PRINTOUT

JOSEPH B. SIDOWSKI

Products

Animal Identification

Ident-A-Band is a slim lightweight sheath of soft vinyl reinforced with a tough strip of Mylar which is placed around the neck of an animal for purposes of identification. All identifying information is recorded on an insert card which is sealed inside the washable water-resistant band. Insert cards are available in either plain white or with color edges for coding.

Used with dogs, monkeys, cats, rabbits, and guinea pigs, Ident-A-Band comes in a continuous strip in a boxed reel dispenser. At no additional cost, the name of the project or laboratory is imprinted, but the line may not exceed 57 characters, including numerals and spaces, and it must be the same for all bands in the order. Sample bands are available.

Hollister Incorporated
211 East Chicago Avenue
Chicago, Illinois 60611

Biomedical Amplifier

MED Associates announce the recent development of a low-cost low-noise biomedical amplifier designed specifically for EEG, ECG, and EMG applications. The Model MED 110 offers the following features: noise—1 microV rms, 0.15-100 Hz, 10-kilohm source; input impedance—10-megohm differential; output impedance—50 ohms; maximum output voltage—6 V p-p into 1 megohm, 2.6 V p-p into 10 kilohms; gain—adjustable to 1,000 with single resistor; frequency response is 0.15-10,000 Hz, rolloff adjustable with single capacitor; common mode rejection—25,000 to 1. The size is 3¼ in. long x 2-1/8 in. wide x 1-1/8 in. high. Price: \$37.

Mr. Karl Zurn
MED Associates
Box 1506
Allentown, Pennsylvania 18105

INTERACT

The Lehigh Valley Electronics INTERACT computer system is now being offered on an item-by-item basis. If an investigator with a DEC or NOVA computer merely wishes to order the language, interface, or both, it is available.

The new system prices are as follows:

Item	New Price
Data General Nova 4K-word minicomputer	\$5,450
Main frame (includes master power supplies, probability generator, system clock, and prewired card file for up to 8 stations)	2,625
ACT language	999
Teletype (ASR-33)	1,500
11-bit station (including 8-A, 28-V dc power supply, 1 station panel, and interface cards for one station)	1,300
Interact control panel	125
Total (1-station INTERACT computer control system)	\$11,999

Options

Extra 4K memory board	\$2,700
High-speed paper-tape reader	1,795
Extra 11-bit stations (each)	1,300
Special cabinet	1,500
Relay rack	45
Installation and training	200*
Factory training	no charge

*plus transportation and lodging per day

So, a four-station INTERACT system with 4K Nova computer, Act language, control panel, station panels, main frame, and relay rack totals \$15,899. An eight-station system with 8K Nova costs \$23,799.

Lehigh Valley Electronics, Inc.
Box 125
Fogelsville, Pennsylvania 18051

Blood Pressure

The H e m o - S p h y g sphygmomanometer is transistorized and portable at a price of \$88. The unit furnishes blood-pressure readings (Korotkoff sounds) directly from a sensitive microphone built into the arm cuff.

Nelkin Medical Products, Ltd.
815 Wyandotte
Kansas City, Missouri 64105

Infant Activity Meter

This unit detects body movements of an infant placed in a container on top of the meter. Proximity sensors serve as sensing elements. Results are shown on a digital counter and/or on a printing counter. If an integrating

averager and pen recorder are used, data may appear graphically in the form of activity vs time.

Columbus Instruments Co.
1591 Presidential Drive
Suite A3
Columbus, Ohio 43212

CRT Replacement for 33 TTY

The Model 440 Data-Screen terminal is a direct plug-for-plug replacement for the Model 33 Teletype and features a 72-char/line, 24-line screen (1,728 char) or a switch-selectable 80-char/line, 1,920-char display. Bottom-line data entry and line feed from the bottom duplicate paper roll-up. A feature not in TTYs is the automatic carriage return and line feed. Teletype interfaces are EIA RS-232C, TTL logic levels, and 20-mA current loop. Half- or full-duplex is switch-selectable and bit transfer rates are 110 or 300 baud. For connection to a Model 33 for on-line hand-copy printout, a nine-pin connector is provided. Price: Approximately \$2,000.

TEC, Inc.
9800 North Oracle Road
Tucson, Arizona 85704

ECG Electrodes

General Electric's Ag/AgCl daisy electrodes and GE-Jel electrode paste are advertised as producing an offset potential 1/50th to 1/100th of that produced by other electrode designs.

General Electric Co.
Medical Systems Department
4855 Electric Avenue
Milwaukee, Wisconsin 53201

Implantable Stimulator

Mentor Corporation is marketing Models ES4 and ES6 implantable electronic stimulators for inducing contractions of the urinary bladder. Platinum bipolar electrodes are used with multichannel active circuitry which reduces stimulus spread to surrounding tissue. Activation is by a hand-held transmitter.

Mentor Corporation
2512 Delaware Street, S.E.
Minneapolis, Minnesota 55414

Disk Systems for Minicomputers

Directly compatible with DEC PDP-8 and PDP-8L computers, a new controller can operate with standard IDS Series 7000 or Series 10,000 disk files. The controller is with 17,000 bits/track. Disk files are priced at \$1,770 for 4-megabit capacity and \$2,200 for 8 megabits.

Genisco Technology Corporation
18435 Susana Road
Compton, California 90221

The XMD-2100 moving-head disk system serves as a minicomputer mass-memory system offering 10-million bits of storage. The system consists of a coupler, disk controller, all necessary cables and power supplies, and one disk drive. Price: \$7,500.

Xebec Systems, Inc.
918 North Rengstorf Avenue
Mountain View, California 94040

Disk systems compatible with the Honeywell 316 and DDP-516 minicomputers are manufactured by Data Disk, Inc., 686 West Maude Avenue, Sunnyvale, California 94086.

Plastic Watering Bottles

A new 500-cc plastic watering bottle is available on a free-sample basis. The bottle is unbreakable and clear with a 1-7/8-in. opening and overall dimensions of 7 x 2-7/8 x 2-3/8 in.

For a sample and price list, make a letterhead request to:

Lab Products, Inc.
635 Midland Avenue
Garfield, New Jersey 07026

New Governed dc Motor

New motor combines Type CYQM-governed permanent-magnet dc motor with built-in brushless tachometer generator. Bidirectional unit has multiple or variable speed settings, with speed adjustment made while motor is running to assure maximum accuracy. Typical applications include magnetic tape drives, chart recorders, camera/projector film drives, interface signals to correspond with PDP-8's programmed data transfer, and three cycle break facilities. Average access time is 16.7 msec. Word-transfer rate is variable. Prices start at \$1,800.

Information Data Systems, Inc.
7550 Walnut Lake Road
Walled Lake, Michigan 48088

Designed to provide mass data storage for minicomputer users, the DSI series disk files include read/write

and servo electronics. Each removable 14-in. disk contains 240 data tracks with other dc equipment.

Barber-Colman Company
Electro-Mechanical Products
Division
Department S
1268 Rock Street
Rockford, Illinois 61101

Systems Industries markets the Model 3400 rapid-access fixed-head-per-track disk system with 8.7-msec average access time and data transfer at 206K words/sec. A choice of minicomputer interfaces is offered. The same company's Model 3050 DECTape/disk controller is for PDP-8 users, as is the Model 3100 DECTape/disk system, with cartridge disk option. The 3100 offers up to four disks (6.6M words) or eight DECTapes (1.5M words) per system. The Model 3500 removable cartridge disk system permits transfer up to 64K words onto the disk with one WRITE routine, and has an on-line storage capacity from 623K to 1.25M 16-bit words per cartridge. The 3500 offers a choice of minicomputer interfaces: special option for PDP-8 users is DECTape software compatibility.

Systems Industries
535 Del Ray Avenue
Sunnyvale, California 94086

Paper-Tape Winders

The TW-33 winder and center unwinder is for teleprinter-punched paper-tape programs; it slips onto the leg of an ASR-33 teletypewriter. The center unwinder handles up to 400 ft of tape; the winder has an 8-in. take-up reel. Price: \$149.

Pivan Data Systems, Inc.
6955 N. Hamlin Avenue
Lincolnwood, Illinois 60645

The Tape-Aid portable battery-operated paper-tape winder is designed for ease of operation with input terminals. Two standard "C" cell batteries power the unit, and a magnetic base is used for attaching the unit to the base of terminals. Price: \$50.

Tape-Aids
P.O. Box 232
Manlius, New York 13104

Cassette-Tape Systems

The Model 2020 cassette-tape transport is designed for minicomputer users. The system has three independent cassette-loaded magnetic tape drives, a tape-drive controller, a complete interface, and software support. Data capacity is 900K 8-bit

characters. The transport has simultaneous read and write on separate decks, backspace-record capability, and bidirectional search for \$6,900, complete with cables.

Canberra Industries, Inc.
45 Gracey Avenue
Meriden, Connecticut 06450

The Model 400T incremental cassette recorder is designed for the remote-terminal user. It is plug-to-plug compatible with many modems, teletypewriters, and other soft- and hard-copy terminals. Storage capacity is greater than 75,000 characters on a single 300-ft Phillips-type cassette. Price: \$1,820.

Mobark Instruments Corporation
1038 W. Eveyne Avenue
Sunnyvale, California 94086

The R4 Advanced Datacorder is a multichannel cassette recorder for analog data needs from dc to 400 Hz. The machine has four independent FM data channels, separate amplifiers, no multiplexing. Features include an integral voice channel for narration, two-speed tape deck (change from 1-7/8 to 15/16 ips), and a 40-dB signal/noise ratio. Price: \$2,495. The R2 Datacorder is the same as the above with only two channels, one for voice or data and the second for data only. The unit can be updated to four channels by ordering plug-in modules. Price: \$1,995.

Advanced Instruments, Inc.
1000 Highland Avenue
Needham Heights, Massachusetts
02194

Preset Timer

The Model 719 is a preset timer module with internal timing based either on the line frequency oscillator or on an external timing reference. A front panel switch selects either 0.1-sec or 0.01-min increments. The timer is preset to the desired interval and started either manually or electrically by a start pulse. External timing input accepts pulses up to a 10-MHz rate; the 719 can thus be used as a 10-MHz prescaler. Outputs are furnished both during and at the end of the counting interval. Zero reset is automatic. Price: \$225.

Ortec, Inc.
0445 Midland Road
Oak Ridge, Tennessee 37830

Printer

The Model 55 Parallel Entry Printer has a capacity of 6-10 columns, 12 character locations per column, and prints 36 char/sec. Each printing

sector can contain any 12 characters, numeric or alpha. Standard format is one blank, one decimal, and digits 0-9. Other arrangements are optional. Full line is printed simultaneously, and it is visible immediately after print cycle. Print and paper space are a function of print command. Data solenoid (one for each print column) is rated at 150 mA at 24 V; minimum pulse is 8 msec. The print solenoid is 500 mA at 24 V. Input: one data solenoid line per column. A light sensor is used to time actuation of individual data solenoids. The light sensor is a photo-Darlington device. The unit operates with 115-V 60-Hz ac motor drive. Price for 6 columns is \$210; for 7-12 columns, add \$2.50 per column.

Addmaster Corporation
416 Junipero Serra Drive
San Gabriel, California 91776

Bioquatic Products

Live fish for laboratory purposes may be purchased from the Blue Spruce Company. Rainbow trout: 1,000 fingerlings 2-3 in., shipped November to April 15th, cost \$90. Large-mouth bass: 100 fingerlings 2-3 in., shipped late July to August, \$60. Blue gills: 100 fingerlings 2-3 in., shipped end of July through August, are \$50. Channel catfish: 100 fingerlings 2-3 in., shipped in late August and September, are \$60.

Various types of aquatic products are available from the same company, as are certain marine species.

Blue Spruce Company
519 S. Maple Avenue
Basking Ridge, New Jersey 07920

Computer Kit

The new Edmund Scientific electronic digital computer kit can be used to teach logic, a knowledge of decimal and binary systems, laws of sets, and some programming. With the assembled computer, the user can perform 39 different experiments, program it to solve simple or intricate math problems, and play an infinite variety of games. The kit, with a 116-page booklet, sells for \$31.50—Stock No. 71, 343.

Edmund Scientific Company
300 Edscorp Building
Barrington, New Jersey 08007

Briefs

Wide-Angle Lens

Spiratone, Inc., of Flushing, New York, has introduced what is claimed to be the first fully automatic ultra-wide-angle lens that will adapt to

virtually any 35-mm single-lens reflex camera. The new 18-mm lens (2 3/4 in. long and less than 3 in. in diam) covers a field 125% wider than the normal wide-angle lens and 50% wider than so-called extreme wide-angle lenses. In photos taken with the Spiratone's lens, straight lines remain straight, in contrast to pictures obtained with a fish-eye lens. The lens can be focused on objects 3 in. away. At f/22, everything from 16 in. to infinity is in focus.

IBM Peripherals

IBM has cut purchase prices of most of its magnetic tape units, disk files, and associated controllers by 15%. New lease plans have also been announced with reduced rentals for longer commitments: 8% off for a 12-month lease and 16% off for 24 months. Products affected are peripherals for which "plug-compatible" alternatives are available from independent vendors.

Minicomputer News

Texas Instruments, Inc., has dropped the price of its Model 960 computer from \$14,500 to \$8,450 and the price of its general-purpose Model 980 from \$16,700 to \$9,580. Prices of both machines are for the rack-mountable versions and include 4K words of core, memory parity, memory protect, and power-fail and autorestart features.

At the Spring Joint Computer Conference, Panasonic (Matsushita Electric Corporation) showed two minis, a small disk drive, and a CRT terminal. The larger and faster of the two computers is the Mc 7/F, a 16-bit 600-nsec machine with 4-16K words of plated wire memory. The unit was priced at \$8,400 with 4K. The companion Mc 7/S is a 16-bit 4-microsec machine with 1-16K of core, priced at \$5,200.

The EPI-118 is a general-purpose computer with 4,096-word 18-bit 900-nsec magnetic core memory, expandable to 32K, with direct memory access control. Also included are four hardware registers, peripheral device interfaces, hardware bootstrap, and internal power supply. Designed for OEM applications, the computer interfaces with magnetic tape equipment, CRT displays, and punched tape or card equipments. Up to 63 such devices can be addressed directly with standard interfaces. Price with Teletype interface is \$5,900 for 4K (Electronic Processors, 5050 South Federal Boulevard, Englewood, Colorado 80110).

Hewlett-Packard has introduced a Model 2100A minicomputer which replaces the 2114, 2115, and 2116 machines. The 2100A is hardware- and

software-compatible with its predecessors, but faster: 980-nsec cycle time. One innovation is microprogramming by IC ROM, which is how such previous options as hardware multiply and divide and memory parity check could be made standard at lower cost. With 4K of 16-bit words, the machine is \$6,900. The company also introduced a low-cost tape memory and a disk-drive combining permanent and interchangeable disks.

Computer Automation has introduced the Alpha 8 to replace the 8-bit Model 108, at \$2,800 instead of \$5,490. The Alpha 16 replaces the Model 116, at \$3,550 instead of \$8,490.

Modular Computer Systems, Inc., of Fort Lauderdale, Florida, widened its Modcomp line at the low end by introducing Modcomp 1, which is upward-compatible with the larger machines. The Modcomp 1 is a 16-bit computer which cycles at 800 nsec; it is designed to be uprated to 300 nsec in the future. With 4K words of mixed memory, the price is \$5,000. Memory is a mixture of core, semiconductor read-write, and ROM; up to 16K words.

Burroughs Corporation is reported to have a 16-bit minicomputer in the works. It is said to be aimed at terminal communications.

Optoelectronics Kit

A Solid State/Fiber OptoDesign Kit at \$39.75 is available for a limited time from Sheridan Sales Company, Box 37646, Cincinnati, Ohio 45237. Sheridan Sales, working together with Motorola, has introduced an inexpensive kit of 30 semiconductor optoelectronic devices and an assortment of fiber optic components and accessories. Also included are three books: "Fiber Optics: Theory and Application," "Solid State Fiber Optics Application Techniques," and Motorola's extensive file of specification sheets and application notes, "Let There be Light."

Standard off-the-shelf light emitters and detectors are included. Nineteen detectors include three each of Types MRD 150, MRD 450, and MRD 3054 phototransistors and five each of two types of Darlington phototransistors. There are 11 light-emitting diodes, including visible red light emitters and infrared sources.

Optical components include 40 11-in.-long plastic fibers, a 9-in.-long 15-plastic-fiber bundle, a 9-in. 800-glass-fiber bundle, a 12-in. light pipe, a 2-in. coherent fiber optic rod, an 8-ft length of PVC jacketed fiber optics, three glass lenses, a penlight with three adaptors, and some heat-shrink tubing.

Circuit applications described in the Motorola publication include a strobe-flash slave adaptor, a light-operated SCR alarm, choppers, logic circuits, linear amplifier, pulse stretcher, a light-operated relay, a light-coupled double-pole/single-throw relay, and an optically monitored dc motor control.

COS/MOS Publication

Experimenters interested in solid-state devices and circuits may find a manual by RCA of real value. The 160-page paperback is designated CMS-270 and costs \$2.50 per copy at most RCA-franchised semiconductor distributors or from RCA Commercial Engineering, Harrison, New Jersey 07029.

Entitled "RCA COS/MOS Integrated Circuits Manual," the publication covers the physics, design, and theory of operation for monolithic ICs containing both p- and n-channel MOS transistors on a single chip. The book deals with fundamentals, basic circuits, series devices, logic system design, counters and registers, astable and monostable oscillators, 32-bit adders, linear biasing of inverters, and crystal oscillators.

Surgical Anesthetic for the Guinea Pig

A recent article in *The Practicing Veterinarian* (43, 1971) by W. Rubright and C. Thayer contains information that may prove of value to researchers working with guinea pigs.

Evidently, the guinea pig has several characteristics which limit the type of anesthetic that can be employed. Ether evokes dangerous fluid secretions that must be countered with atropine. Methoxyflurane is a safer inhalation anesthesia. Intravenous or intraarterial administrations of anesthetic agents run into difficulty because of small external blood vessels. Intraperitoneal administration is risky because the distance between the viscera and inner abdominal wall is small. Pentobarbital sodium is the most commonly used barbiturate. Mortality rates for ether, methoxyflurane, and pentobarbital are 8%, 2%, and 13%, respectively.

The route of choice is intramuscular. A drug which is routinely injected intramuscularly is Innovar-Vet (Pitman-Moore, Fort Washington, Pennsylvania 19034), a narcotic consisting of droperidol, which is a tranquilizing agent, and fentanyl citrate, a morphine-like analgesic which is relatively free from morphine side effects. Innovar-Vet, then, depresses the CNS and brings about a loss of pain and auditory reflexes, as well as a blood-pressure drop and a decrease in heart and respiratory rate.

An evaluation of the drug on 40 guinea pigs (450-500 g) showed induction time to be approximately 5 min. With a test dose of 0.22 ml/kg, guinea pigs placed on their backs could not right themselves for a group median time of 30 min. This was an inadequate dose for laparotomy, although corneal and foot-retraction reflexes were eliminated for an hour or so. With a dose of 0.44 ml/kg, another group of pigs took 60 min to right themselves and the corneal and foot retractions were eliminated for 120 min. Anesthesia was adequate for laparotomy. A dose of 0.88 ml/kg was best for laparotomy and eye enucleation.

So, as a surgical anesthetic, Innovar-Vet appears safe in a dosage of 0.66-0.88 ml/kg. The lethal dose is 4.40 ml/kg. Although the drug has been shown to be a desirable anesthetic for dogs, primates, rabbits, and guinea pigs, Innovar-Vet causes CNS stimulation instead of depression in cats.

Simple New Maze for Planaria and Other Small Free-Swimming Invertebrates

(This note was submitted by C. J. Sherry, Department of Pharmacology, University of Illinois at the Medical Center, Chicago, Illinois 60612.)

Several investigators using apparatuses constructed of plastic have reported that planaria can learn a simple maze. While it takes considerable skill to make a plastic maze, I found that a variety of different sizes and shapes of mazes can easily be constructed of filter paper.

The outline of the maze is drawn on a piece of Whatman No. 1 filter paper and this outline is carefully cut out using a scalpel or razor blade. The maze outline is placed on a piece of reinforced Silastic, a silicone rubber sheeting (Dow Corning, Midland, Michigan 48640). Then oxygenated water is allowed to flow onto the maze from a small pipette. Because of surface characteristics of the Silastic, the water remains on the filter paper and a thick layer of water can be built up on the maze. For example, a "T"-maze with arms 100 mm long and 3 mm wide and with three circular chambers 10 mm in diam has an area of 836 sq mm. This type of maze can hold 9 ml of water, which is sufficient to allow the worm to creep along the surface of the filter paper or on the under surface of the water. If the water on the maze is changed frequently, the worm will continue to move voluntarily, even during a long experimental session.

Filter paper mazes have several advantages over plastic ones. (1) The paper maze can be easily modified, even during the course of an

experiment. (2) As positive reinforcement, the worm will eat small, newly hatched brine shrimp (*Artemia salina*) on the paper maze. (3) As negative reinforcement, the intensity of electrical stimuli can be controlled more easily because of the small volume of water on the paper maze. (4) Because of the simplicity of its construction, a new paper maze can be used for each experimental trial, thereby eliminating any possible influence of slime produced by the worm in previous trials.

Optical Programmer

Sigma Instruments, Inc., of Braintree, Massachusetts, is offering an optical programmer which uses light-beam interruptions to produce timed intervals. The principle of operation is similar to that long used in A-to-D converters. A variable-speed motor, excited by an oscillator, rotates a transparent disk past a small chip containing 14 photoconductive elements illuminated by a standard 4-in. fluorescent lamp. There are concentric opaque arc elements on the disk which serve to mask the face of each photocell for an interval proportional to the arc length. During the dark intervals, the cell is cut off and its associated relay is deenergized. The cell conducts and the relay is pulled in when the light returns. Motor speed and mask segment length determine the length of the timed output intervals.

Hamster Information

At birth, a hamster weighs approximately 2 g compared to the rat's 5-6 g or the guinea pig's 100 g. The weight of an adult male ranges from 85 to 110 g, while the female is about 10 g heavier. The female's estrous cycle varies from 4 to 15 days, with 4 or 5 days the average, and it can breed at 2 months, by which time the weight is 95-120 g. The male breeding age is the same. Gestation is about 16 or 17 days and litter size is 6-10. After parturition, the animals can be rebred at about 6 days. Breeding life for the male and female is approximately 1 year, during which time the female may have 4-5 litters. Hamsters are weaned at about 3 weeks, when the weight reaches about 35 g. Mice and rats have similar weaning ages; guinea pigs may be weaned at 10 days.

Water requirements for the adult are ad lib; adult daily feed usage is 10-14 g per day. Dry food consumption can begin at about 8 days. Hamsters generally require 10-12 h of light, with a room temperature of 70° F at 50% humidity.

Guinea pig susceptibility to the lethal effects of certain antibiotics is conditioned by the ability of various

intestinal floral forms to survive. Erythmycin, streptomycin, penicillin G, and CC-10232 (carbomycin-like antibiotic) have been shown to induce the same phenomenon in hamsters. The method for preventing an acute toxic reaction is to initially administer small nonlethal antibiotic amounts. These are increased gradually over a period of months. Studies suggest that the lethality may be related to gradually accommodated changes in the survival of intestinal bacteria.

Disease in the Gerbil and Hamster

Tyzzer's disease is well distributed in American mouse colonies. A recent report describes a spontaneous outbreak of the same disease in gerbils in England. The infections originated in a breeding colony that had been maintained for a long period of time; 48 animals died spontaneously. Hamsters housed in the same room began to die 10 days after discovery of the epizootic in the gerbils. The

hamster colony was entirely destroyed after the outbreak. The Tyzzer organism is *Bacillus piliformis*.

IC Abbreviations

DIP	Dual in-line package
DTL	Diode-transistor logic
FET	Field-effect transistor
HIC	Hybrid integrated circuit
IC	Integrated circuit
IGFET	Insulated-gate field-effect transistor
JFET	Junction field-effect transistor
LIC	Linear integrated circuit
LSI	Large-scale integration

MIC	Monolithic integrated circuit
MOS	Metal-oxide semiconductor
MOSFET	Metal-oxide semiconductor field-effect transistor
MSI	Medium-scale integration
RAM	Random-access memory
ROM	Read-only memory
RCTL	Resistor-capacitor-transistor logic
RTL	Resistor-transistor logic
TO-can	Transistor-outline metal can package
TTL	Transistor-transistor logic