



Microcomputer Expansion Boards

Few computer users will purchase a system which is configured to meet every future need. Not only would such a system be expensive and difficult to maintain, but the technology of some of the hardware might well be obsolete before it was needed. Instead, most users purchase a computer system to meet current needs and which can be expanded to meet the needs of the future.

One primary vehicle for expansion of computer systems is the addition of interface boards. These circuit boards are inserted into the computer, attaching to a special set of circuits called an interface bus. Each board provides an additional means of connecting outside devices to the computer or an additional level of processing power within it.

Data Decisions has surveyed 81 vendors, offering a combined total of 166 products. The boards ranged from inexpensive interface units at around \$100 to sophisticated laboratory or commercial-quality equipment for many thousands of dollars. The dot chart which accompanies this survey provides a classification of the products by the type of computer they support, the software requirements for their use, and the characteristics which they

possess.

In the accompanying chart, the first several headings identify the computer system for which the board is intended; the IBM PC or its compatibles, Apple systems (generally the Apple II or III), industry-standard bus systems such as those using the Intel Multibus (IEEE-796 standard) or S-100 bus (IEEE-696 standard), or other systems such as DEC's Micro PDP-11. The next segment identifies the operating system which is required or strongly recommended for use with the product. Nearly all board-level products can in theory be used with any operating system which can run on the target computer, but the custom programming required for such use may be far beyond the capabilities of the average business. In the largest segment of the chart, the functions which the board performs are highlighted in terms of what interfaces it possesses (serial, parallel, game port, etc) and what application it can be used for (Local Area Network (LAN), disk backup, etc). Some products are so specialized that they may not fit well into any category. In this section, the "A/D converter" column indicates products which are capable of analog to digital conversion, digital to analog conversion, process control using digital I/O, etc.

MICROCOMPUTER EXPANSION BOARD OUTLINE

VENDOR • PRODUCT	IBM PC Apple Industry Standard Bus System Other	PC-DOS/MS-DOS CP/M 1.6-Bit CP/M 2.0-Bit UNIX Other	Memory Port Serial Port Parallel Port Game Port Clock/Calendar	Display Interface Disk Controller/Subsystem Modem Local Network Interface Co-processor	Analog/Digital Converter 3270 Emulation Video Image Processing Disk Backup System Special Purpose
ABM Computer Sys • Intelligent Communications Co-Processor	•		• • • •		•
ABM Computer Systems • Mem 512	•		• • • •		
ABM Computer Systems • Omniboard	•		• • • •		
ABM Computer Systems • Super Board	•		• • • •		
ABM Computer Systems • Universal Communications Adapter	•		•		
ALF Products, Inc • ALF Processor Board	• •	•	•	•	
Amdek Corporation • Multiple Adapter Interface	•	•	• •		
Ampro • Little Board	• • •		• • •	• •	
Apparat Inc • 512K RAM Card	•		• • • •		
Apparat Inc • Combo II Card	•		• • • •		
Apparat Inc • Crambo	•		• • • •		
Apstek • Handy 1 Plus	•		• • • •		
Apstek • Handy 3	•		• • • •		
Apstek • Handy 4	•		• • • •		
AST Research • AST PC Net II	•		• • • •	•	



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VENDOR • PRODUCT	IBM PC Apple Industry Standard Bus System Other	PC-DOS/MS-DOS CP/M 16-Bit UNIX Other	Memory Serial Port Parallel Port Game Port Clock/Calendar	Display Interface Disk Controller/Subsystem Modem Local Network Co-processor	Analogy/Digital Converter 3270 Emulation Video Image Processing Disk Backup System Special Purpose
AST Research • Combo Plus	•	---	••••	---	---
AST Research • I/O Plus II	•	---	••••	---	---
AST Research • Mega Plus II	•	---	••••	---	---
AST Research • MP Expansion II	•	---	••••	---	---
AST Research • Six Pack Plus	•	---	••••	---	---
Atron • PC Probe	•	•	---	---	•
Bizcomp • PC Intellimodem-1200 Baud	•	---	---	•	---
Bubbl-Tec • MBI-1	•	•	•	---	---
Bubbl-Tec • PBB-1	•	•	•	---	---
Bubbl-Tec • PBC-1	•	•	---	---	•
California Computer Systems • Z/Plus	•	•	••	•	---
California Computer Systems • Supervision	•	---	•	•	---
Cogent • Database Machine	•	•••	---	•	---
Corvus • XT Mirror Card	•	•	---	---	•
Datacube • Data Cube VG-128	•	•	•	•	•
Data Storage Solutions • PC-Plus	•	•	---	---	---
Data Translation • DT-2808	•	•	---	---	•
Daystar Systems, Inc • Ultra 55	•	---	••••	---	---
Desert Technologies • Bus Expansion Module	•	---	---	---	•
Desert Technologies • Disk Drive Expansion Module	•	---	---	---	•
DigiGraphics • Extend 512 M-XSP	•	---	••••	---	---
DigiGraphics • Extend 256 M	•	---	•••	---	---
DigiGraphics • Extend Color Chrome	•	---	---	•	---
DigiGraphics • Extend 384 M	•	---	••••	---	---
Dilog PC Products • Electronic Disk for the IBM PC	•	••	••	---	---
Electronics Solutions • Multichasis	•	•	•	---	---
Falcon Technology • Falcon PC Extender	•	•	••••	•	---
Forte Data Systems • FORTE	•	•	•	---	•
Hayes Microcomputer Products • Smartmodem 1200 B	•	---	---	•	---
Hayes Microcomputer Products • Micromodem II for Apple IIe	•	---	---	•	---
Helix Systems • Helix PCBM	••	••	•	---	---
Hercules Computer Technology • Hercules Graphics Card	•	---	•	•	---
I-Bus • Model R-188	•	•	••	•	---
IDE Associates • IDEAComm 1200 Integral Modem	•	---	•	•	---
IDE Associates • IDEAGraph	•	•	---	•	---
IDE Associates • IDEA 3278 Mainframe Communications Card	•	•	---	---	•
IDE Associates • IDEABoard Memory Card	•	---	•	---	---
IDE Associates • IDEA Mini I/O Card	•	---	••••	---	---
IDE Associates • IDEA Combination Card	•	---	••••	•	---
IDE Associates • IDEA Net	•	---	---	•	---
Image Tech Inc • Function Pak 512	•	---	••••	---	---
Intelligent Technology International Corp • PC Exchange	•	•	••	•	•
Kensington Microware • DataCom 1200 Modem	•	---	---	•	---
LNW Computers • Busboard Multifunction	•	---	••••	••••	•
Lomas Data Products • Thunder 186	•	••	••••	••••	---
Lomas Data Products • Lightning 286	•	••	••••	••	---
MA Systems • Data Line Jr	•	•	---	•	---
MA Systems • I/O Processor	•	•	•	---	---
MA Systems • Jr Expander	•	•	---	•	---
MA Systems • PC Peacock	•	---	•	•	---



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VENDOR • PRODUCT	IBM PC Apple Industry Standard Bus System Other	PC-DOS/MS-DOS CP/M, i8-Bit CP/M, 8-Bit UNIX Other	Memory Serial Port Parallel Port Game Port Clock/Calendar	Display Interface Disk Controller Modem Local Network Interface Co-processor	Analog/Digital Converter 32/0 Emulation Video Image Processing Disk Backup System Special Purpose
Maynard Electronics • Sandstar Memory Card	•	•	•	•	•
Maynard Electronics • Sandstar Multifunction Card	•	•	•	•	•
Maynard Electronics • Sandstar MODFC	•	•	•	•	•
MBC Corporation • Dascon I	•	•	•	•	•
MicroGraphics Technology • Master Graphics I Adapter	•	•	•	•	•
Microlog Inc • Baby Blue II	•	•	•	•	•
Micro-Sci Corporation • Gameport III	•	•	•	•	•
Micro-Sci Corporation • 80/64 Lower Case E Card	•	•	•	•	•
Microtek Inc • Multifunction Board	•	•	•	•	•
Microtek Inc • Serial/Parallel Board	•	•	•	•	•
MMC International • Combination Memory Board	•	•	•	•	•
Mylex Corporation • Mylex Chairman	•	•	•	•	•
Orchid Technology • PCnet	•	•	•	•	•
Orchid Technology • PCnet Plus RAM	•	•	•	•	•
Orchid Technology • PCnet Plus Diskless	•	•	•	•	•
Orchid Technology • Blossom	•	•	•	•	•
Orchid Technology • PCnet/Blossom	•	•	•	•	•
Orchid Technology • PCnet Daughter Board	•	•	•	•	•
Paradise Systems Inc • Multi Display Card	•	•	•	•	•
PC Horizons • PC-XTRA	•	•	•	•	•
PC Products • Rainbow Color Graphics Multifunction Board	•	•	•	•	•
PC Products • Hard Disk/Cartridge Tape Controller	•	•	•	•	•
PC Products • Piggy Back Memory Board	•	•	•	•	•
PC Technology • RAM BOARD	•	•	•	•	•
PC Technologies Corporation • Encore	•	•	•	•	•
PC Technologies Corporation • Encore Plus	•	•	•	•	•
PC Technologies Corporation • Cue Card	•	•	•	•	•
PC Ware Inc • 4-Function Short Board	•	•	•	•	•
Percom Data • PERCOMNET	•	•	•	•	•
Persyst Products • DCP-88	•	•	•	•	•
Persyst Products • SB-384	•	•	•	•	•
Persyst Products • Time Spectrum	•	•	•	•	•
Practical Peripherals • Printerface	•	•	•	•	•
Practical Peripherals • Graphicard	•	•	•	•	•
Practical Peripherals • Proclock	•	•	•	•	•
Profit Systems • ADRAM ELITE	•	•	•	•	•
Profit Systems • Multigraph	•	•	•	•	•
Profit Systems • ADRAM +	•	•	•	•	•
Pure Data Ltd • PDIB-128/384	•	•	•	•	•
Pure Data Ltd • PDI 464 SP	•	•	•	•	•
Pure Data Ltd • PDI 208-SF	•	•	•	•	•
Pure Data Ltd • PDI 208-SS	•	•	•	•	•
Pure Data Ltd • PDI 464 SS	•	•	•	•	•
Quadram • Quadboard	•	•	•	•	•
Quadram • Quadboard II	•	•	•	•	•
Quadram • Quad 512+	•	•	•	•	•
Qubie Distributing • PC 212 A/1200	•	•	•	•	•
RIM Electronics • Multi-People Board	•	•	•	•	•
Rixon Inc • PC 212A with Asynch Port	•	•	•	•	•
Santa Clara Systems • SCS PC Net	•	•	•	•	•



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VENDOR • PRODUCT	IBM PC Apple Industry Other	Standard Bus System	PC-DOS/MS-DOS CP/M, 16-Bit CP/M, 8-Bit UNIX Other	Memory Serial Port Parallel Port Game Port Clock/Calendar	Display Interface Disk Controller Modem Local Network Interface Co-processor	Analog/Digital Converter 3270 Emulator Video Image Processing Disk Backup System Special Purpose
Scion Corporation • Scion PC 640	•	---	---	---	---	---
Scion Corporation • MA 520 Microangelo	---	•	---	---	---	---
Scion Corporation • CS 5000	---	•	---	---	---	---
Seattle Computer Products Inc • I/O Board	•	---	---	•	•	•
Seattle Computer Products Inc • RAM + 3	•	---	---	•	•	•
Seattle Computer Products Inc • RAM +	•	---	---	•	---	---
Semi-Disk Systems Inc • Semi Disk I	•	•	•	•	---	---
Sigma Designs • Maximizer	•	---	---	•	•	•
Sigma Sales • ASYNCH + RAM	•	---	---	•	---	---
Spectra Logic Corporation • Spectra-25	---	•	•	---	•	---
STB Systems • RIO Plus	•	---	---	•	•	•
STB Systems • STB Graphix Plus	•	---	---	•	•	•
STB Systems • Super RIO	•	---	---	•	•	•
Synetix Micro Products • Flashcard	---	•	•	•	---	---
Tecmar • BASEBOARD	•	---	---	---	---	•
Tecmar • BOSUN	•	---	---	•	•	•
Tecmar • DADIO	•	---	---	•	•	•
Tecmar • CAPTAIN	•	---	---	•	•	•
Tecmar • DEVICE MASTER	•	---	---	•	•	•
Tecmar • E+EEProm Programmer/Reader	•	---	---	---	---	•
Tecmar • GRAPHICS MASTER	•	---	---	---	•	---
Tecmar • IEEE-488 Interface	•	---	---	---	---	•
Tecmar • LAB Master	•	---	---	---	---	•
Tecmar • LAB Tender	•	---	---	---	---	•
Tecmar • TIME MASTER	•	•	---	•	---	---
Tecmar • SPEECH MASTER	•	•	---	---	---	---
Tecmar • Video Cassette Recorder Controller	•	•	---	---	---	•
Tecmar • Video Van Gogh	•	---	---	---	---	•
Tecmar • WAVE	•	---	---	•	---	---
Teletek • 16K-256K Memory Board	---	•	---	•	---	---
Thirdware Computer Products • Finger Print	---	•	•	---	•	---
Titan Technologies • Cygnus Pi	•	---	---	•	•	•
Titan Technologies • Cygnus S1	•	---	---	•	•	•
Titan Technologies • Titan Multifunction Board	•	---	---	•	•	•
Titan Technologies • PC Excelsator	•	---	---	•	---	---
Tseng Laboratories • Ultra PAK	•	---	---	•	•	•
U.S. Robotics Inc • S-100 Modem	---	•	---	---	•	---
U.S. Robotics Inc • Personal Communicator	•	---	---	---	•	---
U.S. Robotics Inc • Personal Communicator with 64K/256K	•	---	---	•	•	---
Vectrix Corporation • Midas Color Graphic Board Set	•	•	---	---	•	---
Ven Tel Inc • HP-150 Internal Modem	---	•	---	---	•	---
Ven Tel Inc • PC Modem 1200	•	---	---	---	•	---
Ven Tel Inc • PC Modem Half Card	•	---	---	---	•	---
Vista Computer Inc • Disk Master	•	•	---	---	•	---
Vista Computer Inc • Multi-Card	•	---	---	•	•	•
Vista Computer Inc • Multi-Card Plus	•	---	---	•	•	•
Winterhalter, Inc • Data Talker	•	•	•	•	•	•
Xylogics • 472 Tape Controller	---	•	•	•	---	•
Xylogics • 450 SMD Disk Controller	---	•	---	---	•	•
Zobex • Hard Disk Controller	•	•	---	---	•	---
3Com Corporation • Ether Link	•	•	---	---	•	---



Microcomputer Expansion Boards

MICROCOMPUTER EXPANSION BOARD FEATURES

Most board-level products are designed to provide a specific type of capability to a single type of computer. The number of board products available for a system is directly related to the perception of the board manufacturers that the computer will be successful and expanded. The IBM Personal Computer is by far the most popular with the expansion vendors because it is widely used by businesses and is frequently expanded in scope of usage.

Board level products may be fully compatible with the vendor's own hardware. If this is the case, it is likely that all software available for the target system will run without changes, and therefore no dependency on the operating system will exist.

If a board product is not fully compatible with the vendor hardware, some form of special software patch, driver routine, or utility program may be needed. Even compatible products may offer such software as a feature to expand their usefulness. Where any form of software is provided, it is normally written for the dominant operating system and will not function with other systems which may be available for the computer. For example, many manufacturers of IBM PC memory products will offer a software package to permit their memory board to emulate a floppy disk; a so-called RAM disk program. This program, if written to run on the IBM PC, will almost certainly run only under PC-DOS. CP/M or UCSD p-System users will be unable to use that feature. Where the operation of a board requires a certain operating system (a disk controller with patches provided for that operating system alone, for example) the listing and dot chart will indicate an operating system dependency. This will also be done if the product is significantly less functional without a particular operating system.

The features of multiple-function boards are often optional. The dot chart will indicate any feature which is standard or optional on the board in question. The text of the listing will point out optional products. In some cases, a product may have a feature which is optional in theory, but which will always be included on the products commonly available for sale. These features will not be listed as optional, since there is a strong chance that the form of the product without the feature will be unavailable.

In the features section of this report, vendors are listed alphabetically and the products within a vendor are grouped in a manner which stresses interrelationships. The listings are broken down into the following sections:

Vendor & Product Identification • The vendor name, address, and phone number are provided. Since some small businesses move to new locations as they grow, you may find some changes in the information in time. We suggest you note these changes in the service until they are reflected in an update. Product name may be shown in several forms, a nomenclature favored by the vendor and one which is popularized through advertising. Wherever possible, all popular forms of product name are shown.

Application • This section indicates the basic classification of the board, and is intended to serve as a quick way of selecting the products to be researched further. The current trend toward multifunction boards, however, makes further review of the information advisable if all possible candidates for purchase are to be identified.

Computers/Operating Systems Supported • The target computer system and operating system, if appropriate, are identified in this section. Most of the boards surveyed are designed

for use with the IBM PC or PC/XT. These boards can also run on compatible systems, but we suggest that you check with the computer vendor before making a purchase. As changes are made to both the compatible system vendor's equipment and the PC itself, there is a possibility that there will be a period of divergence. Most vendors will not warrant operation on compatible systems. These remarks apply to Apple-compatible equipment such as the Franklin as well.

Warranty/Service Information • The failure of a keyboard is equivalent to the failure of the entire computer system. Vendor policies on warranty vary from a few months to five years, and the service may be offered by the dealer, the vendor, outside maintenance firms, or a combination. Additional service warranties may be available from the dealer. Purchasers are well advised to be sure they understand the terms of the warranty and the point of warranty repair. Some vendors will commit to a short turnaround in case of warranty service, and such commitments are noted where the vendor has indicated them to be applicable. There may be special rate structures for service out of warranty, and such terms are also noted.

Features • The features of board-level products will vary widely depending on the type of board. In general, the features section will try to address features in a systematic sequence, starting with special articles supplied with the product, then to memory features, serial and parallel I/O, game and light pen interfaces, display capabilities, and any custom interfaces such as digital conversion, clock/calendar, etc. Many products include memory, but not as a part of the system memory available to users. Special-purpose memory such as buffer or display RAM is classified as to purpose and is not available to the users, while system memory is not restricted in this way. For memory cards, the minimum and maximum memory which can be purchased or used on the card is provided, and any restrictions on the minimum memory which must already be installed on the system are noted. Some memory boards will not address themselves below a specific address, and thus require 256K bytes of memory already be on the system before they can be used. This poses a problem to users of early PCs with 64K-byte motherboards or to users of compatible systems which do not have 256K bytes of RAM standard. Card size may also impact the usefulness of boards for the PC and compatible systems. Some of the PC/XT slots are short, requiring a half-size board.

Device interface characteristics for IBM PC boards are generally designed to be compatible with the standard for the target system. For parallel ports such compatibility is almost assured, but serial port users will often find that there are some differences between the IBM Asynchronous Communications Adapter and the board in question. The support for a current-loop interface rather than the standard RS-232 interface is available on the IBM board and is often not available on others. The current loop interface is seldom used, but its users must be sure to purchase a board which supports it.

The 8520 UART (Universal Asynchronous Receiver/Transmitter) communications chip is used on the IBM PC's asynchronous communications adapter board. When this chip is supported by the reported expansion board it is so noted.

Price • This is the basic board cost of the product and representative option or configuration pricing. In cases where the board has numerous options, the price or range of prices for a representative configuration is quoted.

MICROCOMPUTER EXPANSION BOARD LISTINGS

■ ABM COMPUTER SYSTEMS

3 Whatney Drive, Irvine, CA 92714 • 714-859-6531.

□ Intelligent Communications Co-Processor

Application • communication co-processor board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides service, negotiations with national maintenance organizations in progress.



Microcomputer Expansion Boards

Features • includes 3270 emulation software; includes 64K bytes of RAM; full sized board • 4 RS-232 serial ports and one parallel printer port; memory is parity checking and uses standard memory chips; optional software supports various communication protocols • user may program board for custom communication protocols • 4 serial ports—2 are PC compatible; uses 8250N UART for compatible channels and Zilog SID for synchronous channels • diagnostic software for board supplied; mounting bracket provided for serial port connectors • PC-compatible parallel port; parallel port configurable as LPT1,2,3 • contains Z-80 microprocessor for communication control; memory on board is accessible both to PC and to Z-80.

Price • \$995.

Mem 512

Application • memory expansion/RAM disk.

Computer/Operating Systems Supported • IBM PC and other systems which are hardware compatible; MS-DOS/PC-DOS 2.0.

Warranty/Service Information • one-year warranty; vendor provides service, negotiations for third-party maintenance in progress.

Features • ABM Superset RAM disk software supplied; 512K bytes of RAM maximum on board; minimum memory on board is 64K-bytes; no restrictions on minimum installed PC memory for board to operate; full sized board; memory is parity checking and uses standard memory chips; memory expansion in 64K-byte increments.

Price • \$295 for 64K bytes; \$995 for 512K bytes.

OmniBoard

Application • multifunction I/O board with no memory.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides servicing, negotiating with third-party maintenance companies.

Features • clock driver software provided; full sized board; dual serial ports, parallel port, clock/calendar, and game port; serial ports are PC compatible; uses 8250N UART • diagnostic software for board provided; mounting bracket for serial interface connector • parallel printer port; PC compatible; mounting bracket used for printer connector • battery on board for clock/calendar is replaceable; software provided to set clock and set time; leap year detection in calendar • two game ports can interface to Apple joysticks.

Price • \$315.

Super Board

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC and other systems which are hardware compatible • PC-DOS or MS-DOS required for software supplied.

Warranty/Service Information • one-year warranty; vendor provides service, negotiations in progress with third-party maintenance organizations.

Features • personality pack software provided for RAM disk, clock control, print spooler • 384K bytes of RAM maximum on board; board may be purchased and used without memory; no restrictions on the minimum memory installed for board to be used • full-length board; serial and parallel ports, clock, and game port • RAM disk software requires DOS 2.0 • parity checking memory uses standard memory chips; memory available in 64K-byte increments; on-board alarm feature as part of clock circuit; serial port is PC compatible; 8250N UART used; mounting of serial connector is through back panel • PC-compatible parallel printer port; may be configured as LPT1,2,3; mounting bracket for parallel connector • dual 16-pin DIP connectors are compatible with Apple joysticks • clock is battery operated; program provided to set and read clock; leap year detection.

Price • \$345 without memory; \$945 with 384K bytes; memory available at \$100 for each 64K-byte increment.

Universal Communications Adapter

Application • communication interface.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides service, negotiating with third-party maintenance organization.

Features • multiple protocol support software not included; dual serial ports have a PC-compatible mode of operation • supports software for asynchronous, bisync, SDLC/SNA, or HDLC/X.25 (not included); standalone diagnostics program provided.

Price • \$345.

■ ALF PRODUCTS, INC

1315 Nelson Street, Unit F, Denver, CO 80215 • 303-234-0871.

ALF Processor Board

Application • processor board to provide 16-bit power to Apple and other Apple-compatible computer systems.

Computer/Operating Systems Supported • Apple II, IIe, II+, Franklin or other system which is hardware compatible with the Apple II.

Warranty/Service Information • one-year warranty; user pays freight and shipping costs; ALF provides all service.

Features • up to 8K bytes of RAM may be added to board; 64K or 128K bytes of memory expansion available at extra cost • 8087 numeric processor optional available • MS-DOS or CP/M-86 compatible (MS-DOS requires 128K bytes of RAM); not fully PC compatible—MS-DOS compatible • Apple keyboard will limit some PC functionality; Apple disk drives are not PC compatible.

Price • \$345; 64K-byte RAM card available at \$370; 128K bytes for \$445 • 8087 option is \$262.

■ AMDEK CORPORATION

2201 Lively Boulevard, Elk Grove Village, IL 60007 • 312-364-1180.

Multiple Adapter Interface

Application • multifunction card with memory expansion and graphics support.

Computer/Operating Systems Supported • IBM PC with PC-DOS or other hardware-compatible system.

Warranty/Service Information • one-year warranty on parts and labor through vendor; vendor will repair out-of-warranty boards for \$50 plus parts and shipping.

Features • graphics software and print spooler programs included; 64K-byte user memory plus 64K-byte print buffer; PC must already have 256K bytes of RAM installed • full-length PC board; parallel port included; memory is parity checking and uses standard memory chips • parallel port is PC compatible and can be configured as LPT1,2,3; single 25-pin connector mounts through PC back panel • graphics adapter supports RGB, NTSC, or monochrome display; high-resolution mode available—not compatible with PC in this mode; compatible graphics mode is PC compatible.

Price • \$599.99.

■ AMPRO

67 East Evelyn Avenue, Mountain View, CA 94041 • 415-962-0230

Little Board

Application • single-board computer/floppy disk controller.

Computer/Operating Systems Supported • single-board computer.



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Warranty/Service Information • 90-day factory warranty; factory repair after warranty period is typically \$25 plus parts and shipping.

Features • 65-page technical manual included; CP/M-86 compatible product • can be mounted directly on 5.25-inch floppy disk drive • 64K-byte RAM; 2 serial ports, 1 parallel port; Zilog DART used for serial I/O • CP/M operating system included; optional source for BIOS available • same power requirements as disk drive so no additional power is required • Z-80 processor.

Price • \$349.

■ APPARAT INC

4401 South Tamarac Parkway, Denver, CO 80237 • 303-741-1778.

512K RAM Card

Application • memory board.

Computer/Operating Systems Supported • IBM PC and other hardware-compatible systems.

Warranty/Service Information • one-year warranty; service may be provided by vendor or dealer.

Features • RAM disk software supplied with card; 512K bytes of RAM maximum; 64K-byte minimum memory on board; full-length slot required; parity checking memory with standard memory chips • Combo II card may be piggybacked for extra memory; basic board includes 64K bytes of RAM, expandable in 64K-byte increments; no parallel or serial ports.

Price • \$189 for standard board with 64K bytes; \$64 for each additional 64K-byte increment.

Combo II Card

Application • multifunction card.

Computer/Operating Systems Supported • IBM PC or other hardware-compatible systems.

Warranty/Service Information • one-year warranty; vendor or dealer may provide service.

Features • clock driver software included; software is for MS-DOS • full-length card; clock calendar, serial port, and parallel port included; one serial port provided, compatible with IBM serial port; 8250 UART used for serial port; no current-loop support; PC-compatible parallel printer port; printer port may be configured for LPT1,2,3 • all connectors mount through PC back panel • clock/calendar with battery backup; software for clock setting provided; leap year detection supported • PC-compatible game port adapter included.

Price • \$189.

CRAMBO

Application • combination of 512K-byte RAM card and Combo II card in piggyback, acting as memory and multifunction card.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor or dealer may provide service.

Features • clock driver and RAM disk software provided; uses 512K-byte RAM card and Combo II card in piggyback form to provide memory, clock, calendar, and I/O support.

Price • \$807 fully populated with RAM.

■ APSTEK

2636 Walnut Hill Lane, Suite 335, Dallas, TX 75229 • 214-357-5288.

Handy 1 Plus

Application • multifunction card with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • print spooler and RAM disk software provided; 384K bytes of RAM maximum; board will function with no memory as I/O board; PC must have 256K bytes of RAM installed before memory on card may be used; full-length card • clock/calendar, serial port, and parallel port included; memory is parity checking and uses standard memory chips; memory expansion in 64K-byte increments • one serial port, compatible with PC; current-loop operation not supported; 8250 UART used for serial port; PC-compatible parallel printer port; both serial and parallel ports mount through PC back panel • clock/calendar uses lithium replaceable battery; clock set through software (supplied).

Price • \$305 for a board with no memory to \$845 for a fully populated board (384K bytes).

Handy 3

Application • parallel port and clock board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • clock driver software provided; clock/calendar, parallel port; parallel port is PC compatible • lithium replaceable battery for clock/calendar; clock is set through driver software provided.

Price • \$129.

Handy 4

Application • serial port and clock/calendar.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • clock driver software included; serial port included is PC compatible; single serial port uses 8250 UART; no support for current-loop operation; lithium replaceable battery on clock/calendar.

Price • \$139.

■ AST RESEARCH

2121 Alton Avenue, Irvine, CA 92714 • 714-863-1333.

AST PC Net II

Application • LAN and disk sharing support for multiple PCs.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty, extended at extra cost; vendor or dealer may provide service; \$50 charge for service after one year, plus shipping.

Features • software, manuals, and cable provided in starter kit • board is two-thirds full length; supports twisted-pair LAN system for intercomputer data exchange and resource sharing • RJ-11 modular phone connector used on board; data rate of network is 800K bps • disk drive sharing supported; intersystem file transfer is supported; electronic mail, micro-mainframe link optional • supports IBM, Tallgrass, Mountain Hardware hard disk systems.

Price • starter kit, including 2 adapter boards, cable, software, and manuals is \$1,290; extra interface boards are \$595 each, including cable.

Combo Plus

Application • multifunction board including memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty, extension available at extra cost; dealer or vendor may provide service;



Microcomputer Expansion Boards

out-of-warranty service at \$50 plus parts and shipping.

Features • print spooler, RAM disk, and clock/calendar software included for PC-DOS 1.1 through 2.1; 256K-byte RAM maximum • 64K-byte RAM minimum, but board will function if depopulated • PC must have 256K bytes of RAM before memory on board will function; full-length board • clock/calendar, serial port, and parallel port included; memory is parity checking and uses standard memory chips; memory may be added in 64K-byte increments • single PC-compatible serial port; uses 8250 UAER • no support for current-loop interface • connector mounts through back panel of PC • parallel printer port is PC compatible; may be configured as LPT1 or 2 if system has color graphics display, LPT2 or 3 if system has monochrome display; mounted via ribbon cable through back panel • battery operated clock/calendar; clock is set via software supplied.

Price • \$395 for board with 64K bytes of RAM; \$695 for board with 256K bytes of RAM.

I/O Plus II

Application • multifunction I/O board without memory.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty, extension optional at extra cost; vendor or dealer may provide service; service after warranty available at \$50 plus parts and shipping.

Features • print spooler and clock driver software provided • board is two-thirds of full length • parallel printer port, serial port, clock/calendar, and game port; 2 serial ports available, one connecting through back panel of PC and one on ribbon cable; serial ports are PC compatible; 8250 UART used for serial ports • no support for current-loop interface • PC-compatible parallel printer port may be configured as LPT1 or 2 if a color graphics display interface is used or LPT2 or 3 if a monochrome display is used • battery clock/calendar; clock set by driver software provided • game port adapter is PC compatible.

Price • \$165 for a single serial port and clock/calendar; \$315 for 2 serial ports, parallel port, game port, and clock/calendar.

Mega Plus II

Application • multifunction I/O board without memory.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty, extension optional at extra cost; vendor or dealer may provide service; service after warranty available at \$50 plus parts and shipping.

Features • print spooler and clock driver software provided • board is two-thirds of full length • parallel printer port, serial port, clock/calendar, and game port; 2 serial ports available, one connecting through back panel of PC and one on ribbon cable; serial ports are PC compatible; 8250 UART used for serial ports • no support for current-loop interface • PC-compatible parallel printer port may be configured as LPT1 or 2 if a color graphics display interface is used or LPT2 or 3 if a monochrome display is used • battery clock/calendar; clock set by driver software provided • game port adapter is PC compatible.

Price • \$165 for a single serial port and clock/calendar; \$315 for 2 serial ports, parallel port, game port, and clock/calendar.

Mega Plus II

Application • multifunction card with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty, extension available at extra cost; vendor or dealer may provide service; service after warranty period available for \$50 plus parts and shipping.

Features • user manuals and schematic diagrams provided • includes RAM disk, print spooler, and clock driver software;

maximum of 512K bytes of RAM supported on board; minimum shipment has 64K bytes of RAM, but board will function depopulated; PC must have 256K bytes of RAM installed for memory to be used • full sized board • clock/calendar, parallel port, dual serial ports and game port available • RAM disk software supports DOS 1.1 to 2.1 • board uses parity-checking memory and standard memory chips; piggyback board used for memory beyond 256K bytes of memory may be added in 64K-byte increments • dual serial ports are PC compatible; 8250 UART used • no support for current-loop operation • PC-compatible parallel port; parallel port can be configured as LPT2 or 3 on systems with monochrome display, LPT1 or 2 on color graphics systems; parallel port connects via ribbon cable • battery operated clock/calendar; clock set via driver software provided • PC-compatible game port adapter; bus extension connector for future expansion.

Price • \$395 for 64K-byte RAM, clock, and serial port; \$845 for 256K-byte RAM, 2 serial ports, parallel port, game port, and clock; \$100 per 64K-byte memory increment.

MP Expansion II

Application • memory expansion with clock/calendar.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty, extension available at extra cost; vendor or dealer may provide service; service after warranty period at \$50 plus parts and shipping.

Features • RAM disk software, print spooler, and clock driver software included • memory capacity is 384K bytes maximum; board must have at least 64K bytes of RAM installed; PC must have 256K bytes of RAM installed to use board; half-size card • clock/calendar • RAM disk software supports PC-DOS 1.1 to 2.1 • parity-checking memory uses standard memory chips; memory available in 64K-byte increments • battery operated clock/calendar; clock set via driver software provided • first delivery second quarter 1984.

Price • \$295 for 64K bytes of RAM, to \$595 for 256K bytes; additional memory is \$100 per 64K-byte increment.

Six Pack Plus

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty, extension available at extra cost; vendor or dealer may provide service; service after warranty period available at \$50 plus parts and shipping.

Features • RAM disk, print spooler, and clock driver software included; 512K bytes of RAM maximum on board; minimum purchase is 64K bytes of RAM, but board will operate depopulated; PC must have 256K bytes of RAM installed for memory on board to be used; full size board • clock/calendar, serial port, parallel port, and game port • RAM disk software compatible with PC-DOS 1.1 TO 2.1 • memory is parity checking and uses standard memory chips; piggyback board used for memory over 256K bytes, memory may be added in increments of 64K bytes • single serial port is PC compatible; uses 8250 UART • PC-compatible parallel printer port; printer port configurable to LPT2 or 3 if monochrome display adapter is used, LPT1 or 2 if color graphics adapter is used; parallel port uses ribbon cable attachment • battery clock/calendar; clock driver software supplied to set clock; PC-compatible game port adapter.

Price • \$395 for minimum configuration of 64K-byte RAM, parallel and serial port and clock; \$945 for 384K-byte RAM, parallel and serial port, game port, and clock.

■ ATRON

20665 4th Street, Saratoga, CA 95070 • 408-741-5900.

PC Probe

Application • debugging and testing support.



Microcomputer Expansion Boards

Computer/Operating Systems Support • IBM PC or other systems which are hardware compatible; PCjr • requires PC-DOS/MS-DOS 2.0 or higher.

Warranty/Service Information • 90-day warranty on hardware; free software updates for 6 months from purchase; vendor provides service.

Features • manual, disk, and circuit board included • product uses 128K bytes of on board memory not available to user; full sized board • serial port on board used only for diagnostic applications; in-circuit emulation; real-time hardware breakpoints and trace; 8-channel logic analyzer; symbolic debugger; full speed execution of tested program; engineering and software design debugging tool.

Price • \$2,495.

■ BIZCOMP

532 Mercury Drive, Sunnyvale, CA 94086 • 408-733-7800.

PC Intellimodem—1200 Baud

Application • integral modem board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS/MS-DOS required for software supplied.

Warranty/Service Information • 2-year warranty; vendor supplies service; factory quote on repairs out of warranty.

Features • includes software for communication; software requires 64K bytes of RAM; full-sized board • dial tone and busy signal detection; RJ-11 modular jack connection to phone; audio monitor; PC intellicomm software included, supports file transfers; Help function included in software.

Price • \$499.

■ BUBBL-TEC

6800 Sierra Court, Dublin, CA 94568 • 415-829-8700.

MBI-1

Application • bubble memory board for non-volatile storage.

Computer/Operating Systems Supported • Intel Multibus (IEEE-796).

Warranty/Service Information • 90-day warranty; vendor provides service; repair charge of \$65 per hour plus parts and shipping after warranty period.

Features • software driver and diagnostics supplied • up to 512K bytes of RAM per board; 128K-byte minimum on-board memory; RAM disk capability under RMX-86 • uses bubble memory technology; error detection and correction; contents of memory not lost on power off.

Price • \$1,599 for 128K bytes; \$3,579 for 512K bytes.

PBB-1

Application • bubble memory board for non-volatile storage.

Computer/Operating Systems Supported • STD-bus; CP/M 8-bit operating system required for included software.

Warranty/Service Information • 90-day warranty; vendor provides servicing; \$65 per hour labor charge plus parts and shipping for repairs after warranty period.

Features • software drivers included; separate controller card handles up to 16 memory boards; 256K bytes of memory per board maximum; 128K-byte minimum memory per board • CP/M drivers for use as RAM disk included; error detection and correction; contents of memory not lost when power is turned off.

Price • \$1,399 for controller and 128K bytes of memory; \$1,199 for 128K-byte board; \$1,657 for 256K bytes; \$395 for separate controller.

PBC-1

Application • bubble memory controller.

Computer/Operating Systems Supported • STD-bus • CP/M-80 required for included software drivers.

Warranty/Service Information • 90-day warranty; vendor provides servicing; \$65 per hour labor plus parts and shipping for repairs after warranty period.

Features • software driver and diagnostics included • used as part of bubble memory system; controls up to 16 bubble memory cards; bubble system replaces conventional disk storage where environment will not support disk usage.

Price • \$395.

■ CALIFORNIA COMPUTER SYSTEMS

250 Caribbean Drive • Sunnyvale, CA 94086 • 408-734-5811.

Z/Plus

Application • Z-80 co-processor board for IBM PC

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS/MS-DOS required on PC; CP/M-80 is run on Z/Plus.

Warranty/Service Information • one-year warranty covers parts and labor; vendor or dealer may provide servicing.

Features • CP/M-80 included; 192K-byte dual port RAM maximum on board; 64K-byte dual-port RAM minimum; no restrictions on minimum memory installed in PC for board to function; full sized card; serial port included; CP/M 2.2 software included, upgrade to 3.0 in progress; parity-checking memory uses standard memory chips; serial port is compatible with PC and usable under CP/M; runs CP/M 8-bit software on IBM PC

Price • \$645 for 64K bytes of RAM; \$825 for 192K bytes of RAM.

Supervision

Application • graphics card with parallel port.

Computer/Operating Systems Supported • IBM PC or other computers which are hardware compatible; not for use on systems with integral graphics boards such as PC-compatible portables; supports all versions of PC-DOS.

Warranty/Service Information • one-year warranty covers parts and labor; vendor or dealer may provide service.

Features • documentation disk and text editor software included; full size board; parallel port included is PC compatible; connector for parallel port mounts through back panel of PC; uses monochrome display in high-resolution graphics mode; 720x348 graphics resolution in incompatible mode using supplied software; PC-compatible mode operates in B&W with color graphics software; supports all popular graphics in monochrome mode; connector compatible with IBM monochrome display.

Price • \$799 including graphics support; \$599 without graphics.

■ COGENT

P.O.Box 3902, Bellevue, WA 98009 • 206-455-3343.

Database Machine

Application • high-speed hard disk controller.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS/MS-DOS, CP/M-86, or UNIX supported.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • diagnostics and technical manuals included; utility macros optional; uses 40K bytes of PROM, 128K bytes of RAM, and 64K-byte buffer RAM; buffer memory is triple ported; controls 5.25-inch Winchester disk drive; full-length board; database primitives included in macro set; works with most popular LANs; compatible with PC software; provides record locking when used with utility macros (optional); internal multitasking operating system.

Price • \$1,750 with utility macros for multiaccess control, \$1,500 without macros.



Microcomputer Expansion Boards

■ CORVUS SYSTEMS

2029 O'Toole Avenue, San Jose, CA 95131 • 800-426-7887.

XT Mirror Card

Application • use of videotape recorder for backup of hard disk.

Computer/Operating Systems Supported • IBM PC or other system which is hardware compatible; PC-DOS/MS-DOS 2.0 or later required.

Warranty/Service Information • 6-month warranty covers parts and labor; vendor or dealer may provide service, including board swap; factory repair is on an exchange basis.

Features • software and cabling included; 73M bytes of disk data may be backed up to VHS format videotape recorder; backup of typical hard disk system requires 15 minutes or less; multiple block copies for each disk block ensures reliable storage.

Price • \$495 not including recorder.

■ DATACUBE, INC

4 Dearborn Road, Peabody, MA 01960 • 617-535-6644.

Data Cube VG-128

Application • video processing.

Computer/Operating Systems Supported • IBM PC or other system which is hardware compatible; PC-DOS or MS-DOS required, UNIX version available.

Warranty/Service Information • 90-day unconditional warranty; vendor provides services.

Features • image processing software package included • board includes 300K bytes of RAM; PC must have 64K-byte RAM minimum; full-length board; provides video digitalization; optional software for use of memory as a RAM disk; pseudo-color generation; DPLL technology; run, scroll, zoom, pan features; 640x480x8-bit graphics resolution; complete library of image processing software; handles VCR and video disks, cameras including RGB; 16 banks of RAM.

Price • \$3,000.

■ DATA STORAGE SOLUTIONS

2907 North 55th Street #5, Boulder CO 80301 • 303-449-7587.

PC-PLUS

Application • hard disk subsystem.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; DOS 2.0 or higher required.

Warranty/Service • error detection and correction; contents of memory not lost on power off.

Features • software, Winchester drive, and documentation included; 10M-byte capacity emulates PC/XT disk system; full-length board; internally mounted disk drive; 2 drives may be installed; fully IBM compatible hard disk system.

Price • \$1,995.

■ DATA TRANSLATION

100 Locke Drive, Marlboro, MA 01752 • 617-481-3700.

DT-2808

Application • analog/digital, digital/analog converter.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS 1.1 and up supported.

Warranty/Service Information • 90-day warranty; vendor provides servicing.

Features • software library of subroutines; 200-page manual; full sized board; 16 channels A-to-D; 2 channels D-to-A; on-board clock for board control only; on-board microprocessor frees PC from task of conversion; parallel port not compatible with PC

printer port; clock is not battery powered and cannot be used to set the PC clock; process control and power control capability.

Price • \$495.

■ DAYSTAR SYSTEMS, INC

10511 Church Road, Suite L, Dallas, TX 75238 • 214-341-8136.

Ultra 55

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS/MS-DOS 2.0 or later required for software supplied.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • RAM disk and configurator software supplied; up to 1.5M bytes of RAM using 256K-byte RAM chips; full-sized board; clock/calendar, parallel, and serial ports; parity-checking memory; may use compatible memory chips or new 256K-byte chips; board will function depopulated; single serial port is PC compatible; no support for current-loop interface; 8250 UART used; PC-compatible parallel port configurable as LPT1,2,3; serial and parallel connectors mount through back panel; lithium battery powers clock; configuration software to set clock included; first deliveries begin second quarter 1984.

Price • \$795.

■ DESERT TECHNOLOGIES

620 North Talo Verde, Tucson, AZ 85716 • 602-882-1741.

Bus Expansion Module

Application • expansion interface controller.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; no operating system restrictions.

Warranty/Service Information • one-year direct replacement warranty; vendor supplies replacements in lieu of service.

Features • includes cabinet, power supply, interface board, cable, and manuals; adds 6 more expansion slots to PC; interface board is full sized and occupies single slot; expansion slots are full size; styling complements PC.

Price • \$645.

Disk Drive Expansion Module

Application • disk drive expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; no operating systems restricted.

Warranty/Service Information • one-year warranty; vendor will supply replacement in lieu of service.

Features • cabinet, power supply, and cables included; instructions on installation included; supports addition of 2 floppy disk drives to PC; shielded interface cable; styling complements PC.

Price • \$345 without disk drives.

■ DIGIGRAPHICS

10273 Yellow Circle Drive, Minnetonka, MN 55343 • 612-935-9111.

Extend 512 M-XSP

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; software supplied requires PC-DOS/MS-DOS.

Warranty/Service Information • one-year warranty; vendor supplies servicing; \$50 charge for factory repair plus parts and shipping for out of warranty service.



Microcomputer Expansion Boards

Features • includes RAM disk and print spooler; 512K-byte RAM maximum; board may be purchased and used without memory; no restrictions on minimum installed memory in PC for board operation; full sized board; clock/calendar standard, serial and parallel ports optional; parity-checking memory uses standard memory chips; up to 4 serial ports are PC compatible and addressable as COMn; uses 8250 UART; optional PC-compatible parallel port; clock/calendar is battery operated; software provided to set and read clock; leap year detection.

Price • \$435 for basic board with clock/calendar; memory to 256K bytes \$79 to \$399 for fully populated board; memory to 128K bytes plus EPROM socket \$79 to \$279 for fully populated board; serial port options \$289 for dual ports; \$579 for 4 ports.

Extend 256 M

Applications • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS 2.0 required for software supplied.

Warranty/Service Information • one-year warranty; vendor provides servicing; \$50 labor charge for factory repair, plus shipping and parts for out of warranty service.

Features • RAM disk and print spooler software supplied; 256K-byte RAM maximum; board can be purchased with 64K-byte minimum RAM; no restrictions on minimum installed PC memory for use of board; full-length board; parallel and serial ports; parity-checking memory uses standard memory chips; memory added in 64K-byte increments; one serial port, PC compatible; uses 8250 UART; PC-compatible parallel port can be configured as LPT1,2,3; serial and parallel port connectors mount through back panel.

Price • \$399 for 64K bytes; \$699 for 256K bytes.

Extend Color Chrome

Application • color graphics board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; may not be usable with systems having integral graphics boards such as portables.

Warranty/Service Information • one-year warranty; vendor provides servicing; \$50 service charge for out of warranty repair plus parts and shipping.

Features • color/monochrome display capability; dual monitor support; 640x200 or 320x200 resolution; can display up to 42 lines when operating as a terminal from minicomputer or mainframe; has fully PC-compatible mode of operation; light pen interface; RGB or NTSC monitors supported.

Price • \$469.

Extend 384 M

Application • modular multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides servicing; \$50 charge for out of warranty repair, plus parts and shipping.

Features • print spooler and RAM disk software supplied; 640K bytes of RAM maximum on board; board can be purchased and used without memory; no restrictions in minimum installed memory in PC for use of board; full-length board; clock/calendar, up to 4 serial ports optional, optional parallel port; parity-checking memory uses standard memory chips; up to 4 serial ports optional, PC compatible; serial ports configurable as COMn; 8250 UART used; PC-compatible parallel port; parallel port can be addressed as LPT1,2,3; interface connectors mount through back panel; clock has battery backup; software provided to set and read clock; leap year detection.

Price • \$249 to \$749 depending on options; memory ranges from \$79 to \$399 additional; serial ports are \$289 for 2 or \$579 for 4.

■ DILOG PC PRODUCTS

12800 Garden Grove Boulevard, Suite G, Garden Grove, CA 92643 • 714-534-8950.

Electronic Disk for the IBM PC

Application • electronic disk.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; supports PC-DOS/MS-DOS, CP/M-86, and concurrent CP/M-86.

Warranty/Service Information • one-year warranty except for abuse of product; vendor provides servicing.

Features • uses standard software; 384K-byte RAM not accessible to programs; full-length board; serial port; self-contained memory-based disk drive; serial port optional, PC compatible; uses 8250 UART; emulates 360K-byte diskette; provision for external power source for non-volatile storage; system reset does not clear memory disk; does not occupy any PC address space.

Price • \$1,295.

■ ELECTRONIC SOLUTIONS

9255 Chesapeake Drive, San Diego, CA 92123 • 800-854-7086.

Multichassis

Application • bus expansion interface.

Computer/Operating Systems Supported • Intel Multibus (IEEE-796); no software restrictions.

Warranty/Service Information • 3-year warranty; vendor provides servicing.

Features • multibus expansion chassis; includes power supply, manuals, schematic diagrams; memory, PROM boards optional; full-feature front panel available with bus state monitors.

Price • from \$1,895 depending on options.

■ FALCON TECHNOLOGY

6644 South 196th Street, Suite T-101, Kent, WA 98032 • 206-251-8282.

Falcon PC Extender

Application • disk/memory board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; DOS 2.0 or higher required.

Warranty/Service Information • one-year warranty, dealer exchange; repair out of warranty is \$20 plus parts and shipping.

Features • hard disk subsystem with memory expansion; socketed for 192K-byte RAM; 64K-byte minimum memory on PC for use; full-length board; clock/calendar and serial port; no RAM disk support; parity-checking memory uses standard memory chips; one serial port, PC compatible; may be addressed as COM1,2; uses 8250 UART; battery operated clock/calendar; software supplied to set and read clock; 10M- and 15M-byte disk support.

Price • \$2,295 for 10M-byte disk; \$2,595 for 15M-byte disk.

■ FORTE DATA SYSTEMS

2205 Fortune Drive, San Jose, CA 95131 • 408-945-9111.

FORTE (sometimes also called PJ)

Application • 3270 emulator/multifunction I/O.

Computer/Operating Systems Supported • IBM PC and other systems which are hardware compatible; MS-DOS/PC-DOS required for software supplied.

Warranty/Service Information • 180-day warranty; vendor or distributors may provide service.

Features • totally self-contained 3270 emulation environment; software and documentation provided; 128K-byte RAM required for use; full-sized board; serial port provided is PC compatible; serial port uses 8250 UART • emulates 3279 color terminal;



Microcomputer Expansion Boards

720x396 graphics resolution; daughter board for graphics; coaxial interface in 3270 mode; available second quarter 1984.

Price • \$2,590.

■ HAYES MICROCOMPUTER PRODUCTS

5923 Peach Tree Industrial Boulevard, Norcross, GA 30092 • 404-441-1617.

□ Smartmodem 1200 B

Application • integral modem.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; software supplied requires PC-DOS/MS-DOS.

Warranty/Service Information • 2-year limited warranty; vendor provides servicing.

Features • software for communication included; full-sized board; serial port, PC compatible; 0 to 300-bps and 1200-bps operation; direct connect via RJ-11; automatic dial and answer; touchtone or pulse dialing; integral auto-dial commands included; self-test features.

Price • \$599.99.

□ Micromodem II for the Apple IIe

Application • integral modem.

Computer/Operating Systems Supported • Apple II, IIe, II+, III; other Apple-compatible computers such as Franklin; requires one disk drive.

Warranty/Service Information • 2-year warranty; vendor provides servicing.

Features • software and reference manual included; AT&T 103 compatible; 110- to 300-bps operation; automatic dial and answer; touchtone compatible; audio monitor.

Price • \$329.

■ HELIX SYSTEMS

8123-25 Remmet Avenue, Canoga Park, CA 91304 • 818-710-0300.

□ Helix PCBM

Application • bubble memory disk emulator.

Computer/Operating Systems Supported • IBM PC or other computers which are hardware compatible; Apple II and IIe or compatible systems; PC-DOS, MS-DOS 2.0 or higher; UCSD Pascal 4.13; Apple DOS 3.3; Apple Pascal 1.1; Microsoft Apple CP/M.

Warranty/Service Information • 2-year warranty; vendor supplies servicing.

Features • software and documentation included; acts as disk storage; IBM version has 128K to 512K-byte RAM; Apple version has 128K bytes of RAM; memory not addressable by computer as RAM—only as disk; full-size board; PC version can support 4 boards installed; will boot from bubble disk or floppy with new version ROM BIOS; up to 8 times as fast as floppy; uses Intel 7110-4 memory modules.

Price • \$475 for Apple/IBM 128K-byte version; \$995 for IBM 256K-byte version; \$1,495 for IBM 512K-byte version.

■ HERCULES COMPUTER TECHNOLOGY

2550 9th Street, Suite 210, Berkeley, CA 94710 • 415-540-6000.

□ Hercules Graphics Card

Application • graphics/monitor interface card.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • 2-year warranty; vendor supplies service.

Features • manual and diskette supplied; H-BASIC for full usage

of board features; 64K-byte screen buffer; full-sized board; single parallel port is PC compatible and must be LPT1; monochrome display compatible; provides graphics resolution of 720x348; PC Color Graphics software not compatible; Lotus 1-2-3 version offers graphics support; supported by Microsoft Word; standard D connector interface to monochrome display.

Price • \$499.

■ I-BUS SYSTEMS

9235 Chesapeake Drive, San Diego, CA 92123 • 619-569-0646.

□ Model R-188

Application • single-board computer for multibus.

Computer/Operating Systems Supported • Intel Multibus (IEEE-796).

Warranty/Service Information • one-year warranty; vendor supplies service.

Features • documentation, instructions, schematic diagrams supplied; 256K bytes of RAM and 160K bytes of ROM maximum on board; serial port; parity-checking memory uses standard memory chips; uses 8251 USART for serial port; compatible with PC expansion cards; optional ROM monitor/debugger; Intel 8088 processor.

Price • \$795 with 64K-byte RAM, no ROM; \$945 with 64K-byte RAM, 16K-byte ROM, BIOS, and monitor.

■ IDE ASSOCIATES INC

7 Oak Park Drive, Bedford, MA 01730 • 800-257-5027.

□ IDEAComm 1200 Integral Modem

Application • integral modem.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS 1.1 or 2.X required for software.

Warranty/Service Information • one-year warranty, parts and labor; dealer or vendor may provide service.

Features • documentation and diskette software supplied; 128K bytes of RAM required for software; full sized board • serial port included; fully Hayes compatible; one serial port, PC compatible; uses 8250 UART; serial port and modem may not be used simultaneously • automatic dial and answer; dual RJ-11 jacks for extension connection.

Price • \$545.

□ IDEAGraph

Application • graphics interface card.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; may not operate with systems having integral graphics boards; software supplied requires PC-DOS or MS-DOS 1.1 or higher.

Warranty/Service Information • one-year warranty, parts and labor; dealer or vendor may provide service.

Features • documentation and diskette; 128K-byte to 256K-byte display memory • full sized board; compatible with IBM Monochrome display, RGB, or NTSC color monitors; both compatible and incompatible modes of operation • maximum resolution is 1024x1024; multiple monitors supported; PC graphics software compatible • standard D-connector, NTSC, and RGB connectors • up to 4096 colors; hardware zoom to 16x • software configurable for any monitor; hardware fill command; hardware blinks, vector, draw, rectangle, etc.

Price • \$895 to \$1,895 depending on configuration.

□ IDEA 3278 Mainframe Communications Card

Application • 3278 emulation.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS/MS-DOS 1.1 or higher.



Microcomputer Expansion Boards

Warranty/Service Information • one-year warranty, parts and labor; dealer or vendor may provide service.

Features • software and documentation included • requires 128K bytes of RAM; full sized board • emulates 3278 via coaxial attachment at 2.35M bps to control unit • PC printer supported in emulation mode; configurable keyboard; extensive diagnostics • simulates power-off when PC is not in emulation mode; capture screens of data including attributes • 8088 on-board computer; BASIC and assembly language interface access to screen.

Price • \$1,195.

IDEABoard Memory Card

Application • memory board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; DOS 1.1 or higher required for software supplied.

Warranty/Service Information • one-year warranty, parts and labor; vendor or dealer may provide service.

Features • documentation and software included • 256K-byte maximum memory on board; 64K-byte minimum memory; requires 256K-byte minimum memory installed on PC for board use • full-length board; RAM disk support; parity-checking memory uses standard memory chips.

Price • \$239 for 64K bytes to \$449 for 256K bytes.

IDEA Mini I/O Card

Application • multi-I/O board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; DOS 1.1 or higher required for software supplied.

Warranty/Service Information • one-year parts and labor warranty; dealer or factory may provide service.

Features • documentation and disk supplied; parallel port and clock/calendar; dual serial ports optional; uses half-size slot in XT • up to 2 PC-compatible serial ports configurable as COM1,2; uses 8250 UART • PC-compatible parallel port; parallel port may be addressed as LPT1,2; interface connectors mount through back panel • battery operated clock; software provided for reading and setting clock.

Price • \$175 to \$295 depending on configuration.

IDEA Combination Card

Application • multifunction card with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS/MS-DOS 1.1 or higher required for software supplied.

Warranty/Service Information • one-year warranty, parts and labor; dealer or vendor may service.

Features • documentation and software supplied • 256K bytes of RAM maximum; board available and operational without memory; memory on board requires that PC have a minimum of 256K bytes already installed; full-sized board • clock/calendar, serial port, parallel port, hard disk interface available; RAM disk support • parity-checking memory uses standard memory chips • single serial port optional and PC compatible; serial port uses 8250N UART; no support for current-loop interface • print spooler • PC-compatible parallel port; parallel port may be addressed as LPT1,2; optional rear mounting bracket for all interface connectors • battery operated clock with software to set and read clock.

Price • \$256 to \$599 depending on options; a 64K-byte memory system with serial port is \$329.

IDEA Net

Application • LAN interface card.

Computer/Operating Systems Supported • IBM PC or other

systems which are hardware compatible • DOS 2.0 or higher required.

Warranty/Service Information • one-year warranty, parts and labor; dealer or vendor may service.

Features • documentation and some software included, other software optional • 128K-byte RAM required for software • full-length board; coaxial cable connection for LAN; 800K-bps data rate on network; file transfer, disk sharing, printer sharing, file lock and diagnostics supported.

Price • \$595 for hardware interface board; \$795 for software.

IMAGE TECHNOLOGY INC

5994 South Street, Paul Way, Littleton, CO 80121 • 303-794-2074.

Function Pak 512

Application • multifunction card with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible • PC-DOS/MS-DOS required for operation of supplied software.

Warranty/Service Information • one-year warranty; vendor provides service.

Features • documentation, RAM disk software, print spooler, memory utilities provided • 512K-byte RAM maximum on board; minimum purchase system is 64K bytes but board will operate without memory; PC must have 256K bytes memory installed for memory on board to be used • clock/calendar, serial, parallel, and game port—second serial port optional • parity-checking memory uses standard memory chips; game port and second serial port use piggyback board • memory may be added in 64K-byte increments; dual serial ports available, PC compatible; serial ports may be addressed as COM1,2; uses 8250 UART; special ribbon cable attachment for second serial port • PC-compatible parallel port, not configurable as LPT2 or 3 • lithium battery operated clock; software supplied to set and read clock • PC-compatible game port optional.

Price • \$349 for 64K bytes to \$839 for 512K bytes; second serial port and game port optional.

INTELLIGENT TECHNOLOGY INTERNATIONAL CORP

151 University Avenue, Palo Alto, CA 94301 • 415-328-2411.

PC Exchange

Application • voice/data communication support.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; MS-DOS or PC-DOS required.

Warranty/Service Information • 90-day warranty; vendor provides service.

Features • software disk and documentation included • requires 256K-byte RAM • integral modem, serial port, clock/calendar; serial port uses 8250 UART • telephone management and asynchronous communication software included • clock/calendar used for appointment management • 3270 SNA emulation, 3770 RJE emulation, bisync emulation and DEC VT-100 emulation available.

Price • \$1,295 and up, depending on software options.

KENSINGTON MICROWARE

251 Park Avenue South, New York, NY 10010 • 212-475-5200.

DataCom 1200 Modem

Application • integral modem.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides service.



Microcomputer Expansion Boards

Features • complete manual and cables included; half sized board • fully Hayes compatible; PC-compatible serial port addressing but no separate serial connector; uses 8250B UART • includes RELAY asynchronous communication support software package.

Price • \$595.

■ LNW COMPUTERS

2620 Walnut Avenue, Tustin, CA 92680 • 714-641-8850.

Busboard Multifunction

Application • full-feature multifunction board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides servicing; repair after warranty period at \$50 plus parts and shipping.

Features • modular structure with up to 8 modules per board • full configuration takes up 2 slots in PC; maximum of 512K bytes of RAM; 64K-byte RAM minimum; no restrictions on minimum memory on PC for board to be used; full-length board • RAM disk support; parity-checking memory uses standard memory chips; memory can be added in 64K-byte increments • optional CP/M co-processor, serial port, parallel port, floppy disk controller, game port, parallel I/O, A/D converter, and modem board; up to 2 serial ports, PC compatible; serial ports addressed as COM1,2; uses 8250 UART • no current-loop interface support • up to 2 parallel ports, PC compatible; parallel ports addressable as LPT1,2,3 • battery operated clock; software to set and read clock provided • game adapter is PC compatible • Z-80 CP/M co-processor module runs CP/M software • floppy disk controller handles 5.25 or 8-inch format • A/D converter is 16 channels • AT&T 103 modem board to 300-bps asynchronous communication.

Price • basic board is \$349.95; co-processor is \$249.95; serial ports are \$89.95 each; parallel ports are \$69.95 each; clock module is \$69.95; floppy disk controller is \$219.95; game port is \$69.95; 8-bit parallel I/O is \$69.95; 16-channel A/D is \$109.95, and modem is \$149.95.

■ LOMAS DATA PRODUCTS

66 Hopkinton Road, Westboro, MA 01581 • 617-366-6434.

Thunder 186

Application • single board computer.

Computer/Operating Systems Supported • S-100 (IEEE-696) interface; supports MS-DOS, Concurrent CP/M-86 Version 3.1.

Warranty/Service Information • one-year warranty; vendor provides servicing; labor charge \$35 per hour plus parts and shipping after warranty period.

Features • single board computer; uses Intel 80186 microprocessor, 8 MBz • includes disk controller, 2 serial ports, printer port • CP/M-86 included • 256K-byte RAM maximum on board; 128K-byte RAM minimum on board • RAM disk software provided; parity-checking memory using standard memory chips; optional piggyback board • two serial ports using 8251 USART; optional communication software • parallel printer port • delivered first quarter 1984.

Price • \$1,595.

Lightning 286

Application • single board computer.

Computer/Operating Systems Supported • S-100 (IEEE-696) interface • supports MS-DOS, Concurrent CP/M-86 Version 3.1, UNIX.

Warranty/Service Information • one-year warranty; vendor provides servicing; labor charge \$35 per hour plus parts and shipping after warranty period.

Features • single board computer; uses Intel 80286 microprocessor; includes disk controller, 2 serial ports, printer port;

CP/M-86 included; 256K-byte RAM maximum on board; 128K-byte RAM minimum on board; RAM disk software provided; parity-checking memory using standard memory chips; optional piggyback board • 2 serial ports using 8251 USART; optional communication software; parallel printer port.

Price • \$1,395.

■ MA SYSTEMS

2015 O'Toole Avenue, San Jose, CA 95131 • 408-943-0596.

Data Line Jr

Application • disk controller.

Computer/Operating Systems Supported • IBM PCjr; DOS 2.X required.

Warranty/Service Information • one-year warranty; vendor supplies service; minimum \$25 plus parts and shipping for repairs beyond warranty period.

Features • disk controller handles standard or half-height drives; compatible with PCjr software.

Price • \$139, disk drives not included.

I/O Processor

Application • I/O co-processor.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; MS-DOS/PC-DOS.

Warranty/Service Information • 2-year warranty; vendor provides servicing; minimum \$25 charge plus parts and shipping for out of warranty service.

Features • 64K-byte printer buffer on board; requires 64K bytes of RAM in PC; full sized board • 2 parallel ports, one serial port; serial port is PC-compatible parallel ports; parallel and serial ports are configurable in system addressing • Z-80 computer on board for I/O handling • software supplied for print spooling, copying to multiple printers; user programmable • delivery second quarter 1984.

Price • \$399.

Jr Expander

Application • display/memory board.

Computer/Operating Systems Supported • IBM PCjr.

Warranty/Service Information • one-year warranty; vendor provides servicing; minimum \$25 charge plus parts and shipping for out of warranty repair.

Features • 64K bytes of RAM on board; PCjr must have 64K bytes of RAM installed before board can be used; half-length card • 80-column display adapter; parity-checking memory uses standard memory chips • monochrome, RGB, or NTSC display; 16-color display; 320x200 or 640x200 resolution • compatible with PCjr software • delivery second quarter 1984.

Price • \$139.

PC Peacock

Application • graphics board/parallel port.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • 2-year warranty; distributor or vendor may provide servicing; minimum charge of \$25 for out of warranty service.

Features • includes documentation, bracket for interface connector; full sized board • includes parallel interface which is PC compatible; configurable as LPT1,2,3 • light pen interface is PC compatible • color graphics interface—NTSC or RGB; 640x200 or 320x200 resolution; has fully compatible mode of operation • in non-compatible mode, supports 16 foreground colors; supports an RGB and NTSC monitor concurrently • RCA jack and D-connector provided • special interface to TV provided.

Price • \$399.



Microcomputer Expansion Boards

■ MAYNARD ELECTRONICS

400 East Semoran Boulevard, Suite 207, Casselberry, FL 32707
• 305-331-6402.

Sandstar Memory Card

Application • multifunction card with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS, MS-DOS, CP/M, or Concurrent CP/M.

Warranty/Service Information • one-year warranty, parts and labor; vendor provides service, 48-hour turnaround; \$35 minimum charge for service after warranty period.

Features • RAM disk and driver software included • 256K bytes of RAM maximum on board; board available without memory • no restrictions on minimum memory installed on PC for board to operate; full-length board • 3 modules I/O or hard disk controller may be added to board; option for parallel, serial, or game port; optional clock/calendar • memory is parity checking and uses standard memory chips; additional memory module for expansion to 576K-byte RAM available; memory may be added in 64K-byte increments • up to 2 serial ports optional, PC compatible; serial ports addressable as COM1, COM2; uses 8250B UART • PC-compatible parallel port; parallel port may be configured as LPT1 or 2; external mounting bracket for interface connectors • clock uses lithium battery; software provided to set and read clock • game port adapter is PC compatible • hard disk controller will control Winchester drive (optional).

Price • basic board is \$199; each 64K-byte increment of memory is \$75; serial port is \$95; parallel port \$59; same port \$49; clock/calendar \$55; hard disk controller \$495; Winchester drive \$995.

Sandstar Multifunction Card

Application • multifunction card without memory.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS, MS-DOS, CP/M, or Concurrent CP/M.

Warranty/Service Information • one-year warranty, parts and labor; vendor provides service, 48-hour turnaround; \$35 minimum charge for service after warranty period.

Features • full-length board; 6 modules I/O or hard disk controller and 3 I/O modules may be added to board • option for parallel, serial, or game port; optional clock/calendar • memory is parity checking and uses standard memory chips • up to 2 serial ports optional, PC compatible; serial ports addressable as COM1, COM2; uses 8250B UART • PC-compatible parallel port; parallel port may be configured as LPT1 or 2; external mounting bracket for interface connectors • clock uses lithium battery; software provided to set and read clock • game port adapter is PC-compatible • hard disk controller will control Winchester drive (optional).

Price • basic board is \$89; serial port is \$95; parallel port \$59; game port \$49; clock/calendar \$55; hard disk controller \$495; Winchester disk drive \$995.

Sandstar MODFC

Application • disk controller card.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS, MS-DOS, CP/M.

Warranty/Service Information • one-year warranty; vendor provides service, 48-hour turnaround; minimum charge of \$35 for service after warranty period.

Features • floppy disk controller; other Sandstar modules may be attached to product; 3 I/O modules or hard disk controller may be attached • option for parallel, serial, or game port; optional clock/calendar; memory is parity checking and uses standard memory chips; up to 2 serial ports optional, PC compatible • serial ports addressable as COM1, COM2; uses 8250B UART • PC-compatible parallel port; parallel port may be configured

as LPT1 or 2; external mounting bracket for interface connectors • clock uses lithium battery; software provided to set and read clock • same port adapter is PC compatible • hard disk controller will control Winchester drive (optional); standard floppy disk interface handles two 5.25- or 8-inch drives.

Price • basic board is \$265; serial port is \$95; parallel port is \$59; game port is \$49; clock/calendar is \$55; hard disk controller is \$495; Winchester disk drive is \$995.

■ MBC CORPORATION

254 Tosca Drive, Stoughton, MA 02072 • 617-344-1990.

Dascon I

Application • data acquisition system.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software provided.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • data acquisition software included; graphics plotting requires color graphics adapter • clock/calendar is battery operated Nicad rechargeable; software provided to set and read clock • 4 analog input channels with overvoltage protection; 4 analog output channels 30dB switchable filters • 2 RTD interfaces; 2 precision adjustable voltage references; 2 precision 1-mA constant current sources; 2-, 3-, 4-wire bridge operation; external interrupt capabilities; 16-channel throughput • lab data gathering and control applications.

Price • \$485.

■ MICROGRAPHICS TECHNOLOGY

1820 McCarthy Boulevard, Milpitas, CA 95035 • 408-996-8423 Ext 285.

Master Graphics I Adapter

Application • graphics adapter and parallel printer port.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; optional software requires PC-DOS or MS-DOS.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • manual and diagnostics disk provided; graphics software optional • 64K-byte RAM on board graphics memory; full sized card • parallel port is PC compatible; parallel port may be addressed as LPT1 or 2 • light pen interface is PC compatible • monochrome display, color NTSC or RGB interface; 640x200 resolution, 16-color maximum; 768x340 resolution with monochrome display; extended and compatible modes of operation; optional graphics software for extended mode • phono and D-connectors • special interrupt control for animation in extended mode.

Price • \$579.

■ MICROLOG INC

222 RF 59, Suffern, NY 10901 • 914-368-0353.

Baby Blue II

Application • co-processor board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; DOS 1.1, 2.0 required for software provided; runs CP/M-80.

Warranty/Service Information • 90-day warranty; dealer or vendor may service product.

Features • documentation and software diskette provided; RAM disk and print spooler provided; up to 256K bytes of RAM on board; 64K bytes of RAM minimum; PC must have 256K bytes of RAM installed for board memory to be used; full sized board • clock/calendar, 2 serial ports, parallel port • terminal emulator utility provided • uses standard memory chips; memory available in 64K-byte increments • 2 serial ports are PC compatible;



Microcomputer Expansion Boards

configurable as COM1,2; uses 8250 UART • smart terminal emulation package for Hazeltine 1500 or TVI 950 • PC-compatible parallel port is LPT1; mounting bracket for I/O interface connectors • lithium battery for clock; software supplied to set and read clock • Z-80 co-processor for CP/M emulation; intercommunication between Z-80 and 8088 is supported.

Price • \$695 for 64K-byte minimum configuration; \$995 for 256K bytes.

■ MICRO-SCI CORPORATION

2158 South Hathaway Street, Santa Ana, CA 92705 • 714-241-5600.

Gameport III

Application • game port adapter.

Computer/Operating Systems Supported • Apple III.

Warranty/Service Information • 120-day warranty; vendor provides servicing; national third-party maintenance in negotiation.

Features • diskette and instructions included; single game port supports Apple II joysticks or paddles and game software.

Price • \$74.95.

80/64 Lower Case E Card

Application • display interface.

Computer/Operating Systems Supported • Apple IIe; Apple DOS 3.3; may function on Apple-compatible systems.

Warranty/Service Information • 120-day warranty; vendor provides service.

Features • includes 50-page manual, no software; 64K-byte display buffer; 64- or 80-column display interface; 560x192 graphics resolution; diskette patch to DOS provided; supports all standard Apple software.

Price • \$169.

■ MICROTEK INC

4750 Viewridge Avenue, San Diego, CA 92123 • 619-569-0900.

Multifunction Board

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; DOS 2.X required for software provided.

Warranty/Service Information • 2-year warranty; vendor provides servicing.

Features • software diskette and documentation included • 384K bytes of RAM maximum on board; board may be purchased and used with no memory; PC must have minimum 256K bytes of RAM installed for board to be used with memory • clock/calendar, serial port, and parallel port; RAM disk software; parity checking memory uses standard memory chips • single PC-compatible serial port; can be configured as COM1 or 2 • no current-loop interface support; 8250 UART • PC-compatible parallel port; parallel port addressable as LPT1,2,3; interface connectors mount through back panel • battery operated clock; software supplied to set and read clock.

Price • \$395 fully populated with memory.

Serial/Parallel Board

Application • multifunction I/O without memory.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • 2-year warranty; vendor provides servicing.

Features • clock/calendar, serial port, and parallel port; RAM disk, software; parity-checking memory uses standard memory chips • single PC-compatible serial port; 8250 UART; can be

configured COM1 or 2 • PC-compatible parallel port; parallel port addressable as LPT1,2,3 • interface connectors mount through back panel • no current loop interface support • battery operated clock; software supplied to set and read clock.

Price • \$195.

■ MMC INTERNATIONAL

511 Eleventh Avenue South, Suite 429, Minneapolis, MN 55415 • 612-333-4303.

Combination Memory Board

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; software requires PC-DOS, MS-DOS.

Warranty/Service Information • 90-day warranty; vendor provides servicing; minimum \$50 charge plus parts and shipping for repairs after warranty expires.

Features • modem software optional; 384K-byte RAM maximum on board; 64K-byte RAM minimum; motherboard must be fully populated for memory to be used; full-length board • clock/calendar, serial port and parallel port; up to 8 serial ports may be attached • parity-checking memory uses standard memory chips; memory available in 64K-byte increments • up to 8 serial ports; PC compatible; 8250 UART used • lithium clock battery; clock software sets and reads clock • parallel port is PC compatible.

Price • \$695 with 64K-byte RAM; \$1,229 with 384K-byte RAM; serial ports optional at extra cost.

■ MYLEX CORPORATION

5217 NW 79th Avenue, Miami, FL 33166 • 305-592-9669.

Mylex Chairman

Application • graphics board with parallel port.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; software provided requires PC-DOS or MS-DOS.

Warranty/Service Information • 90-day warranty; vendor provides servicing; \$35 minimum repair charge plus parts and shipping for out of warranty service.

Features • diskette, documentation, and mounting bracket included; graphics editor and other graphics programs included • parallel printer port is PC compatible and configurable as LPT1,2,3 • monochrome display compatible; color graphics in NTSC or RGB mode; color graphics in 320x200 4 color and 640x200 monochrome; monochrome display graphics in 320x200 with 4-shade grey scale or 640x200 monochrome; non-compatible mode offers color graphics in 640x200 4 color, 320x200 16 color, or 640x400 monochrome and monochrome display graphics in 640x200 4-shade, 640x400 one-shade, or 320x200 16-shade • standard 9-pin D and phono plug interface • 128K-byte RAM on board for custom character generation.

Price • \$595.

■ ORCHID TECHNOLOGY

47790 Westinghouse Drive, Fremont, CA 94539-7485 • 415-490-8586.

PCNet

Application • LAN interface board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS.

Warranty/Service Information • one-year parts and labor warranty; vendor will provide servicing.

Features • software and documentation included; 128K-byte RAM required; full sized board • CATV cable interface • over 1M-bps data rate • disk sharing, file transfer, electronic mail, gateways to communication and printer sharing • multiple file servers supported; servers are non-dedicated • disk cache.



Microcomputer Expansion Boards

Price • \$695.

PCnet Plus RAM

Application • LAN interface plus memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS.

Warranty/Service Information • one-year parts and labor warranty; vendor will provide servicing.

Features • software and documentation included • up to 256K bytes of RAM on board; board available with no memory installed; • 128K bytes of RAM required for LAN software; full sized board • CATV cable interface; over 1M-bps data rate • disk sharing, file transfer, electronic mail, gateways to communication and printer sharing; multiple file servers supported; servers are non-dedicated; disk cache.

Price • \$795.

PCnet Plus Diskless

Application • LAN plus PROM for diskless operation.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS.

Warranty/Service Information • one-year parts and labor warranty; vendor will provide servicing.

Features • on-board ROM supports booting system over PCnet from server; software and documentation included; 128K bytes of RAM required; full sized board • CATV cable interface • over 1M-bps data rate • disk sharing, file transfer, electronic mail, gateways to communication and printer sharing; multiple file servers supported; servers are non-dedicated; no floppy or hard disks required on system, since booting of operating system can take place over network.

Price • \$795.

Blossom

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; MS-DOS or PC-DOS.

Warranty/Service Information • one-year warranty, parts and labor; vendor provides servicing.

Features • documentation and software diskette included; multifunction basic board with add-on module; 384K bytes of RAM maximum; 64K-byte minimum RAM on board; motherboard must be fully populated for use; full-length board • clock/calendar, parallel port, serial port, PCnet daughterboard socket • RAM disk support; parity-checking memory uses standard memory chips; dealer may add additional memory • single serial port is PC compatible; port can be addressed as COM1 or 2 • current-loop interface support; uses 8250 UART • PC-compatible parallel port configurable as LPT1,2,3 • optional PCnet talk communication software • lithium battery clock; software supplied to set and read clock.

Price • \$365 for basic board with 64K-byte RAM.

PCnet/Blossom

Application • multifunction board with memory expansion and LAN interface.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; MS-DOS or PC-DOS.

Warranty/Service Information • one-year warranty, parts and labor; vendor provides servicing.

Feature • documentation and software diskette included; multifunction basic board with add-on module; 384K-byte RAM maximum; 64K-byte minimum RAM on board; motherboard must be fully populated for use; full-length board • clock/calendar, parallel port, serial port, PCnet daughterboard socket; RAM disk support; parity checking memory uses standard memory chips; dealer may add additional memory • single serial port is PC

compatible; port can be addressed as COM1 or 2; current-loop interface support; uses 8250 UART • PC-compatible parallel port configurable as LPT1,2,3 • optional PCnet Talk communication software • lithium battery clock; software supplied to set and read clock • CATV cable interface; over 1M-bps data rate • disk sharing, file transfer, electronic mail, gateways to communication and printer sharing; multiple file servers supported; servers are non-dedicated; disk cache.

Price • \$795 for basic board socketed for 384K bytes but without memory.

PCnet Daughter Board

Application • add LAN interface to Blossom board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; MS-DOS or PC-DOS.

Warranty/Service Information • one-year warranty, parts and labor; vendor provides servicing.

Features • daughterboard which attaches to Blossom multifunction board • CATV cable interface • over 1M-bps data rate; disk sharing, file transfer, electronic mail, gateways to communication and printer sharing; multiple file servers supported; servers are non-dedicated; disk cache.

Price • \$495.

■ PARADISE SYSTEMS INC

150 North Hill Drive, Brisbane, CA 94005 • 415-468-6000.

Multi Display Card

Application • display interface and parallel port.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; software supplied requires PC-DOS or MS-DOS.

Warranty/Service Information • 90-day warranty with proof of purchase; vendor will provide servicing.

Features • software diskette and documentation included; 32K-byte graphics memory • parallel port is PC compatible; parallel port may be addressed as LPT1,2,3; parallel interface via ribbon cable • monochrome display or color monitor interface (RGB or NTSC); color resolution 320x200, monochrome is 640x200; compatible with PC software; flicker-free scrolling; D-connector for monochrome display and RGB, RCA jack for NTSC; emulates a combination of an IBM Color Graphics Adapter and Monochrome Display Adapter in a single board.

Price • \$595.

■ PC HORIZONS

17802 Irvine Boulevard, Tustin, CA 92680 • 714-953-5396.

PC-XTRA

Application • bus expander for PC.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; vendor will not commit to operation on compatible systems.

Warranty/Service Information • 90-day warranty; vendor provides servicing.

Features • bus expansion chassis for PC; will not accept color graphics adapter; includes interface card for PC, cable, and chassis with power supply; all chassis slots accommodate long cards styling consistent with PC; remote shutoff power supply powers bus expander • off when PC is turned off.

Price • \$549.

■ PC PRODUCTS

2907 Ladybird Lane, Dallas, TX 75220 • 214-357-5300.

Rainbow Color Graphics Multifunction Board

Application • color graphics and multifunction board.

Computer/Operating Systems Supported • IBM PC or other



Microcomputer Expansion Boards

systems which are hardware compatible; PC-DOS/MS-DOS required for software supplied.

Warranty/Service Information • one-year warranty; vendor or dealer may provide servicing.

Features • diskette, cables and bracket, and documentation included; 128K-byte graphics memory; clock/calendar, serial port, parallel port, game and light pen port; display memory may be upgraded from 32K-byte RAM to 128K-byte RAM • single serial port is PC compatible; serial port configurable as COM1,2; uses 8250 UART • PC-compatible parallel port; parallel port may be addressed as LPT1,2,3; bracket for mounting serial and parallel interface connectors • battery operated clock/calendar; software package to set and read clock; PC-compatible game port and light pen interfaces • monochrome Display and Color graphics interface; 640x400 4-color display in color mode maximum PC-compatible mode of operation; supports color monitor and monochrome display at the same time; high-resolution mode and graphics on monochrome display supported by included special software; D-connector and RCA jack for interface to RGB, NTSC color or monochrome display.

Price • \$695 with 32K-byte display memory.

Hard Disk/Cartridge Tape Controller

Application • hard disk and tape cartridge controller.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required.

Warranty/Service Information • one-year warranty; vendor or dealer may provide service.

Features • 10K-byte disk buffer memory on board; piggyback board may be attached using 256K-byte RAM chips to give 2M-byte memory; no restrictions on minimum installed memory in PC for use of memory piggyback; full sized board • floppy disk controller handles 5.25 or 8-inch drives • parity-checking memory using 256K-byte RAM chips • controls Winchester disks and compatible with DOS; cartridge tape backup with utility programs provided.

Price • price not yet established.

Piggy Back Memory Board

Application • add memory to PC or piggyback on other boards.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor or dealer may provide service.

Features • documentation and RAM disk program provided; PC-DOS/MS-DOS required for RAM disk program; up to 2M-byte RAM using 256K-byte RAM chips; up to 512K bytes using standard 64K-byte chips; memory management unit permits addressing to 8M bytes of RAM; full size board • parity checking memory; memory added in 64K- or 256K-byte increments depending on chip used • board is available standalone or as piggyback for other PC product boards.

Price • price not yet established.

■ PC TECHNOLOGY

3714A Silver Star Road, Orlando, FL 32808 • 800-874-7062.

RAM BOARD

Application • memory expansion board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty, parts and labor; vendor provides servicing; \$25 basic repair charge plus parts and shipping after warranty.

Features • documentation included; 256K bytes of RAM maximum on board; 64K bytes of RAM minimum; PC motherboard must be fully populated for board to operate; half size board •

parity checking memory uses standard memory chips; memory may be added in 64K-byte increments.

Price • \$159 for 64K-byte RAM; \$65 for each 64K-byte increment.

■ PC TECHNOLOGIES CORPORATION

2215 Parameter Park, Suite 22, Atlanta, GA 30341 • 404-452-7576.

Encore

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; DOS 2.0 or higher required for software included.

Warranty/Service Information • 2-year warranty; vendor provides servicing.

Features • software supplied includes clock driver, print spooler, and RAM disk; 256K bytes of RAM maximum; board can be purchased and will function without memory; motherboard must be fully populated before use of memory; full sized board • serial port and parallel port; parity checking memory uses standard memory chips • single PC-compatible serial port; serial port may be configured as COM1,2; uses 8250 UART • no support for current-loop interface • PC-compatible parallel port may be configured as LPT1,2,3 • interface connectors mount through back panel.

Price • \$325 to \$595 depending on memory.

Encore Plus

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; DOS 2.0 or higher required for software included.

Warranty/Service Information • 2-year warranty; vendor provides servicing.

Features • software supplied includes clock driver, print spooler, and RAM disk; 256K bytes of RAM maximum; board can be purchased and will function without memory; motherboard must be fully populated before use of memory; full sized board • clock calendar, serial port, and parallel port; parity-checking memory uses standard memory chips • single PC-compatible serial port; serial port may be configured as COM1,2 • no support for current loop interface • PC-compatible parallel port may be configured as LPT1,2,3 • interface connectors mount through back panel; uses 8250 UART • Nicad rechargeable battery for clock; clock driver software sets and reads clock; leap year detection.

Price • \$350 to \$620 depending on memory.

Cue Card

Application • multifunction I/O card without memory.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • 2-year warranty; vendor provides servicing.

Features • full sized board; clock/calendar, serial port, and parallel port; single PC-compatible serial port; serial port may be configured as COM1,2; uses 8250 UART • no support for current-loop interface • PC-compatible parallel port may be configured as LPT1,2,3 • interface connectors mount through back panel • Nicad rechargeable battery for clock; clock driver software sets and reads clock; leap year detection.

Price • \$395.

■ PC WARE INC

4883 Tonino Drive, San Jose, CA 95/36 • 408-978-8626.

4-Function Short Board

Application • multifunction board with memory.

Computer/Operating Systems Supported • IBM PC or other



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systems which are hardware compatible; PC-DOS or MS-DOS required for supplied software.

Warranty/Service Information • 90-day warranty; vendor provides servicing.

Features • clock driver software provided; 256K bytes of RAM maximum on board; 64K bytes of RAM minimum on board; PC motherboard must be fully populated for use; half sized board • optional clock/calendar, serial port, parallel port; parity-checking memory uses standard memory chips; memory may be added in 64K-byte increments • single PC-compatible serial port; port may be addressed as COM1 or 2; support for current-loop interface; 8250 UART • PC-compatible parallel port may also be used as general-purpose parallel I/O port; parallel port may be addressed as LPT1,2,3 • standard interface connectors for ports mounted through back panel • lithium battery clock; software provided to set and read clock.

Price • \$229.95 for 64K bytes; \$269.95 for 128K bytes; \$309.95 for 192K bytes; \$349.95 for 256K bytes; serial port is \$94.95; parallel port is \$89.95; clock/calendar is \$74.95.

■ PERCOM DATA

11220 Pagemill Road, Dallas, TX 75243 • 214-340-5800.

□ PERCOMNET

Application • LAN interface board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS/MS-DOS or UNIX software required.

Warranty/Service Information • 90-day warranty; vendor provides servicing.

Features • board available separately or part of kit including software and cables; 64K-byte dual-port RAM included; full sized board • optional DES encryption; parity-checking memory uses standard memory chips • dual twisted-pair shielded cable used for transport; 1M-bps data rate; disk sharing, file transfer, electronic mail, printer sharing supported; token passing network technology using 2840 chips; 500 feet between boards; repeater for operation to 10,000 feet; timer and interrupt facilities.

Price • \$595 for single board; \$1,695 for evaluation kit including 3 boards, software, cables.

■ PERSYST PRODUCTS

1580 Rockwell Boulevard, Suite A, Irvine, CA 92714 • 714-859-8871.

□ DCP-88

Application • communication co-processor.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; MS-DOS or PC-DOS.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • documentation and software diskette included; 64K-byte dual port memory on board; full sized board; 2 to 4 serial ports supported, not PC compatible • supports synchronous and asynchronous protocols including SDLC, HDLC, bisync; high-speed parallel port not standard PC port; on-board 8088 micro-processor.

Price • \$695 to \$945 depending on options.

□ SB-384

Application • communication co-processor.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; MS-DOS or PC-DOS.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • documentation and software diskette included; 64K-byte dual port memory on board; full sized board; 2 to 4 serial ports supported, not PC compatible • supports synchronous and

asynchronous protocols including SDLC, HDLC, bisync; high-speed parallel port not standard PC port; on-board 8088 micro-processor.

Price • \$695 to \$945 depending on options.

□ SB-384

Application • multifunction card with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software supplied.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • includes software diskette with print spooler, RAM disk and clock driver; 256K bytes of RAM maximum; 64K bytes of RAM minimum on board; fully populated motherboard required for use; full sized board • clock/calendar, parallel port, serial port; parity checking memory uses standard memory chips; memory may be added in 64K-byte increments • single serial port is PC compatible; port may be addressed as COM1 or 2 8250 UART • no support for current-loop operation • PC-compatible printer port may be configured as LPT1 or 2; special cliffhanger cable for parallel port interface connection • Nicad rechargeable battery for clock; software clock driver sets and reads clock; leap year and rollover feature.

□ Time Spectrum

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software supplied.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • RAM disk, print spooler, and clock driver software supplied; 512K bytes of RAM maximum on board; board can be purchased and operated without memory • no restrictions on minimum memory on PC for proper operation of board; full sized board • 2 serial ports, parallel port, clock/calendar; parity-checking memory uses standard memory chips • IBM diagnostics will not operate properly on serial ports • memory may be added in 64K-byte increments • 2 serial ports, second using cliffhanger cable for attachment; ports are PC compatible in general but have more functions; no support for current-loop interface; ports may be configured as COM1 or 2 • PC-compatible parallel port may be configured as LPT1 or 2; cliffhanger cable used for parallel interface connector • Nicad clock battery; software driver sets and reads clock; leap year and rollover provision.

Price • \$318 for board without memory; \$1,190 for board with 512K-byte RAM.

■ PRACTICAL PERIPHERALS

31245 La Boya Drive, Westlake Village, CA 91362 • 213-991-8200.

□ Printerface

Application • printer interface.

Computer/Operating Systems Supported • Apple II, IIe, II+; DOS 3.3.

Warranty/Service Information • 5-year replacement warranty; vendor will provide service.

Features • manual and cable for printer included; single parallel port; software for formatting listings of BASIC program; video echo of data while printing; self testing feature.

Price • \$75.

□ Graphicard

Application • graphics printer interface.

Computer/Operating Systems Supported • Apple II, IIe, II+; DOS 3.3.



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Warranty/Service Information • 5-year replacement warranty; vendor will provide service.

Features • manual and cable for printer included; single parallel port; software for formatting listings of BASIC program • video echo of data while printing; self testing feature; supports many different graphics printers of various resolutions; operates with Apple graphics commands.

Price • \$99.

Proclock

Application • clock/calendar board.

Computer/Operating Systems Supported • Apple II, IIe, II+; DOS 3.3.

Warranty/Service Information • 5-year replacement warranty; vendor will provide service.

Features • adds time and date stamping to system; lithium battery clock; utilities diskette provides for setting clock, reading clock, and interface to programming languages; 12-hour or 24-hour time format.

Price • \$139.

■ PROFIT SYSTEMS

30200 Telegraph Road, Suite 132, Birmingham, MI 48010 • 313-647-5010.

ADRAM ELITE

Application • multifunction card with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS/MS-DOS or Concurrent CP/M.

Warranty/Service Information • one-year warranty; vendor provides servicing, 24-hour turnaround.

Features • taskmaster program provides concurrent tasks under PC-DOS • 512K-byte RAM maximum on board; 64K bytes supplied minimum, but board will operate depopulated; motherboard of PC must be fully populated for memory to operate; full-length board • clock/calendar, serial port, parallel port; RAM disk and print spooler provided; parity-checking memory uses standard memory chips; memory may be added in 64K byte increments • single PC-compatible serial port may be addressed as COM1 or 2; 8250 UART • no support for current-loop interface • PC-compatible parallel port may be addressed as LPT1,2,3 • interface connectors mount through back panel • Nicad rechargeable battery clock; software provided to set and read clock; leap year detection • taskmaster program provides basic concurrency features for PC-DOS/MS-DOS.

Price • \$475 for board with 64K-byte RAM; \$100 for each 64K-byte increment.

Multigraph

Application • graphic display adapter.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS/MS-DOS required for graphics drivers supplied.

Warranty/Service Information • one-year warranty; vendor provides servicing, 24-hour turnaround.

Features • software drivers supplied; 32K-byte display memory; 64K-byte RAM required for operation of software; full-length board • parallel printer port is PC compatible; printer may be addressed as LPT1,2,3 • display supports Monochrome Display, NTSC or RGB monitors but not simultaneously; piggyback board for enhanced graphics functions; color resolution 640x200 or 640x400 16-color maximum; monochrome display resolution 132-column text, 720x700 graphics maximum • 32-bit internal architecture for high speed; D-connector standard, RCA composite connector optional.

Price • \$499 for PC-compatible color or monochrome capability, \$240 for high-resolution color graphics piggyback; \$50 for

monochrome graphics; \$65 for parallel port.

ADDRAM +

Application • multifunction card with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS/MS-DOS or Concurrent CP/M.

Warranty/Service Information • one-year warranty; vendor provides servicing, 24-hour turnaround.

Features • taskmaster program provides concurrent tasks under PC-DOS; 512K-byte RAM maximum on board; 64K bytes supplied minimum, but board will operate depopulated; motherboard of PC must be fully populated for memory to operate; full-length board • clock/calendar, serial port; RAM disk and print spooler provided; parity-checking memory uses standard memory chips; memory may be added in 64K-byte increments • dual PC-compatible serial ports may be addressed as COM1 or 2; 8250 UART • no support for current-loop interface • interface connectors mount through back panel • Nicad rechargeable battery clock; software provided to set and read clock; leap year detection • taskmaster program provides basic concurrency features for PC-DOS/MS-DOS.

Price • \$475 for board with 64K-byte RAM; \$100 for each 64K-byte increment.

■ PURE DATA LIMITED

860 Denison Street, Unit 12, Markham, ON L3R,4H2 • 416-498-1616.

PDIB-128/384

Application • bubble memory disk emulator board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; DOS 2.X required.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • documentation and software included; up to 384K-byte bubble memory; minimum of 128K-byte bubble memory on board; 256K-byte PC required • optional software for password protection will require BIOS parameter • 128K-byte board is half-length, others are full length • emulates floppy disk drive in all respects; error detection and correction on bubble memory; boot from bubble supported; suitable for harsh environments where floppy disk is unadvisable.

Price • \$774 for 128K bytes; \$1,941 for 384K bytes.

PDI 464 SP or SS

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; MS-DOS or PC-DOS required for software utilities provided.

Warranty/Service Information • one-year warranty; vendor provides servicing, 24-to 36-hour turnaround.

Features • extensive installation instructions and software diskette provided; 256K-byte RAM maximum on board; board is available with no memory; 256K-byte minimum memory must be installed on PC before use of memory on board; full-sized board, half length available • clock/calendar, parallel port, serial port; SS model has 2 serial ports and no parallel port; can be configured as SS or DS RAM disk • parity-checking memory uses standard memory chips; up to 2 serial ports may be addressed as COM1 through COM4; PC-compatible serial interfaces support current loop operation; uses 8250 UART; mounting bracket for serial connectors • PC-compatible parallel port may be addressed as LPT1,2,3 • lithium battery clock; software clockdriver for setting and reading clock; leap year detection • serial and parallel print spoolers with selectable buffer size; parity trap software provides graceful recovery from parity errors • 3 level concurrency support through spooling.

Price • \$462 for 64K-byte RAM; \$696 for 256K-byte RAM.



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PD1208-SP

Application • multifunction I/O card without memory.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS 2.X required for software supplied.

Warranty/Service Information • one-year warranty; vendor provides servicing, 24- to 36-hour turnaround.

Features • installation guide and manual plus software diskette included; full-length board • clock/calendar, serial port, parallel port; single serial port is PC-compatible • supports current-loop interface; addressable as COM1 or 2; 8250 UART • PC-compatible parallel port can be addressed as LPT1,2,3 • interface connectors for ports mount on bracket provided • lithium battery clock; software provided to set and read clock; leap year detection.

Price • \$232.

PD1208-SS

Application • multifunction I/O card without memory.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS 2.X required for software supplied.

Warranty/Service Information • one-year warranty; vendor provides servicing, 24- to 36-hour turnaround.

Features • installation guide and manual plus software diskette included; full-length board • clock/calendar, dual serial ports; serial ports are PC-compatible; supports current-loop interface; addressable as COM1 or 2; 8250 UART • PC-compatible parallel port can be addressed as LPT1,2,3 • interface connectors for ports mount on bracket provided • lithium battery clock; software provided to set and read clock; leap year detection.

Price • \$271.53.

■ QUADRAM

4355 International Boulevard, Norcross, GA 30093 • 404-923-6666.

Quadboard

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software utilities provided.

Warranty/Service Information • one-year limited warranty; vendor, dealer, or Xerox may provide servicing.

Features • instruction manual and software diskette included; up to 384K bytes of RAM may be installed on board; board is available without memory; motherboard must be fully populated for memory to operate; full sized board • clock/calendar, serial port, and game port • second serial port or parallel port • RAM disk software operates with all DOS versions • parity-checking memory uses standard memory chips; memory expansion in 64K-byte increments • either one serial and one parallel port or 2 serial ports supported; serial ports are PC-compatible and addressed as COM1 or 2; no support for current-loop interface; ribbon cable mounting for serial and parallel interface connector(s) • PC-compatible parallel port is configurable as LPT1,2,3 • rechargeable clock battery; software clock driver sets and reads clock • PC-compatible game port; disk cache software included.

Price • \$295 with no memory; \$795 fully populated.

Quadboard II

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software utilities provided.

Warranty/Service Information • one-year limited warranty; vendor, dealer, or Xerox may provide servicing.

Features • instruction manual and software diskette included;

up to 256K bytes of RAM may be installed on board; board is available without memory; motherboard must be fully populated for memory to operate; full sized board • clock/calendar, serial port, parallel port • RAM disk software operates with all DOS versions; parity-checking memory uses standard memory chips; memory expansion in 64K-byte increments • serial port is PC compatible and addressed as COM1 or 2; no support for current-loop interface; ribbon cable mounting for serial and parallel interface connector • PC-compatible parallel port is configurable as LPT1,2,3 • rechargeable clock battery; software clock driver sets and reads clock; disk cache software included.

Price • \$295 to \$595 depending on memory.

Quad 512+

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software utilities provided.

Warranty/Service Information • one-year limited warranty; vendor, dealer, or Xerox may provide servicing.

Features • instruction manual and software diskette included; up to 512K bytes of RAM may be installed on board; board is available without memory; motherboard must be fully populated for memory to operate; full sized board • RAM disk software operates with all DOS versions • parity-checking memory uses standard memory chips; memory expansion in 64K-byte increments • serial port is PC-compatible and addressed as COM1 or 2; no support for current-loop interface; ribbon cable mounting for serial interface connector; disk cache software included.

Price • \$325 with no memory; \$895 fully populated.

■ QUBIE DISTRIBUTING

4809 Calle Alto, Camarillo, CA 93010 • 805-482-9829.

PC 212 A/1200

Application • integral modem.

Computer/Operating Systems Supported • IBM PC of other systems which are hardware compatible; software included requires PC-DOS, MS-DOS.

Warranty/Service Information • one-year warranty, 30-day trial period; vendor provides servicing, 48-hour turnaround.

Features • PC-TALK III communication software included; software requires 64K-byte minimum memory; 128K bytes recommended; full sized board • serial port optional at extra cost; serial port is PC compatible and mutually exclusive with modem in operation; can be configured as COM1 or 2; 8250 UART • Hayes compatible; AT&T 212 compatible; operates to 1200 bps.

Price • \$299.

■ RIM ELECTRONICS

530 Farallon Drive, Morgan Hill, CA 95037 • 408-778-1286.

Multi-People Board

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; software requires MS-DOS or PC-DOS.

Warranty/Service Information • 90-day parts and labor warranty, 2 years on defective parts; vendor provides servicing; \$25 fixed labor charge applied on 2-year parts warranty.

Features • software diskette included; • 256K-byte RAM maximum; board can be purchased and operated without memory; no restrictions on minimum memory on PC for board to work; full-length board • clock/calendar, serial port, game controller • RAM disk software operates with all versions of DOS; parity-checking memory uses standard memory chips; additional memory available in 64K-byte increments • cables for interfaces are provided; PC-compatible serial port may be addressed as COM1 or 2; no current-loop interface support; 8250 UART; 2-



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foot cable for connection to device • 5-year Nicad rechargeable battery clock; software provided to set and read clock; leap year detection included • PC-compatible game port has interface for 2 joysticks and 4 buttons; separate cables are provided for each joystick.

Price • \$235 with 64K-byte RAM; \$50 for each 64K-byte increment.

■ RIXON INC

2120 Industrial Parkway, Silver Spring, MD 20904 • 301-622-2121.

□ PC 212A with Asynch Port

Application • integral modem.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software supplied.

Warranty/Service Information • 2-year warranty; point of sale or vendor servicing; maintenance contract available.

Features • demonstration diskette, cables, and manual included; communication software optional; full sized board; optional serial port is PC compatible; port may be addressed as COM1 or COM2; uses 8250 UART • PC COM 1 optional modem software; Hayes-compatible mode • blind dialing for PBX interface; automatic dial and answer; can hunt through busy numbers for free one; dial tone, busy, and ring detect; can operate without handset.

Price • \$499 without serial port; \$539 with serial port; \$59 for communication software if purchased with modem.

■ SANTA CLARA SYSTEMS

1860 Hartog Drive, San Jose, CA 95131 • 408-287-4640.

□ SCS PC Net

Application • LAN interface.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS 2.X required.

Warranty/Service Information • one-year warranty; vendor may provide service, as well as authorized service centers/dealers.

Features • PC network software included; starter kit includes cabling and adapter interfaces • 128K-byte RAM installed; full-length board • 75-ohm CATV wideband cable network; 1M-bps data rate; supports file transfer, disk sharing, electronic mail; multiple, non-dedicated servers for files • no critical node can cause network failure • disk cache, RAM disk, printer sharing; file lock utilities available.

Price • \$1,490 for starter kit with two adapters; \$695 for each additional interface board.

■ SCION CORPORATION

12310 Pinecrest Road, Reston, VA 22091 • 703-476-6100.

□ Scion PC 640

Application • graphics interface

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • Halo software diskette, video cable, and user manual supplied; 256K bytes RAM on board for display interface; minimum 64K-byte user memory required for software; full sized board • supports special high-resolution color monitors; 640x480 resolution; standard display interface required for use as console on PC; Halo graphics primitives supported by interface • light pen interface.

Price • from \$1,595 depending on options.

□ MA 520 (Microangelo)

Application • graphics interface.

Computer/Operating Systems Supported • any S-100 bus (IEEE-696) or Multibus (IEEE-796) computer.

Warranty/Service Information • 90-day warranty; vendor provides servicing.

Features • manual included • 64K-byte display memory; on-board Z-80 microprocessor; light pen interface; RS-170 video output • graphics firmware included; 512x480 graphics resolution; RGB monitor supported; graphics primitives supported through firmware reduce graphics programming; each board supports 2 colors; boards may be combined to increase number of colors.

Price • from \$1,095.00 depending on options.

□ CS 5000

Application • color graphics system.

Computer/Operating Systems Supported • any S-100 bus (IEEE-696) or Multibus (IEEE-796) computer.

Warranty/Service Information • 90-day warranty; vendor provides servicing.

Features • manual included; 64K-byte display memory; on-board Z-80 microprocessor; light pen interface; RS-170 video output; graphics firmware included; 512x480 graphics resolution; RGB monitor supported; graphics primitives supported through firmware reduce graphics programming • multiboard system includes bit plane graphics for color and animation; consists of 3 MA-520 boards and separate mixer board; provides for 8 colors.

Price • \$2,495.

■ SEATTLE COMPUTER PRODUCTS INC

1114 Industry Drive, Seattle, WA 98188 • 800-426-8936.

□ I/O Board

Application • multifunction I/O without memory.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; MS-DOS or PC-DOS required for software supplied.

Warranty/Service Information • one-year warranty; vendor or dealer may provide servicing; \$35 charge plus parts and shipping for failures of up to 5 components after warranty period.

Features • print spooling and RAM disk software included, but requires memory not provided on board itself; half-sized board • single serial port, PC compatible, addressed as COM1 or 2; 8250 UART; 50- to 19,200-bps data rates; mounting through back panel for serial connector • PC-compatible parallel port may be addressed as LPT1,2,3 • lithium battery clock; software drivers to set and read clock; available second quarter 1984.

Price • price not yet established.

□ RAM + 3

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; MS-DOS or PC-DOS required for software supplied.

Warranty/Service Information • one-year warranty; vendor or dealer may provide service; \$35 service charge plus parts and shipping for failures of up to 5 components after warranty.

Features • RAM disk and print spooler software provided; up to 256K bytes of RAM; board will function without memory; motherboard must be fully populated for memory on board to be used; full-length board • clock/calendar, parallel port, serial port; parity checking memory with LED indicators on board and using standard memory chips; memory may be added in 64K-byte increments • PC-compatible serial port addressable as COM1 or 2; no current-loop interface support; uses 8250 UART; data rates to 19.2K bps; connector mounts through back panel • PC-



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compatible parallel port is addressed as LPT1,2,3; mounting bracket and cable provided to interface with connector • lithium battery clock; software driver provided to set and read clock.

Price • \$320 without memory; \$395 for 64K bytes; \$470 for 128K bytes; \$545 for 192K bytes; and \$625 for 256K bytes.

RAM +

Application • memory board with serial port.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; MS-DOS or PC-DOS required for software supplied.

Warranty/Service Information • one-year warranty; vendor or dealer may provide service; \$35 service charge plus parts and shipping for up to 5 components failure after warranty.

Features • RAM disk and print spooler software provided; up to 256K bytes of RAM; board will function without memory; motherboard must be fully populated for memory on board to be used; half-length board • parity checking memory with LED indicators on board and using standard memory chips; memory may be added in 64K byte increments • PC-compatible serial port addressable as COM1 or 2; no current-loop interface support; uses 8250 UART; data rates to 19.2K bps; connector mounts through back panel.

Price • \$220 without memory to \$525 fully populated.

■ SEMI-DISK SYSTEMS INC

P.O. Box G.G., Beaverton, OR 97075 • 503-642-3100.

Semi Disk I

Application • semiconductor disk emulator.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; S-100 (IEEE-696) systems; TRS-80 models II, 12, 16; EPSON QX-10 • CP/M 2.2 required for 8-bit systems; PC-DOS/MS-DOS required for PC or compatible computers.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • software diskette provided for appropriate operating system; 2M-byte total capacity maximum; 256K-byte minimum storage; full sized board; memory available in 64K-byte increments; provides high-speed simulation of disk drives; software drivers included.

Price • \$1,095 for 512K bytes, \$1,795 for 1M bytes.

■ SIGMA DESIGNS

2990 Scott Boulevard, Santa Clara, CA 95050 • 408-496-0536.

Maximizer

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; software supplied requires MS-DOS or PC-DOS.

Warranty/Service Information • one-year warranty; vendor provides servicing; \$40 per hour plus parts and shipping for out of warranty service.

Features • print spooler RAM disk, and clock driver software included; up to 384K bytes of memory; 64K-byte memory minimum supplied, but board will function depopulated; motherboard of PC must be fully populated to use memory; full-length board • clock/calendar, parallel port, serial port; parity-checking memory uses standard memory chips; memory may be added in 64K-byte increments • PC-compatible serial port may be addressed as COM1 or 2; no support for current-loop interface; 8250 UART • PC-compatible parallel port may be addressed as LPT1,2,3; interface connectors mount through PC back panel • rechargeable battery clock; clock driver software sets and reads clock.

Price • \$395 to \$625 depending on memory.

■ SIGMA SALES

329 Washington Street, Woburn, MA 01801 • 617-938-1310.

ASYNCH + RAM

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; MS-DOS or PC-DOS required for software supplied.

Warranty/Service Information • 90-day warranty; vendor provides servicing.

Features • RAM disk software included; 256K-byte RAM maximum on board; 64K-byte RAM minimum on board; motherboard must be fully populated for memory to be used; full sized board • parity-checking memory uses standard memory chips; dealer must add memory to board • PC-compatible serial port addressed as COM1 or COM2; uses 8250 UART; serial interface connector mounts through back panel.

Price • \$385 to \$892 depending on memory.

■ SPECTRA LOGIC CORPORATION

1227 Innsbruck Drive, Sunnyvale, CA 94089 • 408-744-0930.

Spectra-25

Application • multifunction board I/O interface.

Computer/Operating Systems Supported • DEC Q-bus; DEC Micro PDP-11; DEC LSI-11; RSX-11; RSTS; RT-11 with software driver; UNIX.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • includes cables, documentation, software disk or tape; FIFO disk and tape buffers for interface to disk drives or tape units; disk interface supports 2 SMD drives; tape drive supports Pertec half-inch formatted streaming tape drives to 4 drive maximum.

Price • \$3,500.

■ STB SYSTEMS

601 North Glenville, Suite 125, Richardson, TX 75081 • 214-234-8750.

RIO Plus

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; DOS 2.0 required for software included.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • PC-Xcello software RAM disk and print spooler supplied; up to 384K bytes of RAM on board; minimum 64K bytes supplied but board will function depopulated; minimum of 256K-byte RAM must be installed in PC for memory to operate; full sized board • clock/calendar, serial port, parallel port; parity-checking memory uses standard memory chips; PC-compatible serial port may be addressed as COM1 or 2; no current-loop interface support; 8250 UART • PC-compatible parallel port may be addressed as LPT 1 or 2 • interface connectors mount through back panel • penlite battery powers clock; software clock driver; sets and reads clock.

Price • \$395 for 64K bytes, to \$845 for 384K bytes.

STB Graphix Plus

Application • graphics and multifunction I/O board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; DOS 2.0 required for software included.

Warranty/Service Information • one-year warranty; vendor provides servicing.



Microcomputer Expansion Boards

Features • PC-Xcello software RAM disk and print spooler supplied; up to 384K bytes of RAM on board; 16K-byte graphics memory; 64K bytes of RAM required for software; full sized board • clock/calendar, parallel port, light pen interface • PC-compatible parallel port may be addressed as LPT 1 or 2; interface connectors mount through back panel • penlite battery powers clock; software clock driver sets and reads clock; PC-compatible light pen interface • graphics board compatible with monochrome display or color monitors in RGB or NTSC modes; 640x200 graphics resolution; supports both monitor types via switch setting—no concurrent operation; compatible with all PC software; D-connectors supplied plus composite RCA jack.

Price • \$495.

Super RIO

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; DOS 2.0 required for software included.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • PC-Xcello software RAM disk and print spooler supplied; up to 768K bytes of RAM on board; minimum 64K bytes supplied but board will function depopulated; no restriction on minimum memory required installed on PC for memory to operate; full sized board • clock/calendar, serial port, parallel port; parity checking memory uses standard memory chips • PC-compatible serial port may be addressed as COM1 or 2; no current-loop interface support; 8250 UART • PC-compatible parallel port may be addressed as LPT 1 or 2; interface connectors mount through back panel • penlite battery powers clock; software clock driver sets and reads clock.

Price • \$419 to \$689 depending on memory.

■ **SYNETIX MICRO PRODUCTS**

10635 NE 38th Place, Kirkland, WA 98033 • 800-426-7412.

Flashcard

Application • RAM disk card.

Computer/Operating Systems Supported • Apple II, IIe, II+ computers • DOS 3.3; Pascal 1.1 • Softcard with CP/M.

Warranty/Service Information • 6-month warranty; vendor will provide servicing.

Features • documentation and software drivers included; 288K bytes of RAM maximum on board; 144K bytes of minimum memory; Apple must have 64K bytes of memory; full-length board; RAM disk support.

Price • \$395 for 144K bytes; \$595 for 288K bytes.

■ **TECMAR**

6225 Cochran Road, Cleveland, OH 44139 • 216-349-0600.

BASEBOARD

Application • digital I/O interface.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • full-sized board; digital input and output in 4 sections of 24 lines; each section may be used independently; daughterboards used for customized interfaces; 3 daughterboard modules; opto-isolated output, opto-isolated input, and prototype wire-wrap; 24-line sections may be configured as 3x8 or 2x12; TTL level interface.

Price • \$345.

BOSUN

Application • multifunction I/O board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software provided.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • documentation and diskette provided; minimum 64K bytes of RAM required on PC to use software supplied; short slot in PC used for board • serial port, parallel port, clock/calendar; single PC-compatible serial port is addressed as COM1 or 2; no support for current-loop interfaces • PC-compatible parallel port may be configured as LPT1,2,3; interface connectors mount through back panel of PC • battery operated clock; software drivers provided to set and read clock.

Price • \$195.

DADIO

Application • digital/analog conversion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • full sized board; 4 independent D/A converters; 5-microsecond setting time; 12-bit resolution; conversion rate 200,000 Hz; 24 parallel I/O lines • can be used to create waveforms; industrial environment • sample programming provided in manual; 8255 IC used; external trigger capability.

Price • \$395.

CAPTAIN

Application • multifunction I/O board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software provided.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • documentation and diskette provided; software includes RAM disk, print spooler; maximum 384K-byte RAM on board; board may be purchased and used without memory; minimum 64K-byte RAM required on PC to use software supplied; full sized board • serial port, parallel port, clock/calendar; parity-checking memory uses standard memory chips; memory may be added in 64K-byte increments • single PC-compatible serial port is addressed as COM1 or 2; no support for current-loop interfaces • PC-compatible parallel port may be configured as LPT1,2,3; interface connectors mount through back panel of PC • battery operated clock; software drivers provided to set and read clock.

Price • \$349 without memory to \$795 fully populated.

DEVICE MASTER

Application • external control for security, energy management.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • software package optional for control interface; full sized board; controls BSR X-10 units for appliance and lighting control • clock/calendar for time-driven activities; can control computer power on/off; clock is battery powered; package software includes clock setting and reading clock granularity is one millisecond.

Price • \$245 plus \$35 for optional software.

E + EEPROM Programmer/Reader

Application • EPROM, EEPROM programmer.

Computer/Operating Systems Supported • IBM PC or other



Microcomputer Expansion Boards

systems which are hardware compatible; PC-DOS or MS-DOS required for optional software.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • software package is optional; full sized board; programs or reads EPROMs or EEPROMs; handles 2716, 2732, and 2764 EPROMs; 2816 EEPROM; write protect on socket level for copying PROMs • expansion system provides 16 additional sockets for mass PROM burning; LED warning for write enable condition • software package is menu driven with PROM dump utilities.

Price • \$495, software package \$95.

GRAPHICS MASTER

Application • graphics interface board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for optional software.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • high-resolution graphics software supplies; full sized board • light pen interface is PC compatible • supports monochrome display, RGB or NTSC color monitor; 640x400 resolution in 16 colors; 720x700 resolution on monochrome display; has PC-compatible mode of operation; 128K-byte display memory; operates with Video Van Gogh and Videocassette Controller; compatible with all IBM software except for IBM package to provide color graphics options on monochrome display.

Price • \$695.

IEEE-488 Interface

Application • interface to IEEE/HP instrumentation bus.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; optional software requires PC-DOS or MS-DOS.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • optional software for interface available; full sized board; allows PC to act as controller, talker, or listener on the IEEE-488 instrumentation bus • DMA and interrupt facilities; supports control of commercial lab equipment and monitoring devices using IEEE-488; available library of subroutines for interface to BASIC or FORTRAN; 225K bps data rate maximum • uses Intel 8291A, 8292, 8293 GPIB chip set; full handshaking; interrupt or polled operation; file transfer software optional.

Price • \$395; software is \$95.

LAB Master

Application • A/D conversion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • full-sized board; 16 channels for A/D conversion; 12; 14; or 16-bit resolution; 30-, 40-, or 80-KHz conversion rate; 5 independent timers • A/D conversion takes place in remote shielded enclosure; 2 channels of 12-bit D/A conversion; 3 8-bit parallel I/O ports; options to 256 channels A/D.

Price • \$995.

LAB Tender

Application • low cost data acquisition system.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • full-sized board; 24 parallel I/O lines programmed in groups of 8, 12, or 24 via 8255 chip; interrupt capability; external event trigger • A/D provides 32 single-ended or 16 differential channels, 8-bit resolution, 50-KHz conversion; D/A provides 16 output channels, 8-bit resolution; 3-microsecond conversion rate; Nominal +5 to -5 analog range.

Price • \$495.

TIME MASTER

Application • clock/calendar board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software provided.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • clock driver software provided; half-sized board; battery operated clock; automatic insertion of date and time at bootup via software driver; added circuitry will permit unit to turn computer on; alarm capability on month, day, week, hour, minute, second, and tenth of second.

Price • \$135.

SPEECH MASTER

Application • speech synthesizer.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for supplied software.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • full-sized board; uses VOTRAX phoneme system; national vocabulary available for high-quality, limited vocabulary applications; on-board speaker with connection for external audio output; text to speech conversion with 143-word vocabulary; sockets for additional vocabulary PROMs.

Price • \$395.

Video Cassette Recorder Controller

Application • VCR controller.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; Sony SC2500 required.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • requires graphics board and VCR; full sized board; provides frame coding for later retrieval; permits location of individual frames; can be used to integrate computer graphics with videotaped camera images.

Price • \$495.

Video Van Gogh

Application • video digitizer.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for optional software.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • digitizes camera images for computer processing and storage; NTSC or EIA output; 255x255 resolution; RCA phono plug interface; 6-second digitization of B&W image; graphics Master board required • full image control; sync control and information for processing • Van Gogh software package optional.

Price • \$345; \$95 for software.

WAVE

Application • memory board.

Computer/Operating Systems Supported • IBM PC or other



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systems which are hardware compatible; PC-DOS or MS-DOS required for software provided.

Warranty/Service Information • one-year warranty; vendor provides servicing, 72-hour turnaround.

Features • RAM disk software and spooler included; 256K bytes of RAM maximum on board; minimum board is 64K bytes, requires minimum 256K-byte RAM on PC prior to installing board; half-sized board; parity-checking memory uses standard memory chips; additional memory may be added in 64K-byte increments.

Price • \$299 to \$499 depending on memory.

■ TELETEK

4600 Pell Drive, Sacramento, CA 95838 • 916-920-4600.

16K-256K Memory Board

Application • Memory board.

Computer/Operating Systems Supported • S-100 (IEEE-696) computer systems.

Warranty/Service Information • 3-year warranty; vendor provides servicing; \$25 charge for board checkout after warranty, repairs extra.

Features • up to 256K bytes of RAM on board; minimum memory on board is 16K bytes; 4K-byte memory banks defined • may be used as a RAM disk with optional software for CP/M 3.0 or TurboDOS; fully socketed board; 64K-byte memory increments.

Price • \$525 for 64K bytes; \$995 for 256K byte; RAM disk software \$29.

■ THIRDWARE COMPUTER PRODUCTS

4747 NW 72nd Avenue, Miami, FL 33166 • 800-528-6050.

Finger Print

Application • graphic printer system.

Computer/Operating Systems Supported • Apple II, Iie, II+; Apple DOS required; Apple-compatible systems may also be supported.

Warranty/Service Information • 2-year warranty; vendor provides servicing.

Features • disk and cable provided; parallel printer interface for graphics printer; supports many graphics printers; 7-foot interface cable provided; prints graphs from all Apple graphics modes; color printers supported; supports optional software for drawing with mouse or joystick; fingerprint cable supports screen print similar to IBM PC PrtSc key.

Price • \$149.95.

■ TITAN TECHNOLOGIES

P.O. Box 8050, Ann Arbor, MI 48107 • 313-662-8542.

Cygnus Pi

Application • multifunction I/O board without memory.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software supplied.

Warranty/Service Information • one-year warranty, parts and labor; vendor provides servicing.

Features • software package included for clock driver; half-sized board • clock/calendar, parallel port, game port; PC-compatible parallel port may be addressed as LPT1,2,3; game port is PC compatible; interface connectors mount through back panel on PC • lithium battery clock; driver software for clock sets and reads clock.

Price • \$199.

Cygnus S1

Application • multifunction I/O card without memory.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software supplied.

Warranty/Service Information • one-year warranty, parts and labor; vendor provides servicing.

Features • software package included for clock driver; half-sized board • clock/calendar, serial port, game port; single PC-compatible serial port may be addressed as COM1 or 2; 8250 UART used; game port is PC-compatible; interface connectors mount through back panel on PC • lithium battery clock; driver software for clock sets and reads clock.

Price • \$219.

Titan Multifunction Board

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software supplied.

Warranty/Service Information • one-year warranty, parts and labor; vendor provides servicing.

Features • software package included for clock driver, print spooler, RAM disk; 576K-byte RAM maximum on board with piggyback; 64K-byte minimum memory on board; motherboard of PC must be fully populated before board is used; full sized board • clock/calendar, serial port, parallel port, clock/calendar; parity-checking memory uses standard memory chips • RAM disk supports DOS 1.1 and 2.0 • memory may be added in 64K-byte increments • optional hard disk controller for Winchester disks using Zbec 1410 controller supports 10M-, 15M-, 20M-byte disks • dual PC-compatible serial ports may be addressed as COM1 or 2; 8250 UART used • game port is PC compatible; interface connectors mount through back panel on PC • PC-compatible parallel port may be addressed as LPT1,2,3; ribbon cable interface for parallel port; parallel port may be used as digital 8-bit parallel I/O port • lithium battery clock; driver software for clock sets and reads clock.

Price • \$695 for 64K bytes; \$1,495 for 576K bytes; hard disk interface optional, not including Zbec controller card or hard disk.

PC Excelerator

Application • RAM disk.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; driver needed for operating system used.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • RAM disk; 640K-byte maximum memory; 128K-byte minimum memory; full sized board; emulates disk drive; memory can be expanded in 64K-byte increments; increases PC operating speed by reducing disk access time.

Price • \$995, depending on configuration.

■ TSENG LABORATORIES

205 Pleasant Run, Newtown, PA 18940 • 215-968-0502.

Ultra PAK

Application • multifunction board with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software supplied.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • includes RAM disk software; 384K-byte memory maximum on board; 64K-byte memory minimum; PC motherboard must be fully populated; full sized board • clock/calendar, serial port, parallel port; parity-checking memory uses standard memory chips; memory may be added in 64K-byte increments • single PC-compatible serial port may be addressed as COM1



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or 2; 8250 UART used; PC-compatible parallel port; floppy disk controller optional.

Price • \$245 with 64K bytes; \$375 with 64K bytes and floppy disk controller; \$750 fully configured.

■ U.S. ROBOTICS INC

1123 West Washington, Chicago, IL 60607 • 312-733-0497.

S-100 Modem

Application • integral modem.

Computer/Operating Systems Supported • S-100 (IEEE-696) computers • CP/M required for optional software.

Warranty/Service Information • 2-year warranty requires return authorization; vendor provides servicing.

Features • optional communication software; 300 to 1200 bps; automatic dial and automatic answer; optional software package for communication control and file transfer; compatible with S-100 systems.

Price • \$449, software is \$79.

Personal Communicator

Application • integral modem.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software supplied.

Warranty/Service Information • 2-year warranty requires return authorization; vendor provides servicing.

Features • includes communication software; available in full- or half-sized versions; speeds to 1200 bps; automatic dial and answer; automatic speed detection; audiomonitor; fully PC compatible.

Price • \$499.

Personal Communicator with 64K

Application • integral modem with multifunction I/O and memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software supplied.

Warranty/Service Information • 2-year warranty requires return authorization; vendor provides servicing.

Features • includes communication software, RAM disk, print spooler; 64K-byte RAM; motherboard must be fully populated for board to function; full sized board • parity-checking memory uses standard memory chips; no additional memory kits available • modem, parallel port, clock/calendar; speeds to 1200 bps; automatic dial and answer; automatic speed detection; audio monitor; fully PC compatible • battery operated clock; driver software to set and read clock provided.

Price • \$699.

Personal Communicator with 256K

Application • integral modem with multifunction I/O and memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software supplied.

Warranty/Service Information • 2-year warranty requires return authorization; vendor provides servicing.

Features • includes communication software, RAM disk, print spooler; 256K-byte RAM; motherboard must be fully populated for board to function; full sized board • parity-checking memory uses standard memory chips; no additional memory kits available; modem, parallel port, clock/calendar; speeds to 1200 bps; automatic dial and answer; automatic speed detection; audio monitor; fully PC compatible • battery operated clock; driver

software to set and read clock provided.

Price • \$999.

■ VECTRIX CORPORATION

1416 Boston Road, Greensboro, NC 27407 • 800-334-8181.

Midas Color Graphic Board Set

Application • special color graphics board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; requires PC-DOS or MS-DOS for software provided.

Warranty/Service Information • 90-day warranty; vendor provides servicing.

Features • includes software drivers for MS-DOS/PC-DOS; paint software optional; requires 64K-byte RAM for operation; 2 full sized boards in set • light pen interface; 384K bytes of graphic memory; special hardware diagnostics provided • uses Midas color monitor; 672x480 resolution; compatible with PC software in lower resolution mode; DB-9 connector and cable provided; up to 512 colors selected from 4096-color palette; on-board primitives for point, line, arc, polygon; 2- and 3-dimensional drawing; rotation, scaling, translation, perspectives, clipping, view port, zoom, pan, scroll; character generator included with slant, zoom, and spacing parameters.

Price • \$2,995 not including monitor.

■ VEN TEL INC

2342 Walsh Avenue, Santa Clara, CA 95051 • 800-538-5721.

HP-150 Internal Modem

Application • integral modem.

Computer/Operating Systems Supported • HP-150 computer • MS-DOS.

Warranty/Service Information • one-year warranty, parts and labor; vendor provides servicing.

Features • phone and data cable included; AT&T 212 compatible, 1200 bps; on-board speaker for monitoring; compatible with all HP software.

Price • \$425.

PC Modem 1200

Application • integral modem.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software.

Warranty/Service Information • one-year warranty, parts and labor; vendor provides servicing.

Features • Crosstalk software included; software requires 128K-byte RAM; full-length board; phone cable included; on-board speaker/monitor; 1200-bps operation; fully configurable communication parameters; Hayes-compatible option.

Price • \$499.99.

PC Modem Half Card

Application • integral modem.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS required for software.

Warranty/Service Information • one-year warranty, parts and labor; vendor provides servicing.

Features • Crosstalk software included; software requires 128K bytes of RAM; half-length board fits in all XT slots; phone cable included; on-board speaker/monitor; 1200-bps operation; fully configurable communication parameters; Hayes-compatible option.

Price • \$549.



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■ VISTA COMPUTER INC

1317 Edinger Avenue, Santa Ana, CA 92705 • 714-953-0523.

Disk Master

Application • disk controller.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS 1.1, 2.0, 2.1.

Warranty/Service Information • 6-month warranty; vendor provides servicing.

Features • supports 5.25- and 8-inch drives, or V-1200 5M-byte cartridge drive; handles 80-track format as well as 40-track; mixed media supported; maximum drives: 4 5-inch, 3 8-inch, one V-1200.

Price • \$199, disk drives not included.

Multi-Card

Application • multifunction card with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; software provided requires PC-DOS or MS-DOS.

Warranty/Service Information • 6-month warranty; vendor provides servicing.

Features • up to 256K bytes of RAM on board; board may be purchased and used without memory; PC must have 256K-byte RAM already installed for board to function; full sized board • clock/calendar, serial port, parallel port, game port • RAM disk software will operate with any version of DOS; parity-checking memory uses standard memory chips; memory may be added in 64K-byte increments; up to 2 PC-compatible serial ports, addressable as COM1 or 2; no support for current-loop interface; 8250 UART • PC-compatible parallel port addressed as LPT1,2,3 • serial interfaces via ribbon cable, parallel interface through back panel • battery backup clock; software driver sets and reads clock; 2 PC-compatible game ports.

Price • \$299 without memory, to \$699 with 256K bytes.

Multi-Card Plus

Application • multifunction card with memory expansion.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; software provided requires PC-DOS or MS-DOS.

Warranty/Service Information • 6-month warranty; vendor provides servicing.

Features • up to 384K bytes of RAM on board; board may be purchased and used without memory; PC must have 256K-byte RAM already installed for board to function; full sized board • clock/calendar, serial port, parallel port, game port • RAM disk software will operate with any version of DOS; parity-checking memory uses standard memory chips; memory may be added in 64K-byte increments • up to 2 PC-compatible serial ports, addressable as COM1 or 2; no support for current-loop interface; 8250 UART • PC-compatible parallel port addressed as LPT1,2,3 • serial interfaces via ribbon cable, parallel interface through back panel • battery backup clock; software driver sets and reads clock; 2 PC-compatible game ports.

Price • \$239 without memory, to \$849 with 384K bytes.

■ WINTERHALTER INC

3853 Research Park Drive, Ann Arbor, MI 48104 • 313-662-2002.

Data Talker

Application • mainframe/micro communication.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; other systems running CP/M, MS-DOS, TurboDOS, UNIX.

Warranty/Operating Information • 30-day money-back guarantee; one-year warranty with replacement; vendor provides servicing; \$75 per hour service fee after warranty, plus parts and shipping.

Features • included software diskette; includes 64K-byte RAM, not available to system; full-length board; diagnostics included • 3 serial ports are not PC-compatible and addressable as COMn; terminal emulation software provided for host communication; many host protocols supported; users must consult the vendor for detailed information.

Price • \$695 to \$995 depending on PC and host protocol.

■ XYLOGICS

144 Middlesex Turnpike, Burlington, MA 01803 • 800-225-3317.

472 Tape Controller

Application • tape controller.

Computer/Operating Systems Supported • Multibus (IEEE-796) systems.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • supports 4 tape drives; 3M-bps data transfer rate; Pertec formatted interface; 800, 1600, 3200, 6250 drives supported; transport speeds from 12.5 ips to 125 ips supported.

Price • \$1,795 with 2K-byte buffer; \$1,845 with 8K-byte buffer.

450 SMD Disk Controller

Application • disk controller.

Computer/Operating Systems Supported • Multibus (IEEE-796) interface.

Warranty/Service Information • one-year warranty; vendor provides servicing.

Features • 2- or 8K-byte FIFO buffer memory; supports 4 storage module disk (SMD) drives; fast DMA transfer to 3M bps; any capacity drive with SMD interface may be used.

Price • \$2,295 with 2K-byte buffer; \$2,395 with 8K-byte buffer.

■ ZOBEX

7343-J Ronson Road, San Diego, CA 92111 • 619-562-9306.

Hard Disk Controller

Application • disk controller.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; PC-DOS or MS-DOS 2.X required.

Warranty/Service Information • 6-month warranty; vendor provides servicing.

Features • driver software included; full sized board; uses SASI interface; controls Winchester disk drives from 5M bytes up; compatible with PC software.

Price • \$345.

■ 3COM CORPORATION

1390 Shorebird Way, Mountain View, CA 94039 • 415-961-9602.

Ether Link

Application • local network interface board.

Computer/Operating Systems Supported • IBM PC or other systems which are hardware compatible; HP-150; TI Professional • PC-DOS/MS-DOS 2.0 or later required for file server and driver software included.

Warranty/Service Information • 90-day warranty; warranty service is factory return; vendor, dealer, or Xerox may provide servicing; \$125 factory charge for service, plus parts and shipping.



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Features • includes manual and network software; full sized board; coaxial cable network Ethernet compatible; quick release twist connector or 15-pin D-series connection optional; 10M-bps data rate; disk sharing, file transfer, electronic mail, and printer sharing

supported • mainframe link in development.

Price • \$750 per adapter card.

• END

