

10th Anniversary Issue

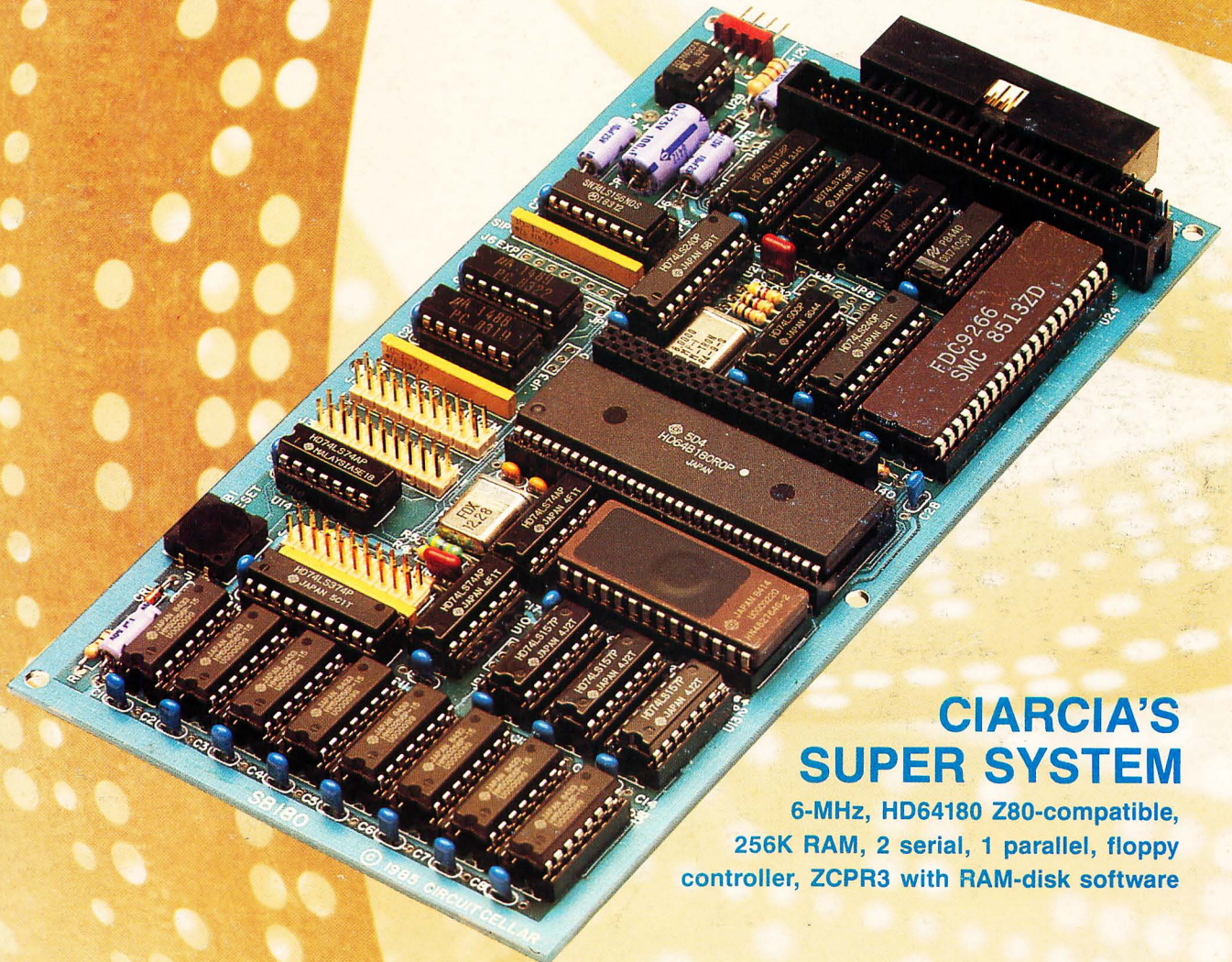
BYTE

THE SMALL SYSTEMS JOURNAL

SEPTEMBER 1985 VOL. 10, NO. 9

\$3.50 IN UNITED STATES
\$4.25 IN CANADA / £2.10 IN U.K.
A MCGRAW-HILL PUBLICATION
0360-5280

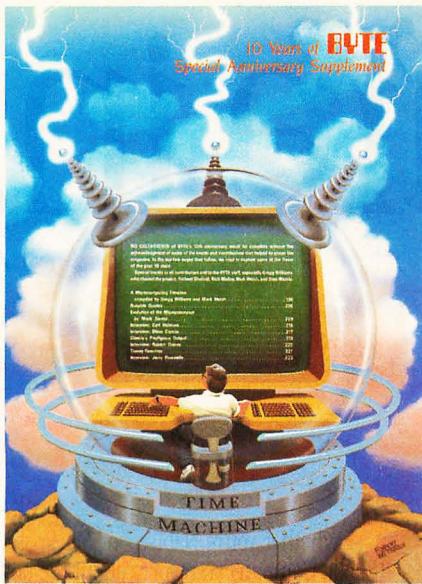
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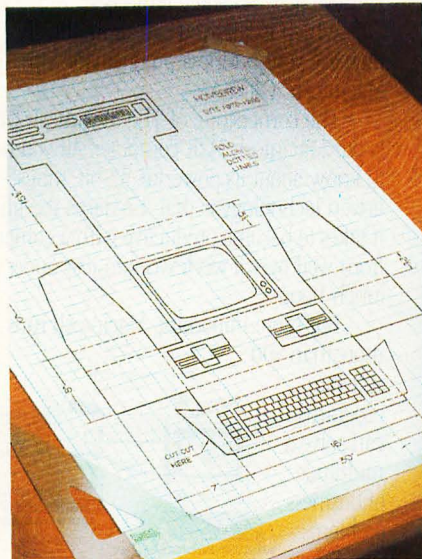
CIARCIA'S SUPER SYSTEM

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256K RAM, 2 serial, 1 parallel, floppy
controller, ZCPR3 with RAM-disk software

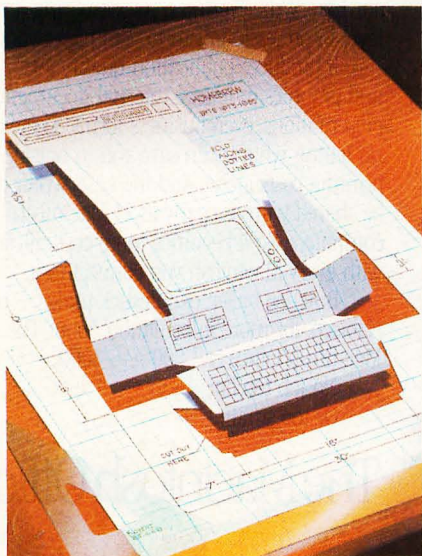
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BYTE (ISSN 0360-5280) is published monthly with one extra issue per year by McGraw-Hill Inc. Founder James H. McGraw (1860-1948). Executive, editorial circulation and advertising offices: 70 Main St., Peterborough, NH 03458, phone (603) 924-9281. Office hours: Mon-Thur 8:30 AM - 4:30 PM, Friday 8:30 AM - 1:00 PM, Eastern Time. Address subscriptions to BYTE Subscriptions, POB 590, Martinsville, NJ 08836. Postmaster: send address changes. USPS Form 3579, undeliverable copies, and fulfillment questions to BYTE Subscriptions, POB 596, Martinsville, NJ 08836. Second-class postage paid at Peterborough, NH 03458 and additional mailing offices. Postage paid at Winnipeg, Manitoba, Registration number 9321. Subscriptions are \$21 for one year, \$38 for two years, and \$55 for three years in the USA and its possessions. In Canada and Mexico, \$23 for one year, \$42 for two years, \$61 for three years. \$69 for one year air delivery to Europe, 17,100 yen for one year surface delivery to Japan. \$37 surface delivery elsewhere. Air delivery to selected areas at additional rates upon request. Single copy price is \$3.90 in the USA and its possessions, \$3.95 in Canada and Mexico, \$4.90 in Europe, and \$5 elsewhere. Foreign subscriptions and sales should be remitted in United States funds drawn on a U.S. bank. Please allow six to eight weeks for delivery of first issue. Printed in the United States of America.

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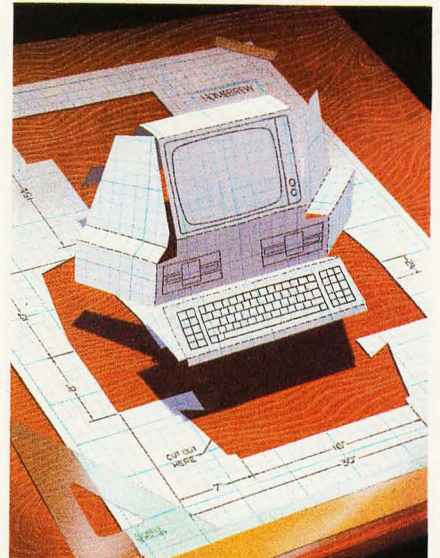
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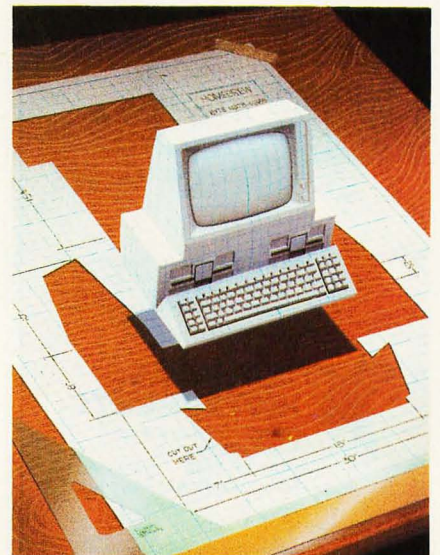
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PICTURED ON THE COVER IS THE NEW SB180 SINGLE-BOARD COMPUTER FROM CIARCIA'S CIRCUIT CELLAR. AS WITH ALL CIRCUIT CELLAR PROJECTS, THIS PRINTED-CIRCUIT BOARD WAS DESIGNED BY CUSTOM PHOTO AND DESIGN OF WALLINGFORD, CONNECTICUT. THE BOARD WAS MANUFACTURED BY TECH CIRCUITS, ALSO OF WALLINGFORD. STEVE CIARCIA WOULD LIKE TO EXTEND SPECIAL THANKS TO GREG PETERSON, PHIL WALTON, AND RAY LONG FOR THEIR FAST TURNAROUND ON THIS PROJECT TO MEET PUBLICATION DEADLINES.



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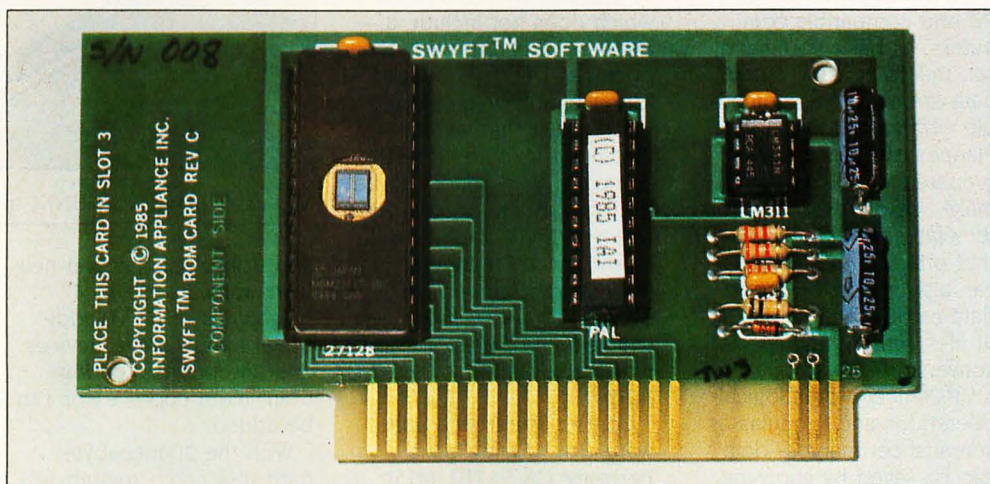
FIRST LOOK

Application Environment for Apple IIe

The SwiftCard from Information Appliance Inc. is a text-oriented data-handling product based in ROM that comes as an add-in card for the Apple IIe. The brainchild of Jef Raskin, former head of the Apple Macintosh development team, the card offers word-processing, information-retrieval, program-development, calculation, and telecommunications capabilities in an integrated package.

The SwiftCard environment is designed for speed. Because the program resides in firmware, there is no need to access a disk for program information. All data manipulation occurs in memory, roughly 40K bytes on a 64K-byte Apple IIe. The SwiftCard uses a disk format that equates one disk to that 40K-byte figure; this wastes some disk capacity, but the only times the program really has to use the disk drive are at the beginning of a work session (retrieving data) and at the end (saving it).

The program is available directly from the card's firmware when you turn on the computer. Since the SwiftCard serves as its own operating system, you need a single disk only to store data. Thus you can use the card with a minimal hardware setup: an 80-column 64K-byte Apple IIe, a monochrome monitor, and one disk drive. The SwiftCard does not interfere with other



The SwiftCard add-in for Apple IIe computers.

Apple software; if you place a program disk in the drive, one keystroke removes the SwiftCard system and loads the new program.

The environment is essentially a continuous scroll of text divided only by page breaks. You enter data as with any word processor, and the SwiftCard provides all standard word-processing functions. There are no files as such; if you wish to print a section of the scroll, you mark the top and bottom of the region and send the block to the printer. Formatting for printing is automatic, although you can change parameters when you want. Rapid movement through the text scroll is provided by a search algorithm that takes advantage of a peculiarity of the Apple IIe keyboard—two keys with apple symbols on either side of the space bar. Depressing one of those keys initiates a search for the next letter or combination of letters entered; you can abort the search by typing a

short string of gibberish. The right key searches forward; the left one moves backward.

The SwiftCard interfaces smoothly to the IIe's AppleSoft BASIC interpreter. You enter programs as raw text. You highlight the program text as you would for any word-processing block operation, press one command key, and the program executes. BASIC can also be used as a shortcut for some text manipulations. For example, you can store boilerplate phrases or paragraphs as string variables. Typing the variable name, marking it, and executing it recalls the stored text; retyping or complex copying operations are replaced by a few keystrokes. You follow similar mark-and-execute procedures for calculating numeric expressions in text and for setting printer and tele-

communications parameters.

You do the same to dial the modem. Once you are connected, the text of your on-line session is incorporated into the scroll. If the modem is set to auto-answer, the SwiftCard will act as a rudimentary bulletin board—it will accept an incoming text stream. If you are at the keyboard, the card stores the message without interrupting your work.

Priced at \$89.95, the SwiftCard package contains the card itself, self-adhesive labels for the nine command keys, a manual, a schematic diagram and theory of operation, a tutorial disk, and a utility to convert SwiftCard files to Apple ProDOS format.

Contact Information Appliance Inc., 530 University Ave., Palo Alto, CA 94301, (415) 328-5160.

—Ezra Shapiro

Inquiry 600.

(continued)

**Spreadsheet Bridges
1-2-3, dBASE**

VP-Planner from Paperback Software is an integrated spreadsheet/database manager for the IBM PC and compatible computers. Its basic command set, macro capability, and data structure are compatible with Lotus 1-2-3; VP-Planner can process files prepared with 1-2-3 and make use of spreadsheet templates developed for that program. VP-Planner can also import or export data as dBASE II or dBASE III files without any special conversion.

VP-Planner stores logical operations and formulas as spreadsheet macros—data can be saved by choosing the most efficient format. The program uses sparse matrix technology to optimize memory use (empty cells or data fields are essentially ignored; only active cells require full space in memory).

VP-Planner can organize data and logic from either database or spreadsheet files (or a combination) into what is called a multidimensional database. Up to five dimensions are supported. The spreadsheet acts as a window into two dimensions of the five. Thus, VP-Planner can perform complex sorts based on multiple criteria and can construct fully relational database joins.

The primary user interface is that of a spreadsheet. However, the grid can be used for entering, viewing, and editing database information (either multidimensional or dBASE) in a table format.

Written in FORTH, VP-Planner also features automatic recognition and use of 8087 and 80287 math coprocessors, a "learn" func-

tion that records keystrokes into macros, background printing of worksheets, zero-width columns, and password protection of databases.

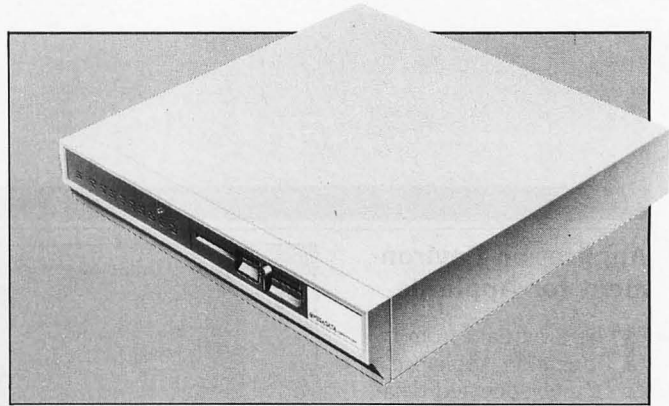
Suggested retail price for VP-Planner will be \$99.95, which does not include a graphics print program. No price has been announced for VP-Graphics, a companion product that will answer that need. According to the company, VP-Planner will be available in late September; release of VP-Graphics will follow shortly thereafter. [Editor's note: This item was based on prerelease software and preliminary documentation. Final product specifications are subject to change.]

Contact Paperback Software, 2612 Eighth St., Berkeley, CA 94710, (415) 644-2116. Inquiry **601**.

**Corvus Cheetah
Uses 68010**

Corvus Systems' Cheetah workstation uses a 10-MHz Motorola 68010 processor and includes a 15-inch monitor with a resolution of 800 by 620 pixels and a 1-to-1 aspect ratio. Designed for computer-aided design, engineering, and electronic publishing applications, the Cheetah also features a 20-megabyte hard-disk drive, one 640K-byte floppy-disk drive, 1 megabyte of RAM, four RS-232C ports, one RS-422 port, and an Omninet local-area network port.

Standard software includes the UNIX System V operating system, a C compiler, a window display manager,



Megadata's Model Seven UNIX system.

and Corvus Connection network software. Up to 4 megabytes of RAM, additional mass-storage devices, and an optional floating-point math coprocessor can be added.

With the 20-megabyte hard disk and 1 megabyte of RAM, the Cheetah is priced at \$9995. For additional information, contact Corvus Systems Inc., 2100 Corvus Dr., San Jose, CA 95124, (408) 559-7000. Inquiry **602**.

**8300 Model Seven
UNIX Processor**

Megadata's 8300 Model Seven uses the 68000 16-/32-bit microprocessor. The basic system features UNIX System V, 1 megabyte of RAM, a 26-megabyte Winchester disk, a 1-megabyte floppy-disk drive, and two RS-232C ports. This desktop computer is transportable.

An expansion board provides eight RS-232C ports and an additional 512K bytes or 1 megabyte of RAM for a maximum of 2 megabytes of system memory and eight users. Other options include increased disk capacity and streaming-tape backup.

The Model Seven sells for \$4399. The expansion board

adds from \$650 to \$990 to the basic system price, depending on amount of memory. Contact Megadata Corp., 35 Orville Dr., Bohemia, NY 11716, (516) 589-6800. Inquiry **603**.

HP Disks

Hewlett-Packard has introduced 10- and 20-megabyte hard-disk subsystems and a ¼-inch streaming-tape backup designed for IBM microcomputers and close compatibles as well as HP's own personal computers.

The HP 9154A 10-megabyte hard-disk drive stands 4½ inches high, runs 3½-inch platters, and has an average access time of 75 milliseconds. In addition, the drive has been modified to withstand shock and vibration, head and bearing assemblies have been redesigned, and the platter has been coated with a layer of sputtered carbon for added surface protection and lubrication. The HP 9134H 20-megabyte hard-disk drive stands 5½ inches high, runs 5¼-inch platters, and has an average access time of 85 milliseconds.

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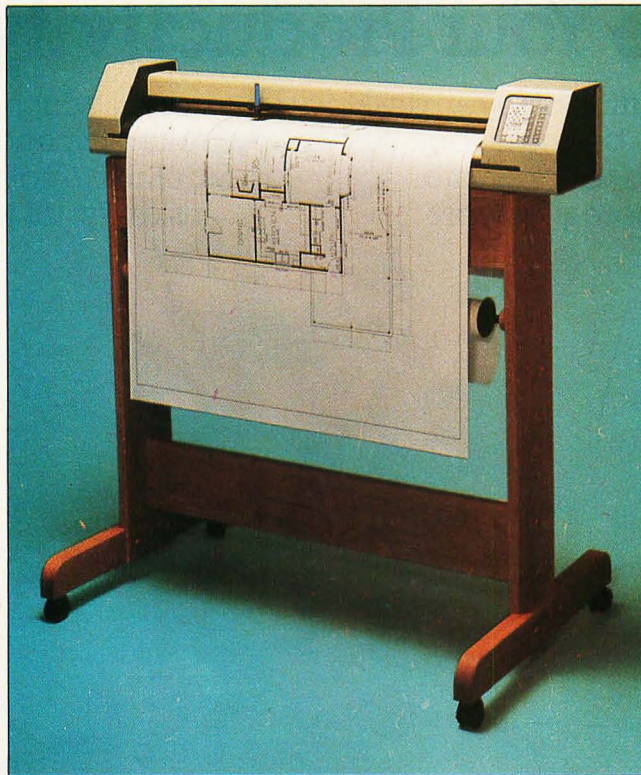
The HP 9142A ¼-inch streaming-tape backup uses standard 15- and 60-megabyte cartridges, storing 2 megabytes of data per minute. The 15-megabyte cartridge has an average access time of 15 seconds; the 60-megabyte cartridge averages 45 seconds.

The PC/T format (Personal Computer/Tape, a registered trademark of Tallgrass Technologies Corporation) that HP has chosen is compatible with PC-DOS 2.0, 2.1, and 3.0, and MS-DOS 2.11. This lets you address files on tape with DOS commands. It also means that the backup unit can emulate a hard disk. In fact, you can boot DOS from the tape. Other PC/T features include selective backup and restore, off-line tape formatting, a media monitor that counts the number of times the tape is used, and the ability to partition a cartridge into one, two, or four volumes, each accessible by its own directory.

The drives can be hooked up to IBM personal computers and close compatibles via the HP 88500A interface kit. The kit includes a short-slot card, cables, and disk-utility software that can support up to seven hard disks and one tape backup.

The HP 9154A 10-megabyte drive is priced at \$1690, the 9134H 20-megabyte drive is \$2390, and the 9142A cartridge-tape backup is \$1690. The 88500A interface kit is \$199. Contact Inquiries Manager, Hewlett-Packard Co., 1820 Embarcadero Rd., Palo Alto, CA 94303 or your local Hewlett-Packard dealer.

Inquiry 604.



The LP3700 large-format plotter.

Large-Format Plotter for Micros

IOLine Corporation's LP3700 Plotter, a large-format \$4995 plotter, has twin RS-232C ports that let you use it in most micro-computer-based CAD/CAE environments. It can draw on any size media, continuously adjustable to full-size "E" (i.e., 36- by 48-inch) drawings.

Axial plotting is performed at 10 inches per second; diagonal plotting speed is 14 inches per second (maximum). Addressable resolution is 0.001 inch, 0.0025 inch, 0.1 mm, and 0.005 inch; mechanical resolution is 0.0025 inch. Repeatability is 0.0025 inch, or, with a pen change, 0.010 inch. The LP3700's buffer can accommodate 14,000 bytes (i.e., approximately 1500 vectors).

Operator controls include eight pen-move directions,

selectable pen-move rates, chart-hold actuation, pen speed, chart size, and plot limits. Among the keyboard indicators are diagnostic test codes, plot out of limits, command error, and viewing/pause.

The LP3700's ASCII character set is resident within the plotter. Its parameters are 8 bits, no parity, and 2 stop bits at 300 to 9600 bps. Since the LP3700 emulates Houston Instrument's DMPL, it can be used with a wide variety of available software. It can use both cut-sheet and roll-stock paper, vellum, matte polyester, mylar, or acetate film. The LP3700 can use such pens as Hewlett-Packard-compatible liquid inks, disposable fiber-tip pens, or roller balls. You can obtain custom pen adapters.

Oak and metal plotter stands are available. Contact IOLine Corp., Suite D1, 19417 36th Ave. W, Lynnwood, WA 98036, (206) 775-7861. Inquiry 605.

LISP Interpreter and Compiler

Levien Instrument Company has introduced a LISP interpreter, BYSO LISP 1.17, and a LISP compiler, BYSO LISP 2.17. The interpreter uses lexical binding, and the compiler supports both lexical and dynamic binding. All the features of version 1.17 are supported by 2.17.

BYSO LISP 1.17 features a full-screen editor, a structure editor that displays programs in graphics format, and six prettyprinting styles. Among its file- and library-management capabilities are open, close, define and save a library, read and write random-access files, read and write sequential characters, atoms, lists, and strings.

Data types include integers, multidimensional arrays, structures, and oblist. Such list-manipulation conventions as car, append, map functions, intersect, and remove are standard. Some of the control structures are cond, if, or, prog, return, let*, and apply.

BYSO LISP is compatible with LISP 1.5, MacLISP, and Common LISP. It's designed for the IBM PC and true work-alikes equipped with 256K bytes of memory.

BYSO LISP 1.17 is \$150. Version 2.17 is \$395. An upgrade for 1.17 is offered. Shipping and handling is \$5 within the U.S. and \$15 overseas. Contact Levien Instrument Co., Sittlington Hill, Box 31, McDowell, VA 24458.

Inquiry 606.

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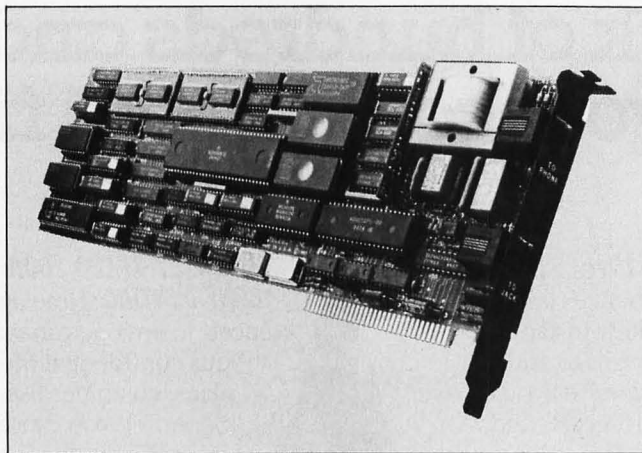
Modem Adapts to Phone Quality

Digital Communications Associates (DCA) and Telebit recently announced Irma's Fastlink, an intelligent, high-speed, packetized modem that transmits and receives data over ordinary dial-up phone lines at up to 10,000 bps. Telebit of Cupertino, CA, developed the patented technology for high-speed, error-free data communications using the concepts of packet switching, dynamic multicarrier modulation, and digital signal processing. DCA, an Alpharetta, GA, company that produces the Irma line of micro-to-mainframe communications devices, is marketing and distributing the modem; Telebit is manufacturing it.

The modem is available in two versions. As a plug-in board for the IBM PC, XT, AT, and compatibles, it costs \$1995 and comes with Crosstalk-Fast from Microstuf. A stand-alone model is priced at \$2395; Crosstalk-Fast is optional.

Both versions provide asynchronous, dial-up connection; automatic error detection and correction; automatic speed selection at time of connection; 300-bps and 1200-bps full-duplex modes for Bell 103 and 212A compatibility; real-time line analysis and adaptation; Adaptive Duplex for maximized throughput; self-test; call progress monitoring and reporting; auto-dial and auto-answer; and a superset of the Hayes command language.

When a Fastlink modem calls a standard 300- or 1200-bps modem, it adjusts to that speed and behaves as a like device. However, Telebit's Packetized Ensemble Protocol (PEP) allows two Fastlink modems (or other PEP devices) to com-



The Fastlink plug-in board for the IBM PC and compatibles.



The stand-alone version of the Fastlink modem.

municate at speeds of 10,000 bps. When one Fastlink calls another, it analyzes phone-line quality to determine the maximum transmission speed.

Fastlink works with a maximum of 512 carriers (every 8 Hz from 8 to 4000 Hz). The phone-line analysis tells which of those carriers is useful at any given time. Three modulation schemes are used to encode data. The lowest density is for low-quality carriers, and the highest density is for carriers with a high signal-to-noise ratio.

All of the hundreds of tones are then generated at the same time, converted

through an inverse fast Fourier transform into a complex waveform, and sent as a packet to the other Fastlink. The packet is accompanied by a 16-bit cyclical redundancy check. If any error is detected, the packet is resent.

After each packet, the Fastlink again analyzes the signal-to-noise ratios on the carriers and reassesses the maximum transmission speed. The previous speed is set back or increased by between 50 and 100 bps.

Fastlink depends on 70,000 lines of code, a 10-MHz 68000, and a Texas Instruments TMS32010 digital signal processor for its processing speed and execution of PEP.

Crosstalk-Fast is a special version of Crosstalk-XVI. Besides high-speed file-transfer capability, it includes terminal-emulation features and access to Fastlink's phone-line analysis characteristics. Telebit has no plans to license PEP.

Contact DCA Inc., 1000 Alderman Dr., Alpharetta, GA 30201, (404) 442-4000. Inquiry **607**.

Interactive Satellite Dish

Equatorial Communications Company is offering the C-200, a small satellite dish designed specifically for personal computers and terminals. The C-200 dish, which measures 4 feet in diameter, can send and receive information at up to 19,200 bps; the dish connects to a personal computer through a standard RS-232C cable.

The C-200 transmits information over the weather-tolerant microwave band C to Equatorial Communications' transponders on the Westar IV and Galaxy III satellites. The information is then sent back to one of Equatorial's 36-foot dish receivers, processed on a mainframe computer, and retransmitted via satellite to another C-200.

The approximate cost for a C-200 setup is \$6000, or about \$225 per month, including charges for Equatorial's network services. The C-200 is designed primarily for large companies that use leased telephone lines. The minimum order is approximately 100 units. Contact Equatorial Communications Co., 300 Ferguson Dr., Mountain View, CA 94043, (415) 969-9500. Inquiry **608**.

(continued on page 431)

NEW SYSTEMS

VersaBraille II

Telesensory Systems has introduced the VersaBraille II system, a portable, disk-based electronic information processor for the blind. This braille computer lets you electronically store, process, and retrieve information. A special telephone modem can link VersaBraille II to other computers.

VersaBraille II consists of a standard 3½-inch micro-floppy-disk system and a braille display that substitutes for a video monitor. Its memory holds up to 30,000 characters; disk support boosts the unit's capacity to 77,000 characters. This is adequate for many word-processing procedures, such as formatting, high-speed searching, and inserting, deleting, and relocating text. The system can simultaneously output braille and print information.

VersaBraille II is fully programmable. Menu guide the user to each of the system's programs. The manufacturer provides special software that converts VersaBraille II into a four-function calculator with algebraic logic, floating decimal point, square root, and percent. Plans for other software packages include a 50,000-word spelling checker, a two-way braille translator, and a language interpreter.

The price of a VersaBraille II system is \$6995 plus shipping and handling. For more information, contact Telesensory Systems Inc., 455 North Bernardo Ave., POB 7455, Mountain View, CA 94039-7455, (415) 960-0920. Inquiry **615**.



HP's Series 300 technical workstation.

Hewlett-Packard's Series 300

The Series 300 technical workstations from Hewlett-Packard expand the HP 9000 family. A modular design lets you choose the CPU, display, systems software, programming language, and peripherals.

For an entry-level to mid-range system, you can choose a 10-MHz Motorola 68010. If you require high-speed processor performance, a 32-bit 16.6-MHz 68020 is available. With both CPU configurations, you get 1 megabyte of RAM, expandable to 7½ megabytes.

Low-resolution display choices include two 12-inch monitors with 512 by 400 pixels in black and white or color. You can also choose a 19-inch color or 17-inch monochrome high-resolution monitor with a 1024- by 768-pixel display.

The Series 300 runs most Series 200 applications software. Packages are available for word processing, spread-

sheets, database management, project management, and graphics. You can choose an integrated word-processing/spreadsheet/database package or programs for electrical and mechanical engineering. BASIC 4.0, Pascal 3.1, and HP-UX are also available.

Peripheral options include digitizer tablets, mice, mass-storage subsystems, printers, and plotters. Two IEEE-802.3 standard cabling options allow linking up to 30 systems over a distance of 185 meters or up to 100 computers over a distance of 500 meters. Series 300 network software provides file transfer, file access, and directory access within the HP 9000 system.

Series 300 prices start at \$3500. A typical system ranges from \$5500 for an entry-level configuration to \$55,000 for a high-end system. Contact your local Hewlett-Packard sales office. Inquiry **616**.

Micro Five AT-Compatible

Micro Five's Series 5000 is compatible with the IBM PC AT. It features an 8-MHz 16-bit Intel 80286 and 150-nanosecond interleaved memory with no wait states. You can select 6- or 8-MHz 80286 operation. An optional 80287 numeric coprocessor is available.

DMA controllers let the hard-disk subsystem read and write a track of data on a single disk revolution. Average disk-access time is 30 milliseconds.

Available with the Series 5000 are MS-DOS 3.1 and XENIX 3.2, which supports up to 16 users. You can also get GW-BASIC 3.1 and a virtual-disk program.

The Series 5000 Model 100 has 512K bytes of memory, a 1.2-megabyte floppy-disk drive, an RS-232C serial port, a Centronics parallel printer port, a clock/calendar with battery backup, and an AT-compatible keyboard. The Model 200 has the same features plus a 27-megabyte formatted 5¼-inch hard disk. Both models have nine expansion slots.

Options include memory expansion to 2 megabytes on the motherboard and 15 megabytes for the system; disk-drive formatting capacities of 27, 45, 62, or 116 megabytes; 60-megabyte 5¼-inch streaming-tape backup; 360K-byte floppy-disk drive; and up to five three-port I/O cards.

Series 5000 list prices are \$3395 for the Model 100 and \$5215 for the Model 200. Contact Micro Five Corp., POB 5011, 3560 Hyland Ave., Costa Mesa, CA 92626. (714) 957-1517. Inquiry **617**.

(continued)

ADD-INS

FFT Coprocessor Card

The Ariel PC FFT card performs fast Fourier transforms by executing a single program line in interpreted and compiled BASIC, IBM Pascal and FORTRAN, Lattice C, and Turbo Pascal. The card's disk-based assembly-language driver routines make the host/peripheral interface transparent to the user. PROM-resident algorithms include forward and inverse FFT, hamming window, and power spectral density.

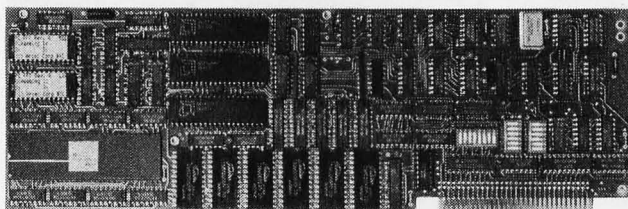
The PC FFT transforms 16-bit integer data arrays of up to 2048 complex points in less than 20 milliseconds. The pipelined architecture lets you fit all the hardware necessary to perform complex signal-processing algorithms inside the computer. The PC FFT's low power consumption lets you install two or more FFT processors in a single host.

The PC FFT card plugs into the IBM PC, XT, AT, or compatible computers and costs \$1850. Contact Ariel Corp., Suite 84, 600 West 116th St., New York, NY 10027, (212) 662-7324. Inquiry **618**.

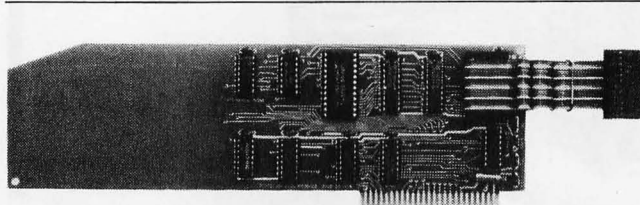
Apple EPROM Programmer

Apparat's Apple 28-pin Prom Blaster is a menu-driven EPROM programmer that will burn the following EPROMs: 2764, 2764A, 27128, 27128A, 27256, 27C256, and 27512.

The Prom Blaster has an edit function for the data buffer and can move system memory into the data buffer. It provides 12½- or



PC FFT coprocessor card from Ariel.



Writable ROM Board from Douglas Electronics.

21-volt programming voltage and +5 or +6 volts for V_{CC} .

The Apple 28-pin Prom Blaster is \$119. It requires 48K bytes of RAM and one floppy-disk drive. Contact Apparat Inc., 4401 South Tamarac Parkway, Denver, CO 80237, (800) 525-7674; in Colorado, (303) 741-1778. Inquiry **619**.

Interface Breadboard for IBM, Commodore

Group Technology has put together the BG-Board, an interface breadboard that lets you construct circuits and use BASIC programs to control the flow of information between a microcomputer and external devices. BG-Board provides access to your machine's data, control, and address buses so you can build interfaces for monitoring home appliances, analytical instruments, security systems, and so on.

Interface cards called CableCards let you use the BG-Board with an IBM PC, Commodore 64, or VIC-20. CableCards are also available for the TRS-80 Models

I, III, and 4 and the Apple II+ and IIe.

The BG-Board is buffered to protect the microcomputer if a wiring error occurs. It provides up to eight decoded address outputs in either the device- or the memory-addressing models. You can address up to 256 I/O devices by using BASIC software. A built-in logic probe permits detection of logic levels and pulse edges.

The Model BG-101A assembled interface breadboard for the IBM PC, Commodore 64, or VIC-20 sells for \$280; the Model BG-101K kit is \$205. For more information, contact Group Technology Ltd., POB 87, Route 1 Box 83, Check, VA 24072, (703) 651-3153. Inquiry **620**.

Apple II Writable ROM

The Writable ROM Board from Douglas Electronics lets an Apple II, II+, or IIe function as a 2K-byte

ROM. The board fits into an expansion slot on the Apple and connects to the ROM socket on a destination computer or device with a 12-inch 24-pin jumper cable.

To test a program, you use software to switch the WROM Board to its RAM mode, copy the program to the board, and switch the board back to ROM mode. The destination computer sees the program as on board in ROM. You execute the program by pressing the destination computer's reset button. For further editing, repeat the process. After you debug the program, a ROM is burned.

You can also use the WROM Board to program a 2816A EEPROM. When you program the EEPROM, you can place it in the destination computer's PROM socket, letting the remote machine function independently.

Model 5010-DE-12 Writable ROM Boards are \$95. Contact Douglas Electronics Inc., 718 Marina Blvd., San Leandro, CA 94577, (415) 483-8770. Inquiry **621**.

Single-board 80286 Computer

Transtec Technology's Hydra SBC is based on the Intel iAPX 286 microprocessor. It includes 1 megabyte of on-board RAM expandable to 4 megabytes, from 16K to 256K bytes of ROM, an on-board floppy-disk controller, an SCSI interface, four serial ports, and one bidirectional parallel port. An 80287 numeric coprocessor is optional.

Graphics resolution is as high as 1024 by 768 pixels. Graphics features include panning, smooth scrolling, and programmable character

ADD-INS

sizes or fonts. A 4-color display is standard; with an optional card, you can display 16 colors from a 4096-color palette.

The Hydra SBC's operating system is Concurrent DOS 3.3 with GSX. The board, with 512K bytes of memory and the operating system, sells for \$1500. Contact Transtec Technology, Unit 5, Ida Complex, Macken St.,

Dublin 2, Ireland; tel: 718521/719800. Inquiry **622**.

Videotaping Graphics Board

New Media Graphics' PC-VideoGraph is an add-on board for the IBM PC, XT, and AT that allows videotaping of computer-gener-

ated graphics and text. The PC-VideoGraph has a 6845 microprocessor and 128K bytes of display memory. It runs IBM graphics and text-generation software and operates in a 640- by 400-pixel mode. The board can display 16 colors; with dithering, it can display up to 136 colors simultaneously.

Demonstration software and graphics libraries for

BASIC, Pascal, FORTRAN, and C are included. A light pen, mouse, touchscreen, and interactive paint and font software are among PC-VideoGraph's options.

Single-quantity price for PC-VideoGraph is \$695. Contact New Media Graphics Corp., 279 Cambridge St., Burlington, MA 01803, (617) 272-8844. Inquiry **623**.

PERIPHERALS

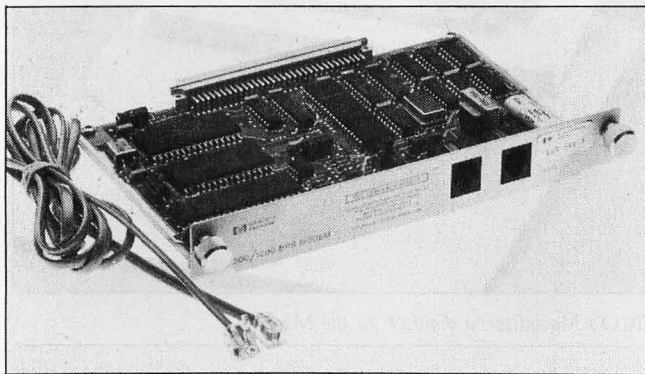
Bus and Modem Support for Integral PC

Hewlett-Packard has introduced two options for its Integral PC: the HP 82904A bus expander and the HP 82915A 300/1200-bps modem.

The bus expander plugs into one of the Integral PC's two I/O ports with a 1-meter cable and expansion interfaces. It has its own power supply and provides five extra ports. Price for the bus expander is \$1295.

The serial modem is an asynchronous, full-duplex interface that features auto-dial and auto-answer modes. You install it in one of the Integral PC's I/O ports and can connect it to a telephone network with a standard modular jack. Built-in communications software lets you switch from 300 to 1200 bps, provides auto-dialing, and uses menu-driven configurations. The modem's protocol is UMODEM.

List price for the HP 82915A serial modem is \$595. Contact your local Hewlett-Packard dealer or sales office. Inquiry **624**.



The HP 82915A modem for the Integral PC.

MIDI Processor

Hinton Instruments' MIDIC is a MIDI processor that contains its own software in ROM. It has a MIDI 1.0 specified interface with an optoisolator for minimum data corruption and an RS-232C/423-compatible interface for connection to a computer. You can use the computer to select commands from a menu. MIDIC's expansion socket allows for software extensions or custom packages.

The MIDIC 1.1 software has two modes of operation. In the process mode, you can insert MIDIC in the data stream of a MIDI equipment setup and process the data as directed by the setups. All setups can be uploaded and down-

loaded between MIDIC and a host computer. In the interface mode, MIDIC can buffer and convert MIDI codes in 8-bit binary or ASCII hexadecimal format. Both modes permit automatic generation of active sensing clocks and MIDI timing clocks. Tempo is variable from 30 to 279 crotchets per minute.

MIDIC costs £300; with a battery backup, it is £350. For more information, contact Hinton Instruments, 168 Abingdon Rd., Oxford OX1 4RA, England; tel: Oxford (0865) 721731.

Inquiry **625**.

Portable Battery and Case for Laptops

The Prairie Power portable battery system helps to extend continuous usage of laptop computers. LEDs on the charger indicate when the unit is charging and when the battery is full. The charging unit also allows for emergency power backup.

The battery is a sealed lead-acid unit that has Department of Transportation approval for air transport. Custom cables are included in the package.

Prairie Power's water-resistant carrying case (17 by 13 by 5 inches) features a removable insert panel that you can use as a laptop workstation. It holds the battery, charger, and computer, and it has a padded pocket with room for acoustic cups, cables, a small recorder, or 3½-inch disk drive.

The complete ensemble sells for \$169. Components are available separately. Contact Prairie Power Systems Inc., 768 Twelve Oaks Center, 15500 Wayzata Blvd., Wayzata, MN 55391, (800) 435-8721; in Minnesota, (612) 475-1793. Inquiry **626**.

(continued)

PERIPHERALS

Interface for Home Control

X-10's Powerhouse interface for the Apple IIe and IIc and the Commodore 64 provides automatic control of electrical devices in the home. It has its own 80C48 processor, on-board ROM, RAM chip, and real-time clock. Its battery backup can sustain the unit without AC power for more than 100 hours. X-10 Powerhouse sends signals over AC wiring to control up to 72 lights and appliances plugged into System X-10 modules, which are plugged into 120-volt outlets.

The interface comes with a home-control software package that uses a color-graphics interactive approach to programming. After you complete installation and programming, you can disconnect the Powerhouse from the computer. The interface will continue to run the control system according to the program.

The X-10 Powerhouse (interface, software, and connecting cable) retails for about \$120. Contact X-10 Inc., 185A Legrand Ave., Northvale, NJ 07647, (201) 784-9700. Inquiry 627.

RS-232C to IEEE-488 Controller

The CmC RG interface lets any personal computer control the IEEE-488 bus. You can connect up to 15 IEEE-488 devices to one RS-232C port by using the interface. In the CmC RG's transparent mode, an IEEE-488 device looks like an RS-232C device to the computer.



GTCO's Macintizer, a digitizer for the Mac.

You can configure this interface for talk and listen commands for all primary and secondary addresses. You can also use a talk-only mode with any listen-only device. The CmC RG understands simple ASCII commands and works with any computer language.

The CmC RG comes with case, power supply, and standard IEEE-488 and RS-232C connectors. The RG4 is for device number 4 only and costs \$495; the RGA supports devices 0 to 30 and costs \$695. Contact Connecticut microComputer, POB 186, Brookfield, CT 06804, (203) 354-9395. Inquiry 628.

Macintosh Digitizer

The Macintizer from GTCO Corp. plugs directly into the Macintosh's mouse port and operates without any modification to the Mac's operating system or applications software. GTCO says this electromagnetic digitizer requires no preventive maintenance and will not skip (as a mouse can). It consists of an electronic work surface and a hand-held stylus.

The Macintizer works in an absolute coordinate mode, so pointing to the center of the tablet always puts the arrow in the center of the screen. You can use the digitizer to trace maps, drawings, and other non-metallic material. The Macintizer's surface has two work areas that provide a one-to-

one screen correspondence and a 33 percent reduction. An optional mouse cable is available.

The Macintizer sells for \$599. Contact GTCO Corp., 1055 First St., Rockville, MD 20850, (301) 279-9550. Inquiry 629.

IBM PC Memory Machine

Peachtree Technology's Memory Machine for the IBM PC is an external dual-drive subsystem that resides between the PC and its monitor. You can choose from several combinations of disk drives, including 5¼-inch Winchester drives, removable Winchester cartridge drives, and backup tape-drive systems. Various configurations provide up to 20 megabytes of fixed-drive and 60 megabytes of tape-drive capacity.

The Memory Machine contains a power supply, cooling fan, overload power-surge protector, and multi-function power director. Its five front-panel power switches and 15-amp three-prong connectors let you supply power to five other peripherals.

Sold as a kit, the Memory Machine's two drives, cables, and instructions cost \$3695. Contact Peachtree Technology Inc., 3020 Business Park Dr., Norcross, GA 30071, (404) 662-5158. Inquiry 630.

Musical Speech System

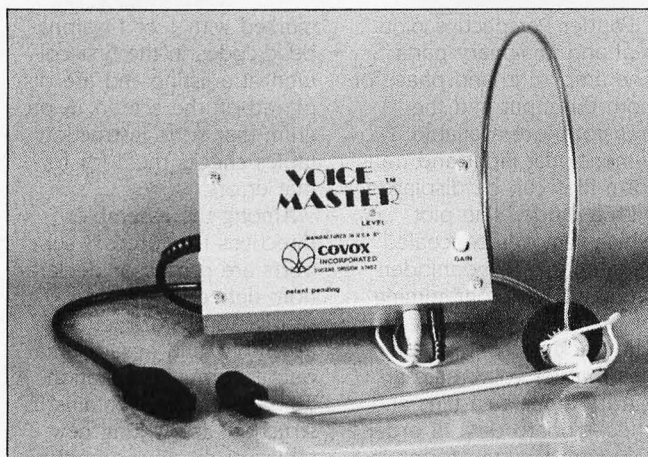
The Voice Master is a digital speech/voice recognition system for the Apple II line, Commodore 64, or Commodore 128. But it's also a music-synthesis program that converts humming and whistling into a music score. The package consists of a hardware module, a headset/microphone, system software, and cables.

The system basically works as a digital tape machine, recording the user's voice as digital information and storing it in vocabulary files on a disk. Each file can contain up to 64 distinct words, sounds, or phrases. The user can control the recording rate, playback speed, and volume.

The accompanying Voice Harp program lets you compose music in real time by humming or whistling; it converts your vocal input into musical output. As you hum or whistle notes, they scroll by on the display in standard musical notation. In editing mode, you can play back and rearrange or change notes. In performance mode, you can change octaves and add chords. When you finish, you can save your composition and print out the score.

The Voice Master costs \$89.95. Sound Master, an optional plug-in card for the Apple II+ and IIe, provides three-part harmony and sound effects; it costs \$39.95. A Voice Master for the Atari 800XL, 65XE, and 130XE reportedly will be available soon. Contact Covox Inc., 675-D Conger St., Eugene, OR 97402, (503) 342-1271.

Inquiry **631**.



Covox's speech system for Apple IIs and Commodores.

Knowledge Integration Toolkit

MacKIT Level 1, a program for the 512K-byte Macintosh, is designed to serve as an introduction to knowledge engineering and help you build expert systems. It features a backward-chaining inference engine, a production rule compiler, a question generator, and a graphics window.

You code your pertinent knowledge into production rules using English and a word processor (MacWrite will do). Employing a back-chaining method, MacKIT starts with conclusions, finds rules that support the conclusions, and tries to verify the premise by searching the knowledge base for relevant facts. The process continues until the conclusions are verified or disproved.

MacKIT is written in MacFORTH. It costs \$149. Contact Knowledge System Environments Inc., 201 South York Rd., Dillsburg, PA 17019, (717) 766-4496.

Inquiry **632**.

Expert-Systems Building Tool for Mac

Expertelligence has developed a microcomputer version of OPS5, a tool for building expert systems. ExperOPS5 runs on the 512K-byte Macintosh and features a forward-chaining inference engine coupled with a pattern-matching algorithm. It also has an interface designed to provide complete access to ExpertLisp, the vendor's LISP development environment for the Mac.

ExperOPS5 has a suggested retail price of \$325 and requires an add-on floppy-disk or hard-disk drive and ExpertLisp software (\$495). Contact Expertelligence Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, (805) 969-7874.

Inquiry **633**.

Mac Meets Juki

Juki's LetterPrint kit gives Macintosh users the option of sending output to Juki 6100 and 6300 letter-quality printers. The software is capable of driving MacWrite word-processing functions directly onto the Juki printer.

The kit contains a disk and instructions. It has a suggested retail price of \$75. A connector cable costs \$20 more. Contact Juki Office Machine Corp., Printer Division, 299 Market St., Saddle Brook, NJ 07662, (800) 932-0590; West Coast, (800) 325-6134; in California, (800) 435-6315.

Inquiry **634**.

Alternatives for Iconoclasts

PBI Software's Icon Switcher lets you alter Macintosh icons or fashion ones of your own design. The program comes with 20 icons and a tutorial and has a suggested retail price of \$19.99.

PBI sells additional sets of icons at \$19.99 each. Icon Library #1 is a collection of business and utilities images. Icon Library #2 consists of "fun and games" icons. Icon Switcher can change the images in both libraries.

Contact PBI Software Inc., 1155B-H Chess Dr., Foster City, CA 94404, (415) 349-8765.

Inquiry **635**.

Spelling Checker for Appleworks

Spellworks proofreads documents prepared with the Appleworks word-processing program. It has a 90,000-word dictionary and checks spelling at a rate of 10 words per second.

The spelling checker retails for \$49.95. Contact Advanced Logic Systems Inc., 1195 East Arques Ave., Sunnyvale, CA 94086, (408) 730-0306.

Inquiry **636**.

(continued)

Scientific Subroutine Library

Wiley Professional Software's BASICA Library consists of 114 pretested and precompiled mathematical and statistical subroutines. The subroutines perform tasks involving the most commonly used complex number operations in such areas as matrices with real or complex elements, polynomials, differential equations, analysis of variance, solution of equations, and general statistics.

BASICA Library comes on three disks containing source code, compressed source code, and test programs and results. System requirements are an IBM PC, XT, AT, or compatible with at least 128K bytes, a double-sided disk drive, and PC-DOS or MS-DOS 1.1 or later. The price is \$125. Contact Wiley Professional Software, John Wiley & Sons Inc., 605 Third Ave., New York, NY 10158, (212) 850-6788. Inquiry **637**.

Fourier Transforms with Graphics

Alligator Transforms has released a package that performs one- and two-dimensional Fourier transforms and displays the results graphically. Fourier Perspective can handle one-dimensional real or complex data sets up to 8192 points and two-dimensional arrays as large as 128 by 128. Reported typical times are 0.5 seconds for a 256-point 1-D transform and 11 seconds for a 64 by 64 2-D transform with an 8087 math coprocessor. The program can also plot individual rows.

Fourier Perspective plots real and imaginary parts. The amplitude and phase of both the input and the transform are available. Two-dimensional input and transform files can be displayed with a hidden line plot, which removes concealed segments, or a nonhidden line plot. No programming or compiling is necessary. The package contains utilities that let you create arbitrary input data files and checkerboard data in order to center the transforms in the frequency domain.

The software runs on the IBM PC, XT, AT, and compatibles and requires DOS 2.0 or later, at least 192K bytes of memory, two disk drives, and a graphics card. Options are a screen-dump utility and an 8087 math coprocessor. List price is \$99. Contact Alligator Transforms, POB 271505, Houston, TX 77277, (713) 665-3855. Inquiry **638**.

Table-based Cross-Assembler

Cross-8 from Universal Cross-Assemblers uses a flexible instruction-table structure to produce code for most microprocessors and microcontrollers with an 8-bit data word and an address word of 16 bits or less. You can specify the format of the hexadecimal machine-language file as Intel, Motorola, or Tektronix 8-bit format.

You can prepare the assembly-language source file using any ASCII text editor. Cross-8 ignores the most-significant bit of all ASCII characters. It selects the corresponding processor instruction file by using the CPU directive within the source code.

Assembly errors are

marked with 1 of 14 alphabetic codes in the first column of a listing and are displayed on the screen. A program that sorts instruction tables checks them for format errors.

Among the assembler directives that Cross-8 supports are processor declaration; define byte, data storage, and word; end of assembly; and hexadecimal output format declaration. A 30-page manual contains instructions for writing new tables or modifying existing ones.

Cross-8 is about 25K bytes long and requires 17 bytes per label and 35 bytes for each instruction in the table. For IBM PCs and compatibles with PC-DOS and MS-DOS 2.0 (or higher), at least 128K bytes of RAM is recommended; an Apple II+ or IIe with CP/M-80 needs at least 48K bytes. The program costs \$99.95 in U.S. funds and \$129.95 in Canadian. Contact Universal Cross-Assemblers, POB 384, Bedford, Nova Scotia B4A 2X3, Canada. Inquiry **639**.

Software Emulates Intel 8051 Family

HiTech Equipment's 8051SIM emulates Intel's 8051 family of microprocessors and provides some of the debug and test facilities of an in-circuit emulator. The menu-driven program accepts Intel .HEX files and features a "hex calculator" mode.

You initiate a typical session after the assembly of an 8051 program by invoking the emulator with the name of the object file. The display is formatted as several windows into the

central processor, and the main menu is displayed. You can single-step or trace (with breakpoints) your program while watching the effects on the screen.

The package is available for IBM PC XTs with PC-DOS and Z80 machines with CP/M for \$199. Contact HiTech Equipment Corp., 9560 Black Mountain Rd., San Diego, CA 92126, (619) 566-1892. Inquiry **640**.

BASIC Matrix Commands

Designed to enhance BASIC on the IBM PC, Matrix 100 provides matrix-manipulation capabilities that you can call with a single statement for each operation. Besides the standard operations, the package has commands to invert matrices, solve equations, perform multiple regression, and obtain LU and QR factors.

Matrix 100 also has source code for an interactive linear programming package and an eigenvalue solver for real symmetric matrices.

According to Stanford Business Software, its program calculates up to 100 times faster than BASIC. In double precision, Matrix 100 with the optional 8087 support is reportedly 25 times faster than the standard package.

Matrix 100 runs on any IBM PC with BASIC or BASICA and at least 128K bytes of RAM (192K bytes is recommended). It costs \$80. With 8087 support, it costs \$125. Additional compiler support raises the price to \$250. Contact Stanford Business Software Inc., Suite 215, 4151 Middlefield Rd., Palo Alto, CA 94303, (415) 424-9499. Inquiry **641**.

Locus of Root Solver

Locipro provides control-system and electronic engineers with a means of quickly determining closed-loop system stability from open-loop transfer functions. The stand-alone program solves the locus of roots for systems up to the 26th order and 10 loop elements.

Output data can be vectored to a line printer or to data files. All program inputs are free-format and menu-driven.

Locipro, priced at \$72.95, is available for PC-DOS, MS-DOS, CP/M-80, and TRSDOS machines in 121 different disk formats. Contact BV Engineering, Suite 207, 2200 Business Way, Riverside, CA 92501, (714) 781-0252. Inquiry **642**.

Cross-Reference Generator

Dalsoft Engineering has developed a cross-reference generator that's designed to work with most programming languages. UCRF comes with configuration files for BASIC, C, Pascal, Modula-2, FORTRAN, COBOL, IBM Macro Assembler, and dBASE II. You can modify these files to accommodate specific language implementations or develop new files to support other languages.

UCRF accepts multiple input files from anywhere on disk and produces program and cross-reference listings with page numbers, user-defined title lines, and date and time stamp. Full directory and path support are provided for input and output.

The program can be operated either from the DOS

command line or activated from batch files to automate the compilation/assembly and listing of groups of program modules. UCRF handles symbol lengths of up to 128 characters and automatically folds long input lines.

Minimum system requirements are 128K bytes of RAM, one disk drive, and PC-DOS 2.0 or higher. UCRF costs \$39.95. Contact Dalsoft Engineering, 3565 High Vista, Dallas, TX 75234, (214) 247-7695. Inquiry **643**.

Low-Cost Video Digitizer

A video-digitizer system for the TRS-80 Color Computer and the Commodore 64 uses a composite standard NTSC video-input source—a video camera, video-cassette recorder, or videodisc player—to construct gray-level images in less than 5 seconds. The package, consisting of software, assembly plans, documentation, and a blank printed circuit board, costs \$39.95. You must supply the other components.

The Color Computer version provides a resolution of 256 by 192 pixels in selectable gray levels of three, five, or seven shades. The joystick and cassette ports are used for interfacing.

The Commodore 64 ver-

sion provides resolution of 160 by 200 pixels with gray levels of four, six, or eight shades. Interface is via the user I/O port.

Both versions are menu-driven. Brightness and contrast are adjustable.

Contact Kinney Software, Dept. B, 121 North Hampton Rd., Donnelsville, OH 45319, (513) 882-6527. Inquiry **644**.

Design Tool for 68000, 68008

O Orion Instruments has developed a disassembler/debugger program for products based on Motorola's 68000 and 68008. The package, called DDB68K, runs on Orion's Universal Development Laboratory (UDL).

UDL is a compact development system that integrates a 48-channel bus-state analyzer, an 8-bit and a 16-bit real-time emulator, an EPROM programmer, and a stimulus generator. The system interfaces with any MS-DOS or CP/M machine and enables software and hardware debugging of more than 30 processors.

DDB68K augments the trace-analyzer features of UDL with multiple breakpoints and single-step capabilities. Hexadecimal or binary files can be directly downloaded into the internal emulation memory of

UDL. The software permits the execution of a program from emulated memory or target-system memory (RAM or ROM) with the capability of memory patching.

The internal registers of a processor can be displayed or modified. A debugged program can be stored on disk or burned directly into an EPROM. The standard UDL supports operation of the 68000 up to 10 MHz; optionally, it can support up to 13 MHz.

DDB68K costs \$395. The standard UDL is \$2995. Contact Orion Instruments Inc., 6th Floor, 702 Marshall St., Redwood City, CA 94063, (415) 361-8883.

Inquiry **645**.

LISP Interpreter

CLISP is a LISP interpreter written in C and running on MS-DOS systems. It has more than 40 built-in functions for list manipulation, arithmetic, and relational and Boolean operations. The package contains what Westcomp calls a "modest" library of LISP functions.

Complete source code for the interpreter is included (C86 by Computer Innovations was the compiler used). With the information in the manual, a user can add in almost any combination of functions, windows, graphics, and so on.

The package costs \$150 and consists of documentation, CLISP source code, run-time program, and LISP routines. Contact Westcomp, Suite 229, 517 North Mountain Ave., Upland, CA 91786-5016, (714) 982-1738. Inquiry **646**. ■

—Compiled by Dennis Barker and Lynne M. Nadeau

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