

## NEW PRODUCTS

New Products Editor:  
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### Adapter for LSI-11 and Unibus allows remote printing

MDB Systems has developed the MDB/MLSI-PLLA11, a dual-size adapter module for DEC computers. The MDB/MLSI-PLLA11 provides long-line differential capability to MDB's printer controllers for LSI-11 based systems, allowing placement of the printer up to 3000 feet from the computer.

The MDB/MLSI-PLLA11 converts the TTL signals from the MLSI-LP11, which operates printers with Centronics or Data-products and other interfaces, or from the MLSI-LP11-A, which operates printers with a Data Printer interface, to RS-422 balanced differential driver/receiver circuitry. The module can be placed before or after MDB printer controllers or adjacent to them in Q-bus backplanes. If it is placed in Q-bus slots, the incorporated jumper provision allows DMA priority and grant signals to be passed, and the module acts as a bus grant card.

The PLLA11 can also be used with all MDB printer controllers for Unibus and VAX systems to provide long-line capability to these computers. When used with Unibus controllers, the module occupies the A-B connector positions of the Unibus backplane.

The module has five edge-mounted LEDs that instantly indicate data strobe and acknowledge/demand signals and printer status signals such as On-Line, Ready, and Fault.

Two cables are provided to allow connection of the MLSI-PLLA11 to MDB-manufactured



The printer long-line adapter module, MLSI-PLLA11, from MDB Systems allows printers for LSI-11 and Unibus systems to be placed up to 3000 feet from the computer.

LSI-11 Q-bus and Unibus/VAX printer controllers. The module can also be used with DEC manufactured controllers if the user fabricates his own connection cables.

The MDB/MLSI-PLLA11 costs \$300 in single quantities with delivery 30 days ARO.

Reader Service Number 31

### Inventory management package runs on Wang VS computers

An inventory management package in Wang VS Cobol for use on the entire family of Wang VS computers has been released by Mini-Computer Business Applications.

The I/M package allows interwarehouse transfers as well as issues and receipts. Quantities received in a purchasing unit of measure are automatically converted to the stocking/selling unit of measure. It also provides physical inventory count-tag support and prints cycle-counting worksheets.

Forecasting features allow the user to choose the length of sales history to be considered for each item and to define the number of days in the forecasting period.

The I/M package will calculate the quantity of an item to be kept as a safety stock. In addition, it creates audit trails, prints usage exception reports, and does ABC analysis.

Source-code licenses for MCBA's Wang I/M package are \$3000 for the first use.

Reader Service Number 32

### Hard-disk subsystems expand Apple II storage capability

Thought Works, Inc., has announced the DataFile series of hard-disk subsystems designed to operate as mass storage media for the Apple II microcomputer. The DataFile series are self-contained hard-disk Winchester drive subsystems with intelligent controller, power supply, cabinet, and software. The three models of DataFile increase Apple II storage capability from less than 288 pages of text to as much as 14,000 pages.

Included with DataFile is software to support three operating systems: ADOS, CP/M, and Pascal.

The DataFile models are available from dealer and distributor stock, and suggested retail prices are based on capacity: 5M bytes for \$2995, 10M bytes for \$3465, and 20M bytes for \$3950.

Reader Service Number 33

### Protocol converter provides ASCII terminal-IBM link

The PDS 300/525 from Perle Systems is a protocol converter designed to connect low-cost ASCII terminals to IBM Systems 34 and 38. The converter is attached to the S34/S38 host via a standard modem or modem eliminator. It emulates a remote 5250 Model 12 cluster and provides a data highway for up to eight standard ASCII asynchronous CRT terminals.

The 47-lb unit fits in a standard 19-inch rack or is suitable for tabletop mounting. Software is loaded via a standard 8-inch floppy diskette. Up to five multiple Z80 processors control the basic function.

Software support is available for a variety of popular ASCII terminals, and custom software is available for special network or terminal requirements.

Prices for the Perle 300/525 are from \$6850 to \$8900.

Reader Service Number 34

## Minicomputer incorporates Unix operating system

Masscomp has announced a minicomputer for scientific and engineering applications called the Masscomp MC-500. According to the company, the 32-bit, 16M-byte virtual memory, real-time, Unix-based computer exceeds the system performance of general-purpose minicomputer systems in real-time data acquisition and control, high-speed analysis of data, and presentation and manipulation of data in graphical format.

The MC-500 incorporates multiple processors and multiple bus structures that allow it to process information without degrading the performance of data acquisition or graphics presentation, the company said. Its graphics processor enables scientists and engineers to create graphs of experimental data as well as CAD images.

The MC-500 features twin 10-MHz Motorola 68000's, a third 68000 in the separate graphics processor, and a high-speed (8 MIPS) bipolar bit-slice processor for data acquisition and control. In addition, the MC-500 can be enhanced with an integrated floating point processor, as well as an array processor.

Standard software for the system includes Unix with real-time enhancements, a menu-driven user interface and window management system, and acquisition and display software libraries.

Data acquisition and control systems start below \$28,000. A typical configuration would consist of 27M bytes of mass storage, a 1M-byte floppy, a 0.5M-byte ECC memory, a 4K-byte cache, three serial lines, real-time Unix software, menu system user interface, window management system, graphics processor, 15-inch display, joystick, data acquisition and control processor, and remote diagnostics capability, selling for \$36,800.

**Reader Service Number 35**

## IBM PC graphics printer replaces matrix printer

IBM now has a graphics printer for the IBM Personal Computer. The printer is an enhancement of the company's matrix printer, which it replaces. Features of the 80-cps bidirectional printer include all-points-addressable graphics capability with up to 240 dots per inch horizontally, 216 dots vertically; two character sets, one similar to the video display character set, the other adding international characters; and superscript and subscript capability plus an underline mode.

The matrix printer can also be upgraded to a functional equivalent of the graphics printer. A conversion kit is available for 90 days and may be installed only by authorized IBM PC dealers.

The cost of the graphics printer is \$595, and conversion is set by dealers. Dealers will also be able to update DOS 1.0 and DOS 1.1 to support the graphics printer.

**Reader Service Number 36**

## Information system uses electron beam/laser recording

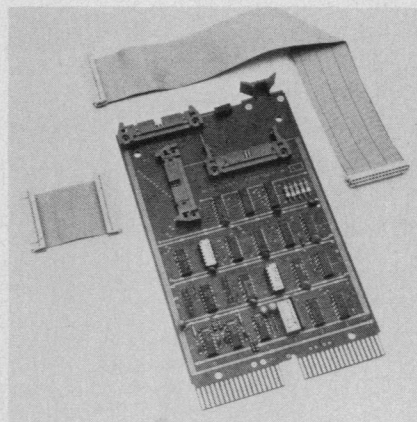
A system that uses electron beam, laser, and electronic technologies to store and retrieve information has been developed by Mnemos. The System 6000 uses electron beam and laser recording to store over 6000 pages of letter-size documents, which can be retrieved at the touch of a button, according to the company.

The System 6000 stores this information on a 12-inch plastic MnemoDisc, which is the same size as and comparable in cost to an LP stereo record. Both graphic images and digitized information are recorded on a glass master, and multiple copies are then made out of a flexible material.

The System 6000 does not read electronically coded graphic information on an optical disc and then project it on a CRT; instead, it reads an actual miniaturization of the graphic itself, similar to micrographics, and projects the image on a rear screen. Digital indexing information and downloadable application software are stored on the same disc, allowing optical and digital storage on the same medium.

Because the microprocessor-driven workstation communicates via an RS-232 communications interface to other databases, the optical information stored on the MnemoDisc can be accompanied by digital data appearing on the 40-character keyboard display.

To retrieve specific items or whole pages, the user enters an information request on the



**The Mnemos System 6000 workstation consists of a nonglare rear-projection screen, and an intelligent keyboard with a separate numeric keypad, function keys, and a 40-character digital display.**

workstation keyboard. If the request is too general, the system will lead the user through a step-by-step question and answer format to find the specific information needed.

The cost of the System 6000 is \$2950. Quantity discounts are available.

**Reader Service Number 37**

## Cross assembler helps develop M68000 software

The Oasys cross assembler lets users develop Motorola 68000 assembly language source code on VAX systems running VMS or Unix and on PDP-11-based systems running Unix or RSX-11M.

The package bundles a relocatable assembler, linker, object module librarian, and cross reference utility in one standard integrated package.

The assembler is fully compatible with Motorola's 68000 resident assembler, and offers conditional assembly, macro processing, an INCLUDE facility, command files to handle multiple input files, and a full complement of pseudo-operations. It also allows symbols with up to 30 characters.

The built-in virtual memory management capability lets the user create a symbol table of

unlimited size. The assembler automatically pages data to the system disk if the user runs out of main memory. Depending on the amount of disk space, according to the company, a user can conceivably define 100,000 symbols—particularly important when assembling very large programs on nonvirtual memory machines like the PDP-11.

The Oasys cross assembler is priced at \$3000, which includes the relocatable macro cross assembler, linker, object module librarian, and cross reference utility. A maintenance package is available for \$300 per year. OEM and distributor discounts are available. Distribution is on 9-track tape or diskettes.

**Reader Service Number 38**

## Business and personal computer uses CP/M 2.2

Morrow Designs has announced Micro Decision, a business and personal computer with floppy disk drive and full-feature CRT terminal.

An 8-bit microcomputer based on the 4-MHz Z80A CPU, Micro Decision includes 64K bytes of RAM, two RS-232 serial ports, a full-size smart terminal with detachable keyboard, and a single-sided 5¼-inch floppy disk drive with 200K bytes of formatted storage. A second floppy drive is optional.

The Micro Decision uses CP/M 2.2, an industry-standard operating system that permits access to more than 2000 business programs. The software package includes Micro-

soft Basic 80, BaZic (compatible with NorthStar Basic), WordStar word processing software, the Correct-It spelling checker, and the LogiCalc electronic spreadsheet.

An additional feature is a menu-driven front end that provides a road map through CP/M, which can be deactivated when the user is familiar with the commands.

The Micro Decision is priced at \$1790 with one floppy disk drive and CRT terminal; a second disk drive is available for \$350. The system can also be purchased without the CRT for \$1195. Quantity discounts are offered.

**Reader Service Number 39**



The 4048A ac hypot and dc electrostatic discharge tester developed by Associated Research is designed for factory and maintenance testing of data processing equipment, where both dielectric withstand testing of the insulation system and ESD evaluation for static electricity are required. The 4048A features a high-voltage, low-energy electrostatic discharge system to simulate static electricity that often destroys sensitive ICs and stored data in DP equipment. In tests, performed with DP equipment in operation, the retractable tip test probe is touched to points accessible to an operator. Stored energy is released, simulating a static discharge, and the DP equipment is observed for bad performance. The 4048A measures  $6\frac{3}{8} \times 9 \times 9\frac{1}{4}$  inches and weighs 20 lbs. The unit price is \$725.

Reader Service Number 40

### Array processor achieves 100M flop speed

The ST-100 Array Processor, manufactured by Star Technologies, uses multiprocessor architecture and VLSI technology to achieve 100 million floating point operations per second. Ten times faster than the speeds of many array processors, the ST-100 may be within the theoretical speed range of the Cray I supercomputer, according to the company.

The ST-100 attaches to general-purpose computer systems for high-speed arithmetic operations and has multiple processors for additional functions, such as the staging of operations. The ST-100 can be attached to most midsize and mainframe computers, including those manufactured by CDC, Perkin-Elmer, Systems Engineering Laboratories, DEC, and IBM.

Features of the ST-100 include multiple programmable internal processors, multiple arithmetic units, and high speed logic circuitry built from Motorola MECL 10,000 Macrocell gate arrays. A "hardware divide" among the arithmetic units makes the machine appropriate for simulation. A master control

processor and three independent processors handle simultaneous input and output of data. Multiple jobs and overlapped data transfers can be queued without affecting arithmetic processing. Main memory consists of eight million 32-bit words using 64K RAMs.

The ST-100 is supported with development, production, and maintenance software. Applications library modules are provided for basic vector and matrix operations. A high-level language consisting of a subset of Fortran statements ties these modules together, permitting routines to be written for geophysical, signal and image processing, and aerodynamic research applications. The basic ST-100 configuration with 512K words of 32-bit main memory and a 48K word data cache is \$250,000, including operating and development software, interface, and installation. Deliveries are scheduled for first quarter 1983.

Reader Service Number 41

### Management system helps wholesale distributors

Ultramate, developed by Honeywell's Data-network, is a comprehensive business management information system designed to meet the information processing and management requirements for market-specific users, particularly wholesale distributors and agribusiness outlets. The system includes a small business computer, network access to the Datanetwork large-scale processing system and customer service center, a complete set of financial applications (accounts receivable, sales order processing, inventory, general ledger, and accounts payable), and a package of user-tailored software programs and databases.

User support will be furnished as requested through Helpmate, which provides a two-way communications service. By pushing the Helpmate key on the system console, the operator is automatically linked with a Honeywell Data-network customer service representative who can remotely monitor all operator actions and provide assistance.

Also through Helpmate, Ultramate offers access to a library of business programs and to database information.

Prices for Ultramate start at \$19,500.

Reader Service Number 42

### Printers offered for Apple II/III

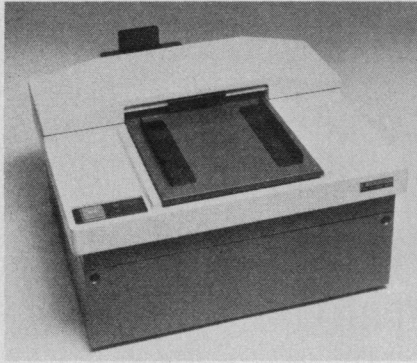
Apple Computer has announced the availability of two printers for its Apple II and III personal computers. The dot matrix printer is a fast, high-contrast printer for graphics and many correspondence-quality applications. The letter quality printer is a daisywheel printer with a graphics capability designed for high-quality print applications.

The dot matrix printer, which uses a parallel interface, has a printhead life of over 100 million characters. It features a heavy duty stepper motor and casting. The printer has high-resolution graphics output ( $7 \times 9$  dot matrix,  $144 \times 160$  dots per square inch) and offers a bidirectional print speed of 120 cps. It permits multiple-pitch and proportional spacing and will mix fonts during a single pass. The dot matrix printer uses pin-addressable graphics and handles cut sheets or tractor-fed paper (roll or fan-fold).

The letter quality printer, which uses a serial interface, prints bidirectionally at 40 cps on individual sheets or continuous forms. Its switch-selectable settings include vertical and horizontal tabs, six- or eight-lpi vertical pitch, 10-, 12-, or 15-cpi horizontal pitch, and auto-line-feed. A full complement of print wheels, including six foreign language character sets, is available.

Both printers can be purchased from authorized Apple dealers. The suggested retail prices are \$695 for the dot matrix printer and \$2195 for the letter quality printer.

Dot Matrix Reader Service Number 43  
Letter Quality Reader Service Number 44



The Model P3278 information display station from Phaze Information Machines is designed to replace the IBM 3278-2 station and attaches to IBM controllers via the IBM 3278 coax protocol. The total weight of the model is less than 32 pounds, and the home row of the keyboard is 30 mm high.

### 32-lb display terminal has IBM 3278 plug compatibility

Phaze Information Machines has developed the Model P3278 information display station, a cluster display unit that operates in IBM 3270 networks and can be used with IBM 370, 8100, and 4300 series computers and their plug-compatible equivalents.

According to the company, the Model P3278 is designed to be a plug-compatible replacement for the IBM 3278-2 Display Station and attaches to a number of IBM terminal controllers and computers through the IBM 3278 coax protocol.

The P3278 has a three-piece modular architecture consisting of a separate terminal display, keyboard, and logic modules with a total weight of less than 32 pounds. Standard features of the station include a separate keyboard with a low profile that eliminates the need for an additional palm rest, a 12-inch, green phosphor screen that tilts and swivels, reverse video and blinking field capabilities, 24 program function keys, a 12-key numeric keypad, a security lock and audible alarm, and a light pen interface.

The unit cost of the Model P3278 is \$1995, and quantity discounts are available.

Reader Service Number 45



The TO-5000 OCR, from Mitsui/Totec can read up to six fonts and interfaces with a number of systems including NBI, DEC, Xerox, Wang, and IBM.

### Desktop OCR reads six fonts

Mitsui/Totec has introduced a desktop, multifont OCR capable of reading as many as six type fonts without manual interchange.

Totec's TO-5000 throughput capacity is 300 pages per hour, and no special format is required. Font, pitch and line spacing do not have to be operator selected. The product's Q feature controls quality on variable copy from light to dark.

The TO-5000 currently interfaces with NBI, CPT, Lanier, AB Dick, Lexitron, Burroughs, Wang, IBM (LS/6 and Displaywriter), Xerox (850 and 860), DEC, Vydec, Micom, AM Jaguar, and Compucorp. The system has an RS-232C serial interface, ASCII 1200 to 9600 baud and a bisync IBM 2770 interface. Special interfaces for format codes have also been developed and are now available for NBI, CPT, Wang, and Xerox.

A hopper automatic paperfeeder accepts 8-1/2 x 4 inch to 8-1/2 x 14 inch variable weight paper stocks. The paper path is short and direct.

The TO-5000 weighs 78 pounds and comes standard with Courier 72, Prestige Elite 72, and OCR B fonts. Pica 72, Courier 12, and Letter Gothic/OCR A are optional.

The unit cost of the standard TO-5000 (three fonts) is \$12,950. With all six fonts the unit is \$15,450.

Reader Service Number 46

### Multiuser desktop microsystem has 16-bit processors

The IST 86 from Interactive Systems Technology is a 16-bit desktop microcomputer system that addresses up to 1M byte of error-correcting memory.

Designed specifically for the small to medium multiuser environment, the IST 86 incorporates all of the functions necessary for a multiuser system into a CRT terminal. Utilizing MP/M from Digital Research, the IST is a real-time, multitasking operating system that provides all of the facilities to implement real-time and interactive applications, according to the company.

Each self-contained unit consists of a 16-bit Intel 8086 main job processor, a 16-bit Intel

8089 I/O processor; 15-inch high-resolution CRT with either a 25 x 80 or 25 x 132 character display; an 83-key detachable keyboard; 10M byte hard disk; tape cartridge drive; 128K bytes of error-correcting memory, expandable to 1M byte within the unit; and six serial ports. Available programming languages include Cobol, Fortran, Basic, PL/1, and Pascal.

The IST 86 costs \$12,950, and production quantities will be available at the end of 1982.

Reader Service Number 47

### Operating system supports multiuser Ada

Intellimac's Multi-System Executive, IN/MSX, provides a multiuser programming support environment for the Telesoft Ada compiler. It is designed to run on the company's 7000 series of Multibus, 68000-based computers. Version 1 of IN/MSX supports up to 1.25M bytes of main memory in a single CPU configuration. Version 2 supports up to 8M bytes of memory and multiple processors.

IN/MSX automatically manages the physical machine resources, including the segmented memory, processors, Winchester and floppy disk controllers, and serial I/O ports. The IN/MSX multilevel resource lockout facility guarantees each user exclusive access to system resources. Lockouts may be invoked at the device, volume, file, and record levels.

IN/MSX also provides scheduling and interrupt handling capabilities. All I/O calls from the TeleSoft Ada PSE are channeled into the IN/MSX multiuser kernel.

IN/MSX also makes optimum use of the Multibus-based architectural features of the 7000 series computers, according to Intellimac. These computers contain a modular mix of bus masters and bus slaves on the Multibus. IN/MSX automatically handles the interrupts generated by the bus masters (processor boards, disk controllers, etc.) and polls the bus slaves to simulate interrupts. This feature is extensible to the 7000 series multiprocessor configurations which make use of the parallel arbitration features of the Multibus.

At any time during system operations, a user may selectively drop back into VMON mode from the Ada PSE shell by typing a control A character. In VMON, the system control or master user can display the status of other users, display the status of each terminal input queue, display the status of each terminal, stop/continue any user, restart any user who has locked out his terminal, and perform system reloads.

An additional multiuser facility of IN/MSX is a printer and serial I/O spooler/despooler. This feature automatically queues users' requests for printing. A "print image" of the material that is to be printed out or otherwise serially dumped is stored in a buffering disk file until the physical device (printer, modem, RS232 line, etc.) is available. Thus, the user can continue programming without waiting for the physical I/O resource to be free. As soon as the requested device becomes available, the waiting output is automatically dumped to it.

IN/MSX gives the programmer the ability to mix and match TeleSoft Pascal and/or the 68000 assembler in the multiuser programming environment. One user can be programming in Ada, another in Pascal, a third in 68000 assembler, and a fourth in all three.

IN/MSX for Intellimac 7000 series computers is available for \$1000 plus the TeleSoft Ada PSE license fee. Upgrades to Version 2 are furnished at no charge to Version 1 users.

Reader Service Number 48

## Workstation automates software development tasks

The MTC2000 Professional Workstation from Multiple Technologies Corporation allows analysts and programmers to automate many of the tasks associated with the design, documentation, implementation, and maintenance of data processing software systems.

The MTC2000 is ergonomically designed for use by either data processing professionals or clerical personnel working from a professional's input. Each workstation includes a 16-bit microprocessor with up to 1M byte of addressable memory and a real-time multi-tasking operating system. A 102-key detached keyboard and system software provide single keystroke manipulation of commonly used design and documentation symbols. The MTC2000 displays graphic symbols and text on a 15-inch, high-resolution video display with 132 columns by 34 lines.

Symbols, connecting lines, and text can be positioned anywhere on the screen, and symbols and text can be edited identically. The system also includes vertical and horizontal scrolling.

Printing can be done directly on a workstation printer just as it appears on the screen, while input or editing continues on other documents. System and file security features restrict access as necessary.

Sample system applications are project plans, PERT charts, HIPO charts, structure charts, data flow diagrams, report layouts, screen layouts, and system or program narratives.

Other features of the system include optional host communication links via IBM 2780/3780 emulation as well as 3270 emulation capability, and the machine-readable form of the work, which allows storing and recall for reuse of design.

Purchase price for a complete system, including software, documentation, a single workstation, a dot matrix printer, and 10.5M bytes of disk storage, starts at \$37,700. Each additional workstation costs \$22,300. The workstations can be clustered to reduce the expense of "poolable" input/output devices such as disks and printers. A maximally configured cluster could include 16 workstations and their associated disk storage and printers.

The cost of an operating lease with two-, three-, and four-year terms for a complete stand-alone system starts at \$1188 per month, with each additional workstation at \$702 per month. System availability is 30 to 45 days ARO.

Reader Service Number 50

## Graphics display system offers 200 ns/pixel vector generation

The GMR 27-68, a raster graphics display system available from Grinnell Systems, generates vectors at speeds up to 200 ns/pixel and produces a 1024×1024, interlaced 30-Hz black-and-white or color display. It displays up to 16 colors, or eight colors with blink, from a palette of 4096 colors.

The system consists of a display generator and power supply, 8 bits of refresh memory, the high-speed vector generator, alphanumeric, and rectangle and image generators. The standard system also includes pan and zoom and a combined 10×12 lookup table/video card. A DEC DR11W Unibus interface is available as an option.

The alphanumerics set in the GMR 27-68 features a 7×9 character font in a 8×12 block and has a capacity of 256 characters. Zoom and pan capability includes zoom factors of 1, 2, 4, and 8, pixel-by-pixel panning, and a zoom cursor. The system generates RS-343-compatible video signals, which drive standard black-and-white or color video monitors.

Software options include a Fortran-callable subroutine package; DEC RT, RSX, and VMS device drivers; and an extended graphics subroutine package with circle generator and area fill. Hardware options available are joystick or trackball controls, a quad independent cursor, and two 1024×1024 overlay memory planes.

Single-system price for the 27-68, housed in a 19-inch by 19¼-inch rack-mountable chassis, is \$23,750 FOB, San Jose. Delivery is 60 days ARO.

Reader Service Number 49

## Bubble memory is designed for multibus microcomputers

The Bubl-Tec division of PC/M, Inc., has announced the MBI-1 magnetic-bubble mass storage memory system for Multibus microcomputer systems.

All-solid-state bubble memory systems are designed to eliminate the problems associated with electromechanical storage media, such as disk deterioration, head crashes, and periodic mechanical maintenance. The bubble storage medium is protected from dust, smoke, and airborne dirt and tolerates adverse environmental conditions such as shock, vibration, and abnormally high operating temperatures.

According to the company, the MBI-1 bubble memory system operates faster than a floppy disk, consumes less power, and improves system reliability. The system includes an intelligent controller and up to 512K bytes of solid-state mass storage on a single printed circuit module. It is expandable to 8M bytes.

The controller on the MBI-1 system is designed around a Z80 microprocessor. It handles bubble device formatting and control, interfaces the bubble memory system to the Multibus bus structure, and provides for both soft- and hard-error detection and correction.

The MBI-1 system is available in capacity options of 128K, 256K, or 512K bytes. 512K-byte expansion modules are also available, and as many as 16 can be controlled by the MBI-1 system through a daisy-chain ribbon cable.

The MBI-1 is priced from \$997 for a 128K-byte system to \$2247 for a 512K-byte system in quantities of 100.

Reader Service Number 51



**Line noise suppression.** This basic text describes the protection of sensitive electronic equipment from problems created by AC line noise, transients, and spikes. *Noise Suppression Reference Manual* is available from Topaz Electronics Div., 9192 Topaz Way, San Diego, CA 92123; (714) 279-0831.

**Selective interfacing.** A hands-on book that requires some hardware and interface experience, *Selective Interface: A Hands-on Approach* (122 pp.) gives a step-by-step procedure for interfacing the IBM Selectric 2740 and 2980 and the Dura 1041 to a computer. The book is available for \$12.97 from Wayne Green Books, Peterborough, NH 03458.

**Micrographic services.** A reference guide that gives supply sources for microfilm service and equipment, *International Micrographics Source Book* lists manufacturer, location, contact, and likely cost. Single copies are available for \$59.50 (US) from Microfilm Publishing, PO Box 313 Wyagł Station, New Rochelle, NY 10804; (914) 235-5246.

**Coding guides for developers.** Guides to both Cobol and Fortran will help software departments formulate standards. Both guides present a methodology consisting of company standards and examples. Available at \$20 each from Associated Technology, Rte 2, Box 448, Estill Springs, TN 37330.

**Update on CP/M.** The second edition of the *Osborne CP/M User Guide* relates the newest CP/M developments including CP/M-86. CP/M derivatives such as MP/M 11 are also considered. Available at \$15.95 from Osborne/McGraw-Hill, 630 Bancroft Way, Berkeley, CA 94710; (415) 548-2805.

**Help for CBM users.** This step-by-step guide to the CBM 8032 and its peripherals covers programming, debugging, and upgrading. An alphabetical summary of CBM Basic statements is also included. The *CBM Professional Computer Guide* is available for \$15 from Osborne/McGraw-Hill at the above address.

**Forth for IBM PC.** Supporting both IBM PC DOS and Digital Research CP/M-86, this package includes an interpreter compiler with virtual memory management, a full screen editor, an 8086/8088 assembler, debugging aids, and a 150-page user manual. Available for \$100 from Laboratory Microsystems, 4147 Beethoven St., Los Angeles, CA 90066; (213) 306-7412.