

PRINTOUT

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PRODUCTS

Gerbrands Programmer

The G5000 Programmer is a low-cost computer-like device designed to interface directly with any type of solid state or electromechanical programming equipment as the tapeless equivalent of a 4-channel paper tape reader and punch. The G5000 can be used for programming simple schedules of reinforcement (CRF, FR, VR, FI, VI), more complex schedules (multiple, mixed, chained, tandem, and differential reinforcement of low rates), and also avoidance and escape contingencies. It can be used as a 4-channel probability gate, a 4-channel pseudorandom sequence generator, a 4-channel interval timer, a 4-channel ratio programmer, or a 4-channel time base. In addition, it can also be used as an instructional aid in basic computer programming for illustrating such basic operations as memory addressing, memory deposit, memory retrieval, binary to decimal conversion, and binary to octal conversion.

Plotter

Compatible with most computers and terminals, the TSP plotter comes with support software and subroutines. The unit has three characters per point.

Time Share Peripherals Corp.
Route 6
Bethel, Conn. 06801

PDP-11 Tape

The Series 2400 tape storage system provides the PDP-11 with up to 23 megabytes of mass storage. The interface card plugs directly into a small peripheral controller slot in the mini. Cost: \$3,935.

Qantex
200 Terminal Dr.
Plainview, N. Y. 11803

Disk Cartridge

The DSD 240 is available for PDP-8 and PDP-11 computers. The controller eliminates bus cabling by plugging directly into the PDP-8 OMNIBUS or mounting inside a PDP-11. Up to eight disks providing 400 million bits of data storage, can be accessed. Price: \$2,500 in small OEM quantities.

Data Systems Design

1122 University Ave.
Berkeley, Calif. 94702

Intelligent CRT

The 200/10 CRT features a RAM programmable memory expandable to 8K, 16-bit words, floppy disks, dual tape cassette, and printer options with speeds up to .250 LPM. The MIDAS software aids in writing and debugging. The floppy disk option comes as a single or dual disk system with 2,944 bytes per disk, and disks can be shared between terminals. IBM 3740 compatible, the basic 200/10 is priced at \$4,200. RAM ranges from \$840 to \$3,300. Interrupt is \$260. Dual cassette is \$2,950.

Computek, Inc.
143 Albany St.
Cambridge, Mass. 02139

Animal Food Catalog

BRS/LVE offers a new 8-page catalog listing standard and special formula food pellets and dispensers. All laboratory food offered is formulated by P. J. Noyes Co. & D&G. All pellets are pelletized by Noyes.

BRS/LVE
5301 Holland Dr.
Beltsville, Md. 20705

Microcomputer

The MicroPac is available with complete interfacing. The standard MicroPac includes the Intex 8080 micro CPU packaged on a self-contained logic module and 5K bytes of memory. With a capacity of 256 plug-in modules, the computer can be ordered to address up to 65K bytes of memory and is available with a real-time clock.

Process Computer Systems
G-4025 S. Center Rd.
Flint, Mich. 48507

Human Stress Testing

AMI's system/two combines the new dyna/trace

Ag/Cl unitized electrode with detachable shielded adaptors and individually shielded patient cables to establish a responsive dynamic stress testing system.

Andover Medical Industries
Andover, Mass. 01810

Speech Synthesizer

The OVE III is a format series synthesizer simulating the vocal tract. The basic principle is that an ideal vowel is completely and uniquely characterized by its formant frequencies, and by its source characteristics. OVE III incorporates three parallel branches for the synthesis of vowels, fricatives, and nasals. Aspirated sounds are produced by introducing controlled noise into the vowel branch. With the 15 parameters, the full range of common speech spectra can be synthesized.

Received data is stored in a digital buffer so that the parameters can be changed individually or in sequence at microsecond rates. One complete control frame contains a 4-bit parameter code and 6-bit log data code. The frequencies are incremented in 3% steps, and the amplitudes in 2-dB steps. Data are then used as coefficients in the analog circuitry generating the pertinent continuous waveforms.

OVE III can be dynamically controlled by a minicomputer having a 10-bit digital output. Basic software is directly available for the NOVA and ALPHA computer families, and is also available in block diagram form for implementation on other computers. Parameter data for synthesis of static sounds can be entered manually on the front panel. A "clear" button simultaneously clears all registers in the buffer.

The U.S. price is \$3,860.

FONEMA
Box 1010
S-640 25 Julita
Sweden

Bio-Mechanical Force Platform

The Quartz Multi-Component Platform measures forces exerted by the human foot in three orthogonal directions, locates the point of force application, and determines the free moment. Measurements can be made while the subject is standing, walking, or jumping. Operation is based on piezoelectric principle utilizing four 3-component force transducer elements.

Kristal Instrument Corp.
2475 Grand Island Blvd.
Grand Island, N. Y. 14072

Telemetry

Miniature telemetry system includes measuring circuits, amplifier, pulse converter, clock, modulator, and RF transmitter. Antenna and battery power supply

can be varied according to user requirements. Initial units include the TIA (temperature) and T3A (EKG) which will be followed soon by units for pressure, EEG, and strain. The units include pulsatile transmission types with a 1-3 meter range, and battery life well over a year. FM modulation types are also available which provides 3-5 meter range with battery life well over a month. All operate in the FM broadcast band. TIA-1 is priced at \$395; T3A-1 is \$295.

Konisberg Instruments, Inc.
2000 E. Foothill Blvd.
Pasadena, Calif. 91107

Telemetry ECG Monitor

The 4-R Telemetry ECG Monitor has four display channels with full-width "freeze" display of any channel on separate part of screen; cascade display shows up to 34 sec of ECG data; digital heart rate display with low and high rate alarm setting. The unit has an internal 17-sec solid state memory delay and automatic/manual ECG recording. Miniature 4 oz FCC approved patient transmitter is included.

Laser Systems & Electronics, Inc.
Box 858
Tullahoma, Tenn. 37388

Reverb Microphone

The Realistic reverb mike has dual dynamic elements that produce a 1.5-sec time delay for the echo effect; a 50-10,000-Hz response in both reverb and normal modes. The unit has 200-ohms impedance, -80-dB output level. Fully self contained, the mike is 8 in. long with a 1-1/2 in. diam. Price is \$29.95 with desk stand, floor stand adapter, 20-ft cable, and 1/4-in. phone plug at Radio Shack stores.

Radio Shack
P. O. Box 1052
Ft. Worth, Tx 76101

Program Debug Console for PDP-11

The Program Debug Console allows the user to perform a range of functions e.g., stopping or interrupting the system at any point, and then examining its various elements. It offers a backward look at the last 16 addresses that appeared on the UNIBUS. The unit is packaged as a small peripheral controller. Price: \$1200.

Formation
One Computer Dr.
Cherry Hill, N. J. 08003

Heating Elements

Various types of heating elements and application aids

are described in Bulletin HE100 covering MINCO products. A variety of miniature type heater-buttons provide concentrated, localized heat; the standard models are 3/4 in. diam for 115 V or 28 V ac or dc with power ratings from 2 to 20 W. Thermofoil heaters are thin/flexible etched-foil elements that apply fast heat in a uniform or profiled manner. Hundreds of blanket, strip and spot heater designs are available.

MINCO also markets precision heater assemblies complete including heating elements and temperature sensor/control hardware to meet customer requirements.

MINCO Products, Inc.
7300 Commerce Lane
Minneapolis, Minn. 55432

Timers and Counters

The Durgin and Browne line of digital timers and counters has drawn favorable comment from psychological researchers. The Company markets electronic pulse counters, counter/controllers, digital timing instruments, digital panel displays, and ultra-slim digital counter displays. Most models can be obtained as panel mountable units or on a pedestal for laboratory timing operations. Options available with panel mountable digital timers are BCD outputs (\$20 per unit) and latching circuits for printing and data storage applications (add \$5 per digit). A Hand Controller, Model HC-20, is an option available for manual control of all bench model timers (\$19). Typical prices: Digital panel displays for counting events, etc., \$30 to \$58 depending on the model, in single quantities; digital timing instruments \$147 to \$174, e.g., the Model LT-BX9 has a range in seconds of 999,999 and costs \$172. Displays are of the LED type. Products are warranted for one year.

Durgin and Browne, Inc.
80 Allen Rd.
South Burlington, VT 05401

BRIEFS

Speech Recognition

Dialog Systems, Inc. of Cambridge, Mass. report a machine said to understand spoken words transmitted over ordinary phone lines. The system is also claimed to understand almost anyone's voice. The system accepts 1,000 different telephone messages with an average untrained accuracy of 99%. The speaker must stop at the end of each word. The pause indicates to the machine when the last word is finished, and the next one about to begin. For a single digit number vocabulary, the method has a claimed accuracy of 95%. To increase

accuracy the system repeats the message back and asks for verification. Following verification of the first message the computer adjusts to understand the caller's particular voice quality. In most cases the system is said to recognize a word almost perfectly after hearing it once in the caller's voice.

Animal Temperature Indicator

Chemical and Pharmaceutical Co., Inc. is marketing a new temperature indicator and thermocouple assembly for testing animals. The TE-3 has an operating range of 16°C-46°C with accuracy of $\pm 1.0^\circ$ and two thermocouple positions for studying two animals. Up to 15 thermocouples can be connected to a multiple connection box permitting monitoring of 15 to 30 animals. Temperature at the thermocouple is pinpointed by means of a light beam type indicator with a hairline rule. An automatic recording version is available.

Mini-Cassette

Hewlett-Packard will offer a scaled-down version of the 3M-type tape cassette. The unit is about the size of the Phillips. The mini-tape (capacity of about 100,000 characters) will be made by 3M. The HP cassettes will be used with the firm's new line of terminals and may be offered as paper tape replacement aboard minicomputer systems. The drive is said to be intelligent in that if the cassette is taken out during a data reading operation and then replaced, the drive automatically retreats to the beginning of the block of data.

Low Cost Computer Terminal

The December, 1974, issue of *Popular Electronics* describes a method of building a very low cost computer terminal (Pp. 38-43). The method is detailed, and a parts list is included. The parts are available from MITS, Inc., 6328 Linn, N.E., Albuquerque, New Mexico 87108. The main pc board is priced at \$6.50; display board at \$5.50; kit of all ICs, pc boards, LEDs, numerical displays, and assembly manual for \$38. The complete kit including power supply regulator and transformer, key-switch pad, hardware case and filter bezel for \$57. Copies of the pc foil patterns and component layouts can be obtained free upon request.

Microcomputer

Intel Corp. has introduced the MCS-4A microcomputer at less than \$100 in quantities. The unit contains a 4004 cpu and five memory and peripheral circuits. Based on the 4004 p-channel 4-bit cpu with a 10.8 microsec instruction cycle time, the cpu may be programmed with a standard set of 46 instructions or with special instructions implemented through microprogramming. The cpu processes 4-bits of data in parallel and operates in both decimal and binary modes. System components include a 320-bit RAM, 10-bit shift register, address latching unit, I/O control unit, and a

2,048-bit erasable PROM. ROM program storage may be expanded to 84,096 8-bit words; RAM capacity to 1,280 4-bit words; I/O to 128 lines.

Minicomputer Companies

Applied Computing Technology
17815 Sky Park Circle
Irvine, Ca. 92707

Automatic Electronic Systems, Inc.
570 McCaffrey St.
St. Laurent H4T 1N1, P. Quebec, Canada

Basic/Four Corp.
18552 MacArthur Blvd.
Santa Ana, Ca. 92707

Bendix Corp.
Navigation & Control Div.
Teterboro, NJ 07608

California Data Processors
2019 S. Ritchey St.
Santa Ana, Ca 92705

Cascade Data, Inc.
3000 Kraft Ave., S.E.
Grand Rapids, Mi. 49508

Cincinnati Milacron Co.
Process Controls Div.
Mason Marrow Rd.
Lebanon, Ohio 45036

Computer Automation Inc.
18651 Von Karman Ave.
Irvine, Ca. 92664

Computer Hardware, Inc.
2550 Fair Oaks Blvd.
Sacramento, Ca. 95825

Computer Technology Ltd.
Eaton Rd., Hemel Hempstead,
Hertfordshire HP2 7EQ, England

Comstar Corp.
7413 Washington Ave., S.
Edina, Minn. 55435

Control Data Corp.
8100 34th Ave., S.
Minneapolis, Minn. 55440

Data General Corp.
Rt. 9
Southboro, Mass. 01772

Datacraft Corp.
1200 Gateway Dr.
P. O. Box 23550
Ft. Lauderdale, Fla. 33309

Datapoint Corp.
9725 Datapoint Dr.
San Antonio, Tx. 78284

Digital Computer Controls, Inc.
12 Industrial Rd.
Fairfield, NJ 07006

Digital Equipment Corp.
146 Main St.
Maynard, Ma. 01754

Digital Scientific Corp.
11455 Sorrento Valley Rd.
San Diego, Ca. 92121

Electronic Associates, Inc.
185 Monmouth Parkway
West Long Branch, NJ 07764

Electronic Processors, Inc.
1265 W. Dartmouth
Englewood, Co. 80110

Four-Phase Systems, Inc.
19333 Vallco Parkway
Cupertino, Ca. 95014

Fujitsu Ltd.
680 Fifth Ave.
New York, NY 10019

GEC Computers, Ltd.,
Elstree Way, Borehamwood,
Hertfordshire WD 6 1RX, England

General Automation, Inc.
1055 S. East St.
Anaheim, Ca. 92805

GRI Computer Corp.
320 Needham St.
Newton, Ma. 02164

GTE Information Systems, Inc.
One Stamford Forum
Stamford, Ct. 06904

Hewlett-Packard Co.
Cupertino Div.
11000 Wolfe Rd.
Cupertino, Ca. 95014

Hitachi, Ltd.
23-15 6-chrome, Minamiohi
Shinagawa-ku, Tokyo 140, Japan

Honeywell Information Systems, Inc.
200 Smith St.
Waltham, Ma. 02154

Information Computer Systems, Ltd.
Heron House
19 Marylebone Rd.
London NW1, England

Intel Corp.
3065 Bowers Ave.
Santa Clara, Ca. 95051

Interdata, Inc.
2 Crescent Pl.
Oceanport, NJ 07757

IBM Corp.
Data Processing Div.
1133 Westchester Ave.
White Plains, NY 10604

Linolex Systems, Inc.
5 Esquire Rd.
North Billerica, Ma. 01862

Lockheed Electronics Co.
6201 E. Randolph St.
Los Angeles, Ca. 90022

Microdata Corp.
17481 Red Hill Ave.
Irvine, Ca. 92705

Modular Computer Systems, Inc.
1650 West McNab Rd.
Fort Lauderdale, Fla. 33309

Nanodata Corp.
2457 Wehrle Dr.
Williamsville, NY 14221

National Semiconductor Corp.
2900 Semiconductor Dr.
Santa Clara, Ca. 95051

Nuclear Data, Inc.
Golf & Meacham Rd.
Schaumburg, Ill. 60172

Omnus Computer Corp.
1310 E. Edinger "B"
Santa Ana, Ca. 92705

Philips-Electrologica B. V.
OEM Marketing
P. O. Box 245
Apeldoorn, the Netherlands

Prime Computer, Inc.
23 Strathmore Rd.
Natick, Ma. 01760

Qantel Corp.
3474 Investment Blvd.
Hayward, Ca. 94545

Raytheon Data Systems Co.
1415 Boston-Providence Turnpike
Norwood, Ma. 02062

Rolm Corp.
18922 Forge Dr.
Cupertino, Ca. 95014

R2E Micro-Computers
38 Garden Rd.
Wellesley Hills, Ma. 02181

Systems Engineering Laboratories, Inc.
6901 W. Sunrise Blvd.
Ft. Lauderdale, Fla. 33313

Texas Instruments, Inc.
Digital Systems, Div.
P. O. Box 1444
Houston, Texas 77001

UNIVAC
UNIVAC Park
P. O. Box 3525
St. Paul, Minn. 55165

Varian Data Machines
2722 Michelson Dr.
Irvine, Calif. 92664

Westinghouse Electric Corp.
Computer Department
1200 W. Colonial Dr.
Orlando, Fla. 32804

Xerox Corp.
701 South Aviation Blvd.
El Segundo, Ca. 90245

On-Line Computer Conference

The Proceedings of the National Conference on the Use of On-Line Computers in Psychology will be printed as the entire March, 1975, issue of this Journal.

The 1975 meetings of the Conference will be held in

Boulder, Colorado on Wednesday, November 5. Psychonomic Society meets in Denver on Thursday, Friday, and Saturday, November 6-8. The University of Colorado will act as the host institution for the Computer Conference. Daniel Bailey and Peter Polson of the Psychology Department, University of Colorado, are co-chairmen of the Conference. A call for papers, symposia, etc. will be issued in 1975; August 1, 1975 is the deadline for receipt of same.

Microcomputer

Scientific Micro Systems (Mt. View, Calif.) formerly Signetics Memory Systems will make available a proprietary "MicroController" that will be a complete microcomputer system incorporating a bipolar Schottky microprocessor with a 300-nsec cycle time. The system will allow control sequences to be executed up to 100 times faster than many currently available microprocessor systems.

Computer Eye

Computer Eye 108 is a peripheral input device. Any picture that can be sensed by a television-type camera tube can be input for computer processing. A 48-page Computer Eye Handbook is available free.

Spatial Data Systems, Inc.
Box 249
508 South Fairview
Goleta, Calif. 93017

Behavior Research Methods & Instrumentation
1975, Vol. 7 (1), 66-67

NOTE

The grid test: A measure of alcohol- and barbiturate-induced behavioral impairment in mice

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Austin, Texas 78712

A number of procedures have been reported for the production of physical dependence in laboratory animals to drugs of the sedative-hypnotic class. These include alcohol (Mello, 1973), phenobarbital (Belknap, Waddingham, & Ondrusek, 1973; Freund, 1971), sodium barbital (Crossland & Turnbull, 1972), phenobarbital (Ho, Sutherland, and Loh, 1973) and others (Schuster & Thompson, 1969). These methods are also advantageous in the study of acquired functional tolerance, since this usually develops maximally under conditions where physical dependence production is maximized. This is of interest since most theorizing about physical dependence

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has implied that acquired functional tolerance and physical dependence share common neural mechanisms (Kalant, LeBlanc, & Gibbins, 1971).

Since acquired tolerance refers to a change in response to a drug, the measurement of acquired tolerance requires at least two separate assessments of behavioral impairment (intoxication) at different points in time. This also requires that the degree of drug-induced behavioral impairment be readily quantifiable and sensitive to varying levels of the drug. There is a need for a wider variety of methods that possess these attributes. The present report describes one such method.

As noted by Kalant et al. (1971), the most useful methods for assessing drug-induced behavioral impairment are reliable and reproducible, and they are sensitive to small dose increments over a wide range of drug doses. The sleep-time test (a frequently used measure based on the duration of loss of the righting reflex) is sensitive to small dose increments, but it is limited to only the highest dose range where "sleep" can be induced (Damjanovich & MacInnes, 1973). A third desirable attribute is that a measure yield continuously variable scores rather than scores based on discrete or quantal (all or none) events. A fourth attribute is that a measure of behavioral impairment be amenable to scoring large numbers of animals in a rapid and efficient manner. Measures that possess these four attributes should readily lend themselves to the construction of dose-effect curves to serve as the basis for monitoring drug intoxication and acquired tolerance.

Several published methods appear to meet these criteria. The rota-rod test as modified by Jones and Roberts (1968) involves placing an animal on a rotating rod which is then subjected to a constant acceleration. At the moment the animal falls, the speed of rotation attained is then recorded, as well as the duration of the trial. In the inclined-plane test (Arvola, Sammalisto, & Wallgren, 1958), an animal is placed on a board that is tilted at progressively greater angles until the animal slides off. When this occurs, the angle of inclination is then recorded as the animal's intoxication score. The treadmill test (Gibbins, Kalant, & LeBlanc, 1968) is based on the total time an animal can remain upon a moving belt suspended above an electrified grid during a 2-min trial.

THE GRID TEST

The grid test is a measure of neuromuscular impairment that is sensitive to drug-induced staggering or stumbling. A mouse is required to walk upon a ½-in. wire-mesh grid along a 1-1/8-in.-wide square track (see Figure 1). Intoxicated mice frequently stumble with one or more feet passing through the wire grid and contacting an underlying Plexiglas plate suspended 14 mm below the grid. An error is counted whenever contact is made with the underlying plate, which in turn