PRINTOUT

PRODUCTS

JOSEPH B. SIDOWSKI

Ultrasound Stethoscope

The Model LF3A Ultrasound stethoscope is a doppler instrument for the detection of fetal life. The unit is battery operated, lightweight, and small enough to slip into a shirt pocket. Cost of the stethoscope plus automatic speaker is \$485. The stethoscope with headset and battery is \$295.

Medsonics, Inc.
790 Hemmeter Lane
P.O. Box M
Mountain View, Calif. 94042

Cat Surgical Head Holder

The David Kopf Model 345 cat surgical head holder has been redesigned to give the researcher greater flexibility in the selection of skull sizes that can be accommodated. The 345 is priced at \$125. A surgical head holder is also available (on special order) for rhesus monkeys.

David Kopf Instruments
7324 Elmo St.
Tujunga, Calif. 91042

Pedi-Pulsor

The Pedi-Pulsor is an instrument for stimulating venous blood flow in humans. The unit consists of two foot treadles, a motor and associated brake mechanisms for varying the resistive pressure of the treadles, and a control box containing a timer, counters, and brake pressure control. A switch allows for selection of either a passive or active operating mode. With the S's feet on the treadles, the active mode requires that the treadles be operated by foot pressure exerted by the S. The resistive pressure of the treadles is adjustable over a wide range. In the passive mode, the treadles are motor driven through an arc to provide plantar and dorsiflexion of the feet. The number of strokes in either active or passive modes registers continuously on a counter. The Pedi-Pulsor sells for \$850.

Barber-Colman Co.
Medical Products Div.
Rockford, Ill. 61101

Stepping Hydraulic Microdrive

David Kopf Instruments recently introduced the new

Model 607WCP stepping hydraulic microdrive. Panel-mounted controls include a seven-position rate switch (rates from 1.5 to 200 steps/sec), external oscillator input, preset steps as an option (range 1-999 microns), over travel indicator, micron counter to indicate micron steps in either direction (option), provision for counter-computer interface. A hand-held remote-control box contains operating controls for single, multiple step, step rate vernier, and forward-reverse. The hydraulic section features miniature cylinders that can be used in chronic or acute applications. Price of the complete system is \$2,195.

David Kopf Instruments
7324 Elmo St.
Tujunga, Calif. 91042

Strip-Chart Recorders

The new Essex Series 1200 strip-chart recorders are self-balancing, high-input impedance, potentiometer type, continuous trace recorders. The units accept inputs from all standard analog measuring elements thermocouple, millivolt, resistance thermometers, pressure, and motion, etc. The unit may also be interfaced with digital transmitter/transducers. All standard models include inputs from RTD, thermistor, dc or ac signals (from 1 mV), 1-5 mA, 4-20 mA. Recorder is supplied for portable or panel mounting (as ordered), 5-sec pen speed, 115-V 60-Hz operation, single chart speed. Price is \$275. A two-speed switch selectable drive is \$40; a single event marker is \$30.

Essex Engineering Co.
Essex, Conn. 06426

The Hewlett-Packard Model 7155A is a 5-in. chart recorder that operates up to 9 h on internal battery and is available for operation on external dc or ac. Input sensitivity is 1 mV to 100 V full scale in 16 ranges with overlapping vernier. Seven chart speeds range from 20 sec/in. to 60 min/in. Speed is specified in time/distance rather than distance/unit time for easier conversion. Stepper motor drive system driven from internal oscillator makes chart drive independent of line frequency. Basic price is \$985.

Hewlett-Packard Co.
1501 Page Mill Rd.
Palo Alto, Calif. 94304

Telemetry ECG Monitor

Model WEP-6121 telemetric ECG monitor includes a scope display and heart-rate meter. Transmitter can operate in three types of batteries. With Mercury batteries, the unit functions for 2 weeks continuously. Transmission range indoors is 30 m.

Nihon Kohden Kogyo Co., Ltd.
31-4 Nishicohiai 1-Chome Shinjuku-Ku
Tokyo, 161 Japan

Fingertip Sensor

The Whittaker Pulse-Watch is a fingertip heart-rate monitor. The unit is a portable, battery-operated device with continuous meter readout in beats per minute, plus tone and flashing light with each pulse. An electro-optical sensor straps to the fingertip.

Whittaker Corp.
10880 Wilshire Blvd.
Los Angeles, Calif. 90024

Instrumentation Amplifier

The Model 1124 differential amplifier is designed to meet the instrumentation requirements for many physiological applications, including EEG and ECG. The unit is ac-dc coupled, battery operated, with a bandwidth of dc-5 KHz, noise of 8 microV peak to peak, a gain of 200-100,000, and a 60-Hz notch filter. Price: \$325.

Data, Inc.
Box 2074
Fort Collins, Colo. 80521

Digital Printer

The Model 2010A digital printer operates at 2.5 lines/sec and records in black or red on fanfold paper. Ten-column unit prints 8 columns of data and 2 columns of function; 18-column unit, 16 of data and 2 of function. Data produced 4 microsec after print command. Price: \$875 per 18 columns, \$795 for 10 columns.

John Fluke Mfg. Co., Inc.
P.O. Box 7428
Seattle, Wash. 98133

Miniportable Oscilloscope

The PS900s are miniportable scopes, battery or ac powered, with dc-20 MHz bandwidth, 10 mV/div sensitivity, and recharging circuitry. Standard C size battery cells can be used. The unit weighs 7 lb and is available from \$595.

Vu-Data Corp.
7170 Convoy Ct.
San Diego, Calif. 92111

EEG Frequency Analysis

Modular system allows user to select a standard unit, modify an existing system, or structure an instrument compatible with his needs. Basic system may be purchased and later expanded, or not, according to plans or budget. System prices range from \$795 to \$3,990. Unit is compatible with Grass, Beckman, and Irig polygraphs.

Med Associates, Inc.
Box 47
East Fairfield, Vt. 05448

Catheter Pressure Transducers

This transducer has three Mikro-Tip pressure sensors mounted along a single catheter. The catheter is a 7F or 8F nylon core, woven Dacron, NIH catheter tapering to a 6F catheter distal to the middle sensor. The distal Mikro-Tip pressure sensor is located at the tip of the 6F portion of the catheter. Spacing between the three sensors is made according to customer specifications with a minimum spacing of 3 cm between any two adjacent sensors. Price: \$2,425.

Millar Instruments, Inc.
P.O. Box 18227
Houston, Tex. 77023

Miniature FM Transmitter

The 40-71-1 miniature FM transmitter, priced at \$150, is tiny enough to be mounted on the smallest animals. No preamp is required. Range, 50 ft; response, dc-5 KHz; dynamic range, 0-100 mV; power, 1.5-9 V, .2 mA; input resistance, $>10^{12}$ ohms. Cost of the 40-71-5 receiver is \$195; the 40-71-2 battery pack is \$40.

Frederick Haer & Co.
P.O. Box 2138
Ann Arbor, Mich. 48106

Solid State Timing Programmer

The Model TP-41 can activate up to 8 external relays. Solid state circuitry improves reliability over that of conventional motor-driven cam electromechanical devices, and digital clock provides 0.01% timing accuracy. A matrix of screw-in terminals accomplishes the desired activating time of each of the 8 relay signals. Relays can be activated in numerical sequence or all can be activated relative to the starting time. Timing capability is selectable internally in 0.25-, 0.5-, or 1-sec increments up to over 1,000 sec. Input power is 28 V dc. Cost: \$890.

Bayshore System Corp.
5406A Port Royal Rd.
Springfield, Va. 22151

chromato-chambers, TLC strips, developing solvent, and spray reagents for 150 tests.

Supelco, Inc.
Supelco Park
Bellefonte, Pa. 16823

A fetal maturity kit is also marketed by

Helena Laboratories
P.O. Box 752
Beaumont, Tex. 77704

at a price of \$157.50.

Neurograph

The N-3 Neurograph is a nerve-signal analyzer. The unit captures 20-msec analog signals (amplitude resolution 0.1%) and converts them into 2,048 digital format samples (1,024 in dual-channel mode). Data may be read out digitally for direct computer input or converted to analog signals and played back at 0.5-50 sec to drive chart recorder directly. Repetitive playback of sorted data may be visualized on oscilloscope or analyzed by sweep-type analyzer.

Transidyne General Corp.
462 S. Wagner Rd.
Ann Arbor, Mich. 48106

Ultrasonic Stethoscope

The Model BF5A ultrasound stethoscope uses doppler to detect blood flow transcutaneously in smaller arteries lying close to the surface of the body. The unit is powered with an 8.4-V battery with a pencil-size probe tip.

Medsonics, Inc.
790 Hemmeter Lane
P.O. Box M
Mountain View, Calif. 94040

Electromyograph

The Model 14A11 DISA electromyograph has a high stimulus output capability, 500 V at 90 mA, which permits stimulation of deeply seated nerves through surface electrodes or supramaximal stimulation of sensory nerve fibers. The unit is single channel with a 2-Hz to 10-kHz frequency range, an amplifier which covers 5 microV/cm range, a digital latency readout from 0.1-90 msec, and stimulator with impulse durations of 100, 200, and 500 microsec.

Siemens Corp.
186 Wood Ave., S.
Iselin, N.J. 08830

Pressure Transducer

The Mikro-Tip is for measuring pressure gradients in

blood vessels, pulse velocity, heart sounds, esophageal motility, etc. Active sensing surfaces are insensitive to flow and catheter whip.

Millar Instruments, Inc.
P.O. Box 18227
Houston, Tex. 77023

Infant Movement Sensor

The Apnea alarm is a special mattress that senses the movements of infants. A logarithmic sensitivity control plus dual threshold indicator lights eliminate false alarms.

Spearhead, Inc.
1401A Cedar Post Lane
Houston, Tex. 77055

Measuring Light Intensity

The Y-BAR-1 is a photometric response sensor with the same characteristics as the diffused function silicon photoelectric cell that offers composite glass absorption filter for spectral response with 1% of standard CIE observer curve between 400 and 700 nm.

Photon Products
P.O. Box 1230
Cupertino, Calif. 95014

Kits

The Psych-Tone kit (\$53.15) is a programmable melody synthesizer with 28 controls and a 63-note memory. Basically a "pseudorandom" sequence generator which operates as a tune computer, the Psych-Tone allows variation of tempo, voicing, selection of pauses, and tone shaping. It can be set for 1,728 different note sequences, which may be selected and combined with any of 63 pause combinations to produce 108,864 different melodic lines. Six different voices are provided and the user has control of the attack, sustain, and decay functions.

The Digital Logic Microlab (\$29.95) includes 4 flip-flops, 4 gates, 2 buffers, and 3 bounceless switch contacts that can be used to make hundreds of basic logic circuits. Each logic block has a light to indicate state. Three types of input signals are available. Connections are made with clip-on leads. No possible combination of connections, no matter how wrong, can damage the circuits.

The Function Generator kit (\$39.95) has switch selection of waveform, frequency range, and type of offset. Output amplitude is constant to less than ± 1 dB on any range and with any waveform. Sine-wave distortion is less than 1% from 20-20,000 cycles. Square-wave and pulse rise times are less than 0.25 microsec.

Southwest Technical Products Corp.
219 W. Rhapsody
San Antonio, Tex. 78216

Used Computers

NCE is advertising used Data General minicomputers at the following prices: NOVA with 4K CPU at \$2,750; NOVA 1200 with 4K CPU at \$3,300. Varian computers are priced as follows: 520i with 28K, \$9,000; 620i with 4K, 32K disk, and ASR 33 Teletype at \$4,000 total (original price \$27,200). A DEC PDP-8 with a 4K CPU is \$1,500; PDP-8L with 4K CPU is \$2,500, one with 8K is noted at \$3,500; PDP-8L with 12K CPU, \$5,000. The company also advertises PDP-12 systems with multiple configurations. A DECTape controller (TC01) is advertised at \$5,000. DEC modules are advertised at 60% of list.

Newman Computer Exchange
222 N. Seventh St.
Ann Arbor, Mich. 48103

BRIEFS

Category Norms for Verbal Items for Children in Grades 2-6

(Submitted by Carla J. Posnansky, College of Education, University of Rochester, Rochester, New York 14627)

In 1969 Battig and Montague published normative category information for 56 categories with adult Ss. Developmental studies of organization of memory have been dependent upon this adult normative information without regard to whether the use of the same normative information is appropriate. The developmental manipulation of type of list structure is, however, no doubt best based upon normative information which has also been collected developmentally. Thus, 394 children in Grades 2 through 6 were asked to generate instances of 25 Battig and Montague (1969) categories within a time period of 1 min per category. Ss wrote their responses in a test booklet using a separate page for each category.

Data were tallied so that category instances were ranked on the basis of their frequency of occurrence within each grade level. Additionally, indications of the average number of category instances generated by children at each grade level within each category was provided.

An analysis of variance was performed separately within each category, using the rank of any item appearing with a frequency of 10 or more in any grade as the dependent measure. Thus, the proportion of variance accounted for by distinct instances in each category was provided, and this is an indication of the consistency of ranking across grades for the most frequent category instances.

Complete copies of this normative information are available upon request from the author: Carla Posnansky, Department of Education/Psychology, University of Rochester, Rochester, New York 14627.

(Reference: Battig, W. F., & Montague, W. E. Category norms for verbal items in 56 categories: A replication and extension of the Connecticut category norms. *Journal of Experimental Psychology Monograph*, 1969, 80, 1-46.)

An Inexpensive Modification of a Rodent Respirator
(Submitted by Claude J. Gaebelein, James L. Howard, and J. Stanford Hutcheson of the Department of Psychiatry and Biological Sciences Research Center of The Child Development Institute, University of North Carolina, Chapel Hill, North Carolina 27514)

This is a description of an inexpensive modification of the Harvard rodent respirator (Model 681), which results in a variable inspiration-expiration (I:E) ratio capability.

In the Harvard respirator, ventilation rate is controlled by a variable transformer which supplies voltage to a motor. This motor turns a cam, which, operating through a series of shafts, levers, valves, and a plunger, results in the delivery of room air to the animal (inspiration). Further rotation of the cam returns the piston to its original position, allowing a passive expiration.

Independent control of the inspiratory and expiratory phases of this respirator is easily attained by adding a double-pole, single-throw microswitch and another, matching, variable transformer. The switch is mounted on the metal plate next to the cam and positioned so that the eccentricity of the cam throws the switch to each pole during one revolution of the cam. The other variable transformer is mounted on the side of the respirator housing.

The switch is wired so that line voltage to the motor is alternately changed from one transformer to the other during each phase of the respiratory cycle (Fig. 1). As a result, one transformer controls motor speed during inspiration and the other during expiration. The duration of each phase may be independently manipulated by adjusting the appropriate transformer.

The system must be recalibrated to obtain transformer settings for mean respiratory rates at various I:E ratios. Accuracy of this procedure may be improved by imposing a small resistance (e.g., a balloon) at the end of the inspiratory tubing to approximate the resistance of the rat lung.

The cost of the modification is under \$20.

(This investigation was supported in part by Research Grant MH-07995 NIH, and Institutional Grant HD-03110 NICHD, USPHS.)

Inexpensive Device for Behavioral Event Entries to a Digital Computer

(Submitted by G. Bernstein, McGill University, Montreal, Canada)

This note describes a device that can be used to enter observed behavioral events to an on-line computer. It is reliable, durable, and can be purchased "ready to go" at an extremely attractive price from local suppliers of telephone equipment (ours cost \$18.75). The device is the common touch-tone telephone pad that provides 12 unique buttons, the normally open contacts of which are arranged in a row by column matrix. When one of the buttons is depressed, two switch closures are made which correspond to the row and column in which the

Fig. 1. Circuit diagram for modification of respirator.

depressed button is located on the pad. The seven contacts (4 rows, 3 columns) may be directly connected to a computer's input sense lines and decoded using fairly simple software techniques. Alternately, interface hardware and logic may be added to eliminate contact bounce and transform the 2 out of 7 code to binary coded decimal.

The major problem one encounters in using the device is that upon depression of a button located in Row *i* and Column *j*, Contacts *i* and *j* do not close simultaneously because of the variation in contact gap width. We have dealt with this problem in two ways. An ordinary spark plug gauge was used to "tune" the gaps of all the contacts so that they were approximately equal. Because our application involved timing of behavioral events occurring at relatively slow rates, we allowed the software to do the rest.

The software technique (on a DEC PDP-11 computer) was to generate an external interrupt each time a button was depressed on the pad. The interrupt servicing routine then read the contents of the digital input word repetitively for 10 msec, and ORed result was then compared against a list of 12 8-bit bytes until a match was found. The list of 12 bytes represented the numbers one would obtain when the 7 contacts of the pad were connected to the digital input word in a predetermined

order. We have yet to miss or falsely classify an entry using this technique.

SKED Users' Group

A SKED users' group has been organized. The main function of the group will be to distribute software, documentation, and news of the development of new versions or additions to existing versions of software. The group produces a monthly newsletter, which contains information on useful programming hints, F3s, data analysis routines, etc. Group members wishing to receive the newsletter will be charged \$5 annually to cover mailing and preparation costs. For the heavy software, a \$5 fee will be required for each listing. A \$1 fee will be charged for each binary tape. For smaller programs, subroutines and patches, a \$1 charge will cover both listings and tapes. Persons interested in joining the SKED Users' Group should contact Arthur G. Snapper, SKED Users' Group, Department of Psychology, Western Michigan University, Kalamazoo, Mich. 49001.

Stereotaxic Atlases

A useful source for obtaining a number of out-of-print books (atlases) is the Krieger Publishing Co., Inc., P.O. Box 542, Huntington, N.Y. 11743.

Teletype Equipment

Reconditioned teletypewriter equipment is available from the National Teletypewriter Corp., 23 Cain Dr., Plainview, N.Y. 11803.

Used Computer Equipment

The American Used Computer Corp. (P.O. Box 68, Kenmore Station, Boston, Mass. 02515) buys, sells, trades, and appraises all computers. The company also sells new and used line printers, paper-tape readers, disk drives, etc.

CMOS Microprocessor

The RCA Solid State Division of Somerville, N.J., has developed what it claims to be the first microprocessor employing low-power CMOS technology. The two-chip unit contains a total of approximately 6,000 devices and is said to have the most powerful input-output capability of any known microprocessor. The two-chip CPU provides a 40-pin interface to simplify system design. Architecture is based on an array of 16 address pointers. Each can be used as a program counter, for data storage or as data pointers, or to control an on-chip direct memory access capability. An 8-bit two-way data bus interconnects the processor, any mixture of RAM and ROM, and peripheral devices. When operating from a typical power supply of 10-12 V, machine cycle time (8 clock pulses) will be about 3 microsec.

LSI Mini

Apparently, DEC has given Western Digital Corp. a \$6 million contract to develop an LSI version of the PDP-11/05 mini. The LSI-11 processor being developed will consist of a two-chip set that uses fast n-channel MOS technology. Reports indicate that the new machine will be faster than the initial LSI mini offered by Computer Automation and will have wider memory access than the 8-bit unit from General Automation. The LSI-11 is expected to sell for about \$2,000.

LEDs

Several new LEDs are available from Litronix, Inc. (19000 Homestead Rd., Cupertino, Calif. 95014), including a pair of constant-brightness devices and a series of orange lamps. The new constant-brightness units combine a current-regulating IC and a red LED in a single package. Identified as Types RLC-200 and RLC-210, the devices can be used over a voltage range of 4.5 to 12.5 V, thus eliminating the need for different drive resistors in equipment with varying voltages in its circuit design. Unit prices are 90 cents for the RLC-200 and \$1 for the 210. The new range LEDs, Types OL-30 and OL-31, are GaAsP devices priced the same as their equivalent red types, the RL-4403 and R1-209, respectively.

Expandable Terminal Family

Incoterm has an \$85 per month intelligent terminal that can be expanded into a full-fledged remote processing system. The new terminal family consists of the SPD-320 (an 8,192-byte processor with up to 8 visual display units plus keyboards, and is compatible with IBM 3270 devices), and the SPD-20/20 processor with expandable memory, up to 32K bytes and up to 16 display stations. An 8K SPD-320 system with 1,920-character VDUs sells for \$2,500 per station. On 2-year rental, it is \$85 per station monthly. A 32K SPD-20/20 with four 1,920-character VDUs, two medium-speed printers, one high-speed printer, two disk drives, and controller sells for a total of \$41,000.

Incoterm Corp.

6 Strathmore Rd.

Natick, Mass. 01760

New Ortec Signal Averager

Ortec has introduced a modular signal averager at a total system price of \$2,915. The new Ortec 4623/4620 system displays a true average at every sweep. Heart of the system is the 4620 memory control, a 256-data-point MOS memory with 128 addresses and circuitry for control and readout.

Life Science Products

Ortec, Inc.

203 Midland Rd.

Oak Ridge, Tenn. 37830

New Relay

Fifth Dimension, Inc. (Box 483, Princeton, N.J. 08540) recently introduced a new LC2RA mercury film relay designed to offer an alternative to dry reed and mercury wetted reed relays. The 0.75-in.-long and 0.375-in.-high relay has a terminal construction that permits it to be mounted on many PC boards already tooled for existing reed relays.

Transillumination of the Rabbit Ear

A device for transilluminating the rabbit ear is described in Vol. 9, 1973, of the Laboratory Animal Digest (published by Ralston Purina Co., Checkerboard Sq., St. Louis, Mo. 63188). The author, S. K. Fisk (Campus Research Animal Veterinarian, University of Missouri, Columbia, Mo. 65201) describes a device that provides a versatile, cool light source of high intensity that can be inexpensively constructed from standard components available through electronics parts dealers. The easily constructed device may be made at a cost of approximately \$15.