PRINTOUT

JOSEPH B. SIDOWSKI
University of South Florida, Tampa, Florida 33620

PRODUCTS

Automated Sphygmomanometer

The Model 77070 Schneider automated sphygmomanometer offers virtually continuous, absolute, non-invasive blood pressure measurements. Either systolic or diastolic blood pressure determinations may be made approximately every 3 sec without significant venous occlusion or subject discomfort. Automatic cuff inflation cycles occur at selectable sample rates of 3-99 sec. Features include easy-to-read $\frac{3}{4}$ -in. LED display, 0 to 250-mmHg aneroid gauge, error indicator, plus BCD and IRIG analog outputs for external data collection. Accessory biofeedback monitors are available for visual, audio, or absolute digital feedback.

Lafayette Instrument Company
P.O. Box 1279
Lafayette, IN 47902
(317) 423-1505

ECG

The Model VS-4B electrocardiograph provides for 4 h of continuous battery operation. The ECG responds to signal frequencies over 100 Hz. Paper loading is done with a drop-in cassette. Paper widths of 48 or 63 mm and speeds of 25 or 50 mm/sec may be chosen.

Cambridge Instrument Company
73 Spring Street
Ossining, NY 10562

Biomedical Telemetry

This low-band telemetry transmitter (EKG, EEG) is built around plug-in block circuits that provide for voice, tone, or slow-speed digital data transmission.

Repco
6835 Cockran Road
Solon, OH 44139

Infusion Pump

This implantable, self-contained, self-powered infusion system is small enough to be placed subcutaneously or intraperitoneally in mice or rats. Once implanted, the unit delivers solutions for up to 7 days without the need for external connections or frequent animal handling.

Alza Corporation
950 Page Mill Road
Palo Alto, CA 94304

Digital Thermometer

The Model 400 electronic thermometer uses a disposable probe cover which is placed on the probe before placement under the subject's tongue. Readout appears on a digital display. A built-in TPR system allows the user to take pulse and respiration readings at the same time.

Diatek, Inc.
3910 Sorrento Valley Boulevard
San Diego, CA 92121

Multipurpose Printer

The SP-302 5 by 7 impact dot matrix 40-column intelligent printer features a microprocessor controller that allows it to perform many functions, including double-width printing, double- and triple-space format. Tab functions are standard for simple software control from a host device or computer. The unit prints at a rate of 50 characters/sec and has multicopy capability. It is capable of using ordinary adding-machine paper. Dimensions are 9.6 x 5.0 x 12 in. Price is \$575.

Syntest Corporation
Marlboro, MA 01752

Graphics and Video Processor for NOVA

The Model 200-D graphics and imaging video processor is self-contained on a 15 x 15 in. printed-circuit board that fits into any standard Data General NOVA or ECLIPSE series computer. The unit generates raster scanned, refresh, graphics, and imaging displays up to 512 by 512 pixels in black and white or 256 by 256 pixels in 16-level gray scale or color. Prices begin at \$4,900.

Lexidata Corporation
Burlington, MA 01803

Wang Computer

The new WCS-15 computer features 16k bytes of user memory, expandable to 32k, at 12-in. CRT, a multizone keyboard, and a single diskette drive. Each diskette provides 262k bytes of on-line storage and extensive off-line storage. User options include expanded memory, a second diskette drive, a variety of printers and plotters, and an interface controller. Basic price is \$10,200.

Wang Laboratories, Inc.
Lowell, MA 01851

Alphanumeric Printer

The Model AIP-40 is a stand-alone alphanumeric impact printer that includes a power supply. The unit prints the standard 64-character ASCII set, 10 by 7 double-width characters, corresponding to a 20-column line. The 8-bit parallel interface printer is \$425. Serial interfaces start at \$625. Average printing rate is 50 characters/sec.

Datel Systems, Inc.
1020 Turnpike Street
Canton, MA 02021

Rodent Guillotine

The rodent guillotine instantly decapitates rats, mice, and other small animals. Price: \$125.

EDCO Scientific, Inc.
P.O. Box 64A
Sherborn, MA 01770

Spiral Aftereffect Test

The Spiral Aftereffect Test is equipped with an Archimedes spiral disk which rotates clockwise or counterclockwise at 80 rpm. It is equipped with a totalizer to measure duration of the afterimage and has a selection timer to allow a variation of rotation time of the spiral. Cost is \$300.

Robert Schaeffer & Associates, Inc.
612 West Horatio Street
Tampa, FL 33606

PDP-11 Controller

A plug-in controller that enables the PDP-11 to serve as the intelligence for up to 32 remote CRT stations has been announced by Echolab, Inc. The Model CVD-11 includes two-monitor capability and a video/data multiplexer that allows keyboard printer and TV monitor to share a single coax wire. The controller card plugs into a key slot and two small remote interfaces. Each remote CRT station is converted to its controller with a single cable that can be up to 1,000 ft long.

Echolab, Inc.
Burlington, MA 01803

Microcomputer with PDP-8 Compatibility

The PCM-12 is a new 12-bit microprocessor system that is software compatible with DEC's PDP-8 computer family. The system incorporates Intersil's IM6100 12-bit CMOS microprocessor, MOS, and low-power Schottky technology. Because IM6100's instruction set is identical to the PDP-8's, the PCM-12 user has access to the minicomputer software and mass storage operating systems developed for the PDP-8 family. The PCM-12 has virtually no point-to-point wiring; all board inter-

connects are handled by the backplane busboard and a single ribbon cable. Among options to be available soon are: an EPROM/RAM memory module, a floppy disk storage module, interface for TTY/CRT, an audio cassette recorder interface, and a high-speed paper tape reader/punch interface. The basic price is \$989. A kit is available for \$679.

Pacific Cyber/Metrix, Inc.
San Ramon, CA 94583

Square-Wave Generator

The Phipps and Baird square-wave stimulator Model 611 provides a square wave 0-100 V in amplitude, .04-50 msec in duration, a 1 pulse/sec to 1,000 frequency, and a sync-output of 10 V. Price is \$225.

Fisher Scientific Company
711 Forbes Avenue
Pittsburgh, PA 15219

Miniature Battery-Powered ECG

The SURTECH Mini-Graph is a miniature battery-powered ECG with built-in electrodes. About the size of a paperback book (1-3/4 x 4-3/8 x 5 in.), the unit can be placed directly on the thorax for ECG recordings. The thermosensitive chart paper has a width of 1-1/8 in. The unit is powered by 6AA alkaline cells, allowing about 100 min of recording before replacement.

Survival Technology, Inc.
7801 Woodmont Avenue
Bethesda, MD 10014

Portable Data Acquisition

The Model 200L data logger, with universal interface, operates from an internal rechargeable battery for up to 3 months. The system sequentially samples up to 12 input signals at 24 predetermined (switch-selectable) intervals ranging from 2 sec to 1 h. Data is recorded in 8-bit, serial phase-encoded form on standard magnetic tape cassettes. The total package is 6 x 6 x 10 1/2 in. and weighs less than 20 lbs with battery.

CSI/N, Inc.
450 Drew Court
King of Prussia, PA 19406

Printer for Microcomputers

The Micro-1 includes case, power supply, 96-character ASCII generator and interface, low-paper detector, and multiline asynchronous input buffer. The microprinter prints 240 characters/sec on aluminum-coated paper. Users can select 20, 40, or 80 columns. Price: \$595.

Centronics Data Computer Corporation
Hudson, NH 03051

BRIEFS

Slide Syncer

The Slide Syncer is a programming device that allows one to record verbal material and a slide projector advance signal on the same tape track. It can be built inexpensively and is reliable and quiet. Incorporated into the system is a speaker for use with the external speaker pack on a cassette or open-reel tape recorder. The self-contained power source consists of four AA cells. The unit requires +6 V dc.

The circuit and instructions for construction of the programmer for audio-visual presentations are provided in *Popular Electronics*, 1976, 10, 74-76.

Low-Cost Terminal Interface

If you bought a terminal for a microcomputer and found it incompatible with your microprocessor board, an article in the June 5, 1977 of *EDN* (pp. 205-206) may be of interest. Circuits are provided for three computer-terminal interfaces that were breadboarded with several transistors, resistors, and open collector TTL ICs. Although 2N3646s are used, almost any popular transistor will perform equally well.

New Products

Motorola introduced a bipolar LSI circuit for microprocessor systems. The PIC (Priority Interrupt Controller) allows priority control on the interrupt inputs to a microprocessor and has been dually designated MC8507/MC6828 to indicate that its performance has been optimized for the M6800 microprocessor system, but can be used for non-M6800 applications. Basically, the PIC eliminates the software interrupt polling routing in systems containing eight, or multiples of eight, I/O devices. The PIC can change the interrupt vector, reserved in memory for hardware interrupts, into one of eight alternate vectors assigned to the I/O service routines. The unit modifies the low-order bytes of the reserved input.

Teledyne Semiconductor is marketing two new ICs for a conventional logic circuits. The HINIL 306 and 307 both contain two two-input NOR gates and two three-input NOR gates. The 306 features active pull-up outputs and 10-mA output drive currents that permit it to drive lines up to 10 ft without loss of noise immunity. The 307 has open collectors so the outputs can be collector OR'd. Both units operate on 10-16 V dc.

Intersil, Inc. markets the 8240, 8250, 8260 monolithic programmable timer circuits for a variety of applications. Each device comprises an accurate low-drift oscillator, a counter section of cascaded master-slave flip-flop, and suitable logic and control circuitry. The integral time-base oscillator can be set with an external R-C network, or disabled, with the time base supplied by an external clock. The counter outputs are open-collector transistors that can be programmed easily at the external pins. With additional logic cir-

cuitry, timing can be programmed by a computer or microprocessor. Each device has a counting ability of two decades, permitting selection of time delays from 1 RC to 99 RC (RC represents external timing network), while a carry-out gate allows expansion to as many decades as needed.

Intersil, Inc.

10900 North Tantau Avenue
Cupertino, CA 95014

Radio Shack Microcomputer

Radio Shack (Tandy Corporation) has a microcomputer system with a CRT and BASIC language. The "Tandy" computer uses the Zilog Z80 CPU and comes complete with a 53-key keyboard, 12-in. video monitor, and tape cassette for \$599.95. Included are a power supply and cabinet and a 4k PROM with BASIC. Standard RAM is 4k also, but, according to the manufacturer the 4ks can be removed and 16ks inserted in the sockets for an additional \$289. A floppy disk and disk operating system will be available for less than \$600. An expansion board plugs into the back.

Pulse Rate Monitor

The Series 4600 digital pulse rate monitor is an electronic instrument that measures and displays heart rate digitally and in real time. In the basic operating mode, the unit uses a standard photoelectric finger sensor to detect pulse rate. Results are presented on a three-digit display. Readout is instantaneous or four-beat average, switch selectable. The 4600 also provides a capability for detecting and displaying the rate of electrical activity occurring during the heart beat. It provides the means for monitoring not only through peripheral flow but also by ECG signal. The 4600 is lightweight (less than 5 lbs) and battery operated.

G & W Applied Science Laboratories

335 Bear Hill Road
Waltham, MA 02154

Coulbourn Instruments Retrofit Logic Modules

The Series 200-CI module line is designed to retrofit Tech-Serv (BRS-LVE) Series 200 digital logic systems. Inputs and outputs are directly compatible with the original BRS-LVE units. All CI outputs are protected from shorts to ground and output interconnections. The CI offering consists only of cards, basic I/O logic, and programming modules. Where possible, cards are plug-in replacements for original equipment with additional features, such as inverted outputs, occupying pins unused in the BRS-LVE line.

Coulbourn Instruments

P.O. Box 2551
Lehigh Valley, PA 18001

Coulbourn Instruments recently opened a second office west of the Mississippi: P.O. Box 194, Laramie, WY 82070 [Phone (307) 742-8246].

Surplus Equipment

Beckman Type SC11 dynograph recorder is priced at \$950. The system has eight channels plus event and is all solid state. Brush Model RD 1664-00 has six channels plus event marker (heated stylus) with eight chart speeds at \$525. An ink writing brush Model RD 1661-20 with six channels and a vertical writing surface is \$495. Hewlett-Packard 210-A square-wave generator is priced at \$35; a 202-A low-frequency function generator (sine, square, or triangle) is \$45. An all solid state Honeywell Instrumentation tape recorder is \$975. The system includes 1-in. 14-track heads, 7-channel FM record amplifiers, 14-channel FM playback amplifiers, 14 each center frequency plug-in cards (5.4, 1.08, 10.8, and 108.0 kc), 7-channel scope monitor, and a spare set of record and playback heads.

Jack Watts Company
151 West 154th Street
Gardena, CA 90248

Programmable Stimulator

The Medtronic Model 5325 programmable stimulator is a portable battery-powered programmable pulse generator designed for use during cardiac electrophysiological studies. The device provides programmed premature stimuli synchronized at selected intervals to asynchronous pacing pulses or to sensed spontaneous depolarizations. The Model 5325 can deliver high-rate stimuli at rates up to 800 pulses/min (ppm) for short-term atrial stimulation. The output delivers constant-current pulses 1.8 msec in duration. Current amplitude of these pulses is adjustable .1 to 20 mA. A recorder output connector permits recording or monitoring from the same electrodes as used for stimulation.

Medtronic, Inc.
3055 Old Highway Eight
P.O. Box 1453
Minneapolis, MN 55440

Grason-Stadler Electromechanical Programming Equipment

Due to a steady decline in customer demand, the Enviromedics Division of GenRad has announced the discontinuance of the Grason-Stadler electromechanical programming equipment and animal environments. Limited quantities are being offered at reduced prices. Price lists are available from

GenRad
Enviromedics Division
Route 117
Bolton, MA 01740

Used Computer Equipment Newsletter

Associated Computer Products is publishing a monthly newsletter devoted to the firm's offerings of used DEC and Data General computers, terminals, and peripherals. Subscriptions are free from

Associated Computer Products
472 Pepper Street
Monroe, CT 06468

Achieving limited four-channel capacity in three-channel tachistoscopes

(Submitted by Victor M. Catano, Saint Mary's University, Halifax, Nova Scotia, Canada B3H 3C3)

Limited four-channel capacity can be achieved in three-channel tachistoscopes whose operations are controlled by pulses that are emitted when a digital counter reaches predetermined numbers during the counting process.

Research on visual information storage which follows the methods developed by Averbach and Sperling (1961) requires (a) a blank white field followed in succession by (b) a letter array, (c) a blank white field, (d) a target indicator, and (e) a blank white field. Through recycling of the time sequence, Channel 1 of the tachistoscope can be used for a and e while Channels 2, 3, and 4 are needed, respectively, for b, c, and d. Because of the normal operation of some three-channel tachistoscopes, it is generally impossible to have c also take place in Channel 1, necessitating a fourth channel. However, any tachistoscope operated through digital pulses can be modified to have repeated presentations of any channel at different stages of the timing sequence. In the example above, a, c, and e would all occur in Channel 1.

A basic digital tachistoscope system, for example, Iconix Products, consists of an exposure box controlled by a lamp-driver unit. When each lamp driver receives a pulse from a preset control timer, it causes the lamps in a given channel of the exposure box either to go on or to go off. Pulses are generated by the control timer when a time-base/counter unit reaches predetermined numbers during the counting process. However, the input jacks on the lamp driver are capable of receiving a pulse from only one control timer. This limitation prevents the repeated use of a given exposure box channel.

By making a simple "Y-connector," that is, sending the output of two (or more) control timers into a common input jack of the lamp driver, a lamp driver will receive pulses from the two control timers which may be programmed independently of one another. The same exposure box channel may then be used at different times within a sequence of operations. With the use of the "Y-connector," Channel 1 can be used for Operation c as well as for a and e. Of course, experiments which require four different stimuli cannot be performed with a modified three-channel tachisto-

scope, but it can be used for research which requires presentation of three distinct stimuli with the repetition of any or all three. The only limiting factor is the number of control timers available to generate pulses at given times, a control timer being needed for each ON and each OFF operation.

REFERENCE

Averbach, E., & Sperling, G. *Short-term storage of information in vision*. In C. Cherry (Ed.), *Symposium on information theory*. London: Butterworth, 1961.

A method of marking animal subjects for easy identification during observation

(Submitted by Mary Bertino, Catherine Jen, Jan Morofsky, and Francine Wehmer, Wayne State University, Detroit, Michigan 48202)

Observational studies of individuals in freely behaving groups is difficult when the species under study is sexually nondimorphic and is phenotypically homogeneous in appearance. A means of marking individuals

is necessary to make focal observation feasible. A method of marking rodent subjects we have found most useful in facilitating focal animal observation is dyeing the fur of the subjects with commercial hair dye. Specifically, we have used Shade 83 ("Natural Black") of *Loving Care* by Clairol, a mild nonperoxide hair dye, readily available and easily applied. Unlike many other hair dyes, it is premixed and storable. We applied the dye in a distinctive pattern with a camel-hair brush, painting it liberally on the fur of the subject. The dye was left on the fur for 45 min. Excess dye was then rinsed off with warm tap water. The subject was wiped thoroughly with a towel and placed under a lamp to dry.

We have used the dye to mark pups as young as 12 days. Under normal lighting conditions, the mark is visible for at least 30 days after application. Under dim red light, the mark was adequate for at least 12 days. With adult animals, the mark would probably be distinguishable for longer periods, since adults do not grow at the same rate as pups. There are a few package warnings with the dye which should be followed.

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