PRINTOUT

JOSEPH B. SIDOWSKI

SERVICES

Duplicating Data Tapes

Occasionally an investigator may require quantities of data tapes copied for distribution to other laboratories, to data processing centers, or for master files. Robins Data Devices will duplicate or color-code any length, any material, or any quantity of tapes.

Robins Data Devices, Inc.
15-58 127th St.
Flushing, N.Y. 11356
(212) 445-7200

PRODUCTS

VARIAC Adjustable Autotransformers

The W8MT3 Variac autotransformer (price—\$38.00) and its metered model, W8MT3VM (price—\$68.50 with .0-150-V meter output), have the following specifications.

Input: 120 V, 50-60 Hz.

Output: 0-140 V; rated current of 10 A, equivalent to 1,400 W at max output voltage.

Weight: 10 lbs net.

General Radio
West Concord, Mass. 01781

Plug-In Time Delay Relay

The Series 319 electronic TDR employs a transistor circuit offering extremely high repeat accuracy and fast reset time. Power requirement: 120 V, 50-60 Hz. Contacts: DPDT, 10 A, 120 V ac resistive load. Size: 1-31/32 x 1-31/32 x 3-7/8 in. to octal base. Housed in a molded plastic case. The prices are as follows: \$25.00 for ranges to 30 sec; \$26.00 for 60-sec range; \$28.00 for 100- and 300-sec ranges.

Automatic Timing and Controls, Inc.
201A Gulph Rd.
King of Prussia, Pa. 19406

Portable Oscillograph

The Esterline-Angus Model 0-501 oscillograph weighs 14 lbs and is 13-3/8 in. W x 7-7/8 in. D x 4-3/8 in. H. It is inkless, entirely solid state including the chopper, with 15 selectable ranges from .50 microvolts/mm. Chart speeds are selectable from 1, 2, 5, 10, 25, and 50 mm/sec. Recording amplitude is 40 mm (4 cm) with a frequency response of -3 dB at 10 mm p to p dc to 75 Hz and -3 dB max at 40 mm p to p dc to 50 Hz. Price: \$725.00.

Esterline Angus
Box 24000
Indianapolis, Ind. 46224
(317) 244-7611

Miniature Potentiometers

The Series 10 wirewound trimming potentiometers are 1/4 in. square with resistance values to 25K ohms and a 25-turn screw adjustment. Models 11 and 13 have stranded leads, Models 12 and 14, weldable nickel leads; Models 15 and 16 are for circuit-board flush-mount or stand-off, respectively.

Techno-Components Corp.
7803 Lemona Ave.
Van Nuys, Calif. 91405
(213) 781-1642

Desk-Top Calculator

The Wang 700 is an advanced electronic calculator that features: 960 core-stored program steps; 120 data registers; dual Nixie-type display; special function keys for sin, cos, arcsin, etc.; and execution times of approximately 300 microsec for + and -, 3.0 msec for X, 3.5 msec for ÷, 15 msec for log X, 35 msec for e^X, and 250 msec for trigonometric functions.

Typical statistical programs include regression analysis (up to seventh order), normal probability frequency and distribution functions, multiple regression analysis (up to eight variables), factorial design (Yates analysis), analysis of variance, Fourier analysis, Gamma functions, matrix inversion (up to 10 x 10), and random numbers.

Wang Laboratories
836 North St.
Tewksbury, Mass. 01876

Diode Switches

The following firms manufacture Semiconductor Diode Switches.

ARRA
15 Harold Court
Bay Shore, N.Y. 11706
(516) 231-8400

Airtron Div.
Litton Industries
200 E. Hanover Ave.
Morris Plains, N.J. 07950
(201) 539-5500

Alpha Industries
381 Elliot St.
Newton Upper Falls, Mass. 02164
(617) 969-6480

American Electronic Labs
P. O. Box 552
Lansdale, Pa. 19446
(215) 822-2929

Anaren Microwave
478 E. Brighton Ave.
Syracuse, N.Y. 13210
(315) 475-6121

Applied Research
76 S. Bayles Ave.
Port Washington, N.Y. 11050
(516) 883-5700

Automatic Metal Products
323 Berry St.
Brooklyn, N.Y. 11211
(212) 388-6057

Calvert Electronics
220 E. 23rd St.
New York, N.Y. 10010
(212) 679-1340

G-L Microwave
875 Black Oak Ridge Rd.
Wayne, N.J. 07470
(201) 835-2765

Hewlett-Packard
1501 Page Mill Rd.
Palo Alto, Calif. 94304
(415) 326-7000

Hyletronics
100 Ainsworth Rd.
Wilmington, Mass. 01887
(617) 272-0670

Kevlin Mfg.
26 Conn St.
Woburn, Mass. 01801
(617) 935-4800

Micro State
152 Floral Ave.
Murray Hill, N.J. 07971
(201) 464-3000

Microwave Associates
Northwest Industrial Park
Burlington, Mass. 01803
(617) 272-3000

Philco-Ford
500 S. Main St.
Spring City, Pa. 19475
(215) 948-8400

Rantec
24003 Ventura Blvd.
Calabasas, Calif. 91302
(213) 347-5446

Relcom
2329 Charleston Rd.
Mountain View, Calif. 94040
(415) 961-6265

Sanders Associates
P. O. Box 907
Nashua, N. H. 03060
(603) 885-2445

Somerset Radiation Lab
2060 N. 14th St.

Arlington, Va. 22201
(703) 525-4255

Sylvania Electric Products
100 Sylvan Rd.
Woburn, Mass. 01803
(617) 933-3500

Transco Products
4241 Glencoe Ave.
Venice, Calif. 90291
(213) 391-7291

Varian
Salem Rd.
Beverly, Mass. 01915
(617) 922-6000

Western Microwave
16845 Hicks Rd.
Los Gatos, Calif. 95030
(408) 266-4820

Microminiature Parts

Minelco produces microminiature trimmer potentiometers advertised as the smallest in the world. The Model No. HA1, for example, has a knob and base 7/32 in. deep, with the extended index pin 5/32 in.; the No. 30 stranded leads are 2¼ in. long and tinned; the diameter is .250 in. Standard resistance (ohms) for this particular unit is 100 to 10K. Other pots cover the range from 20 to 25K.

The same company manufactures microminiature rotary selector switches (.350 in. diam), and miniature BITE indicators.

Minelco Miniature Electronic Components Corp.
600 South St.
Holbrook, Mass. 02343
(617) 963-7717

Breadboard for Easier Circuit Building

The S-DeC breadboard contains 70 push-in contact points arranged in two sets of five numbered rows with each five points joined together by a leaf-spring busbar. Larger circuits are made by keying units together to form a continuous breadboard of any size.

Components are simply pushed into the sockets where they are held securely by double-leaf phosphor-bronze contacts. The accessory kit provides solderless connectors to use with the controls which are mounted on a panel slotting into the S-DeC base.

S-DeC with control panel, jig accessories, and project leaflet—\$5.75 each.

DeC STOR has an additional two decks with a components tray, all in a black plastic box—\$11.75 each.

4-DeC kit consists of four decks, two control panels, jigs, accessories, and project book in case—\$20.75 each.

Intratec
399 Jefferson Davis Hwy.
Arlington, Va. 22202

Transistor Amplifiers

Transistor amplifiers are marketed by the following companies:

Acrodyne Industries
666 Davisville Rd.
Willow Grove, Pa. 19090
(215) 657-1800

Aertech Industries
815 Stewart Dr.
Sunnyvale, Calif. 94086
(408) 732-0880

Airton Div.
Litton Industries
200 E. Hanover Ave.
Morris Plains, N.J. 07950
(201) 539-5500

Ampar Div.
Adams-Russell
39 Green St.
Waltham, Mass. 02154
(617) 899-1900

Applied Research
76 S. Bayles Ave.
Port Washington, N.Y. 11050
(516) 883-5700

Applied Technology
3410 Hillview Ave.
Palo Alto, Calif. 94304
(415) 321-5135

Avantek
2981 Cooper Dr.
Santa Clara, Calif. 95051
(408) 739-6170

California Microwave
1188 Elko Ave.
Sunnyvale, Calif. 94086
(408) 734-3000

E & M Labs
5388 Sterling Center Dr.
West Lake Village, Calif. 91360
(213) 889-1470

Electro/Data
3121 Benton St.
Garland, Tex. 75040
(214) 276-6167

Fairchild Microwave Products
2513 Charleston Rd.
Mountain View, Calif. 94040
(415) 961-1391

HRB-Singer
P. O. Box 60
State College, Pa. 16801
(814) 238-4311

Hewlett-Packard
1501 Page Mill Rd.
Palo Alto, Calif. 94304
(415) 326-7000

LEL Div., Varian
Akron St.
Copiague, N.Y. 11726
(516) 264-2200

Micromega
4134 Del Rey Ave.
Venice, Calif. 90291
(213) 391-7137

Microphase
35 River Rd.
Cos Cob, Conn. 06807
(203) 661-6200

Micro State
152 Floral Ave.
Murray Hill, N.J. 07971
(201) 464-3000

Microwave Power Devices
556 Peninsula Blvd.
Hempstead, N.Y. 11550
(516) 538-7520

Microwave Products Group
115 Old Country Rd.
Carle Place, N.Y. 11514
(516) 741-1500

Optimax
258 N. Main St.
Ambler, Pa. 19002
(215) 646-4201

Pico Systems
202 Dominion Rd.
Vienna, Va. 22180
(703) 938-2306

RCA Electronic Components
415 S. 5th St.
Harrison, N.J. 07029
(201) 485-3900

RHG Electronics
94 Milbar Blvd.
Farmingdale, N.Y. 11735
(516) 694-3100

Rantec
24003 Ventura Blvd.
Calabasas, Calif. 91302
(213) 347-5446

Sanders Associates
P. O. Box 907
Nashua, N.H. 03060
(603) 885-2445

SpaceKom
P. O. Box 235
Goleta, Calif. 93017
(805) 967-7144

Texas Instruments
13500 N. Central Expressway
Dallas, Texas 75231
(214) 238-3741

Trak Microwave
4726 Kennedy Rd.
Tampa, Fla. 33614
(813) 884-1411

Watkins-Johnson
3333 Hilview Ave.
Palo Alto, Calif. 94304
(415) 326-8830

Infrared Vidicon Tube

The Resistron Type 2000 is a television camera tube of Vidicon type that is sensitive in the spectral range 3,500-18,000 Å. The tube is suitable for TV camera operation in infrared light and has been used for the closed circuit television recording of ocular behavior in the human infant (see, for example, the article by Haith, M. M., in the recent Instrumentation Issue of *American Psychologist*, Vol. 24, pp. 279-283). It is sensitive enough to record in the dark and has numerous possibilities for the study of animal and human behavior.

The Type 2000 Resistron can be used in any television camera that is suitable for the operation of ordinary 1-in. Vidicon tubes. Older cameras can easily be adapted.

The Type 2000 tube is available in two quality grades: IND at \$1,075.00, and Type AMR at \$685.00. The two grades differ in sensitivity, uniformity of layer, lag, and spots within an area of 6 mm diam of the cathode.

Epic, Inc.
150 Nassau St.
New York, N.Y. 10038
(212) 349-2470

Constant Weight Cage

This device consists of a weight sensor on the animal's cage that automatically signals food delivery when the animal falls below a preset body weight level. Scale range is 500 g. The cage is ½ x 1 in. welded wire, 8 in. W x 7 in. H x 6½ in. D. An ultrasensitive magnetic reed weight-sensor with microadjust dial permits fast and accurate control of body weight. A pilot light indicates when the sensor is adjusted. Includes water bottle, stainless steel food cup, and drop pan for collection of waste materials beneath cage. The switching circuit may trigger food from standard pellet dispenser (not included). Price: \$149.50.

Behavioral Controls, Inc.
1506 W. Pierce St.
Milwaukee, Wis. 53246
(414) 671-1255

Ultraminiature Connectors and Cable

Two coaxial connector sizes are currently in production at Microtech: the Miniature A-Series with outer diameters of ¼ in. and the Ultraminiature C-Series with outer diameters of 1/8 in. Overall length of the ultraminiature connector is less than ¼ in. Multicontact connectors are available in D-Series with 4-pins and E-Series in 7-pins. The outer diameters are 9/32 and 11/32 in., respectively.

The bodies and pins are gold-plated brass, the sockets gold-plated beryllium copper, and the insulating inserts are of TFE Teflon. Prices: A-Series—\$3.50 each; C-Series—\$3.50 each; D-Series—\$4.75 each; E-Series—\$5.75 each.

Microtech, Inc.
The Park Square Bldg.
777 Henderson Blvd.
Folcroft, Pa. 19032

Devices for Introductory Psychology

BRS-Foringer announces a new line of products developed to supplement existing texts in Introductory Psychology by providing demonstrations and experiments in learning, perception, and physiological areas. The devices include: a Mirror Tracer—\$37.00, Pencil Maze—\$9.00, GSR Meter—\$60.00, Steadiness Tester—\$18.00, 2-Point Esthesiometer—\$5.00, Reaction Time Monitor—\$4.00, Concept Formation Cards—\$7.00, Illusion Set—\$7.00, Biological Model of the brain and skull—\$20.00, Goggles Blindfold Set—\$3.00, Comparative Weights—\$10.00, Algesimeter—\$8.00, Sound Localization Tester—\$5.00, and a Color-Vision Screen—\$32.00.

BRS-Foringer
A Div. of Tech Serv, Inc.
5451 Holland Dr.
Beltsville, Md. 20705
(301) 474-2900

Delayed Feedback Recorder

A high-fidelity Viking portable tape recorder is the basic unit used for delayed feedback (or delayed sidetone) work, and as a standard interview recorder or for dictation purposes. Delayed feedback to S is variable and calibrated .08 to .4 sec. This delay time may be doubled by switching to low speed. Direct feedback without delay is included. Additional delay is available for .4 to 3 sec. Basic Price: \$690.00. Additional .4- to 3-sec delay: \$118.00.

Lafayette Instrument Co.
P. O. Box 1279
Lafayette, Ind. 47902
(317) 742-4998

Automatic Fish Feeder

An automatic fish feeder that feeds an adjustable amount of dry food once a day for as long as several months is marketed by Era Products. Guaranteed for 2 years, the feeder attaches easily to the aquarium and includes a synchronous, electric timer. Price: \$19.95.

Era Products
261 Thrift St.
San Francisco, Calif. 94112

Tachistoscopes

Tachistoscopes may be purchased from the following firms.

AIM Bio Sciences, Ltd.
Bar Hill
Cambridge, England

Electronic Developments
46 St. James Ave.
Hampton Hill, Middlesex
England

Farrall Instrument Co.
P. O. Box 658
Grand Island, Nebr. 68801

Ralph Gerbrands
8 Beck Rd.
Arlington, Mass. 02174

Hudson Photographic
Irvington-on-Hudson, N.Y. 10533

Lafayette Instrument
By Pass 52 & N. 9 St.
Box 1279
Lafayette, Ind. 47902

Marietta Apparatus
118 Maple St.
Marietta, Ohio 45750

Massey Dickinson Co.
9 Elm St.
Saxonville, Mass. 01706

Perceptual Development Labs
6767 Southwest Ave.
St. Louis, Mo. 63143

Pharmaceutical Research & Development Co.
6144 Springhill Terrace
Greenbelt, Md. 20770

Polymetric Co.
1415 Park Ave.
Hoboken, N.J. 07030

Psychological Instrument Co.
Box 6113
Richmond, Va. 23222

Schuco Scientific
110 5th Ave.
New York, N.Y. 10011

Scientific Prototype Mfg. Co.
615 W. 131 St.
New York, N.Y. 10027

C. H. Stoelting Co.
424 N. Homan Ave.
Chicago, Ill. 60624

Teaching Technology Corp.
5520 Cleon Ave.
North Hollywood, Calif. 91601

Subminiature Indicator Triodes

The Amperex 6977 is a high-input impedance, special-quality indicator tube for indicating the output level of flip-flops in computer circuits utilizing either positive or negative logic. An array of these triodes can monitor the contents of a register, the status of an input-output device, or any other logic function amenable to direct binary readout. With its grid connected to the collector of the flip-flop to be monitored, logic output levels switch the indicator on and off. When "ON" the tube displays a brilliant blue-green bar of light.

The tube measures 1 in. H and 3/16 in. diam. Thirty-two binary outputs can be displayed in 7 in. of panel space. For circuit protection a series resistor (100K or 1 mego) isolates the grid from the circuit being monitored. The 6977 requires only a grid resistor, heater supply (direct, ac or dc, parallel supply) and anode potential—no high voltage transistors, no SCRs, no switching logic. Price: \$2.50 in quantities of 1-24.

Amperex Electronic Corp.
Semiconductor & Microcircuits Div.
Slatersville, R.I. 02876

Visual Perception Transparencies

Research Media, Inc., announces a new series of overhead transparencies for visual perception. Materials for 17 optical illusions are available in two parts. Part 1 contains 9 illusions including horizontal-vertical, diagonal, interrupted-line, and arrow; Part 2 consists of 8 illusions including circle-contrast, herringbone, filled-empty figures, and others. Cost: Part 1—\$38.00; Part 2—\$38.00; Complete Set—\$73.00.

Research Media, Inc.
163 Eileen Way
Syoset, N.Y. 11791

Perforated Tape Winder

The winding and folding of short lengths of perforator tapes may be done with a heavy duty manual winder. The single flange reel has adjustable guide posts for size of tape and length of fold required. It can be adjusted to fold tapes at 5-, 6-, or 7-in. lengths. Price: \$40.00.

Robins Data Devices, Inc.
15-58 127th St.
Flushing, N.Y. 11356

Diodes/Rectifiers Kit

Each kit contains an assortment of 12 diodes/rectifiers accompanied by an identification sheet to determine which parts are included in the pack. The diodes have all been checked for Go-No-Go with the original cost ranging from \$1.00 to \$11.00 each. Manufactured by International Rectifier Corp., all diodes are new. Price per kit: \$.39.

Cornell Electronics Co.
4217 University Ave.
San Diego, Calif. 92105

Thin Film Chip Resistors

FMI's chip resistors are advertised as the smallest made by the industry. Characteristics: Length, $\pm .005$; Width, $\pm .005$; Thickness, $0.010 \pm .001$. The resistor element is chromium, the terminations are solder or gold, and the substrate is 96% alumina. Size of the resistor may vary as a function of the resistance range.

Film Microelectronics, Inc.
P. O. Box 164
Burlington, Mass. 01803
(617) 272-5650

Digital Millisecond Timers

Ralph Gerbrands Co., Inc., announces a new line of direct reading Digital Millisecond Timers (time interval generators) that may be used in any application requiring a series of accurately timed pulses for the operation of a number of events. Depending upon laboratory requirements, the series of pulses can consist of equal or unequal intervals, occurring simultaneously or consecutively in different time patterns or operating modes. Several timers may be combined to achieve an even wider variety of operations. These instruments are compatible with both conventional relay circuitry and modern digital systems.

Model 300-4L (Price: \$1,150.00) is a four-channel digital millisecond timer for generating four independently adjustable intervals; the second, third, and fourth channels have START/END switches. Model 300-6L (Price: \$1,650.00) is similar in all respects except that the number of channels has been increased to six and the second through sixth channels have been equipped with START/END switches.

The Range is 0-99 msec in 1-msec steps; 10-990 msec in 10-msec steps; 100 msec to 9.9 sec in 100-msec steps. The MILLISECOND front panel control has one two-section thumbwheel switch per channel that sets the basic interval for that channel. There is also one multiplier switch per channel (factors direct reading on thumbwheel) with values of X1, X10, and X100.

The outputs for each channel are both RELAY and complementary 5-V TTL Logic. The logic outputs are octal connectors at which a 5-V signal appears during operation of the timing channels. Relay outputs are SPDT bistable mercury wetted relays, 100 V peak voltage, 2 A max current through contacts. Both timers are available at much lower cost without relay outputs. Parts and labor are warranted for 1 year.

Ralph Gerbrands Co., Inc.
8 Beck Rd.
Arlington, Mass. 02174
(617) 648-6415

DataMate Digital Computer

DataMate 16 digital computer has a 4,096-word memory, modularly expandable to 32,724 words. Memory cycle time is 1.0 μ sec; over 80 commands. The flexible Input/Output bus accommodates up to 64 peripheral devices. Data throughput rate is 1,000,000 16-bit words per second. Software includes symbolic assembler and utility package, ASA Fortran, and a symbolic editor and hardware diagnostics. This package is normally supplied on paper tape and operational with 4K memory and ASR 33 Teletype.

The cost of the basic computer package is \$14,900 and includes the DM-16/000 with 4,096 x 16, 1.0- μ sec memory, hardware multiply/divide, eight levels of priority interrupt, DMA I/O bus, hardware index register, power fail/restart and power supply. A 4,096-word increment is priced at \$6,500.00. The DM-16/200 Teleprinter, Modified ASR-33 costs \$1,950.00.

DataMate Computer Systems, Inc.
P. O. Box 310
Big Spring, Tex. 79720
(915) 267-8766

Brush Recorder

The Mark 260 has 10 channels, 6 analog and 4 event (2 on margins, 2 interchannel). Chart speeds are 1, 5, 25, and 125 mm/sec plus the same speeds in mm/min. There is a 14-step attenuator for each channel: 1, 2, 5, 10, 20, 50, 100, 200, and 500 mV/div; 1, 2, 5, and 10 V/div; and "off." Sensitivity control provides stepless attenuation (between above steps) from 1 to 2.5 x the attenuator setting.

Clevite Corp.
Brush Instruments Div.
37th & Perkins
Cleveland, Ohio 44114

Oscilloscope Camera

The Model PC-2A continuous recording camera requires no mounting stand and is designed for mounting directly on the face of the scope. Priced at \$1,440.00, the system includes the camera, oscilloscope hood, remote control unit, data card illuminator, and accessories. The built in lens allows simultaneous photography and waveform viewing.

Lehigh Valley Electronics, Inc.
Box 125
Fogelsville, Pa. 18051
(215) 285-4211

Solid State Relays

Solid state relays are available in SPST (N.O.), DPST (N.O.) and SPDT contact configurations. The relays are intended for switching ac power, 50/60 Hz. Relay styles, such as the octal base which cannot readily transfer heat to the mounting surface, are rated on the same basis as the basic unmounted styles.

Coil input can be any voltage in the range of 3-140 V ac (to 25 K Hz) or 3-200 V dc.

Ohmite Manufacturing Co.
3601 Howard St.
Skokie Ill. 60076

BRIEFS

Electro-Mechanical Equipment and Components

American Relays' new 3-69 Guidebook lists an exceptionally large number of accelerometers, activators, blowers, motors of various types, potentiometers, relays, timers, etc. Prices are included for each item in a booklet containing 107 pages.

American Relays
Electronics Div.
39 Lispenard St.
New York, N.Y. 10013
(212) 966-5650

Psychological Equipment

Modern Teaching Associates, Inc. (MTA) of Milwaukee, Wisconsin, has changed its name to

Behavioral Controls, Inc.
1506 W. Pierce St.
Milwaukee, Wis. 53246
(414) 671-1255

Behavioral Controls, Inc., manufactures both human and animal psychological research equipment including animal feeders, memory drums, operant conditioning apparatus, and automated teaching devices.

Fiber Optics

Flexible light guides (pipes) of various diameters and lengths are available from:

Electro Fiberoptics Corp.
45 Water St.
Worcester, Mass. 01604
(617) 791-7391

Optics Technology, Inc.
901 California Ave.
Palo Alto, Calif. 94304

Ultraviolet Sensor

A modestly priced solid-state ultraviolet sensor is being marketed by Clairex Electronics, Inc., 1239 Broadway, New York, N.Y. 10001. The Type 7UV10, housed in a TO-5 case, exhibits negligible response to visible light, but has a cell resistance sensitivity as great as 100:1 when illuminated by a UV source.

Analog Multipliers

Burr-Brown has introduced two new low-priced analog multipliers. These new discrete units employ a proprietary circuit

technique somewhat similar to the variable transductance method, yet they outperform this type of multiplier at a much lower price. These 4-quadrant multipliers will perform both multiplication and division and will accept either differential or single-ended inputs. Prices are \$75.00 and \$95.00 for Models 4097/25 and 4098/25, respectively. Specifications may be obtained from:

Instrument Specialists, Inc.
1909 State St.
San Diego, Calif. 92101
(714) 232-2017

Burr-Brown Research Corp.
International Airport Industrial Park
Tucson, Ariz. 85706
(602) 294-1431

Magnetic Tape for Small Computers

Tri-Data now offers the CartriFile with an interface for the PDP8 computer. CartriFile has four magnetic-tape transports, cartridge loaded, and can be rack-mounted or used on desk top. Capacity is 320,000 12-bit words (80,000 per tape) with simultaneous read and write from different tapes. Start time is 15 msec; stop time is 10 msec. With PDP8 interface the price is \$5,700.00; plug-compatible interface with PDP8, PDP8/S, PDP8/I, PDP8/L.

Tri-Data Corp.
800 Maude Ave.
Mountain View, Calif. 94040
(415) 969-3700

Fan-Fold Perforated Tapes

Prefolded perforated tapes eliminate reels, winding and rewinding, are convenient for storage, and are easy to label and file. Available in oiled, unoled, photoelectric, paper/mylar/paper, and vulcanized fiber.

Robins Data Devices, Inc.
15-58 127th St.
Flushing, N.Y. 11356
(212) 445-7200

Cooling Patient's Brain for Surgery

A Russian research team headed by Dr. E. Polenko has developed a refrigerated crash helmet to be worn on the head during surgery to cool the brain. It is claimed that the brain is cooled to 72 deg F in 2 or 3 min, allowing surgeons to operate on other vital body organs in greater safety.

Digital Filter for PDP-8 Computer

A digital filter has been developed for the PDP-8 digital computer which is high-speed and programmable. The filter offers exact reproducibility of filter characteristics and the capability of handling wide bandwidth input signals in real time. It can perform a unique multiply/add algorithm in 400 nsec; this permits implementation of filter bandwidths up to 1 MHz.

The digital-filter/PDP-8 combination is useful for Fourier transform computations, auto- and cross-correlation function computation, function generation, speech synthesis, and other applications.

ADCOM
808 Memorial Dr.
Cambridge, Mass. 02139
(617) 868-1000

Square Lens Lampholder

The Model 301 Square Lens Lampholder has ample legend space, mounts in a round hole, and allows closed-up spacing of lamps side by side. It is two-terminal, subminiature, and uses a T 1 3/4 incandescent lamp replaceable from the front.

Sloan Co.
7704 San Fernando Rd.
P. O. Box 367
Sun Valley, Calif. 91353

Metric Units

Numerical Value		Power ¹⁰	Prefix and Abbreviation
Tenth	.1	(10 ⁻¹)	deci (d)
Hundredth	.01	(10 ⁻²)	centi (c)
Thousandth	.001	(10 ⁻³)	milli (m)
Ten-thousandth	.000 1	(10 ⁻⁴)	
Hundred-thousandth	.000 01	(10 ⁻⁵)	
Millionth	.000 001	(10 ⁻⁶)	micro (μ)
Ten-millionth	.000 000 1	(10 ⁻⁷)	
Hundred-millionth	.000 000 01	(10 ⁻⁸)	
Billionth	.000 000 001	(10 ⁻⁹)	nano (n)
Ten-billionth	.000 000 000 1	(10 ⁻¹⁰)	
Hundred-billionth	.000 000 000 01	(10 ⁻¹¹)	
Trillionth	.000 000 000 001	(10 ⁻¹²)	pico (p)
Ten-trillionth	.000 000 000 000 1	(10 ⁻¹³)	
Hundred-trillionth	.000 000 000 000 01	(10 ⁻¹⁴)	
Quadrillionth	.000 000 000 000 001	(10 ⁻¹⁵)	femto (f)
Ten-quadrillionth	.000 000 000 000 000 1	(10 ⁻¹⁶)	
Hundred-quadrillionth	.000 000 000 000 000 01	(10 ⁻¹⁷)	
Quintillionth	.000 000 000 000 000 001	(10 ⁻¹⁸)	atto (a)
Ten-quintillionth	.000 000 000 000 000 000 1	(10 ⁻¹⁹)	
Hundred-quintillionth	.000 000 000 000 000 000 01	(10 ⁻²⁰)	

Miniature Brushless dc Motors

The Siemens Brushless dc Motor offers a minimum of RF noise, of voltage fluctuations, acoustical noise, high current drain, and replacement problems. The motors feature reliable solid-state controls, adjustable speed controls, and instantaneous reversibility.

Problems in motor design involve the need to sense the exact position of the rotor in relation to the stator, and the changing relationships of the voltages or magnetic fluxes as the rotor rotates. The Siemens Motor uses a new Hall effect device to accomplish the precision sensing task. The Hall Generator is a four-terminal unit affected by the strength and direction of the current flow at its input. The input to the four-terminal unit is dc and the output is proportional to the strength and direction of magnetic flux in the field which it "sees." With a rotor constructed of a bipolar cylindrical magnet with two Hall generators at 90-deg angles, the output from one is at maximum while the output from the other is at minimum; and two sine waves, 90 deg out of phase, are generated if the magnet is rotated at constant speed. Then the outputs from the two Hall generators are each amplified by a push-pull amplifier creating four sine waves in quadrature. These four ac voltages are applied to stator cores of the motor in the correct phase relationship.

Siemens America, Inc.
Power Equipment Div.
350 Fifth Ave.

Recording Tape

Although sound tape recorders are among the most commonly used and available instruments in the behavioral sciences, few users are acquainted with the characteristics of recording tape. A few of the more important features will be described here.

The plastic base common to most sound recording tapes is either cellulose acetate or polyester, with several manufacturers providing slight variations of these basic materials. Mylar, for example, is the Dupont trademark for a brand of polyester-base tape. With all, however, a combination of oxide particles and a liquid binder are applied to the plastic base in varying thicknesses depending on the magnetic and physical characteristics desired. Aside from the more obvious features, such as recording time (thinner tape allows more to be wound on the same size reel), variations in thickness and plastic base also influence yield or break strength. Yield strength is the more important since it refers to the force required for stretching which introduces distortion and changes the frequency in the stretched section of the tape. Breaks are inconvenient but seldom introduce distortion and can easily be repaired by splicing. Some notion of the manner in which tapes vary in yield and breaking strengths for two conditions of humidity can be obtained from the following information:

Material	Strength*			
	Yielding		Breaking	
	90% humidity	50%	90% humidity	50%
Polyester: .5 mil**	2.0	2.0	2.9	2.9
Polyester: 1.0 mil	4.1	4.2	7.6	7.6
Polyester: 1.5 mil	6.3	6.3	14.5	14.5
Acetate: 1.0 mil	1.8	3.7	2.5	3.9
Acetate: 1.5 mil	3.0	5.0	4.1	5.5

*strength = force in pounds necessary for yield or break as tape is subjected to starts and stops, wind and rewind, etc. All values are approximate.

**mil = thousands of an inch—referring here to thickness.

Note that the force required for yielding or breaking is much higher for 1.5-mil acetate tape than for the thinner types, but that a 1.0-mil acetate tape, if handled carefully, will provide 50%

more recording time and perform very well. Polyester-base tape is superior to acetate in resistance to both breakage and stretch for equivalent thicknesses, but it is more expensive.

Temperature has much less effect on polyester tapes. Acetate-base tape tends to shrink under conditions of low humidity, and expands more than polyester at the higher temperatures and humidities; it also has a greater tendency to become brittle and break at temperature extremes.

A treated or tempered .5-mil polyester tape may be purchased that utilizes a combination of oxides which permits thin coatings and allows long recording times (about 180 min with a 7.5-ips recording time on a 7-in. reel). The tape is also relatively strong. For example, its break strength is better than that of 1.5-mil acetate and its yield strength is as good.

Another characteristic of all tapes is "print-through," which refers to the transfer of the recorded signal to adjacent layers in the reel. This occurs because the tape is a magnetizable material; when the signal creates a magnetic field this magnetism is transferable. So, as the reel turns, the layers of tape adjacent to the magnetic field are magnetized. When the tape is played back, echos of the original sound result with the strongest coming from the preprint, i.e., the adjoining layers immediately preceding the recorded signal. The postprint layer is not as loud since the magnetizing effect has to pass through the thicknesses of both the base and the coating to reach its surface. There is also a great deal of masking of this portion by the sounds that follow. So, it is the preprint level that is supplied with tape specifications.

Print-through can be minimized by recording below the maximum recording level, and by storing the tape in a temperature no higher than 70 deg F, especially during the first 4 days after recording. The effect appears to increase up to that time. Obviously magnetic tape should not be stored near other magnetic fields, e.g., those generated by motors. For long storage, "low-print" tapes may be purchased which have a print-through effect several decibels below the standard.

Tachistoscopes

The Ralph Gerbrands Co., Inc., 8 Beck Rd., Arlington, Mass. 02174, was inadvertently omitted from the Tachistoscope supplier listing of the recent Buyer's Guide, Instrumentation Issue of American Psychologist, March 1969. The R. Gerbrands Co. markets the Harvard Tachistoscope: Models T-1C-3 and T-2B-1 are two-field T-scopes; Model T-3B-1 is a three-field instrument. An updated list of tachistoscope suppliers is provided in the Products section of PRINTOUT, this issue.