Why Sol Should be your Small Computer Choice.

Sol-20 Terminal Computers are complete. You don't spend an extra penny for necessary interfaces. Sol computer systems start at $1850 in kit form.

We've done the software job. Only Processor Technology offers a fully implemented disk operating system for small computers: PTDOS. Our high level languages include Extended BASIC, FORTRAN,* FOCAL, PILOT* and Assembler.

You can expand the Sol to handle business, engineering and research problems. Today's Sol can handle 65,536 bytes of memory and operate with a three megabyte on-line disk memory. S-100 bus compatibility means you can use a big group of standard peripherals.

Sol systems are conservatively rated. They won't quit on you. With over 5,000 in the field, we know the track record for reliable performance is outstanding.

We back Sol with the best documentation in the industry plus a factory support team to give you caring counsel by phone or letter. What's more, on site maintenance and service folks are located in over 50 cities throughout the U.S. and Canada.

So when you are shopping for a small computer, see your Sol dealer last. Then you can take your Sol with you!

For more information, please address Processor Technology Corporation, Box I , 7100 Johnson Industrial Drive, Pleasanton, CA 94566. (415) 829-2600.

*available soon   U.S. prices only.

Processor Technology
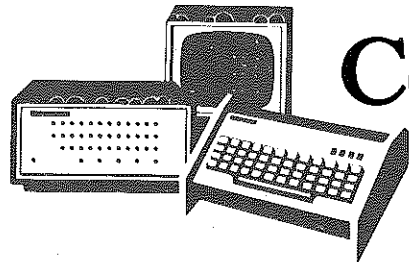
Computer Bits

by Leslie Solomon

HIGH-RESOLUTION GRAPHICS

NO MATTER how many alphanumeric characters your terminal can put on the screen, there are times when those characters are no substitute for graphics. However, when you examine the field, you will find that many low-cost "graphics" displays are simply nonalphanumeric characters resident within the character generator used, or they are limited to simple bar graphs. There are boards and systems that have some graphics capability, but the graphics are generally small "blocks" rather than discrete dots, so their overall effect is somewhat coarse.

Recently we had an opportunity to try out a new graphics board, the ALT-256*2 Graphic Display Interface ($395 assembled and tested) from Matrox Electronic Systems, POB 56, Ahuntsic Stn., Montreal, Canada H3L 3N5 (Tel: 514-481-6838), and available through most computer stores. This S-100 bus board can display 256 lines with 256 individually addressed dots on each line, thus allowing for excellent resolution. Each dot can be made black, white, or, if three boards are used, any color. The system can work with as many as eight boards but in this case, direct manipulation of the color byte is required as explained in the manual. Access time is 3.4-μs per dot, and the entire screen can be erased with a single instruction. The board can use external sync, and can be strapped for USA or European TV standards for noninterlaced display.
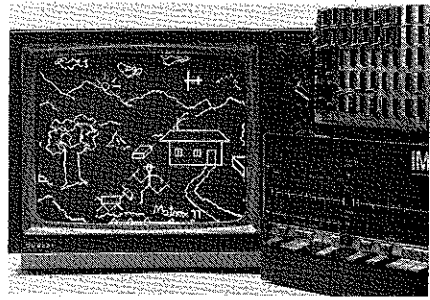
Graphics using the Matrox interface, shown at upper right.

The ALT-256*2 board contains 65k × 1 of RAM, and individual 8-bit registers for the X and Y coordinates and the data for each dot. Thus, it is easy to specify an individual dot anywhere on the screen, and determine whether that particular dot should be black or white (or color if you use extra boards). The screen can be erased black or white depending on the data sent to the input.

The software provided with the ALT-256*2 consists of a very detailed manual, and a pair of paper tapes. One tape contains the MTX GRAPH software that is configured as a series of callable subroutines while the second tape contains a demonstration program that uses the MTX GRAPH to create a continuous action graphics display. Total memory required is about 1k.

Six of the seven subroutines in the MTX GRAPH package are: INITG (initializes the system to standard defaults); PAGE (erases the entire screen); CURSOR (allows positioning the cursor at point X, Y); DOT (sets the point defined by the cursor); LINE (creates a line of dots between the current cursor position and the point X, Y); and CHAR (displays an ASCII character at the current cursor position). In the latter routine, the cursor is left at the next character position. Certain control characters are then used to select color, fixed or proportional character spacing, and dot size. The last routine is called ANIMAT, which produces a pause until the start of the next vertical blanking period, and is used in animation routines.

After plugging the ALT-256*2 into our S-100 computer, we loaded both tapes, and following the manual, started the demonstration program. Because we had only one board; and a monochrome monitor, we had no experience with color operation.

Comments on Use. The demonstration is impressive. It starts with a set of large characters on screen, followed by an interesting "lace curtain" effect that

---

INTERFACE AGE

The magazine that brings the computer home.
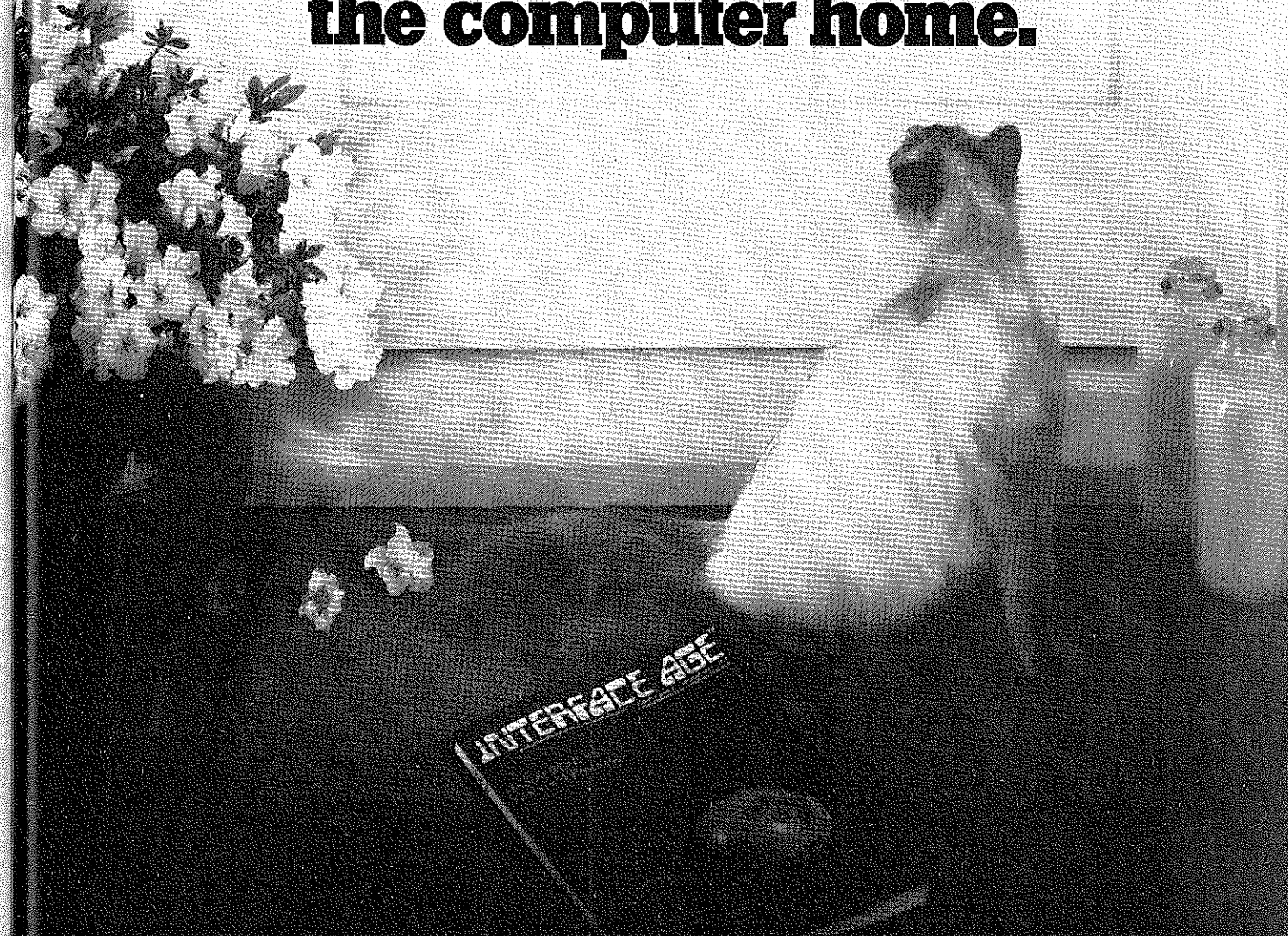
You want to learn all you can about personal computing. **Interface Age** tells it all. In simple, easy to understand language.

Each issue of **Interface Age** revolves around the latest information in the world of microcomputing. Articles, letters, new products, opinions, humor, experiments and new programs to help you choose and understand your computer and use it to full capacity.

Did you know your personal computer can –
• Help you start a business at home providing services to others.
• Increase your child's educational opportunity.
• Analyze real estate, stock market and other investments.
• Show you how to save money by computing and simplifying income tax & deduction records.
• Inventory your household items, store shopping lists and establish a recipe bank to plan daily meals.
• Control your small business with accounting and inventory control systems.

Technology has brought the computer to your world. **Interface Age** brings it home.

Order your subscription to **Interface Age** NOW with this convenient coupon. Save $7 over newsstand price.
12 Monthly Issues: $14 U.S.; $16 Canada/Mexico; $24 International. 24 Issues: $24 U.S.; $28 Canada/Mexico. 36 Issues: $36 U.S.; $42 Canada/Mexico.

Name_____

Address_____

City_____ State_____ Zip_____
          ☐ Visa Card   ☐ Master Charge

Acct. No._____ Exp. Date_____

Signature_____
Check or money order (U.S. Funds drawn on U.S. Bank)
Make checks payable to: **INTERFACE AGE MAGAZINE**
P.O. Box 1234 Dept. PE4 Cerritos, CA 90701
☐ *Please send information on issues available back to 1975.*

Put a benchtop DMM in your pocket. Only $169.
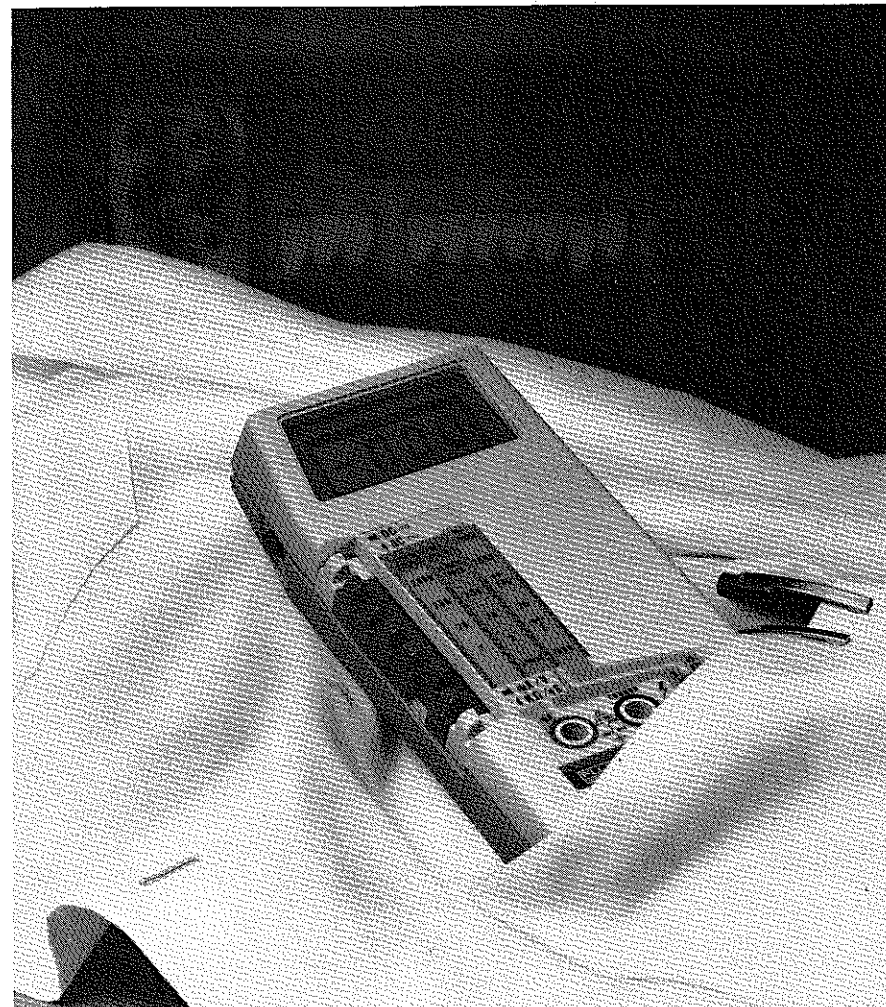
Our new 8020A digital multimeter puts typical benchtop-type measurement capability in your pocket, your briefcase or your tool kit. And it puts true Fluke value in your hand.

At only $169,* the 8020A has features you won't find on any other multimeter, at any price.

Features like 26 ranges for seven functions, including conductance that measures leakage to 10,000 MΩ. Dependable CMOS LSI single-chip innovation, custom designed for the 8020A.

It's only 13 ozs. of reliable, shock-resistant measurement perfection. All guaranteed for a full year, including specs and its NBS-traceable calibration.

Benchtop performance for $169.* And Fluke's dedication to after-sale support, with service centers located worldwide for fast, cost-effective support. A priceless combination.

Call (800) 426-0361, toll free. Give us your chargecard number and we'll put an 8020A in *your* pocket. Or, we'll tell you the location of the closest Fluke office or distributor for a personal feel for the best DMM value around. Put savings in your pocket too, and buy a "Ten-Pack" of 8020As for only $1521*, and get ten for the price of nine!

*U.S. price only.

Command Performance: Demand the Fluke 8020A.

1809-7002

|FLUKE|®

---

creeps across the screen. Suitable pauses are built-into the program so that you can study the various patterns on screen. Then follows a series of fan-like displays that illustrate line-calling routines, and some small (but very clear) alphanumerics. After a few more demonstrations of the various calling routines, a little man is made to "walk" across the screen, with swinging arms, to demonstrate the animation portion.

The manual contains a considerable amount of information and includes a complete listing of both the demonstration program and the MTX GRAPH package.

We have been playing with some 8080 machine language programs to "call" the various graphics subroutines and learn how best to use the high-resolution graphics. The results have been surprisingly good. We are also writing some BASIC programs using FILL and CALL commands to access the graphics software, also with successful results. One future project is a joystick interface for some really adventurous picture creations.

If high-resolution graphics appeals to you, drop into your local computer store and take a look at this new system from Matrox.

Z80 Things. North Star Computers, Inc., 2465 Fourth St., Berkeley, CA 94710 (Tel: 415-549-0858) has intro-
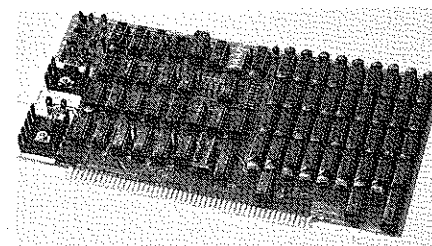
The North Star 16k RAM board for use with 8080 or Z80.

duced a couple of Z80 goodies. The first is a 4-MHz Z80 board compatible with an S-100 bus, called the ZPB. It is available for $199 in kit form or $259 fully assembled. Features include auto-jump startup, vectored interrupts, operation with or without front panel, and space for 1k of 2708 EPROM. The EPROM option is $49 for the kit and $69 assembled.

The other Z80 device is a 16k RAM board (S-100) for use with either 8080 or Z80 and will operate at full speed (no wait states) at 4 MHz. The RAM's are 200 ns, and on-board refresh is provided. Bank switching capability is provided

---

and board addressing is switch-selectable in two 8k sections. An important feature is the availability of a parity check option. The 16k board is $399 in kit form, and $459 fully assembled. The parity option is $39 kit and $59 assembled.

PROMing. Oliver Audio Engineering, Inc., 676 West Wilson Ave., Glendale, CA 91203 (Tel: 213-240-0080), which brought us the first low-cost paper-tape reader, now introduces its PP-2708/16 PROM programmer ($249 as a kit, $295 assembled and tested). The new programmer plugs directly into any 2708 or TMS-2716 socket, and the PROM to be programmed is mounted in its zero-insertion-force socket. The data is dumped over the eight lower address lines using the OAE interface. No additional power supplies are required and all timing and control sequences are au-
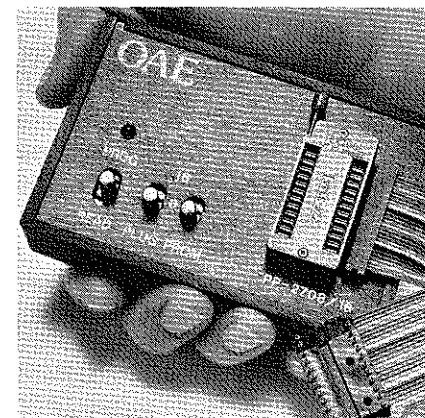
The OAE PP-2708/16 PROM programmer plugs into any 2708 or TMS-2716 socket.

tomatically handled by the programmer. Because of this simplicity, only a short software routine is required. A five-foot flat ribbon cable interconnects the programmer with the PROM socket.
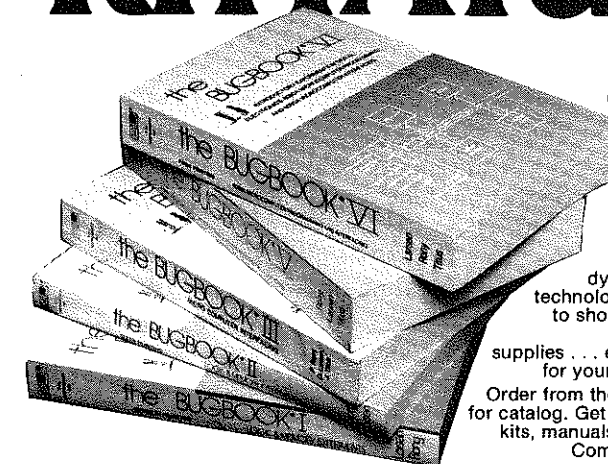
Bus Stop. If you have an Altair/S-100 bus system, or are planning to get one, there are a couple of new motherboards of which you should be aware. The first is from Vector Electronic Co., Inc., 12460, Gladstone Ave., Sylmar, CA 91342 (Tel: 213-365-9661). Their Model 8803 costing $29.95 accommodates 11 plug-in boards, and can have passive or active bus termination. One slot position may be used to interface the motherboard for system expansion. Twelve tantalum capacitors are included to suppress transients on the various power supply lines. Ground and +5-volt traces are rated at 10 amperes while the ±12-volt busses are rated at 7 amperes.

The second S-100 bus motherboard is from Thinker-Toys, 1201 10th St., Berkeley, CA 94710 (Tel: 415-527-7548) and costs $76. Called the Wunderbuss, this new motherboard features full shielding of the signal paths, and active termination of all data lines. Signal isolation is achieved by a cross-coupled system of ground lines interlaced between signal lines. The motherboard with 10 edge connectors is available for $120, and with 20 edge connectors the price is $154.

PROM/RAM Board. Now available from Vector Graphic, Inc., 790 Hampshire Road, Westlake Village, CA 91361 (Tel: 805-497-6853) is a new S-100 board that occupies two independently addressable 8k blocks, has 1k of RAM on board, and a capacity of up to 12k of 2708 EPROM's. Complete addressing flexibility is provided, and video or disk-operating system boards can be nested in the 3k of unused space. MWRITE logic and jump-on-reset allow operation without a front panel. A 24-command

Whatever you're looking for
you'll find it with a price/performance

in the way of electronics...
## advantage in the new Heathkit Catalog!
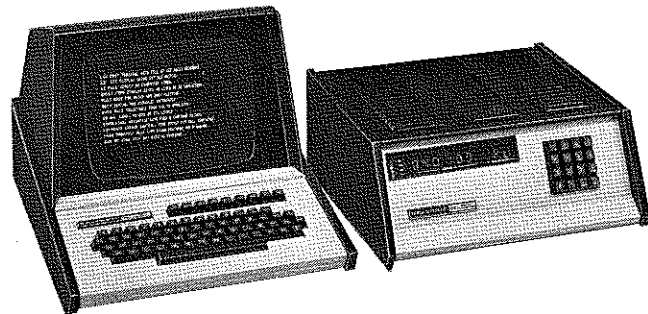
Put Computer versatility and convenience in your home with the H8 Personal Computer System

Get into personal computing the right way with a powerful computer system from Heath. Start with the H8. It features 8-bit operation, fully expandable memory, a versatile 8080A CPU, and is the only machine in its price class that, due to its "intelligent" front panel and built in monitor program, can function without peripherals.

Next, add our 12" CRT video terminal. The H9 operates in three different modes, has a 67-key ASCII keyboard, and features a built in interfacing board to make hook-up a breeze.

Add "mass storage" with the ECP-3801 cassette recorder/player and cassette I/O and you've got a system that's ready to go wherever your programming skills take you.
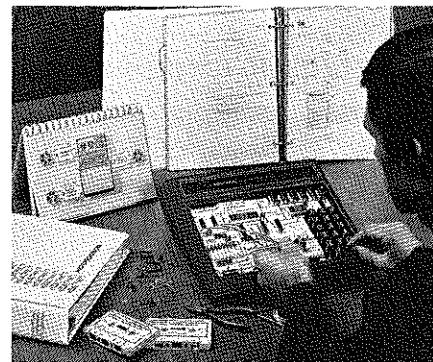
Our low-cost, effective Microprocessor Course teaches you all about Computers

Using our challenging self-instruction techniques and the optional ET-3400 Trainer, the EE-3401 Microprocessor Course takes you step-by-step through hardware, I/O interfacing, machine language programming, number systems, microprocessor operation, and much more. You'll complete experiments, gain hands-on experience and work directly with the devices that are "taking over" in today's electronics.

Weigh yourself with electronic precision with our Digital Electronic "Weighing Machine"

Uses solid-state electronics and a strain-gauge transducer element like expensive laboratory scales. The GD-1186 features 300-lb. capacity, can be wired to give weight in pounds or kilograms, and has a bright, easy-to-read 4-digit LED display. It's battery operated so it's safe to use even after a shower. And for extra convenience, the GD-1186 comes with additional cable so you can mount the read-out most anywhere you desire.
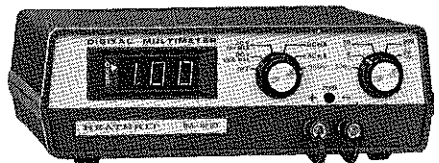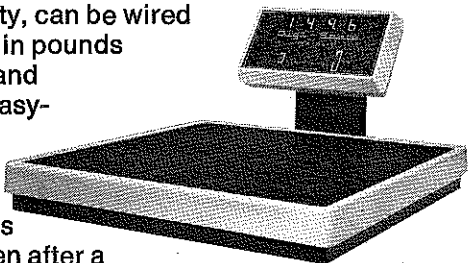
This Low-cost Multimeter gives you digital accuracy at analog prices

The IM-1210 is an economical performer that hobbyists and service techs have been waiting for. Capabilities include AC voltage measurement to 700 volts, DC to 1000 volts, current measurement, and 5-ranges for resistance checks. Accuracy is excellent and the bright digital display gives you readings at a glance.
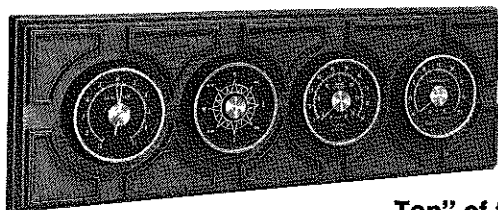
Stay "On Top" of the Weather with this Five-function Weather Station

The ID-1290 Weather Station monitors indoor and outdoor temperatures, barometeric pressure, wind speed and direction — all with electronic accuracy and reliability. Ideal for home or office or anywhere accurate, instant weather information is needed.
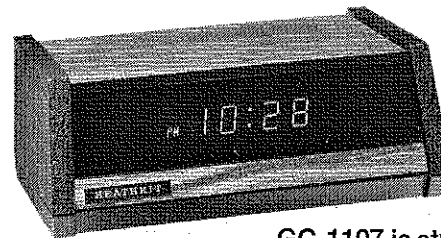
Smartly-styled Low-Cost Digital Alarm Clock

Unobtrusive and elegant, the GC-1107 is styled in handsome wood grained vinyl, and features an easy-to-read 4-digit blue-green display, 12 or 24 hour format, and automatic dimming to adjust for ambient light conditions. Its "snooze" feature lets you take 9-minute "catnaps" for as long as an hour. And for extra convenience — there's even a handy power failure indicator. A perfect kit for the beginner.

This SSB/CW Receiver is the one the Hams are enthused about!
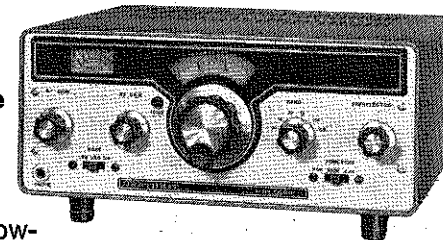
An excellent, low-cost choice for your first receiver is the HR-1680. With it you'll find total solid-state construction, no-instrument alignment, and a sensitivity figure of less than 0.5 μV. It covers 80, 40, 20, 15 and the lower 1 MHz of 10 meters. And with a MOSFET "front end" and preselector tuning — you'll be digging out the "rare" ones in no time!

Send the coupon or visit the Heathkit Electronic Center nearest you today!

Our AR-1515 Stereo Receiver sets new standards in performance, price and features

Undoubtedly the finest AM/FM stereo receiver we've ever designed, the AR-1515 combines distinctive functional styling with excellent tuner performance, and a clean, powerful, amplifier section to give you a home entertainment center of unsurpassed quality. Power output is 70 watts, minimum RMS, per channel into 8 ohms with less than 0.08% total harmonic distortion from 20-20,000 Hz. FM sensitivity is an outstanding 1.8 μV for really clean and clear reception. And the AR-1515 is the only stereo receiver in its price range that provides digital frequency readout!

PROM monitor is available to interface with most I/O boards. Price is $135 in kit form, $175 assembled.

Print an Apple. If you have an Apple II computer, then you should be aware that Microproducts, 1024 17th St, Hermosa Beach, CA 90265 (Tel: 213-374-1673), has introduced its PCB that interfaces the Apple II with the SWTP PR-40 Printer. The board, at $49.95 assembled, plugs into the Apple II and comes with an interconnecting ca-

ble. A cassette with operating software is also provided. The printer prints one line at a time when the return key is depressed. The printer subroutine can also be called in a BASIC program for usual printing.

New I/O Port. Since getting stuff into and out of a computer is somewhat of a necessity, and since most hobbyists now use more than one I/O device, multi-porting is becoming very important. Dajen Electronics, 7214 Springleaf Ct.,
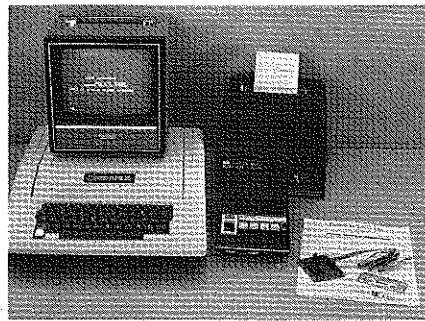
A Microproducts board interfaces an Apple II with an SWTP PR-40.

Citrus Heights, CA 95610 (Tel: 916-723-1050) has one answer in their System Central Interface (SCI) board selling for $285 in kit form and $345 assembled and tested. This S-100 bus board provides a serial port with RS-232 and 20/60-mA current loops; baud rates from 45 to 9600; three independent 8-bit parallel ports that can be programmed bitwise for input and latched output; biphase (Tarbell) cassette port; onboard relays for control of two recorders; and three status lines to control an automatic tape deck. Also included are 256 bytes of RAM for stack and buffer storage; a 2708 programmer; space for three 2708's; and 2k system monitor program, having 18 commands. All IC's are socketed, and the board will work with 4-MHz Z80 systems. All output connectors, cable and plugs for recorder are provided.

1802 Items. Netronics, 333 Litchfield Rd., New Milford, CT 06776 (Tel: 203-354-9375), the source for the Elf-II, has announced a 4k RAM board for the Elf-II bus at $89.95 plus $3 postage/handling. Using 2102's and requiring 500-mA from the 5-volt line, the memory is buffered and decoded with page selection in 4k blocks anywhere in memory. There is an on-board regulator and three-state outputs. The board will preserve the 256 bytes of the original.

This same firm also has an Elf-II prototype board ($17 plus $1 postage/handling) that has room for 32 IC's in a mix of 14, 16, 20, 22, 24, or 40 pins. Wire-wrap or solder pencil connections can be used. Like the memory board, this board has gold-plated Elf-II bus connector fingers, and has provisions for a 5-volt regulator.

The third item announced by Netronics is an outboard Elf-II power supply that provides ±8 volts at 5 amperes, unregulated, and ±16 volts at 1 ampere, also unregulated. Price is $34.95 plus $3 for postage and handling. ◇

files and label-printing, schedules and lists, among others. The System will run on any BASIC with statements for DATA, DIM, GO-SUB, GOTO, INPUT, LET, PRINT, READ, REM and string variable with MIDS; this includes most 8k and some 5k BASICS. The system is available in book form, with complete source listing and applications printout, for $14.95. Write: Microware Div., Physical Biological Sciences Ltd., Box 47, Blacksburg, VA 24060.

8080 Software Contest. College and university students and faculty are eligible to enter a software contest announced by Intel's Insite program library. Entries must be written in Intel assembly language or PL/M and must include a source listing and test program to assure program validity, and a source paper tape or diskette. More than $28,000 worth of microcomputer development equipment, plus numerous $100 memberships in the Intel User's Library, will be awarded to colleges and

universities submitting the best programs by June 30, 1978. Monthly winners will receive Intel PROMPT 48 or PROMPT 80/85 microcomputer design aid systems. The grand prize will be an Intellec 888 Microcomputer Development Center, including 64k RAM, dual-drive one-megabyte diskette system, CRT console, and software. Programs will be judged for their originality, documentation, creativity and applicability to microprocessors. Both individuals and teams may enter. For entry forms and details, write: Insite Library Contest, Intel Corp., Microcomputer Div., 3065 Bowers Ave., Santa Clara, CA 95051.

8080/Z80 Cassette Operating System. The ZAPS Cassette Operating System includes a Z80 assembler, text editor, in-memory file system, labelled cassette tape storage system and other utilities. Runs in 14k of memory, including buffers and 1k for symbol table, on most 8080 and Z80 systems. The assembler processes the Zilog mnemon-

Software Sources

Basic Data Base Management System. People's Data Base System is a BASIC program for use in a variety of applications including word-processing, accounting, software development, mailing-list

---

---

ics, with a wide variety of pseudo-operands available. The system can accept numerical values in hex, octal, decimal or binary. A 90-page user manual includes I/O modification instructions. On Tarbell, Digital Group or TDL cassette, $60 from computer stores or write to Algorithmics, Box 56, Newton Upper Falls, MA 02164.

High-Level Language for 6502.
FCL65E, a high-level language similar to DEC's FOCAL, is available for 6502-based microcomputer systems. The 6.5k program offers 8-to-9-digit accuracy, 8-level priority interrupt handling, string variables and functions. Commands include Ask, Comment, Continue, Do, Erase, For, Go, If, Modify, On, Quit, Return, Set, Type and Write, plus several commands called by symbols. The interpreter permits editing, corrections of current line, debugging and error detection, plus functions for absolute value, integer, integer rounding, random number, I/O device functions, ASCII/decimal and decimal/ASCII conversions, terminal echo suppression, memory examine and deposit, user subroutines, string comparisons, and others. FCL65E is available for TIM- and KIM-based systems. All system-specific I/O calls are located in a zero page block for easy modifica-

tion to other 6502 systems. A complete listing is $35, a mini-manual is $6 and a 104-page user's manual is $12. Hex or binary paper tape or hex dump is available for $17. The program is also available on KIM cassettes in Hypertape (6X speed) format at $19. At regular speed, KIM cassettes are $23.50, and 3X-speed cassettes are $20.25. Write: The 6502 Program Exchange, 2910 Moana Ln., Reno, NV 89509.

6800 Text Editing & Processing Systems.
The editing system is line- and content-oriented for easier assembly-language program development and document preparation. Edit directives include Append, Change, Copy, Move, Delete, Insert, Overlay, Print, and Replace—plus pointer-addressing and string searches. Other commands display output-format and up to 20 tab-stop settings, and display or suppress line numbers. Renumbering is also available, as are paper-tape or cassette save, write, read and gap (null string) commands. The Text Processing System, a companion program, is used to format edited files for printing or display. Options include paging, titling, page numbering, paragraphing, spacing and right-margin justification. The 6800 Text Editing System is $23.50; the Text Processing System (which can also

be used independently) is $32, with both in complete manual form with source listing. KC-standard cassettes are $6.95 each, for either program. Write: Technical System Consultants, Inc., Box 2574, W. Lafayette, IN 47906.

PDP-8 Simulator for 8080.
The Simul8tor permits 8080 computers to run PDP-8 programs, which are widely and inexpensively available. (However, speed limitations may preclude the use of such programs as PDP-8 BASIC and FOCAL, and the availability of DP-8 software on paper tape rather than cassette may be intolerable to some users.) Simul8tor is available on Intel-format paper tape or Tarbell cassette for $20. Write: The Amide Corp., Box 600, Sag Harbor, NY 11963.

6800 Disassembler.
Available in punched paper tape (MIKBUG format) with assembly listing, object code and instructions, this program will print an assembly listing of the object code of any program stored in memory. It operates in less than 1.8k bytes, beginning at 0800 hex (2k decimal). $12.95. Write: Software Exchange, 2681 Peterboro, W. Bloomfield, MI 48033.

Popular Electronics
Reprint series

Many important articles covering a variety of interests in the broad field of electronics are published in POPULAR ELECTRONICS. Reprints of selected articles and test reports are now available in the event that you missed some you would like to have for reference or study purposes—or for projects you wish to build. Reprints in this series are only $1 each (*75¢ for those marked with an asterisk.) Minimum order is $2.

SPECIAL ARTICLES

AUDIO
1. How The New FTC Hi-Fi Rules Affect You
2. How To Evaluate Tape Recording Specs
3. A New Standard For FM Tuner Measurements

COMPUTER
7. How To Select A Microcomputer
8. Ins & Outs Of Computers For Beginners
COSMAC "ELF" SERIES (Reprint #'s 4, 5, 6, & 17)
4. Low Cost Experimenter's Microcomputer
5. Experimenter's Microcomputer/With Hardware Improvements & More Programming Details
6. Microcomputer/How To Expand Memory, Plus More Programs
17. Build The Pixie Graphic Display

CB RADIO
9. CB Specifications Made Easy
10. How To Choose CB Base Station Antennas

OTHER
14. How To Design Your Own Power Supplies
15. The Care & Feeding Of NiCd Batteries
16. Build A Gas & Fume Detector
LEARNING ELECTRONIC THEORY WITH CALCULATORS SERIES (Reprint #'s 11, 12, & 13)
11. Basic Equations and OHM's Law
12. Reactance, Time Constants And AC Calculations
13. RC Coupling, Basic Amplifier Calculations, and RLC Relationship

TEST REPORTS

AUDIO
18. ADC Accutrac 4000 Record Player
19.*Empire Model 698 Manual Turntable
20. Kenwood Model 600 Integrated Stereo Amplifier
21.*MXR Stereo Graphic Equalizer

22.*Nakamichi Model 500 Stereo Cassette Deck
23. Onkyo Model TX-4500 AM/Stereo FM Receiver
24.*Ortofon MC20 Moving Coil Phono Cartridge
25.*Pickering Model XV-15/625E Stereo Phono Cartridge
26. Pioneer Model CT-F8282 Stereo Cassette Deck
27. Radio Shack "Realistic" Model STA-2000 AM/Stereo FM Receiver
28. Rotel RX-7707 AM/Stereo FM Receiver
29. Sansui Model TU-9900 AM/Stereo FM Tuner
30.*Shure Model M24H Stereo Phono Cartridge
31.*Sony Model TA-4650 V-FET Stereo Power Amplifier
32.*Spectro Acoustics Model 210 Stereo Graphic Equalizer
33.*Stanton Model 681EEE Stereo Phono Cartridge
34. Teac Model PC-10 Portable Stereo Cassette Deck
35.*Technics Model SB-6000A Linear Phase Speaker System
36.*Thorens Model TD-126C Record Player

COMMUNICATIONS
37.*Cobra Model 29XLR 40-Ch. AM CB Mobile Transceiver
38.*Drake Model SSR-1 AM/SSB Communications Receiver
39.*Kenwood Model TS-820 Amateur Radio Transceiver
40.*Kris Model XL-50 40-Ch. AM CB Mobile Transceiver
41.*President Model "Washington" 40-Ch. AM/SSB CB Base Station
42. Yaesu Model FRG-7 AM/SSB Communications Receiver

TEST INSTRUMENTS
43.*B&K-Precision Model 280 Digital Multimeter
44.*B&K-Precision Model 1471B Dual-Trace Scope
45.*Ballantine Model 1010A Dual-Trace Scope
46.*Fluke Model 8020A Digital Multimeter
47.*Hewlett-Packard Model 280 Digital Multimeter
48.*Sencore Model DVM-32 Digital Multimeter
49.*Sencore Model TF-70 Portable Transistor Tester
50.*Triplet Model 60 Analog Multimeter

*REPRINTS MARKED WITH ASTERISK 75¢; ALL OTHERS $1.00. MINIMUM ORDER $2.00.