R & D section of Princeton Applied Research Corp., Princeton, N.J., has developed a simple, compact signal correlator that computes auto- or crosscorrelation functions in real time. It is claimed that the instrument can compute 100 points of correlation function continuously and simultaneously. The PAR Model 100 incorporates a quantized circuit to convert analog signals into digital pulses in order to use a digital shift-register for obtaining delay. It also includes a new type of hybrid multiplier for direct multiplication of an analog and a digital signal. The correlator has a selectable range of delay times from 100 msec to 10 sec. The minimum delay of 100 msec (or 1 msec/increment) allows signal frequencies to 300 kHz. Computed voltages are averaged and stored in capacitor memory circuits; stored data can be read out in correlogram form at a later time and at a selected speed. Price: \$8,500.

Solid State Lamp

General Electric Co., Miniature Lamp Dept., Cleveland, Ohio, has developed a silicon carbide light-emitting diode that emits light at 5900 Å (yellow) at 3 V forward bias. Test lamps have operated continually for more than 10,000 h with no sign of deterioration. The diodes are shock-proof, switch in 10 μ sec, and are tolerant of temperatures above 250 C. Priced at \$9.50 per sample, \$6.50 each in quantity.

Ultrahigh-speed Phosphors

Westinghouse Electric Corp., Research and Development Center, Pittsburgh, Pennsylvania, has discovered ultrahigh-speed phosphors which react 100 to 1,000 times faster than the fastest phosphors previously known. The phosphors, zinc oxide and cadmium sulfide, have been made in powder form or as thin phosphor films deposited on glass. The two phosphors show near-edge emission at room temperature, violet in ZnO and green in CdS. Ordinarily such emission can be seen only at low temperatures, but in the new phosphors unusually high concentrations of free electrons are provided to enforce emission at room temperature.

Miniature CRTs: Experimental Potential

Miniature CRTs are not new. But advances in the past few years have resulted in improvements in resolution, light output and depletion sensitivity, and linearity that provide the instrument with interesting experimental capabilities. Advertised sizes for miniature CRTs vary, but generally the category includes tubes with less than a 2-in. diameter and less than an 8-in. length. Tubes less than 3 in. long are available that can display a 1000-bit matrix; 1-in. diameter tubes can deliver 1,000 ft-L if designed with high efficiency phosphors (P31) and 4-to-5-kV operating voltages to permit an aluminized screen. As a result, miniature projection displays can be developed with interesting form factors in mixed colors or in monochrome. Although miniature tubes require close-to-the-eye viewing, the same amount of data may be presented as on large-screen CRTs.

Lightweight monocular and binocular headsets have recently been developed that incorporate the CRT and wide-angle optics to present a virtual image of the display through a combining prism (Perkin-Elmer, 723 Main Avenue, Norwalk, Conn.). To the headset wearer, the focused image appears to be superimposed on the normal visual scene. With a masked headset, this allows either simultaneous or electronic image observation. The optical system provides a 40 deg field of view; at a normal viewing distance this presents a display equivalent to a 21 in. monitor.

Research applications would appear to be numerous. For example, TV displays on the tube might be used in conjunction with head motion sensors for directing the TV camera. Also, with the binocular system, a two color presentation might be used for coding alphanumeric or graphics by using two CRTs with different phosphor screen properties. Or, the two screens may have phosphors with different persistence characteristics. Presenting information with different rates of decay simultaneously provides an interesting research capability. For example, one might study information processing ability as a function of simultaneous low-speed and high-speed stimulus display. Superimposing two images for mixed color or stereoscopic displays is considered feasible, although the linearity and image registration required for superimposition apparently have not been investigated in detail.