

PRINTOUT

Joseph B. Sidowski

Products

Printer

The REPCO 120 is a low-cost solid-state impactless printer designed to interface with all CRT terminals, minicomputers, or other remote data terminals. It operates asynchronously at speeds to 120 characters/sec, 80 characters/line, 6 lines/in. vertically. The machine will handle serial or parallel data of 64-character standard ASCII code. When interfaced with a modem or acoustic coupler, it can be used as a terminal printer over telephone or private communication lines. Single unit price: \$1,500.

REPCO Incorporated
1940 Lockwood Way
P.O. Box 7065
Orlando, Florida 32804
(305) 422-2451

Mixer

The Model ASK-2 is a micro-miniature .05-cu-in. ultra-broadband mixer, which covers greater than 14 octaves from audio to UHF. Having a base area of 0.15 in. to minimize board space, the pins are located on a 0.2-in. grid for design convenience. Bandwidth is 25 kHz-500 MHz, and the conversion loss is under 6 dB. The unit can be used as a very fast switch, a current controlled attenuator, a balanced modulator, a frequency doubler, or as a phase detector. Warranty is 1 year.

Mini-Circuits Laboratory
2913 Quentin Road
Brooklyn, New York 11229
(212) 252-5252

Digit Multimeter

Hickok's new Model 3300 3½-digit multimeter has 26 ranges of ac-dc voltage and current and ohms. Ranges are 100.0 mV to 15.00 kV, 1.000 mA to 1.999 A, 100.0 ohms to 199.9 megohms. Operates 24 h off internal battery pack (standard) and recharges overnight, or uses the ac line. Price: \$395.

Hickok Instrument Group
10514 Dupont Avenue
Cleveland, Ohio 44108
(216) 541-8060

Miniature Digital Readout

The DROD is a miniature digital readout device which uses fiber optics

to achieve greater clarity and illumination. Operation is from a low-voltage source, eliminating the need for a conventional high-voltage power supply. Illumination is provided to the digital display by a disposable seven-lamp module with miniature bulbs and by means of optical fibers, producing a seven-bar readout. The DROD is ½ in. high, 0.43 in. wide, and 1 in. long. Character size is 0.4 in. high x ¼ in. wide. Price is approximately \$40 per single unit.

Rank Precision Industries, Inc.
360 N. Route 303
West Nyack, New York 10994
(914) 358-4450

Drum Timer

Sealectro Corporation is marketing a low-cost drum timer featuring two switches actuated by two independent program channels. The timer provides up to 60 ON-OFF functions per revolution on each channel and serves as a pulse generator or process timer, providing extended or individual pulses using bridge-type cam inserts. Alternatively, the second channel may be used for motor control. The slots are indexed, thus providing 100% repeatability when resetting to a former program. When used with standard stepping switches, the timer provides the flexibility of 11 different time cycles. The unit permits experimenting with different time cycles in applications where total time cycle has not been determined. Standard single- and double-switch models are available in 1 rpm, 1 rph, 1 rpd, 2/5 rpm, and 1/24 rpm. Contacts are rated for 15 A. Price: \$20.

Programming Devices Division
Sealectro Corporation
Hoyt Street
Mamaroneck, New York 10543
(914) 698-5600

Minicounter

The Mini-Flex Model 7124 series counter combines low-voltage electronic counting decades with a six-figure electromechanical totalizer for high-speed counting. Signals are accepted from switch closure or pulse input. With the latter, count speed is 400/sec for models with one electronic counting decade; it is 4,000 counts/sec with two counting devices. Either a remote switch or a manual pushbutton

may be used to reset the counter and electronic decades to zero. Standard models are 5 or 24 V dc. The unit is 4-33/64 in. long x 4½ in. high x 2½ in. deep and weighs 24 oz. Price: \$150 for one decade; \$185 for two decades.

Veedor Root, Inc.
70 Sargeant Street
Hartford, Connecticut 06102
(203) 527-7201

12-Channel Card/Tape Readout

Consisting of 12 separate glass-fiber optic light pipes, the terminations of the readout end of the card reader measure ¼ in. on centers. Each slot is 1/8 x 1/16 in. The opposite end of each termination is brought out in a cylindrical area. The 12 light pipes are molded in a 3 x 2 x 7/16 in. plastic form, and each light pipe may be individually controlled for card or tape readout. Sold under Catalog No. 92CU945, the unit sells for \$5.95. The same supplier sells a photocell (92CU1047) especially designed for this work.

Poly Paks
P.O. Box 942
South Lynnfield, Massachusetts
01940
(617) 245-3829

Electronic Event Counter

The Type 320 event counter is a compact, panel-mounted, all-solid-state digital display device containing an integral ac power supply. Features include speed to 1 megacycle, 0.6-in. tube display, and buffered or isolated BCD output. Count input: trigger on positive 2-V level. Maximum count: 1,999. Weight: 28 oz. Size: 4.38 in. wide, 3.13 in. high, and 3.12 in. deep. The unit sells for \$149.

DIGILIN Digital Instruments
1007 Air Way
Glendale, California 91201
(213) 240-1200

Miniature Recorder

The Esterline Angus Minigraph is a miniature inkless recorder which employs a special stylus firmly positioned against pressure-sensitive paper. A cammed assembly on the 2-rpm drive motor causes the stylus to write a record consisting of dots. Dotting speed is one dot every 2 sec. Fourteen chart speeds are available.

ranging from 1/8 to 60 in./h. Installing a new gear train changes speeds. Options for the Minigraph are two hook-on current transformers for ac current measurements; one is for 60 Hz and the other for 50 Hz. Both are rated for indoor use to 750 V and can be used to 1,000 Hz. Prices vary according to range requirements, from \$99.50 to \$160 (with hook-on transformer).

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

Interconnection Board

QICSYS Systems, Inc., announced a new component in their ruggedized modular interconnection system. Used for interfacing, cable connecting, breadboarding, and programming, the interconnection board (ICB) is a 5 x 9 x 1/16 G-10 printed circuit board with solder-mounted sockets. Socket pins are brought out to imbedded male push-on tabs. Ground plane and shielded signal lines are standard.

QICSYS Systems, Inc.
128 West 58th Street
Bayonne, New Jersey 07002
(201) 437-9363

Cardio-Microphone

This cardio-microphone is encapsulated in silicone rubber. Imbedded in the front surface is a stainless steel disk to facilitate the application of the mike to the S with special double-locked adhesive disks. When disks are used, no external strapping or taping is required. A special low-noise cable is used in the construction of the transducer assembly. A standard 1/4-in. phone plug is supplied with the mike. For optimum electrical performance, the mike output should be fed into a high-input impedance amplifier (5-10 megohms). Price of the cardio-microphone is \$95. The Model 1076 cardio-preamp costs \$150.

Industrial Scientific Research Corporation
2220 Howell Avenue
Anaheim, California 92805
(714) 633-7907

Motors

GE or Robbins & Meyers, Inc., 1/20-hp 115-V ac single-phase 1,725-rpm reversible motors originally cost \$60. The motors were removed from Honeywell computers where they were used as tape-drive motors and are now priced at \$6.95.

Bodine low-speed high-torque motors are internally geared so that

the shaft speed is low and the torque is high. Two speeds are available for the motors rated at 115 V ac, 60 cycles. Price: \$2.50 each.

A Barber-Coleman fan motor (110 V ac with 1/8-in. shaft) is priced at \$1.00.

A new dc servo motor manufactured by Electro-Craft Corporation costs \$9.95. The motor is rated at 24 V dc, 4.2 A, with 25 in./oz torque.

Delta Electronics Company
P.O. Box 1
Lynn, Massachusetts 01903

Logic Lite

The LL-4 and LL-4H provide instant logic status with inputs that are TTL and DTL compatible. Signal requirements: lamp on, +2.1 V minimum at 50 microA; lamp off, 0 ± 0.5 V maximum at -1.8 mA. Power requirements: 5 V dc +10% at 90 mA. The lamp has an intensity of .015 MSCP with a life of 5,000 h minimum. Price: \$9.

Unique Devices Company
Box 786
Reseda, California 91335
(213) 881-6634

CartriFile

CartriFile is an electronic data-processing system with four mag tape transports and controller. The unit has high transfer rates, error detection and correction, and simultaneous reading and writing. It is cartridge-loaded, and interfaces are available for 25 minicomputers. Prices start at \$2,900.

Tri-Data
800 Maude Avenue
Mountain View, California 94040
(415) 969-3700

Stepper Motor

The Model VR 2490-15 is a new stepper motor which achieves high flux densities with a small, light rotor. The motor has a rotor inertia of 20×10^{-6} lb in. sec² and high torque (90 in. oz). The unit operates on 20 V dc. Step rate is 1,600 pulses/sec; slew rate is 2,400 pulses/sec. The step angle is 15 deg. The unit weighs 46 oz and has the following dimensions: diameter, 3 1/4 in.; length, 4-7/8 in. The motor is reversible and two 1/4-in. output shafts are provided.

Bulova Watch Co., Inc.
Systems and Instruments Division
Green Acres Road West
Valley Stream, New York 11582
(516) 561-2600

Infrared Pupillography

The HTV Irisorder is an automatic system combining infrared light sources, closed-circuit TV, and an oscillographic recorder. The unit is advertised as allowing for the real-time recording of quick pupillary movement (within milliseconds) as well as the visual monitoring of the entire pupillary area rather than just the diameter. Images of the pupil are presented on the picture monitor magnified six times. The apparatus consists of three assemblies: (1) the infrared-sensitive, electrostatic-focusing, and deflection-type Vidicon camera for accurate video analysis of the pupil; (2) the video analyzing system with integrating circuits calculating pupil area; and (3) a monitor scope and recording system with on-line analog-to-signal output, and a means for recording the pupil response directly. More than three channels are available to indicate the absolute value of the area, the deviation of the area, and the marker for the stimulator.

Hamamatsu TV Co., Ltd.
1126 Ichino-cho
Hamamatsu, Japan

or

Technical Resources, Inc.
600 Main Street
Waltham, Massachusetts 02154

Miniature Light Sources

Airypoints are microoptical systems which project minute intense points of light. Working ranges extend from 0.5 mm to several centimeters from the tip. Light-point sizes, limited only by diffraction, can be provided as small as 1.5 microns in diameter or as large as 1,000 microns (1 mm). Optical fiber light transports can be inserted directly into Airypoints for convenience of light control or isolation. Wavelengths of light ranging from 3,800 Å to over 15,000 Å can be utilized. Any light input can be employed, including subminiature lamps, diodes, and lasers. Basic unit prices range from \$60 to \$85.

Aeroptix Technology Corporation
25 North Mall
Plainview, New York 11803
(516) 293-4616

Wireless Headset Microphone

The RH-27 Simplex wireless headset is a two-earpiece headset microphone combination, using circumaural earpieces, with integral crystal-controlled transmitter, receiver, controls, and power supply. Printed circuit board, mike boom, right

speaker, telescopic antenna, volume control, and antenna loading coil and transmit switch are built into the right earpiece cup. The on-off switch, 8.4-V battery, and left speaker are built into the left earpiece cup. The telescopic antenna is 5 in. long retracted and 24 in., extended. The high-impact cyclac earcups are shock- and shatterproof, with up to 40 dB rejection of ambient noise. Band of operation, 27 MHz (GRS-CB) amplitude modulation. The weight is 2 lbs and the price is \$200.

Sharpe Audio Division
Scintrex, Inc.
Amherst Industrial Park
Tonawanda, New York 14150
(716) 693-8331

Neuronal Spike Analyzer

The Model N-750 allows on-line monitoring of interspike interval and enables the interspike interval to be graphically displayed on a chart recorder or oscilloscope simultaneously with the display of other relevant information. The N-750 contains a sensitive differential amplitude discriminator which separates spikes of a given amplitude from a signal which includes a variety of spikes of different amplitudes originating from different neurons. The discriminator operation is described as follows. Assume that an input signal containing a series of unit spikes occurs at times T_1 through T_4 applied to the input. These unit spikes are at three distinct amplitudes. The discriminator input is connected to two differential voltage comparators, labeled A and B. The differential voltage comparator has an output of 0 V until the input voltage just exceeds a specific preset reference level, at which time the output switches suddenly from zero to a large positive voltage. The outputs of both comparators go to a logic function module which generates an output pulse if, and only if, Comparator A switches on and off again in the absence of any pulse from B. Assume that Spike T_1 falls short of triggering Comparator A, and that Spike T_3 triggers both A and B. Then only Spikes T_2 and T_4 will generate an output pulse from the logic module. Reference levels, say Levels L_A and L_B , in the unit are adjustable. These form a variable "window" such that only spikes with a peak amplitude falling between the two levels will generate an output. This operation gives rise to the descriptive term "window discriminator."

The N-750 discriminator levels are adjustable over a range from 0 to 1 V in steps of 1 mV. The window resolution is 2 mV. The discriminator

is advertised as separating spikes which differ from each other in amplitude by less than 1%. Risetime, duration, or waveform of the input are said not to affect the discriminator, which will function effectively on pulses only 10 microsec in duration or on slowly varying waves lasting a number of seconds. This allows for the selection of EEG waves of a given amplitude as well as unit spikes.

The discriminator output is connected to a pulse interval timer which measures the interval between consecutive pulses. The measured interval is displayed on a meter, which has three ranges and reads from 1 msec to 1 sec. Each time an output is received from the discriminator, a new pulse interval reading is displayed. At high discharge rates, the meter reads the average interspike interval.

The unit also contains an audio monitor and speaker which allow the E to monitor spike discharges by ear. The monitor can be switched to the raw input signal or the discriminator output. Price of the unit is \$985.

Mentor Corporation
2512 Delaware Street, S.E.
Minneapolis, Minnesota 55414
(612) 331-5177

Mag Tape Erase Head

Nortronics is marketing an erase head for 1/2-, 1-, and 2-in. video and instrumentation applications. The unit employs a die-case metal frame that is 11/32 in. wide to allow for installation in tight quarters. The REX-100 head uses a metal face and case for improved tape contact and heat transfer. Prices start at \$30.

Nortronics Co., Inc.
8101 Tenth Avenue North
Minneapolis, Minnesota 55427
(612) 545-0401

BRS-Foringer New Products

BRS-Foringer recently announced a number of new products, including the following: CR-201/202 Cumulative Recorder Drivers to control the functions of the Gerbrands C3 and C3-SHS Harvard recorders, respectively (\$85); DATAMARK 100, a high-speed real-time computer-compatible data-recording system which records events in binary notation on seven-channel mag tape and accepts inputs from any solid-state or electromechanical source (\$7,800 with eight inputs); the PTC-001 Free Operant Primate Test Cage, which accommodates primates up to 25 lbs and contains a shock grid and "intelligence" panel (approximately \$1,000, depending on accessories); RD-901 Relay Decoder designed to convert binary information to decimal

format for processing by electromechanical equipment—4-bit (\$75); CCL-801 Classical Conditioning Lab designed for undergraduate instructional aids to simulate the operation of a Pavlovian laboratory (\$80); RAS-003 Random Access System for the automatic control of slide projections—includes control package, Kodak RA-950 projector, and Carousel remote control unit (\$1,600). The company also announced a reduction in relay prices resulting from the introduction of new production techniques.

BRS Foringer
5451 Holland Drive
Beltsville, Maryland 20705
(301) 474-3400

New Surplus Digital Readouts

Brand new digital readouts are available at reduced surplus prices. The units were made by Industrial Electronic Engineers and sold for over \$40 each. Operation is from 12 to 28 V, but the units can easily be converted to 6 V by changing the bulbs at a cost of 10 cents each. The numerals are 1/2 in. wide and 1 in. high and are projected on the front plastic screen which is lighted from behind by 12 bulbs. The lamp housing has a quick disconnect for replacement of any defective bulb. Two formats are available: one has the numerals 0-9, plus symbols — and —; the other has the numerals 0-7 plus —, —, T_p , and T_x . With a little ingenuity the format can be changed by reworking the readily accessible screen.

The DR 0-9 is \$9.50; the DR 0-7 is \$6.50. Both are sold by BF Enterprises, P.O. Box 44, Hawthorne, Massachusetts 01937.

Briefs

Tracking Control

At the Fall Joint Computer Conference (1970), Measurement Systems, Inc., of Norwalk, Connecticut, displayed a tracking system. The Digital Cursor Simulator includes programmed targets and electrical stopwatch for error and time-to-position measurements. The operator's command generates a pair of 10-bit binary numbers representing X and Y coordinates. D-A converters produce coordinate voltages to drive a high resolution (1024 x 780) CRT display.

NPN High-Voltage Transistors

Fairchild Semiconductor has introduced the 2N5964-65 and 2N5830-33 high-voltage rpm transistors. Both groups feature beta

linearity from 1.0 to 50 mA with low leakage currents. The units are in plastic packages.

Fairchild Semiconductor
313 Fairchild Drive
Mountain View, California 94040

Measurement of Oxygen Consumption

The Metabolic Rate Monitor (MRM) measures oxygen consumption continuously. A servo-controlled blower draws room air through a facepiece, adjusting its volume flow so that oxygen tension downstream from the man is kept essentially constant. The indicated and recorded error signal in the servo loop is continuously proportional to oxygen consumption.

A motor blower drawing ambient air through the system is servo controlled by sensing the partial pressure of oxygen in the airstream by a polarographic cell located downstream from the man. As downstream oxygen content decreases, the blower speeds up, increasing the volume flow and thus returning the downstream oxygen content toward that of ambient air. The polarographic cell, operating at an optimal point on its response curve, maintains a volume flow which is directly proportional to oxygen consumption. The recorder is a continuous analog signal (0 to 5 V dc) proportional to oxygen consumption based on 1 V/liter of oxygen consumed per minute.

The headpiece consists of a curved plastic faceplate, adjustable head band, blower, and O₂ sensor with single connecting cable. The weight is 3 lbs. Dynamic range is 0 to 5 liters/min oxygen uptake, and response time is 90% in 10 sec.

The MRM method offers several advantages. For example, since the flow rate of outside air is 100 times the V_{O₂}, it is approximately four times the respiratory minute volume (V_E). As work increases, V_O and V_E increase. The volume of flow through the blower increases automatically. Evidently, the S finds this refreshing. Also, the S wears no mouthpiece or noseclip, and there are no valves in the mainstream. So there appears to be no resistance added to breathing.

In enabling the user to make continuous measurements, the signal output to the recorder is a continuously varying voltage showing the "instantaneous" V_{O₂} of the S. It is claimed that the continuous MRM records show variation in V_{O₂} which are unrelated to changes in work and which are highly individual in character.

A detailed description of the instrument is available in the following reference: Webb, P., & Troutman, S. J. An instrument for continuous

measurement of oxygen consumption. *Journal of Applied Physiology*, 1970, 28, 867-871.

Price: \$3,950.

Webb Associates, Inc.
Box 308
Yellow Springs, Ohio 45387
(513) 767-7238

Minicomputers

Systems Engineering Laboratories, Inc., in an agreement to acquire Multidata, Inc., will acquire a 64k 16-bit-word minicomputer, marketed as the Systems 72. SEL also has the System 82, an in-house development, with 4k-16k words of core and a memory-cycle time of 900 nsec. Evidently the company is attempting to compete with the Digital Equipment Corporation. The SEL 810B covers the big minicomputer range. The Systems 72 is set up to compete with the PDP-8.

Used Instrument Rehabilitation Plan

Beckman Instruments, Inc., will update your Beckman (or "Offner") recorder, using as much of your existing instrument as possible. Updating includes meeting all of the latest design and operational specifications. For example, if you have an eight-channel Type R recorder, it can be updated to a new Type RM recorder for \$3,500 less than a new Type RM. The RM is the second-generation refinement. Rehabilitated instruments carry a 1-year warranty.

Frederick Patrick
Factory Service Supervisor
Beckman Instruments, Inc.
Electronic Instruments Division
3900 River Road
Schiller Park, Illinois 60176
(312) 671-3300

Sound-Activated Switch

Sonus Corporation of Natick, Massachusetts, has a sound-activated remote-control switch that can be used to turn equipment off or on merely by slapping the hands together or whistling. The switch reacts at distances up to 100 ft. Two sharp sounds are used to activate the switch in the range of 14-18 kHz within a ½-sec interval; the 13.5-kHz narrow-frequency range responds to the whistle.

Miniature CRT Visual System

Bell Helicopter Company has developed a night vision system, in which the image is picked up by a TV camera with a low light-level response. The subject (a pilot in this case) has an eyeglass mounted over one eye through which the picture is displayed

on a miniature CRT. The subject sees the image superimposed on the field being observed because of the partial transparency of the eyeglass. The TV camera is automatically aimed to the area being observed by an electromechanical headtracker.

Digital Line Printer

Hecon Corporation recently released a preliminary spec sheet on the Series DP 500 BCD Input/Series DP 550 Pulse Input Digital Line Printer. The unit is a compact 4- to 12-column (10 characters/column) asynchronous printer with pluggable BCD or pulse train. The pulse-counting print columns accumulate data up to 40 cps and are equipped with reset-to-zero capability. The printer comes with power supply and 117 ac cord. Other input requirements are data lines (four per column for BCD, one per counter bank for pulse counting), print command, and ground return. A print override capability is present should there be a need to reprint data previously printed without regard to new data. During number selection and printout, an inhibit signal alerts the user that the printer is cycling and data must be held constant during this time. The machine prints at an average asynchronous speed of 5 lines/sec, and a worse case speed of 4 lines/sec. The unit is marketed by Hecon Corporation, P.O. Box 247, Eatontown, New Jersey 07724.

Fiber Optics

Corning Glass recently installed additional equipment which allows volume pricing as low as 3 cents/ft for glass flexible fiber optics. High-speed end finishing equipment which automatically optically finishes flexible glass light pipes allows selling prices of less than 12 cents for a cut and terminated 1-ft lead. The company is also offering a selection of standard cut and terminated lengths, as well as snap-on colored lenses. The Flexible Fiber Optics Department of the Corning Glass Company is located in Houghton Park, Corning, New York 14830.

Used DEC Computers

The Laboratory Instrument Exchange (LABEX) is advertising a number of used DEC computer systems at reduced prices. Several of the listings are as follows: DEC Model PDP-9 with 8k memory, tape reader/punch, real-time clock, and KSR-33 Teletype—qualifies for DEC service (\$19,500); DEC Model PDP-8I, with 4k and ASR-33 Teletype (\$9,450); DEC Model PDP-8, with 4k memory and ASR-33 Teleprinter—qualifies for DEC service

Notes

A SYSTEM FOR CONVERTING A CAROUSEL PROJECTOR INTO A STIMULUS PROJECTOR

STANLEY G. SMITH
The University of Mississippi
University, Mississippi 38677

Several investigators have altered the Carousel projector for experimental purposes (e.g., Biederman, 1969; Campbell & Gollin, 1967; Lubow & Stevens, 1964; Siegel, 1964). The Carousel projector system described here was designed for research which required both operation of the shutter independently of slide advance and coding of each slide (i.e., either S+ or S-) without matching stepper programming.¹

The shutter modification for external control of the projection period, without slide advance, was accomplished by the following procedure (cf. Fig. 1): (1) An 8-mm-diam hole was drilled 7.5 cm from the front and 1 cm from the side

on the bottom of the projector; (2) an L-brace, 8 cm long, 2 cm wide, top bend 2 cm, with a 24-V dc solenoid (Guardian Solenoid, continuous duty, No. 11) attached to it, was mounted on the bottom of the projector next to the 8-mm hole; (3) a piece of 24-ga stainless steel wire (obtained from Delta Surgical, 22 North Pauline, Memphis, Tennessee 38105) was strung from the shutter arm to the solenoid and adjusted for maximum shutter closure.

After the shutter was modified, a number of experimental conditions were programmable without advancing the slide-change mechanism, e.g., time-out (TO), intertrial interval (ITI) for discrete operant research, flashing of the stimulus, and response correction (i.e., reshowing a stimulus after an incorrect response is made by the S).

Modification of the Kodak Carousel projector for a slide code-sensing system was accomplished by the following procedures (see Fig. 2): (1) A 2-mm-diam hole, located 9.5 cm from the front and 1 cm from the top, was drilled on the right side of the projector for insertion of a fiber optic light guide; (2) a 4-mm-diam hole, located 12.5 cm from the front and

(\$7,865); DEC LINC-8 computer with 4k 12-bit memory, multiplexed inputs, oscilloscope display, dual magnetic tape unit, analog-to-digital converter, multiplier channels on teleprinter—advertised as in near-perfect condition (\$21,450).

LEBEX lists other DEC computers also. One Hewlett Packard machine is cited, the 2114A. This computer has 8k of 16-bit memory, duplex register, ASR-33 Teletype, and includes Fortran, Assembly, Basic, and Diagnostic software. The 2114A is priced at \$14,500, \$2,700 under list.

A catalog covering used computers and other equipment for sale or rent is available from Laboratory Instrument Exchange, Inc., 301 East Erie Street, Chicago, Illinois 60611.

A Simple Tailshock Electrode for Restrained Rats

The most common method of applying electric shock to rats has been by means of a grid floor. However, certain experimental situations require that shock be given a restrained S via the tail. Accordingly, a very simple and inexpensive tailshock electrode costing less than 25 cents has been devised.

The electrode consists of a Buss No. 4405 fuse holder (two fuse clips separated by, and imbedded in, plastic) that is easily and snugly clipped to the rat's tail. The fuse clips are contoured and can be adjusted to accommodate individual differences in tail diameter. The large surface ensures good electrical contact so that electrolytic solutions are not required. In addition, the solder terminals permit easy soldering of wires from the shock generator. A notable feature of this device is that it is ideal for yoked control group designs. Several fuse holders wired in parallel may be used to provide uniform administration of tailshock to all Ss, although differences in resistances must be considered.

In pilot work, we found that the electrode, if taped to the tail, worked reasonably well with unrestrained rats. A tail electrode for unrestrained rats is cited by J. M. Weiss in *Journal of the Experimental Analysis of Behavior*, 1967, 10, 85-86.

(The above note was submitted by Herman Huber, David L. Wolgin, and John M. Williams of the Department of Psychiatry, Rutgers Medical School, New Brunswick, New Jersey 08903. The research was supported by Grants MH-17824, to Peter Manto, Jr., and MH-08585, to Peter Carlton.)

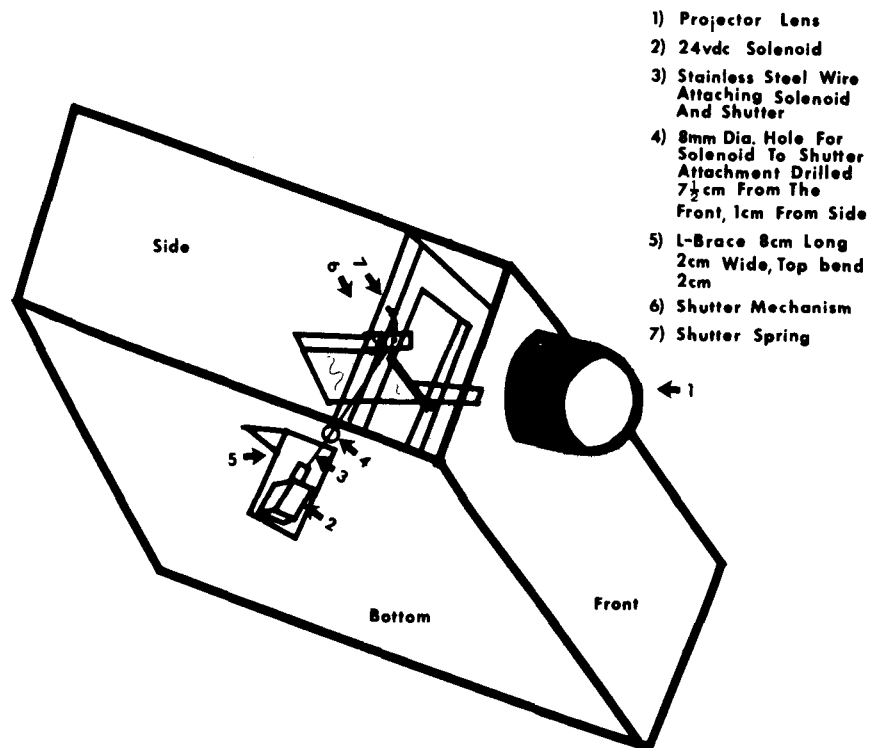


Fig. 1. A three-sided view of the modifications made on a Kodak Carousel projector for external control of the shutter mechanism.