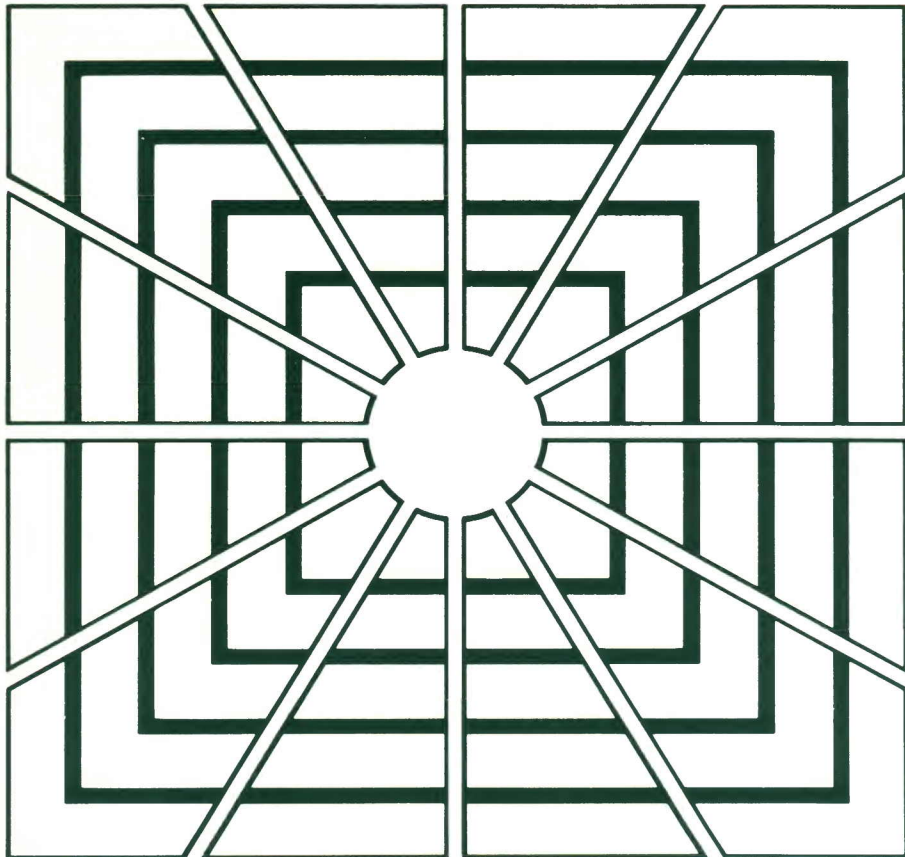




# MICROWORLD

## SOFTWARE/HARDWARE SELECTION GUIDE

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# MICROWORLD

## SOFTWARE/HARDWARE SELECTION GUIDE

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# OPERATING SYSTEMS

## Product Summaries

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### ALPHABIT COMMUNICATIONS

13349 Michigan Ave  
Dearborn MI 48126

(313) 581-2896

#### ► MultiDOS

A disk operating system for the Tandy Radio Shack TRS-80 Models I, III, and IV; Max 80 Models III and V; and LPNW computers

**Price** \$100

**Description** MultiDOS provides a combination of all regular DOS commands, BASIC enhancements, and TRSDOS commands, as well as additional commands for keyboard control, resetting the computer, and controlling how the computer functions when it is turned on. In addition, it provides utility programs, including RESTOR, which restores dead files; DEBUG, an advanced debugger; and SUPERBASIC, which provides commands for setting breakpoints within programs, single-stepping BASIC programs, and running programs one command or line at a time.

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### APPLE COMPUTER

10260 Bandlely Dr  
Cupertino CA 95014

(408) 996-1010

#### ► Apple Disk Operating System (DOS)

A single-user operating system for the Apple II and Apple II Plus

**Price** On request

**Description** The Apple II and Apple II Plus processors, configured with at least one Disk II subsystem and controller and 32K bytes of memory, can implement Apple's DOS, Version 3.3. The current DOS 3.3 release provides file housekeeping routines that include capabilities to save, load, run, rename, and verify data files. Data retrieval methods include both sequential and random access, and files are referenced by user-assigned symbolic names. The system contains a master diskette for diskette copying or conversion operations, as well as utility programs for file and diskette maintenance backup. A LOCK feature protects user-specified files from accidental erasure.

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### APPLE COMPUTER

10260 Bandlely Dr  
Cupertino CA 95014

(408) 996-1010

#### ► Sophisticated Operating System (SOS)

A multicomponent operating system for the Apple III

**Price** On request

**Description** SOS, which is supplied with each Apple III, consists of five components that manage files, I/O devices, memory, interrupts, and utilities. Two other elements are included for system utilities and custom configuration. SOS features a hierarchical file system, both device- and user-level (event) interrupt capabilities, and a device-independent file system. All languages for Apple III use SOS, allowing them to share a common disk format; for example, a Pascal application program can access a BASIC file as well as files written in Pascal. An Apple II/II Plus emulation mode allows Apple II and Apple II Plus programs to be run with only minor modifications.

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### AT&T INFORMATION SERVICES

1 Speedwell Ave  
Morristown NJ 07960

(201) 898-3278

#### ► UNIX

A development-oriented operating system for the Motorola MC 68000

**Price** Available only through OEM vendors

**Description** UNIX is an interactive, multiuser operating system developed by Bell Laboratories. It features an assortment of text editing, typesetting, program development, and graphics facilities to encourage modular program and system design. Communications facilities include data encryption and local area networking.

The modular design of UNIX enables it to be adapted to various hardware and software configurations. Programs written under UNIX are independent of devices and file formats. All I/O operations are directed to the terminal unless redirected by the user to another device. The output from one program can also be piped directly to another program for input. Files and commands can be accessed through user-defined aliases.

UNIX organizes files into an inverted-tree structure of directories and links. A file can be listed in more than one directory and under more than one name for cross-referencing. Users' access to files is determined by which directories they can enter.

Compilers and interpreters are available for UNIX for the following languages: Ada, BASIC, APL, C, COBOL, Concurrent Euclid, LISP, FORTRAN, Pascal, and Prolog.

In addition to supporting one screen-oriented and two line-oriented text editors, UNIX provides spelling cor-

rection, text analysis, and a data base of awkward and inappropriate phrases.

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## DIGITAL RESEARCH

PO Box 579  
Pacific Grove CA 93950

(408) 649-3896

### ► CP/M 2.2

A single-user operating system for microcomputers based on the Zilog Z80 and Intel 8080 and 8085

**Price** \$150 purchase

**Description** CP/M is a widely used general-purpose operating system for 8-bit single-user microcomputers. A variety of application programs have been developed by third-party vendors for the CP/M operating system. Most of these programs are easily transported between different microcomputers.

CP/M consists of several integrated modules. The Basic Disk Operating System (BDOS) manages directories and files on both disk and diskette systems. The raw storage capacity of disk drives is divided by BDOS into logical drives for easy storage and file manipulation. CP/M supports both sequential and random file access.

The Basic Input/Output System (BIOS) contains system-independent I/O peripheral device handlers, manages noncontiguous memory areas for application programs, and provides a standard file structure that is compatible with other CP/M systems.

CP/M features several utilities, including PIP, the peripheral interchange program for file copying and transfer; ED, a text and program editor; STAT, a utility that displays and alters peripheral and file status; and an assembler and debugger.

Numerous high-level languages are available for CP/M from both Digital Research and independent vendors. CP/M has been modified by a variety of computer manufacturers for implementation on specific computer systems.

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## DIGITAL RESEARCH

PO Box 579  
Pacific Grove CA 93950

(408) 649-3896

### ► CP/M-68K

A version of CP/M for microcomputers based on the Motorola MC 68000

**Price** Available only with hardware systems

**Description** CP/M-68K is a single-user, single-tasking operating system that provides a high-performance, user-friendly environment for business applications and software development. It supports all standard CP/M utilities as well as a set of sophisticated development tools for the MC 68000 environment.

The file system used by CP/M-68K is an enhanced version of that used by CP/M and CP/M-86; CP/M and

CP/M-86 software can therefore be easily converted to run under CP/M-68K.

Up to 16M bytes of RAM and 16 disk drives of 512M bytes each can be managed under CP/M-68K.

A C language compiler and run-time library are included with CP/M-68K. Programs written in C are easily transported to other 16-bit systems, including those running under CP/M-86 and Bell Laboratories Unix Version 7.

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## DIGITAL RESEARCH

PO Box 579  
Pacific Grove CA 93950

(408) 649-3896

### ► CP/M-86

A disk-based operating system for microcomputers based on the Intel 8086 and 8088

**Price** \$100

**Description** CP/M-86 is a general-purpose control program that includes three modules. The Command Console Processor (CCP), the human interface of the operating system, parses and executes user commands. The Basic Disk Operating System (BDOS), the logical invariant portion of the operating system, performs system services, such as managing disk directories and files. The Basic Input/Output System (BIOS), the physical variant portion of the operating system, contains the system-dependent I/O device handlers and has the following features:

- Provides efficient memory space—Resides in 12K bytes
- Manages up to 1M bytes of RAM
- Allows up to 128M bytes of online magnetic storage
- Allows multiple programs in memory cross-development tools for customization on CP/M-based 8-bit systems
- Provides a file structure compatible with CP/M for 8-bit systems
- Allows noncontiguous physical memory areas
- Manages noncontiguous memory areas for application programs

In addition, CP/M-86 supports a variety of utility programs, including PIP, a peripheral interchange program; ED, a text and program editor; ASM-86, the CP/M-86 assembler; DDT-86, the CP/M-86 dynamic debugging tool; a submit utility for batching commands; a STAT utility that alters and displays I/O device and file status; and DEWCMD and LMCMD for file formatting.



**DIGITAL RESEARCH**

PO Box 579  
Pacific Grove CA 93950

(408) 649-3896

► **MP/M-86**

A multiuser operating system for the Intel 8086 and 8088

**Price** Available only with hardware system

**Description** MP/M-86 is a multiuser 16-bit multitasking operating system, upward compatible with CP/M, MP/M II, and CP/M-86 operating systems. MP/M-86 provides record and file locking with password protection for use in business settings where data base integrity is essential. MP/M-86 supports up to 16 logical drives that manage up to 512M bytes each. It features extensive error handling and reporting, real-time capabilities, and date and time stamps on files. MP/M-86 supports simultaneous editors, program translators, and background printer spoolers.

**FORTH**

2309 Pacific Coast Hwy  
Hermosa Beach CA 90254

(213) 372-8493

► **polyFORTH II**

A multiuser, multitasking operating system based on the 8080, 8086, 8088, Z80 processors and the LSI and PDP-11 families

**Price** \$600

**Description** The polyFORTH II package includes the operating system, the FORTH compiler, assembler, editor, math library, data base support system, and utilities. polyFORTH is a multiuser, multitasking operating system featuring context switching and intertask communication at text and logic levels, device and facility level lockout, transparent virtual memory for data storage, concurrent printer operation, and disk maintenance utilities. The language supplied contains more than 400 commands with an extensible compiler and interpreter. Also supported are math capabilities, text and string handling, vectored device and facility support, definite and indefinite loop structures, user-definable control structures, and user-definable data types and procedures. The assembler provided is a complete macroassembler using FORTH-like syntax for the CPU. It allows inline access to higher-level data structures and can be linked to procedures. Interrupt routine support is also provided. The editor is a standard FORTH string editor providing search and replace, deletion, and character editing on both a global and local level. Debugging tools provided include a memory dump, stack examination, and buffer and status monitoring.

**HEMENWAY**

1399 Ninth Ave  
San Diego CA 92101

(619) 239-2241

► **OS/ENGINE**

A real-time multitasking operating system nucleus designed for use on the Omnibyte K1A ABC and Motorola VM02 SBC

**Price** \$7,500

**Description** The OS/ENGINE nucleus supplies a structured base for application software design. It provides five elements for the systems software designer: a structured library of multitasking system calls and error traps, preconfigured device drivers, hardware and software initialization, high-level language support, and a resident, multitasking, real-time debugger.

A set of 31 system calls and six TRAPS manage system features such as multitasking operation, interprocess communications, mutual exclusion and synchronization, device independent I/O, and time management.

Device drivers and interrupt service routines are provided for many of the popular small-business computers. In addition, facilities are provided for the user to add-in additional drivers and service routines to support custom hardware. These custom drivers and routines may be added permanently or on a dynamic basis while the operating system is executing.

The OS/ENGINE is capable of system initialization. Upon power-up or reset, it performs all initialization of system hardware and software device drivers.

Application software can be written in high-level languages through the use of the supplied interface libraries. Six system calls are provided to execute multitasking functions. Each task is associated with a data structure called a Process Control Block (PCB), which contains information about the task and provides mechanisms for the support of concurrency. Tasks also have priority levels in the range 1-255, which may be dynamically changed through the system call SETPRI.

The kernel Resource Monitor is a central design element within the OS/ENGINE. Monitors offer a structured and efficient mechanism to provide mutual exclusion and synchronization of tasks. System calls are provided to dynamically allocate and deallocate memory. All 16M bytes of the M68000's address space is memory managed. The system software maintains a software real-time clock that is updated every 50 milliseconds. This time information is used by the system to schedule tasks. OS/ENGINE allows a task to make a single I/O system call, regardless of the hardware device with which it is communicating. Mailboxes are provided within the system as a vehicle to intertask communications. Each mailbox has an associated box number, sending task, receiving task, status, and message buffer.

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**HUNTER & READY**445 Sherman Ave  
Palo Alto CA 94306

(415) 326-2950

**► VRTX**

A task-dedicated operating system

**Price** \$5,275**Description** VRTX is a real-time multitasking operating environment for communications, office automation, robotics, and instrument-controlling equipment based on embedded 8- and 16-bit microprocessors. VRTX eliminates the need to write in-house memory management and interrupt handlers for such specialized systems. VRTX has been implemented for the Zilog Z80, Z800, and Z8002, Intel 8086 and 8088, and Motorola MC 68000 microprocessors.

The VRTX multitasking kernel is available on an integrated circuit. Hunter &amp; Ready has also implemented a run-time library on 16-bit VRTX-based systems, allowing Microsoft MS-DOS applications programs to be transported to VRTX.

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**IBM**1133 Westchester Ave  
White Plains NY 10604

(914) 696-1900

**► PC DOS**

A single-user operating system for the IBM Personal Computer

**Price** Available only as part of system configuration**Description** PC DOS 1.0 and PC DOS 2.0 are versions of Microsoft's MS-DOS 1.25 and MS-DOS 2.0 configured specifically for the IBM Personal Computer. Both versions of PC DOS provide complete control over keyboard features, screen formatting, system peripherals, and internal memory of the IBM Personal Computer. PC DOS 2.0 offers hierarchically structured disk directories, providing quick access to the disk drive included with the IBM Personal Computer XT.

Most MS-DOS-based applications software can run with few modifications under PC DOS. PC DOS software, however, cannot be easily used on MS-DOS-based computers.

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**INTEL**3065 Bowers Ave  
Santa Clara CA 95051

(408) 987-8080

**► iRMX86**

A multitasking operating system for Intel 8086-based microcomputers

**Price** On request**Description** The iRMX operating system controls dynamic memory allocation, separately invokes and aborts

individual applications, and separates name spaces. It provides a terminal handler for line editing, multi-character type-ahead, control characters for suspending and resuming output at the terminal, a debugger, and a means of awakening the debugger. The basic I/O system supports access to named files, physical files, and stream files. An extended I/O system is also included that decreases the implementation cost of the basic I/O system, while adding enhancements to it.

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**LIFEBOAT ASSOCIATES**1651 Third Ave  
New York NY 10028

(212) 860-0300

**► SB-80**

A general-purpose operating system for the Intel 8080 and 8085 and Zilog Z80 microprocessors

**Price** \$275**Description** SB-80 is a real-time general-purpose development-oriented operating system similar to Digital Research CP/M. Sequential and random file management are standard, and ISAM file access is optional. It provides contiguous memory management and features utilities for disk copying, debugging, batch processing, background print/suspend, and status reporting.

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**LOGICAL SYSTEMS**11520 N Port Washington Rd  
Mequon WI 53092

(414) 241-3066

**► SMAL-LDOS**

An LDOS operating system for the Tandy Radio Shack TRS-80 Models I and III

**Price** \$49**Description** SMAL-LDOS, a subset of the full LDOS operating system, provides both the command syntax and overall design of the original but uses only 36K bytes of memory. It provides a variety of utilities, including BACKUP to copy files; FORMAT to prepare disks for new data; CONV to read files and move their data from Model III TRSDOS diskettes to an LDOS diskette; HITAPE for cassette support under LDOS with BASIC; and REPAIR to change disk formats from TRSDOS to LDOS. In addition, SMAL-LDOS supports special driver programs, including PDUBL and RDUBL for driving disks; KI/DVR, a keyboard driver; and PR/FLT, a printer filter that allows parameters to be set for printout height and width and left margin width, and determines whether to send a line feed after a carriage return.

**MICROSOFT**

10700 Northup Way  
Bellevue WA 98004

(206) 828-8080

**► MS-DOS 1.25**

A general-purpose operating system for systems based on the Intel 8086 and 8088

**Price** Available only as part of system configuration

**Description** MS-DOS 1.25 is a development-oriented operating system available for a variety of 16-bit microcomputers. MS-DOS 1.25 provides contiguous memory management to enhance the speed and efficiency of program execution. The system's logical disk sectoring and internal sector buffering minimize the number of disk accesses required during operation.

The core of MS-DOS 1.25 consists of three modules: MSDOS.SYS, a transparent, device-independent I/O handler capable of high-level random or sequential file access; IO.SYS, a device-dependent module usually configured by OEM suppliers of MS-DOS-based microcomputers; and COMMAND.COM, a console command interpreter. COMMAND.COM executes program files contained on disk, including COM binary programs, EXE relocatable subroutines, and BAT batch command files. COMMAND.COM can be replaced on MS-DOS diskettes by application programs, allowing turnkey systems to be created easily.

**MICROSOFT**

10700 Northup Way  
Bellevue WA 98004

(206) 828-8080

**► MS-DOS 2.0**

A general-purpose operating system for 16-bit microcomputers based on the Intel 8086 and 8088 microprocessors

**Price** Available only as part of system configuration

**Description** MS-DOS 2.0 features fast and efficient logical disk sectoring, contiguous memory management, and powerful development utilities. A significant improvement over previous versions of MS-DOS is the hierarchical inverted-tree file structure for use on disk systems. Like earlier versions of MS-DOS, MS-DOS 2.0 is compatible with a variety of computer languages.

MS-DOS 2.0 requires no major alterations to accommodate peripheral device drivers added to a system. During program execution, MS-DOS 2.0 treats these device drivers like files requiring simple read and write calls.

MS-DOS 2.0 features piping, which uses output from one process or program as input for another. The operating system supports a serial terminal driver, which enhances the portability of MS-DOS-based applications programs. The file, process, and device management features of MS-DOS 2.0 improve the compatibility of MS-DOS and Microsoft's XENIX 3.0.

**MICROSOFT**

10700 Northup Way  
Bellevue WA 98004

(206) 828-8080

**► XENIX Version 3.0**

A general-purpose operating system for microcomputers based on the Motorola MC 68000, Intel 8086, and Zilog Z8000

**Price** \$395 to \$595 purchase, depending on configuration

**Description** XENIX Version 3.0, a licensed derivative of the Bell Laboratories UNIX System III, is a development-oriented operating system supporting more than 200 UNIX utilities as well as BASIC, FORTRAN, COBOL, Pascal, and C compilers.

Under XENIX, file directories are based on an inverted-tree structure, and file access techniques include sequential, random, and ISAM. Disk access times are significantly faster under XENIX Version 3.0 than under previous versions of XENIX. Other improvements include record locking, shared data areas for multiuser systems, electronic mail capability, and the ability to write files into a Microsoft MS-DOS format for use on other microcomputers.

XENIX 3.0 is available to end users in time-sharing, software development, and text editing versions. Single- and multiuser versions are available for the Apple Lisa and IBM Personal Computer.

**OASIS TECHNOLOGIES**

201 Lafayette Circle  
Suite 100  
Lafayette CA 94549

(415) 283-4290

**► Oasis8**

A single- or multiuser operating system based on the Zilog Z80

**Price** \$495

**Description** Oasis8 supports both single-user installations and multiuser installations of up to 16 users, with sequential, direct, keyed, and ISAM data file access. It provides the EXEC JCL, a text editor and script processor, a multiuser print spooler with 26 user-defined queries, diagnostic and conversion tools, and a BASIC interpreter and pseudocode compiler. In addition, it allows file send and receive and provides a terminal emulator and an accounting history based on time of day.

The Oasis8 provides data integrity for the multiuser environment through built-in security features. User accounting provides each user with individual password- and security-access privilege levels to protect data. Command security prohibits undesired execution of system maintenance commands by users with lower privilege levels. Automatic record locking shields data integrity by permitting user access for updating individual records one at a time. All Oasis8 8-inch media are com-



patible, and most 5-1/4-inch media are similar enough to be read by most machines.

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## OASIS TECHNOLOGIES

201 Lafayette Circle  
Suite 100  
Lafayette CA 94549

(415) 284-4290

### ► Oasis86

A 16-bit multiuser operating system for computers based on the Intel 8086, 8088, and 80186

**Price** \$695

**Description** Oasis86 supports 32 users. It provides all the features of its partner, Oasis8, and adds enhanced B-tree ISAM file access; enhanced usage history, with CPU utilization and operation tracking; improved read, write, and erase protection; and an extended bisynchronous communications interface. In addition, it provides an enhanced EXEC JCL; a full-screen editor; a multiuser, multiprinter, print spooler that can control four printers at once; interprocess communications; a BASIC interpreter and native code compiler; dynamic file allocation; batch processing; a multilevel directory; priority scheduling; support for variable-length records, and four times the effective programming space.

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## PICK SYSTEMS

1691 Browning  
Irvine CA 92714

(714) 261-7425

### ► Pick

A multiuser operating system for the IBM Personal Computer XT

**Price** \$495

**Description** Pick is a multiuser, virtual memory operating system that has a built-in relational data base with a dictionary file structure. It has an English-like nonprocedural query language, an extended compiled version of BASIC, and a stored procedure language. Imbedded at the lowest level of the system, the virtual memory manager addresses disk storage memory in units called frames. The disk is addressed as if it were the main memory of the system. In effect, main memory is as large as the available disk space. When the Pick operating system determines that programs or data are not already contained in main memory, it finds the appropriate frame on disk and brings it into main memory.

The Pick multiuser system is oriented toward video display, or CRT, terminal users and is designed for interactive uses. The System Monitor provides the interrupt-driven multiuser scheduling required. Functionally, Pick memory management lies under the instruction set. The file structure features data strings of variable length. There are no fixed file or record lengths. Files and records automatically expand or contract as data is added or deleted.

ACCESS is the English-like query language that allows analysis of data based on relations between data. This is a nonprocedural language. The user specifies the desired results, not what the processor must do to get them. Pick Basic is a compiled/interpreted version of Dartmouth Basic and contains all the constructs needed to write structured code.

The compiler provides program development assistance options, including a line-by-line list as the program is compiled, listings that can include error messages, error-line-only listings, assembled code listings of source statements, cross-reference storage, and a variable-statement map. Additional features of the operating system include variable names of any length, optional statement labels, typeless variable specifications, LOOP, WHILE, UNTIL, DO, REPEAT statements, CASE statements, IF-THEN-ELSE blocks nested to any level, internal and external subroutine calls, automatic data conversion, recursively executable subroutines, one- or two-dimensional arrays, pattern matching, and multiple statements per line. A procedure language called PROC is provided to create a list of commands for the execution of sequential processes. It permits the storage and execution of a lengthy series of commands or operations and the ability to customize data base input, inquiry, retrieval, and report generation. Pick's Editor, in addition to processing text and entering source programs, can be used to examine and alter any attribute of any item in any file. RUNOFF is the system's page formatter and document processor. It will number pages and chapters automatically. It allows headers and footers and performs column alignment, centering, and selective right-hand justification. It also allows underlining and bold-face printing and can automatically build an index if needed. The print spooler serves as a buffer, preventing conflicts and allowing printer-bound data to be written to a disk as it is generated. The spooler will accommodate up to 125 queues, one high-speed parallel printer and two serial printers, and 600 individual files.

Long-run quality control checks are included, and security protection is provided. Under the operating system security procedures, access is controllable on the file level as well as the system level. File access is monitored separately for both retrieval and update operations. Four levels of password security and code protection are provided.

Approximately 95 percent of the Pick operating system is written in a virtual assembly language, or pseudo-code. This gives the operating system a high degree of transportability. Software running on one machine maintains flexibility across the total micro-mini-mainframe spectrum. A software package running the Pick system on an IBM Personal Computer XT could conceivably be ported over to a Honeywell Information Systems Inc Level 6 minicomputer or an IBM 4300.



**RYAN-MCFARLAND**

609 Deep Valley Dr  
Rolling Hills Estates CA 90274

(213) 541-4828

**► RM/COS**

A multiuser, multitasking operating system for machines with an installed MC 68000 processor

**Price** \$1,700

**Description** Among the features of RM/COS are record locking, multiuser and multitasking capabilities, multilevel access security, I/O capabilities, print queue management and service, and a complete job description language. The RM/COS is a multiuser system and the number of users on the system is limited only by the amount of memory resident in the machine. Four users can reside in 256K bytes of RAM. Full ANSI 74-level sort/merge capabilities are supported by RM/COS. The system comes with an interactive and batch JCL, including parameter passing between job steps and conditional execution. The system definition file provides automatic log-on and password protections. Backup and restore capabilities of the system preserve the hierarchical structure of the data. The tape support feature enables an application to read and write both IBM-style and ANSI record formats. An optional communication package includes IBM 2780 and 3780 emulation. In addition, an RS-232 user link allows data to be passed between computers.

RM/COS includes a service-call mechanism that can port certain programs from MS-DOS and UNIX operating systems to run on RM/COS. This service-call mechanism enables the operating system to execute MC 68000 object code applications that use the service-call mechanism, regardless of the source language in which they are written.

In addition, Thoroughbred/OS provides three different levels of file security, each controlling access and alteration of data.

**SOFTECH MICROSYSTEMS**

16885 W Bernardo Dr  
San Diego CA 92127

(619) 451-1230

**► p-System**

A general-purpose operating system for various micro-computers and mainframes

**Price** \$395

**Description** The p-System combines a powerful program development and execution environment with a comprehensive library of utilities. The operating system and all operational components are organized in a menu-driven tree structure. The p-System features automatic program linking, overlaying, and multitasking. Ten macro cross-assemblers, a symbolic debugger, print spooler, graphics utilities, native code generators, and other performance aids are included with the p-System.

A variety of language compilers are supported by the p-System. The program preparation environment includes a screen-oriented text editor for source code maintenance and a file handler for general disk housekeeping. One of the most powerful features of the p-System is the complete portability of object code generated by compilers running under the system. Underlying the p-System is a hypothetical computer known as the p-machine. System compilers create object code for this hypothetical machine, and the code is then executed by a p-machine emulator written in the native language of the host processor. A variety of p-machine emulators have been written for Zilog Z80 and Z8000, Intel 8080, 8086, and 8088, and Motorola MC 68000 and 6502 microprocessors. Emulators are also available for Digital Equipment PDP-11 and VAX mainframe computers.

**SMC SOFTWARE SYSTEMS**

Division of Science Management Corp  
1011 Rte 22  
PO Box 6800  
Bridgewater NJ 08807

(201) 685-9000

**► Thoroughbred/OS**

A UNIX-based operating system for 16-bit Intel 8086-based computers

**Price** \$795

**Description** Thoroughbred/OS is a multiuser multi-processing operating system that provides software portability, adaptable system commands, extensive file management, I/O flexibility, efficient space utilization, and support for customized programming. Its file management provides a hierarchical file structure that allows users to develop a number of files of any depth, partitioned as needed. Its command flexibility allows the construction of individual commands or command combinations and makes available numerous commands for file creation, manipulation, editing, and management.

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**TANDY**1800 One Tandy Ctr  
Fort Worth TX 76102

(817) 390-3011

**► TRSDOS**

A single-user operating system for Tandy Radio Shack TRS-80 computers

**Price** On request

**Description** TRSDOS, the operating system for any TRS-80, is incorporated within the system and automatically loaded at power-on. It includes the software required to operate the disk system and file management utilities. When the BASIC command is entered, TRSDOS initiates Disk BASIC, which enhances Level II BASIC with several new commands and allows random or sequential disk files. Programs can be stored in BASIC as ASCII- or compressed-format files. All programs are tagged with an eight-character name, a three-character extension, an eight-character password, or a specific disk drive number. TRSDOS also includes a supervisor program, I/O drivers, utilities, a communications command set, 37 library commands, a key-ahead feature that buffers commands for execution while others are entered, and an auxiliary code that is loaded as needed into an overlay area. There are five communications commands: ECHO, which begins the echo keyboard input to the display; HOST, which allows keyboard input from a remote terminal, as well as video input to a remote terminal; RECEIVE, which inputs data into RAM from a serial interface; SETCOM, which sets RS-232C port parameters; and TERMINAL, a menu-driven ASCII communications program.

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**WATERLOO MICROSYSTEMS**175 Columbia St W  
Waterloo Ontario  
Canada N2L 5Z5

(519) 884-3141

**► Port V2.10**

An operating system designed for the IBM Personal Computer and Personal Computer XT, Zenith T150 & T160, and the Compaq II & II Plus

**Price** \$2,460

**Description** Port operates on a single personal computer or a network of personal computer workstations. Each computer uses a card inserted into any available expansion slot. The networked computers are connected by coaxial cable. Port allows the user to run PC DOS 2.0, 2.1, and 3.0 as guest operating systems under Port. The PC DOS activity runs concurrently with other activities under Port. Port provides the ability to convert PC DOS files to Port files and vice versa. "Virtual" PC DOS disk volumes may be stored in local or remote Port files, allowing virtual disk volumes to be shared among users of the network. Port can accommodate concurrent activities. Each activity has its own window, which can be displayed or hidden from view.

The Browser and Editor handle the file management functions in the system. The Browser allows the user to search through the hierarchical tree-structured file system, remove files, make new files, copy, move and print files, and start an editor. The Text Editor is a full-screen text editor for creating and revising documents. The Editor's operations are based on pointing to and selecting portions of text. The Port Text Formatter is used to prepare and produce documents such as reports and books. File security is controlled by lock files that contain entries consisting of user IDs and their specific file access permissions. A lock file can be inserted at any level in a file system tree to control access to the files beneath the lock file. The Terminal Activity allows the user to link the workstation to a mainframe computer. Terminal creates a window that simulates a terminal to the mainframe computer. Multiple windows allow the simultaneous use of more than one remote computer. Files can be transferred between remote computers with this activity. Also among Port's features is a mouse-driven user interface that uses menus and icons.

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**WHITESMITHS**97 Lowell Rd  
Concord MA 01742

(617) 369-8499

**► IDRIS**

A multiuser, multitasking operating system for the Digital Equipment PDP-11 family, PRO-35, Micro-11, and the Motorola 68000

**Price** \$1,500

**Description** IDRIS consists of a real-time multitasking executive with integrated utilities for program and system control, file and text manipulation, multiuser support, terminal control, and program development. IDRIS was initially designed as a software development system to be compatible with the UNIX Version 6 operating system. Both memory-managed and non-memory-managed hardware is supported. The binary distribution includes the sources of all device drivers (written in C) and the low-core image of the operating system. The multitask environment is managed by a "hybrid" scheduler that allows execution of real-time and time-sharing processes. This scheduler is entirely event- and priority-driven. A system timer provides for preemption of processes via a tuneable "time quantum" scheme. There is a built-in relationship between a process's priority and the time quantum it is allocated at that priority. When the time quantum for the current running process expires, that process is put at the end of the list of running processes at the same priority. A real-time process keeps its original priority, but a time-sharing process decreases in priority over time. As this decrease occurs, any other time-sharing processes on the run list increase in priority.



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**WICAT SYSTEMS**

PO Box 539  
1875 S State  
Orem UT 84057

(801) 224-6400

**► MCS**

A multiuser operating system for the Wicat System 100

**Price** On request

**Description** MCS is a real-time multitasking operating system that provides dynamic memory management, process control, background processing, and interprocess communication with page sharing and time synchronization for multiple users. Features include a screen-oriented, terminal-independent editor with two levels of editing functions and virtual edit buffering; a file system that provides a hierarchical directory with automatic cataloging, file protection and dating, and automatic file size extension if needed; command line editing; file-name pattern matching; and I/O redirection. In addition, it can support a variety of programming languages, including Pascal, C, FORTRAN-77, COBOL, BASIC, Assembler, and APL 68000.



# DATA BASE MANAGEMENT

## Compatibility Matrix

221.0025.001

Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	Unix	Xenix
<b>American Planning</b> BOSS (Business Oriented Software System)			•	•		•	•	•	•								North Star DOS
<b>Analytica</b> REFLEX									•								
<b>Apple Computer</b> AppleFile III	•																
<b>Applied Software Technology</b> VersaForm	•					•			•								
<b>Artsci</b> Magic Memory	•																
<b>Ashton-Tate</b> dBASE II dBASE III Friday!			•	•		•	•		•	•							ZDOS
<b>Caxton Software</b> Cardbox			•				•										
<b>Compumax</b> MICROBASE	•	•				•											Atari DOS
<b>Computer Control Systems</b> FABS/PC						•			•								
<b>Computer Headware</b> WHATSIT?	•	•															AMOS, North Star DOS
<b>Concentric Data Systems</b> Concentric Information Processor (CIP)						•			•								
<b>Condor Computer</b> Condor 1			•	•		•	•		•								TurboDOS
<b>Construction Data Control</b> Construction Data Base/Assembly Estimating		•															
<b>Contel Information Systems</b> RTFILE																	Digital Equipment PRO/RT-11
<b>Cosmos</b> Network Revelation Revelation Runtime Revelation									•	•							
<b>Data Access</b> DataFlex 2.0		•	•	•		•			•								TurboDOS, Mmmost, North Star DOS

Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	Unix	Xenix
<b>Day One Software</b> DAY ONE			•				•			•							
<b>Designers &amp; Builders of Informations Systems (DBIS)</b> Data Base Information System (DBIS)												•					
<b>Eagle Enterprises</b> CITATION			•				•										
<b>ESP Computer Resources</b> dataKEYper	•																
<b>Golemics</b> Sequitur											•				•		
<b>Hayes Microcomputer Products</b> Please							•			•							
<b>Holliday Software</b> Database 3			•				•										
<b>Hoyle and Hoyle Software</b> Query!2	•	•					•						•				ZDOS, HDOS
<b>Information Builders</b> PC/FOCUS							•										
<b>Information Unlimited Software (IUS)</b> EasyFiler							•			•							
<b>Institute for Scientific Information (ISI)</b> Sci-Mate Personal Data Manager The Searcher		•	•	•													
<b>International Software Alliance</b> Btrieve Record Manager							•										
<b>ITSoftware</b> KeepIT							•										
<b>Key Software</b> ResQ							•										
<b>LJK Enterprises</b> Data Perfect	•																Atari DOS
<b>Martin Marietta Data Systems</b> RAMIS II																	IBM VM/370 on the IBM Personal Computer XT/370
<b>Micro Data Base Systems</b> Knowledge Man MDBS III		•		•	•	•	•	•	•	•				•	•		TurboDOS



Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	Unix	Xenix
<b>MicroPro International</b> InfoStar			•	•	•												
<b>Micro-Ap</b> Selector V			•						•								
<b>Microrim</b> R:base 4000						•		•									
<b>Multi-Soft</b> Multi-Trieve	•																
<b>Oracle</b> ORACLE Version 3															•	•	
<b>PEARLsoft</b> Personal PEARL			•	•	•			•									
<b>PowerBase</b> PowerBase 2.1						•											
<b>Probase Group</b> Probase			•	•					•								
<b>Professional Software</b> InfoPro																	Commodore DOS
<b>Protemp</b> Notebook						•											
<b>Qint Database Systems</b> QINT/SQL						•		•									
<b>Quic-N-Easi Products</b> Q-PRO 4			•				•										TurboDOS, Mmmost
<b>Quadram</b> The Data Base Manager						•		•									
<b>The Small Computer Co</b> filePro 16						•		•									
<b>The Software Connection</b> DECISION S/1000																	Pick
<b>Software Publishing</b> PFS:FILE PFS:REPORT	• •					• •		• •				• •					
<b>SSR</b> OMNIFILE									•								
<b>Stoneware</b> Advanced DB Master DB Master 4 PLUS	•					•											
<b>Structured Systems Group</b> Analyst			•	•			•	•									
<b>Supersoft</b> Personal Data Base						•											
<b>Tandy</b> PROFILE III Plus												•					





Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	Unix	Xenix
TCS Software Q/LABEL			•														
Vector Graphic DataManagr																	Vector microcomputer

# DATA BASE MANAGEMENT

## Product Summaries

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### AMERICAN PLANNING CORP

Suite 423  
4600 Duke St  
Alexandria VA 22304

(703) 751-0451

#### ► BOSS (Business Oriented Software System)

A business-oriented DBMS

**Price** \$495 purchase

**Description** BOSS integrates a menu-driven DBMS with an application program development system. The program handles files of up to 80,000 records. Up to 15 key indexes can be defined for each file; the indexes are automatically updated by BOSS as changes are made to the records. BOSS is compatible with microcomputers running under CP/M, MP/M-II, CP/M-86, MP/M-86, MS-DOS, PC DOS, North Star DOS, or Advantage GDOS.

Multiuser versions of BOSS feature automatic record locking.

**Compatibility Matrix:** 221.0025.001

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### ANALYTICA CORP

3155 Kearney St  
Fremont CA 94538

(415) 490-3643

#### ► Reflex

A data base management system featuring cross tabulation

**Price** \$495 purchase

**Description** Reflex features include pull-down menus, screen windows, and instructional help screens that can be accessed through single keystrokes. Users can also employ the keyboard or an optional mouse.

Information can be reviewed in a variety of formats and can be grouped and summarized to reveal interrelationships, trends, and deviations. Data can be organized in lists and tables, selectively extracted and displayed in charts and graphs, and summarized or combined through several built-in financial, statistical, and mathematical functions.

Records are created through the use of the program's "form view." Users design their own forms on the computer screen as they would create fill-in-the-blanks forms on paper. After records have been created, the information they contain can be accessed and displayed in a variety of ways. A user can scroll through records one by one using the form view or can use the list view to

scan many records at once. The list view summarizes the information in rows and columns, with rows representing different records and columns displaying data from desired fields. The graphical view allows data from different records to be exhibited in several formats, such as line and bar graphs and pie and scatter charts, for a visual summary of trends and comparisons. The user can shift between the overview presented in the graph and the details behind it.

Field information can be entered or modified not only in the form view but also in the list and graphical views. The program allows fields to be moved, renamed, added, or deleted at any time. Changing data in one view immediately changes it in all other views.

The cross-tab view has rows and columns similar to those of the list view, but users select both the row and column headers. The result is a numerical breakdown and overview in tabular form. In addition to summing information, the cross-tab view can perform counts, averages, minimums, maximums, variances, and standard deviations.

**Compatibility Matrix:** 221.0025.001

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### APPLE COMPUTER

20525 Mariani Ave  
Cupertino CA 95014

(408) 996-1010

#### ► AppleFile III

A structured DBMS for the Apple III

**Price** \$325 purchase

**Description** AppleFile III allows users to build record files of up to 16M bytes, with up to 30,000 records per file, 80 fields per record, 8 keys per file, and 8 fields per key. AppleFile III is a structured data management program that permits users to scan many records, using summary keys for each record. AppleFile III is built around Record Processing Services (RPS), which allows data files from AppleFile III to be easily exchanged among other programs based on RPS.

**Compatibility Matrix:** 221.0025.001

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**APPLIED SOFTWARE TECHNOLOGY**

170 Knowles Dr  
Los Gatos CA 95030

(408) 370-2662

**► VersaForm**

An application-oriented DBMS

**Price** \$100 purchase

**Description** VersaForm is a forms-oriented DBMS that features lookup tables, B-tree record access using one or two key fields, and an unlimited number of fields per record. The program automatically dates forms and automatically calculates selected fields by using values entered in other fields. VersaForm features a full-screen editor for the design of data entry and report forms. Users can define entry screens that confirm that each entry falls within a specified range.

VersaForm is available for the Apple II+ and IIe, Apple III, IBM Personal Computer and Personal Computer XT, Corvus Concept, and other microcomputers running under MS-DOS.

**Compatibility Matrix:** 221.0025.001

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**ARTSCI**

5547 Satsuma Ave  
North Hollywood CA 91601

(818) 985-2922

**► Magic Memory**

An electronic filing system for the Apple II, II+, and IIe

**Price** \$60 purchase

**Description** Magic Memory is a menu-driven program for storing, categorizing, sorting, and printing lists of items or addresses. The program consists of 50 sections, each capable of maintaining 250 entries of nine lines each. Twenty-six of the 50 sections constitute an alphabetical address list; the other 24 sections can be labeled by the user. The sort feature allows users to reorganize files into different orders.

**Compatibility Matrix:** 221.0025.001

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**ASHTON-TATE**

10150 W Jefferson Blvd  
Culver City CA 90230

(213) 204-5570

**► dBASE II**

A DBMS for systems running under CP/M, CP/M-86, PC DOS, MS-DOS, or ZDOS

**Price** \$495 purchase; \$100 purchase for run-time version

**Description** dBASE II creates data base files, modifies files, and generates reports. The system is used by specifying commands or by compiling a series of operations into a file and executing them with one command.

dBASE allows the user to modify the entire data base or change single characters in data fields. Automatic calculations can be performed on fields or records. A report function selects information, totals, subtotals, and presents the information in a user-defined format.

dBASE II supports data files containing up to 65,535 records, with up to 32 fields per record. The report generator can access two files simultaneously. The latest version of dBASE II (version 2.4) features several enhancements that make dBASE II easier to use. A disk-resident tutorial and extensive Help screens are available. With the Set Format To <file> command, the Edit, Append, Create, and Insert commands can use screen format files to expedite record updating and processing. A Text/End Text command has also been added for use in generating merged-mail form letters directly from dBASE II.

Though not the easiest to use, dBASE II is the most popular microcomputer DBMS, and its popularity ensures its continued support. Many supporting programs, such as graphics packages, application generators, and statistical analysis programs, have been developed by third-party vendors.

Ashton-Tate has recently announced a multiuser version of dBASE II that runs under TurboDOS or MP/M-86 as well as on such local area networks as the 3Com EtherSeries. Features include record locking, shared information files, password protection, and expanded data file capacity.

**Compatibility Matrix:** 221.0025.001



**ASHTON-TATE**

10150 W Jefferson Blvd  
Culver City CA 90230

(213) 204-5570

**► dBASE III**

A relational DBMS for the IBM Personal Computer and Personal Computer XT and compatible computers with a minimum 256K bytes of RAM

**Price** \$695 purchase

**Description** dBASE III is an enhanced version of Ashton-Tate's dBASE II data base program, rewritten to take advantage of the increased capabilities of 16-bit computers. dBASE III allows up to two billion records per data base and 128 fields or 4K bytes per record. Other enhancements include variable-length text fields of up to 4K bytes per field, faster sorting and indexing operations, and the ability to create relational data bases by using up to 10 data files simultaneously. dBASE III allows users to use either the dBASE command language or the dBASE Assistant (an interactive command assistant) to create data base applications. dBASE III is fully compatible with the Ashton-Tate Framework integrated productivity program. Programs and data files created under dBASE II can be transferred for use under dBASE III through the translation facility provided with dBASE III.

**Compatibility Matrix:** 221.0025.001**ASHTON-TATE**

10150 W Jefferson Blvd  
Culver City CA 90230

(213) 204-5570

**► Friday!**

An electronic filing system for microcomputers running under CP/M, CP/M-86, MS-DOS, or PC DOS

**Price** \$295 purchase

**Description** Friday! features a circular menu structure, which allows users to create, update, restructure, and process data records quickly and easily. Files can be sorted cumulatively on up to five fields. The Friday! data entry program can be set up to automatically perform mathematical calculations on specified fields. Customized reports can feature math and total fields. Friday! reformats files for use with WP programs.

**Compatibility Matrix:** 221.0025.001**CAXTON SOFTWARE LTD**

10-14 Bedford St  
Covent Garden  
London WC2E 9HE  
England

01-379-6502

**► Cardbox**

A record management system for microcomputers running under CP/M or MP/M

**Price** \$245 purchase

**Description** Cardbox stores records on disk and presents them on screen in a user-defined index card format. Up to 65,500 records can be tracked; each record contains up to 26 fields and 1,404 characters. Although Cardbox does not feature mathematical or Boolean functions, it does support extensive indexing, searching, and sorting commands. Cardbox can perform inclusive and exclusive searches up to 100 levels deep. Users can index any or all words in a field.

**Compatibility Matrix:** 221.0025.001**COMPUMAX**

PO Box 7239  
Menlo Park CA 94025

(415) 854-6700

**► MICROBASE**

A data base manager and report writer system

**Price** \$149 purchase

**Description** MICROBASE is a data base management system and report writer facility for the novice or first-time computer user. It supports up to 255 characters per record. File access uses indexed sequential B-trees. All computations are performed in double precision. The report generator uses user-defined formulas. System reports are as simple or as sophisticated as the user desires. Written in Microsoft BASIC, MICROBASE is operational on CP/M-based computer systems as well as Apple II and Atari microcomputers and the IBM Personal Computer.

**Compatibility Matrix:** 221.0025.001

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**COMPUTER CONTROL SYSTEMS**Route 3, Box 168  
Lake City FL 32055

(904) 752-0912

**► FABS/PC**

A routine for B-tree keyed file access

**Price** \$150 purchase

**Description** FABS/PC is an assembly language subroutine for use on microcomputers based on the Intel 8086 or 8088 microprocessor and running under PC DOS or Victor 9000-compatible MS-DOS. FABS/PC is called from within programs written in such higher-level languages as Microsoft BASIC, Microsoft FORTRAN, Microsoft Pascal, Microsoft COBOL, and IBM BASICA. The subroutine supports a key-sequential, multipath, balanced-tree file structure. The key file is independent of the data file and never needs to be resequenced. FABS/PC supports variable-length and duplicate keys.

**Compatibility Matrix:** 221.0025.001

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**COMPUTER HEADWARE**PO Box 14694  
San Francisco CA 94114

(415) 647-8518

**► WHATSIT?**

A conversational query/retrieval system

**Price** \$150 purchase

**Description** WHATSIT? (Wow! How'd All That Stuff Get In There) is a conversational query/retrieval system that was especially conceived for the consumer market but offers large capacity and quick response (2 to 10 seconds). In contrast to so-called data base programs, WHATSIT? does not restrict stored data to pre-declared fields but accommodates new storage attributes (called *tags*) dynamically during normal interactive use. Storage of any number of free-form entries is permitted at a single tag, with disk storage space allocated automatically. There is no limit to the number of records per file or the number of fields per record. Files can span up to four diskettes. WHATSIT? is especially suited for experimental or unpredictable applications. Queries may take several forms, including indexed and selective retrieval. WHATSIT? runs on Apple II, North Star, and Alpha Micro systems as well as on systems running under CP/M.

**Compatibility Matrix:** 221.0025.001

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**CONCENTRIC DATA SYSTEMS**18 Lyman St  
Westboro MA 01581

(617) 366-1122

**► Concentric Information Processor 1C (CIP 1C)**

A file manager for the IBM Personal Computer, Personal Computer XT, Personal Computer AT, and compatible computers

**Price** \$395 purchase

**Description** CIP 1C is a menu-driven filing system that works on both disk- and diskette-based systems. The program allows users to create and maintain a single data file of up to 65,000 records; each record consists of up to 40 fields of 50 characters each. Data files can be easily modified, indexed, or transferred into formats for use by other programs, such as VisiCorp VisiCalc, Ashton-Tate dBASE II, MicroPro WordStar, and Lotus 1-2-3.

**Compatibility Matrix:** 221.0025.001

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**CONDOR COMPUTER CORP**2051 S State St  
Ann Arbor MI 48104

(313) 769-3988

**► Condor 1**

A relational DBMS for microcomputers running under CP/M, CP/M-86, MS-DOS, or PC DOS

**Price** \$650 purchase

**Description** Condor 1 is a family of relational DBMS products constructed around an English-like query language. Fifteen microcomputer manufacturers have chosen the Condor 1 for their OEM systems. The Condor 1 query language is well suited for a variety of common business applications. Condor 20-3, the most extensive of the packages, supports disk-based systems and allows files of up to 32,767 records, with a maximum of 1K characters and 127 data fields per record.

Condor 1 products allow access to information in three ways: through an unstructured and versatile query, through what-if models, and in user-designed periodic reports. Sorting files before generating a report reduces response time significantly.

**Compatibility Matrix:** 221.0025.001

**CONSTRUCTION DATA CONTROL INC**6140 Northbelt Pkwy  
Norcross GA 30071

(404) 448-4722

**► Construction Data Base/Assembly Estimating**

A building assembly estimating program for contractors

**Price** \$3,000 purchase

**Description** The Construction Data Base/Assembly Estimating program allows an estimator to build assemblies so that a take-off can be made by the number of assemblies as well as by data base items. Pricing changes in the catalog can automatically update assemblies and all estimates in process or on file. Items contained in assemblies are printed on the estimate, providing a complete listing of all materials. Each data base item may be factored or adjusted in accordance with user requirements. Any number of estimates in progress can be made. The program runs on any CP/M-based computer system with 64K bytes of RAM.

**Compatibility Matrix:** 221.0025.001**CONTEL INFORMATION SYSTEMS**Small Computer Systems Group  
4330 East-West Hwy  
Bethesda MD 20814

(301) 654-9120

**► RTFILE**

An interactive relational DBMS for those systems running under PC DOS

**Price** \$500 to \$5,000 purchase depending on system configuration

**Description** RTFILE is an interactive, forms-oriented DBMS that enables end users to perform a variety of common DP tasks without programming. RTFILE users can select menu options and complete CRT display forms to sort and define files, perform data entry, select records, and generate reports with calculated fields. RTFILE also includes a set of FORTRAN-callable subroutines for use in more complex processing requirements.

RTFILE is also available for Digital Equipment mini-computers and mainframes running under RT-11, RSX-11M, RSTS/E, STAR-eleven Unix, and VAX/VMS.

**Compatibility Matrix:** 221.0025.001**COSMOS INC**19530 Pacific Hwy S  
Seattle WA 98188

(206) 824-9942

**► Network Revelation**

A relational data base management system for personal computer networks

**Price** \$1,495 purchase for 4-user system

**Description** Network Revelation contains the same features as the single-user version of Revelation but runs on IBM's PC-Network, Nestar's Plan 3000, and networks from various manufacturers running Novell Netware. The LINK file structure for large files in Network Revelation implements record-locking by using forward- and backward-linked frames of 1K-byte blocks of data. ROS, the other filing system used in Network Revelation, is designed for confidential network files.

**Compatibility Matrix:** 221.0025.001**COSMOS INC**19530 Pacific Hwy S  
Seattle WA 98188

(206) 824-9942

**► Revelation**

A relational data base system

**Price** \$950 purchase

**Description** Revelation is a relational data base and applications environment for most MS-DOS-based personal computers. Release G includes program, utility, and tutorial disks in addition to user's and technical manuals. The program consists of five separate modules: R/Design, a fourth-generation application and program generator for defining files and building menus; R/List, a dictionary-driven report generator; R/Edit, an interactive line editor; R/Basic, Revelation's hybrid procedural language for advanced applications and structured programming; and R/Text, a full-screen editor.

**Compatibility Matrix:** 221.0025.001

**COSMOS INC**19530 Pacific Hwy S  
Seattle WA 98188

(206) 824-9942

**► Runtime Revelation**

A run-time version of Revelation for programmers

**Price** \$200 purchase

**Description** Runtime Revelation is designed for programmers who create applications for other users. The software is a fully functional version of Revelation without the programming tools. R/Design, Revelation's menu-driven applications generator and R/Basic, the software's structured procedural language, are not included. Since this version is intended for use with applications that require separate documentation, Revelation manuals are not included with this package.

**Compatibility Matrix:** 221.0025.001**DATA ACCESS CORP**8525 SW 129th Terr  
Miami FL 33156

(305) 238-0012

**► DataFlex 2.0**

A relational DBMS for 8- and 16-bit microcomputers

**Price** Purchase: \$750 (single user), \$1,250 (multiuser)

**Description** DataFlex 2.0 is a standalone relational DBMS designed for commercial applications development. The program is based on a macro-based language that allows users to rename or build commands to suit their needs. DataFlex 2.0 includes a multifile, multi-page screen image and report generator, data dictionary, multikey ISAM structure, and English-like interactive query language. DataFlex 2.0 supports data files with up to 64,000 records, records with up to 255 fields, and fields with up to 255 bytes. (Numeric data is stored in BCD format.) Multiuser versions of DataFlex 2.0 feature field-level record locking during concurrent operations.

DataFlex 2.0 is available for microcomputers running under CP/M, CP/M-86, MS-DOS, PC DOS, TurboDOS, Mmmost, North Star DOS, or any of various local area network operating systems. Applications developed on one system are completely transportable to any other operating system. Data Access offers the source code for DataFlex 2.0 as a library of Microsoft Pascal/MT+ subroutines for program development.

**Compatibility Matrix:** 221.0025.001**DAY ONE SOFTWARE INC**West Valley Business Center  
Suite 402  
Wayne PA 19087

(215) 293-9777

**► DAY ONE**

A DBMS with an advanced applications and report generator

**Price** \$695 advanced purchase

**Description** DAY ONE is a menu-driven DBMS with a capacity of 65,000 records per file, 891 fields per record, and 255 characters per field. The DAY ONE report writer is a menu-driven subsystem that allows users to manipulate any number of fields using any number of complex mathematical equations. Other DAY ONE features include multiple indexing, concurrently maintained indexes, rapid file scan and search, redefinition and restructuring of files and reports, multiuser capability, utility functions to convert files from other programs into DAY ONE format, and field-level data security.

DAY ONE includes the Day One Teacher Disk and an extensive indexed tutorial. DAY ONE is available in a basic or advanced version for the IBM Personal Computer under PC DOS, other microcomputers under MS-DOS or CP/M, and the Apple II and Tandy TRS-80 systems under CP/M. The advanced version of DAY ONE supports multiple file data bases; up to nine files can be accessed in preparing one report.

**Compatibility Matrix:** 221.0025.002**DESIGNERS & BUILDERS OF INFORMATION SYSTEMS (DBIS)**One Mayfair Rd  
Eastchester NY 10707

(914) 779-5292

**► Data Base Information System (DBIS)**

A data base manager for OASIS-based computer systems

**Price** \$800 purchase

**Description** Data Base Information System (DBIS) is a general-purpose data base manager consisting of a custom report generator, a file query facility, and an update program. DBIS has two major functions:

- To aid users in generating reports and storing data. This is achieved through a series of programs, including REPORT, a custom report generator, and UPDATE, a generalized file query and update program. These programs, along with the other file utilities, allow the first-time user immediate access to the system. No knowledge of BASIC or any other programming language is required.
- To act as a programming aid. Because of the structured character of DBIS files, it is possible to modify them even after they are operational. The DBIS methodology for file I/O encourages structured programming techniques.

An extensive set of general accounting and industry-specific applications software based on DBIS is available from the vendor.

**Compatibility Matrix:** 221.0025.002

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**EAGLE ENTERPRISES**2375 Bush St  
San Francisco CA 94115

(415) 346-1249

**► CITATION**

A fact management and personal filing system for the IBM Personal Computer and microcomputers running under CP/M

**Price** \$185 purchase

**Description** CITATION stores and retrieves information by using three predefined screen formats: name and address of a person or company; book reference; and journal or magazine citation. All three formats can be used in a single data base. CITATION allows users to designate up to six predefined fields as keyword fields. Up to ten 80-character lines can be associated with each record.

CITATION also features data compression techniques, automatically maintained B-tree indexed files, built-in recovery of damaged files, and compatibility with most merged-mail mailing list programs.

**Compatibility Matrix:** 221.0025.002

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**ESP COMPUTER RESOURCES INC**155 Main Dunstable Rd  
Suite 105  
Nashua NH 03060

(603) 886-4937

**► dataKEYper**

A menu-driven data manager for Apple II+ computers

**Price** \$100-\$150 purchase

**Description** dataKEYper is designed to manage data formats and files for Apple II+ computer systems. It is available in a hard disk version or for 5.25- and 8-inch flexible disks. The hard disk version of dataKEYper handles volume management and restart/recovery automatically. Floppy dataKEYper files are easily upgraded to the hard disk. The report writer has automatic column alignment, page numbering, date printing, display to screen or printer, and totaling capabilities. dataKEYper accommodates up to 3,500 records/files with up to 2,000 fields per record. Alphanumeric fields hold 255 characters. The system features a report/label generator, sorting on up to 10 fields, data file maintenance, file query, and reset protection.

**Compatibility Matrix:** 221.0025.002

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**GOLEMICS INC**2600 10th St  
Berkeley CA 94710

(415) 486-8347

**► Sequitur**

A DBMS with integrated WP

**Price** \$395 purchase (MS-DOS) 3.0

**Description** Sequitur is a table-driven relational DBMS with WP capabilities. It helps users enter, categorize, compare, and manipulate data, and it formats information into such forms as mailing labels, invoices, and reports. Sequitur also generates tables with user-defined column headings.

WP features include insert/typeover, word wraparound, delete/insert/move, search/replace, and mail list/mail merge.

**Compatibility Matrix:** 221.0025.002

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**HAYES MICROCOMPUTER PRODUCTS**5923 Peachtree Industrial Blvd  
Norcross GA 30092

(404) 449-8791

**► Please**

A data management system for the IBM Personal Computer and Personal Computer XT and compatible computers

**Price** \$199 purchase

**Description** Please is a menu-driven data management system that simplifies many of the steps needed for inputting data or outputting reports. The program handles up to two million records, with 99 fields per record, 999 characters per field, and 2K characters per record. Please includes a screen form designer that enables users to define data validation limits, on-screen field placement, group headings, and default values. Please offers users the option to dump selected records by using the Quick List function or produce more structured reports by using one of the four output plans: list, form, replacement, and export. List produces tabular reports with user-defined subtotal and total fields. Form prints information on preprinted forms or mailing labels on a record-by-record basis. Replacement changes or deletes entire fields or records. Export transfers data from Please to other programs, including Lotus 1-2-3, Ashton-Tate dBASE II, and VisiCorp VisiCalc, that can read and write standard ASCII format files.

**Compatibility Matrix:** 221.0025.002



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**HOLLIDAY SOFTWARE**4807 Arlene St  
San Diego CA 92117

(619) 292-7766

**► Database 3**

A general-purpose file management system for the IBM Personal Computer and systems running under CP/M

**Price** \$50 purchase

**Description** Database 3 is a general file maintenance package that files and maintains various types of data on disks. A user-friendly menu format supports variable-length field names and allows sorted indexes for any field. Files include up to 65,535 records, with 15 or more fields per record and up to 255 characters per field (to a maximum of 3,825 characters per record). Print capabilities include horizontal and vertical printing as well as mailing labels, with any number of labels per name and any number across the page.

**Compatibility Matrix:** 221.0025.002

**Description** PC/FOCUS is identical in function to the Information Builders mainframe version of FOCUS. PC/FOCUS differs from the mainframe version only in the mathematical limits imposed by the architecture of the IBM Personal Computer. In addition to data base management facilities, fourth-generation query language, and advanced graphics and statistics, PC/FOCUS includes an integrated full-screen editor and full support of asynchronous communications for transferring files to and from host mainframes.

**Compatibility Matrix:** 221.0025.002

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**HOYLE AND HOYLE SOFTWARE**716 S Elam Ave  
Greensboro NC 27403

(919) 378-1050

**► QUERY!2**

A general filing system for various microcomputers

**Price** \$30 purchase

**Description** QUERY!2 consists of five interrelated subroutines: CREATE, PRINTER, VIEW, SORT, and SEARCH. CREATE allows users to define data base files that contain records with up to 255 fields of 255 characters each. File size is limited only by disk capacity. PRINTER allows users to list selected records and, using the Maillist Option, create mailing labels based on the first seven fields of each record. VIEW displays records on screen. SORT alphabetizes records according to any given field. SEARCH matches records to selected criteria, using substring or first-character match, Boolean operators, and logical And/Or relationships on up to 40 different fields. QUERY!2 runs on the Apple IIe, Tandy TRS-80 Models III and 4, Zenith microcomputers under HDOS or ZDOS, IBM Personal Computer, and systems running under CP/M.

**Compatibility Matrix:** 221.0025.002

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**INFORMATION BUILDERS**1250 Broadway  
New York NY 10001

(212) 736-4433

**► PC/FOCUS**

A DBMS for the IBM Personal Computer

**Price** \$1,500 purchase

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**INFORMATION UNLIMITED SOFTWARE (IUS)**2195 Fortune Dr  
San Jose CA 95131

(415) 331-6700

**► EasyFiler**

An advanced DBMS and report generator

**Price** \$400 purchase**Description** EasyFiler is a DBMS designed for the IBM Personal Computer and microcomputers running under MS-DOS. It supports an indexed file of up to 10,000 records, each containing up to 1,000 characters and 50 fields. The program accesses up to 50M bytes of data on a disk drive. EasyFiler allows records to be sorted or selected by up to 10 different index key fields. A Soundex phonetic search feature allows the retrieval of information even when the exact spelling is unknown.

EasyFiler reads and writes BASIC files for use with other programs. It can generate customized merged mailings when used with the IUS EasyWriter II word processor.

**Compatibility Matrix:** 221.0025.002

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**INSTITUTE FOR SCIENTIFIC INFORMATION (ISI)**3501 Market St  
Philadelphia PA 19104

(215) 386-0100

**► Sci-Mate Personal Data Manager**

A menu-driven DBMS for systems running under CP/M or CP/M-86

**Price** \$540 purchase**Description** Sci-Mate Personal Data Manager features a flexible file format that adapts to fit any textual information, including research notes, abstracts, or bibliographic citations. Data from mainframe data bases can be downloaded to the microcomputer data base by using the ISI Sci-Mate Universal Online Searcher.

The Sci-Mate Personal Data Manager handles multiple-file data bases with up to 32,000 records per file and 1,900 characters per record. Any character, word, or phrase anywhere in the record can be used as a keyword match. The program can scan 5,000 records per minute.

**Compatibility Matrix:** 221.0025.002

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**INSTITUTE FOR SCIENTIFIC INFORMATION (ISI)**3501 Market St  
Philadelphia PA 19104

(215) 386-0100

**► The Searcher**

A communication utility for use with the ISI Sci-Mate Personal Data Manager

**Price** \$440 purchase**Description** Sci-Mate Universal Online Search allows users to offload information from mainframe data bases for use with the Sci-Mate Personal Data Manager. In addition to dumb terminal emulation, the program features a universal, menu-driven command language that allows users to query DIALOG, BRS, MEDLINE, SDC, or ISI online data bases. The program supports autodial 300- or 1,200-baud modems.**Compatibility Matrix:** 221.0025.002

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**INTERNATIONAL SOFTWARE ALLIANCE**1835 Mission Ridge Rd  
Santa Barbara CA 93101

(805) 966-3077

**► Btrieve Record Manager**

A record manager for the IBM Personal Computer

**Price** \$195 purchase**Description** Btrieve Record Manager builds files based on B-tree structures and allows random and sequential keyed access to records in a data base. Programmers call the Btrieve function and pass the necessary variables from IBM BASICA or Pascal programs.**Compatibility Matrix:** 221.0025.002

**IT SOFTWARE**

PO Box 2392  
Princeton NJ 08540

(800) 222-0592  
(609) 799-2600

**► KeepIT 2.4**

A relational DBMS for the IBM Personal Computer, Personal Computer XT, and compatible systems

**Price** \$450 purchase

**Description** KeepIT 2.4, part of the ITSoftware family of programs, is a menu-driven DBMS that supports data files with up to 32,767 records per file, 99 fields per record, and 70 characters per field (up to 2,400 characters per record). KeepIT 2.4 features forms-oriented data entry as well as full screen capabilities in change data mode; users control screen layout, minimum and maximum data limits, and logical relationships between entered fields. Users either define lookup tables to substitute selected entered data or specify that a given field use the value entered in the previous record, add one to the value used in the previous record, or be entered as the result of a computation involving two entered fields. Up to nine entry screens can be used to enter a single record. Data files can be organized using up to three key fields or selected using up to seven levels of and/or conditions.

KeepIT 2.4 can transfer data to a variety of spreadsheet, graphics, and WP programs for development of models, charts, or merged-mail form letters. Using ITSoftware LinkIT or PassIT, data can also be sent to a mainframe or remote microcomputer in emulation of a TTY or IBM 3270 terminal, and interfaces with RAMIS II.

ITSoftware is a division of Martin Marietta Data Systems.

**Compatibility Matrix:** 221.0025.002

**KEY SOFTWARE**

1000 Skokie Blvd  
Suite 200  
Wilmette IL 60091

(312) 256-6776

**► ResQ**

A DBMS for the IBM Personal Computer

**Price** \$295 purchase

**Description** ResQ is a menu-driven data base management program that implements the special function keys of the IBM Personal Computer and supports disk and multi-user systems. The program supports up to 60 fields per record, with up to 80 characters per field. Records can be sorted quickly by up to 38 key indexes or selected by boolean operators. Math functions with 8 category subtotals can be defined.

A flexible screen and report formatter enables users to define a variety of mailing labels, invoices, checks, and summary reports. Sort and selection procedures can be

stored as disk files for automatic execution. Data files can be merged or accessed by WP programs.

**Compatibility Matrix:** 221.0025.002

**LJK ENTERPRISES**

7852 Big Bend Blvd  
St Louis MO 63119

(314) 962-1855

**► Data Perfect**

A file manager for Apple II and Atari 800 microcomputers

**Price** \$50 purchase

**Description** Data Perfect supports the creation and correction of data bases and prints reports and mailing labels. Records can be up to 511 characters in length, with one field specified as an indexed key field. Data Perfect manages multiple disk files, but sorting and selecting can be performed on only one disk at a time. Data Perfect interfaces to LJK Enterprises Letter Perfect to generate merged mailings.

**Compatibility Matrix:** 221.0025.002



**MARTIN MARIETTA DATA SYSTEMS**

Information Technology Div  
PO Box 2392  
Princeton NJ 08540

(609) 799-2600

**► RAMIS II**

A mainframe-level DBMS and fourth-generation query language system for the IBM Personal Computer XT/370

**Price** \$1,395 purchase

**Description** All capabilities of mainframe versions of RAMIS II are available on the microcomputer version operating on the IBM Personal Computer XT/370. Applications developed under RAMIS II on a mainframe do not require modification to run on the IBM Personal Computer XT/370. Options include RAMLINK, for data transfers between mainframe and microcomputer versions of RAMIS II; FSM, the formatted screen manager; RELATE, for extended relational capabilities; and English, an interactive query system that allows users to access data and process reports by using conversational English.

**Compatibility Matrix:** 221.0025.003

**MICRO DATA BASE SYSTEMS**

PO Box 248  
Lafayette IN 47902

(317) 463-2581

**► Knowledge Man**

A DBMS with built-in spreadsheet functions

**Price** \$500 purchase

**Description** Knowledge Man is a language-oriented, table-driven relational DBMS for systems running under PC DOS, MS-DOS, or CP/M-86. Information from the Knowledge Man data base can be consolidated into spreadsheet models. The built-in spreadsheet module features a matrix of 255 rows by 255 columns, automatic label spillover, split-screen windowing, and control over a full-color text display. Knowledge Man also includes a statistics module for computing count, sum, minimum, maximum, average, standard deviation, and variance.

Knowledge Man maintains data files as user-defined tables, though data entry and updating is handled through screen forms developed using a sophisticated full-screen editor. Up to 65,535 records are allowed per table, with 255 fields and up to 65,535 characters per record. Users can organize Knowledge Man files in B-tree format using an unlimited number of indexes. Reporting can be done on an ad-hoc basis (using an SQL-like query language) or a structured basis (using the forms manager). Knowledge Man can read and write data in ASCII, BASIC, or DIF (Data Interchange Format) file formats.

**Compatibility Matrix:** 221.0025.002

**MICRO DATA BASE SYSTEMS**

PO Box 248  
Lafayette IN 47902

(317) 448-1616

**► MDBS III**

A modular DBMS and application development system for a variety of microcomputers

**Price** Ranges to \$3,500 purchase, depending on options

**Description** MDBS III is a modular series of data management and application development tools for both single- and multiuser microcomputers. It is available for CP/M, MP/M-II, TurboDOS, CP/M-86, MP/M-86, MS-DOS, PC DOS, Unix, Xenix, and Unity. It features host language interfaces for BASIC, COBOL, C, FORTRAN, PL/1, and Pascal.

MDBS III allows users to define each data relationship with a descriptive name. This method enables direct representation of many-to-many and recursive relationships without using redundant records. MDBS III permits an unlimited number of relationships per data base (up to 16 parallel data files) and an unlimited number of sort levels in a given data relationship. Records and fields can contain up to 65,524 bytes. The number of records in a data base is limited only by disk storage (maximum 4.2G bytes).

The core of MDBS III is the Data Description Language and Data Management System (DDL/DMS). DDL is a free-form language for use in specifying the logical structure of a data base. A data dictionary is automatically created by MDBS III using DDL specifications. DMS allows data selection and manipulation to the record level. DMS includes a host language interface.

Optional modules for MDBS III include:

- RTL—A recovery and transaction logging mechanism that prevents data losses due to media or power-supply failures.
- QRS—An interactive query language for either ad hoc inquiries or structured generation of reports. QRS can output data into a DIF (Data Interchange Format) file for use in spreadsheet programs such as VisiCorp VisiCalc or into an ASCII flat file for use with MDBS Knowledge Manager.
- IDML—An interactive version of DML for use by nonprogrammers.
- RDL—A report definition language for use by nonprogrammers.
- DMU—A menu-driven maintenance program for renaming files and changing user passwords.
- IRS—A menu-driven system for logical and physical restructuring of MDBS III data bases.

**Compatibility Matrix:** 221.0025.002

**MICRO PRO INTERNATIONAL**

33 San Pablo Ave  
San Rafael CA 94903

(415) 499-1200

**► InfoStar**

A general-purpose DBMS with a screen generator and report writer

**Price** \$250 purchase

**Description** InfoStar is a repackaged version of MicroPro DataStar and ReportStar programs for the Apple II, IBM Personal Computer, and systems running under CP/M, CP/M-80, CP/M-86, MS-DOS, and PC DOS. DataStar consists of two separate programs, FORMGEN and FORMSORT. FORMGEN allows users to design screen input forms for creating data bases of up to 65,535 records, with 255 fields per record and 120 characters per field. FORMGEN supports user-defined data prompts and validates the accuracy of data during input. FORMSORT allows InfoStar files to be resequenced according to 32 sort fields.

ReportStar uses information entered under DataStar to generate detailed and summary reports. The RGEN program of ReportStar automatically generates these reports by using the file definitions created under DataStar. RGEN features column totaling, averaging, and item and page counting. The REDIT program adds headers, footers, and more detailed column headings to reports generated by RGEN.

InfoStar is suited to a variety of applications. Report and input screen formats can be saved and reused. The InfoStar command structure is similar to that used by MicroPro WordStar. Files created under InfoStar can be merged with letters written under WordStar to generate integrated mailings.

**Compatibility Matrix:** 221.0025.003**MICRO-AP**

7033 Village Pkwy  
Dublin CA 94568

(415) 828-6697

**► Selector V**

A relational DBMS for systems running under CP/M or MS-DOS

**Price** \$450 purchase

**Description** Selector V handles multiple-file data bases, with up to 99,999 records per file and 89 fields per record. The program presents menus that allow users to select and define input screens, record formats, field characteristics, processing commands, and report and query formats. The program supports multiple key fields and operates interactively or in batch mode.

**Compatibility Matrix:** 221.0025.003**MICRORIM**

3380 146th Place SE  
Bellevue WA 98007

(206) 641-6619

**► R:base 4000**

A relational DBMS for microcomputers running under MS-DOS

**Price** \$495 purchase

**Description** R:base 4000 is a single-user relational DBMS that supports multiple-file data bases of up to 100 billion records. Each data base can have up to 400 fields. R:base 4000 allows users to perform ad hoc queries or generate structured reports. The program uses interactive commands and provides extensive prompting and on-screen Help information for every command and process. Users can create menu-driven applications that invoke stored lists of R:base 4000 commands and can be used by clerical personnel.

R:base 4000 reads and writes information stored in standard ASCII (for use with WP programs in creating merged-mail form letters), SYLK (for combining information into Microsoft Multiplan models), or dBASE II (for converting data stored in Ashton-Tate dBASE II applications).

Microrim offers an optional extended ReportWriter and a Program Interface that allows direct access of data base files through Pascal or FORTRAN programs.

**Compatibility Matrix:** 221.0025.003

**MULTI-SOFT**

120 E 90th St  
New York NY 10028

(212) 534-0602

**► Multi-Trieve**

A menu-driven DBMS for Apple II+ and IIe microcomputers

**Price** \$199 purchase

**Description** Multi-Trieve displays multiple records per screen in a tabular format and provides right and left justification of data fields, column headings, decimal point alignment, and running totals for numeric fields. Multi-Trieve supports 80-column text cards for the Apple IIe, increasing the number of fields visible at one time. Multi-Trieve features fast file search, multiple indexing, file sort at data entry, and multiple-field record selection. Printing options offered by Multi-Trieve include Default Report Writer, which prints reports in a tabular format; Form/Label Writer, which prints mailing labels; and single-stroke snapshot dumping of screen contents.

**Compatibility Matrix:** 221.0025.003

**ORACLE CORP**

2710 Sand Hill Rd  
Menlo Park CA 94025

(415) 854-7350

**► ORACLE Version 3**

A relational DBMS

**Price** Purchase: \$600 (single user), \$2,000 (multiuser)

**Description** ORACLE Version 3, an end-user-oriented relational DBMS developed for use on mainframes, has been ported for use on Motorola MC68000-based microcomputers running under Unix or Xenix. All features of the mainframe-level ORACLE are available on microcomputer implementations. ORACLE Version 3 features SQL, a unified language for data definition, interactive data query, data manipulation, and data control. The system also includes the UFI report writer, IAP interactive forms processor, and HLI host language interface that allows programs written in FORTRAN, COBOL, BASIC, PL/1, Pascal, or C to access ORACLE data files. ORACLE Version 3 permits users to establish a communications link between mainframe and microcomputer versions of the DBMS for distributed data entry and analysis.

**Compatibility Matrix:** 221.0025.003

**PEARLSOFT INC**

PO Box 638  
25195 SW Parkway  
Wilsonville OR 97070

(503) 682-3636

**► Personal PEARL**

A forms-oriented DBMS for systems running under CP/M, CP/M-86, PC DOS, or MS-DOS

**Price** \$295 purchase

**Description** Personal PEARL is a menu-driven DBMS that provides four levels of functions. Users can design data entry forms, design reports, enter or update records, and produce reports. The report generator outputs to a printer, screen, or disk file. Reports sent to disk are compatible with WP programs, such as MicroPro WordStar, or spreadsheet programs, such as Sorcim SuperCalc, that read ASCII format files.

Personal PEARL matches newly created files with existing files. The user can identify fields common to both files, and Personal PEARL automatically retrieves those fields during the entry session for the new data file. Changes made to a master file are automatically reflected in related files.

**Compatibility Matrix:** 221.0025.003

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**POWERBASE**12 W 37th St  
New York NY 10018

(212) 947-3590

**► POWERBASE 2.1**

A DBMS for the IBM Personal Computer

**Price** \$395 purchase

**Description** POWERBASE 2.1 features fast search, sort, and mathematical capabilities and automatically recalculates derived data fields when a base field changes. Files of up to 65,000 records are supported on diskette or disk systems. Records contain up to 1,600 characters and 64 alphanumeric, numeric, monetary, date, or boolean fields. All files are randomly accessed and have up to six indexes. A Soundex retrieval system allows searches for phonetically similar words. A DataZoom feature allows users to focus on information within a data base to obtain detailed information on the components of the field.

**Compatibility Matrix:** 221.0025.003

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**PROBASE GROUP**1738 W La Palma Ave  
Anaheim CA 92801

(714) 535-2833

**► Probase**

A data base management system running under CP/M, CP/M-86, and MS-DOS operating systems

**Price** \$650

**Description** Probase is a relational data base program with three fully programmable program generators. The end user can create data base management applications according to the directions of the three program generators: QuicGen, ReportGen, and MenuGen. Programming and code entry are eliminated, so the end user need not be a programmer. QuickGen generates data entry and display programs, ReportGen formats the data in printed reports, and MenuGen lets the end user tie procedures together in menus or selection lists. A group of 16 macroinstructions provides access to programming routines and capabilities. These macros may be used for programming applications systems from scratch. Also included in the system is a programmable RS-232C I/O utility that allows data to be input directly into Probase through an RS-232C port from any source and in any format.

**Compatibility Matrix:** 221.0035.003

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**PROFESSIONAL SOFTWARE**51 Fremont St  
Needham MA 02194

(617) 444-5224

**► InfoPro**

A general information management system for the Commodore CBM 8032 microcomputer

**Price** \$295 purchase

**Description** InfoPro is a menu-driven information management system that can be interfaced to Professional Software WordPro for merged-mail letters. InfoPro is preformatted for mailing list applications, but the structure of the files can be modified to fit other applications. The program handles files containing 999 records of 12 fields each or 650 records of 24 fields each. The built-in report writer allows users to use five parameters to select and manipulate data.

**Compatibility Matrix:** 221.0025.003

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**PROTEMP**2363 Blvd Circle  
Walnut Creek CA 94595

(415) 497-3573

**► Notebook**

A filing system for the IBM Personal Computer and systems running under CP/M-86

**Price** \$250 purchase

**Description** Notebook places no restrictions on record size or structure. Users can develop reports or restructure the data base at any time using a screen-oriented editor. Notebook removes spaces from all fields to lessen the amount of disk storage required to maintain data files.

**Compatibility Matrix:** 221.0025.003

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**QINT DATABASE SYSTEMS**50 Waban Hill Rd  
Chestnut Hill MA 02167

(617) 527-9329

**► QINT/SQL**

A relational data base for microcomputers running under MS-DOS or PC DOS

**Price** \$1,000-\$9,000 purchase

**Description** QINT/SQL is a relational DBMS for microcomputers that features the Structured Query Language (SQL) for generating reports and updating records. QINT/SQL can be used in multiuser environments and offers various development tools for centralized management of the data base and greater end-user control over report formats.

**Compatibility Matrix:** 221.0025.003

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**QUADRAM CORPORATION**4355 International Blvd  
Norcross GA 30093

(404) 923-6666

**► The Data Base Manager**

A data base management package for machines based on PC DOS and MS-DOS

**Price** \$199 purchase

**Description** The Data Base Manager is menu driven and integrates with most popular spreadsheets and word processors, such as Freestyle, The Outline-Based Word Processor, VisiCalc, Multiplan, Lotus 1-2-3, dBASE II, and WordStar. The program comes with 2 sorts: an in-memory sort (with a 2,500-record capacity and an immediate report option) and a multilevel disk sort that can sort up to 40 fields at a time for as many records as are on the disk. Fields can be sorted in alphabetic, numeric, or data formats and in ascending or descending order.

The program performs up to 18 different calculations on numeric fields. The Create/Change Report Formats Menu permits the addition of a nonpreconfigured field to perform unplanned calculations.

Data base specifications are as follows: 60 characters per field, 40 fields per record, up to 32,767 records per data base, and one input form per data base. The number of data bases per disk is limited only by disk capacity.

Additional features of The Data Base Manager include report and form letter generation as well as data base reconfiguration and merge capabilities. Expanded applications are possible through integration of spreadsheets and word processors.

**Compatibility Matrix:** 221.0025.003

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**QUIC-N-EASI PRODUCTS INC**136 Granite Hill Ct  
Langhorne PA 19047

(215) 968-5966

**► Q-PRO 4**

A table-driven DBMS

**Price** Purchase: \$595 (single user), \$795 (multiuser)

**Description** Q-PRO 4 supports index sequential, random, and sequential file access methods. There are no restrictions on field length, number of fields per record, record length, number of records per file, or number of files open at the same time. Q-PRO 4 can be used in two ways. The first allows users to define input screen formats using a built-in full-screen editor and a parameter-driven content editor. The second uses an interpreted language to develop procedures for making complex field validations; numerical, textual, and logical Boolean manipulations of entered or updated records; and comparisons between entered data and a memory-based table. An option permits replacement of entered data and online debugger.

Q-PRO 4 includes a report generator that accesses up to six files simultaneously, sorts on any field in the record, and updates records during printing. Users design reports up to 300 columns wide by using the full-screen editor. Up to 255 accumulators can be used to compile reports.

Q-PRO 4 is available for microcomputers running under CP/M, MP/M-II, TurboDOS, or Mmmost.

**Compatibility Matrix:** 221.0025.003

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**THE SMALL COMPUTER COMPANY INC**

230 W 41st St  
Suite 1200  
New York NY 10036

(212) 398-9290

**► filePro 16**

A menu-driven relational DBMS for the IBM Personal Computer XT, Tandy Model 2000, and other disk-based microcomputers running under MS-DOS

**Price** \$495 purchase

**Description** filePro 16 is a menu-driven applications development tool with a built-in relational data base. filePro 16 allows users to set up data bases and data entry screens by using a set of default selections. Experienced users can override the default values and take advantage of the more sophisticated features of filePro 16. Up to 16 million records are allowed per file, with 999 fields or 4,608 characters per record. filePro 16 allows relational data bases, with the number of data files limited only by available disk storage. Other features of filePro 16 include:

- Calculated fields based on values in other fields or in other records in a related data file
- Conditional mathematics, with calculations executed only if certain criteria are met
- Data validation during data entry
- File indexing using up to 12 keys
- Information transfer between filePro 16 and Microsoft Multiplan or MicroPro WordStar

The Small Computer Company developed the Profile Plus and Profile III Plus DBMS programs for Tandy. A multiuser version of filePro is available for Unix- and Xenix-based systems. The Small Computer Company also offers a version for CP/M-based computers.

**Compatibility Matrix:** 221.0025.003**THE SOFTWARE CONNECTION**

9016 SW 152 St  
Miami FL 33157

(305) 252-2051

**► DECISION S/1000**

A DBMS and program generator for systems running under PICK

**Price** \$595 purchase (microcomputer version)

**Description** DECISION S/1000 is a DBMS for mainframes and minicomputers that has been refined for use on microcomputers. Advanced utilities provided with the DBMS include a dictionary builder, an automatic menu builder, an applications generator for building transactional systems, and a report builder that features record sorting and selection as well as headers and footers. DECISION S/1000 allows users to develop online documentation for all reports, menus, and application programs generated by the utility programs.

**Compatibility Matrix:** 221.0025.003**SOFTWARE PUBLISHING CO**

1901 Landings Dr  
Mountain View CA 94043

(415) 962-8910

**► PFS:FILE**

A personal filing system for the Apple II and II+, IBM Personal Computer, Texas Instruments Professional Computer, Hewlett-Packard HP 150, and Tandy TRS-80 Models III and 4

**Price** \$140 purchase; \$125 purchase (Tandy TRS-80)

**Description** PFS:FILE stores information on disk for use in mailing lists or summary reports. It allows users to control screen formatting in data entry and inquiry. Files can be reformatted without reentering data. PFS:FILE can search for data or text using user-selected combinations of numeric range, wild card, and opposite match search criteria. Each record matching the criteria is individually displayed on screen for reviewing, updating, or printing.

PFS:FILE is fully compatible with other Software Publishing software, including PFS:REPORT for tabular summary reports, PFS:GRAPH for creating graphs and charts, and PFS:WRITE for generating merged mailings.

**Compatibility Matrix:** 221.0025.003

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**SOFTWARE PUBLISHING CO**1901 Landings Dr  
Mountain View CA 94043

(415) 962-8910

**► PFS:REPORT**

A personal report writer for the Apple II, IBM Personal Computer, Texas Instruments Professional Computer, Hewlett-Packard HP 150, and Tandy TRS-80 Models III and 4

**Price** \$125 purchase; \$100 purchase (Tandy TRS-80)

**Description** PFS:REPORT uses data files created under PFS:FILE to produce summary reports in tabular format. The program sorts, processes, formats, and prints file information. Its menu-driven organization allows users to create eight predefined reports easily. Reports generated by PFS:REPORT can be combined with text created under PFS:WRITE.

**Compatibility Matrix:** 221.0025.003

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**SSR CORPORATION**1600 Lyell Ave  
Rochester NY 14606

(716) 254-3200

**► OMNIFILE**

An information management system

**Price** \$254 purchase

**Description** OMNIFILE provides a menu-driven structure as its user interface. Full query capabilities allow for more retrieval than simple field match inquiries. Other features include multiple field indexes, field-level password protection, and a global editing function. In addition, OMNIFILE allows for an unlimited number of data views and different record types, thereby providing a multiple logical file capability within each DOS file.

**Compatibility Matrix:** 221.0025.003

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**STONEWARE INC**50 Belvedere St  
San Rafael CA 94901

(415) 454-6500

**► Advanced DB Master**

A data base manager and report writer

**Price** \$495 purchase

**Description** Advanced DB Master is a forms- and document-oriented DBMS for the IBM Personal Computer and Personal Computer XT. It handles records or documents of up to 3,000 characters and a total of 250 fields. Advanced DB Master stores up to one million records per data base on a disk or multiple diskettes. Any document in the data base can be found in one second. Up to 30 display screens can be combined to enter or update records. Entry screens and reports can be designed by the user with a full-screen editor. Advanced

DB Master also supports the use of up to 100 computed fields per input screen. Lookup tables can be defined by the user.

**Compatibility Matrix:** 221.0025.003

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**STONEWARE INC**50 Belvedere St  
San Rafael CA 94901

(415) 454-6500

**► DB Master 4 PLUS**

A DBMS with a built-in report generator for the Apple II+, IIe, and IIc

**Price** \$295 purchase

**Description** DB Master 4 PLUS contains a complete, self-contained file manager and a report generator. Under DB Master 4 PLUS, each record contains up to 4K bytes, with 500 fields per record and 250 characters per field. Numerous field types are supported, including compacted numeric and user-defined computed fields. Data entry and updating are handled through user-defined input screens of up to nine screen pages. Short forms can be used to quickly scan or update data files. The file manager supports true ISAM organization, including a multipart primary key, multiple secondary keys, and sophisticated data compression routines.

**Compatibility Matrix:** 221.0025.003

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**STRUCTURED SYSTEMS GROUP**

111 Broadway  
Suite 203  
Oakland CA 94606

(415) 268-1488

► **Analyst**

A DBMS for systems running under CP/M, MP/M, CP/M-86, or MP/M-86

**Price** \$250 purchase

**Description** Analyst can be used to create, update, and process data files with up to 50 numeric, integer, alphanumeric, and date fields. Data records can be extracted from files by using Ranges, Matches, Not Ranges, Not Matches, And, Or, and Exclusive-Or selection conditions. Customized reports can use math functions to show totals, percentages, and trends.

Analyst processes data files created by other application programs.

**Compatibility Matrix:** 221.0025.003

arithmetic functions on specified fields. It creates a user menu and password protects any screen, report, or label format. A special index feature provides high-speed access to a record. The number of storable records depends on the number of drives configured with the TRS-80 Model III. PROFILE III Plus specifies any record length up to 1,020 characters and defines as many as 99 fields per record. The system can be used with Radio Shack's Super SCRIPT for report or correspondence composition and with VisiCorp's VisiCalc.

**Compatibility Matrix:** 221.0025.003

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**SUPERSOFT**

PO Box 1628  
Champaign IL 61820

(217) 359-2112

► **Personal Data Base**

A data base management system for the IBM Personal Computer

**Price** \$195 purchase

**Description** Personal Data Base is a multipurpose data base manager primarily for home or personal computing applications. The system creates files and records, exercising complete control over the size and layout of all fields. Files are limited only by diskette storage space. Each record contains up to 1,000 characters divided among a maximum 20 fields. Personal Data Base supports searching on any field (up to three at a time) and high/low or low/high sorting on two different fields. Screen design and report formats are user-defined. With Personal Data Base, the user can create mailing lists, client accounts, personnel records, tax records, job reports, and various other data files.

**Compatibility Matrix:** 221.0025.003

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**TANDY**

1800 One Tandy Center  
Fort Worth TX 76102

(817) 390-3549

► **PROFILE III Plus**

A DBMS for the Tandy TRS-80 Model III

**Price** \$199 purchase

**Description** PROFILE III Plus is a data base manager featuring up to five formats for screen layouts, report generation, and mailing labels. The system performs all



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**TCS SOFTWARE INC**

6100 Hillcroft  
Suite 600  
Houston TX 77081

(713) 771-6000

**► Q/LABEL**

A label generator program used with the TCS TOTAL ACCOUNTING SYSTEM

**Price** \$295 purchase

**Description** Q/LABEL functions as a standalone module or interfaces with other accounting systems running under CP/M. Q/LABEL, combined with the other modules of the TCS TOTAL ACCOUNTING SYSTEM, allows the user to prepare labels from information stored in program data files. The format of the label is completely user defined. Labeling information may be prepared on materials other than standard labels.

**Compatibility Matrix:** 221.0025.003

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**VECTOR GRAPHIC**

500 N Ventu Park Rd  
Thousand Oaks CA 91320

(805) 499-5831

**► DataManagr**

A data base management system for Vector computers

**Price** \$495 purchase

**Description** DataManagr creates and maintains data base files for use with members of the Vector Professional Series of applications software. Data contained in DataManagr files can be integrated with the ExecuPlan II financial planning system. The MEMORITE III word processing system can retrieve data for use in letters, documents, and reports. Charts and graphs can be created and printed with the ACCUCHART graphics program. Data entry is accomplished using CONECT communications software that interfaces the Vector system with larger computers. Files can be sorted by one or more fields. One file can be separated into two distinct files, or two files can be combined into a single file. The system produces reports in several formats. Specified fields can be selected, sorted, and subtotaled. The user designs the report and selects titles and the date. Data used to construct reports can be saved. The user can request a display of cataloged reports and select a report for printing.

**Compatibility Matrix:** 221.0025.004



# DATA COMMUNICATIONS Compatibility Matrix

222.0025.001

Vendor/Package	Compatible Operating Systems														Others		
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS	UCSD p-System		UNIX	XENIX
<b>Abstract Systems</b> HayesSys																	Poly Morphic 8810 & 8813 OS
<b>Alpha Logic Business Systems</b> DFX II	•															•	
<b>ATON International</b> Micro/Remote 3270 Emulator																	C language
<b>Comshare</b> MICROSEEK							•										
<b>Context Management Systems</b> Connector	•																
<b>Cypher Communications Technology</b> Cycom 1																	Osborne 1 microcomputers
<b>Digital Marketing</b> The Micro Link II			•	•					•								
<b>Dow Jones Software</b> Dow Jones News/Retrieval Dow Jones Straight Talk	•												•				Atari DOS Apple Macintosh
<b>Dynamic Microprocessor Associates</b> Asynchronous Communications (ASCOM)							•										
<b>Frontier Technologies</b> Bi-sync/3270							•		•								
<b>General DataComm</b> Acculine							•										
<b>General Micro Systems</b> PC 102							•		•						•		
<b>Hawkeye Grafix</b> COMMX CONSOLX			•	•													
<b>Hayes Microcomputer Products</b> Smartcom I Smartcom II	•	•					•										ProDos
<b>The Headlands Press</b> PC-Talk Version 2.0							•										
<b>Howe Software</b> Smart Terminal													•				
<b>IBM</b> Asynchronous Communications Support Program Enhanced Display Station Emulation Program PC Network Program PC Network SNA 3270 Emulation Program							•										



Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	UNIX	XENIX
PC Support/36 Personal Computer Cluster Program Personal Computer DisplayComm BSC Personal Services/PC							•	•	•								
<b>IE Systems</b> ACCULINK Micro BIS-HASP BIS-3270 BIS-3780			•	•	•				•								
<b>Information Builders</b> FOCTALK							•		•								
<b>Inner Loop Software</b> VDTE2							•										
<b>Intelligent Technologies</b> PC-to-PC 4800 Baud							•		•								
<b>Lindbergh Systems</b> Omniterm													•				
<b>Mark of the Unicorn</b> PC/Intercomm							•										
<b>Micro Innovative Technology</b> TransMIT			•	•			•		•			•		•			
<b>Micro Systems Software</b> MTERM							•					•					
<b>MicroCALL Services</b> AMCALL MCALL II			•	•													
<b>Microstuf</b> CROSSTALK			•														
<b>Monroe Systems for Business</b> The 3270 SNA/SDLC			•														Monroe OC 8820 microcomputers
<b>Mycroft Labs</b> Mite			•	•					•								Macintosh
<b>Nestar Systems</b> File Transfer Server (FTS)	•																
<b>On-Line Software International</b> OMNILINK File Transfer Advanced Function OMNILINK File Transfer Entry Level							•		•								



Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	UNIX	XENIX
<b>PerSoft</b> SmarTerm 100 SmarTerm 125 SmarTerm 220 SmarTerm 400								•			•						
<b>Rabbit Software</b> Rabbit 3270-Plus															•		BTOS, CTOS
<b>Shared Systems Technologies</b> ACE				•	•	•	•			•							
<b>Softronic</b> Softerm Softerm 1 Softerm 2 Softerm PC	•																
<b>Software Connections</b> LAN: Mail Monitor											•						
<b>Software Module Marketing</b> PC-TRACS								•									
<b>Software Sorcery</b> Apple Bulletin Board System (ABBS) Pascal Interactive Terminal Software (PITS) PUMP	•																Pascal compiler Pascal compiler
<b>Supersoft</b> TERM-II				•													
<b>Telephone Software Connection</b> Answering Machine	•																
<b>Vector Graphic</b> BIS/3270 BIS/3780 CONNECT																	Vector Graphic systems Vector Graphic systems Vector Graphic systems
<b>VM Personal Computing</b> Relay RELAY/TSO								•		•							
<b>Westico</b> ASCOM				•	•					•							
<b>Zenith Data Systems</b> IBM 3270 Emulator																	Zenith microcomputers





Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	UNIX	XENIX



# DATA COMMUNICATIONS

## Product Summaries

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### ABSTRACT SYSTEMS

191 White Oaks Rd  
Williamstown MA 01267

(413) 458-8421

#### ► HayesSys

A data communications program for the Poly Morphic Systems 8813 and 8810

**Price** \$65

**Description** The HayesSys program, an addition to the Poly operating system, dials remote systems, connects and turns on the carrier; and routes incoming data to a printer or file. The user specifies such parameters as baud rate, stop bits, parity, and full- or half-duplex transmission.

**Compatibility Matrix:** 222.0025.001

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### ALPHA LOGIC BUSINESS SYSTEMS INC

1119 N Union Rd  
Woodstock IL 60098

(815)568-5166

#### ► DFX II

A data communications program for the Apple II

**Price** \$50

**Description** DFX is a program used to transfer DOS 3.3 files between Apple computers equipped with the Hayes Micromodem II. A chat mode allows simultaneous message transmission and file transfer. A copy of DFX can be transferred to a third Apple by the DFX Pull Through utility.

**Compatibility Matrix:** 222.0025.001

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### ATON INTERNATIONAL INC

1765 Scott Blvd  
Suite 119  
Santa Clara CA 95050

(408) 554-9922

#### ► Micro/Remote 3270 Emulator

An IBM intelligent terminal emulation program for various microcomputers

**Price** \$7,500 purchase

**Description** Micro/Remote 3270 Emulator enables microcomputers to be used with IBM mainframe computers for interactive and transaction processing applications. The program emulates an IBM 3275 Model 2 intelligent terminal with an IBM 3284 Model 3 printer,

and uses single- or multipoint nonswitched communications protocol.

The package automatically translates data from EBCDIC to ASCII character codes but retains all attribute and control characters in their original EBCDIC form. Application programs running on a local microcomputer can use Micro/Remote 3270 Emulator to automatically download data stored on the mainframe, modify it, and transmit it back to the mainframe.

Micro/Remote 3270 Emulator is written in C language to enhance portability between microcomputers, and its modular design simplifies modification. The program can be expanded, with assistance from ATON International, to support IBM 3271/3274/3276 cluster systems.

**Compatibility Matrix:** 222.0025.001

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### COMSHARE INC

30001 S State St  
Ann Arbor MI 48106

(313) 994-4800

#### ► MICROSEEK

A communications program for the IBM Personal Computer and Personal Computer XT

**Price** \$200 purchase

**Description** MICROSEEK supports asynchronous communications with remote mainframes. It features ASCII and binary file transfer, terminal emulation, a set of prepackaged log-on sequences, and the ability to automate repetitive communications tasks. Special functions, such as inquiry into a mainframe-based DBMS, can be stored as executable sequence files for easy use under MICROSEEK. Comshare also offers a handshaking program for mainframe communications, known as MICROSEEK PLUS, that runs on IBM 30xx and 43xx mainframes.

**Compatibility Matrix:** 222.0025.001

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**CONTEXT MANAGEMENT SYSTEMS**23864 Hawthorne Blvd  
Suite 101  
Torrance CA 90505

(818) 706-3141

**► Connector**

A data communications program for the Apple II, Apple II +, and Apple III (in emulation mode)

**Price** \$180 purchase

**Description** The Connector program converts data files from any mainframe, data base programs (e.g., Datadex), and standard Apple DOS text files into Visi-Calc format. Features include file-transfer and storage routines for data extracted from information services and data bases. Additional commands create user phone directories and autodial.

**Compatibility Matrix:** 222.0025.001

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**DOW JONES SOFTWARE**PO Box 300  
Princeton NJ 08540

(800) 257-5114

**► Dow Jones News/Retrieval**

A data communications program for Apple, Atari, and Radio Shack microcomputers

**Price** Varies

**Description** The Dow Jones News/Retrieval program gives users access to data bases that contain approximately 3,200 companies' corporate financial data; more than 6,000 companies' profile and 10-K extracts; current and historical quotes; a weekly economic survey of money market services; transcripts of the "Wall Street Week" television program; weather reports; sports scores and statistics; and financial investment data.

**Compatibility Matrix:** 222.0025.001

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**CYPHER COMMUNICATIONS TECHNOLOGY**Suite 1005  
1712 I St NW  
Washington DC 20006

(202) 887-0834

**► Cycom 1**

A dumb terminal emulator for the Osborne 1

**Price** \$120 purchase

**Description** Cycom 1 emulates a dumb terminal for file transfers and simple remote processing. It allows electronic mail exchange and access to a variety of on-line information services. Cycom 1 supports an auto-dial, autoanswer modem.

**Compatibility Matrix:** 222.0025.001

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**DIGITAL MARKETING CORP**2670 Cherry La  
Walnut Creek CA 94596

(415) 938-2880

**► The Micro Link II**

A communications program for microcomputers running under CP/M, CP/M-86, or MS-DOS

**Price** \$99 purchase

**Description** The Micro Link II is a user-friendly, menu-driven program that permits rapid and inexpensive information exchange over phone lines or direct cable. It sends and receives text, object and source code, and data files. The program is easily installed and requires minimal modification. Files can be captured and then printed or stored on disk.

**Compatibility Matrix:** 222.0025.001

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**DOW JONES SOFTWARE**PO Box 300  
Princeton NJ 08540

(800) 257-5114

**► Dow Jones Straight Talk**

A program that enables Apple Macintosh users to access online information services

**Price** \$79 purchase

**Description** Using the mouse and the pull-down menus of the Macintosh, Dow Jones Straight Talk automatically logs on to Dow Jones News/Retrieval. The package is designed to help the user access, store, and organize retrieved information and transfer that information to another Macintosh through a modem.

**Compatibility Matrix:** 222.0025.001

point-to-point or multipoint telephone lines with any IBM System/360, System/370, 30xx, or 40xx CPU that provides standard IBM support for one of the following configurations: IBM 3271 Model 2 Control Unit with attached 3277 Model 2; IBM 3274 Control Unit with attached 3278 Model 2; IBM 3275 Model 2 Control Unit/Display Station; IBM 3276 Control Unit/Display Station; IBM 3284 or 3286 Printer. The software supports file transfer in both directions. For transfers from the mainframe to the microcomputer, the printer can be defined to be a disk file so that data destined for the printer becomes a standard file that can be processed offline. SNA/SDLC 3270 also has a SEND command that allows files to be transferred from the microcomputer to the host.

**Compatibility Matrix:** 222.0025.001

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**DYNAMIC MICROPROCESSOR ASSOCIATES**545 Fifth Ave  
New York NY 10017

(212) 687-7115

**► Asynchronous Communications (ASCOM)**

A data communications program for the IBM Personal Computer

**Price** \$195 purchase

**Description** ASCOM is a versatile modem-control program that allows the user to change the terminal's speed, parity, and translate-table. Files can be transferred in several ways using the file-transfer functions.

**Compatibility Matrix:** 222.0025.001

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**GENERAL DATACOMM INC**Straits Turnpike  
Middlebury CT 06762

(203) 574-1118

**► Acculine**

A data communications package

**Price** \$99 purchase

**Description** Under Acculine, the user can both auto-dial and log on to any of 24 communications options with a single keystroke. Each menu item is defined on the screen as it is selected. There are more than 60 help screens, selectable by function key, that are keyed to the particular operations being performed. Features include automatic redial and alternate number selection. All letter and number keys can be programmed for user-selectable functions. Once the user is connected, the user may transfer and receive files. The method of transmission may be either standard ASCII or XMODEM protocols. Connect time is displayed. If available in the modem, diagnostics the software can call up include self-test, analog loopback, and digital loopback. The software also tests for the presence of the modem and cable and the intelligence level of the modem. A feature of Acculine is the Living Software update service, which is free for two years after the date of purchase. Any registered user using an Acculine modem can call in to the service and receive the latest software update over the telephone.

**Compatibility Matrix:** 222.0025.001

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**FRONTIER TECHNOLOGIES CORP**3510 N Oakland Ave  
PO Box 11238  
Milwaukee WI 53211

(414) 964-8699

**► Bi-sync/3270**

A data communications package

**Price** \$695 purchase

**Description** The Bi-sync/3270 emulation software from Frontier Technologies is designed to support bi-synchronous communications between an IBM Personal Computer XT and an IBM or plug-compatible host or other computer using bisynchronous protocols. Standard features include easy user configuration of hardware, diagnostics, line tracing, error checking and correcting, carriage control decoding, and flexible EBCDIC-ASCII translation. The software is designed to run on the Frontier Technologies AdCon2 series of communication controllers. Bi-sync/3270 is a full-function IBM 3270 terminal emulator for the IBM Personal Computer. Using this software, the computer can communicate over

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**GENERAL MICRO SYSTEMS**PO Box 5330  
Hopkins MN 55344

(612) 944-0593

**► PC 102**

A terminal emulation program with file transfer and local printer support capabilities for IBM personal computers and compatible microcomputers

**Price** \$139 purchase

**Description** PC 102 supports mainframe communications while emulating Digital Equipment Corporation VT100, VT102, and VT52 terminals. Full keyboard and screen emulation is provided. Completely memory resident, PC 102 features direct or modem connection to a host computer, full RS-232C interface with up to 9.6K-bit-per-second transmission speed (selectable), and split screen and selective erase. Multiple character sets, including U.S., European, ASCII, and special line graphics, are standard.

PC 102 prints text snapshots and transfers text files between the host and personal computer.

**Compatibility Matrix:** 222.0025.001

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**HAWKEYE GRAFIX**23914 Mobile St  
Canoga Park CA 91307

(818) 348-7909

**► COMM X**

A data communications program for MS-DOS and CP/M-based microcomputers

**Price** \$199 purchase

**Description** COMM X enables CRC16 error detection and correction protocols to be used during binary file transfer. Mainframe modes support X-On/X-Off, line/continue, echo wait, and terminal-session logging to disk; local mode options display disk directories with disk space, rename and delete files. The program supports user-developed autodial directory and remote console functions.

**Compatibility Matrix:** 222.0025.001

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**HAWKEYE GRAFIX**23914 Mobile St  
Canoga Park CA 91307

(818) 348-7909

**► CONSOL X**

A data communications program for MS-DOS and CP/M systems

**Price** \$150 purchase

**Description** The CONSOL X program provides remote control of a CP/M system. It allows callers to access the system using a password, execute programs, and log off. On loss of connection, CONSOL X can au-

tomatically restart and await the next caller. No installation is required for the program, and it supports null select, a welcome file or bulletin board, call counters, and chat and test modes.

**Compatibility Matrix:** 222.0025.001

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**HAYES MICROCOMPUTER PRODUCTS INC**5923 Peachtree Industrial Blvd  
Norcross GA 30092

(404) 441-1617

**► Smartcom I**

A data communications program for the Apple IIc and IIe

**Price** Varies

**Description** Smartcom I is the companion program for Hayes Micromodem IIe and Smartmodem 300. The package supports stop/start, send-lines, and verification protocols for information services, bulletin boards, and data transmission. Apple DOS 3.3, ProDos, CP/M, and Pascal data formats can be used. The package creates, sends, receives, names, lists, prints, and deletes files. Other features include online conversation, file directory printing, and autoanswer.

**Compatibility Matrix:** 222.0025.001

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**HAYES MICROCOMPUTER  
PRODUCTS INC**

5923 Peachtree Industrial Blvd  
Norcross GA 30092

(404) 449-8791

► **Smartcom II**

A data communications program for the IBM personal computers, the AT&T PC 6300, and other IBM-compatible microcomputers

**Price** \$120 purchase

**Description** Smartcom II brings the full power of an IBM Personal Computer using a Hayes Microcomputer Products Smartmodem 300 or 1200 to data communications. Data sent by the host mainframe can be captured and sent to either the disk drive or printer while it is being displayed on the screen. Keys to start and stop data capture allow selective storing and printing of a file.

Files can be created, displayed, printed, erased, or renamed on the IBM Personal Computer disk drive without exiting the program or breaking connection with the host computer.

Smartcom II originates and answers telephone calls. Macrofiles can be created to automatically log on to a remote system or to eliminate the retyping of commonly used commands.

**Compatibility Matrix:** 222.0025.001

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**THE HEADLANDS PRESS**

PO Box 862  
Tiburon CA 94920

(415) 435-0770

► **PC-Talk Version II**

A data utility and communications program for the IBM Personal Computer

**Price** \$35 purchase

**Description** PC-Talk is designed to save data in disk files and transmit disk files through the computer's serial port. PC-Talk also interfaces with the Hayes Microcomputer Systems Smart program, which establishes a master telephone directory complete with user-defined operating parameters.

The contents of a disk file can be displayed online or directly on disk. All file transmission is done as a straight dump from memory and does not provide error correction and capture routines.

Written in BASIC, PC-Talk uses simple screen formats and data input arrangements. If the user makes disk file and parameter changes that could effect the transmission of files, PC-Talk displays warning messages.

**Compatibility Matrix:** 222.0025.001

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**HOWE SOFTWARE**

14 Lexington Rd  
New City NY 10956

(914) 634-1821

► **Smart Terminal**

A data communications package

**Price** \$75 purchase

**Description** Smart Terminal is a data communications program for the Tandy Radio Shack TRS-80 Model 1, 3, and 4 microcomputers. It uses the computer's available RAM as a memory buffer to hold data to be transmitted automatically to the communication device or to receive data transmitted from that device. The buffer can be loaded from, or saved on, cassette or diskette media. In addition to these capabilities, the program provides character translation, a true BREAK key, and configuration options that allow the user to change the baud or parity and filter out line feed characters.

**Compatibility Matrix:** 222.0025.001

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**IBM CORP**

PO Box 1328  
Boca Raton FL 33432

(305) 998-2000

► **Asynchronous Communications Support Program**

A data communications program for the IBM Personal Computer

**Price** \$40 purchase

**Description** The Asynchronous Communications Support Program enables an IBM Personal Computer to function as a terminal that can communicate with several computers supporting ASCII. Computers running IBM VM/370 or TSO operating systems are accessed by local cable connections or remote common carrier lines; an upload/download facility transfers data and program files.

**Compatibility Matrix:** 222.0025.001

**IBM CORP**

PO Box 1328  
Boca Raton FL 33432

(305) 998-2000

► **Enhanced Display Station Emulation Program**

A program enabling an IBM Personal Computer to be attached directly to a System/34, 36, or 38

**Price** \$195 purchase

**Description** The Enhanced Display Station Emulation Program requires the installation of an adapter card. It enables the Personal Computer to emulate an IBM 5250 workstation and uses a "hot key" to switch between standalone and System/3x work sessions. This program can be used with PC/Support/36. A remote version enables the Personal Computer to connect to a remote System/3x through communications lines.

**Compatibility Matrix:** 222.0025.001

**IBM CORP**

PO Box 1328  
Boca Raton FL 33432

(305) 998-2000

► **PC Network Program**

A program for sharing data and peripherals in the IBM PC Network

**Price** \$75 purchase

**Description** The PC Network Program is used in conjunction with the PC Network adapter card and translator unit to attach up to 72 personal computers in a coaxial cable network. The network provides facilities for sharing data, files, programs, messages, printers, and storage devices among personal computers within a 1,000-foot radius. The PC Network works in conjunction with PC DOS 3.1.

**Compatibility Matrix:** 222.0025.001

**IBM CORP**

PO Box 1328  
Boca Raton FL 33432

(305) 998-2000

► **PC Network SNA 3270 Emulation Program**

A program to provide IBM personal computers with access to IBM host mainframes

**Price** \$375 purchase

**Description** The PC Network SNA 3270 Emulation Program is used in conjunction with the PC Network adapter card and translator unit, which enable up to 72 Personal Computers to be attached in a coaxial cable network. The emulation program gives personal computers in the network access to IBM host systems using

the SNA communications protocol. The PC Network works in conjunction with PC DOS 3.1.

**Compatibility Matrix:** 222.0025.001

**IBM CORP**

PO Box 1328  
Boca Raton FL 33432

(305) 998-2000

► **PC Support/36**

A set of programs enabling an IBM System/36 and an IBM personal computer to transfer data and share resources

**Price** \$700 purchase; \$45/month monthly license

**Description** PC Support/36 consists of software for IBM personal computers and the System/36. It enables data transfer between the two systems, with concurrent use of virtual print, virtual disk, and data transfer services across the link. Personal Computer users can direct printer output to a System/36 printer.

**Compatibility Matrix:** 222.0025.002



**IBM CORP**

PO Box 1328  
Boca Raton FL 33432

(305) 998-2000

**► Personal Computer Cluster Program**

A program for connecting IBM Personal Computers in a file-sharing cluster

**Price** \$92 purchase

**Description** The Personal Computer Cluster Program is used with the Personal Computer Cluster Adapter and PCjr Cluster Attachment to connect up to 64 computers in a cluster. The computers share the Winchester disk of one system designated as a file server. The program defines one public volume for the cluster and one private read-only volume per system. File and message transfers are supported.

**Compatibility Matrix:** 222.0025.002

**IBM CORP**

PO Box 1328  
Boca Raton FL 33432

(305) 998-2000

**► Personal Computer DisplayComm BSC**

A program providing BSC batch transmission capability for IBM personal computers

**Price** \$375 purchase

**Description** The Personal Computer DisplayComm BSC program supports data exchange between an IBM personal computer and an IBM Displaywriter word processor, 5520 administrative system, Office System 6, or host computer, as well as between Personal Computers equipped with the package. The package communicates revisable form text document content architecture (RFTDCA), page image, or card image text. Eight communications setups can be stored, and a send queue of 20 documents or files is supported. Communications at up to 4.8K bits per second is possible.

**Compatibility Matrix:** 222.0025.002

**IBM CORP**

PO Box 1328  
Boca Raton FL 33432

(305) 998-2000

**► Personal Services/PC**

A program providing electronic mail management to IBM Personal Computer users

**Price** \$250 purchase

**Description** With Personal Services/PC, the user of an IBM Personal Computer connected to an IBM DISOSS/370 computer system can send and receive messages and office correspondence and transfer files through multiple DISOSS/370 systems or directly to other Personal Computers. A Personal Computer does

not have to be plugged into a host to use such functions as viewing mail and replying to correspondence. The connection to the DISOSS/370 system can be made through asynchronous communications or 3278/3279 emulation.

**Compatibility Matrix:** 222.0025.002

**IE SYSTEMS INC**

112 Main St  
Newmarket NH 03857

(603) 659-5891

**► ACCULINK Micro**

A data communications program for microcomputers running under CP/M, CP/M-86, or MS-DOS

**Price** \$245 purchase

**Description** ACCULINK Micro is a menu-driven program that supports various communications and handshaking protocols for accurate data transmission. Help and tutorial features are available to users at any time. ACCULINK Micro automatically displays menus of available options if the user hesitates or issues a partial command.

Keyboard commands can be combined into macrofiles for easy log-on and file transfer. Communications control features of ACCULINK Micro include wild-card file specification and control character suppression. Standard microcomputer operating system commands to erase, display, and copy disk files are accessible from within the program.

ACCULINK Micro is used most effectively with the IE Systems ACCULINK Host software for Digital Equipment mainframes, but it can communicate with a variety of other time-sharing computer systems.

**Compatibility Matrix:** 222.0025.002



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**IE SYSTEMS INC**98 Main St  
Newmarket NH 03857

(603) 659-5891

**► BIS-HASP**

A HASP multileaving workstation program for microcomputers running under CP/M, CP/M-86, MS-DOS, or PC DOS

**Price** \$695 purchase**Description** BIS-HASP provides full-function communications with any mainframe that supports HASP-type multileaving workstations.

BIS-HASP performs all data translation, packing, unpacking, and data stream management functions. One card-reader stream, one console stream, and two print or punch streams are supported. The streams are directed to physical devices or to pseudodevices defined as disk files for data storage and offline manipulation.

The BIS-HASP User Program Interface allows user-written programs to supply and process data while interactively communicating with the host mainframe.

**Compatibility Matrix:** 222.0025.002

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**IE SYSTEMS INC**98 Main St  
Newmarket NH 03857

(603) 659-5891

**► BIS-3270**

A terminal emulator program for microcomputers running under CP/M, CP/M-86, MS-DOS, or PC DOS

**Price** \$695 purchase**Description** BIS-3270 fully emulates the operation of an IBM 3270 Series intelligent terminal, with or without a printer.

BIS-3270 matches transaction-oriented IBM mainframes with the local processing power of a microcomputer. Files received from the host computer can be stored for later manipulation by the microcomputer; the BIS-3270 User Program Interface allows user-written programs to supply or process data while communicating interactively with the host mainframe.

The software supports data transmission in IBM 3270 format. Any addressable-cursor ASCII terminal can be used with BIS-3270 for data communications.

**Compatibility Matrix:** 222.0025.002

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**IE SYSTEMS INC**98 Main St  
Newmarket NH 03857

(603) 659-5891

**► BIS-3780**

A terminal emulator package for microcomputers running under CP/M, CP/M-86, MS-DOS, or PC DOS

**Price** \$695 purchase**Description** BIS-3780 is a full-function IBM 2780/3780 terminal emulator suited to RJE and transmission of batched data.

The software supports data file transfers. Files stored on the microcomputer disk drive are written in standard CP/M format, allowing offline data manipulation. The BIS-3780 User Program Interface enables user-written programs to interactively supply data to the host mainframe.

Full RJE console support, a feature of the BIS-3780 package, allows users to enter IBM HASP or POWER commands through the microcomputer console, greatly simplifying control over remote processing.

**Compatibility Matrix:** 222.0025.002

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**INFORMATION BUILDERS INC**1250 Broadway  
New York NY 10001

(212) 736-4433

**► FOCTALK**

A standalone micro-to-mainframe link for users of FOCUS and PC/FOCUS

**Price** \$450 purchase**Description** FOCTALK enables microcomputer users to specify, access, and transfer data from any mainframe file or data base accessible through the mainframe-resident FOCUS Report Writer. It also allows files created on the microcomputer to be transferred to the mainframe and FOCUS report requests developed on the microcomputer to be sent to the mainframe for execution. Executed reports can be received at the microcomputer in FOCUS ASCII, DIF, or LOTUS 1-2-3 PRN format. FOCTALK uses an asynchronous or bisynchronous (using a Digital Communications Associates IRMA board) link and features TableTalk (report creation) and FileTalk (file creation) components as well as a full-screen editor. To run FOCTALK, an IBM Personal Computer must be equipped with PC DOS release 2.0 or higher.**Compatibility Matrix:** 222.0025.002

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**INNER LOOP SOFTWARE**5456 McConnell Ave  
Suite 120  
Los Angeles CA 90066

(213) 822-2800

**► VDTE2**

A program that enables IBM Personal Computers to emulate Hewlett-Packard and Digital Equipment video terminals

**Price** \$200 purchase**Description** VDTE2 is a video terminal emulation program designed to emulate the Hewlett-Packard HP2624 and HP2648 and Digital VT52 terminals. The desired terminal configuration mode needs to be entered only once.

Standard features include:

- Eight software-controlled function keys
- HP2624B block/format mode
- Seven pages of off-screen scrolling memory
- A subset of HP2648A vector graphics
- Ten data communications speeds, from 75 to 19.2K bits per second
- ASCII file transfer between the personal computer and host computer.

**Compatibility Matrix:** 222.0025.002

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**INTELLIGENT TECHNOLOGIES**151 University Ave  
Palo Alto CA 94301

(415) 328-2411

**► PC-to-PC 4800 Baud**

A package for synchronous communications between IBM personal computers

**Price** \$695**Description** PC-to-PC 4800 Baud enables users of the Intelligent Technologies PC Express communications board to send files and electronic mail over voice-grade lines at speeds up to 4.8K bits per second. Automatic error recovery helps ensure data integrity. The high data rate (more than one typewritten page per second) helps reduce data communications costs.**Compatibility Matrix:** 222.0025.002

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**LINDBERGH SYSTEMS**41 Fairhill Rd  
Holden MA 01520

(617) 852-0233

**► Omniterm**

A communications program for Tandy microcomputers

**Price** \$95-\$175, depending on the computer**Description** Omniterm is a menu-driven program for terminal emulation and file transfer. It supports a buffer of 25K bytes or larger to capture and manipulate data

sent by the host mainframe. Users can scroll backward and forward through data stored in the buffer. The CRT screen can be easily reformatted to any column width without affecting the width of hard-copy printouts.

Omniterm also provides extensive control over the transmission and capture of data files. Keyboard characters, for example, can be easily redefined to accommodate control-character protocols required by many mainframe computers.

**Compatibility Matrix:** 222.0025.002

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**MARK OF THE UNICORN INC**222 Third St  
Cambridge MA 02142

(617) 576-2760

**► PC/Intercomm**

A data communications program for the IBM Personal Computer and Personal Computer XT

**Price** \$124 purchase**Description** PC/Intercomm enables an IBM Personal Computer to emulate Digital Equipment VT100 and VT52 terminals. It supports communications throughput at 9,600 baud but can also support other baud rates. The program is menu driven, offers full printer support, transmits and receives data files to and from a remote mainframe, and features an onscreen status line, 30 function keys, and fully adjustable tab stops. With the PC/Intercomm, the IBM Personal Computer can be used as a full-screen, addressable terminal for mainframe application programs requiring on-screen input forms and menus.**Compatibility Matrix:** 222.0025.002

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**MICRO INNOVATIVE TECHNOLOGY INC**229 W Bute St  
Suite 627  
Norfolk VA 23510

(804) 622-2777

**► TransMIT**

A data communications package

**Price** \$70 purchase**Description** TransMIT is designed to enable the user to prepare messages offline and then transmit them online. In addition, TransMIT allows the user to receive messages from other computers, save the messages, and store them for later use. The system also allows the user to use commands without exiting the program. Users can select these commands from a menu or from command prompts.

TransMIT operates in several modes. Terminal mode allows the user to send data or receive data from remote systems. The user can perform several operations while in the terminal mode simply by pressing a function key or ALT key. Command mode provides the commands needed to perform such tasks as loading or saving between disk and buffer. Communications parameters may be changed, loaded, and saved in command modes. Process mode supports automated processing of TransMIT's functions, system configuration, and remote log-on without user intervention. Emulation mode allows operation with a remote system that requires such full-screen operations as the VI editor on a UNIX system. The ADM3 and VT100 are available with the TransMIT system. The control and escape sequences supported for each emulation are described in the manual. All TransMIT modes provide screen displays with status information, menu selections, or a combination of the two. Any text displayed on the screen when a user moves from the terminal mode to the command mode is restored upon return to the terminal mode. At any menu, a user may receive help by pressing the F9 key. TransMIT features include XMODEM protocol transfer, single-key online help, 40-entry telephone directory, ADM3 and VT100 screen emulation, DOS command execution online, and online application program execution.

**Compatibility Matrix:** 222.0025.002

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**MICRO SYSTEMS SOFTWARE INC**4301-18 Oak Circle  
Boca Raton FL 33431

(305) 391-5077

**► MTERM**

A data communications program

**Price** \$80 purchase**Description** MTERM, a terminal emulation and data communications program for Tandy Radio Shack TRS-80 Models I and III and the IBM Personal Computer, operates at up to 9,600 baud. MTERM features automatic dialing and log-on. Control commands can be

combined into macrofiles for easy operation, and each macrofile can invoke another macrofile.

MTERM supports transmission of both standard ASCII files and machine language files. Data can be reserved in the program buffer and then transferred to disk following transmission. Large files can be sent or received by XFER/CMD, a disk file transfer program that duplicates, track by track, a disk on a remote microcomputer. MTERM can receive data from the host computer while the user issues commands regarding buffer size. This unique feature ensures that no data is lost during transmission.

An 80-page user manual included with MTERM provides nontechnical users with thorough operating instructions. The manual also discusses the technical aspects of MTERM in detail.

**Compatibility Matrix:** 222.0025.002

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**MICROCALL SERVICES**PO Box 650  
Laurel MD 20707

(301) 776-5253

**► AMCALL**

A communications program for microcomputers running under CP/M or PC DOS

**Price** \$150 purchase**Description** AMCALL, also called AutoMCALL, supports both ASCII and binary file transfer under various protocols, including X-On/X-Off for remote mainframes and WUTWX for telex services. It features full printer support and control character filtering. Communications may be put on hold, without breaking connection, to access CP/M commands. AMCALL supports S-100 bus autodial/autoanswer modems.**Compatibility Matrix:** 222.0025.002

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**MICROCALL SERVICES**PO Box 650  
Laurel MD 20707

(301) 776-5253

**► MCALL II**

A communications program for microcomputers running under CP/M or PC DOS

**Price** \$125 purchase**Description** MCALL II allows transfer of both ASCII and binary files to or from a host mainframe under a variety of protocols. It features full printer support and control character filtering and allows CP/M commands to be executed without breaking connection with the mainframe. MCALL supports a number of standard, AT&T-compatible modems.**Compatibility Matrix:** 222.0025.002

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**MICROSTUF INC**

1000 Holcomb Woods  
Suite 440  
Rosewell GA 30076

(404) 998-3998

► **CROSSTALK**

A data communications program for CP/M, PC DOS, and MS-DOS systems

**Price** \$195 purchase

**Description** CROSSTALK is a terminal and file transfer program that permits communication with remote computer systems. It accepts user-defined passwords for time-sharing systems, employs all features of Hayes modems, and includes autodial and autoanswer. Program and data files are transferred between two CP/M systems with complete error checking. The disk formats of the two systems need not be compatible.

**Compatibility Matrix:** 222.0025.002

used by the operator who needs access to a corporate data base.

**Compatibility Matrix:** 222.0025.002

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**NESTAR SYSTEMS INC**

2585 E Bayshore Rd  
Palo Alto CA 94303

(415) 493-2223

► **File Transfer Server (FTS)**

A communications program for the Apple II

**Price** \$995 purchase

**Description** FTS is a communications program that allows CLUSTER/ONE networks to transmit files to each other. The system supports long distance links via direct-connect Apple-resident modems, the Hayes Micromodem II, and the Apple CAT from Novation, as well as via extended modems connected through an RS-232C serial interface. FTS features automatic dialing and answering and automatic record keeping.

**Compatibility Matrix:** 222.0025.002

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**MONROE SYSTEMS FOR BUSINESS**

The American Rd  
Morris Plains NJ 07950

(201) 993-2000

► **The 3270 SNA/SDLC**

A terminal emulation program for microcomputers running under CP/M

**Price** Vendor declined to provide

**Description** The 3270 SNA/SDLC package emulates an IBM 3271 controller with an IBM 3277 terminal or an IBM 3274 controller with an IBM 3278 terminal. Its high-speed data transfer rates and bisynchronous communications protocol efficiently use computer and telecommunications facilities.

**Compatibility Matrix:** 222.0025.002

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**MYCROFT LABS INC**

2615 N Monroe St  
Tallahassee FL 32303

(904) 386-4051

► **Mite**

A data communications package

**Price** Macintosh, \$145; CP/M, \$150; CP/M-86 and MS-DOS, \$195 (all prices for purchase)

**Description** Mite is a menu-driven, multiprotocol asynchronous communications package with autodialing, autoanswer, and autolog-on that downloads binary and text files. It turns any Apple Macintosh or microcomputer running under CP/M or MS-DOS into an intelligent terminal. Applications include accessing asynchronous ASCII online systems or transferring any file to or from another microcomputer. Mite can also be



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**ON-LINE SOFTWARE INTERNATIONAL**Fort Lee Executive Park  
Two Executive Dr  
Fort Lee NJ 07024

(201) 592-0009

**► OMNILINK File Transfer Advanced Function**

A micro-to-mainframe link for IBM and plug-compatible mainframes and microcomputers

**Price** Purchase: personal computer portion \$800; mainframe portion \$20,000 (DOS), \$30,000 (OS)

**Description** Advanced Function OMNILINK not only provides all the capabilities of OMNILINK but also enables microcomputer users to access multiple mainframe files and to select, extract, and combine data from those files to be downloaded. Electronic mail facilities provide microcomputer-to-microcomputer communications. Microcomputer files containing data, text, graphics, or programs can be routed to other microcomputers in the network without reformatting.

**Compatibility Matrix:** 222.0025.002

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**ON-LINE SOFTWARE INTERNATIONAL**Fort Lee Executive Park  
Two Executive Dr  
Fort Lee NJ 07024

(201) 592-0009

**► OMNILINK File Transfer Entry Level**

A file transfer and electronic mail package for IBM personal computers and compatible microcomputers

**Price** Purchase: \$10,000 (DOS); \$15,000 (OS)

**Description** OMNILINK is the base module of a network communications system that provides an intelligent software link between IBM (and IBM plug-compatible) mainframes and IBM personal computers as well as Wang and IBM word processors. This link supports file transfer, document distribution, and electronic mail.

Messages can be sent to one user, many users, a distribution list, a terminal, or a printer. Messages can be displayed on request or automatically as they are received. Users can verify that a message arrived and was seen by the recipient. Other systems, terminals, and word processors may be configured through the use of an application program interface (if they are available to the CICS system).

**Compatibility Matrix:** 222.0025.002

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**PERSOFT INC**2740 Ski La  
Madison WI 53713

(608) 273-6000

**► SmarTerm 100**

A data communications package

**Price** \$149 purchase

**Description** SmarTerm 100 is a general-purpose asynchronous communications package for the IBM Personal Computer and compatible machines. SmarTerm 100 provides full-featured emulation of the Digital Equipment Corporation VT100, VT102, and VT52 terminals and includes multiple setups, smart soft keys, printer support and online help screens. Text and binary file transfer is built in and requires no special host software. SmarTerm 100 also includes automatic file transfer and the PDIP and XMODEM error-free protocols. 132-column display mode is available with a special video display board or horizontal scrolling. SmarTerm 100 fully supports European versions of DOS.

**Compatibility Matrix:** 222.0025.003

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**PERSOFT INC**2740 Ski La  
Madison WI 53713

(608) 273-6000

**► SmarTerm 125**

A data communications package

**Price** \$295

**Description** SmarTerm 125 is a general-purpose asynchronous communication package that allows an IBM Personal Computer to emulate a Digital Equipment Corporation VT100, VT102, VT52 and VT125ReGIS graphics terminal. Powerful text and binary file transfer capabilities are included. SmarTerm 125 may be used to access such popular graphics programs as SAS/Graph, RS/1, Tellapgraph, DECgraph, Datatrieve, and GRAF-MASTER. SmarTerm 125 features emulation of position, vector curve, text, downloadable character sets, shading, multiple writing planes, macrographs, and permanent or temporary writing controls. SmarTerm 125 versions are available for the standard IBM Personal Computer color display or the monochrome display with a Hercules-compatible board. SmarTerm 125 includes all the features of SmarTerm 100.

**Compatibility Matrix:** 222.0025.003



**PERSOFT INC**2740 Ski La  
Madison WI 53713

(608) 273-6000

**► SmarTerm 220**

A data communications package

**Price** \$195

**Description** SmarTerm 220 is a general-purpose asynchronous communications package that allows an IBM Personal Computer to emulate the Digital Equipment Corporation VT220, VT100, VT102, or VT52 terminals. SmarTerm 220 includes an English setup mode, programmable function keys, multinational character sets, and both 7- and 8-bit control modes. SmarTerm 220 also adds several major improvements to the VT220 terminal, including the ability to define eight separate setup configurations as well as smart soft keys to simplify autodial, log-on, file transfer, and other frequently performed tasks. SmarTerm 220 fully supports A-to-Z and other Digital Equipment software packages that require VT220 terminals.

**Compatibility Matrix:** 222.0025.003**PERSOFT INC**2740 Ski La  
Madison WI 53713

(608) 273-6000

**► SmarTerm 400**

A data communications package

**Price** \$149 purchase

**Description** The SmarTerm 400 is a general-purpose asynchronous communications package that enables an IBM Personal Computer to emulate a Data General Dasher D100, D200, or D400 terminal. SmarTerm 400 includes multiple display windows with independent vertical scrolling and window erase, full character display attributes, European and line-drawing character sets, full local printer support, eight separate setup configurations, smart soft keys to simplify repetitive tasks, TTY mode, and XMODEM protocol (a popular protocol used on bulletin board services). Fully functional sample AOS/VIS FORTRAN-77 and AOS FORTRAN 5 programs for error-free file transfer to a host computer are included in the SmarTerm package.

**Compatibility Matrix:** 222.0025.003**RABBIT SOFTWARE CORP**1 Great Valley Pkwy E  
Great Valley Corporate Ctr  
Malvern PA 19355

(215) 647-0440

**► Rabbit 3270-Plus**

A terminal emulation and data communications program

**Price** \$750 purchase

**Description** Rabbit 3270-Plus allows microcomputers running under UNIX, CTOS, or BTOS to be used as intelligent IBM 3270 workstations for local and host processing. A suspend/resume feature enables users to manipulate data locally without breaking connection to the host computer. SCREEN-TO-FILE and SCREEN-TO-PRINT commands allow storage and printing of data captured from the host system.

Rabbit 3270-Plus features split-screen processing and screen sharing between remote and local processing.

**Compatibility Matrix:** 222.0025.003**SHARED SYSTEMS TECHNOLOGIES INC**Route 4  
PO Box 196  
Killington VT 05751

(802) 775-0837

**► ACE**

A data communications package

**Price** \$125 purchase

**Description** ACE is an asynchronous communications package for the IBM Personal Computer, Personal Computer XT, and Personal Computer AT and compatible computers. ACE works with almost all microcomputer and modem configurations at baud rates up to 9,600. Using ACE, a microcomputer can be a terminal to mainframe and time-sharing computer systems and services. File transfers can be made in either direction between the microcomputer and mainframe systems or services. Files can also be transferred between two ACE-equipped microcomputer systems. ACE uses either a menu or command line to change such options as character length, parity, stop bits, baud rate, echo/no echo (half or full duplex), and filtering (ignoring specified characters during sending or receiving a file, displaying to the screen, or printing to the printer). ACE also allows a microcomputer to emulate a Digital Equipment Corporation VT100 terminal.

**Compatibility Matrix:** 222.0025.003

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**SOFTRONICS INC**6626 Prince Edward  
Memphis TN 38119

(901) 755-5006

**► Softerm**

A terminal emulation and data communications program for Apple II + and Apple II with Autostart ROM

**Price** \$150 purchase

**Description** Softerm emulates IBM 3101, Digital Equipment VT100 and VT52, Applied Digital Data Systems Regent Series, and Hazeltine terminals. Softerm interfaces to mainframe computers directly or through a modem and supports communications at up to 9,600 baud.

File transfers are accomplished with high-level commands, such as DIAL, CATALOG, SEND, RECEIVE, ONERR, and MONITOR. These commands can be executed interactively in immediate command mode or combined into a macrofile for later execution. Softerm allows access to Apple DOS commands and disk utilities from within the program.

A 300-page user manual and a FORTRAN-77 source program for communications support on the host mainframe are supplied with Softerm. Softronics provides a free online update service to Softerm users. Macrofile patches, terminal emulator updates, and programming advice are available through this service.

**Compatibility Matrix:** 222.0025.003

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**SOFTRONICS INC**3639 New Getwell Rd  
Suite 10  
Memphis TN 38118

(901) 683-6850

**► Softerm 1**

A data communications package for the Apple II series of computers

**Price** \$135 purchase

**Description** Softerm 1 is a communications program that operates on the Apple II, II+, IIe, and IIc personal computers. Softerm 1 accesses information services, bulletin boards, electronic mail systems, and TTY-compatible terminal communications from various host computers.

Softerm 1 operates at speeds up to 9,600 baud and allows the personal computer system to be hardwired to a host computer locally or connected remotely through manual or autodial modems.

Utility functions are provided in online mode for printing screens, capturing received data to print or disk, and transmitting files from disk.

Softerm 1 includes a disk utilities option that allows to select DOS, CP/M, or Pascal disk functions without exiting the Softerm 1 program.

Softerm 1 includes a dial utilities option that maintains a

user phone directory and provides the ability to automatically dial phone numbers from the directory if the system includes communications ports connected to autodial modems.

Softerm 1 provides both local and line file transfer options. The local file transfer capabilities allow Softerm 1 to function as a file utility program while maintaining communications with a host computer system. A selection of edit options available in both the local and line file transfer modes compensates for variations in data formats used by host computers.

The character protocol provides flexibility for text file transfers. Transmit options include user definable fixed or variable block size, end of block terminate and acknowledge character strings, end of block delay, and character echo wait. Receiving files using character protocol provides a line capture mode in which all data received is captured as part of the file transfer.

The XMODEM protocol is compatible with the standard CP/M Users Group protocol and allows files to be transferred to or from systems supporting a version of the MODEM and XMODEM protocol.

The Softrans protocol is a protocol designed specifically for asynchronous file transfers between computer systems. Features provided by this protocol include automatic retransmission and data compression. A FORTRAN-77 source program supplied with Softerm 1 is adaptable to any host computer to allow file transfers with Softerm using the Softrans protocol.

**Compatibility Matrix:** 222.0025.003



**SOFRONICS INC**

3639 New Getwell Rd  
Suite 10  
Memphis TN 38118

(901) 683-6850

**► Softerm 2**

A data communications package

**Price** \$195 purchase

**Description** Softerm 2 is a communications and terminal emulation program that operates on the Apple II family of computers. Softerm 2 accesses information services, bulletin boards, electronic mail systems and company mainframes. Softerm 2 includes a three-key keypad that connects to the mouse/game I/O port or a special printed circuit card.

Softerm 2 operates at speeds of up to 9,600 baud and allows the personal computer system to be hardwired to a host computer locally or connected remotely through autodial modems. Softerm 2 is written entirely in assembly language.

Utility functions are provided in online terminal mode for printing screens, capturing received data to print or disk, and transmitting files from disk.

Softerm 2 includes a disk utilities option that allows the user to select DOS, CP/M, or Pascal disk functions without exiting the Softerm 2 program.

Softerm 2 also includes a utilities option that maintains a user phone directory and provides the ability to automatically dial phone numbers from the directory if the system includes communications ports connected to autodial modems.

Softerm 2 offers file transfer modes supporting DOS, CP/M, and Pascal disk formats to match user requirements and provides both local and line file transfer options. The local file transfer capabilities allow Softerm 2 to function as a file utility program while maintaining communications with a host computer system. A selection of edit options available in both the local and line file transfer modes compensates for the variations in data formats used by host computers.

The character protocol provides flexibility for text file transfers. Transmit options include user-definable fixed or variable block size, end of block terminator and acknowledge character strings, end of block delay, and character echo wait. Receiving files using character protocol provides a line capture mode in which all data received is captured as part of the file transfer.

The XMODEM protocol is compatible with the standard CP/M Users Group protocol and allows files to be transferred to or from systems supporting a version of the MODEM and XMODEM protocol.

The Softrans protocol, designed specifically for asynchronous file transfers between computer systems, provides features including automatic encoding and decoding, CRC-16 error checking with automatic retransmission and data compression. A FORTRAN-77 source program is supplied with Softerm 2 and is adapt-

able to any host computer to allow file transfers with Softerm 2 using the Softrans protocol.

**Compatibility Matrix:** 222.0025.003

**SOFRONICS INC**

3639 New Getwell Rd  
Suite 10  
Memphis TN 38118

(901) 683-6850

**► Softerm PC**

A data communications package

**Price** \$195

**Description** Softerm PC is a communications and terminal emulation program that operates on various personal computers. It can be used to access information services, bulletin boards, electronic mail systems, or host computers. Complete emulation of all keyboard and display functions is provided, and both conversational and block modes are supported. Host computer applications written for a specific CRT terminal will operate with a system transparently and without programming changes.

Softerm PC operates at speeds up to 9,600 baud and allows the personal computer system to be hardwired to a host computer locally or remotely connected through manual or autodial modems.

Softerm PC provides management of multiple serial and parallel ports through a multitask manager known as the Communications Agent. The Communications Agent provides direct support for terminal emulation, remote file transfer, and print functions. The Communications Agent can be installed with the DOS terminate and stay resident feature so that users can access its functions while using application programs that are subsequently executed. The Communications Agent allows the integration of concurrent communications capabilities, including remote file transfer and local file printing.

Through the disk utilities option, users can use a selection of DOS disk functions without exiting the Softerm program. The disk utilities can be accessed in the online terminal operation mode. The disk utilities option creates a display directory, which shows all the files in the directory and allows the files to be renamed or deleted.

Softerm PC can function as a background print program that provides multipoint print spooling capability to allow printing to be accomplished concurrently with the execution of other programs. Softerm can be operated as a background utility program that provides access to disk and file utility functions without termination of the program currently executing. Softerm can be used as a background communications program allowing file transfers with remote systems to be processed concurrently with the execution of other programs and allowing unattended remote access to local files while the system is being used for another purpose.

**Compatibility Matrix:** 222.0025.003



**SOFTWARE CONNECTIONS INC**

2041 Mission College Blvd  
Suite 135  
Santa Clara CA 95054

(408) 988-0300

**► LAN: Mail Monitor**

A data communications package

**Price** \$745-\$1,195

**Description** LAN: Mail Monitor is a store and forward electronic mail and file transfer system designed specifically for local area networks. It lets the user send letters and data files to other users on the network or to users at remote networks over telephone lines. It requires no mail server unless users are sending mail over telephone lines, in which case a modem server will be needed to automatically dial on demand or at preset times. Letters can be composed on the built-in letter editor or most MS-DOS word processing programs. A standard letter form is provided for quick memos. Special forms creation capability is provided to enable the user to create custom forms. Letters can be addressed to specific users or to predefined distribution lists, and directories are provided to help keep track of users on the system. Routing systems allow the user to edit and forward mail. Mail confidentiality is preserved through the use of mailbox names and passwords. In addition, certified mail and automatic time and date stamping features are provided to let the user know when letters have been picked up. A single-user remote option is available for single-station users at remote sites, such as sales reps who want to communicate with the central network. This option lets the user dial into an office network and transfer a program or file to a personal computer at home.

**Compatibility Matrix:** 222.0025.003**SOFTWARE MODULE MARKETING**

Crocker Bank Bldg/Penthouse  
1007 Seventh St  
Sacramento CA 95814

(800) 824-8512

**► PC-TRACS**

An IBM 3780 batch terminal emulator for the IBM Personal Computer

**Price** \$950 purchase

**Description** PC-TRACS is a menu-driven, full-function IBM 3780 terminal emulator for RJE processing on host mainframes.

PC-TRACS automatically blocks and reformats IBM Personal Computer data records for batch transmission to a host mainframe. This feature can be overridden to allow source code and other sensitive data to be sent without affecting data integrity. PC-TRACS automatically answers the phone and receives data from the remote computer without user intervention. Several calls can be received in succession under the unattended re-

ceive mode. All PC-TRACS capabilities can be invoked by a JCL command file on the host mainframe.

The purchase price of PC-TRACS includes a bisynchronous RS-232C communications interface card that must be added to the IBM Personal Computer.

**Compatibility Matrix:** 222.0025.003**SOFTWARE SORCERY INC**

8375 Leesburg Pike  
Suite 427  
Vienna VA 22180

(703) 471-0572

**► Apple Bulletin Board System (ABBS)**

A data communications program for the Apple II and Apple II +, IIe, IIc

**Price** \$165 purchase

**Description** ABBS automatically answers telephone calls and determines their transmission speed. The system queries the caller's name and lists it, allows the caller to read or write messages on system, and hangs up. It can also support add-on modules, including conferencing, up- and downloading, privacy, and news.

**Compatibility Matrix:** 222.0025.003**SOFTWARE SORCERY INC**

8375 Leesburg Pike  
Suite 427  
Vienna VA 22180

(703) 471-0572

**► Pascal Interactive Terminal Software (PITS)**

A data communications program for the Apple II and Apple II +, IIe, and IIc

**Price** \$55 purchase

**Description** PITS uses Apple Pascal and communicates with other computer systems at 110- or 300-baud ASCII. PITS copies incoming data into a 24K-byte buffer that can later be transferred to disk as a sequential text file. Text files are also transmitted to remote systems from disk and to time sharing systems using a handshake protocol. Available functions include copy on/off, buffer save/clear, printer on/off, select baud rate and duplex, and terminate.

**Compatibility Matrix:** 222.0025.003

**SOFTWARE SORCERY INC**

8375 Leesburg Pike  
Suite 427  
Vienna VA 22180

(703) 471-0572

**► PUMP**

A data communications program for the Apple II and Apple II +, IIe, and IIc

**Price** \$300 purchase

**Description** PUMP extends the Apple Pascal language to include the Hayes Micromodem II as a peripheral through Pascal functions and procedures in the system library file. Boolean values that show their relationships are returned by functions RING and CARRIER. Procedure CARON sets the baud rate, DIAL dials available telephone numbers, while WRDLNGTH sets word length and parity. Other procedures initialize the modem and send or receive single characters from it.

**Compatibility Matrix:** 222.0025.003

**SUPERSOFT INC**

PO Box 1628  
Champaign IL 61820

(217) 359-2112

**► TERM-II**

A system-to-system communications program for computers operating under CP/M

**Price** \$200 purchase

**Description** TERM-II is a communications program designed to allow any computer supporting CP/M to communicate with another TERM-II user. It also provides file transfer, autodial/autoanswer, conversational mode, translation tables for character translation, and log sessions for printer or disk.

**Compatibility Matrix:** 222.0025.003

**TELEPHONE SOFTWARE CONNECTION INC**

PO Box 6548  
Torrance CA 90504

(213) 516-9430

**► Answering Machine**

A data communications program for the Apple II

**Price** \$35 purchase

**Description** Answering Machine automatically answers the telephone in the user's name and receives and delivers messages. The program includes security routines for confidentiality. Messages are retrievable by the user or exited to BASIC from a remote terminal. A detailed system log can be viewed on the screen or printed in hard copy form.

**Compatibility Matrix:** 222.0025.003

**TRANSEND CORP**

1887 Otoole  
Suite C209  
San Jose CA 95131

(408) 435-0701

**► Transend**

A family of data communications programs for the Apple II

**Price** Purchase: \$89, Transend 1; \$149, Transend 2; \$275, Transend 3

**Description** Transend is a family of programs that provides intelligent terminal and file transfer capabilities for the Apple II computer. It is menu driven and supports more than 25 interface cards and 110-, 300-, and 1,200-baud modems. Transend performs data compression and transmits both text and DOS 3.3 files. It also supports print and capture buffers. Transend 2 incorporates the features of Transend 1 plus verified file transfer; Transend 3 has the features of Transend 2 plus electronic mail capabilities.

**Compatibility Matrix:** 222.0025.003

**VECTOR GRAPHIC INC**

500 N Ventu Park Rd  
Thousand Oaks CA 91320

(805) 499-5831

**► BIS/3270**

A data communications program for Vector computers

**Price** \$550 purchase

**Description** BIS/3270 allows Vector computer systems to emulate the popular IBM 3270 Series of terminals. The Vector system can be configured to operate like a 3271 controller with 3277 CRTs or like a 3275 terminal in dial-up mode. The program supports polling operations for 3270, 3271, 3277, and 3275 emulation. It includes hardware diagnostics, line trace, and error checking and provides EBCDIC-to-ASCII translation.

**Compatibility Matrix:** 222.0025.003

**VECTOR GRAPHIC INC**

500 N Ventu Park Rd  
Thousand Oaks CA 91320

(805) 499-5831

**► BIS/3780**

A data communications program for Vector computers

**Price** \$550 purchase

**Description** BIS/3780 gives Vector systems the remote data entry and batch transmission capabilities of expensive remote batch terminals at a fraction of the cost. The package is used with Vector Data Manager software.

**Compatibility Matrix:** 222.0025.003

**VECTOR GRAPHIC INC**500 N Ventu Park Rd  
Thousand Oaks CA 91320

(805) 499-5831

**► CONECT**

A data communications program for Vector computers

**Price** \$150 purchase**Description** CONECT allows the user to interact with a user on another computer. The program can save a record of that transmission, either as a file on disk or as a printed copy. It allows the user to define groups of commands, telephone numbers, parameters, and automatically executed files for routine data exchange.**Compatibility Matrix:** 222.0025.003**WESTICO**25 Van Zant St  
Norwalk CT 06855

(203) 853-6880

**► ASCOM**

A data communications program for CP/M, CP/M-86 and MS-DOS systems

**Price** \$175 purchase**Description** ASCOM is an interactive microcomputer telecommunications program used for time-sharing and data transfer. The conversation mode transmits and saves data and controls remote computers. Commands for displaying directories and files on the host computer are included.**Compatibility Matrix:** 222.0025.003**VM PERSONAL COMPUTING INC**475 Fifth Ave  
New York NY 10017

(212) 686-1450

**► RELAY**

A communications program for IBM personal computers

**Price** \$90 purchase**Description** RELAY has a background/foreground mode that allows users to send and receive messages and files while other material is printed or edited. In addition, RELAY reformats the IBM Personal Computer for use as an APL terminal.**Compatibility Matrix:** 222.0025.003**ZENITH DATA SYSTEMS**1000 Milwaukee Ave  
Glenview IL 60025

(312) 391-8860

**► IBM 3270 Emulator**

An emulation program that allows Zenith microcomputers to emulate IBM intelligent terminals

**Price** \$650 purchase, \$750 purchase with bisynchronous communications**Description** IBM 3270 Emulator allows Zenith microcomputers to function as IBM 3276 Model 2 intelligent terminals attached to IBM 3278 printers. The program uses the entire Zenith keyboard, including the special function keys and numeric keypad. Color-coded labels are included with the program to adapt the Zenith keyboard to that of the IBM 3270.

Incoming and outgoing character codes are automatically translated from EBCDIC to ASCII or ASCII to EBCDIC.

**Compatibility Matrix:** 222.0025.003**VM PERSONAL COMPUTING INC**475 Fifth Ave  
New York NY 10017

(212) 686-1450

**► RELAY/TSO**

A package for transferring files between IBM mainframes and IBM, IBM-compatible, and Wang microcomputers

**Price** \$4,995 purchase**Description** A microcomputer requires no add-on communications hardware to run RELAY/TSO. Used with Personal Computing's RELAY mainframe software, RELAY/TSO allows uploading and downloading of files in a variety of formats over dial-up telephone lines and provides full error detection and correction in both directions. A microcomputer can concurrently run another program while communicating through RELAY/TSO.**Compatibility Matrix:** 222.0025.003

# UTILITIES

## Compatibility Matrix

223.0025.001

Vendor/Package	Compatible Operating Systems														Others		
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS	UCSD p-System		Unix	Xenix
<b>Applied Microcomputer Systems</b> BIN85																	HP BASIC
<b>Award Software</b> CROSSAVE CROSSDATA		•			•		•			•							
<b>Axel Johnson</b> Cross/File							•			•							
<b>California Software Products</b> BABY/34 California 10 Pak																	
<b>Cdex</b> Cdex Sudden Knowledge Training Library	•						•										
<b>Computer Applications</b> Nibbles Away II	•																
<b>Computer Control Systems</b> AUTOSORT AUTOSORT/86 ULTRASORT-II				•		•				•							
<b>Computing!</b> MENU/POWER! POWER!		•	•				•	•		•							
<b>CompuView Products</b> SYSTRAN V-SPOOL				•													
<b>Data Development</b> The Bandit				•						•							
<b>Digital Marketing</b> Filefix Synopsis				•													
<b>Digital Research</b> Access Manager DESPOOL Display Manager SID XLT86		•	•	•	•		•	•	•	•							TurboDOS TurboDOS
<b>Dymek</b> RID	•						•										
<b>Dynamic Microprocessor Associates</b> UT-86					•		•			•							
<b>Errex</b> EXETTE							•										



Vendor/Package	Compatible Operating Systems														Others		
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS	UCSD p-System		Unix	Xenix
<b>Florida State University</b> KEY2DISK			•														
<b>Frontier Software</b> Application Development Utilities (ADU) General Subroutine Package (GSR)			•	•	•	•			•								
<b>Holliday Software</b> TYPEIT			•														
<b>Inner Loop Software</b> ScrollMate							•										
<b>ITSoftware</b> SortIT							•										
<b>Johnson Associates Software</b> DATAENTR 200 ISAM-300			•				•						•				
<b>Logical Systems</b> MemDISK													•				LDOS
<b>MAS</b> VAULT							•										
<b>MicroPro International</b> SuperSort			•	•	•	•			•								
<b>Microtech Exports</b> ReformatTer			•	•	•	•			•				•				CDOS, SDOS, TurboDOS, Cromix, RT-11
<b>Misosys</b> PDS/PRO-PADS													•				
<b>Mycroft Labs</b> COMPAT																	Otrona CP/M or MS-DOS
<b>New Generation Systems</b> MicroShell			•														
<b>Norell Data Systems</b> System-Backup							•										
<b>Omega Microwave</b> Locksmith	•																
<b>Pericomp</b> Superfile Backup			•	•	•	•			•								
<b>Peter Norton</b> The Norton Utilities							•										
<b>RoseSoft</b> ProKey							•										
<b>Seasoned Systems</b> SureStroke							•										



Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	Unix	Xenix
<b>Selfware</b> CONVERT							•		•								
<b>Sensible Software</b> DISK RECOVERY Multi-Disk Catalog III SUPER DISK COPY	•	•															
<b>Signum Microsystems</b> Documax	•																
<b>Stok Software</b> BackRest		•	•		•		•	•		•							TurboDOS, MmmOST, PC/NET, Omni/NET
<b>Structured Systems Group (SSG)</b> QSORT			•				•										
<b>Supersoft</b> Disk-Edit (DED)			•		•		•			•							
<b>Verbatim</b> Disk Drive Analyzer	•																
<b>Vertex Systems</b> Xeno-Copy Plus							•										
<b>VisiCorp</b> VisiTutor	•						•										





# UTILITIES

## Product Summaries

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### APPLIED MICROCOMPUTER SYSTEMS

Box 150  
Silver Lake NH 03875

(603) 367-8004

#### ► BIN85

A programmer's utility package for the Hewlett-Packard HP 83 and HP 85

**Price** \$145 purchase

**Description** BIN85 is an assembly language program that adds a set of 26 new statements and functions to the HP Series 80 BASIC language. The new functions and statements allow users to:

- Enter commas and quote in an INPUT statement
- Disable selected portions of the keyboard
- Scroll the display under program control
- Move the cursor to any position on screen under program control
- Enter and display time and date
- Underline strings and trim blanks and carriage returns from strings
- Treat any string as a bit array of logical flags
- Replace standard HP BASIC error messages with user-defined messages.

**Compatibility Matrix:** 223.0025.001

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### AWARD SOFTWARE

236 N Santa Cruz Ave  
Los Gatos CA 95030

(408) 395-2773

#### ► CROSSAVE

A hard disk backup and restore utility for systems under PC DOS versions 1.1 or 2.0, CP/M-86, or Concurrent DOS

**Price** \$99 purchase

**Description** CROSSAVE transfers files from a disk to diskettes. Users can specify that either all files be copied, only those files that have been modified, or all files under a specific path name. CROSSAVE compresses data files on an optional basis. Restoration, also done on a global or selective basis, copies files from diskettes back to the disk.

**Compatibility Matrix:** 223.0025.001

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### AWARD SOFTWARE

236 N Santa Cruz Ave  
Los Gatos CA 95030

(408) 395-2773

#### ► CROSSDATA

A file and diskette format conversion utility for microcomputers under MS-DOS

**Price** \$99 purchase

**Description** CROSSDATA reads, writes, and formats diskettes for more than 30 CP/M- and MS-DOS-based microcomputers. Six conversion pathways are supported:

- From selected CP/M to host MS-DOS
- From host MS-DOS to selected CP/M
- From selected CP/M to host CP/M
- From host CP/M to selected CP/M
- From selected CP/M to selected CP/M
- From selected MS-DOS to selected MS-DOS

CROSSDATA can be used in menu- or language-driven mode. CROSSDATA allows users to add additional CP/M and MS-DOS diskette formats to the original library of formats.

**Compatibility Matrix:** 223.0025.001

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### AXEL JOHNSON CORP

666 Howard St  
PO Box 7067  
San Francisco CA 94120

(415) 777-3800  
(800) 262-8800

#### ► Cross/File

A file editing and reformatting utility for microcomputers running under PC DOS or MS-DOS

**Price** Vendor declined to provide

**Description** Cross/File reformats standard ASCII-format files into the formats required by VisiCorp VisiCalc, Lotus 1-2-3, Microsoft Multiplan, Ashton-Tate dBASE II, and MicroPro WordStar. Cross/File is compatible with any spreadsheet, data base, graphics, or WP program that reads DIF-, SYLK-, CSV-, or ASCII-format files. This compatibility allows data sent from a remote computer and dumped onto the microcomputer diskette by the modem-to-modem communications program to be used in a variety of other programs regardless of its original format.

**Compatibility Matrix:** 223.0025.001





**CALIFORNIA SOFTWARE PRODUCTS INC**

525 N Cabrillo Park Dr  
Suite 300  
Santa Ana CA 92701

(714) 973-0440

**► BABY/34**

Provides an emulated IBM System/34 environment for the IBM Personal Computer and Personal Computer XT

**Price** \$2,500 purchase

**Description** BABY/34 allows programs and system utilities written in RPG II for the IBM System/34 to be transported intact to the IBM Personal Computer and Personal Computer XT. BABY/34 includes an operations control language, an RPG II compiler and run-time execution package, a screen format generator, a data file manager, and a data exchange conversion utility.

**Compatibility Matrix:** 223.0025.001

**CALIFORNIA SOFTWARE PRODUCTS**

525 N Cabrillo Park Dr  
Santa Ana CA 92701

(714) 973-0440

**► California 10 Pak**

A library of 10 utilities for the IBM Personal Computer

**Price** \$100 purchase

**Description** California 10 Pak includes utilities for the manipulation of files, diskette storage, and program memory. Browse allows full screen display, with selected printer dumping of any source file. Sort provides both RAM- and disk-resident sort capability. CDIR provides directories of any diskette or disk; a space map of the disk shows hidden files, bad sectors, and used and unused space. DISASM disassembles any in-memory routine into ready-to-assemble source code. DISASF produces source code from any specified COM or EXE file. CMEM and CENV produce pictorial maps of system memory and configuration. CDISP produces hexadecimal and/or alphanumeric displays of any file. CCOMP produces hexadecimal and/or alphanumeric comparisons of any two files and highlights all differences.

**Compatibility Matrix:** 223.0025.001

**CDEX CORP**

5050 El Camino Real  
Los Altos CA 94022

(800) 982-1213  
(415) 964-7600**► Cdex Sudden Knowledge Training Library**

A family of programs for user training in computer hardware and software

**Price** \$70 purchase per program

**Description** Cdex Sudden Knowledge Training Library consists of three product lines: the How to Use, How to Apply, and Expert series. The How to Use series teaches users to use personal computer hardware, operating systems, and applications software. Included in this series are "How to Use Your IBM PC" and "Cdex Training for VisiCalc". The How to Apply series, which includes "Managing Your Business with Lotus 1-2-3" and "Making Key Business Decisions Using Electronic Spreadsheets", helps business and professional users apply packaged software to business functions. The Expert series provides a more comprehensive, in-depth review of the capabilities of computer hardware and operating systems.

Cdex Sudden Knowledge Training Library programs are available for the IBM Personal Computer, Personal Computer XT, and PCjr as well as the Apple II+ and Iie. The most widely used spreadsheet analysis, data base management, WP, and financial accounting packages are covered.

**Compatibility Matrix:** 223.0025.001

**COMPUTER APPLICATIONS**

13300 SW 108 St Circle  
Miami FL 33186

(305) 285-4277

**► Nibbles Away II**

A diskette copying utility for the Apple II, II+, and Iie

**Price** \$70 purchase

**Description** Nibbles Away II enables users to make backup copies of any diskette, including those that are copy protected with an internal protection scheme. Nibbles Away II includes a diskette track and sector editor and a disk drive diagnostic utility.

**Compatibility Matrix:** 223.0025.00

**COMPUTER CONTROL SYSTEMS INC**

298 21st Terrace SE  
Largo FL 33541

(813) 586-1886

**► AUTOSORT**

A high-speed sort/merge/select program

**Price** \$150 purchase

**Description** AUTOSORT is a subroutine for record sorting, selection, and merging that can be used with programs written in Digital Research CBASIC, CB-80, Pascal/MT+, or PL/1-80 or Microsoft BASIC. A unique bootstrap overlay technique reduces the resident memory requirements to less than 2K bytes. Ten sort keys, four select keys, and string and numeric fields are supported. AUTOSORT permits records of 5K bytes and does not limit file size. The user simply defines a sort command string and calls the sort to operate.

**Compatibility Matrix:** 223.0025.001



**COMPUTER CONTROL SYSTEMS INC**298 21st Terrace SE  
Largo FL 33541

(813) 586-1886

**► AUTOSORT/86**

A sort, merge, and select utility

**Price** \$150 purchase

**Description** AUTOSORT/86 is an assembly language sort routine for the IBM Personal Computer and Personal Computer XT as well as other microcomputers running under MS-DOS. AUTOSORT/86 can be used as a standalone sort program or called as a subroutine from programs written in Digital Research CBASIC-86 or CB-86 or Microsoft Pascal or FORTRAN. The program sorts in ascending or descending order on up to 10 sort keys and provides four selection keys for specifying the retention or deletion of records greater than, less than, or equal to a given value. Records can be up to 5K bytes in length. Files are limited only by disk space; a RAM-resident work space of up to 60K bytes is supported.

**Compatibility Matrix:** 223.0025.001**COMPUTER CONTROL SYSTEMS INC**298 21st Terrace SE  
Largo FL 33541

(813) 586-1886

**► ULTRASORT-II**

A CP/M-based sort utility

**Price** \$150 purchase

**Description** ULTRASORT-II is a sort utility providing rapid sorting of CBASIC files on a CP/M disk operating system. CBASIC fixed- or variable-length fields are supported. ULTRASORT-II handles virtually unlimited record and file size and has record-select features. The system can stand alone or be called from CBASIC.

**Compatibility Matrix:** 223.0025.001**COMPUTING!**2519 Greenwich St  
San Francisco CA 94123

(415) 567-1634

**► MENU/POWER!**

A menu-driven file and disk housekeeping utility

**Price** \$149 purchase

**Description** MENU/POWER! is a front-end program for computers running under CP/M, MP/M, MS-DOS, Concurrent DOS, or PC DOS. MENU/POWER! provides utilities for copying, erasing, recovering, and renaming files. The program also tests diskettes for bad blocks. MENU/POWER! is an easier-to-use version of

the more powerful POWER! utility.

**Compatibility Matrix:** 223.0025.001**COMPUTING!**2519 Greenwich St  
San Francisco CA 94123

(415) 567-1634

**► POWER!**

A file and disk housekeeping utility for microcomputers running under CP/M, CP/M-86, Concurrent DOS, MS-DOS, or PC DOS

**Price** \$169 purchase

**Description** POWER! consists of 55 menu-driven utilities that replace many standard operating system commands. COPY replaces the CP/M PIP command and presents a numbered file directory from which the user selects the files to be copied. Other commands provide direct access to diskette and disk sectors or tracks. POWER! can test a diskette sector, reconstruct a bad disk directory, and provide password protection for specified files.

**Compatibility Matrix:** 223.0025.001**COMPUVIEW PRODUCTS**1955 Pauline Blvd  
Suite 300  
Ann Arbor MI 48103

(313) 996-1299

**► SYSTRAN**

A utility to read, write, and format diskettes of various computers

**Price** \$120 purchase

**Description** SYSTRAN is a menu-driven utility that allows IBM Personal Computers and other microcomputers operating under CP/M-86 to read, write, and format diskettes for more than 25 different CP/M-based microcomputers. The program converts data files to and from CP/M and MS-DOS Version 1.1 or 2.0.

**Compatibility Matrix:** 223.0025.001

**COMPUVIEW PRODUCTS**

1955 Pauline Blvd  
Suite 300  
Ann Arbor MI 48103

(313) 996-1299

**► V-SPOOL**

A print spooler for microcomputers running under CP/M

**Price** \$79 purchase

**Description** V-SPOOL buffers up to 16K bytes of data in one second, allowing application programs to continue running without waiting for data to be sent to the printer. V-SPOOL, with a predefined buffer size ranging from 3K to 16K bytes, is loaded into program memory. V-SPOOL is completely transparent to application programs; the only programs that cannot use V-SPOOL are those with self-contained, specialized keyboard or printer drivers.

**Compatibility Matrix:** 223.0025.001

**DATA DEVELOPMENT INC**

1111 Route 46 East  
Little Falls NJ 07424

(800) 526-5368  
(201) 785-9120

**► The Bandit**

A backup and file archival utility for microcomputers running under CP/M or MS-DOS

**Price** \$299 purchase

**Description** The Bandit compresses text and data files by up to 50 percent during archival procedures. On a diskette-based system, The Bandit creates a cataloged library of data, text, and programs; on a disk-based system, it transforms multivolume data files into compressed, manageable diskette files. Users can quickly scan archived files to identify a particular file, or they can transmit compressed data files over the telephone. The Bandit can archive files on an as-changed basis.

**Compatibility Matrix:** 223.0025.001

**DIGITAL MARKETING CORP**

2363 Boulevard Circle  
Walnut Creek CA 94595

(415) 947-1000  
(800) 826-2222

**► Filefix**

Recovers erased files; protects, deletes, and renames files; and forges multiuser links to a single CP/M file

**Price** \$100 purchase

**Description** Filefix contains utility programs that enable a user to scroll through text files one screen at a time and encrypt files with a one- or two-letter password. Copy and verify files are included. The system can perform dumps and branch to any memory location.

**Compatibility Matrix:** 223.0025.001

**DIGITAL MARKETING CORP**

2363 Boulevard Circle  
Walnut Creek CA 94595

(415) 947-1000  
(800) 826-2222

**► Synopsis**

Automatically creates, updates, searches, and displays an index on any CP/M file the user wants to catalog

**Price** \$125 purchase

**Description** Synopsis creates an index with the file and disk name, plus four user-defined lines of comments for each file. Without remembering the contents of text files, the user can locate information quickly by searching the index.

**Compatibility Matrix:** 223.0025.001

**DIGITAL RESEARCH**

PO Box 579  
Pacific Grove CA 93950

(408) 649-3896

**► Access Manager**

A file access manager for use with any Digital Research language

**Price** \$300 purchase

**Description** Access Manager provides a compatible method of data file access for all Digital Research computer languages. Access Manager interfaces multiple languages into a common data file and maintains a separate index file that eliminates the need to sort records. Access Manager features:

- A height-balanced B-tree index structure
- Support for multiple keys
- Record and file locking for use in multiuser systems
- Automatic reclamation of disk space
- Communications network support.

**Compatibility Matrix:** 223.0025.001

**DIGITAL RESEARCH**

PO Box 579  
Pacific Grove CA 93950

(408) 649-3896

**► DESPOOL**

A printer control utility program for microcomputers running under CP/M

**Price** \$50 purchase

**Description** DESPOOL is a print utility that allows simultaneous printing and editing of files or programs. Output to be printed by DESPOOL is sent to the disk drive as a file. DESPOOL prints the disk file while CP/M is waiting for operator responses during editing or debugging sessions.

**Compatibility Matrix:** 223.0025.001



**DIGITAL RESEARCH**

PO Box 579  
Pacific Grove CA 93950

(408) 649-3896

**► Display Manager**

A screen generator for microcomputers based on Zilog Z80, Intel 8080, or Intel 8086 microprocessors

**Price** \$400 purchase

**Description** Display Manager is a productivity aid for writers of interactive applications programs. A full-screen editor is included that can be used to design interactive screens exactly as they will appear to the end-user. A run-time library is also included. Its capabilities enable Display Manager to:

- Allow programmers to create interactive screen displays
- Support flashing, reverse video, underlining, and highlighting
- Execute programs on a variety of CRTs.

**Compatibility Matrix:** 223.0025.001**DIGITAL RESEARCH**

PO Box 579  
Pacific Grove CA 93950

(408) 649-3896

**► SID**

A fully symbolic instruction debugger for microcomputers based on the Zilog Z80, Intel 8080, or Intel 8086 microprocessor

**Price** \$75-\$150 purchase

**Description** SID allows step-by-step program execution to locate logic errors more quickly. Parameters for SID commands can be entered in symbolic form, allowing users to display memory contents, set program breakpoints, or move blocks of code within memory without specifying memory addresses.

**Compatibility Matrix:** 223.0025.001**DIGITAL RESEARCH**

PO Box 579  
Pacific Grove CA 93950

(408) 649-3896

**► XLT86**

An object code translator for systems running under CP/M-86

**Price** \$150 purchase

**Description** XLT86 translates 8-bit Intel 8080 assembly code programs into code for the 16-bit Intel 8086 microprocessor. XLT86 preserves all labels, comments, and symbols.

**Compatibility Matrix:** 223.0025.001**DYMEK CORP**

1851 Zanker Rd  
San Jose CA 95112

(408) 947-8700

**► RID**

A disk drive diagnostic utility for the Apple II, II+, and IIe and IBM Personal Computer and Personal Computer XT

**Price** \$35 purchase

**Description** RID performs a series of tests to ensure that disk drives meet requirements necessary to interchange disks with all similar drives for reading and writing operations. RID tests disk speed, noise (low-level signal) tolerance, write-then-read operation, track alignment, positioner backlash, diskette clamping, and erase cross-talk. If failures are detected, RID provides a recommended course of action to correct the problem. Test results can be printed to provide a service record.

**Compatibility Matrix:** 223.0025.001**DYNAMIC MICROPROCESSOR ASSOCIATES**

545 Fifth Ave  
New York NY 10017

(212) 687-7115

**► UT-86**

Four utility programs for the IBM Personal Computer and microcomputers running under MS-DOS or CP/M-86

**Price** \$95 purchase

**Description** The four UT-86 utilities are D, COPYFILE, PRINT, and PATCH. D is a directory program that lists each file in alphabetical order giving its size, number of 128K-byte records, and a character indicating whether it is a system or data file. COPYFILE provides the user with a series of interactive prompts for copying files. PRINT allows files to be printed with user-specified formats, including page length, numbered pages, form feeds, and tab expansion. PATCH is an editor program with the ability to extend files.

**Compatibility Matrix:** 223.0025.001

**ERREX INC**

5 Research Dr  
Ann Arbor MI 48103

(313) 996-8666

**► EXETTE**

A diskette error recovery utility for the IBM Personal Computer and Personal Computer XT

**Price** \$80 purchase

**Description** EXETTE restores garbled sectors on any diskette that has been previously protected by the EXETTE EDC (error detection and correction) coding method. EXETTE supports three basic functions: encode, verify, and recover. Encode translates data from the diskette into the EDC codes and stores it on two tracks of the diskette (2.5 percent of the total storage available). Verify scans the diskette and reports bad sectors. Recover transfers all data to a new diskette and corrects as many errors as possible. EXETTE fully restores any two unreadable tracks, any 18 radially contiguous bad sectors, any nine pairs of radially contiguous bad sectors, or any 18 bad sectors when no more than 2 bad sectors occur on a spiral.

EXETTE supports single- and double-sided diskettes formatted in either eight or nine sectors per track. ERREX also offer EXFIVE, which uses five tracks (6.25 percent of total storage) to store EDC codes and can restore up to 45 bad sectors.

**Compatibility Matrix:** 223.0025.001

**FLORIDA STATE UNIVERSITY**

Computing Center  
402 Education Bldg  
Tallahassee FL 32306

(904) 644-2764

**► KEY2DISK**

A data entry utility for microcomputers running under CP/M

**Price** \$250 purchase

**Description** KEY2DISK is a driver program that enables any microcomputer running under CP/M to emulate a dedicated unit record data entry station. KEY2DISK, which includes a powerful column-oriented screen editor and forms designer, is designed to interface easily with other programs. All files are stored on disk in CP/M ASCII format for use with other programs written in high-level languages.

**Compatibility Matrix:** 223.0025.002

**FRONTIER SOFTWARE**

(Division of ASYST Design Services)  
756 Bowling Green  
Cortland NY 13045

(607) 756-8247

**► Application Development Utilities (ADU)**

An interactive application program development system for any microcomputer using CBASIC

**Price** \$495 purchase

**Description** ADU consists of eleven utility programs, eleven program templates, and eight program skeletons using pretested code to produce sophisticated applications in reduced time. The utilities document programs and maintain screen masks, error messages, and data definition files. The templates generate programs for menu selection, file maintenance, data entry, file update, and report printing. The skeletons are program structures requiring additional customization. The General Subroutine (GSR) package is included.

**Compatibility Matrix:** 223.0025.002

**FRONTIER SOFTWARE**

(Division of ASYST Design Services)  
756 Bowling Green  
Cortland NY 13045

(607) 756-8247

**► General Subroutine Package (GSR)**

An integrated data entry/reporting/diagnostic program facility for microcomputers running CBASIC

**Price** \$295 purchase

**Description** GSR contains over 50 subroutines and six utility programs that perform functions commonly required in a variety of business application programs. Features include formatted screen input and display, data file input and output, indexed file access, printer/report routines, debugging assistance, and other miscellaneous functions.

**Compatibility Matrix:** 223.0025.002

**HOLLIDAY SOFTWARE**

4807 Arlene St  
San Diego CA 92117

(619) 292-7766

**► TYPEIT**

A print utility program for microcomputers running under CP/M

**Price** \$25 purchase

**Description** TYPEIT is a utility program that enables continuous printing of a large number of files or program listings. Menu choices include print files, write a title file, read and list title files, and printer control. Files to be printed can be on separate disks; operator prompts are given when a disk change is needed.

**Compatibility Matrix:** 223.0025.002



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**INNER LOOP SOFTWARE**5456 McConnell Ave  
Suite 120  
Los Angeles CA 90066

(213) 822-2800

**► ScrollMate**

An off-screen scrolling utility for the IBM Personal Computer or Personal Computer XT

**Price** \$70 purchase**Description** ScrollMate stores all display output in a buffer and transmits it to the IBM Personal Computer display screen. Up to 15 screens of 25 lines each can be kept in the buffer. Users can scroll up and down within the entire buffer. ScrollMate works with any PC DOS command, utility, or program that sends characters to the screen sequentially.**Compatibility Matrix:** 223.0025.002

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**IT SOFTWARE**PO Box 2392  
Princeton NJ 08540(800) 222-0592  
(609) 799-2600**► SortIT**

A record sorting and merging utility for the IBM Personal Computer and Personal Computer XT

**Price** \$125 purchase**Description** SortIT allows the sorting of data records in ascending or descending sequence using up to nine fields. Up to 10 files can be merged into a single file. Output can be directed to a disk file, printer, or CRT. SortIT can be called from within a BASIC program or used as a standalone program. SortIT supports various data types, including ASCII, alphanumeric, integer (2-byte signed binary), word (2-byte unsigned binary), and floating-point (both single- and double-precision) characters. File size is limited only by available disk space.**Compatibility Matrix:** 223.0025.002

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**JOHNSON ASSOCIATES SOFTWARE**PO Box 3069  
Redding CA 96049-3069

(916) 221-0740

**► DATAENTR 200**

Utility for developing and operating data entry programs

**Price** \$80 purchase**Description** DATAENTR 200 assists the applications programmer in developing data entry screens, allowing up to 30 entry fields per screen and multiple data fields per line. Individual fields are limited to 54 characters on 64-character-wide screens and 70 characters on 80-character-wide screens. Data is verified and can be modified or corrected.**Compatibility Matrix:** 223.0025.002

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**JOHNSON ASSOCIATES SOFTWARE**PO Box 3069  
Redding CA 96049-3069

(916) 221-0740

**► ISAM-300**

Utility program for file access

**Price** \$190 purchase**Description** ISAM-300 is a set of subroutines that can be included in an application program to control random data files. The program opens ISAM files, retrieves and updates existing records, inserts new records, and deletes existing records. It also stores file attributes, including field names, field lengths, and record blocking.**Compatibility Matrix:** 223.0025.002

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**LOGICAL SYSTEMS INC**8970 N 55th St  
PO Box 23956  
Milwaukee WI 53223

(414) 355-5454

**► MemDISK**

A utility program for the Tandy TRS-80 Models I, III, and 4 using LDOS or TRSDOS Version 6.0

**Price** \$29 purchase**Description** MemDISK uses a part of the TRS-80 RAM to emulate one or more disk drives, providing improved program-access speed. LDOS, the operating system under which MemDISK runs, supports up to eight drives at once, but the system RAM capacity usually limits MemDISK to two drives.**Compatibility Matrix:** 223.0025.002

**MAS INC**6826 Dean Dr  
McLean VA 22101

(202) 293-1624

**► VAULT**

A data encryption utility for the IBM Personal Computer

**Price** \$285 purchase

**Description** VAULT uses a sophisticated encryption algorithm to scramble any data file. The encryption key seed is specified by the individual user on a file-by-file basis. Files can still be copied or transferred through a modem, but they will appear as garbled data without decryption by VAULT. For encryption security greater than that available with the file-specific keys, VAULT can be configured with its own program access code. If the access code is used, users must give the code before encrypting or decrypting files; moreover, only the VAULT system used to encrypt a file can be used to unscramble it.

**Compatibility Matrix:** 223.0025.002

**MICROPRO INTERNATIONAL**33 San Pablo Ave  
San Rafael CA 94903

(415) 499-1200

**► SuperSort**

Sorts, merges, and selects records on microcomputers running under CP/M, CP/M-86, MS-DOS, or PC DOS

**Price** Purchase: \$250 (8 bit), \$200 (16 bit)

**Description** SuperSort is designed to sort and merge up to 32 files into a single file, accept fixed- or variable-length records, allow the establishment of sophisticated sort-merge-select routines, and employ any number of conditional tests on text strings, BCD numbers, or binary values. Conditional tests include ranges and may be used with AND, OR, and XOR. The 8-bit version of SuperSort includes a library of assembly language sub-routines that can be called from programs written in various high-level languages.

**Compatibility Matrix:** 223.0025.002

**MICROTECH EXPORTS**467 Hamilton Ave, Suite 2  
Palo Alto CA 94301

(415) 324-9114

**► ReformatTter**

A diskette format conversion utility for microcomputers running under CP/M, CDOS, SDOS, TurboDOS, TRSDOS, RT-11, Cromix, CP/M-86, MS-DOS, or PC DOS

**Price** \$350 purchase

**Description** ReformatTter is a format conversion utility that allows microcomputers and minicomputers to read from and write to 8-inch diskettes in a variety of diskette formats. ReformatTter can transfer complete files, display or alter diskette directories, translate to and from ASCII and EBCDIC, and read and write data in other formats under program control. ReformatTter is available in the following versions:

- CP/M to and from IBM 3740 (8-inch format)
- CP/M to and from RT-11
- TRSDOS to and from CP/M
- TRSDOS to and from RT-11
- RT-11 to and from CP/M
- Cromix to and from RT-11
- CP/M-86 to and from IBM 3740
- MS-DOS to and from IBM 3740
- PC DOS to and from IBM 3740.

**Compatibility Matrix:** 223.0025.002

**MISOSYS**5904 Edgehill Dr  
Alexandria VA 22303

(703) 960-2998

**► PDS/PRO-PADS**

File storage program for Tandy TRS-80 Models I, III, and 4

**Price** \$40 purchase

**Description** PDS/PRO-PADS constructs partitioned data sets (PDSs) on Tandy TRS-80 diskettes, allowing up to 255 subfiles to be contained within one disk file. Commands for developing and maintaining PDS files include COPY, CREATE, KILL, COPY from a PDS file to a regular file, and DISPLAY the directory or subdirectory for a specific PDS.

**Compatibility Matrix:** 223.0025.002

**MYCROFT LABS INC**2639 N Monroe St  
Suite B188  
Tallahassee FL 32303

(904) 385-1141

**► COMPAT**

A diskette format conversion utility for the Otrona Attache

**Price** \$195 purchase

**Description** COMPAT allows the Otrona Attache computer to read, write, and in some cases format diskettes from almost 20 different CP/M-based computers. Four MS-DOS diskette formats are also supported: single-sided eight sector, single-sided nine sector, double-sided eight sector, and double-sided nine sector.

**Compatibility Matrix:** 223.0025.002



**NEW GENERATION SYSTEMS**

1253 Golf Course Dr (800) 368-3359  
Reston VA 22091 (703) 476-9143

► **MicroShell**

A front-end utility for computers running under CP/M

**Price** \$150 purchase

**Description** MicroShell adds advanced programming features to CP/M. Users can search for a file without specifying drive letters, combine several CP/M commands on the same line, easily redirect input and output, and store frequently used command sequences in a library of command files.

**Compatibility Matrix:** 223.0025.002

**NORELL DATA SYSTEMS**

3400 Wilshire Blvd  
PO Box 70127 (213) 257-2026  
Los Angeles CA 90010

► **System-Backup**

A diskette copy utility for the IBM Personal Computer

**Price** \$50 purchase

**Description** System-Backup allows the IBM Personal Computer to create backup copies of both copy-protected and unprotected software.

**Compatibility Matrix:** 223.0025.002

**OMEGA MICROWARE**

222 S Riverside Plaza  
Chicago IL 60606 (312) 648-4844

► **Locksmith**

A diskette copy utility for the Apple II, II+, and IIe

**Price** \$100 purchase

**Description** Locksmith combines diagnostic routines with a bit-nibble copy utility. The diagnostic utilities check media surfaces for bad blocks and monitor disk speed. The copy routine allows users to create backup copies of most diskettes, including many copy-protected programs.

**Compatibility Matrix:** 223.0025.002

**PERICOMP**

Five Star Software Div  
14 Huron Dr (617) 655-7660  
Natick MA 01760

► **Superfile Backup**

A file archival utility for microcomputers running under CP/M, CP/M-86, or MS-DOS

**Price** \$50 purchase

**Description** Superfile Backup creates archival copies of files of any type or size. The program uses all available space on each archival diskette and requests additional diskettes as needed. A central directory of all files and file segments is maintained on each diskette. Superfile Backup creates read-only files completely protected from accidental erasure. Files can be purged only through Superfile Backup housekeeping routines.

**Compatibility Matrix:** 223.0025.002

**PETER NORTON**

2210 Wilshire Blvd  
Santa Monica CA 90403 (213) 399-3948

► **The Norton Utilities**

A series of utilities for the IBM Personal Computer

**Price** \$80 purchase

**Description** The Norton Utilities is a collection of programs that enhances the power and efficiency of PC DOS. Unerase and Filefix enable users to restore files that have been accidentally erased or patch disks with damaged sectors. Diskopt increases disk access speeds. Other programs allow users to perform sophisticated screen handling under PC DOS.

**Compatibility Matrix:** 223.0025.002

**ROSESOFT INC**

4710 University Way NE  
Suite 601  
Seattle WA 98105 (206) 524-2350

► **ProKey**

A keyboard utility for the IBM Personal Computer

**Price** \$129 purchase

**Description** ProKey allows users to rearrange the layout of the IBM Personal Computer and execute multiple keystrokes or commands with a single keystroke. Up to 12,000 keystrokes can be associated with a single key. ProKey is compatible with most programs running under PC DOS. It resides in memory with each program, allowing complex commands, such as those that transfer data from one program to another, to be executed by pressing a single key.

**Compatibility Matrix:** 223.0025.002



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**SEASONED SYSTEMS INC**Box 3036  
417 Lakeshore Lane  
Chapel Hill NC 27514

(919) 967-5818

**► SureStroke**

Converts the IBM Personal Computer keyboard to the Dvorak keyboard layout

**Price** \$50 purchase

**Description** SureStroke translates the QWERTY layout of the IBM Personal Computer keyboard into the Dvorak layout, following the ANSI Alternate Keyboard Arrangement X4.22-1983. SureStroke includes an interactive disk-based tutorial to teach Dvorak touch typing and a set of keycap labels for marking the keys. The ergonomic Dvorak layout places the most frequently used letters on the home row of the keyboard.

**Compatibility Matrix:** 223.0025.002

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**SELFWARE INC**3545 Chain Bridge Rd  
Suite 3  
Fairfax VA 22030

(703) 352-2977

**► CONVERT**

A utility that reads, writes, and formats diskettes for more than 25 models of microcomputers

**Price** \$99 purchase

**Description** CONVERT runs on the IBM Personal Computer and many other microcomputers operating under MS-DOS. It reads, writes, and formats diskettes for more than 25 models of CP/M-based microcomputers. CONVERT transfers data between MS-DOS and CP/M, or between two CP/M-based computers with an MS-DOS-based system as the transfer medium.

**Compatibility Matrix:** 223.0025.003

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**SENSIBLE SOFTWARE**24011 Seneca  
Oak Park MI 48237

(313) 399-8877

**► DISK RECOVERY**

A diskette maintenance utility for the Apple II+ running under Apple DOS Version 3.2.1 or 3.3

**Price** \$30 purchase

**Description** DISK RECOVERY consists of the BAD BLOCK SCAN and optional REDO VTOC programs. BAD BLOCK SCAN examines all sectors on a diskette and marks bad blocks to prevent Apple DOS from storing data in those areas. REDO VTOC examines the layout of files on a diskette to correct errors in the volume table of contents (VTOC). This examination eliminates

wasted space and prevents inadvertent overwriting of files.

**Compatibility Matrix:** 223.0025.003

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**SENSIBLE SOFTWARE**24011 Seneca  
Oak Park MI 48237

(313) 399-8877

**► Multi-Disk Catalog III**

A data base management package that tracks Apple II diskette libraries

**Price** \$25 purchase

**Description** Multi-Disk Catalog III keeps track of diskette libraries for Apple II+ or IIe microcomputers running under Apple DOS Version 3.2.1 or 3.3. It reads the catalog of each Apple DOS diskette, assigns a locator number to the diskette, and adds the information to a master list of file names.

The system keeps the following information about each diskette:

- Name of each file in the catalog
- Type of each file (e.g., Applesoft or Integer)
- Number of sectors in each file
- Number of unused sectors
- Volume number of each diskette.

**Compatibility Matrix:** 223.0025.003

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**SENSIBLE SOFTWARE**24011 Seneca  
Oak Park MI 48237

(313) 399-8877

**► SUPER DISK COPY**

A diskette copy utility for the Apple II, II+, and IIe

**Price** \$35 purchase

**Description** SUPER DISK COPY is a menu-driven copy utility that allows any unprotected diskette to be copied in its entirety or on a track-by-track basis. SUPER DISK COPY restores any files that have been accidentally deleted, deletes Apple DOS from a diskette to provide greater storage space, corrects errors in the volume table of contents (VTOC), or copies entire diskettes, transferring only the sectors that have actually been used to store data. SUPER DISK COPY can also copy individual files from 13-sector Apple DOS Version 3.2.1 to 16-sector Apple DOS Version 3.3 or vice versa.

**Compatibility Matrix:** 223.0025.003

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**SIGNUM MICROSYSTEMS**120 Mountain Ave  
Bloomfield CT 06002

(203) 726-1911

**► Documax**

A diskette file tracking and compression utility for the Apple II, II+, and IIe running under Apple DOS Version 3.3

**Price** \$175 purchase

**Description** Documax is a menu-driven utility that manages diskette files. The compression algorithm allows text files, binary files, or AppleWriter files to be compressed and stored on specially formatted diskettes. These diskettes cannot be read by Apple DOS, but Documax includes a function that scans compressed files for user-defined keywords. Files can then be restored for use with other programs.

**Compatibility Matrix:** 223.0025.003

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**STOK SOFTWARE**17 W 17th St  
New York NY 10011

(212) 243-1444

**► BackRest**

A hard disk backup facility

**Price** \$180 purchase

**Description** BackRest is a disk file backup utility for microcomputers running under CP/M, MP/M-II, CP/M-86, Concurrent DOS, PC DOS, MS-DOS, TurboDOS, or MmmOST. The program supports local area networks (LANs), such as PC/NET and Omni/NET, as well as all multitasking windowing capabilities of Concurrent DOS 3.1. BackRest allows users to define backup sequences that can be easily used by inexperienced personnel. It features full error trapping, password protection, and data file compression. Large files can be easily split among several diskettes; each diskette is assigned a sequence number for automatic restoration.

**Compatibility Matrix:** 223.0025.003

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**STRUCTURED SYSTEMS GROUP INC**5204 Claremont Ave  
Oakland CA 94618

(415) 547-1567

**► QSORT**

Sort/merge package for ASCII disk files

**Price** \$100 purchase

**Description** QSORT sorts data files up to 8M bytes in size. Up to five separate key fields can be simultaneously sorted in ASCII disk files or the Structured Sys-

tems Group NAD and Analyst data files. QSORT is included with NAD.

**Compatibility Matrix:** 223.0025.003

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**SUPERSOFT**PO Box 1628  
Champaign IL 61820

(217) 359-2112

**► Disk-Edit (DED)**

A general-purpose disk utility program for computers running under CP/M, CP/M-86, MS-DOS, or PC DOS

**Price** \$100 purchase

**Description** A general-purpose disk utility program, DED is designed to provide direct access to diskette surfaces. A variety of popular terminals support this package through a streamlined terminal-definition procedure, which automatically keys in the proper parameters. Any sector, track, or file can then be accessed and rewritten. Additional capabilities allow the program to provide disk access by files, sectors, or tracks; support variable scrolling rate; display bytes as hexadecimal numbers and ASCII characters; and perform forward and reverse string searches.

**Compatibility Matrix:** 223.0025.003

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**VERBATIM CORP**323 Soquel Way  
Sunnyvale CA 94086

(408) 245-4400

**► Disk Drive Analyzer**

A diagnostic tool for the Apple II+ and IIe

**Price** \$70

**Description** Disk Drive Analyzer is useful in providing preventative maintenance for Apple diskette drives. The program runs four comprehensive tests covering head alignment, disk clamping, reading and writing accuracy, and disk speed. The results are then displayed along with indications of performance and recommendations on whether tested areas require repair or adjustment.

**Compatibility Matrix:** 223.0025.003

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**VERTEX SYSTEMS**7950 W Fourth St  
Los Angeles CA 90048

(213) 938-0857

**► Xeno-Copy Plus**

A diskette reformatting utility for the IBM Personal Computer

**Price** \$150 purchase

**Description** Xeno-Copy Plus enables users to transfer files from non-PC DOS format to PC DOS format diskettes, as well as from PC DOS format to non-PC DOS format diskettes. Among the formats read and written by Xeno-Copy Plus are diskettes from the Kaypro 2, Tandy TRS-80 Model III under CP/M, Xerox 820 II, Televideo TS 802, and Osborne 1 and 2. Xeno-Copy Plus runs on IBM Personal Computers with two diskette drives and requires no additional hardware.

**Compatibility Matrix:** 223.0025.003

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**VISICORP**2895 Zanker Rd  
San Jose CA 95134

(408) 946-9000

**► VisiTutor**

A series of training programs for VisiCalc

**Price** \$80 purchase

**Description** VisiTutor, available in versions for the IBM Personal Computer and Personal Computer XT and the Apple IIe, educates first-time users in the functions and applications of VisiCalc. VisiTutor simulates the operation of VisiCalc while providing feedback on accessing various functions and constructing a spreadsheet model. A detailed users' guide is included.

**Compatibility Matrix:** 223.0025.003



# PROGRAM DEVELOPMENT/DEBUGGING Compatibility Matrix

224.0025.001

Vendor/Package	Compatible Operating Systems														Others		
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS	UCSD p-System		Unix	Xenix
<b>Apple Computer</b> Workbench	•																Apple Pascal, ProDOS
<b>Axel Johnson</b> Autocode 1			•		•		•			•							
<b>Borlund International</b> MenuMaster			•		•		•			•							
<b>Bytel</b> COGEN Menu Master			•		•		•	•		•					•		RT-11 RT-11
<b>CodeWriter</b> FileWriter II	•		•				•			•							Commodore DOS
<b>Computer Control Systems</b> DB-FABS							•			•							
<b>Computer Marketing Services</b> THE LAST ONE	•		•		•		•						•				Commodore DOS
<b>CompuView Products</b> V-BUG V-COM			•		•												Zilog Z80 based Zilog Z80 based
<b>Creative Solutions</b> MultiFORTH																	Hewlett-Packard HP 9826, HP 9836
<b>Desktop Software</b> NPL Information Management System														•			
<b>Execuware</b> Next Step							•										
<b>Flexware</b> Application Development System															•		
<b>Fox &amp; Geller</b> dUTIL QUICKCODE			•				•			•							
<b>Hayden Software</b> ORCA/M	•																
<b>ICR FutureSoft</b> QUIKPRO + II			•				•						•				
<b>Index Technology (InTech)</b> Excelerator							•										
<b>The Information People</b> Organizer II			•		•		•	•		•							TurboDOS
<b>Information &amp; Systems Research</b> RIMS/MPG	•		•		•		•								•		



Vendor/Package	Compatible Operating Systems														Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS	UCSD p-System		Unix	Xenix	
<b>Key Solutions</b> DataBurst							•											
<b>Micro Focus</b> ANIMATOR FORMS-2		•	•		•		•	•	•	•						•	•	TurboDOS TurboDOS
<b>MISOSYS</b> DSMBLR II/III PRO-DUCE													•					
<b>OBS Software</b> WYLBUR/pc							•											
<b>Phoenix Software Associates</b> P-FIX86 P-LINK86 P-MATE86					•		•			•								
<b>PMI</b> MICROSCREENS			•															
<b>Quelo</b> BLX/C Quelo 68000 Assembler			•	•	•		•			•								
<b>RG Software Systems</b> Pro-Matic							•											
<b>Sensible Software</b> APLUS BASIC Enhanced Software Tools (B.E.S.T.)	•	•																
<b>Sensible Software</b> Edit-Soft The Bug	•	•																
<b>Smart Systems</b> SMARTSCREEN																	Apple Pascal	
<b>Software Automation</b> SALVO			•		•		•			•								
<b>The Software Express</b> APPGEN															•	•	PICK	
<b>The Software Group</b> Programmer's Apprentice			•															
<b>Software Strategies</b> ScreenMaster							•											
<b>Sorcim</b> A.C.T.	•	•					•			•							TurboDOS, SDOS	
<b>Sunbelt Computer Systems</b> SUNED80 SUNED86M			•							•								



Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	Unix	Xenix
<b>SuperSoft</b> Diagnostics II			•		•		•			•							
<b>Tandy</b> Assembly Language Development System													•				
<b>Technical Systems Consultants</b> 68000 Cross Assembler																	FLEX, UniFLEX





# PROGRAM DEVELOPMENT/DEBUGGING

## Product Summaries

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### APPLE COMPUTER

20525 Mariani Ave  
Cupertino CA 95014

(408) 996-1010

#### ► Workbench

A series of programming tools for Apple II, II+, and IIfx computers under Apple DOS or ProDOS and Apple III computers under Apple SOS or Pascal

**Price** Vendor declined to provide

**Description** Workbench is a series of program development aids available separately or as a bundled package. Included in the Workbench series are:

- DOS Programmer's Tool Kit—Includes 6502 assembler and editor and a collection of programs for creating and modifying Applesoft BASIC programs
- ProDOS Technical Reference Manual—Provides the ProDOS operating system, an extensive reference manual, and an interactive tutorial that allows users to invoke ProDOS system calls directly from the keyboard
- ProDOS Assembler Tools—A 6502 assembler and editor for the Apple IIfx
- Apple Pascal Numerics—Allows Apple II or Apple III Pascal programs to use double-precision real numbers and 64-bit integers
- Apple III Pascal Tool Kit—Includes an enhanced version of the Apple III Pascal compiler, a program comparison utility, variable cross-referencer, program reformatter, and disk directory sort utility
- Pronto: Apple III Pascal Debugger—Allows step-by-step or full-speed execution of Pascal programs.

**Compatibility Matrix:** 224.0025.001

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### AXEL JOHNSON CORP

Stemmos Div  
666 Howard St  
San Francisco CA 94015

(415) 777-3800

#### ► Autocode 1

A dBASE II code generator

**Price** \$195 purchase

**Description** Autocode 1 generates data input screens and report routines for the Ashton-Tate dBASE II DBMS on computers running under CP/M, CP/M-86, MS-DOS, or PC DOS. The system supports the full range of dBASE II string, numeric, data, and calculated

fields as well as the sort, select, and tabulate functions used in generating reports and specialized applications.

**Compatibility Matrix:** 224.0025.001

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### BORLUND INTERNATIONAL

4807 Scotts Valley Blvd  
Scotts Valley CA 95006

(408) 438-8400

#### ► MenuMaster

A front-end menu system for microcomputers running under CP/M, CP/M-86, MS-DOS, or PC DOS

**Price** \$195 purchase

**Description** MenuMaster organizes the operating system console commands (used for disk and file copying, disk initialization, directory inquiry, and program execution) under a single user-definable menu. The menu processor replaces the standard console command processor (CCP) and loads into computer memory under the basic disk operating system. Application programs can therefore run under MenuMaster without modification. The amount of space required by the menu overhead is 512 bytes.

**Compatibility Matrix:** 224.0025.001

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### BYTEL

1029 D Solano Ave  
Berkeley CA 94706

(415) 527-1157

#### ► COGEN

A COBOL program generator

**Price** \$950 purchase

**Description** COGEN produces COBOL program modules for standard business applications, including file maintenance, inquiries, and reports. A series of interactive menus and data entry screens are used, eliminating much of the repetitive work of program development. Programs produced by COGEN are structured and self documented. COGEN is data dictionary driven and features an open structure that allows knowledgeable users to alter the way COGEN generates source code.

COGEN is compatible with Ryan-McFarland RM/COBOL and MicroFocus Level II COBOL and runs on microcomputers operating under CP/M, MP/M II, CP/M-86, OASIS, MS-DOS, RT-11, or Unix.

**Compatibility Matrix:** 224.0025.001



**BYTEL**1029 D Solano Ave  
Berkeley CA 94706

(415) 527-1157

**► Menu Master**

Menu implementation package for COBOL programs

**Price** \$250 purchase

**Description** Menu Master uses an interactive technique to aid in the development of multilevel (tree-structured) menus. Available for a wide range of business applications, the development aid runs on systems supporting RM/COBOL from Ryan-McFarland. Ten levels of security clearance can be used through password, user-name, and access-level verification.

**Compatibility Matrix:** 224.0025.001**CODEWRITER CORP**7847 N Caldwell Ave  
Niles IL 60648

(312) 470-0700

**► FileWriter II**

An applications generator for the IBM Personal Computer, Apple and Commodore microcomputers, and microcomputers running under CP/M or MS-DOS

**Price** \$99-\$249 purchase

**Description** FileWriter II allows users to generate data entry and report application programs without using BASIC. The code is unprotected so that experienced programmers can add subroutines. The system features full interactive data validation with numeric, alphanumeric, and monetary fields. Files can contain up to 36,000 records, with 100 fields per record.

**Compatibility Matrix:** 224.0025.001**COMPUTER CONTROL SYSTEMS**298 21st Terrace SE  
Largo FL 33541

(813) 586-1886

**► DB-FABS**

A data, screen, and report manager for the IBM Personal Computer, Personal Computer XT, and other microcomputers running under MS-DOS

**Price** \$295 purchase

**Description** DB-FABS allows users to create data files, screen input forms, or structured reports. DB-FABS supports up to 65,536 records of 8,160 characters each, and it handles all file I/O and keyword indexing. Files and reports created under DB-FABS can be used directly from within DB-FABS or linked with programs compiled by Microsoft's BASIC compiler.

**Compatibility Matrix:** 224.0025.001**COMPUTER MARKETING SERVICES**26 Springdale Rd  
Cherry Hill NJ 08003

(609) 795-9480

DJ 'AI' Systems  
Station Rd  
Ilminster, Somerset  
England TA19-9BQ

(04605) 4117

**► THE LAST ONE**

A program generator for the IBM Personal Computer, Tandy TRS-80 Model II, Apple II+ and IIe, Commodore 8032 and 64, and microcomputers running under CP/M or CP/M-86

**Price** Purchase: \$100 (Commodore 64), \$395 (Apple II+ and IIe), \$495 (all others)

**Description** THE LAST ONE produces ready-to-use BASIC programs from user responses to menu prompts. Submenus allow users to refine application definitions. Once a problem is specified, THE LAST ONE produces error-free BASIC code and a printout detailing the parameters used to produce the code. Users of THE LAST ONE must be knowledgeable BASIC programmers. Programs generated by THE LAST ONE are user friendly and access up to nine data files.

**Compatibility Matrix:** 224.0025.001**COMPUVIEW PRODUCTS**1955 Pauline Blvd  
Suite 300  
Ann Arbor MI 48103

(313) 996-1299

**► V-BUG**

A debugging utility for Zilog Z80 Assembler code

**Price** \$75 purchase

**Description** V-BUG incorporates a ROM-resident monitor with an I/O handler and program debugger. As a resident monitor, V-BUG supplies flexible and hardware-independent I/O capabilities to operating systems and user programs. It can also support terminal emulation using X-On/X-Off protocols. As a program debugger, V-BUG provides a range of commands to display and alter CPU status and memory. Under full user control, the user can disassemble instructions in memory, set breakpoints, and trace instructions. Several widely used EPROM burners are supported.

**Compatibility Matrix:** 224.0025.001

**COMPUVIEW PRODUCTS INC**

1955 Pauline Blvd  
Suite 300  
Ann Arbor MI 48103

(313) 996-1299

**► V-COM**

Disassembler for Zilog Z80- and Intel 8080-based systems

**Price** \$80 purchase

**Description** V-COM, a noninteractive disassembler, produces an Assembly-language program from machine code. Available in four different forms, V-COM can be used with a variety of Zilog Z80 and Intel 8080 assemblers, including the TDL assembler with Intel mnemonics, the Digital Research MAC with Intel memories, and two versions for Zilog assemblers.

**Compatibility Matrix:** 224.0025.001

**CREATIVE SOLUTIONS INC**

4801 Randolph Rd  
Rockville MD 20852

(301) 984-0262

**► MultiFORTH**

Multitasking 79-standard FORTH-based software development system

**Price** \$2,500 purchase

**Description** MultiFORTH is designed for data acquisition and process control on the Hewlett-Packard HP 9826 and 9836 desktop computers. It includes interactive compilers, screen editors, and graphics capabilities, forming an integrated software development environment. Support for HP-IB, parallel, and serial interfaces is also featured, as well as DMA and color graphics.

**Compatibility Matrix:** 224.0025.001

**DESKTOP SOFTWARE CORP**

228 Alexander St  
Princeton NJ 08540

(609) 924-7111

**► NPL Information Management System**

A nonprocedural language for microcomputers running under the UCSD p-System, including the Apple II and III, IBM Personal Computer, and Digital Equipment Rainbow 100

**Price** \$950 permanent license

**Description** The NPL Information Management System allows users unfamiliar with high-level computer languages to create data base-oriented application programs. The system uses simple, English-like sentences to design data entry screens with automatic data validation, perform ad hoc queries, or generate structured reports. The number of records per file is limited only by available disk storage. Each record includes up to 100

fields (1.2K bytes total). All fields can be specified as index keys. Files created by the NPL Information Management System are upward compatible with such mainframe query languages as the Information Builders FOCUS, Mathematica Product Group RAMIS II, and National CSS NOMAD.

**Compatibility Matrix:** 224.0025.001

**EXECUWARE**

7415 Pineville-Mathews Rd  
Charlotte NC 28226

(704) 541-1199

**► Next Step**

An applications generator

**Price** \$345 purchase

**Description** Next Step produces Microsoft BASIC programs for the IBM Personal Computer or Personal Computer XT according to parameters defined by the user. The system generates data base-oriented application programs with up to 99 fields per record, of which 15 can be SORT key fields. A step-by-step tutorial manual is included. Next Step allows users to include built-in HELP screens with input and report sections of application programs.

**Compatibility Matrix:** 224.0025.001

**FLEXWARE**

15404 E Valley Blvd  
Industry CA 91746

(213) 961-0237

**► Application Development System**

An application development package for any computer running under the UCSD p-System

**Price** Established by distributor

**Description** Application Development System is a self-documenting system that uses a data dictionary and data base to define and modify applications. Applications can therefore be transported to other computers based on the UCSD p-System. Application Development System develops input screens for easy data input and features password protection at the field level. A telecommunications utility is also included.

Flexware has designed the Application Development System for use by systems houses in developing software for end users. Various configurable accounting modules are available from Flexware to form the bases of specialized accounting systems.

**Compatibility Matrix:** 224.0025.001

**FOX & GELLER**604 Market St  
Elmwood Park NJ 07407

(201) 794-8883

**► dUTIL**

A syntax checker for dBASE II command files

**Price** \$99 purchase**Description** dUTIL assists users in developing and maintaining command files for use with the Ashton-Tate dBASE II or dBASE III DBMS. The program allows command files to be merged. It can be used to check program syntax while automatically indenting all IF-ENDIF and DO WHILE-ENDDO loops for increased program clarity. dUTIL can be used on computers running under CP/M or MS-DOS.**Compatibility Matrix:** 224.0025.001**FOX & GELLER**604 Market St  
Elmwood Park NJ 07407

(201) 794-8883

**► QUICKCODE**

An applications generator for use with Ashton-Tate dBASE II or dBASE III on computers running CP/M, MS-DOS, or PC DOS

**Price** \$295 purchase**Description** QUICKCODE is a visually oriented application generator that produces code for use with the Ashton-Tate dBASE II or dBASE III DBMS. QUICKCODE includes a screen editor for the creation of data entry screens, data base structures, and data validation procedures. After the parameters of a data base have been defined, QUICKCODE produces code for handling generic applications such as adding records, editing existing records, creating and using index files, printing reports based on user parameters, and transferring dBASE II data into a format for use with MicroPro WordStar or MailMerge.**Compatibility Matrix:** 224.0025.001**HAYDEN SOFTWARE**600 Suffolk St  
Lowell MA 01853(800) 343-1218  
(617) 937-0200**► ORCA/M**

A Synertek 6502 or 65C02 macroassembler for the Apple II

**Price** \$149 purchase**Description** ORCA/M, an advanced microcomputer Assembly-language development system, includes an assembler, an object linker, an 80-character screen editor, and a powerful command editor that allows users to

directly edit disk sectors. ORCA/M runs under the DOS 3.3 operating system and supports 16K-byte RAM cards. A library of subroutine libraries offers such features as floating-point, double-precision floating-point, and 2- and 4-byte integer arithmetic.

**Compatibility Matrix:** 224.0025.001**ICR FUTURESOF**PO Box 1446-DM1  
Orange Park FL 32073

(800) 824-7888

**► QUICKPRO + II**

A BASIC program generator for the IBM Personal Computer, the Tandy TRS-80, and microcomputers running under CP/M

**Price** \$150-\$260 purchase**Description** QUICKPRO+II is a menu-driven program that produces Microsoft BASIC-compatible source code based on user responses to specific prompts. The system handles routines for data entry, file access and indexing, free-form reporting, and sorting. The source code produced by QUICKPRO+II can be used as is, modified by the user for more specific applications, or incorporated as subroutines into existing BASIC programs.**Compatibility Matrix:** 224.0025.001**INDEX TECHNOLOGY CORP (INTECH)**5 Cambridge Center  
Cambridge MA 02142

(617) 491-7380

**► Excelerator**

A systems analysis workbench for the IBM Personal Computer XT

**Price** \$9,500 purchase**Description** Excelerator is a fully integrated, menu-driven software environment that assists systems analysts in all phases of systems analysis, design, organization, and documentation. The program offers specialized, detailed graphics for creating flowcharts or data structure diagrams. A centralized data dictionary maintains all system data structures, process logic, screen definitions, and report layouts. Excelerator includes Microsoft's Word WP program, an interface for Microsoft's Mouse, and a special high-resolution graphics board.**Compatibility Matrix:** 224.0025.001

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**THE INFORMATION PEOPLE**443 Hudson Ave  
Newark OH 43055

(614) 349-8644

**► Organizer II**

A front-end menu-generating system for microcomputers running under CP/M, MP/M II, TurboDOS, CP/M-86, MS-DOS, or PC DOS

**Price** \$149 purchase

**Description** Organizer II generates front-end menus for use as operator interfaces or job control processors. Using any ASCII text editor, users can create command files that automatically call application programs or operating system functions from a cursor-controlled menu. Organizer II allows users to define HELP screens that explain choices presented on the menu. Menus, command streams, and HELP screens can be easily adapted to any microcomputer that supports Organizer II, thus providing a consistent user interface on different computer systems.

**Compatibility Matrix:** 224.0025.001

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**INFORMATION & SYSTEMS  
RESEARCH INC**Airport Office Park Bldg 1  
410 Rouser Rd  
Coraopolis PA 15108(412) 262-5507  
Telex: 812359**► RIMS/MPG**

A system that generates application programs for Level II COBOL-based microcomputers

**Price** \$1,600 purchase

**Description** RIMS/MPG enables system integrators and applications developers to create programs without manually writing source code. The program can also be used to modify existing general-purpose applications packages into industry-specific packages. Interactive development is used to determine parameters. RIMS/MPG responds by generating machine code and Level II COBOL source code for microcomputers operating under CP/M, CP/M-86, PC DOS, Unix, or Apple SOS.

**Compatibility Matrix:** 224.0025.001

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**KEY SOLUTIONS**PO Box 2297  
Santa Clara CA 95055

(408) 554-6125

**► DataBurst**

A set of program development utilities for writing interactive BASIC programs

**Price** \$225 purchase

**Description** DataBurst, a set of programming utilities for writing interactive BASIC programs on the IBM Per-

sonal Computer. It performs as a screen editor and provides run-time support. The screen editor uses a full-screen picture to design a data entry format with up to 255 fields per screen. The system uses this picture to generate a screen definition written in BASIC.

Run-time support occurs when the BASIC program executes. DataBurst handles all screen and keyboard operations. One Assembly-language run-time module handles the user interface. This module replaces such statements as LOCATE, PRINT, and INPUT, thus reducing the amount of BASIC code required.

DataBurst also provides run-time support of BASIC compilers, enabling users to modify and test BASIC programs using the DataBurst interpreter and then immediately invoke the compiler. Key Solutions also plans to introduce support for a C language interface.

**Compatibility Matrix:** 224.0025.002

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**MICRO FOCUS**2465 E Bayshore Rd  
Suite 400  
Palo Alto CA 94303

(415) 856-4161

26 West St  
Newbury, Berkshire  
England RG13 1JT

(06) 353-2595

**► ANIMATOR**

A visual COBOL debugging utility for microcomputers running under CP/M, CP/M-86, MP/M II, MP/M-86, Concurrent DOS, MS-DOS, PC DOS, TurboDOS, Xenix, or Unix

**Price** Purchase: \$795; \$1,195 (high-performance version)

**Description** ANIMATOR monitors program source code and intermediate object code to provide users with direct observation of program execution. Each statement is highlighted as it executes. Whenever program control passes to another section of the program, ANIMATOR automatically shifts the display to include the new section. Program variables can be displayed or modified, program execution can be halted and resumed at any point, and program source code can be viewed using two independent screen windows.

ANIMATOR is compatible with Micro Focus Level II COBOL and CIS COBOL.

**Compatibility Matrix:** 224.0025.002

**MICRO FOCUS**

2465 E Bayshore Rd  
Suite 400  
Palo Alto CA 94303

(415) 856-4161

26 West St  
Newbury, Berkshire  
England RG13 1JT

(06) 353-2595

**► FORMS-2**

Screen generator for microcomputers running under CP/M, CP/M-86, MP/M II, MP/M-86, Concurrent DOS, PC DOS, MS-DOS, TurboDOS, Xenix, or Unix

**Price** Purchase: \$195; \$295 (high-performance version)

**Description** FORMS-2 speeds the creation of interactive screen forms. Users design forms directly on the screen, and FORMS-2 translates the forms into error-free COBOL source code, including all required record definitions. Forms can be updated or redesigned. FORMS-2 is compatible with Micro Focus Level II COBOL and CIS COBOL compilers.

**Compatibility Matrix:** 224.0025.002

**MISOSYS**

5904 Edgehill Dr  
Alexandria VA 22303

(703) 960-2998

**► DSMBLR II/III PRO-DUCE**

A disassembler program for Tandy TRS-80 Models I, III, 4.

**Price** \$40 purchase

**Description** DSMBLR II/III PRO-DUCE converts object code into Assembly-language source code, enabling the programmer to examine the way in which a program works and to make necessary modifications. DSMBLR II/III PRO-DUCE allows code located virtually anywhere in memory to be disassembled. The result of the disassembly can be output to a display terminal, printer, or disk file.

**Compatibility Matrix:** 224.0025.002

**OBS SOFTWARE**

115 Sansome St  
San Francisco CA 94104

(415) 391-9555

**► WYLBUR/pc**

A version of the mainframe program development system for the IBM Personal Computer

**Price** Vendor declined to provide

**Description** WYLBUR/pc offers data base development, intercomputer communications and full-screen text editing capabilities. The data base development features allow full user control over screen and menu lay-

out, indexed file access, and data manipulation. The communications facility permits communications with other micro- or minicomputers as well as with mainframe software, such as OBS Software's WYLBUR or IBM's TSO or CICS. The full-screen text editor offers global search and replace on text, program source code, compressed data, or indexed data files. The text editor uses the computer's special function keys and allows users to create command synonyms.

All EXEC file-based applications developed under WYLBUR/pc are upward compatible with mainframe versions of WYLBUR.

**Compatibility Matrix:** 224.0025.002

**PHOENIX SOFTWARE ASSOCIATES**

1420 Providence Hwy  
Suite 260  
Norwood MA 02062

(617) 769-7020

**► P-FIX86**

A symbolic debugger for computers under MS-DOS

**Price** \$245 purchase

**Description** P-FIX86 is a symbolic debugger with windowed full-screen display, in-line assembler, and the capability to perform breakpoint test evaluations. P-FIX86 can load maps produced by the P-LINK86 linkage editor. While the test program is running, users can switch between windows displaying program prompts, program memory areas, and program data files. The inline assembler produces code for the Intel 8086 and 8088 processors and the Intel 8087 math coprocessor.

**Compatibility Matrix:** 224.0025.002

**PHOENIX SOFTWARE ASSOCIATES**

1420 Providence Hwy  
Suite 260  
Norwood MA 02062

(617) 769-7020

**► P-LINK86**

A linkage editor for microcomputers running under PC DOS, MS-DOS, or CP/M-86

**Price** \$345 purchase

**Description** P-LINK86 is a linkage editor that handles the object code output of Microsoft and Digital Research compilers. It also handles other compilers, such as Lattice or Computer Innovation C compilers. The user can specify memory overlays without modifying the application program object code. P-LINK86 includes the P-LIB86 object library manager.

**Compatibility Matrix:** 224.0025.002



**PHOENIX SOFTWARE ASSOCIATES**

1420 Providence Hwy  
Suite 260  
Norwood MA 02062

(617) 769-7020

**► P-MATE86**

A full-screen text and program editor for microcomputers running under PC DOS, MS-DOS, or CP/M-86

**Price** \$225 purchase

**Description** P-MATE86 is a full-screen, single-stroke editor with such advanced capabilities as automatic disk buffering that allows users to page forward and backward, 10 auxiliary buffers that can be individually edited or used as temporary scratch pads, horizontal scrolling of lines up to 250 characters across, and an extensive macro command language. Deleted text is stored in a stack and can be recalled. P-MATE86 offers automatic word wraparound, global or local margin settings, and tab and indentation stops.

**Compatibility Matrix:** 224.0025.002

**PMI INC**

PO Box 87  
Buckfield ME 04220

(800) 227-1836  
(207) 336-2500**► MICROSCREENS**

A screen-display entry and formatting facility for computers running under CP/M

**Price** \$99 purchase

**Description** MICROSCREENS allow the end user to perform professional forms-style input on screen forms of up to 127 fields of 128 characters each. A machine-language routine gives full control of protected fields and cursor-controlled editing. Numeric and data fields are validated on input. A set of CBASIC routines initializes the computer system and interfaces with MICROSCREENS. Utilities are provided to configure MICROSCREENS to the VDU in use, to locate the system to the top of the TPA, and to "draw" screen formats.

**Compatibility Matrix:** 224.0025.002

**QUELO**

2464 33d Ave West  
Seattle WA 98199

(206) 285-2528

**► BLX/C**

A structured program development facility for microcomputers running under CP/M

**Price** \$95 purchase

**Description** BLX/C is a structured programming tool specifically designed to enhance the readability of pro-

grams written in CBASIC or Microsoft BASIC. Features include an abundant assortment of structures for program flow control and a consistently formatted listing to highlight program structure.

**Compatibility Matrix:** 224.0025.002

**QUELO**

2464 33d Ave West  
Suite 173  
Seattle WA 98199

(206) 285-2528

**► Quelo 68000 Assembler**

A cross assembler that produces Motorola MC 68000 machine code

**Price** Purchase: \$595 (object code); \$750 (portable source code)

**Description** Quelo 68000 Assembler is a cross assembler for microcomputers running under CP/M, CP/M-86, PC DOS, MS-DOS, or CP/M-68K. Quelo 68000 Assembler produces relocatable, linkable object code that conforms to the Motorola-resident assembler and machine code. Symbols can include up to 31 characters and can be cross-referenced for assembler and linker modules. The linker produces Motorola S-records, Intel HEX records, and MOSTEK HEX records.

**Compatibility Matrix:** 224.0025.002

**RG SOFTWARE SYSTEMS**

501 Office Center Dr  
Fort Washington PA 19034

(215) 646-0590

**► Pro-Matic**

A data base-oriented program generator for the IBM Personal Computer, Personal Computer XT, and compatible computers

**Price** \$749 purchase

**Description** Pro-Matic is a menu-driven, data base-oriented program generator. Applications defined under Pro-Matic use up to 99 data fields per record; maximum record size is 1K bytes. Each data base contains up to 3.2 million records; Pro-Matic automatically splits the data base onto multiple diskettes when required. Users can define multiple entry screens, printer reports, and index keys directly from Pro-Matic's central menu. Because Pro-Matic uses a centralized data dictionary, data elements can be easily transferred between data base files. Modifications to any data element are automatically reflected throughout all data bases that use the data element.

**Compatibility Matrix:** 224.0025.002

**SENSIBLE SOFTWARE**24011 Seneca  
Oak Park MI 48237

(313) 399-8877

**► APLUS**

A programming aid for Apple computers

**Price** \$40 purchase

**Description** APLUS, a structured programming enhancement for Applesoft BASIC, provides additional commands to increase efficiency and simplify program rewriting. The package includes WHEN-ELSE-FIN, UNTIL, WHILE, UNLESS, CASE, SELECT (variable), and OTHERWISE commands as well as multiline IF-FIN statements.

**Compatibility Matrix:** 224.0025.002**SENSIBLE SOFTWARE**24011 Seneca  
Oak Park MI 48237

(313) 399-8877

**► BASIC Enhanced Software Tools (B.E.S.T.)**

A programming aid for Apple computers

**Price** \$40 purchase

**Description** B.E.S.T. helps users write, analyze, debug, and fine tune Applesoft BASIC programs. It provides automatic numbering, renumbering, HOLD, and MERGE commands. Variable and line number cross-reference maps help users understand programs. After a program has been developed and is working, B.E.S.T. compresses the program and increases its execution speed. In addition, B.E.S.T. can remove remark (REM) statements from programs.

**Compatibility Matrix:** 224.0025.002**SENSIBLE SOFTWARE**24011 Seneca  
Oak Park MI 48237

(313) 399-8877

**► Edit-Soft**

A programming utility for Apple II+ and IIe microcomputers

**Price** \$40 purchase

**Description** Edit-Soft, a line editor for writing and revising Applesoft programs, edits existing program lines or lines being entered. The system can search for specified variables or character strings. Users can insert or delete characters from the program being edited. The package can load, define, and save several combinations of user-definable keys while working on a program.

**Compatibility Matrix:** 224.0025.002**SENSIBLE SOFTWARE**24011 Seneca  
Oak Park MI 48237

(313) 399-8877

**► The Bug**

A programming aid for Apple computers

**Price** \$50 purchase

**Description** The Bug is an assembly debugging aid and learning tool that controls the execution speed of Assembly programs by using game paddles. Users load The Bug into the language card or any other free area in memory. The Bug can trace the execution of Assembly-language instructions and reset breakpoints during execution.

**Compatibility Matrix:** 224.0025.002**SMART SYSTEMS INC**499 Sulky Ln  
Frederick MD 21701

(301) 694-4728

**► SMARTSCREEN**

A screen generator for the Apple II running under Apple Pascal

**Price** \$75 purchase

**Description** SMARTSCREEN supports free-form input screen design for application programs developed under Apple Pascal. The system features 40- or 80-character display editing, field and message highlighting using flashing or inverse video characters, interactive input data validation, and automatic data type conversions. SMARTSCREEN also allows systems designers to associate up to a full screen of online tutorial documentation with each data field in the input screen.

**Compatibility Matrix:** 224.0025.002**SOFTWARE AUTOMATION**14333 Proton Rd  
Dallas TX 75234

(214) 392-2802

**► SALVO**

An applications generator

**Price** \$495 purchase

**Description** SALVO is a FORTH-based fourth-generation language that runs in standalone mode (SALVO I) or distributed processing mode (SALVO II) on systems operating under CP/M, CP/M-86, PC DOS, or MS-DOS. SALVO provides relational data base management and application generator features linking up to 16 files with each application. Artificial intelligence features include natural-language processing. In addition, SALVO can support graphics.

**Compatibility Matrix:** 224.0025.002

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**THE SOFTWARE EXPRESS**10103 Fondren  
Suite 220  
Houston TX 77096

(800) 231-0062

**► APPGEN**

An applications generator

**Price** \$12,000 purchase**Description** APPGEN is an advanced automated applications software development tool that develops self-documenting, bug-free Unix-, Xenix-, and PICK-based application packages. Because it uses a parameter-driven development system, APPGEN develops packages in less time than traditional code-based programming methods.**Compatibility Matrix:** 224.0025.002

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**THE SOFTWARE GROUP**10471 S Brookhurst St  
Anaheim CA 92804

(714) 535-5274

**► Programmer's Apprentice**

A program-development tool for CP/M-based microcomputers

**Price** \$800 purchase**Description** Programmer's Apprentice supports menu creation, data-structure creation, data base maintenance, report definition, and several utilities. Program development time is reduced by interactive screen formatting that enables the user to design screen layouts directly on the screen. Programmer's Apprentice also allows users to store specialized routines and call them up from other programs. A master menu of these routines can be created to aid access. Data entered is thoroughly tested by the package to ensure that it falls within the specified limits.**Compatibility Matrix:** 224.0025.002

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**SOFTWARE STRATEGIES**7412 Washington Ave South  
Eden Prairie MN 55344

(800) 328-7847

**► ScreenMaster**

A screen handler and data entry facility for IBM Personal Computer

**Price** \$80 purchase**Description** SCREENMASTER, a screen handler and data entry facility, is provided in source code for inclusion in programs requiring full-screen and/or multiscreen input. SCREENMASTER gathers the data and returns it, in memory, to the programmer, who can then perform editing or control functions. Commands available to the programmer and terminal user include GOTO (field)n, BACK/FORWARD n(fields), NEXT/PRIOR

(screen), PRINT (screen), SUBMIT, and ABORT. Utilities are provided to create and test screens and configure for any dumb terminal. Required memory is 48K bytes.

**Compatibility Matrix:** 224.0025.002

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**SORCIM**2310 Lundy Ave  
San Jose CA 95131

(408) 942-1727

**► A.C.T**

CP/M-compatible cross-assembler family for 8-bit microcomputers

**Price** \$175 purchase**Description** A.C.T features full macro capabilities, comprehensive pseudo instructions, and link file structures. It includes cross-reference-map and algebraic-expression capabilities and is available for the following processors: Intel 8080, 8086, 8088; Zilog Z80; Synertek 6502; and Motorola MC 6800 and 6809.**Compatibility Matrix:** 224.0025.002

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**SUNBELT COMPUTER SYSTEMS**5525 E 51st St  
Suite 111  
Tulsa OK 74135(800) 331-9163  
(918) 660-0670**► SUNED80, SUNED86M**

Program editors for microcomputers running under CP/M or MS-DOS

**Price** \$125 purchase**Description** SUNED80 and SUNED86M allow users to develop and modify source code for use with structured language compilers. Features include global search and replace; block move, copy, or append within or between files; line manipulation; and automatic tabbing. The editors use special function keys.**Compatibility Matrix:** 224.0025.002



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**SUPERSOFT**PO Box 1628  
Champaign IL 61820

(217) 359-2112

multitasking operating system similar to the AT&amp;T Unix.

**Compatibility Matrix:** 224.0025.003**► Diagnostics II**

A diagnostic routine for microcomputers running under CP/M, CP/M-86, MS-DOS, or PC-DOS

**Price** \$125 purchase**Description** Diagnostics II, a diagnostic routine licensed to several microcomputer manufacturers, examines each system component to ensure that it is functioning properly. The CPU, memory, terminal, printer, and disk drives are all thoroughly checked for any malfunctions.**Compatibility Matrix:** 224.0025.003

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**TANDY CORP**1800 One Tandy Ctr  
Ft Worth TX 76102

(817) 390-3300

**► Assembly Language Development System (ALDS)**

A Zilog Z80 assembler and editor for Tandy TRS-80 Models III, 4, and 4P

**Price** \$149 purchase**Description** The Assembly Language Development System (ALDS) includes the ALEDIT text and program editor, ALASM assembler, ALLINK linker, ALBUG memory- or disk-based object code debugger, and ALTRAN file transfer program for intercomputer communications. ALASM, the core of ALDS, includes directives for relocatable code, macro creation, indexes, text manipulation, and listing formats. ALASM supports 30 arithmetic, logical, and relational operators, as well as a set of 10 extended Zilog Z80 mnemonics.**Compatibility Matrix:** 224.0025.003

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**TECHNICAL SYSTEMS CONSULTANTS**111 Providence Rd  
Chapel Hill NC 27514

(919) 493-1451

**► 68000 Cross Assembler**

A cross assembler for Motorola MC 6809-based systems

**Price** \$250 purchase**Description** The 68000 Cross Assembler generates object code for the Motorola 32-bit microprocessor chip. The program supports the entire 68000 instruction set, as well as most of Motorola's standard mnemonics. This package runs on any MC 6809-based microprocessor using the FLEX operating system. A version is also available that runs on the TSC UniFLEX, a multiuser

# LANGUAGES Compatibility Matrix

225.0025.001

Vendor/Package	Compatible Operating Systems														Others		
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M-68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS	UCSD p-System		UNIX	XENIX
<b>Adventure International</b> Apple Spice	.																
<b>Alcor Systems</b> Alcor Pascal													.				
<b>Alpha Computer Service</b> Forlib-Plus		.			.		.			.							
<b>American Planning</b> Megabasic		.			.		.			.							
<b>Apple Computer</b> Apple Logo	.																
<b>Borland International</b> Turbo Pascal		.	.		.		.			.							
<b>Computer Innovations</b> C86-C Compiler Optimizing C86 Compiler		.			.		.		.	.							
<b>Datamed Research</b> Modula II	.																Xerox 820 system
<b>Digital Research</b> C Compiler 2.1 CBASIC CBASIC/16 CBASIC/86 CB80 CB86 CIS COBOL DR FORTRAN-77 DR Logo Level II COBOL-86 Pascal/MT + PL/I-80 PL/I-86			.		.									.	.		
<b>Ellis Computing</b> Nevada COBOL Nevada FORTRAN			.		.												
<b>ISE</b> C Compiler			.										.				
<b>Kaypro</b> S-Basic			.														
<b>Laboratory Microsystems</b> PC/FORTH						.											



Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M-68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	UNIX	XENIX
<b>Lifeboat Associates</b> baZic II Lattice C Compiler					•												Zilog Z80 systems
<b>Manx Software Systems</b> Aztec C Compiler			•														
<b>mbp Software and Systems Technology</b> mbp COBOL						•			•								
<b>Micro Focus</b> Level II COBOL	•		•	•					•						•	•	iRMX/86 & Apple Lisa
<b>Microsoft</b> Microsoft BASIC Compiler Microsoft BASIC Interpreter Microsoft Business BASIC Compiler Microsoft C Compiler Microsoft COBOL Microsoft FORTRAN Microsoft FORTRAN-80 Microsoft Pascal	•		•	•					•	•	•	•	•	•		•	
<b>Miller Microcomputer Services</b> MMSFORTH V 2.4						•							•				
<b>MPSI (Microcobol Products)</b> Microcobol																	BOS/5
<b>Onyx Systems</b> OASIS BASIC										•							
<b>RR Software</b> Janus/Ada		•	•	•	•	•			•								
<b>Ryan-McFarland</b> RM/COBOL RM/FORTRAN			•	•	•	•	•	•	•	•		•		•	•	•	TurboDOS
<b>Savvy</b> Savvy PC						•											
<b>SMC Software Systems</b> SMC Thoroughbred BASIC															•	•	Apple Lisa
<b>Softech Microsystems</b> BASIC FORTRAN-77 FORTRAN-77 and BASIC Runtime Units UCSD-Pascal													•	•	•		
<b>STSC</b> APL*PLUS/PC APL*PLUS/80						•							•				



Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M-68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	UNIX	XENIX
<b>Sunbelt Computer Systems</b> SUNDB80				•													
<b>SuperSoft</b> Ada BASIC Compiler C Compiler Forth SSS FORTRAN		•	•		•		•			•							
<b>Technical Systems Consultants</b> 68000 Cross Assembler																	Uniflex or Flex
<b>Unified Software Systems</b> UNIFORTH		•			•		•			•							
<b>Volition Systems</b> Modula-2	•						•									•	•
<b>Whitesmiths</b> Whitesmiths C Compiler			•							•						•	P/OS, Idris





# LANGUAGES

## Product Summaries

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### ADVENTURE INTERNATIONAL

PO Box 3435  
Longwood FL 32750

(305) 862-6917  
(800) 327-7172

#### ► Apple Spice

Extends the functions of Applesoft BASIC

**Price** \$30 purchase

**Description** Apple Spice provides several functions not included with Applesoft BASIC but found in many versions of extended BASIC. Examples of these are print using, if-then-else, and line input. A string search feature and word wraparound capability are also included.

**Compatibility Matrix:** 225.0025.001

aid the user in making calls to the libraries. An additional library is included that is the composite of the other three. The three libraries aid in graphics, communication, and file handling/disk support. An additional feature within the graphics library is the ability of one FORTRAN program to call another and to pass data to it. Within the communication library, there are routines that will permit interrupt-driven, buffered data to be received. With this capability, 9,600-baud communication is possible.

**Compatibility Matrix:** 225.0025.001

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### ALCOR SYSTEMS

1132 Commerce Dr  
Richardson TX 75081

(214) 238-8554

#### ► Alcor Pascal

A Pascal compiler for the TRS-80

**Price** \$90 purchase

**Description** The Alcor Pascal package consists of an editor, a Pascal compiler, and run-time support. The general-purpose editor inserts, modifies, and deletes text. Two versions of the compiler are available: the faster one takes up most of the TRS-80's main memory; the slower one leaves ample room in memory for programs up to 4,000 lines long.

**Compatibility Matrix:** 225.0025.001

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### AMERICAN PLANNING CORP

4600 Duke St  
Suite 423  
Alexandria VA 22300

(703) 751-0451

#### ► Megabasic

A software development language processor for Intel 8086- and 8088-based computers running under CP/M-86, MS-DOS, and PC DOS

**Price** \$375 (single user) \$495 (multiuser) purchase

**Description** Megabasic is a high-level extendable BASIC program language designed to access packages from memory in much the same way as FORTH.

The system features a configuration program; a compaction program that removes spaces and remarks, combines short lines, and scrambles source code for security; and a cross-reference program that provides listings of all variables, strings, arrays, subroutines, functions, and other program information.

**Compatibility Matrix:** 225.0025.001

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### ALPHA COMPUTER SERVICE

PO Box 2517  
Cypress CA 90630

(714) 894-6808

#### ► Forlib-Plus

Provides graphics, communications, and file-handling FORTRAN libraries for IBM and compatible personal computers

**Price** \$70 purchase

**Description** Forlib-Plus is a set of three assembly-coded, supplemental FORTRAN libraries plus support, FORTRAN-coded subroutines, and demonstration programs. The libraries are designed to supplement the user's FORTRAN library. The sources for the FORTRAN-coded subroutines and the demonstration programs are included to

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**APPLE COMPUTER INC**10260 Bandley Dr  
Cupertino CA 95014

(408) 996-1010

**► Apple Logo**

A beginner's programming language for the Apple II

**Price** \$175 purchase**Description** The Apple Logo language provides a facility for graphics, list-processing commands, named function capability with local variables, recursive functions, and an inherent full-screen function editor. Like Applesoft BASIC, Apple Logo is an interpreted language that executes programs immediately after they are typed in.**Compatibility Matrix:** 225.0025.001

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**BORLAND INTERNATIONAL INC**4807 Scotts Valley Dr  
Scotts Valley CA 95066

(408) 438-8400

**► Turbo Pascal**

A Pascal language compiler for software development on microcomputers running under CP/M, CP/M-86, MS-DOS, and PC DOS

**Price** \$49 purchase**Description** Turbo Pascal is a one-pass, native code compiler integrated with a WordStar-emulating editor. It is menu driven and has dynamic debugging capabilities at compile time and trace debugging capabilities in the source code at run time.**Compatibility Matrix:** 225.0025.001

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**COMPUTER INNOVATIONS INC**980 Shrewsbury Ave  
Tinton Falls NJ 07724

(201) 542-5920

**► C86-C Compiler**

A compiler implementing the complete C language and library for 16-bit microcomputers running under CP/M-86, MS-DOS, and PC DOS.

**Price** \$395 purchase**Description** The C86-C Compiler implements the full language and library as specified by Kernighan and Ritchie in *The C Programming Language*. The output of the compiler is relocatable 8086/8088 object module. The linker combines object modules with functions from the relocatable library to produce native 8086/8088 programs.

The C86-C Compiler allows for identifier names of up to 31 characters and provides unsigned character and unsigned long data types, overlay support, and command line name definitions. It supports a nested comment option and optionally produces a listing of the

source program after macros substitution.

The C86 library includes the standard functions in Kernighan and Ritchie and additional functions that access the operating system, input/output ports, and memory. The library is supplied in both source and object formats; librarians for both formats are provided. The user may choose between floating-point software or 8087 floating-point hardware.

**Compatibility Matrix:** 225.0025.001

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**COMPUTER INNOVATIONS INC**980 Shrewsbury Ave  
Tinton Falls NJ 07724

(201) 542-5920

**► Optimizing C86 Compiler**

A C Compiler for 16-bit computers running under MS-DOS, CP/M-86, MP/M-86, and concurrent CP/M-86

**Price** \$395 purchase**Description** Optimizing C86 Compiler is a three-pass compiler with full Kernighan and Ritchie C compatibility, a large library of UNIX C and machine-dependent functions, and support of the Intel 8087 math coprocessor. The compiler produces relocatable object code and supports up to 1M bytes of addressable RAM.**Compatibility Matrix:** 225.0025.001

**DATAMED RESEARCH INC**

1433 Roscomare Rd  
Los Angeles CA 90077

(213) 472-8825

**► Modula II**

A compiler for Modula II, a language similar to Pascal

**Price** \$500 purchase

**Description** The Modula II language features the Modula II compiler, which includes pointer and address arithmetic, true concurrency, dynamic arrays, constant expressions, and flexible input and output.

**Compatibility Matrix:** 225.0025.001

**DIGITAL RESEARCH INC**

60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► CBASIC/16**

A BASIC compiler/interpreter for microcomputers running under UNIX

**Price** \$325 purchase

**Description** CBASIC/16 is an implementation of the CBASIC language for UNIX. CBASIC source code is compiled into pseudocode, which is then interpreted by the CRUN run-time system included with CBASIC/16. Any program written in CBASIC or CBASIC/86 is compatible with the CBASIC/16 system.

**Compatibility Matrix:** 225.0025.001

**DIGITAL RESEARCH INC**

60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► C Compiler 2.1**

A 16-bit C compiler for microcomputers running under CP/M-86

**Price** \$600 purchase

**Description** The Digital Research C Compiler 2.1 is compatible with versions of C running under UNIX Version 7 and Digital Research CP/M-68K. C Compiler 2.1 features single- and double-digit precision floating-point math with optional support of the Intel 8087 math coprocessor. A relocating linker and assembler as well as a library of Digital Research and UNIX-like utilities are included with the C Compiler 2.1. C Compiler 2.1 supports program overlays (where RAM is at a premium) and large object files (when large amounts of RAM are accessible).

**Compatibility Matrix:** 225.0025.001

**DIGITAL RESEARCH INC**

60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► CBASIC**

A BASIC compiler/interpreter for microcomputers running under CP/M

**Price** \$150 purchase

**Description** CBASIC, derived from BASIC, is designed for commercial applications. The CBASIC compiler generates pseudocode, which is then interpreted by the CRUN run-time system included with CBASIC. CBASIC handles real numbers in a 14-digit BCD floating-point format and supports string variables and assembly language calls. It is upward compatible with all versions of BASIC offered by Digital Research.

**Compatibility Matrix:** 225.0025.001



**DIGITAL RESEARCH INC**60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► CBASIC/86**

A BASIC compiler/interpreter for microcomputers running under CP/M-86 and MS-DOS

**Price** \$325 purchase

**Description** CBASIC/86, a version of CBASIC, is designed for commercial application programs running on computers containing the Intel 8086 microprocessor. Programs written in CBASIC are upward compatible with the CBASIC/86 system.

**Compatibility Matrix:** 225.0025.001

**DIGITAL RESEARCH INC**60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► CIS COBOL**

A COBOL compiler and development system for microcomputers running under CP/M and CP/M-86

**Price** \$800 purchase

**Description** CIS COBOL is an implementation of ANSI-74 standard COBOL used on various microcomputers. Source code generated under the CIS COBOL system is upward compatible with Digital Research Level II COBOL-86.

**Compatibility Matrix:** 225.0025.001

**DIGITAL RESEARCH INC**60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► CB80**

An extended BASIC compiler for microcomputers running under CP/M or MP/M-II

**Price** \$500 purchase

**Description** CB80, an enhanced version of Digital Research CBASIC, offers all CBASIC features. Other features include the support of strings larger than 32K bytes, assembly language calls, alphanumeric labels, and external multiline functions. The CB80 compiler generates native machine code for the Intel 8080 microprocessor, providing significantly faster operation than the run-time pseudocode interpreter of the CBASIC system. CBASIC programs are upward compatible with the CB80 compiler.

**Compatibility Matrix:** 225.0025.001

**DIGITAL RESEARCH INC**60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► CB86**

A BASIC compiler for microcomputers running under CP/M-86 and MS-DOS

**Price** \$600 purchase

**Description** CB86 compiles CBASIC source code into native machine code for the Intel 8086 and 8088 microprocessors and offers significantly faster execution times than the run-time pseudocode interpreter of the CBASIC/86 system. All CBASIC source code is upward compatible with CB86, which also supports Digital Research Display Manager, Access Manager, and CP/M Graphics utilities.

**Compatibility Matrix:** 225.0025.001



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**DIGITAL RESEARCH INC**60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► DR FORTRAN-77**

A FORTRAN compiler for 16-bit microcomputers running under CP/M-86 and PC DOS

**Price** \$350 purchase

**Description** DR FORTRAN-77 has been certified for full compliance with the ANSI X3.9-1978 standard. Several features are included to facilitate the porting of large programs to microcomputers; for example, programs can use the full 1M bytes of memory supported on Intel 16-bit processors. The compiler supports the Intel 8087 math coprocessor as well as free-file source, overlays, subscript checking, and a library manager. It interfaces with C and assembler programs.

**Compatibility Matrix:** 225.0025.001

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**DIGITAL RESEARCH INC**60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► DR Logo**

A version of Logo for the IBM Personal Computer

**Price** \$149 purchase

**Description** DR Logo is a graphics-oriented educational programming language with advanced list processing capabilities. DR Logo includes turtle graphics with text and string handling as well as a sophisticated editing and debugging facility that allows graphics, program output, debugging information, and editing commands to be displayed on separate windows on the screen. Built-in help commands explain DR Logo primitives and give examples of their use. Users can add new words by defining new procedures. DR Logo supports double-precision floating-point mathematics and a full set of transcendental functions, such as logarithms and inverse logarithms.

**Compatibility Matrix:** 225.0025.001

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**DIGITAL RESEARCH INC**60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► Level II COBOL-86**

A COBOL compiler for microcomputers running under CP/M, MP/M, CP/M-86, concurrent CP/M-86, MP/M-86, and MS-DOS

**Price** \$1,600 purchase

**Description** Level II COBOL-86 is a full implementation of mainframe-level COBOL. Microcomputers using this compiler can compile and run ANSI-74 COBOL

with minimal modification. Source code written under Digital Research CIS COBOL is upward compatible with the Level II COBOL-86 compiler.

**Compatibility Matrix:** 225.0025.001

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**DIGITAL RESEARCH INC**60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► Pascal/MT +**

A Pascal compiler for microcomputers running under CP/M and CP/M-86

**Price** \$350 purchase for CP/M, \$600 purchase for CP/M-86

**Description** Pascal/MT+, a compiled version of ISO standard Pascal, translates source code directly into object code for the Zilog Z80 and Intel 8080, 8085, and 8086 microprocessors. Pascal/MT+ provides a complete program development environment consisting of a compiler, a linker, a symbolic debugger, and various utilities (e.g., the optional Speed Programming Package [SPP]) for producing modular, high-speed code. The SPP includes a screen-oriented text editor, an online reformatter, and an interactive syntax checker.

**Compatibility Matrix:** 225.0025.001

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**DIGITAL RESEARCH INC**60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► PL/1-80**

A PL/1 compiler for microcomputers running under CP/M

**Price** \$500 purchase**Description** The PL/1-80 compiler generates native machine code for the Intel 8080 microprocessor. The PL/1-80 package includes a compiler, linkage editor, librarian, run-time library, and macroassembler. The compiler supports Picture specifications for record handling, block programming structure, 25-digit decimal arithmetic, and fast fixed- and floating-point binary arithmetic. PL/1-80 source code is cross compatible with Digital Research PL/1-86 and upward compatible with the ANSI-standard PL/1 Subset G available for various minicomputers.**Compatibility Matrix:** 225.0025.001

grams compiled through the use of Nevada COBOL can be remarketed royalty free.

**Compatibility Matrix:** 225.0025.001

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**ELLIS COMPUTING INC**3917 Noriega St  
San Francisco CA 94122

(415) 753-0186

**► Nevada FORTRAN**

A FORTRAN compiler for microcomputers running under CP/M

**Price** \$40 purchase**Description** Nevada FORTRAN is based on ANSI-66 FORTRAN standards, with several ANSI-77-level features added. The compiler includes fully formatted if-then-else constructs, TRACE-style debugging, and error messages in English.**Compatibility Matrix:** 225.0025.001

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**DIGITAL RESEARCH INC**60 Garden Ct  
Monterey CA 93942

(408) 649-3896

**► PL/1-86**

A PL/1 compiler for microcomputers running under CP/M-86 and MS-DOS

**Price** \$750 purchase**Description** PL/1-86 is a block-structured, procedure-oriented language. The compiler is fully compatible with source code from Digital Research PL/1-80 and generates native machine code for the Intel 8086 microprocessor. PL/1-86 supports 53-digit binary arithmetic and exponential numbers in a range of E-308 to E+308; the eventual support of the Intel 8087 math coprocessor should increase both these ranges. Source code from PL/1-86 programs is upward compatible with ANSI Subset G PL/1.**Compatibility Matrix:** 225.0025.001

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**ELLIS COMPUTING INC**3917 Noriega St  
San Francisco CA 94122

(415) 753-0186

**► Nevada COBOL**

A COBOL compiler for microcomputers running under CP/M

**Price** \$40 purchase**Description** Nevada COBOL is based on ANSI-74 standards with Level II features, including compound conditionals and full CALL CANCEL. Up to 4,000 statements can be compiled on a 48K-byte system. Pro-

**ISE**

PO Box 248  
Lafayette IN 47902

(317) 463-2581

**► C Compiler**

A C compiler for Tandy TRS-80 microcomputers and microcomputers running under CP/M

**Price** Vendor declined to provide

**Description** The ISE C Compiler is an extension of the BDS C Compiler offered by B.D. Software. Enhancements to this version of C include a standardized I/O library, an extensive preprocessor, a code optimizer, and a general-purpose linker. The compiler generates relocatable object code and is compatible with the ISE MDBS III data base management system.

**Compatibility Matrix:** 225.0025.001

**KAYPRO CORP**

PO Box N  
Del Mar CA 92014

(619) 481-3920

**► S-Basic**

A structured BASIC compiler for microcomputers running under CP/M

**Price** \$75 purchase

**Description** S-Basic compiles BASIC source code into binary code for execution on CP/M-based microcomputers. The compiler supports a variety of statements that promote greater structure in BASIC programs, such as BEGIN and END, REPEAT-UNTIL, WHILE-DO, and CASE. S-Basic features sophisticated I/O functions, and a variety of devices can be specified as input sources. The compiler supports PRINT USING statements for greater control over printing format, and the TEXT statement allows large portions of text to be sent to the console or printer without pause.

**Compatibility Matrix:** 225.0025.001

**LABORATORY MICROSYSTEMS INC**

4147 Beethoven St  
Los Angeles CA 90066

(213) 306-7412

**► PC/FORTH**

A version of FORTH for the IBM Personal Computer and for 16-bit microcomputers running under CP/M-86 and MS-DOS

**Price** \$100 purchase

**Description** PC/FORTH includes the FORTH interpreter/compiler, which supports virtual memory management and multitasking program execution. The system also includes a screen editor, an assembler, various debugging aids, and several demonstration programs. PC/FORTH stores files on diskette in the stan-

dard formats of PC DOS, CP/M-86, and Concurrent CP/M-86.

Laboratory Microsystems Inc also offers an IBM Personal Computer-based FORTH cross compiler for developing dedicated disk- or ROM-based applications under the Zilog Z80; Intel 8080, 8086, or 8088; Motorola MC 68000; or Synertek 6502 microprocessor.

**Compatibility Matrix:** 225.0025.001

**LIFEBOAT ASSOCIATES**

1651 Third Ave  
New York NY 10028

(212) 860-0300

**► baZic II**

A Zilog Z80-based interpreter

**Price** \$150 purchase

**Description** The baZic II interpreter executes programs written in North Star BASIC. It operates on virtually any Zilog Z80-based system, with few or no modifications.

**Compatibility Matrix:** 225.0025.002

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**LIFEBOAT ASSOCIATES**1651 Third Ave  
New York NY 10028

(212) 860-0300

**► Lattice C Compiler**

A 16-bit C compiler for microcomputers running under MS-DOS, CP/M-86, Lifeboat SB-86, and the Intel UDI operating system

**Price** \$500 purchase

**Description** The Lattice C Compiler is a two-pass compiler supporting full Kernighan and Ritchie C. The compiler produces Intel 8086/8088 relocatable object code, which can be linked and overlaid through the use of the Phoenix Software Associates Plink86 linkage editor. Lattice C offers a large subset of UNIX Version 7 C library functions as well as various non-UNIX utilities. The execution speed of Lattice C object code is enhanced by support of the Intel 8087 math coprocessor.

**Compatibility Matrix:** 225.0025.002

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**MANX SOFTWARE SYSTEMS**PO Box 55  
Shrewsbury NJ 07701

(201) 780-4004

**► Aztec C Compiler**

A C compiler for microcomputers running under CP/M

**Price** \$300 purchase

**Description** The Aztec C Compiler includes two compilers for generating either Intel 8080 or Zilog Z80 relocatable native machine code. The Intel 8080 compiler assembly code can be linked through the use of either the linker supplied with the Aztec C Compiler or the Microsoft L80 linker. The Aztec C Compiler meets the full Kernighan and Ritchie C standard.

**Compatibility Matrix:** 225.0025.002

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**MBP SOFTWARE AND SYSTEMS  
TECHNOLOGY INC**7700 Edgewater Dr  
Oakland CA 94621

(415) 632-1555

**► mbp COBOL**

A language processor for the IBM Personal Computer and any Intel 8088- or 8086-based microcomputer

**Price** \$750 purchase

**Description** mbp COBOL allows ANSI COBOL programs to run faster by translating them into native machine code and executing them in one step. Large production routines, such as payroll, file updates, and inventory processing are handled more efficiently.

mbp COBOL options include run-time execution, debugging, index checking, and error limit setting. The system supports more than 500 detailed compilation er-

ror messages. Listing options allow source code, object code, map, and cross-reference tracking.

**Compatibility Matrix:** 225.0025.002

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**MICRO FOCUS INC**1860 Embracadero Rd  
Suite 235  
Palo Alto CA 94303

(415) 856-4161

**► Level II COBOL**

An ANSI-74 COBOL compiler for various microcomputers

**Price** \$1,500-\$3,000

**Description** Micro Focus Level II COBOL is a mainframe-level microcomputer COBOL certified at the highest level of implementation by the U.S. General Services Administration (GSA). In addition to full support of ANSI-74 COBOL, the system offers such development tools as the FORMS-2 screen format generator and ANIMATOR screen-oriented debugger. Micro Focus Level II COBOL can be implemented on CP/M, CP/M-86, MS-DOS, UNIX, XENIX, iRMX/86, and the Apple III and Apple Lisa microcomputers.

**Compatibility Matrix:** 225.0025.002

**MICROSOFT CORP**10700 Northup Way  
Bellevue WA 98004

(206) 828-8080

**► Microsoft BASIC Compiler**

A BASIC compiler for Apple II computers and systems running under CP/M, MS-DOS, and XENIX

**Price** \$395 purchase**Description** The Microsoft BASIC (MS-BASIC) Compiler compiles code written under the MS-BASIC Interpreter, allowing native machine code to execute faster than interpreted programs. The accuracy of all transcendental functions is also improved by the compiler to 16-digit precision. The compiler allows MS-BASIC programs to be linked to routines written in MS-FORTRAN, MS-Pascal, or MS-Macroassembler.**Compatibility Matrix:** 225.0025.002**MICROSOFT CORP**10700 Northup Way  
Bellevue WA 98004

(206) 828-8080

**► Microsoft BASIC Interpreter**

An interpreted BASIC for microcomputers running under MS-DOS and CP/M

**Price** \$350 purchase**Description** The Microsoft BASIC (MS-BASIC) Interpreter exceeds the current ANSI BASIC standards through the inclusion of such features as variable-length numeric precision, program branching, and graphics. Writing, editing, and debugging programs in MS-BASIC is accomplished through such interactive commands as AUTO, for automatic line numbering; RE-NUM; and TRON and TROFF for program tracing. The interpreter allows partially written programs to be run. MS-BASIC is the latest version in a series of BASIC offerings. MS-BASIC was introduced in 1975 and has been implemented on various systems on an OEM basis. The current version of MS-BASIC is compatible with the MS-BASIC Compiler.**Compatibility Matrix:** 225.0025.002**MICROSOFT CORP**10700 Northup Way  
Bellevue WA 98004

(206) 828-8080

**► Microsoft Business BASIC Compiler**

An enhanced BASIC for microcomputers running under MS-DOS

**Price** \$450 purchase**Description** Microsoft Business BASIC Compiler adds several features to standard MS-BASIC. Decimal-based mathematical functions offered by Microsoft

Business BASIC are accurate to 14 digits. The compiler also supports multiline user-defined functions. Programs compiled separately as well as subroutines can be linked to form modular programs. A special facility allows Digital Research CBASIC source files to be converted into the Microsoft Business BASIC format.

**Compatibility Matrix:** 225.0025.002**MICROSOFT CORP**10700 Northup Way  
Bellevue WA 98004

(206) 828-8080

**► Microsoft C Compiler**

A C compiler for microcomputers running under MS-DOS

**Price** \$500 purchase**Description** Microsoft C Compiler, a full implementation of Kernighan and Ritchie C, is useful in developing text processing, file manipulation, and operating system utilities. Microsoft C is a portable language. The compiler generates relocatable native machine code, and the linker allows several independently compiled modules to be combined into a single program.**Compatibility Matrix:** 225.0025.002

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**MICROSOFT CORP**10700 Northup Way  
Bellevue WA 98004

(206) 828-8080

**► Microsoft COBOL**

A COBOL compiler and development system for various microcomputers

**Price** \$700 purchase

**Description** Microsoft COBOL (MS-COBOL) is designed for microcomputers running under CP/M, including the Apple II with the Microsoft CP/M SoftCard and MS-DOS. The system is an implementation of ANSI low intermediate standard COBOL. MS-COBOL accepts numbers containing up to 18 digits during data entry and accurately maintains up to 30 digits on internal calculations. It supports sequential, line sequential, relative, and ISAM file and record access. A special sort utility is optional. The MS-COBOL system features several program development tools, including advanced screen-formatting capabilities, interactive debugging, and linkage and overlay managers for implementing large programs.

**Compatibility Matrix:** 225.0025.002

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**MICROSOFT CORP**10700 Northup Way  
Bellevue WA 98004

(206) 828-8080

**► Microsoft FORTRAN**

A FORTRAN compiler for microcomputers running under MS-DOS

**Price** \$350 purchase

**Description** Microsoft FORTRAN (MS-FORTRAN) is a native code compiler and development system that meets the X3.9-1978 ANSI standard for subset-level FORTRAN. The compiler accurately handles double-precision calculations containing up to 14 significant digits and supports IEEE standard floating-point arithmetic. Other features include list-directed I/O and use of the Intel 8087 math coprocessor for increasing computation speed. MS-FORTRAN can link compiled modules written in other languages into a single program.

**Compatibility Matrix:** 225.0025.002

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**MICROSOFT CORP**10700 Northup Way  
Bellevue WA 98004

(206) 828-8080

**► Microsoft FORTRAN-80**

A FORTRAN compiler for the Apple II+ and other microcomputers running under CP/M

**Price** \$195 purchase

**Description** Microsoft FORTRAN-80 meets all requirements of the ANSI 1966 standard FORTRAN, except complex data types. The native code compiler features an extensive library of efficient subroutines for 16- and 32-bit integer arithmetic and 32- and 64-bit floating-point arithmetic.

**Compatibility Matrix:** 225.0025.002

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**MICROSOFT CORP**10700 Northup Way  
Bellevue WA 98004

(206) 828-8080

**► Microsoft Pascal**

A Pascal compiler for microcomputers running under MS-DOS

**Price** \$300 purchase

**Description** Microsoft Pascal (MS-Pascal) is a native code compiler meeting ISO Level 0 standards for Pascal. The compiler offers extensive program development features, such as dynamic array handling, variable-length strings, double-precision real numbers, control flow features, and the ability to link separately compiled modules. MS-Pascal supports the Intel 8087 math coprocessor and includes an 8087 emulator that allows application programs requiring an 8087 to be executed on systems configured without the coprocessor.

**Compatibility Matrix:** 225.0025.002

**MILLER MICROCOMPUTER SERVICES**61 Lake Shore Rd  
Natick MA 01760

(617) 653-6136

**► MMSFORTH V 2.4**

A FORTH compiler for Tandy Radio Shack TRS-80 Model I and III microcomputers and the IBM Personal Computer

**Price** \$180 purchase for TRS-80, \$249 purchase for Personal Computer

**Description** MMSFORTH V 2.4 includes 1979 standard FORTH, a structured language using stack-oriented arithmetic and featuring user-defined commands and procedures. MMSFORTH V 2.4 also features double-precision integers, user-callable disk I/O, and a complete Assembler for the Intel 8080 and 8088. MMSFORTH V 2.4 supersedes the standard computer operating system and allows programs and data to be read and run interchangeably between a Tandy TRS-80 and IBM Personal Computer.

**Compatibility Matrix:** 225.0025.002

**MPSI**2471 E Bayshore Rd  
Palo Alto CA 94303

(415) 856-3382

**► Microcobol**

A COBOL compiler and program development system for computers running under the BOS/5 operating system

**Price** Vendor declined to provide

**Description** Microcobol supports the development of commercial application programs and offers mainframe-level utilities to microcomputer users. Entry Microcobol includes a built-in text editor for creating and maintaining COBOL source code, linker/editor for implementing program overlays, symbolic debugger, and library of file access routines. Six file access methods are supported by Microcobol, including relative sequential (RSAM) and indexed sequential (ISAM). Utilities for multikey sorting and RSAM or ISAM conversion are also supported. Extended Microcobol includes a facility for full, interactive screen layout mapping. Advanced Microcobol, the third and most advanced level of Microcobol, supports additional facilities used by expert systems developers. An Interface Kit supports the development of device handlers for nonstandard peripheral devices.

**Compatibility Matrix:** 225.0025.002

**ONYX SYSTEMS INC**25 E Trimble Rd  
San Jose CA 95131

(408) 946-6330

**► OASIS BASIC**

A combination interpreter and compiler for BASIC

**Price** Vendor declined to provide

**Description** OASIS BASIC provides an interactive editor and interpreter to enter programs and check statement syntax. Program development time is shortened, since many common program operations can be accessed from a library featured with the package. Large programs can be segmented into two logical blocks and executed sequentially. Variables common to both blocks retain their values while the remaining memory is rewritten.

**Compatibility Matrix:** 225.0025.002

**RR SOFTWARE INC**PO Box 1512  
Madison WI 53701

(608) 244-6436

**► Janus/Ada**

A program for microcomputers running under CP/M-86, MS-DOS, and PC DOS to train users to design programs in Ada

**Price** \$100-\$1,500 purchase

**Description** Janus/Ada is a partial implementation of Ada specifically designed for microcomputers. The Janus/Ada compiler includes such features as true modular programming, error messages in English, full error walk backs, and reentrant initialized variables, and full Ada syntax.

**Compatibility Matrix:** 225.0025.002



**RYAN-MCFARLAND CORP**

609 Deep Valley Dr  
Rolling Hills Estates CA 90274 (213) 541-4828

**► RM/COBOL**

A COBOL compiler for various computers

**Price** \$750-\$1,200 purchase

**Description** RM/COBOL is an implementation of ANSI-74 standard COBOL for the development and execution of COBOL business programs on microcomputers. RM/COBOL uses COBOL source code to generate object code for a hypothetical RM/COBOL machine. Implementation of RM/COBOL on a given operating system requires a RM/COBOL machine emulator.

Emulators are available for various operating systems, including CP/M, MP/M, CP/M-86, MP/M-86, MS-DOS, PC DOS, OASIS, TRSDOS, UNIX, XENIX, and TurboDOS. RM/COBOL features full Level 2 relative and indexed file access methods, with multikeyed index files using up to 14 alternate keys. The record- and file-level locking offered by RM/COBOL supports multiuser and shared-file systems.

**Compatibility Matrix:** 225.0025.002

**RYAN-MCFARLAND CORP**

609 Deep Valley Dr  
Rolling Hills Estates CA 90274 (213) 541-4828

**► RM/FORTRAN**

A full-level FORTRAN-77 compiler

**Price** \$595-\$750 purchase

**Description** RM/FORTRAN is available for Motorola MC 68000-based microcomputers running under UNIX or UNIX-like operating systems, such as Microsoft XENIX and Unisoft UniPlus+. It also runs on the Apple Lisa. RM/FORTRAN generates p-code for a pseudomachine (p-machine); a p-machine emulator then interprets the p-code into the host processor's native machine code. Other microprocessors, such as the Intel 8088 and 8086, will support RM/FORTRAN as suitable p-machine emulators are made available by Ryan-McFarland. RM/FORTRAN meets the ANSI X3.9-1978 standard for FORTRAN and supports Hollerith and hexadecimal constants, IEEE floating-point arithmetic, variable names of up to 31 characters, and a library of industrial real-time intrinsic functions. All variables and labels can be cross-referenced to their sources and destinations. Other performance enhancements are also supported, including common subexpression elimination, constant propagation, constant expression evaluation, invariant code motion, and strength reduction.

**Compatibility Matrix:** 225.0025.002

**SAVVY CORP**

122 TU Lane  
Albuquerque NM 87106 (505) 265-1273

**► SAVVY PC**

A natural, associative programming language for the IBM Personal Computer

**Price** Vendor declined to provide

**Description** SAVVY PC combines an adaptive pattern recognition system with a DBMS. Users can associate specific tasks with natural-language expressions. The data base holds up to 20,000 records per file, and each record has up to 1,000 characters. SAVVY PC also supports virtual memory management, allowing users to create application programs of up to 20M bytes.

**Compatibility Matrix:** 225.0025.001

**SMC SOFTWARE SYSTEMS**

PO Box 0600  
Basking Ridge NJ 07920 (201) 647-7000

**► SMC Thoroughbred BASIC**

A BBIII-Level Business BASIC

**Price** Vendor declined to provide

**Description** SMC Thoroughbred BASIC is an enhanced version of Business BASIC for the Apple Lisa and for 16-bit microcomputers running under UNIX, XENIX, and other UNIX-like operating systems. SMC Thoroughbred BASIC supports SMC IDOL, a DBMS with a report writer and screen format generator, as well as various software for financial management and accounting.

**Compatibility Matrix:** 225.0025.002



**SOFTECH MICROSYSTEMS INC**16885 W Bernardo Dr  
San Diego CA 92127

(619) 451-1230

**► BASIC**

A BASIC compiler and run-time unit for the UCSD p-System

**Price** \$225 purchase

**Description** This BASIC compiler and run-time unit, written in the UCSD p-System, supports compatibility with UCSD Pascal and FORTRAN-77. Systems can be developed that integrate features from the three languages. The XenoFile feature converts files from CP/M to UCSD p-System format and vice versa.

**Compatibility Matrix:** 225.0025.002**SOFTECH MICROSYSTEMS INC**16885 W Bernardo Dr  
San Diego CA 92127

(619) 451-1230

**► UCSD-Pascal**

A Pascal compiler for the UCSD p-System

**Price** \$375 purchase

**Description** This Pascal compiler, written in the UCSD p-System, supports programs written for one microcomputer recompilation. BASIC and FORTRAN compilers from Softech Microsystems are also written in the UCSD p-System, supporting compatibility between the three languages. Systems can therefore be developed that integrate features from each of the languages.

**Compatibility Matrix:** 225.0025.002**SOFTECH MICROSYSTEMS INC**16885 W Bernardo Dr  
San Diego CA 92127

(619) 451-1230

**► FORTRAN-77**

A FORTRAN compiler and run-time unit for the UCSD p-System

**Price** \$375 purchase

**Description** This package compiles ANSI-77 FORTRAN programs into the UCSD p-System. A screen-oriented editor is provided, running in both programming and text-editing modes. Compatibility between BASIC and Pascal programs that are also compiled in the UCSD p-System is supported. The XenoFile feature converts files from CP/M to UCSD p-System format and vice versa.

**Compatibility Matrix:** 225.0025.002**SOFTECH MICROSYSTEMS INC**16885 W Bernardo Dr  
San Diego CA 92127

(619) 451-1230

**► FORTRAN-77 and BASIC Runtime Units**

Programs to support the execution of UCSD p-System application programs written in FORTRAN-77 and BASIC for IBM and compatible personal computers, Apple II and Iie, Digital Equipment Rainbow, and Xerox 820-II

**Price** \$100 purchase

**Description** The FORTRAN-77 and BASIC Runtime Units are a fully integrated program product designed to execute UCSD p-System application programs written in FORTRAN-77 and BASIC.

A unique file conversion feature, XenoFile, transfers CP/M files to UCSD p-System and vice versa.

**Compatibility Matrix:** 225.0025.002

**STSC INC**

2115 E Jefferson St  
Rockville MD 20852

(301) 984-5000

**► APL \*PLUS/PC**

An APL language and application environment for the IBM Personal Computer and Personal Computer XT and compatibles

**Price** \$595 purchase

**Description** APL\*PLUS/PC functions are compatible with versions of APL running on IBM and Digital Equipment mainframes as well as APL\*PLUS/80 for the Tandy Radio Shack TRS-80 Model III. The APL\*PLUS/PC language processor includes features designed to use the hardware capabilities of the IBM Personal Computer to full advantage. User-developed machine language subroutines can be integrated with APL programs to create as well as read APL data variables within the APL work space. APL\*PLUS/PC supports several sorting primitives, including routines to sort character data tables. The APL\*PLUS/PC system modifies the IBM Personal Computer to run as either a standalone APL processor or an APL terminal connected to a host mainframe. The communications facilities support full ASCII X-On/X-Off protocol.

**Compatibility Matrix:** 225.0025.002

**STSC INC**

2115 E Jefferson St  
Rockville MD 20852

(301) 984-5000

**► APL \*PLUS/80**

An APL application development system

**Price** \$295 purchase

**Description** APL\*PLUS/80 is a full-featured development system for the Tandy TRS-80 Model III microcomputer running under TRSDOS or LDOS. Programs written under APL\*PLUS/80 are upward compatible with mainframe versions of STSC APL. Microcomputers running APL\*PLUS/80 can function as standalone processors or as communications terminals to remote mainframes. Communications can use either the APL or ASCII character sets. The APL\*PLUS/80 system includes a ROM-based APL character generator. The system can also be interfaced to non-APL programs running on the TRS-80 Model III.

**Compatibility Matrix:** 225.0025.003

**SUNBELT COMPUTER SYSTEMS**

Sunbelt Center  
2455 E 51st St  
Tulsa OK 74105

(918) 742-0706  
(800) 331-9163

**► SUNDB80**

A CP/M-compatible implementation of the DATABUS programming language

**Price** \$995 purchase

**Description** SUNDB80 includes all the features of the latest DATABUS release except hardware-dependent instructions. The source file is compiled into absolute machine code rather than interpretive code, resulting in improved performance. There is no limit on the user data area within overall program size with SUNDB80.

**Compatibility Matrix:** 225.0025.003

**SUPERSOFT INC**

PO Box 1628  
Champaign IL 61820

(217) 359-2112

**► Ada**

A native code, fully recursive, two-pass compiler that generates object code

**Price** \$300 purchase

**Description** Compatible with microcomputers using CP/M, SuperSoft's Ada supports most features of the standard Ada language.

**Compatibility Matrix:** 225.0025.003



**SUPERSOFT INC**

PO Box 1628  
Champaign IL 61820

(217) 359-2112

**► BASIC Compiler**

A compiler for BASIC programs for 16-bit microcomputers running under CP/M-86, MS-DOS, and PC DOS compatible with the Microsoft Corporation BASIC interpreter

**Price** \$300 purchase

**Description** BASIC Compiler, a superset of the standard BASIC language, is compatible with a BASIC interpreter. Designed to accept conventional BASIC syntax, it also supports many extensions to the language.

BASIC Compiler is a true native code compiler, not an intermediate code interpreter. Four variable types are supported—integer, string, and single- and double-precision floating point (13-digit binary-coded decimal). Full PRINT USING is available for formatted output.

**Compatibility Matrix:** 225.0025.003**SUPERSOFT INC**

PO Box 1628  
Champaign IL 61820

(217) 359-2112

**► C Compiler**

A C compiler for microcomputers running under CP/M, CP/M-86, MS-DOS, or PC DOS

**Price** \$350 purchase

**Description** The SuperSoft C Compiler supports most functions of the UNIX Version 7 standard C and includes the complete source code to all of the more than 80 library functions. The multipass compiler includes a code optimizer to reduce the size and run time of the final object code. Other features supported are #INCLUDE and #DEFINE statements, dynamic memory allocation, and double floating-point functions.

**Compatibility Matrix:** 225.0025.003**SUPERSOFT INC**

PO Box 1628  
Champaign IL 61820

(217) 359-2112

**► Forth**

A FORTH compiler for microcomputers running under CP/M and CP/M-86

**Price** \$200 purchase

**Description** SuperSoft Forth is a complete program development package with a system editor, interactive parser, removable symbol table, Zilog Z80 assembler, and a debug program included with the kernel of 150 predefined reserved FORTH words. Programs created and compiled under SuperSoft Forth can be transferred to an EPROM through the use of the ROMGEN utility.

**Compatibility Matrix:** 225.0025.003**SUPERSOFT INC**

PO Box 1628  
Champaign IL 61820

(217) 359-2112

**► SSS FORTRAN**

A FORTRAN-66 compiler for microcomputers running under CP/M, CP/M-86, and MS-DOS; supports the use of full memory under MS-DOS and PC-DOS

**Price** \$325 purchase

**Description** The SSS FORTRAN compiler is a full implementation of the 1966 ANSI standard with extensions. The compiler supports many advanced capabilities, including complex arithmetic, character variables, and functions. SSS FORTRAN compiles up to 600 lines per minute. Recursive subroutines with static variables are supported.

Also supported is SSS RATFOR, a preprocessor that compiles to SSS FORTRAN, allowing the user to write structured code while retaining the benefits of FORTRAN. SSS RATFOR allows the use of contemporary loop control and is similar to FORTRAN-77.

**Compatibility Matrix:** 225.0025.003

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**TECHNICAL SYSTEMS CONSULTANTS  
INC**

111 Providence Rd  
Chapel Hill NC 27514

(919) 493-1451

**► 68000 Cross Assembler**

A cross assembler for use on 6809 UniFlex or Flex systems

**Price** \$250 purchase

**Description** The 68000 Cross Assembler allows the user to assemble 68000 source programs into 68000 object code on a 6809 UniFlex or Flex system. It supports all 68000 microprocessor instructions. Macros, conditional assemble, and numerous assembler directives are also supported. The Cross Assembler accepts all standard Motorola instruction mnemonics except the A (address), Q (quick), and I (immediate) variations of the root mnemonics ADD, AND, CMP, EOR, MOVE, OR, and SUB. Instead of allowing the programmer to explicitly append these suffixes to the instructions, the assembler analyzes the operand and determines the best type of instruction or opcode to generate.

Labels can be of any length up to eight significant characters. Expressions can contain decimal, octal, hexadecimal, or ASCII constants and permit the following operators: add, subtract, multiply, divide, shift right, shift left, relational operators, and Boolean operators. All expressions are evaluated to 32 bits. Numerous directives and options permit page formatting; control of object code production, use of command line parameters; inclusion of separate source files; setting of word boundaries; and printing of assembled source listing, sorted symbol table, titles, subtitles, line numbers, and warnings. The 68000 Cross Assembler also supports macros and conditional assembly. The absolute object code is written in Motorola S1/S2/S8/S9 records of ASCII hexadecimal data.

**Compatibility Matrix:** 225.0025.003

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**UNIFIED SOFTWARE SYSTEMS**

PO Box 2644  
New Carrollton MD 20784

(301) 552-9590

**► UNIFORTH**

A superset of the FORTH-83 Standard for the IBM Personal Computer and other microcomputers running under MS-DOS, CP/M-86, and Concurrent CP/M-86

**Price** \$245 purchase

**Description** UNIFORTH is a superset of the FORTH-83 Standard. It adds a floating-point video editor and a full macroassembler. Options include the MetaFORTH cross-compiler, a terminal emulator, file transfer, games, and other user-oriented applications.

UNIFORTH is available as a task under an operating system. UNIFORTH also provides automatic loading of

any source code block and/or execution of any word on start-up.

**Compatibility Matrix:** 225.0025.003

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**VOLITION SYSTEMS**

PO Box 1236  
Del Mar CA 92014

(714) 481-2286

**► Modula-2**

A compiler for the Apple II and III, Xerox 820, IBM Personal Computer, and various other systems based on the Motorola MC 68000, Zilog Z80, and Intel 8080 microprocessors.

**Price** Vendor declined to provide

**Description** Modula-2 is a programming language that includes some of the features of Pascal. While overcoming some of the limitations of Pascal, it retains Pascal's strict type checking, but provides escape mechanisms to allow low-level programming.

**Compatibility Matrix:** 225.0025.003

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**WHITESMITHS LTD**

97 Lowell Rd  
Concord MA 01742

(617) 369-8499

**► Whitesmiths C Compiler**

A C compiler for various microcomputers

**Price** Varies

**Description** Whitesmiths C Compiler is available in native code or cross code for use in systems development. The system includes a preprocessor, parser, and code generator. A Pascal translator that compiles Pascal programs with the Whitesmiths C Compiler by first translating the Pascal source code into C source code is available. Whitesmiths C Compiler is available for microcomputers running under 30 operating systems, including CP/M, MS-DOS, UNIX, various UNIX look-alikes, P/OS, RSTS/E, RT-11, Idris, and VMS/AME.

**Compatibility Matrix:** 225.0025.003



# MULTIUSER MICROCOMPUTERS

## Market Analysis Report

### INTRODUCTION

The multiuser microcomputer market has grown significantly during the past year. This growth is due in part to the greater availability of business and office software that runs on the more popular multiuser micro operating systems, particularly AT&T's UNIX® and the increasing number of UNIX-compatible systems. In addition, implementing a multiuser system is usually more cost-effective in the long run than installing a comparable group of networked PCs.

Attempting to capture a share of the growing multiuser market are scores of vendors offering hundreds of systems. Auerbach's recent survey uncovered 89 vendors that market 244 multiuser micros. Some of the vendors are well established in the DP/microcomputer marketplace; others, though less known, offer a product equal or even superior to the products of their better-known competitors. A superior product, however, is no guarantee of success. As one industry analyst has noted, marketing seems to be the major factor in selecting a microcomputer, while technology is barely a consideration.

Not only are prospective buyers confronted with a plethora of vendors and systems, they must also contend with the industry's rather volatile status. Experts predict major industry shakeouts and numerous mergers in the coming months. Determining which vendors will survive is a dicey undertaking.

Our survey of multiuser micros is designed to take much of the uncertainty out of your purchase decision. The 244 systems in the survey have been evaluated against more than a dozen major selection criteria. The survey, together with a directory of the vendors offering the systems, appears after this analysis.

The following sections focus on the five most important selection criteria: processors, number of users supported, operating systems, price, and vendor. Analyzing the 244 systems by these criteria provides an important perspective. For example, a system that does not support one of the more popular industry-standard operating systems or cannot be expanded to meet future processing needs probably should not be a top choice.

Armed with the information in the following analysis and the accompanying survey (Specifications Chart) and Vendor Directory, you are assured of making your purchase decision with confidence.

### PROCESSORS

Not too many years ago, 8-bit processors were the norm for

personal computers. Advances in very large scale integration (VLSI) technology have created new standards for PC processors. With one-third of the multiuser microcomputers surveyed supporting 32-bit processors, we see a trend toward increased performance and memory capacities as well as an increase in the number of users and tasks supported. The most popular 32-bit processors are the Motorola MC 68000 and MC 68010. The next most popular processors—supported by 20 percent of the systems surveyed—are the 16-bit Intel 8086 and 80186 processors, which provide compatibility with the popular IBM PC AT.

Another trend we uncovered was the use of dual processor systems. These were developed, it seems, in response to a common complaint among the first multiuser microcomputer users: even with a 32-bit microprocessor, most multiuser systems are not as fast as a dedicated, single-user system. Because multiuser micros are frequently run as single-user systems, users resent the significant loss of speed. Today, fifteen percent of the systems surveyed support dual processors as standard while one-half of the systems support an optional processor.

Figure 1 illustrates the distribution of processors among the 244 systems surveyed.

### NUMBER OF USERS SUPPORTED

In selecting a multiuser microcomputer, the *number of users* that the system can support is obviously a key selection criterion. When determining the number of users that your system must support, be sure to consider future as well as current requirements. The system should afford you the flexibility to add users as your requirements change.

Keep in mind that adding users to a system reduces its processing speed. And, though it might be technically possible to configure a system with the maximum number of users that the vendor claims it can support, processing speeds may degrade dramatically. Thus, the advertised maximum number of users supported is generally not the recommended number. Some vendors, such as AT&T Information Systems, actually publish the recommended number of supported users. The AT&T 3B2/400 system, for example, supports a maximum of 46 terminals. However, the vendor recommends that only 10 to 25 simultaneous users be connected and notes that the users' mix of applications will affect performance levels.

The largest percentage of systems surveyed (41 percent), support from two to eight users. Another 33 percent support from nine to sixteen users. The maximum number of users supported in the systems surveyed is a whopping 255.

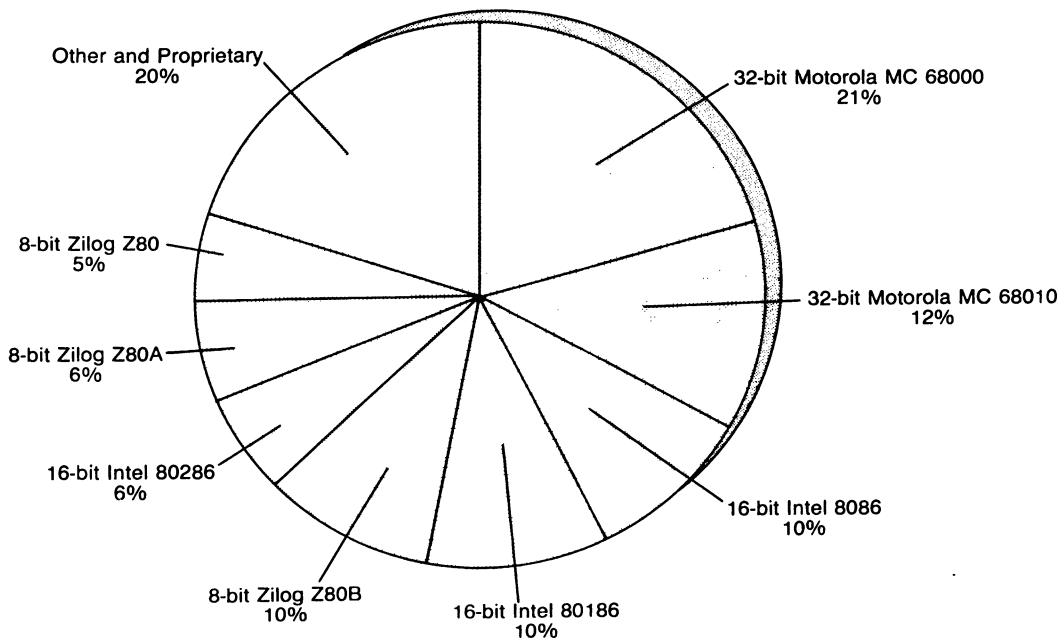


Figure 1. Distribution of Processors Among Systems

Figure 2 summarizes our findings on the number of users supported.

**OPERATING SYSTEM**

The operating system is arguably the most important component of any computer system purchase decision. The operat-

ing system, which is sometimes referred to as the system's housekeeper, monitors and controls the execution of all programs run in the system. It is the operating system that defines the application environments supported by the system.

With 58 percent of the microcomputers surveyed supporting more than one operating system, users have a wide variety of applications available to them. Figure 3 depicts the percentage

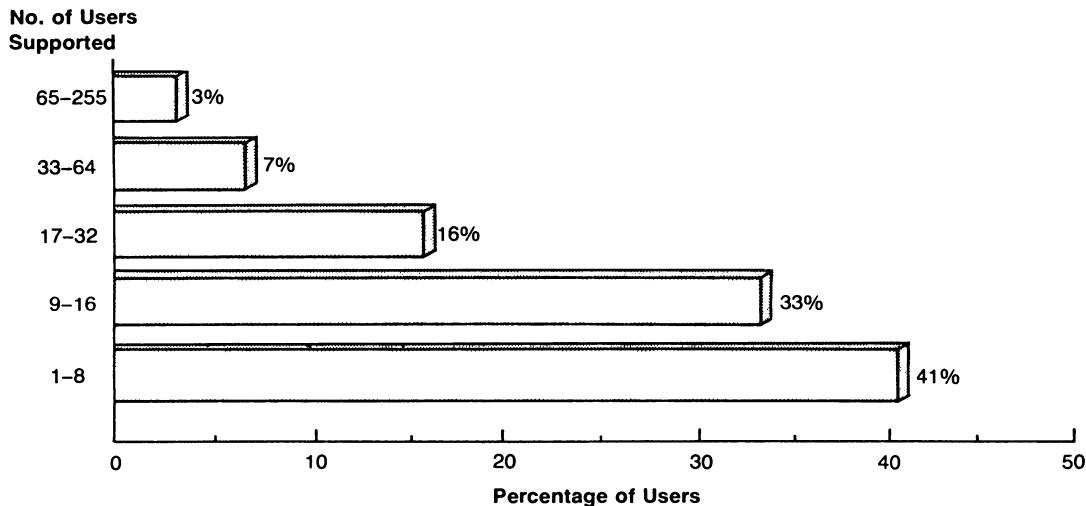


Figure 2. Number of Users Supported



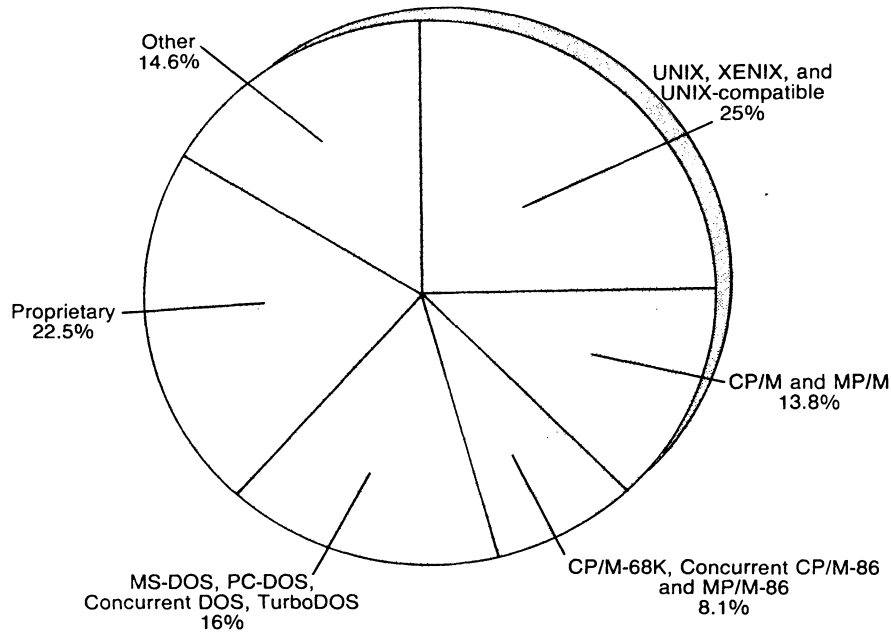


Figure 3. Distribution of Operating Systems

of systems that operate under the popular commercially available microcomputer operating systems. Thirty-five percent of the vendors surveyed offer proprietary operating systems, with more than half also providing support for at least one additional commercially available operating system.

The survey indicated that the most commonly used microcomputer operating systems are AT&T's UNIX, Microsoft Corporation's XENIX, and proprietary UNIX compatibles. Twenty-five percent of the systems surveyed support some version of UNIX. Interestingly, just more than 37 percent of the operating systems are proprietary or represent less popular commercially available offerings.

The UNIX operating system has been in existence for a number of years. Initially geared toward scientific and technical applications, it was considered too complicated for the casual or novice microcomputer user. As the demand for multiuser micros grew in the business and office arenas, UNIX was enhanced to become more user friendly, and more business and office software was developed for it. Although the number of UNIX-compatible business applications is not as large as most users would like, more and more software developers are jumping on the UNIX bandwagon to get a piece of this increasingly popular market. As a result, additional packages are rapidly being added to the availability list.

A high percentage of vendors also offer compatibility with such popular single-user operating systems as CP/M and MS-DOS. Though restricted to operating in a single-user mode, the user can access the wealth of applications that these operating systems support.

## PRICE

Though the initial outlay for a multiuser system is greater than that for a comparable group of networked PCs, adding terminals to a multiuser system is less expensive than adding PCs to a network. Multiuser systems are clearly the choice when the cost per user is a consideration and when the number of users to be supported falls between eight and thirty-two.

Although price is only one factor in any purchase decision, for some users it may be the deciding factor. The price ranges depicted in Figure 4 are based on prices for entry-level configurations.

Of the systems surveyed, 50 percent are priced between \$3,000 and \$11,000, and 25 percent are priced from \$11,000 to \$20,000. Prices range from as low as \$999 to as high as \$120,000 for a fully configured system.

## VENDORS

The stability of a particular vendor is an important consideration for any buyer, even in good market times. In bad market times such as these, vendor stability assumes critical proportions.

Based on microcomputer revenues for 1984 (according to the DATAMATION 100 and Computer Decisions 100 1984 rankings of DP companies), Auerbach has identified the vendors we consider to be financially sound and that offer consistently competitive products in terms of our purchase criteria.





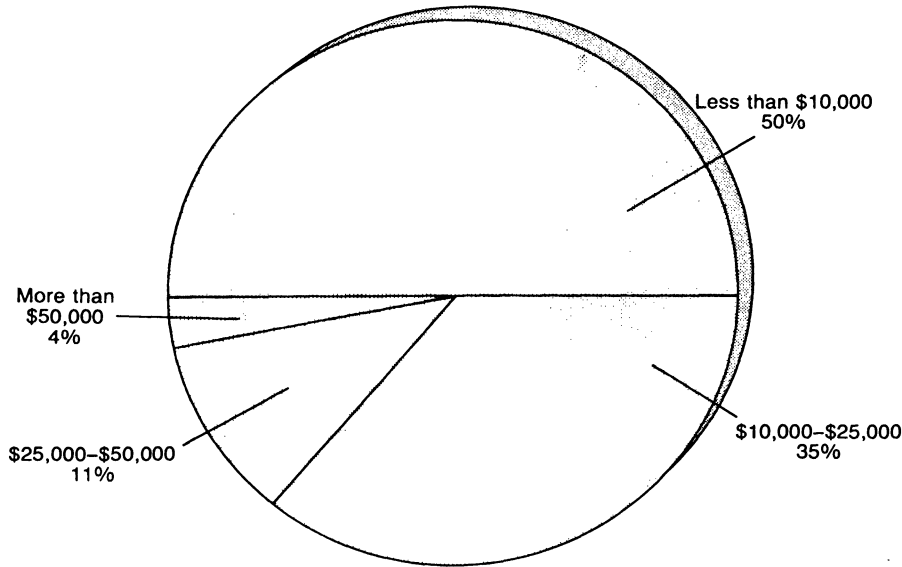


Figure 4. Base System Pricing

To no one's surprise, IBM leads the pack with microcomputer revenues of \$4 billion. Other firms with high microcomputer revenues (that market multiuser microcomputers) include Sperry Corporation, Digital Equipment Corporation, NCR Corporation, AT&T Information Systems, Data General, and Altos Computer Systems. These firms boast microcomputer revenues of \$100 million to slightly more than \$500 million.

A closer inspection of these companies reveals that Altos Computer Systems entered the multiuser market early-on and is the only firm that deals strictly with microcomputers. IBM, Digital Equipment Corporation, AT&T Company, and Data General all offer an upward-compatible line of minicomputers. Sperry Corporation offers a system that supports the largest number of users and features the highest price tag. IBM's offerings in the multiuser microcomputer market are possibly the most surprising of all. With support for the least amount of users, and some very low prices, one has to wonder when the giant will catch up and announce a system that offers more power and possibly sets the stage for a whole new industry standard.

All the major vendors offer numerous microcomputer

models with wide variations in price and number of users supported.

## GETTING STARTED

The following page contain detailed specifications of the 244 systems that we surveyed (specification chart) as well as the address and phone number of the systems' vendors (company directory). Using the information presented in the foregoing analysis, select a few potential systems and arrange for demonstrations of each. With one-third of the systems surveyed available through independent dealers, you may have the opportunity to view one or more systems side by side. In addition, because most of the prices are suggested retail and may vary considerably among dealers, it is probably wise to shop around for the best combination of price and support.

Extended hands-on experience with a system is always the acid test. Check warranty and service provisions before making a final choice. You will be spending a lot of time with your new multiuser micro. Take the time in the beginning to guarantee the best possible choice for your applications.

# MULTIUSER MICROCOMPUTERS

## Company Directory

227.0032.001

Vendor	Address/Telephone	Model
ACT	Shenstone House Dudley Rd Halesowen West Midlands B63 3NT England 021-501 2284  ACT (North America) Inc 3375 Scott Boulevard Suite 336 Santa Clara CA 95051 (408) 727-8090	Apricot Point 32 Apricot Point 7
Alcyon	8716 Production Ave San Diego CA 92121 (619) 578-0860	APS APS.RMS APX
Alpha Micro	17332 Von Karman PO Box 18347 Irvine CA 92713 (714) 957-8500	AM-1000E AM-1000X AM-680 Series ELS
Altos Computer Systems	2641 Orchard Pkwy San Jose CA 95134 (408) 946-6700	Altos 186 Altos 486 Altos 580 Altos 586 Altos 986 Altos 986T
Astraea Computer	846 Del Ray Ave Sunnyvale CA 94086 (408) 773-8500	AC-S9100 AC-S9101
AT&T Information Systems	One Speedwell Ave Morristown NJ 07960 (201) 898-2000	3B2/300 UNIX PC Model 7300
Bunker Ramo Information Systems	35 Nutmeg Dr Trumbull CT 06609 (203) 386-2000	Aladdin
Business Operating Systems	2835 E Platte Ave Colorado Springs CO 80909 (303) 634-1541	BOS/Mini-Pronto BOS/Pronto DVR Series II
CADO Systems	c/o Dateline Communications 1255 Lincoln Blvd Suite 300 Santa Monica CA 90401 (213) 393-9494	TIGER ATS 16 TIGER ATS 32 TIGER ATS 64 TIGER ATS 8
Callan Data Systems	2645 Townsgate Rd Westlake Village CA 91361 (805) 497-6837	UNISTAR 300
Charles River Data Systems	983 Concord St Framingham MA 01701 (617) 626-1000	Universe 2203T Universe 2402F Universe 2403FT Universe 68/05 Universe 68/137T Universe 68/35 Universe 68/67T
Charter Information	2421 Rutland Dr Austin TX 78758 (512) 835-1111	System 4 Core System 4 Trio

Vendor	Address/Telephone	Model
Chrislin Industries	Computer Products Div 31352 Via Colinas, No. 101 Westlake Village CA 91362 (818) 991-2254	CI-MICRO 11B CI-MICRO 11C
Cifer	Cifer Place Avro Way Bowerhill Melksham Wiltshire SN12 6TP England	Series 1 & 2 Series 9
Codata Systems	285 N Wolfe Rd Sunnyvale CA 94086 (408) 735-1744 (800) 521-6543	3400
Comark	93 West St PO Box 474 Medfield MA 02052 (617) 359-8161	Diskstor M-5 MB86I
Compucorp	2211 Michigan Ave Santa Monica CA 90404 (213) 829-7453	785 795 OA 3200
Computer Systems	26401 Harper Ave St Clair Shores MI 48081 (313) 779-8700	PC/88
Computone Systems	One Dunwoody Pk Atlanta GA 30338 (404) 393-3010	CC3 (Models 405, 410, 415) CC3/MP (Models 43S, 86S, 129S)
Convergent Technologies	30 E Plumeria St San Jose CA 95134 (408) 945-8877	MiniFrame Plus
Corona Data Systems	275 E Hillcrest Dr Thousand Oaks CA 91360 (805) 495-5800	Mega PC
Creative Micro Systems	3822 Cerritos Ave Los Alamitos CA 90720 (213) 493-2484	9687 9688
Cromemco	280 Bernardo Ave PO Box 7400 Mountain View CA 94039 (415) 964-7400	System 1 System 100 System 2 System 3 System 300 System 400
CYB Systems	6448 Hwy 290 E Suite D-106 Austin TX 78723 (512) 458-3224	Unite 16i Unite 32i Unite 4i Unite 8i WorkManager II WorkManager III WorkMaster WorkMate I WorkMate II
Data General	4400 Computer Dr Westboro MA 01581 (617) 366-8911	DESKTOP GENERATION Series, Models 10 & 10/SP DESKTOP GENERATION Series, Model 20 DESKTOP GENERATION Series, Model 30

Vendor	Address/Telephone	Model
Datapoint	9725 Datapoint Dr San Antonio TX 78284 (800) 334-1122	DESKTOP GENERATION Series, Model 45 microNOVA 1560 3200
Davidge	292 E Hwy 246 PO Box 1869 Buellton CA 93427 (805) 688-9598	System I System III System IV
Digital Equipment	146 Main St Bldg PK3-1 Maynard MA 01754 (617) 897-5111	MicroPDP-11/23 MicroPDP-11/73 MicroPDP-11/RC MicroPDP-11/SV MicroVAX I MicroVAX II
Dual Systems	2530 San Pablo Ave Berkeley CA 94702 (415) 549-3854	83/500 83/80
E & U Engel Consulting	1719 S Carmelina Ave Los Angeles CA 90025 (213) 820-4231	Angel-1 Baby-Angel 80 Baby-Angel 86
Fujitsu Systems of America	9841 Airport Blvd Los Angeles CA 90025 (213) 642-4706	Micro 16S Micro 16SX
General Automation	1045 S East St PO Box 4883 Anaheim CA 92803 (714) 778-4800	Zebra 1750 Zebra 2500 Zebra 3500 Zebra 5500 Zebra 6700
General Robotics	57 N Main St Hartford WI 53027 (414) 673-6800	Gemini Hercules Scorpio
GIMIX	1337 W 37th Place Chicago IL 60609 (312) 927-5510	GMX 020 GMX III
Heurikon	3201 Latham Dr Madison WI 53713 (608) 271-8700	814/68010 Minibox
IBC/Integrated Business Computers	21621 Nordhoff St Chatsworth CA 91311 (213) 882-9007	Ensign IBC System 68 MegaStar MultiStar Super Cadet
IBM	1133 Westchester Ave White Plains NY 10604 (914) 696-1900	Personal Computer AT Personal Computer AT/370
ICL Computers	ICL PO Box 10276-2276 Stamford CT 06904 (203) 968-7200	DRS 20
IMS International	2800 Lockheed Way Carson City NV 89701 (702) 883-7611	1600 Series, Model 1610 1600 Series, Model 1620 1600 Series, Model 1630 1600 Series, Model 1640

Vendor	Address/Telephone	Model
Independent Business Systems	5915 Graham CT Livermore CA 94550 (415) 443-3131	800 Series, Model 810 800 Series, Model 820 800 Series, Model 830 800 Series, Model 840  Ultraframe/16 Ultraframe/8
Intecolor	Intecolor Dr 225 Technology Pk Norcross GA 30092 (404) 449-5961	Datavue DV 3000 Datavue DV 4000
Intel	3065 Bowers Ave Santa Clara CA 95051 (408) 987-8080	286/310 86/310
Intertec Data Systems	2300 Broad River Rd Columbia SC 29210 (803) 798-9100	HeadStart ATS-286 HeadStart ATS-86
Ironics	Computer Systems Div 742 Cascadilla St Ithaca NY 14850 (607) 277-4060	IV 1600/DUM VMEbus Development System
Isotron	140 Sherman St Fairfield CT 06430 (203) 255-7443	OSI-345 OSI-710
J C Information Systems	4695 Valley Way Milpitas CA 95035 (408) 945-0317	JCS 4X JCS 507 JCS 807 JCS 810
Kaypro	533 Stevens Ave Solana Beach CA 92075 (619) 481-4300	286i
Logical Business Machines	264 Santa Ana Ct Sunnyvale CA 94086 (408) 737-1911	Adam III Goliath
MAI Basic Four Information Systems	14101 Myford Rd Tustin CA 92680 (714) 731-5100	MAI 2000
Micro Five	3560 Hyland Ave Costa Mesa CA 92626 (714) 957-1517	Series 1000 Turbo 1700
Molecular Computer	251 River Oaks Pkwy San Jose CA 95134 (408) 262-2122	Durango Poppy 186 Durango Poppy 286/186
Monroe Systems for Business	The American Rd Morris Plains NJ 07950 (201) 993-2636	MS 2000
Motorola/Four-Phase Systems	10700 N DeAnza Blvd Cupertino CA 95014 (408) 255-0900	Series 2000, Model 240 Series 2000, Model 260 Series 6000, System 6300 Series 6000, System 6600

Vendor	Address/Telephone	Model
Motorola Semiconductor Products	5005 E McDowell Rd Phoenix AZ 85008 (602) 244-6900	VME/10
NCR	Personal Computer 1700 S Patterson Dayton OH 45479 (513) 449-2000	I-Tower MiniTOWER PC8 TOWER 1632 TOWER XP
Nixdorf Computer	300 Third Ave Waltham MA 02154 (617) 890-3600	8870 Micro 7
NNC Electronics	15641 Computer La Huntington Beach CA 92649 (714) 895-8000	M/20 M/40 Model 520 Model 540 Model 820 Model 840
NoHALT COMPUTERS	1750 New Hwy Farmingdale NY 11735 (516) 225-2121	RELIANT
North Star Computers	14440 Catalina Dr San Leandro CA 94577 (415) 357-8500	DIMENSION HORIZON 8/16
Northern Telecom	PO Box 1222 Minneapolis MN 55440 (612) 932-8000	565 585 Meridian DV-1
Onyx Systems	25 E Trimble Rd San Jose CA 95131-1162 (408) 946-6330	Onyx 5010 OASIS Business Systems Onyx 5012 Series Onyx 6001 Series Onyx 6810 Series Business Computers
OSM Computer	665 Clyde Ave Mountain View CA 94043 (415) 961-8680	Zeus 3x Zeus 4
Pacific Microcomputers	119 Aberdeen Dr Cardiff CA 92007 (619) 436-8649	PM200
Perkin-Elmer	Data Systems Group 2 Crescent Pl Oceanport NJ 07757 (201) 530-5900	7350A Supermicro
Pertec Computer	17112 Armstrong Ave Irvine CA 92713-9602 (714) 660-0488	3215C 3220C 3230C 3240C
Plexus Computers	3833 N First St San Jose CA 95134 (408) 943-9433	P/15 P/35 P/60
Point 4	2569 McCabe Way Irvine CA 92714 (714) 863-1111	Mark 2

Vendor	Address/Telephone	Model
QDP	10330 Brecksville Rd Cleveland OH 44141 (216) 526-0838	300 400
Quay	22 Meridian Rd PO Box 783 Eatontown NJ 07724 (201) 542-7340	500 Series 520 540 900 900/33 910
Rexon Business Machines	5800 Uplander Way Culver City CA 90230 (213) 641-7110 (800) 421-5184	Rexon RX 100 Rexon RX 105 Rexon RX 200 Rexon RX 205 Rexon RX 400 Rexon RX 405 Rexon RX 450 Rexon RX 50
SBE	2400 Bisson La Concord CA 94520 (415) 680-7722	S200/300 Series S250/350 Series
Sentinel Computer	9902 Carver Rd Cincinnati OH 45242 (513) 984-6622	DS-130 DS-140 DS-170 DS-180
SGS Semiconductor	1000 E Bell Rd Phoenix AZ 85022 (602) 867-6100	Samson
Smoke Signal	31336 Via Colinas Westlake Village CA 91362-3984 (818) 889-4340	VAR/68 VAR/68K
Sperry	PO Box 500 Blue Bell PA 19424-0001 (215) 542-4011	Series 5000, Model 20 Series 5000, Model 40 Series 5000, Model 60 Series 5000, Model 80
STAR Technologies	5 Studebaker Irvine CA 92714 (714) 768-6460	STAR PC
STM Electronics	535 Middlefield Rd Suite 250 Menlo Park CA 94025 (415) 326-6226	STM AT
Stride Micro	4905 Energy Way Reno NV 89502 (702) 322-6868	Stride 420 Stride 440 Stride 460
Sykes Datatronics	375 Orchard St Rochester NY 14606 (716) 458-8000	Genus GC3
Tandy	1800 One Tandy Center Fort Worth TX 76102 (817) 390-3011	Tandy 6000
TeleVideo Systems	550 E Brokaw Rd San Jose CA 95112 (408) 971-0255	Personal Mini TS 804 TS 806/20 TS 816/40

Vendor	Address/Telephone	Model
Universal Data Research	2457 Wehrle Dr Buffalo NY 14221 (716) 631-3011	Model 2200 Model 2400
Vector Graphic	500 N Ventu Park Rd Thousand Oaks CA 91320 (805) 499-5831	Vector MX Series
VIASYN (formerly CompuPro)	3605 Breakwater CT Hayward CA 94545 (415) 786-0909	CompuPro 286 CompuPro 816/10 + 2 CompuPro 816/10 + 40 CompuPro 816/C CompuPro 816/D CompuPro 816/E CompuPro 816/F CompuPro 816/G
Visual Technology	540 Main St Tewksbury MA 01876 (800) 341-5400 (617) 851-5000	V2000
Wicat Systems	PO Box 539 1875 S State Orem UT 84058 (801) 224-6400	System 150 System 155 System 160 System 200 System 220 System 2220
Zenith Data Systems	1000 Milwaukee Ave Glenview IL 60025 (312) 391-8860	Z-200 ADVANCED PC
Zentec	2400 Walsh Ave Santa Clara CA 95050 (408) 727-7662	Series 2000
Zilog	1315 Dell Ave Campbell CA 95008 (408) 370-8000	System 8000/12 System 8000/22 System 8000/32







# MULTIUSER MICROCOMPUTERS

## Specifications Chart Guide

The Microcomputer Specifications Chart summarizes the significant characteristics of microcomputers. The information is presented in a chart to facilitate the evaluation and comparison of alternative systems. The chart lists available microcomputers in alphabetical order by manufacturer.

### VENDOR AND MODEL

This section identifies the microcomputer vendor by name and the product model number and name.

### CLASS

This section identifies the size category into which the microcomputer falls. A portable model will be designated as handheld (up to 3 pounds), portable (3 to 10 pounds), or transportable (10 to 35 pounds). A single- or multiuser nonportable system will be designated as desktop, floor standing, or rackmounted.

### USERS/TASKS

This section indicates whether the model is a single- or multiuser computer and whether it is a single- or multitasking machine.

### MAIN UNIT

This section describes the characteristics of the central processing unit.

- **Main Processor**—This entry identifies the central processor vendor and the processor model number or name.
- **Word Size**—This entry indicates the number of bits handled as a unit both internally and externally.
- **Clock Rate**—This entry, expressed in MHz, indicates the rate at which a word is transferred from one internal computer element to another.
- **Other Processors**—This entry identifies by vendor and model number any additional coprocessors (e.g., math and graphics) that are standard or optional on the system.

### MEMORY

This section describes, in bytes the minimum and maximum amounts of RAM, the available RAM increments in bytes, and the amount of ROM available.

### DISKETTE STORAGE

This section describes the characteristics of the diskette drives and media.

- **No. of Drives**—This entry indicates the number of internal diskette drives. External and optional drives may also be noted.
- **Size and Format**—This entry indicates the diameter (in inches) of the diskettes used and the format of the diskettes: single- or double-sided (SS or DS), and single-, double-, or quad-density (SD, DD, or QD).
- **Capacity**—This entry indicates the amount of storage, in bytes, available on each diskette.
- **Access Time**—This entry indicates, in milliseconds, the interval between the time information is called from storage and the time at which data is available.

### HARD DISK STORAGE

This section describes the characteristics of disk storage. The entries are similar to those given under Diskette Storage.

### OTHER STORAGE

This section indicates type and capacity of any other type of mass storage (e.g., tape cartridge, bubble memory).

### DISPLAY

This section describes the characteristics of standard and optional displays.

- **Size and Type**—This entry indicates the diagonal size of the display screen (in inches) and describes the technology (e.g., CRT, LCD, RGB).
- **Text Display**—This entry indicates how many lines and characters the screen can display.
- **Character Matrix**—This entry indicates the number of dots available within a character block to form a character.
- **Resolution**—This entry indicates, horizontally by vertically, the number of pixels (picture elements) available on the screen for forming images.
- **Screen Attributes**—This entry indicates any special features (e.g., underlining or reverse video) that make the display suitable for specific applications, such as word processing or graphics.
- **Colors**—This entry indicates the number of colors that can be displayed simultaneously and the number of colors available in the entire palette.

### KEYBOARD

This section describes the characteristics of the standard keyboard.

- **Keyboard Type**—This entry indicates whether the keyboard is detachable from or integral to (nondetachable)

the system unit or display.

- **No. of Keys**—This listing indicates the number of keys, including function, numeric, and cursor control keys.
- **Cursor Control**—This entry indicates how the cursor is controlled.
- **No. of Function Keys**—This entry indicates the total number of dedicated and programmable function keys.
- **Numeric Pad**—This entry indicates whether the numeric keypad is integral, detached, embedded, optional, or not available.

## INPUT/OUTPUT

This section describes the characteristics of the input/output section of the computer.

- **No. of Open I/O Slots**—This entry indicates the number of card slots available for expansion after installation of boards for the display and one diskette drive.
- **Serial Ports**—This entry indicates the number and type of serial ports.
- **Parallel Ports**—This entry indicates the number and type of parallel ports.
- **Special Output Ports**—This entry indicates any other type of output ports included, such as IEEE-488, RGB, composite video, or audio.
- **Special Input Ports**—This entry indicates any special input ports for such devices as a light pen, bar code reader, mouse, tablet, or other graphics devices.

## DATA COMMUNICATIONS

This section indicates whether asynchronous and/or synchronous communications are standard, optional, or not available. If available, emulation protocols are given. An internal

modem will also be indicated as standard, optional, or not available.

## SOFTWARE

This section indicates which operating systems are standard and optional, which applications software is included with the cost of the system, and which languages will run on the system.

## PHYSICAL AND ELECTRICAL

This section describes the physical dimensions (length, width, height, and weight) of the system as well as the power requirements (Hz, VAC, watts).

## SALES AND SERVICE

This section indicates the announcement and delivery dates of the system as well as sales and service channels.

## PRICING

This section gives the price of the system and its various configurations and indicates the number of diskettes, disk capacity, and amount of RAM included.

## COMMENTS

This section allows the vendor to list any special features provided by the unit.



# SPECIFICATIONS CHART

## Multiuser Microcomputers

227.0045.001

<b>Vendor</b>	<b>ACT</b>	<b>ACT</b>	<b>Alcyon</b>
<b>Model</b>	Apricot Point 32	Apricot Point 7	APS
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	Multi/—	Multi/—	1-12/Multi
<b>Main Unit</b>			
Main Processor	Intel 8086	Intel 8086	Motorola MC 68000, 68010
Word Size (bits)	16/16	16/16	32/16
Clock Rate (MHz)	5	5	10
Other Processors	—	—	Opt. floating point processor
<b>Memory</b>			
RAM Min/Max (bytes)	256K/1M	256K/1M	256K/2M
RAM Increments (bytes)	128K, 256K, 512K	128K, 256K, 512K	256K, 512K
ROM (bytes)	32K	32K	16K/64K EPROM
<b>Diskette Storage</b>			
No. of Drives	NA	1	Opt.
Size (in.) & Format	NA	3.5 DS	—
Capacity (bytes)	NA	720K	—
Access Time (msec)	NA	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1	2 (1 fixed, 1 removable)
Capacity (bytes)	10M, 20M	10M	10M (fixed), 10-112M (removable)
Access Time (msec)	—	—	20-40
<b>Other Storage</b>	200MB .25-in. cartridge tape	—	—
<b>Display</b>			
Size and Type	9-in., 12-in. CRT, or 10-in. RGB CRT	9-in. or 12-in. CRT; 10-in. RGB CRT (opt.)	12-in. CRT; 12-in. RGB CRT
Text Display (lines x col)	25 x 80	25 x 80	24 x 80
Character Matrix (dots)	10 x 16	10 x 16	9 x 12
Resolution (pixels)	800 x 400; 320 x 200 (RGB)	800 x 400; 320 x 200 (RGB)	640 x 480
Screen Attributes	—	—	—
Colors (simul/palette)	16/16 (RGB)	16/16 (RGB)	Green monochrome; 8/1,024 (RGB)
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	92	92	85
Cursor Control	4-key cluster	Separate 4-key cluster	4-key cluster
No. of Function Keys	14	14	19
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	—	—	6
Serial Ports	—	—	4-12
Parallel Ports	—	—	1
Special Output Ports	—	—	1 IEEE-488, 1 RGB, 1 composite video, DMA, synchronous, or Ethernet (opt.)
Special Input Ports	—	—	Light pen (opt.)
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Opt.	Opt.	Opt. (IBM 2780/3780, HDLC, bisync, Ethernet)
Internal Modem	—	Opt.	—
<b>Software</b>			
Operating Systems	MS-DOS 3.0 w/MS-Net	Concurrent DOS	REGULUS (UNIX-compatible); UNIX System V - BSD 4.2 (opt.)
Bundled Applications	—	—	NA
Languages	—	—	C, FORTRAN, Pascal, BASIC, DIBOL, COBOL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	16.5 x 12.5 x 4	16.5 x 12.5 x 4	14.5 x 18.25 x 14.6
Weight (lbs)	—	—	40.4
Power Supply	—	—	94-136/187-264 VAC, 47-63 Hz, 266 watts
<b>Sales and Service</b>			
Announced/Delivered	July 1984	July 1984	November 1982/March 1983
Sales Channels	Dealers	Dealers	Direct, distributor
Service Channels	Dealers	Dealers	Direct, distributor
<b>Pricing</b>	\$3,295 (w/10MB hard disk) \$3,995 (w/20MB hard disk)	\$6,495 (not available in the USA)	\$9,950
<b>Comments</b>	This enhanced version of the portable Apricot xi uses an Omninet local area network card to act as a file server.	This enhanced version of the portable Apricot xi includes a six-terminal cluster controller.	NA

**Notes:**

NA Not applicable  
— Information unavailable at press time



<b>Vendor</b>	<b>Alcyon</b>	<b>Alcyon</b>	<b>Alpha Micro</b>
<b>Model</b>	APS.RMS	APX	AM-1000E
<b>Class</b>	Rackmount	Floor model	Desktop
<b>Users/Tasks</b>	1-20/Multi	1-24/Multi	3-11/Multi
<b>Main Unit</b>			
Main Processor	Motorola MC 68000, 68010	Motorola MC 68000, 68010	Motorola MC 68000
Word Size (bits)	32/16	32/16	32/16
Clock Rate (MHz)	10	10	8
Other Processors	MC 68000 I/O processor, floating point processor (opt.)	MC 68000 I/O processor, floating point processor (opt.)	NA
<b>Memory</b>			
RAM Min/Max (bytes)	256K/4M	512K/4M	640K/896K
RAM Increments (bytes)	256K	512K	256K
ROM (bytes)	16K-64K	16K/64K EPROM	8K
<b>Diskette Storage</b>			
No. of Drives	Opt.	Opt.	1
Size (in.) & Format	—	—	5.25 DSDD
Capacity (bytes)	—	—	800K
Access Time (msec)	—	—	150
<b>Hard Disk Storage</b>			
No. of Drives	2 (1 fixed, 1 removable)	1 or more	1 internal, 3 external
Capacity (bytes)	10M (fixed), 10-112M (removable)	76M, 430M	30M
Access Time (msec)	20-40	—	45
<b>Other Storage</b>	45MB 1/4-in. cartridge tape	60MB .5-in. streaming tape	—
<b>Display</b>			
Size and Type	Third party	Third party	14-in. CRT; RGB CRT
Text Display (lines x col)	NA	NA	26 x 80
Character Matrix (dots)	NA	NA	—
Resolution (pixels)	NA	NA	—
Screen Attributes	NA	NA	Reverse video, blinking, low intensity
Colors (simul/palette)	NA	NA	Green monochrome; 8/8 (RGB)
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Detachable
No. of Keys	NA	NA	106
Cursor Control	NA	NA	—
No. of Function Keys	NA	NA	32
Numeric Pad	NA	NA	Integral
<b>Input/Output</b>			
Open I/O Slots	12	12	1
Serial Ports	4-28	4-28	3-11 RS-232C/422
Parallel Ports	1	1	1
Special Output Ports	1 IEEE-488, 1 RGB, 1 composite video, DMA, synchronous or Ethernet (opt.)	1 IEEE-488, 1 RGB, 1 composite video, DMA synchronous, Ethernet (opt.)	NA
Special Input Ports	Light pen (opt.)	Light pen (opt.)	NA
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Opt. (IBM 2780/3780, HDLC, bisync, Ethernet)	Opt. (2780/3780, HDLC, bisync, Ethernet)	Opt. (IBM 2780/3780)
Internal Modem	—	—	NA
<b>Software</b>			
Operating Systems	REGULUS (UNIX compatible); UNIX System V, BSD 4.2 (opt.)	REGULUS (UNIX compatible); UNIX System V, BSD 4.2	AMOS; UNIX V, CP/M (opt.)
Bundled Applications Languages	NA C, FORTRAN, Pascal, BASIC, DIBOL, COBOL	NA C, FORTRAN, Pascal, BASIC, DIBOL, COBOL	— BASIC, FORTRAN, Pascal, COBOL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	24 x 19 x 5.25	21 x 21 x 30	20 x 6 x 15
Weight (lbs)	38	80	30
Power Supply	94-136/187-264 VAC, 47-63 Hz, 266 watts	94-136/187-264 VAC, 47-63 Hz, 450 watts	115/230 VAC, 50/60 Hz
<b>Sales and Service</b>			
Announced/Delivered	January 1984/January 1984	November 1982/March 1983	1982
Sales Channels	Direct, distributor	Direct, distributor	Dealer, OEM
Service Channels	Direct, distributor	Direct, distributor	Direct, dealer
<b>Pricing</b>	\$9,950	\$29,900	\$10,415 (w/640KB RAM, 30MB disk drive, 3 serial I/O ports)
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time



<b>Vendor</b>	<b>Alpha Micro</b>	<b>Alpha Micro</b>	<b>Altos Computer Systems</b>
<b>Model</b>	AM-1000X	AM-680 Series ELS	Altos 186
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	3-11/—	1-3/Multi	2/—
<b>Main Unit</b>			
Main Processor	Motorola MC 68000	Intel 8088; Motorola MC 68000	Intel 80186
Word Size (bits)	32/16	16/8; 32/16	16/16
Clock Rate (MHz)	8	4.7	8
Other Processors	NA	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	640K/896K	256K/640K (8088); 128K/256K (MC 68000)	512K/512K
RAM Increments (bytes)	256K	128K	NA
ROM (bytes)	8K	—	—
<b>Diskette Storage</b>			
No. of Drives	1	1	1
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	800K	360K	720K (formatted)
Access Time (msec)	150	—	132
<b>Hard Disk Storage</b>			
No. of Drives	1 internal, 3 external	1	1
Capacity (bytes)	55M	10M	10M (formatted)
Access Time (msec)	30	—	85
<b>Other Storage</b>	—	—	NA
<b>Display</b>			
Size and Type	14-in. CRT; RGB CRT	12-in. CRT; 13-in. RGB CRT	14-in. CRT
Text Display (lines x col)	26 x 80	24 x 80	26 x 80/132
Character Matrix (dots)	—	8 x 16; 8 x 8	10 x 13 or 6 x 8
Resolution (pixels)	—	320 x 200	640 x 400
Screen Attributes	Reverse video, blinking, low intensity	—	Blinking, scroll, screen saver, terminal status
Colors (simul/palette)	Monochrome; 8/8 (RGB)	16/16 (RGB)	Monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Separate	Detachable
No. of Keys	106	83	105
Cursor Control	—	4-key cluster in numeric pad	4-key
No. of Function Keys	32	10	—
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	1	3	NA
Serial Ports	3-11 RS-232C/422	1 RS-232C	2
Parallel Ports	1	1	NA
Special Output Ports	NA	Main monitor port	1 RS-422, 1 console
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	Std	Opt.	Std (TTY)
Synchronous	Opt. (IBM 2780/3780)	NA	Opt. (IBM 3270/3780, 3270; SNA, X.25)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	AMOS; UNIX V, CP/M (opt.)	AMOS, MS-DOS	XENIX; Concurrent CP/M-86 (opt.)
Bundled Applications	—	NA	NA
Languages	BASIC, FORTRAN, Pascal, COBOL	GWBASIC	FORTRAN, Pascal, BASIC, COBOL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	20 x 6 x 15	20 x 14 x 4	15.3 x 16.5 x 3.5
Weight (lbs)	30	35	24
Power Supply	115/230 VAC, 50/60 Hz	—	120 VAC, 60 Hz, 180 watts
<b>Sales and Service</b>			
Announced/Delivered	1984	October 1984	October 1984/November 1984
Sales Channels	Dealer, OEM	OEM, dealers	Dealer, distributor
Service Channels	Direct, dealer	Alpha Serve dealers	Dealer, TRW, Depot
<b>Pricing</b>	\$12,915 (w/640KB RAM, 55MB disk drive, 3 serial I/O ports)	\$6,870 (w/monochrome monitor) \$7,340 (w/color monitor and controller)	\$5,990
<b>Comments</b>	NA	Hard disk can be partitioned between AMOS and MS-DOS.	NA

Notes:

- NA Not applicable
- Information unavailable at press time



	Altos Computer Systems	Altos Computer Systems	Altos Computer Systems
<b>Vendor Model</b>	Altos 486	Altos 580	Altos 586
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	4/—	3/—	5/—
<b>Main Unit</b>			
Main Processor	Intel 80186	Zilog Z80	Intel 8086
Word Size (bits)	16/16	8/8	16/16
Clock Rate (MHz)	8	4	10
Other Processors	Zilog Z80A	NA	—
<b>Memory</b>			
RAM Min/Max (bytes)	512K/872K	192K/192K	512K/1M
RAM Increments (bytes)	—	NA	512K
ROM (bytes)	—	—	—
<b>Diskette Storage</b>			
No. of Drives	1	1	1
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	720K (formatted)	720K (formatted)	720K
Access Time (msec)	132	135	132
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	21M (formatted)	15M, 37M (formatted)	16M, 33M (formatted)
Access Time (msec)	95	85, 45	95, 45
<b>Other Storage</b>	NA	17MB magnetic tape unit (opt.)	17MB 9-track magnetic tape unit (opt.)
<b>Display</b>			
Size and Type	14-in. CRT	14-in. CRT	14-in. CRT
Text Display (lines x col)	26 x 80/132	24 x 80/132	24 x 80/132
Character Matrix (dots)	10 x 13 or 9 x 13	10 x 13 or 9 x 13	—
Resolution (pixels)	640 x 400	640 x 400	640 x 400
Screen Attributes	Blinking, smooth scroll, screen saver, terminal status	—	Blinking, smooth scroll, screen saver, terminal status
Colors (simul/palette)	Monochrome	Monochrome	Monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	101	101	—
Cursor Control	4-key	4-key	4-key
No. of Function Keys	—	—	—
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	1	NA	—
Serial Ports	5	4	6
Parallel Ports	NA	1	NA
Special Output Ports	1 RS-422, 1 disk expansion	1 disk expansion	1 RS-422, 1 disk expansion
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	Std (TTY)
Synchronous	Opt. (IBM 3270/3780, 3270; SNA, X.25)	NA	Opt. (IBM 3270/3780, 3270 SNA; X.25)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	XENIX; Concurrent CP/M-86 (opt.)	MP/M 2.0; Oasis (opt.)	XENIX; Concurrent CP/M-86 (opt.)
Bundled Applications	NA	NA	NA
Languages	FORTRAN, Pascal, BASIC, COBOL	FORTRAN, Pascal, COBOL, BASIC	FORTRAN, COBOL, Pascal, BASIC
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	15.25 x 17 x 3.5	18 x 17 x 6	18 x 17 x 6
Weight (lbs)	20	33	33
Power Supply	120 VAC, 60 Hz, 250 watts	120 VAC, 60 Hz, 250 watts	120 VAC, 60 Hz, 250 watts
<b>Sales and Service</b>			
Announced/Delivered	October 1984/November 1984	June 1982	June 1982
Sales Channels	Dealer, distributor	Dealer, distributor	Dealer, distributor
Service Channels	Dealer, TRW, Depot	Dealer, TRW, Depot	Dealer, TRW, Depot
<b>Pricing</b>	\$6,490	\$4,490-\$5,490	\$7,990-\$9,990
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable  
 — Information unavailable at press time



Vendor	Altos Computer Systems	Altos Computer Systems	Astraea Computer
<b>Model</b>	Altos 986	Altos 986T	AC-S9100
<b>Class</b>	Desktop	Desktop	Desktop, rack mount
<b>Users/Tasks</b>	9/—	9/—	2/—
<b>Main Unit</b>			
Main Processor	Intel 8086	Intel 8086	Motorola MC 68000
Word Size (bits)	16/16	16/16	32/16
Clock Rate (MHz)	10	10	8, 10
Other Processors	—	—	Graphics processor
<b>Memory</b>			
RAM Min/Max (bytes)	1M/1M	1M/1M	256K/8M
RAM Increments (bytes)	NA	NA	256K, 2M
ROM (bytes)	—	—	48K
<b>Diskette Storage</b>			
No. of Drives	1	1	1
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	720K	720K (formatted)	.6M
Access Time (msec)	132	135	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	42M, 33M	67M, 37M (formatted)	10M, 20M, 40M, 100M
Access Time (msec)	45	45, 37	—
<b>Other Storage</b>	17MB 9-track magnetic tape unit (opt.)	60MB streaming tape unit	Streaming tape or 9-track reel-to-reel tape (opt.)
<b>Display</b>			
Size and Type	14-in. CRT	14-in. CRT	12-in. CRT; 13-in. RGB CRT (opt.)
Text Display (lines x col)	24 x 80/132	24 x 80/132	25 x 80; 24 x 80 (RGB)
Character Matrix (dots)	—	10 x 13 or 9 x 13	7 x 9; 8 x 10 (RGB)
Resolution (pixels)	640 x 400	640 x 400	—; 640 x 480 or 512 x 512 (RGB)
Screen Attributes	Blinking, smooth scroll, screen saver, terminal status	—	Blinking intensity, UL, reverse
Colors (simul/palette)	Monochrome	Monochrome	Monochrome; — (RGB)
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	—	101	94
Cursor Control	4-key	4-key	4-key
No. of Function Keys	—	—	26
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	—	NA	5
Serial Ports	10	10	2 RS-232C
Parallel Ports	NA	NA	1 Centronics
Special Output Ports	1 RS-422, 1 hard disk expansion	1 RS-422, 1 disk expansion	1 IEEE-488, 1 RGB
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	Std (TTY)
Synchronous	Opt. (IBM 3270/3780, 3270 SNA; X.25)	Opt. (IBM 3270/3780, 3270 SNA; X.25)	Opt. (SDLC, HDLC, bisync)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	XENIX; Concurrent CP/M-86 (opt.)	XENIX; Concurrent CP/M-86 (opt.)	UNIX V Regulus; CP/M (opt.)
Bundled Applications	NA	NA	—
Languages	FORTRAN, COBOL, Pascal, BASIC	FORTRAN, Pascal, COBOL, BASIC	C, FORTRAN-77, FORTH
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	18 x 17 x 6	18 x 17 x 6	20.25 x 17 x 11.5
Weight (lbs)	33	37	79
Power Supply	120 VAC, 60 Hz, 250 watts	120 VAC, 60 Hz, 250 watts	120/230 VAC, 60 Hz, 500 watts
<b>Sales and Service</b>			
Announced/Delivered	June 1982	November 1984/January 1985	January 1984/January 1984
Sales Channels	Dealer, distributor	Dealer, distributor	Direct, manufacturer's reps
Service Channels	Dealer, TRW, Depot	Dealer, TRW, Depot	Dealer
<b>Pricing</b>	\$11,990	\$13,490–\$15,490	\$11,750 (w/256KB RAM)
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable  
 — Information unavailable at press time



Vendor	Astraea Computer	AT&T Information Systems	AT&T Information Systems
<b>Model</b>	AC-S9101	3B2/300	Unix PC Model 7300
<b>Class</b>	Desktop, rackmount	Desktop	Desktop
<b>Users/Tasks</b>	1-8/-	1-18/-	1-3/Multi
<b>Main Unit</b>			
Main Processor	Motorola MC 68000	WE 32000	Motorola MC 68010
Word Size (bits)	32/16	32/8, 16, 32	32/16
Clock Rate (MHz)	8, 10	7.2	10
Other Processors	Graphics processor	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	512K/16M	512K/2M	512K/2M
RAM Increments (bytes)	256K, 2M	—	512K
ROM (bytes)	48K	32K	16K
<b>Diskette Storage</b>			
No. of Drives	1	1	1
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	.6M	720K	320K
Access Time (msec)	—	90	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	10M, 20M, 40M, 100M	10M, 32M	10M, 20M
Access Time (msec)	—	85, 45	—
<b>Other Storage</b>	Streaming tape or 9-track reel-to-reel tape (opt.)	Additional 720KB diskette	—
<b>Display</b>			
Size and Type	12-in. CRT; 13-in. RGB (opt.)	12-in. CRT	12-in. CRT
Text Display (lines x col)	25 x 80; 24 x 80 (RGB)	25 x 80/132	29 x 80
Character Matrix (dots)	7 x 9; 8 x 10 (RGB)	7 x 9	—
Resolution (pixels)	—; 640 x 480 or 512 x 512 (RGB)	—	720 x 348
Screen Attributes	Blinking, intensity, upper/lower, reverse	Blinking, underline, windowing	Reverse, underline, blinking, high intensity
Colors (simul/palette)	Monochrome; — (RGB)	—	Green monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	94	89	103
Cursor Control	4-key	—	Mouse, 4-key cluster
No. of Function Keys	26	11	—
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	13	4	3
Serial Ports	10 RS-232C; 18 or 26 RS-232C (opt.)	4 RS-232C	1
Parallel Ports	1 Centronics	1 Centronics	1
Special Output Ports	Opt.	—	—
Special Input Ports	NA	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std	—
Synchronous	Opt. (SDLC, HDLC, bisync)	Opt. (IBM SDLC/BSC 3270)	—
Internal Modem	NA	NA	Std
<b>Software</b>			
Operating Systems	UNIX V, Regulus; CP/M-68K (opt.)	UNIX System V	UNIX System V
Bundled Applications	—	—	User Interface, Telephone Manager, Async Communications
Languages	C, FORTRAN-77, FORTH	C, BASIC, FORTRAN	—
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	20.25 x 17 x 21	22 x 17 x 3.6	18 x 18 x 18
Weight (lbs)	153	30	40
Power Supply	120/230 VAC, 60 Hz, 200 watts	115 VAC, 60 Hz	110-130 VAC, 59-61 Hz, 150-200 watts
<b>Sales and Service</b>			
Announced/Delivered	January 1984/January 1984	March 1984/March 1984	1985
Sales Channels	Direct, manufacturers' reps	Direct, VARs, OEMs	Direct, distributor, dealer
Service Channels	Dealer	Vendor	Dealer
<b>Pricing</b>	\$20,750 (1MB RAM)	\$9,950 and up	\$5,095-6,095
<b>Comments</b>	NA	NA	Includes mouse

## Notes:

NA Not applicable

— Information unavailable at press time



Vendor	Bunker Ramo Information Systems	Business Operating Systems	Business Operating Systems
<b>Model Class</b>	Aladdin Desktop	BOS/Mini-Pronto Rackmount	BOS/Pronto Floor model
<b>Users/Tasks</b>	16/—	1-6 users per system/2 tasks per processor	1-12/—
<b>Main Unit</b>			
Main Processor	Motorola MC 68000	Zilog Z80B; Intel 80186	Zilog Z80A/B; Intel 80186
Word Size (bits)	32/16	8/8; 16/8	8/8; 16/8
Clock Rate (MHz)	5.5	6; 6-10	6; 8
Other Processors	Zilog Z80A	AMD 9511/9512, Intel 3211/3212, ISBX bus Intel 80186	AMD Floating Point Processor; ISBX bus Intel 80186
<b>Memory</b>			
RAM Min/Max (bytes)	1M/2M	64K/128K (Z80B); 256K/512K (80186)	64K/128K (Z80A/B), 256K/512K (80186)
RAM Increments (bytes)	1M	64K, 128K; 256K, 512K	64K, 256K
ROM (bytes)	16K	4K	4K
<b>Diskette Storage</b>			
No. of Drives	1	2	2
Size (in.) & Format	5.25 DSDD	8	8 DSDD
Capacity (bytes)	800K	1.2M	1.2M
Access Time (msec)	—	90	91
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	10M, 20M, 45M	45M, 90M, 180M	90M, 180M, 225M (unformatted)
Access Time (msec)	—	—	30
<b>Other Storage</b>	20MB cartridge tape (opt.)	External 67MB tape cartridge, 512KB cache memory board (opt.)	67.1M (formatted) .25-in. cartridge tape system
<b>Display</b>			
Size and Type	5-in., 9-in., or 14-in. CRT	Third party	Third party
Text Display (lines x col)	15 x 40; 25 x 80; 25 x 80	NA	NA
Character Matrix (dots)	—	NA	NA
Resolution (pixels)	—	NA	NA
Screen Attributes	—	NA	NA
Colors (simul/palette)	Monochrome	NA	NA
<b>Keyboard</b>			
Keyboard Type	Detachable (multiple types)	Third party	Third party
No. of Keys	99	NA	NA
Cursor Control	4-key row	NA	NA
No. of Function Keys	16	NA	NA
Numeric Pad	Integral	NA	NA
<b>Input/Output</b>			
Open I/O Slots	5	9	16
Serial Ports	1	14 RS-232C	24 RS-232C
Parallel Ports	Opt.	6	6
Special Output Ports	IEEE-488	RS-422 (opt.)	RS-422 (opt.)
Special Input Ports	NA	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std	Std
Synchronous	Std (IBM 3270 bisync, SNA)	Std (3270)	Std (IBM 3270)
Internal Modem	NA	Opt.	NA
<b>Software</b>			
Operating Systems	UNIX	TurboDOS, CP/M, CP/M-86, MP/M-86, MS-DOS, PC DOS 1.1	TurboDOS, CP/M, MP/M, CP/M-86, MP/M-86, MS-DOS 1.xx, PC DOS 1.xx
Bundled Applications	NA	WP, database	—
Languages	C, BASIC, COBOL	FORTRAN, Pascal, C, BASIC, Assembly	FORTRAN, BASIC, Pascal, COBOL, Assembly
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	13.9 x 22.3 x 5.8	20.5 x 13.5 x 21	26.5 x 18.5 x 23.5
Weight (lbs)	30	110	160
Power Supply	115/240 VAC, 50/60 Hz	120/220 VAC, 50 Hz	110/220 VAC
<b>Sales and Service</b>			
Announced/Delivered	1983/1983	—	—
Sales Channels	Direct	Direct, distributor, dealer	Direct, distributor, dealer
Service Channels	Direct	Dealer, direct	Dealer, third party
<b>Pricing</b>	Contact vendor	Contact vendor	Contact vendor
<b>Comments</b>	NA	NA	NA

Notes:

- NA Not applicable
- Information unavailable at press time



Vendor	Business Operating Systems	CADO Systems	CADO Systems
<b>Model Class</b>	DVR Series II Rackmount	Tiger ATS 16	Tiger ATS 32
<b>Users/Tasks</b>	1-22 users per system/2 tasks per processor	16/16	32/32
<b>Main Unit</b>			
Main Processor	Zilog Z80B, Intel 80186	Intel 80186	Intel 8089, Intel 8086
Word Size (bits)	8/8; 16/8	16/16	16/16
Clock Rate (MHz)	6 (Z80B), 6-10 (80186)	8	5
Other Processors	AMD 9511/9572, Intel 3211/3212, ISBX bus Intel 80186	NA	—
<b>Memory</b>			
RAM Min/Max (bytes)	64K/128K (Z80B); 256K/512K (80186)	512K/512K	314K/660K
RAM Increments (bytes)	64K, 128K; 256K, 512K	NA	128K plus 16K, 32K, or 10K
ROM (bytes)	4K	16K PROM	24K/48K PROM
<b>Diskette Storage</b>			
No. of Drives	2	1	1
Size (in.) & Format	8	5.25 SSSD	8 SSSD
Capacity (bytes)	1.2M	1.2M	1.2M
Access Time (msec)	90	—	260
<b>Hard Disk Storage</b>			
No. of Drives	2	1-2	1-4
Capacity (bytes)	45M, 90M, 180M, 255M	10M, 15M or 36M	15M
Access Time (msec)	—	65	65
<b>Other Storage</b>	67MB internal tape drive, 512KB cache memory board (opt.)	20MB or 45MB 1/4-in. streaming cartridge tape	20MB, 45MB .25-in. streaming cartridge tape
<b>Display</b>			
Size and Type	Third party	14-in. CRT	14-in. CRT
Text Display (lines x col)	NA	25 x 80	25 x 80
Character Matrix (dots)	NA	9 x 13	9 x 13
Resolution (pixels)	NA	—	—
Screen Attributes	NA	Blinking, half and full intensity, reverse video	Blinking, full or half density, reverse
Colors (simul/palette)	NA	Monochrome	Monochrome
<b>Keyboard</b>			
Keyboard Type	Third party	Detachable	Detachable
No. of Keys	NA	74	74
Cursor Control	NA	—	—
No. of Function Keys	NA	34	34
Numeric Pad	NA	Opt.	Opt.
<b>Input/Output</b>			
Open I/O Slots	30-34	15	31
Serial Ports	46 RS-232	16 RS-232C or RS-423	32 RS-232C or RS-423
Parallel Ports	22	NA	NA
Special Output Ports	RS-422 opt.	NA	NA
Special Input Ports	—	NA	NA
<b>Data Communications</b>			
Asynchronous	Std	Std (TWX, Telex, DDD, 8A1)	Std (TWX, Telex, 8A1, and other)
Synchronous	Std	Std (IBM 3741, 2770, 2780/3780)	Std (IBM 3741, 2770, 2780/3780)
Internal Modem	Opt.	NA	NA
<b>Software</b>			
Operating Systems	TurboDOS, CP/M, CP/M-86, MP/M-86, MS-DOS 1.1, PC DOS 1.1	TIGER 16 Operating System (proprietary)	Multi-Master/Interpretive Operating System
Bundled Applications	—	—	—
Languages	FORTRAN, Pascal, C, BASIC, Assembly	CADOL	CADOL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	—	19 x 8 x 23.5	25.8 x 15.3 x 29.1
Weight (lbs)	—	70	153
Power Supply	110/220 VAC	120 VAC, 120 watts	120 VAC, 500 watts
<b>Sales and Service</b>			
Announced/Delivered	—	May 1984/May 1984	September 1983
Sales Channels	Direct, distributor, dealer	Distributor	Distributor
Service Channels	Dealer, direct	Distributor	Distributor
<b>Pricing</b>	Contact vendor	\$14,390 (w/4-user CPU, 512KB RAM, 1.2MB diskette drive, 10MB Winchester drive)	\$26,390 (w/8-user CPU, 512KB RAM, 20MB streaming tape, 15MB disk)
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time



<b>Vendor</b>	<b>CADO Systems</b>	<b>CADO Systems</b>	<b>Callan Data Systems</b>
<b>Model</b>	Tiger ATS 64	Tiger ATS 8	UNISTAR 300
<b>Class</b>	—	Desktop	Floor model
<b>Users/Tasks</b>	55/55	8/2 per user	4-8/Multi
<b>Main Unit</b>			
Main Processor	1-4 Intel 8089, 3-10 Intel 8086	Intel 80186	Motorola MC 68010
Word Size (bits)	16/16	16/16	32/16
Clock Rate (MHz)	5	8	10
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	314K/1.1M	256K/512K; plus 64K at each display terminal	512K/2M
RAM Increments (bytes)	128K plus 16K, 32K, or 10K	256K	512K, 1M
ROM (bytes)	24K-128K	—	—
<b>Diskette Storage</b>			
No. of Drives	1	1	1
Size (in.) & Format	8 SSSD	5.25 DSDD	5.25
Capacity (bytes)	1.2M	1.2M (formatted)	616K
Access Time (msec)	260	93	—
<b>Hard Disk Storage</b>			
No. of Drives	1-4	1-2	1-4
Capacity (bytes)	30M, 60M, 142M	10M, 15M, 20M, 30M, 36M, 72M (formatted)	43M
Access Time (msec)	45	85, 30	—
<b>Other Storage</b>	20MB or 45MB .25-in. streaming cartridge tape	—	45MB streaming tape
<b>Display</b>			
Size and Type	14-in. CRT	14-in. CRT	14-in. RGB CRT
Text Display (lines x col)	25 x 80	25 x 80	—
Character Matrix (dots)	9 x 13	7 x 9	—
Resolution (pixels)	—	720 x 325	640 x 480
Screen Attributes	Blinking, half or full-density, reverse	Low intensity, reverse, blinking, zero intensity, protected format	—
Colors (simul/palette)	Monochrome	Green monochrome	256/4,096
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	74	74	82
Cursor Control	—	Cluster	—
No. of Function Keys	34	—	—
Numeric Pad	Opt.	Integral	—
<b>Input/Output</b>			
Open I/O Slots	54	—	7
Serial Ports	55 RS-232C or RS-423	8 RS-423, 1 RS-232C	4-20 RS-423/RS-232C
Parallel Ports	NA	—	1 Centronics
Special Output Ports	NA	—	—
Special Input Ports	NA	—	—
<b>Data Communications</b>			
Asynchronous	Std (TWX, Telex, 8A1 and other)	Std	Opt.
Synchronous	Std (IBM 3741, 2770, 2780/3780)	Std (IBM 3780, 2780, 2770, 3741)	Opt.
Internal Modem	NA	—	NA
<b>Software</b>			
Operating Systems	Multi-Master/Interpretive Operating System	Proprietary	UNIX System V
Bundled Applications	—	WP, DBMS	—
Languages	CADOL	CADOL (proprietary)	C, BASIC, ADA, COBOL, FORTRAN 77, Assembler
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	32 x 24.5 x 46.8	17.38 x 15 x 8	27 x 10 x 25
Weight (lbs)	265	42-53	180
Power Supply	120 VAC, 500 watts	120 watts	115/230 VAC, 50/60 Hz
<b>Sales and Service</b>			
Announced/Delivered	November 1982	March 1985/March 1985	—
Sales Channels	Distributor	Distributor, OEM	—
Service Channels	Distributor	Distributor	ITT Courier
<b>Pricing</b>	\$35,395 (w/8-user CPU, 512KB RAM, 20MB cartridge tape, 30MB disk, terminal)	\$7,650 (w/4-port CPU, 1.2MB diskette drive, 10MB Winchester drive)	\$19,950 (w/512KB RAM, diskette & 43MB disk drive, tape drive, UNIX)
<b>Comments</b>	NA	NA	NA

Notes:  
 NA Not applicable  
 — Information unavailable at press time



	Charles River Data Systems	Charles River Data Systems	Charles River Data Systems
<b>Vendor</b>	Universe 2203T	Universe 2402F, 2403FT	Universe 68/05
<b>Model</b>	Desktop	Rack, wall, or table mount	Desktop
<b>Class</b>	4/256	4-64/Multi	4-64/256
<b>Users/Tasks</b>			
<b>Main Unit</b>			
Main Processor	Motorola MC 68000	Motorola MC 68000	Motorola MC 68000
Word Size (bits)	32/16	32/16	32/16
Clock Rate (MHz)	12.5	12.5	12, 5
Other Processors	Motorola MC 68000 peripheral controllers	Motorola MC 68000	2nd Motorola MC 68000 as built-in I/O processor
<b>Memory</b>			
RAM Min/Max (bytes)	512K/10M	512K/10M	256K/10M
RAM Increments (bytes)	512K	1M, 2M, 4M	512K
ROM (bytes)	32K	32K PROM	32K
<b>Diskette Storage</b>			
No. of Drives	NA	1	1
Size (in.) & Format	NA	—	8 DSDD
Capacity (bytes)	NA	320K	1.2M
Access Time (msec)	NA	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1 internal; add'l. external (opt.)	1	1 internal; add'l. external (opt.)
Capacity (bytes)	35MB	20M, 35M, 60M, 120M	10M
Access Time (msec)	30, 60	—	18-90
<b>Other Storage</b>	45MB .25-in. magnetic tape	45MB .25-in. streaming tape (2403FT)	45MB .25-in. magnetic tape (opt.)
<b>Display</b>			
Size and Type	Third party	Third party	Third party
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Resolution (pixels)	NA	NA	NA
Screen Attributes	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Third party
No. of Keys	NA	NA	NA
Cursor Control	NA	NA	NA
No. of Function Keys	NA	NA	NA
Numeric Pad	NA	NA	NA
<b>Input/Output</b>			
Open I/O Slots	2	7-12	2
Serial Ports	4	4-72	4-64
Parallel Ports	NA	0-7	0-7
Special Output Ports	0-2 IEEE-488	NA	1-2 IEEE-488 (opt.)
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	Std (TTY, UUCP)	Std	Std (TTY, UUCP)
Synchronous	Std (SNA, X.25)	Opt.	Std (SNA, X.25)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	UNOS; UN/System V (opt.)	UNOS, UN/System V	UNOS; UN/System V (opt.)
Bundled Applications	NA	Opt.	NA
Languages	C, BASIC, FORTRAN, Pascal, RM/COBOL	Opt.	C, BASIC, FORTRAN, Pascal, RM/COBOL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	26 x 19 x 7	10.5 x 17.5 x 21	26 x 19 x 7
Weight (lbs)	—	65	—
Power Supply	100-250 VAC, 50/60 Hz	47-440 Hz, 500 watts	100-250 VAC, 50/60 Hz
<b>Sales and Service</b>			
Announced/Delivered	July 1984/November 1984	April 1985/July 1985	October 1982/January 1983
Sales Channels	Direct	Direct	Direct
Service Channels	Direct, Depot, 3rd party	Direct, Depot, 3rd party	Direct, Depot, 3rd party
<b>Pricing</b>	\$19,900 (w/512KB RAM, 35MB disk, 45MB magnetic tape, 4 ports)	\$9,999: 2402F (w/12 slot VME chassis, VCP 2000 processor w/4 serial ports, 512KB RAM, 20M disk drive, 320KB diskette drive) \$17,000: 2403FT (w/12 slot VME chassis, VCP 2000 processor w/4 serial ports, 1MB RAM, 35MB disk drive, 320KB diskette drive)	\$15,000 (w/256KB RAM, 10MB disk drive, diskette drive, 4 serial ports, two MC 68000 processors)
<b>Comments</b>	Error correction code memory available	Error correction code memory available.	Error correction code memory available

## Notes:

NA Not applicable  
— Information unavailable at press time



Vendor	Charles River Data Systems	Charles River Data Systems	Charles River Data Systems
<b>Model</b>	Universe 68/137T	Universe 68/35	Universe 68/67T
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	Multi/Multi	Multi/Multi	Multi/Multi
<b>Main Unit</b>			
Main Processor	Motorola MC 68000	Motorola MC 68000	Motorola MC 68000
Word Size (bits)	32/16	32/16	32/16
Clock Rate (MHz)	12.5	12.5	12.5
Other Processors	Motorola MC 68000	Motorola MC 68000	Motorola MC 68000
<b>Memory</b>			
RAM Min/Max (bytes)	512K/—	512K/—	512K/—
RAM Increments (bytes)	512K, 1M	512K, 1M	512K, 1M
ROM (bytes)	—	—	—
<b>Diskette Storage</b>			
No. of Drives	NA	1	NA
Size (in.) & Format	NA	8	NA
Capacity (bytes)	NA	1.25M	NA
Access Time (msec)	NA	—	NA
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	120M; 32M, 64M (opt.)	35M	64M
Access Time (msec)	—	45	—
<b>Other Storage</b>	45MB .25-in. streaming cartridge tape	—	45MB .25-in. streaming cartridge tape
<b>Display</b>			
Size and Type	Third party	Third party	Third party
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Resolution (pixels)	NA	NA	NA
Screen Attributes	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Third party
No. of Keys	NA	NA	NA
Cursor Control	NA	NA	NA
No. of Function Keys	NA	NA	NA
Numeric Pad	NA	NA	NA
<b>Input/Output</b>			
Open I/O Slots	—	—	—
Serial Ports	4-64	4-64	4-64
Parallel Ports	0-8	Opt.	0-8
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Opt.	Opt.	Opt.
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	UN/System V, UNOS	UNOS, CRDS System V	UNOS, CRDS System V
Bundled Applications	Opt.	Opt.	Opt.
Languages	Opt.	Opt.	Opt.
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	14 x 19 x 27	7 x 19 x 27	14 x 19 x 27
Weight (lbs)	—	—	—
Power Supply	110/130 or 220/240 VAC	120 VAC, 60 Hz, 220/240 VAC, 50 Hz	110/130 VAC or 220/240 VAC
<b>Sales and Service</b>			
Announced/Delivered	—/January 1984	—/January 1984	—/January 1984
Sales Channels	Direct	Direct	Direct
Service Channels	Direct, Depot, 3rd party	Direct, Depot, 3rd party	Direct, Depot, 3rd party
<b>Pricing</b>	\$28,700 (7 slot system, 120MB disk drive, 45MB cartridge tape, 4 serial ports, 1MB RAM)	\$16,700 (w/1MB RAM, 8-in. diskette drive, 35MB disk drive, 4 serial ports, 5-slots) \$18,700 (same as above except tape drive replaces diskette drive)	\$26,700 (7 slot system w/60MB disk drive, 45MB cartridge tape drive, 4 serial ports, MB RAM)
<b>Comments</b>	Error correction code memory available. Model 68/37N, identical to 68/137, but with 35MB disk drive, 1MB RAM, & 5.25-in. 1MB diskette drive is available for \$18,700.	Error correction code memory available	Error correction code memory available

Notes:  
 NA Not applicable  
 — Information unavailable at press time



Vendor	Charter Information	Charter Information	Chrislin Industries
<b>Model</b>	System 4 Core	System 4 Trio	CI-MICRO 11B
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	16/—	3/—	20/20
<b>Main Unit</b>			
Main Processor	Zilog Z80A or Z80B	Zilog Z80A or Zilog Z80B	Digital Equipment LSI-11/23+
Word Size (bits)	8/8	8/8	16/22
Clock Rate (MHz)	6, 4	4	10
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	64K/128K	64K/1M	256K/4M
RAM Increments (bytes)	—	—	256K
ROM (bytes)	32K	32K	—
<b>Diskette Storage</b>			
No. of Drives	1	1	2
Size (in.) & Format	5.25 DSDD	5.25 DSDD	8 DSDD
Capacity (bytes)	714K	714K	2M
Access Time (msec)	—	—	83
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	5M-74M	10M, 20M	20M
Access Time (msec)	—	—	60
<b>Other Storage</b>	—	—	70MB streaming tape
<b>Display</b>			
Size and Type	12-in. CRT	12-in.	Third party
Text Display (lines x col)	24 x 80	24 x 80	NA
Character Matrix (dots)	7 x 9	7 x 9	NA
Resolution (pixels)	—	—	NA
Screen Attributes	—	—	NA
Colors (simul/palette)	Green monochrome	Green monochrome	NA
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Third party
No. of Keys	80	80	NA
Cursor Control	4-key cluster	4-key cluster	NA
No. of Function Keys	24	24	NA
Numeric Pad	Integral	Integral	NA
<b>Input/Output</b>			
Open I/O Slots	8	2	14
Serial Ports	Up to 8 RS-232C	1 RS-232C	2 RS-232C
Parallel Ports	Up to 8 Centronics	1 Centronics	Opt.
Special Output Ports	NA	1 composite video	Opt.
Special Input Ports	—	—	Opt.
<b>Data Communications</b>			
Asynchronous	Std	Std	Std (TTY)
Synchronous	Opt. (IBM 3270)	Opt.	Opt.
Internal Modem	Opt.	Std	NA
<b>Software</b>			
Operating Systems	TurboDOS; CP/M, MS-DOS (opt.)	TurboDOS; CP/M, MS-DOS (opt.)	UNIX; RSX11, RT11
Bundled Applications	WP, BASIC	WP, spreadsheet	—
Languages	—	BASIC, Pascal	—
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	50 x 34 x 9	19 x 17 x 5	26 x 19 x 5.25
Weight (lbs)	38	16	75
Power Supply	—	—	400 watts
<b>Sales and Service</b>			
Announced/Delivered	February 1981/February 1981	—	1982
Sales Channels	Direct	Direct	Direct
Service Channels	Direct	Direct	—
<b>Pricing</b>	\$10,000-\$35,000	\$11,000	\$7,695 (w/256KB RAM, 20MB Winchester drive, 2MB dual diskette drive)
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time



<b>Vendor</b>	<b>Chrislin Industries</b>	<b>Cifer</b>	<b>Cifer</b>
<b>Model</b>	CI-MICRO 11C	Series 1 and 2	Series 9
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	20/20	1-4/—	4-6/40
<b>Main Unit</b>			
Main Processor	Digital Equipment LSI-11/73	Motorola MC 68000	Motorola MC 68000
Word Size (bits)	16/22	32/16	32/16
Clock Rate (MHz)	10	10	10
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	256K/4M	64K/1M	512K/1M
RAM Increments (bytes)	256K	—	512K
ROM (bytes)	—	32K	32K
<b>Diskette Storage</b>			
No. of Drives	2	1-2	1
Size (in.) & Format	8 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	2M	800K	800K
Access Time (msec)	83	140	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	20M	10M, 21M	10M, 21M, 43M, 74M, 93M
Access Time (msec)	60	90	—
<b>Other Storage</b>	70MB streaming tape	—	5MB Winchester
<b>Display</b>			
Size and Type	Third party	9-in. or 12-in. CRT	12-in. CRT
Text Display (lines x col)	NA	25 x 40/80/132	25 x 80/132
Character Matrix (dots)	NA	7 x 11	9 x 11 or 7 x 8
Resolution (pixels)	NA	—	1,024 x 300
Screen Attributes	NA	Bold, underline, italic, reduced intensity, blinking Monochrome	Bold, underline, italic, reduced intensity, blinking Monochrome
Colors (simul/palette)	NA	—	—
<b>Keyboard</b>			
Keyboard Type	Third party	Integral	Detachable
No. of Keys	NA	100	103
Cursor Control	NA	4-key cluster	5-key cluster
No. of Function Keys	NA	40	110
Numeric Pad	NA	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	13	—	1
Serial Ports	4 RS-232C	—	—
Parallel Ports	Opt.	—	—
Special Output Ports	Opt.	—	—
Special Input Ports	Opt.	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	—	Std
Synchronous	Opt.	—	Opt.
Internal Modem	NA	—	—
<b>Software</b>			
Operating Systems	UNIX; RSX11, RT11	CP/M, MP/M, UNIX; BOS (opt.)	UNIX; BOS (opt.)
Bundled Applications	—	Cifer Pathfinder (Menu front end, utilities)	Cifer Pathfinder (Menu front end, utilities)
Languages	—	C, BASIC, FORTRAN-77, Pascal, COBOL, Prolog	C, BASIC, FORTRAN-77, Pascal, COBOL, Prolog
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	19 x 26 x 5.25	17.5 x 15.2 x 10.1	19.5 x 5.5 x 10.5
Weight (lbs)	75	41	16.5
Power Supply	400 watts	50 Hz, 220-240 VAC, 146 watts	50 Hz, 220-240 VAC, 65 watts
<b>Sales and Service</b>			
Announced/Delivered	1984/1984	1983/1983	1983/1983
Sales Channels	Direct	—	—
Service Channels	—	Manufacturer	Manufacturer
<b>Pricing</b>	\$9,695 (w/20MB Winchester, 2MB dual diskette drive, 1MB RAM)	£ 2,595 (Series 1 w/dual diskette drives, CP/M) £ 4,985 (Series 2 w/10MB disk drive and diskette drive, CP/M and UNIX)	£ 5,895 (w/21MB disk, 512KB RAM, 800KB diskette drive), £ 695-£ 995 (T series terminals)
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable  
— Information unavailable at press time



<b>Vendor</b>	<b>Codata Systems</b>	<b>Comark</b>	<b>Comark</b>
<b>Model</b>	3400	Diskstor M-5	MB861
<b>Class</b>	Desktop, rackmount	Desktop, rackmount	Desktop
<b>Users/Tasks</b>	10-16/40	4/user definable	Multi/Single or Multi
<b>Main Unit</b>			
Main Processor	Motorola MC 68000	Intel 8086	Intel 8086
Word Size (bits)	32/16	16/16	16/16
Clock Rate (MHz)	8	10	10
Other Processors	Zilog Z80 I/O processors	AMD 9511A math processor	Intel 8087, Intel 8089
<b>Memory</b>			
RAM Min/Max (bytes)	756K/4M	512K/1M	512K/1M
RAM Increments (bytes)	512K, 1M	512K	512K
ROM (bytes)	—	64K	64K
<b>Diskette Storage</b>			
No. of Drives	1	1	Opt.
Size (in.) & Format	5.25 DSDD	8 SSSD	—
Capacity (bytes)	1M	241K	—
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1	2	1 (opt.)
Capacity (bytes)	20M, 320M	20M (formatted)	20M
Access Time (msec)	—	—	—
<b>Other Storage</b>	13MB cartridge tape (opt.)	—	—
<b>Display</b>			
Size and Type	Third party	Third party	15-in. CRT
Text Display (lines x col)	NA	NA	24/48 x 80/132
Character Matrix (dots)	NA	NA	—
Resolution (pixels)	NA	NA	1,024 x 768
Screen Attributes	NA	NA	Reverse video, double height and width characters, dual intensity, blinking, underline
Colors (simul/palette)	NA	NA	Monochrome
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Integral
No. of Keys	NA	NA	—
Cursor Control	NA	NA	4-key cluster
No. of Function Keys	NA	NA	30
Numeric Pad	NA	NA	Integral
<b>Input/Output</b>			
Open I/O Slots	—	—	—
Serial Ports	2-18	5	3
Parallel Ports	NA	24	24
Special Output Ports	NA	NA	NA
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	NA	Std	Std
Synchronous	NA	Std	Std
Internal Modem	NA	NA	Opt.
<b>Software</b>			
Operating Systems	UNIX	MP/M-86	CCP/M-86; MS-DOS, CP/M-86 (opt.)
Bundled Applications	NA	—	—
Languages	FORTRAN-77, APL, RM/COBOL, BASIC +, SMC BASIC, Pascal	—	—
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	22 x 14.5 x 8	19 x 19 x 10.5	23.95 x 17.8 x 17
Weight (lbs)	38	70	96
Power Supply	115/230 VAC, 50/60 Hz	110 VAC, 60 Hz, 200 watts	110 VAC, 60 Hz, 200 watts
<b>Sales and Service</b>			
Announced/Delivered	1983/1983	1983/1983	—
Sales Channels	Distributors, direct	Direct	Direct
Service Channels	Direct, ITT	Factory	Factory
<b>Pricing</b>	\$75,000 (w/756KB RAM, diskette drive, 47MB disk drive, UNIX)	\$10,995 (4-user, multi-tasking system)	\$5,495-\$12,995
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time



<b>Vendor</b>	<b>Compucorp</b>	<b>Compucorp</b>	<b>Compucorp</b>
<b>Model</b>	785	795	OA 3200
<b>Class</b>	Desktop	Desktop	Floor model
<b>Users/Tasks</b>	1-16/Multi	1-16/Multi	16/Multi
<b>Main Unit</b>			
Main Processor	Zilog Z80	2 Zilog Z80	Motorola MC 68000
Word Size (bits)	8/8	8/8	32/32
Clock Rate (MHz)	4	4	8
Other Processors	—	—	Zilog Z80
<b>Memory</b>			
RAM Min/Max (bytes)	256K/—	256K/256K	512K/—
RAM Increments (bytes)	—	NA	—
ROM (bytes)	8K	8K	24K
<b>Diskette Storage</b>			
No. of Drives	1	1	1
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	650K	650K	650K
Access Time (msec)	28	28	28
<b>Hard Disk Storage</b>			
No. of Drives	1	1	3
Capacity (bytes)	5M	15M	100M
Access Time (msec)	20	20	20
<b>Other Storage</b>	—	—	21MB tape backup
<b>Display</b>			
Size and Type	12-in. CRT	12-in. CRT	12-in. CRT
Text Display (lines x col)	24 x 80	24 x 80	24 x 80
Character Matrix (dots)	10 x 12	10 x 12	10 x 12
Resolution (pixels)	—	—	—
Screen Attributes	Blink, reverse, underline, bold	Blinking, underline, reverse, bold	Blink, underline, reverse, bold
Colors (simul/palette)	—	Monochrome	Monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	103	103	103
Cursor Control	5-key cluster	5-key cluster	5-key cluster
No. of Function Keys	79	79	79
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	3	3	32
Serial Ports	3 RS-232C	3 RS-232C	32 RS-232C
Parallel Ports	NA	NA	NA
Special Output Ports	NA	NA	NA
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	Std (TTY, VT100)	Std (TTY, VT100)	Std (TTY, VT100)
Synchronous	Std (bisync, IBM 3270)	Std (bisync, IBM 3270)	NA
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	ZEBRA (proprietary); CP/M (opt.)	ZEBRA (proprietary); CP/M (opt.)	XENIX
Bundled Applications	OMEGA	OMEGA	XENIX compatible
Languages	FORTRAN, BASIC, Assembler	FORTRAN, BASIC, Assembler	FORTRAN, Pascal, COBOL, BASIC, Assembler, C
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	18.75 x 20.25 x 23.86	18.75 x 20.25 x 23.86	18.75 x 20.25 x 23.86
Weight (lbs)	84	84	84
Power Supply	110 VAC, 60 Hz	110 VAC, 60 Hz	110 VAC, 60 Hz
<b>Sales and Service</b>			
Announced/Delivered	1982	1982	1983
Sales Channels	Direct, dealer, distributor	Direct, dealer, distributor	Direct, dealer, distributor
Service Channels	Direct, dealer, distributor	Direct, dealer, distributor	Direct, dealer, distributor
<b>Pricing</b>	\$8,995	\$10,495	\$25,995
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time



Vendor Model	Computer Systems PC/88	Computone Systems CC3 (Models 405, 410, 415)	Computone Systems CC3/MP (Models 43S, 86S, 129S)
<b>Class</b>	Desktop or rackmount	Desktop	Desktop
<b>Users/Tasks</b>	8-16/8	4/Multi	104/Multi
<b>Main Unit</b>			
Main Processor	Intel 8088; Intel 80286 (opt.)	Intel 8086	Intel 8086
Word Size (bits)	16/8; 16/16	16/16	16/16
Clock Rate (MHz)	4; 8	8	8
Other Processors	Intel 8087 co-processor, graphics processor (opt.)	—	Intel 80186 disk controller
<b>Memory</b>			
RAM Min/Max (bytes)	128K/1M	128K/512K	256K/13M
RAM Increments (bytes)	64K	128K	128K, 384K, 512K
ROM (bytes)	32K and up	—	—
<b>Diskette Storage</b>			
No. of Drives	2	1	NA
Size (in.) & Format	5.25, 3.5 DSDD	5.25 DSDD	NA
Capacity (bytes)	256K-1M	730K	NA
Access Time (msec)	—	158	NA
<b>Hard Disk Storage</b>			
No. of Drives	1-4 external (opt.)	1	1-3
Capacity (bytes)	10M, 300M	5M (405), 10M (410), 15M (415)	43M (43S), 86M (86S), 129M (129S)
Access Time (msec)	—	68	30
<b>Other Storage</b>	64K and up EPROM, bubble memory	—	22MB streaming tape backup
<b>Display</b>			
Size and Type	9-in. to 25-in. CRT ; LCD (opt.)	12-in. CRT (intelligent terminal)	13-in. CRT (intelligent terminal)
Text Display (lines x col)	25 x 80, 40 x 132; 25 x 80 (LCD)	25 x 88, 30 x 132	25 x 80, 30 x 132
Character Matrix (dots)	—	9 x 12, 6 x 10	9 x 12, 6 x 10
Resolution (pixels)	Up to 1024 x 1024 CRT; 640 x 480/1024 (LCD)	784 x 300	784 x 300
Screen Attributes	—	Reverse video; graphics (opt.)	Reverse video; graphics (opt.)
Colors (simul/palette)	128/2048 RGB CRT; 16/256 (LCD)	Monochrome	Monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Separate	Separate
No. of Keys	82	97	97
Cursor Control	—	4-key column in numeric pad	4-key column in numeric pad
No. of Function Keys	16	17	17
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	7	—	32
Serial Ports	1-8 RS-232C	4 RS-232C/422	4-104 RS-232C/422
Parallel Ports	1-8	1	1-26 Centronics
Special Output Ports	1-4 IEEE-488, 1-2 RGB, 1-2 composite video, 1 audio output; A/D to D/A (opt.)	NA	1-104 composite video
Special Input Ports	Light pen and mouse (opt.)	NA	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	Std (TTY)
Synchronous	Opt. (SNA, SDLC, bisync)	NA	NA
Internal Modem	Opt.	NA	NA
<b>Software</b>			
Operating Systems	DOS, CP/M; MP/M, UNIX (opt.)	CS/DOS; MS-DOS (opt.)	CS-DOS; MS-DOS (opt.)
Bundled Applications	—	—	—
Languages	BASIC, Pascal, COBOL, FORTRAN	HIBOL, BASIC, C, COBOL, FORTRAN, Pascal	HIBOL (CS-DOS), BASIC, FORTRAN (MS-DOS)
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	18 x 5 x 20	16 x 14 x 13	21 x 18.5 x 6
Weight (lbs)	30	50	50
Power Supply	115 VAC	100-115 VAC, 50/60 Hz	110-115 VAC, 50/60 Hz
<b>Sales and Service</b>			
Announced/Delivered	1984/1984	June 1983	September 1983
Sales Channels	Direct, dealer	Dealers	Dealer
Service Channels	Direct, third party	Dealers	Dealer
<b>Pricing</b>	\$1,980 (base system w/dual diskette drives, 256KB RAM, CRT and keyboard)	\$8,800 (Model 405) \$9,500 (Model 410) \$10,200 (Model 415)	\$16,093 (CC3/MP-43S) \$23,786 (CC3/MP-86S) \$28,686 (CC3/MP-129S)
<b>Comments</b>	NA	NA	Holds up to 26 controller boards, each supporting 512KB RAM and 4 users.

## Notes:

NA Not applicable

— Information unavailable at press time



Vendor Model Class Users/Tasks Main Unit	Convergent Technologies MiniFrame Plus Floor model 16/Multi	Corona Data Systems Mega PC Desktop Multi/—	Creative Micro Systems 9687 Desktop 10/128
<b>Main Processor</b>	Motorola MC 68010	Intel 8088	Motorola MC 68B09E
<b>Word Size (bits)</b>	32/16	16/8	16/8
<b>Clock Rate (MHz)</b>	10	8	8
<b>Other Processors</b>	—	6845 super-res. graphics coprocessor; Intel 8087-2 math coprocessor (opt.)	2
<b>Memory</b>			
RAM Min/Max (bytes)	512K/2M	256K/512K	64K/1M
RAM Increments (bytes)	512K	128K	—
ROM (bytes)	—	16K	4K
<b>Diskette Storage</b>			
No. of Drives	1	1	1-2
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25, 8 DSDD
Capacity (bytes)	640K	360K	635K, 1M
Access Time (msec)	—	93	—
<b>Hard Disk Storage</b>			
No. of Drives	2	1-2	1
Capacity (bytes)	13M, 26M, 50M	10M, 20M, 40M	20M
Access Time (msec)	—	—	—
<b>Other Storage</b>	55MB streaming tape (opt.)	43MB streaming tape backup, 10MB removable Winchester	NA
<b>Display</b>			
Size and Type	12-in. CRT; 12-in. graphics CRT (opt.)	14-in. CRT	14-in. CRT (opt.)
Text Display (lines x col)	29 x 80/132	25 x 80	24 x 80/132
Character Matrix (dots)	9 x 12	16 x 16	—
Resolution (pixels)	720 x 348 (graphics CRT)	640 x 400	—
Screen Attributes	Scrolling, windowing, tilt, swivel	Blinking, reverse video, underline, highlighting, text overlays graphics	—
Colors (simul/palette)	Green monochrome	Monochrome	—
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Opt. (w/CRT)
No. of Keys	98	83	—
Cursor Control	6-key cluster	4-key cluster	—
No. of Function Keys	16	10	—
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	—	9	14
Serial Ports	2-18 RS-232C; 1 RS-422	1 RS-232C on file server, 1 RS-232C per APC card	11
Parallel Ports	1 Centronics	1 Centronics	4
Special Output Ports	—	1-8 composite video	NA
Special Input Ports	Mouse on graphics terminal	—	NA
<b>Data Communications</b>			
Asynchronous	Std	Std (TTY, other third party)	Std
Synchronous	Std	Opt.	—
Internal Modem	NA	Opt.	Opt.
<b>Software</b>			
Operating Systems	CTIX (prop. impl. of UNIX)	MS DOS 2.11; CP/M, QNX, UCSD p-System (opt.)	OS-9 Level 2
Bundled Applications	—	—	—
Languages	BASIC, COBOL, C, FORTRAN-77, Pascal, RPG	C, BASIC, FORTRAN, COBOL, Pascal, FORTH	C, Pascal, COBOL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	23 x 10 x 22.5	19.86 x 18.19 x 15	—
Weight (lbs)	45	49	—
Power Supply	115/230 VAC, 47/440 Hz	115/230 VAC, 300 watts	—
<b>Sales and Service</b>			
Announced/Delivered	May 1985	August 1984/November 1984	—
Sales Channels	OEM, VAR	Distributor, OEM, private label	Direct
Service Channels	Honeywell, C3, Prime	—	—
<b>Pricing</b>	Vendor declined to give pricing	\$9,320 (diskette drive, 40M disk drive, 1 workstation) \$1,675 per additional workstation	\$5,995-\$7,795
<b>Comments</b>	NA	NA	NA

Notes:

- NA Not applicable
- Information unavailable at press time



Vendor	Creative Micro Systems	Cromemco	Cromemco
<b>Model</b>	9688	System 1	System 100
<b>Class</b>	Rackmount	Desktop	Desktop
<b>Users/Tasks</b>	8/64	1-8/Multi	8/Multi
<b>Main Unit</b>			
Main Processor	Motorola MC 6809	Motorola MC 68000	Motorola MC 68000
Word Size (bits)	8/8	32/16	32/16
Clock Rate (MHz)	2	10	10
Other Processors	—	Cromemco coprocessor; Zilog Z80	Zilog Z80; Fast Floating Point coprocessor (opt.)
<b>Memory</b>			
RAM Min/Max (bytes)	64K/655K	64K/4M	512K/4M
RAM Increments (bytes)	64K	64K, 256K, 2M	256K, 512K, 2M
ROM (bytes)	0-655K	—	8K
<b>Diskette Storage</b>			
No. of Drives	1	1-2	1
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	1M	390K	390K
Access Time (msec)	—	120	100
<b>Hard Disk Storage</b>			
No. of Drives	1	1 (opt.)	1
Capacity (bytes)	20M	21M, 52M	50M
Access Time (msec)	30	30	30
<b>Other Storage</b>	NA	32MB cartridge tape drive (opt.)	32MB streaming cartridge tape
<b>Display</b>			
Size and Type	14-in. CRT (opt.)	12-in. CRT (opt.)	12-in. CRT
Text Display (lines x col)	24 x 80/132	25 x 80	25 x 80
Character Matrix (dots)	—	7 x 9	—
Resolution (pixels)	—	720 x 384	—
Screen Attributes	—	Blinking, reverse video, underline	Blinking, reverse video, half intensity, underline
Colors (simul/palette)	—	Monochrome	Monochrome
<b>Keyboard</b>			
Keyboard Type	Opt. (w/CRT)	Detached	Detachable
No. of Keys	—	96	98
Cursor Control	—	4-key cluster	4-key cluster
No. of Function Keys	—	20	20
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	—	3-4	2
Serial Ports	10 RS-232C	1 RS-232C	1 std, 8 opt.
Parallel Ports	1 Centronics	Opt.	Opt.
Special Output Ports	NA	Opt.	Opt.
Special Input Ports	NA	—	—
<b>Data Communications</b>			
Asynchronous	—	Std	Std (TTY)
Synchronous	—	Opt.	Opt. (SNA, X.25)
Internal Modem	—	NA	NA
<b>Software</b>			
Operating Systems	Microware OS-9	CDOS, CROMIX-D	UNIX, System V, CROMIX
Bundled Applications	—	—	—
Languages	BASIC, C, Pascal, COBOL	FORTRAN, COBOL, Pascal, BASIC, C	FORTRAN, BASIC, C, Pascal, COBOL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	—	19 x 7 x 18	17.8 x 14.2 x 7
Weight (lbs)	—	46-53	51
Power Supply	120 VAC, 60 Hz	100/115/130/220/240/260 VAC, 50/60 Hz	220 watts
<b>Sales and Service</b>			
Announced/Delivered	1981	1980	July 1984
Sales Channels	Direct	Direct, distributor, dealer	Direct, distributor, dealer
Service Channels	Direct	Dealer, TRW, factory	Dealer, TRW, factory
<b>Pricing</b>	\$5,995-\$7,795	\$3,995	\$9,995
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time



<b>Vendor</b> <b>Model</b> <b>Class</b> <b>Users/Tasks</b> <b>Main Unit</b> Main Processor Word Size (bits) Clock Rate (MHz) Other Processors <b>Memory</b> RAM Min/Max (bytes) RAM Increments (bytes) ROM (bytes) <b>Diskette Storage</b> No. of Drives Size (in.) & Format Capacity (bytes) Access Time (msec) <b>Hard Disk Storage</b> No. of Drives Capacity (bytes) Access Time (msec) <b>Other Storage</b> <b>Display</b> Size and Type Text Display (lines x col) Character Matrix (dots) Resolution (pixels) Screen Attributes Colors (simul/palette) <b>Keyboard</b> Keyboard Type No. of Keys Cursor Control No. of Function Keys Numeric Pad <b>Input/Output</b> Open I/O Slots Serial Ports Parallel Ports Special Output Ports Special Input Ports <b>Data Communications</b> Asynchronous Synchronous Internal Modem <b>Software</b> Operating Systems Bundled Applications Languages <b>Physical and Electrical</b> Size (L x W x H, in.) Weight (lbs) Power Supply <b>Sales and Service</b> Announced/Delivered Sales Channels Service Channels <b>Pricing</b> <b>Comments</b>	<b>Cromemco</b> System 2 Rackmount 1-16/Multi Motorola MC 68000 32/16 10 Cromemco coprocessor; Zilog Z80 512K/16M 512K, 2M — 1-2 5.25 DSDD 390K — 1 (opt.) 21M, 52M 30 32MB cartridge tape drive (opt.) 12-in. CRT 25 x 80 7 x 9 720 x 384 Blinking, reverse video, underline Monochrome Detachable 96 4-key cluster 20 Integral 16-17 1 RS-232C Opt. Opt. — Std Opt. NA CDOS, CROMIX-D — FORTRAN, COBOL, Pascal, BASIC, C 12.75 x 19 x 20.75 56 100/115/130/220/240/260 VAC, 50/60 Hz 1977 Direct, distributor, dealer Dealer, TRW, factory \$4,695 NA	<b>Cromemco</b> System 3 Rackmount 1-16/Multi Motorola 68000 32/16 10 Cromemco coprocessor; Zilog Z80 512K/16M 256K, 512K, 2M — 1-2 8 DSDD 1.2M — 1 (opt.) 21M, 52M 30 32MB cartridge tape (opt.) 12-in. CRT (opt.) 25 x 80 7 x 9 720 x 384 Blinking, reverse video, underline — Detachable 96 4-key cluster 20 Integral 16-17 1 RS-232C Opt. Opt. — Std Opt. NA CDOS, CROMIX-D — FORTRAN, COBOL, Pascal, BASIC, C 12.75 x 19 x 20.75 84 100/115/130/220/240/260 VAC, 50/60 Hz 1978 Direct, distributor, dealer Dealer, TRW, factory \$6,995 NA	<b>Cromemco</b> System 300 Desktop 16/Multi Motorola MC 68000, Zilog Z80 32/16 10 Zilog Z80; fast Floating Point coprocessor (opt.) 512K/16M 256K, 512K, 2M 8K 1 8 DSDD 1.2M 91 1 50M 30 32MB .25-in. streaming cartridge tape 12-in. CRT 25 x 80 — — Blinking, reverse video, half intensity, underline Monochrome Detachable 98 4-key cluster 20 Integral 14 1 (std), 16 (opt.) Opt. Opt. — Std (TTY) Opt. (SNA, X.25) NA — UNIX System V, CROMIX — FORTRAN, BASIC, C, Pascal, COBOL 20.75 x 19 x 12.25 92 550 watts July 1984 Direct, dealer, distributor Dealer, TRW, factory \$12,995 NA
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Notes:  
 NA Not applicable  
 — Information unavailable at press time



Vendor	Cromemco	CYB Systems	CYB Systems
<b>Model</b>	System 400	Unite 16i	Unite 32i
<b>Class</b>	Floor model	Tabletop	Table top/Rackmount
<b>Users/Tasks</b>	Multi/Multi	1-16/—	1-32/—
<b>Main Unit</b>			
Main Processor	Motorola MC 68010	Motorola MC 68010	Motorola MC 68010
Word Size (bits)	32/16	32/16	32/16
Clock Rate (MHz)	10	10	10
Other Processors	Opt.	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	4M/16M	2.1M/12M	2.1M/12M
RAM Increments (bytes)	256K, 512K, 2M	512K, 1M	512K, 1M
ROM (bytes)	8K	—	—
<b>Diskette Storage</b>			
No. of Drives	1	1 (opt.)	1-2 (opt.)
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	390K	1M	1M
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1-2	1-3	1
Capacity (bytes)	140M	54M	168M
Access Time (msec)	—	—	20
<b>Other Storage</b>	32MB .25-in. cartridge tape	45MB streaming cartridge tape	45MB streaming cartridge tape (std); 9-track reel to reel magnetic tape (opt.), 474MB external 8-in. SMD disk (opt.)
<b>Display</b>			
Size and Type	12-in. CRT	Third party	Third party
Text Display (lines x col)	25 x 80	NA	NA
Character Matrix (dots)	—	NA	NA
Resolution (pixels)	—	NA	NA
Screen Attributes	Blinking, reverse video, half intensity, underline	NA	NA
Colors (simul/palette)	Monochrome	NA	NA
<b>Keyboard</b>			
Keyboard Type	Detachable	Third party	Third party
No. of Keys	98	NA	NA
Cursor Control	4-key cluster	NA	NA
No. of Function Keys	20	NA	NA
Numeric Pad	Integral	NA	NA
<b>Input/Output</b>			
Open I/O Slots	21	4	10
Serial Ports	1 (std), 16 (opt.)	2-18 RS-232C	2-34 RS-232C
Parallel Ports	Opt.	—	—
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std	Std
Synchronous	Opt. (X.25, SNA)	NA	NA
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	UNIX System V, CROMIX	UNIX System V	UNIX System V
Bundled Applications	—	—	—
Languages	FORTRAN, BASIC, C, Pascal, COBOL	C, BASIC, ADA, FORTRAN, Pascal, RM/COBOL, Philon FAST/COBOL, FAST-C, FAST-M	C, Pascal, ADA, FORTRAN, BASIC, RM/COBOL; Philon FAST/COBOL, FAST/BASIC, FAST BASIC-C, FAST BASIC-M
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	—	27 x 17 x 8.5	27 x 17 x 8.5
Weight (lbs)	115	35-60	75-85
Power Supply	500 watts	250 or 400 watts	400 watts
<b>Sales and Service</b>			
Announced/Delivered	January 1985/February 1985	June 1984	July 1984
Sales Channels	Same	Direct, dealer, distributor	Distributor, direct
Service Channels	Same	Remote maintenance, dealer	Remote maintenance
<b>Pricing</b>	\$24,995-\$30,995	\$24,445	\$49,995 (32 user system)
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time



<p><b>Vendor</b> <b>Model</b> <b>Class</b> <b>Users/Tasks</b> <b>Main Unit</b> Main Processor Word Size (bits) Clock Rate (MHz) Other Processors <b>Memory</b> RAM Min/Max (bytes) RAM Increments (bytes) ROM (bytes) <b>Diskette Storage</b> No. of Drives Size (in.) &amp; Format Capacity (bytes) Access Time (msec) <b>Hard Disk Storage</b> No. of Drives Capacity (bytes) Access Time (msec) <b>Other Storage</b>  <b>Display</b> Size and Type Text Display (lines x col) Character Matrix (dots) Resolution (pixels) Screen Attributes Colors (simul/palette) <b>Keyboard</b> Keyboard Type No. of Keys Cursor Control No. of Function Keys Numeric Pad <b>Input/Output</b> Open I/O Slots Serial Ports Parallel Ports Special Output Ports Special Input Ports <b>Data Communications</b> Asynchronous Synchronous Internal Modem <b>Software</b> Operating Systems Bundled Applications Languages  <b>Physical and Electrical</b> Size (L x W x H, in.) Weight (lbs) Power Supply <b>Sales and Service</b> Announced/Delivered Sales Channels Service Channels <b>Pricing</b> <b>Comments</b></p>	<p><b>CYB Systems</b> Unite 4i Desktop 1-4/—  Motorola MC 68010 32/16 16 8  1.1M/2.1M 512K or 1M —  1 5.25 DSDD 1M —  1  26M, 40M — —  Third party NA NA NA NA NA NA  Third party NA NA NA NA NA  Std NA NA  UNIX System V  Unite Networking Software C, BASIC, ADA, FORTRAN, Pascal, Philon FAST/ COBOL, RM/COBOL  16 x 20.75 x 4 32 130 watts  July 1984 Dealer, direct Dealer, remote maintenance \$11,108 NA</p>	<p><b>CYB Systems</b> Unite 8i Desktop 1-8/—  Motorola MC 68010 32/16 10 —  1.1M/12M 512K, 1M —  1 (opt.) 5.25 DSDD 1M —  1 (full-height) or 3 (half-height) 54M (full-height); 40M (half-height) — 45MB streaming cartridge (opt.)  Third party NA NA NA NA NA NA  Third party NA NA NA NA NA  Std NA NA  UNIX System V  C, BASIC, FORTRAN, ADA, Pascal, RM/COBOL, Philon FAST/COBOL, FAST-C, FAST-M  16 x 20.75 x 7.5 40 200 watts  June 1984/June 1984 Direct, dealer, distributor Remote maintenance, dealer \$16,995 NA</p>	<p><b>CYB Systems</b> WorkManager II Table top, rackmount 32/16  Motorola MC 68010 16/— 10 —  2.1M/12M 512K, 1M —  1 5.25 DSDD 1M —  1-3  54M — 168MB SMD disk, 45MB streaming cartridge tape, .5-in. reel-to-reel tape (opt.)  Third party NA NA NA NA NA NA  Third party NA NA NA NA NA  Std NA NA  UNIX System V; RM/COS (opt.)  C, BASIC, ADA, FORTRAN, Pascal, RM/COBOL; Philon FAST/COBOL, FAST/ BASIC-C, FAST/BASIC-M  27 x 17 x 8.5 35-60 250 watts  April 1984 Distributor, direct Remote maintenance \$18,995 (16 user system) NA</p>
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Notes:  
NA Not applicable  
— Information unavailable at press time





<b>Vendor</b> <b>Model</b> <b>Class</b> <b>Users/Tasks</b> <b>Main Unit</b> Main Processor Word Size (bits) Clock Rate (MHz) Other Processors <b>Memory</b> RAM Min/Max (bytes) RAM Increments (bytes) ROM (bytes) <b>Diskette Storage</b> No. of Drives Size (in.) & Format Capacity (bytes) Access Time (msec) <b>Hard Disk Storage</b> No. of Drives Capacity (bytes) Access Time (msec) <b>Other Storage</b>  <b>Display</b> Size and Type Text Display (lines x col) Character Matrix (dots) Resolution (pixels) Screen Attributes Colors (simul/palette) <b>Keyboard</b> Keyboard Type No. of Keys Cursor Control No. of Function Keys Numeric Pad <b>Input/Output</b> Open I/O Slots Serial Ports Parallel Ports Special Output Ports Special Input Ports <b>Data Communications</b> Asynchronous Synchronous Internal Modem <b>Software</b> Operating Systems  Bundled Applications Languages  <b>Physical and Electrical</b> Size (L x W x H, in.) Weight (lbs) Power Supply <b>Sales and Service</b> Announced/Delivered Sales Channels Service Channels <b>Pricing</b>  <b>Comments</b>	<b>CYB Systems</b> WorkManager III Table top/rackmount 1, 16/—  Motorola MC 68000 32/16 10 —  2.1M/12M 512K, 1M —  1 5.25 DSDD 1M —  1-3 54M — 168MB SMD disk, 45MB streaming cartridge tape, .5-in. reel-to-reel tape (opt.)  Third party NA NA NA NA NA NA  Third party NA NA NA NA NA  Third party NA NA NA NA  6 2-18 RS-232C — Ethernet —  Std NA NA  UNIX System V; RM/COS  — C, BASIC, ADA, Pascal, FORTRAN, RM/COBOL, Philon FAST/COBOL, FAST/BASIC-C, FAST/ BASIC-M  27 x 17 x 8.5 35-60 400 watt  April 1984 OEM/Direct Remote maintenance Contact vendor  NA	<b>CYB Systems</b> WorkMaster Table top/Rackmount 1-16/—  Motorola MC 68010 32/16 10 —  2.1M/12M 512K, 1M —  1-2 5.25 DSDD 1M —  1 168M 20 468MB 8-in. SMD disks, 45MB cartridge tape, .5-in. reel-to-reel tape (opt.)  Third party NA NA NA NA NA  Third party NA NA NA NA  — 2-18 RS-232C — — —  Std NA NA  UNIX System V  — C, Pascal, ADA, FORTRAN, BASIC, RM/COBOL; Philon FAST/COBOL, FAST/ BASIC, FAST/BASIC-C, FAST/BASIC-M  27 x 17 x 8.5 75-85 400 watts  April 1984 OEM, direct Remote maintenance \$38,750 OEM quantity-one price NA	<b>CYB Systems</b> WorkMate I Desktop 1-4/—  Motorola MC 68010 32/16 8 —  1.1M/2.1M 512K, 1M —  1 5.25 DSDD 1M —  1 26M; 40M (opt.) —  Third party NA NA NA NA NA  Third party NA NA NA NA  1 2-8 RS-232C 1 Centronics 1 Ethernet —  Std NA NA  UNIX System V; RM/COS (opt.)  — C, BASIC, FORTRAN, Pascal, ADA, RM/COBOL, Philon FAST/COBOL, FAST/BASIC-C, FAST/ BASIC-M, FAST/C  16 x 20.75 x 4 32 130 watts  July 1984 Dealer, direct Dealer, remote maintenance \$10,108 (single-user system) \$11,108 (4 user system) NA
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## Notes:

NA Not applicable

— Information unavailable at press time



<p><b>Vendor Model</b></p> <p><b>Class</b></p> <p><b>Users/Tasks</b></p> <p><b>Main Unit</b></p> <p>  Main Processor</p> <p>  Word Size (bits)</p> <p>  Clock Rate (MHz)</p> <p>  Other Processors</p> <p><b>Memory</b></p> <p>  RAM Min/Max (bytes)</p> <p>  RAM Increments (bytes)</p> <p>  ROM (bytes)</p> <p><b>Diskette Storage</b></p> <p>  No. of Drives</p> <p>  Size (in.) &amp; Format</p> <p>  Capacity (bytes)</p> <p>  Access Time (msec)</p> <p><b>Hard Disk Storage</b></p> <p>  No. of Drives</p> <p>  Capacity (bytes)</p> <p>  Access Time (msec)</p> <p><b>Other Storage</b></p> <p><b>Display</b></p> <p>  Size and Type</p> <p>  Text Display (lines x col)</p> <p>  Character Matrix (dots)</p> <p>  Resolution (pixels)</p> <p>  Screen Attributes</p> <p>  Colors (simul/palette)</p> <p><b>Keyboard</b></p> <p>  Keyboard Type</p> <p>  No. of Keys</p> <p>  Cursor Control</p> <p>  No. of Function Keys</p> <p>  Numeric Pad</p> <p><b>Input/Output</b></p> <p>  Open I/O Slots</p> <p>  Serial Ports</p> <p>  Parallel Ports</p> <p>  Special Output Ports</p> <p>  Special Input Ports</p> <p><b>Data Communications</b></p> <p>  Asynchronous</p> <p>  Synchronous</p> <p><b>Internal Modem</b></p> <p><b>Software</b></p> <p>  Operating Systems</p> <p>  Bundled Applications</p> <p>  Languages</p> <p><b>Physical and Electrical</b></p> <p>  Size (L x W x H, in.)</p> <p>  Weight (lbs)</p> <p>  Power Supply</p> <p><b>Sales and Service</b></p> <p>  Announced/Delivered</p> <p>  Sales Channels</p> <p>  Service Channels</p> <p><b>Pricing</b></p> <p><b>Comments</b></p>	<p><b>CYB Systems</b></p> <p>WorkMate II</p> <p>Desktop</p> <p>1-8/—</p> <p>Motorola MC 68010</p> <p>32/16</p> <p>10</p> <p>—</p> <p>256K/2.5M</p> <p>512K, 1M</p> <p>—</p> <p>1</p> <p>5.25 DSDD</p> <p>1M</p> <p>—</p> <p>1-3</p> <p>40M</p> <p>—</p> <p>45MB streaming cartridge tape (opt.)</p> <p>Third party</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>Third party</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>3</p> <p>2-10 RS-232C</p> <p>—</p> <p>—</p> <p>—</p> <p>Std</p> <p>NA</p> <p>NA</p> <p>UNIX System V; RM/COS (opt.)</p> <p>—</p> <p>C, BASIC, FORTRAN, Pascal, ADA RM/COBOL; Philon FAST/COBOL, FAST/BASIC-C, FAST/BASIC-M, FAST/C</p> <p>16 x 20.75 x 5.63</p> <p>40</p> <p>200 watts</p> <p>June 1984</p> <p>Dealer, direct</p> <p>Dealer, remote maintenance</p> <p>\$15,995 (8 user system)</p> <p>NA</p>	<p><b>Data General</b></p> <p>DESKTOP GENERATION Series, Models 10 &amp; 10/SP</p> <p>Desktop</p> <p>8/Multi</p> <p>Data General microECLIPSE</p> <p>16/16</p> <p>16</p> <p>Intel 8086</p> <p>128K (10), 256K (10/SP)/1.75M</p> <p>256K, 512K</p> <p>16K</p> <p>1-2</p> <p>5.25 SS or DS</p> <p>368K</p> <p>—</p> <p>0-2</p> <p>15M, 38.6M, 71M</p> <p>—</p> <p>18MB cartridge tape</p> <p>Several models avail.</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>Monochrome or color</p> <p>Several models avail.</p> <p>—</p> <p>—</p> <p>—</p> <p>Integral</p> <p>3-8</p> <p>1 (std), add'l. (opt.)</p> <p>1 (opt.)</p> <p>1 IEEE-488, Ethernet</p> <p>Tablet, mouse</p> <p>Opt.</p> <p>Opt. (DG XODIAC, SNA; IBM X.25, HASP, RJE80, 3270)</p> <p>NA</p> <p>MS-DOS, CP/M-86, DG AOS, DG RDOS</p> <p>NA</p> <p>Extended and Business BASIC, COBOL, FORTRAN, Pascal</p> <p>12 x 4.5 x 9</p> <p>NA</p> <p>120 VAC, 47/63 Hz</p> <p>July 1983</p> <p>Direct</p> <p>Direct</p> <p>\$11,705 (Model 10)</p> <p>\$4,200-\$13,995 (Model 10/SP)</p> <p>NA</p>	<p><b>Data General</b></p> <p>DESKTOP GENERATION Series, Model 20</p> <p>Desktop</p> <p>8/Multi</p> <p>ECLIPSE S/20</p> <p>16/16</p> <p>16</p> <p>NA</p> <p>256K/2M</p> <p>256K, 512K</p> <p>16K</p> <p>1-2</p> <p>5.25 SS or DS</p> <p>368K</p> <p>—</p> <p>1-2</p> <p>15M, 38.6M, 71M</p> <p>—</p> <p>18MB cartridge tape drive</p> <p>Several models avail.</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>Monochrome or RGB</p> <p>Several models avail.</p> <p>—</p> <p>—</p> <p>—</p> <p>Integral</p> <p>2-7</p> <p>1 (std), add'l. (opt.)</p> <p>1 (opt.)</p> <p>1 IEEE-488, Ethernet</p> <p>—</p> <p>Opt.</p> <p>Opt. (DG XODIAC, SNA; IBM X.25, HASP, RJE80, 3270, 2780/3780; D200)</p> <p>NA</p> <p>DG RDOS and DG AOS</p> <p>NA</p> <p>Extended and Business BASIC, COBOL, FORTRAN, Pascal</p> <p>12 x 4.5 x 9</p> <p>58</p> <p>120 VAC, 47/63 Hz</p> <p>July 1983</p> <p>Direct</p> <p>Direct</p> <p>\$8,520-\$18,770</p> <p>NA</p>
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Notes:  
 NA Not applicable  
 — Information unavailable at press time



Vendor Model	Data General DESKTOP GENERATION Series, Model 30 Desktop 8/Multi	Data General DESKTOP GENERATION Series, Model 45 Desktop 8/Multi	Data General microNOVA
<b>Class</b>			Floor model
<b>Users/Tasks</b>			18/Multi
<b>Main Unit</b>			
Main Processor	Data General microECLIPSE	Motorola MC 68000; Data General microECLIPSE	Data General mN602
Word Size (bits)	16/16	32/16; 16/16	16/16
Clock Rate (MHz)	16	16; 16	—
Other Processors	Floating point processor (opt.)	NA	—
<b>Memory</b>			
RAM Min/Max (bytes)	512K/2M	512K/4M	32K/128K
RAM Increments (bytes)	512K	512K, 1M, 2M	8K, 16K, 32K, 64K
ROM (bytes)	16K	16K	8K/32K PROM
<b>Diskette Storage</b>			
No. of Drives	1-2	1-2	1-2
Size (in.) & Format	5.25 SS or DS	5.25 SS or DS	—
Capacity (bytes)	368K	368K	1.26M
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1-2	1-2	1
Capacity (bytes)	15M, 38.6M, 71M	15M, 38.6M, 71M	5M, 15M, 25M
Access Time (msec)	—	—	—
<b>Other Storage</b>	18MB cartridge tape	18MB cartridge tape	Streaming tape (opt.)
<b>Display</b>			
Size and Type	Several models avail.	Several models avail.	12-in. CRT; 12-in. graphics CRT
Text Display (lines x col)	—	—	24 x 80
Character Matrix (dots)	—	—	7 x 11
Resolution (pixels)	—	—	640 x 240 (graphics CRT)
Screen Attributes	—	—	Blinking, reverse video, brightness, underscore
Colors (simul/palette)	Monochrome or RGB	Monochrome or RGB	Green monochrome; 16 levels brightness (graphics CRT)
<b>Keyboard</b>			
Keyboard Type	Several models avail.	Several models avail.	Detachable
No. of Keys	—	—	96 characters
Cursor Control	—	—	4-key cluster
No. of Function Keys	—	—	15
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	2-7	—	8 (total)
Serial Ports	1 (std), add'l. (opt.)	1 (std), add'l. (opt.)	2
Parallel Ports	1 (opt.)	1 (opt.)	—
Special Output Ports	1 IEEE-488, 1 Ethernet	1 IEEE-488, Ethernet	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Opt.	Opt.	Opt.
Synchronous	Opt. (DG XODIAC, SNA; IBM X.25, HASP, RJE80, 3270, 2780/3780; D200)	Opt. (TCP/IP, uucp)	Opt. (IBM BSC, 2780/3780, 3270 RJE, HASP; X.25)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	DG RDOS, DG AOS	DESKTOP/UX	MP/OS, DOS
Bundled Applications	NA	—	—
Languages	Extended and Business BASIC, COBOL, FORTRAN, Pascal	Extended and Business BASIC, COBOL, FORTRAN, Pascal	BASIC, DG/L, FORTRAN, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	12 x 4.5 x 9	12 x 4.5 x 9	19 x 15.8 x 5.25
Weight (lbs)	—	NA	23-27
Power Supply	120 VAC, 47/63 Hz	120 VAC, 47/63 Hz	47-63 Hz, 120 VAC
<b>Sales and Service</b>			
Announced/Delivered	July 1983	April 1985	1979
Sales Channels	Direct	Direct	Direct, distributor
Service Channels	Direct	Direct	—
<b>Pricing</b>	\$11,570-\$21,820	\$11,845 (w/512KB RAM, diskette and 15MB disk drives)	\$4,200 (w/32KB RAM)
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time



<b>Vendor</b>	<b>Datapoint</b>	<b>Datapoint</b>	<b>Davidge</b>
<b>Model</b>	1560	3200	System I
<b>Class</b>	Desktop	Floor model	Desktop
<b>Users/Tasks</b>	5/5	28/Multi	1-4/1-4
<b>Main Unit</b>			
Main Processor	Zilog Z80A	Motorola MC 68000	Zilog Z80B
Word Size (bits)	8/8	32/16	8/8
Clock Rate (MHz)	4	12.5	6
Other Processors	NA	Motorola MC 68000 for I/O operations	Intel 8086
<b>Memory</b>			
RAM Min/Max (bytes)	128K/128K	1M/8M	64K/256K
RAM Increments (bytes)	NA	1M, 4M	64K
ROM (bytes)	12K	—	2K-128K
<b>Diskette Storage</b>			
No. of Drives	2	1	NA
Size (in.) & Format	8 DSDD	8 DSDD	NA
Capacity (bytes)	1M	1M	NA
Access Time (msec)	—	—	NA
<b>Hard Disk Storage</b>			
No. of Drives	1	1 (std); 1 (opt.)	NA
Capacity (bytes)	20MB	32M; 120M (opt.)	NA
Access Time (msec)	—	—	NA
<b>Other Storage</b>	NA	45MB streaming tape, 4KB cache memory	NA
<b>Display</b>			
Size and Type	12-in. CRT	Third party	Third party
Text Display (lines x col)	24 x 80	—	NA
Character Matrix (dots)	5 x 7	—	NA
Resolution (pixels)	—	—	NA
Screen Attributes	Highlighting, inverse video, two-level video	—	NA
Colors (simul/palette)	Monochrome	—	NA
<b>Keyboard</b>			
Keyboard Type	Detachable	Third party	Third party
No. of Keys	76	—	NA
Cursor Control	4-key cluster	—	NA
No. of Function Keys	10	—	NA
Numeric Pad	Integral	—	NA
<b>Input/Output</b>			
Open I/O Slots	—	4-28	—
Serial Ports	2 RS-232C	4 or 12 (std), 12 additional (opt.)	2-4
Parallel Ports	NA	1	1
Special Output Ports	—	—	—
Special Input Ports	ARCNET interface	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Opt.	Std
Synchronous	Std (Burroughs Poll Select, 3780/2780, 3270 SNA, bisync, Honeywell VIP)	Opt. (IBM 2780/3780, ARC network)	Opt.
Internal Modem	Std	NA	NA
<b>Software</b>			
Operating Systems	Datapoint DOS; CP/M (opt.)	UNOS	CP/M 2.2; CP/M 3.0, MP/M II (opt.)
Bundled Applications	DOS, Multiplan, WP, ARC networking	—	NA
Languages	FORTRAN, BASIC, DATABUS, COBOL, Pascal	C, DATABUS (prop.), RM/COBOL	All CP/M compatible
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	22.7 x 20 x 12.4	26 x 8 x 22	—
Weight (lbs)	54	26	21
Power Supply	115/230 VAC, 50/60 Hz, 300 watts	115/230 VAC, 50/60 Hz	115 VAC, 60 Hz
<b>Sales and Service</b>			
Announced/Delivered	—	November 1984/—	January 1982/January 1982
Sales Channels	Direct, distributor	Direct	Direct, distributor
Service Channels	Datapoint Worldwide Service	Direct	Factory
<b>Pricing</b>	\$2,400-\$8,950	\$16,845	\$475
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time

<b>Vendor</b>	<b>Davidge</b>	<b>Davidge</b>	<b>Digital Equipment</b>
<b>Model</b>	System III	System IV	MicroPDP-11/23
<b>Class</b>	Desktop	Desktop	Desktop, floor model
<b>Users/Tasks</b>	1-4/1-4	1-4/1-4	2-6/5
<b>Main Unit</b>			
Main Processor	Zilog Z80B	Zilog Z80B	Digital Equipment F-11
Word Size (bits)	8/8	8/8	16/16
Clock Rate (MHz)	6	6	13.8
Other Processors	Intel 8086	Intel 8086	—
<b>Memory</b>			
RAM Min/Max (bytes)	64K/256K	64K/256K	512K/4M
RAM Increments (bytes)	64K	64K	512K, 1M, 2M
ROM (bytes)	2K-128K	2K-128K	8K
<b>Diskette Storage</b>			
No. of Drives	1-2	2	2
Size (in.) & Format	5.25 DSDD	8 DSDD	5.25
Capacity (bytes)	700K	1,200K (formatted)	400K
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1 (opt.)	1
Capacity (bytes)	10M	10M	11M, 31M
Access Time (msec)	—	—	85, 45.5
<b>Other Storage</b>	—	—	—
<b>Display</b>			
Size and Type	Third party	Third party	12-in. CRT (opt.)
Text Display (lines x col)	NA	NA	24 x 80/132
Character Matrix (dots)	NA	NA	7 x 9
Resolution (pixels)	NA	NA	—
Screen Attributes	NA	NA	Scrolling, split screen, reverse image
Colors (simul/palette)	NA	NA	White, green, or amber monochrome
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Detachable
No. of Keys	NA	NA	105
Cursor Control	NA	NA	Inverted T
No. of Function Keys	NA	NA	12
Numeric Pad	NA	NA	Integral
<b>Input/Output</b>			
Open I/O Slots	—	—	4
Serial Ports	2-4	2-4	2-6
Parallel Ports	1	1	—
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std	Std	Opt.
Synchronous	Opt.	Opt.	Opt. (IBM 2780/3780, 3271, 3277; SNA, X.25, UN 1004, DECnet)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	CP/M 2.2; CP/M 3.0, MP/M-II (opt.)	CP/M 2.2; CP/M 3.0, MP/M-II (opt.)	RT-11, CTS-300, Micro-RSX, Micro-RSTS/E, DSM11, Ultrix-11
Bundled Applications	NA	NA	—
Languages	All CP/M compatible	All CP/M compatible	FORTRAN, COBOL-81, BASIC-2, C, DIBOL, Pascal, CORAL, MACRO, MUMPS
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	—	14 x 7.5 x 6.5	28.5 x 22.25 x 6 (desktop), 28.5 x 10 x 24.5 (floor model)
Weight (lbs)	21	21	70 (desktop & floor model), 55 (rackmount)
Power Supply	115 VAC, 60 Hz	115 VAC, 60 Hz	120/240 VAC, 50/60 Hz, 345 watts
<b>Sales and Service</b>			
Announced/Delivered	April 1983/April 1983	February 1983/February 1983	—
Sales Channels	Direct, distributor	Direct, distributor	OEM, dealer, Digital Business Centers
Service Channels	Factory	Factory	Digital Equipment, dealer, OEM
<b>Pricing</b>	\$1,539	\$1,195	—
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time



<b>Vendor Model Class</b>	<b>Digital Equipment</b> MicroPDP-11/73 Desktop, floor model 4-12/8	<b>Digital Equipment</b> MicroPDP-11/RC Desktop, floor model 8-12/10	<b>Digital Equipment</b> MicroPDP-11/SV Desktop, floor model 1-4/4
<b>Users/Tasks</b>			
<b>Main Unit</b>			
Main Processor	Digital Equipment J-11	Digital Equipment J-11	Digital Equipment F-11
Word Size (bits)	16/16	16/—	16/16
Clock Rate (MHz)	15	15	13.8
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	512K/4M	512K/4M	512K/4M
RAM Increments (bytes)	256K, 512K	512K, 1M, 2M	512K, 1M, 2M
ROM (bytes)	32K	—	8K
<b>Diskette Storage</b>			
No. of Drives	1-2	2	1-2
Size (in.) & Format	5.25	5.25	5.25
Capacity (bytes)	400K	400K	400K
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	11M, 31M	52M	11M, 31M
Access Time (msec)	—	—	85, 45.5
<b>Other Storage</b>	8KB cache memory; 60 MB streaming tape (opt.)	—	—
<b>Display</b>			
Size and Type	12-in. CRT (opt.)	Third party	12-in. CRT (opt.)
Text Display (lines x col)	24 x 80/132	—	24 x 80/132
Character Matrix (dots)	7 x 9	—	7 x 9
Resolution (pixels)	—	—	—
Screen Attributes	Scroll, split screen, rev image	—	—
Colors (simul/palette)	White, green, amber mono	—	—
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	105	105	105
Cursor Control	Inverted T	Inverted T	Inverted T
No. of Function Keys	12	12	12
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	4	—	1
Serial Ports	9	2	2
Parallel Ports	—	—	—
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Opt.	—	Opt.
Synchronous	Opt. (IBM 2780/3780, 3271, 3277; SNA, X.25, UN1004, DECnet)	—	Opt. (IBM 2780/3780, 3271, 3277, SNA; Ethernet, X.25, UN 1004)
Internal Modem	—	—	—
<b>Software</b>			
Operating Systems	RT-11, CTS-300, Micro-RSX, Micro-RSTS/E, DSM11, Ultrix-11	RT-11, CTS-300, Micro-RSX, Micro-RSTS/E, DSM11, Ultrix-11	RT-11, CTS-300, Micro-RSX, Micro-RSTS/E, DSM11, Ultrix-11
Bundled Applications Languages	FORTRAN, COBOL-81, BASIC-2, C, DIBOL, Pascal, CORAL, MACRO, MUMPS	FORTRAN, COBOL-81, BASIC-2, C, DIBOL, Pascal	FORTRAN, COBOL-81, BASIC-2, C, DIBOL, Pascal, CORAL, MACRO, MUMPS
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	28.5 x 22.25 x 6 (desktop)	—	28 x 22 x 6 (desk), 25 x 19 x 5 (rack)
Weight (lbs)	70 (desk & floor), 55 (rack)	—	70 (desk & floor), 55 (rack)
Power Supply	120/240 VAC, 50/60 Hz, 320 watts	—	120/240 VAC, 50/60 Hz, 320 watts
<b>Sales and Service</b>			
Announced/Delivered	—	September 1984/December 1984	January 1985/January 1985
Sales Channels	OEM, dealer, Digital Business Centers	OEM, dealer, Digital Business Centers	OEM, dealer, Digital Business Centers
Service Channels	Digital Equipment, dealer, OEM	Digital Equipment, dealer, OEM	Digital Equipment, dealer, OEM
<b>Pricing</b>	\$7,950 (floor model w/512KB RAM, before addition of disks & monitor)	—	\$5,995 (w/512KB RAM, diskette & 11MB disk) \$7,495 (w/512KB RAM, diskette & 31MB disk)
<b>Comments</b>	NA	NA	Entry level to and compatible with MicroPDP-11 family

Notes:  
 NA Not applicable  
 — Information unavailable at press time



Vendor Model Class	Digital Equipment MicroVAX I Desktop, floor model, rackmount	Digital Equipment MicroVAX II Floor model	Dual Systems 83/500 Floor model
<b>Users/Tasks</b>	12/Multi	1-30/Multi	2-16/40
<b>Main Unit</b>			
Main Processor	Digital Equipment KD 32	Digital Equipment MicroVAX 78032	Motorola MC 68000
Word Size (bits)	32/16	32/32	16/16
Clock Rate (MHz)	—	40	10
Other Processors	—	Digital Equipment MicroVAX 78132 floating point proc	—
<b>Memory</b>			
RAM Min/Max (bytes)	512K/4M	1M/9M	1M/6M
RAM Increments (bytes)	256K, 512K, 1M	1M, 2M, 4M	512K, 1M
ROM (bytes)	8K	Std	64K
<b>Diskette Storage</b>			
No. of Drives	2	1-2	1
Size (in.) & Format	5.25	5.25	8 DSDD
Capacity (bytes)	400K	400	1.6M
Access Time (msec)	—	—	90
<b>Hard Disk Storage</b>			
No. of Drives	1	1-2 (1 external, opt.)	1-2
Capacity (bytes)	11M, 31M	31M, 71M	512MB
Access Time (msec)	—	49	25
<b>Other Storage</b>	8KB cache memory, 95MB streaming tape	95MB cartridge tape	30MB 9-track tape
<b>Display</b>			
Size and Type	12-in. CRT	12-in. CRT	14-in. CRT (Kimtron, opt.)
Text Display (lines x col)	24 x 80/132	24 x 80/132	25 x 80
Character Matrix (dots)	7 x 9	7 x 9	7 x 9
Resolution (pixels)	—	—	—
Screen Attributes	Scroll, split screen, rev image	Scrol, split screen, rev image	Inverse video, blinking, half intensity, underline
Colors (simul/palette)	White, green, or amber mono	White, green, or amber mono	Amber or green monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	83	83	98
Cursor Control	4-key row	4-key row	4-key row
No. of Function Keys	15	15	10
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	5	12 total	10
Serial Ports	1-13	1-23	8-16
Parallel Ports	NA	NA	—
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std (ASCII, TTY)	Std (ASCII, TTY)	Std (TTY, UUCP)
Synchronous	Opt. (IBM 2780/3780, SNA; X.25, X.29, DecNet, Ethernet)	Opt. (IBM 2780/3780, SNA; X.25, X.29, DECNet, Ethernet)	—
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	MicroVMS, ULTRIX-32, VAXELN	MicroVMS, ULTRIX-32, VAXELN	UNIX System V
Bundled Applications Languages	—	—	C programming language
	APL, BASIC, C, COBOL, DIBOL, FORTRAN, Pascal, RPG	APL, BASIC, C, COBOL, DIBOL, FORTRAN, Pascal, RPG	COBOL, FORTRAN, BASIC, FORTH, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	28.5 x 22.25 x 6 (desk), 28.5 x 10 x 24.5 (floor), 25.5 x 19 x 5.25 (rack)	28.5 x 10 x 24.5 or 27.5 x 13 x 24.5	53 x 24 x 43
Weight (lbs)	55 (rackmount)	53	580-720
Power Supply	120/240 VAC, 50/60 Hz, 230 watts	120 VAC, 50/60 Hz, 345 watts	115 VAC, 60 Hz
<b>Sales and Service</b>			
Announced/Delivered	—	May 1985	1984/1984
Sales Channels	Direct, dealer, OEM	Direct, distributor, OEM	Direct, distributor
Service Channels	Direct, dealer, OEM	Direct	Factory, Breagan
<b>Pricing</b>	\$10,145 (before addition of monitor & disk drives)	\$18,840 to \$43,000	\$51,610 (w/2MB RAM, 513MB disk, 8 ports, diskette drive, UNIX, C)
<b>Comments</b>	NA	CPU is on a single chip	NA

## Notes:

NA Not applicable

— Information unavailable at press time



<b>Vendor</b> <b>Model</b> <b>Class</b> <b>Users/Tasks</b> <b>Main Unit</b> Main Processor Word Size (bits) Clock Rate (MHz) Other Processors  <b>Memory</b> RAM Min/Max (bytes) RAM Increments (bytes) ROM (bytes) <b>Diskette Storage</b> No. of Drives Size (in.) & Format Capacity (bytes) Access Time (msec) <b>Hard Disk Storage</b> No. of Drives Capacity (bytes) Access Time (msec) <b>Other Storage</b>  <b>Display</b> Size and Type  Text Display (lines x col) Character Matrix (dots) Resolution (pixels) Screen Attributes  Colors (simul/palette) <b>Keyboard</b> Keyboard Type  No. of Keys Cursor Control No. of Function Keys Numeric Pad <b>Input/Output</b> Open I/O Slots Serial Ports Parallel Ports Special Output Ports Special Input Ports <b>Data Communications</b> Asynchronous Synchronous Internal Modem <b>Software</b> Operating Systems  Bundled Applications Languages  <b>Physical and Electrical</b> Size (L x W x H, in.) Weight (lbs) Power Supply  <b>Sales and Service</b> Announced/Delivered Sales Channels Service Channels <b>Pricing</b>  <b>Comments</b>	<b>Dual Systems</b> 83/80 Rackmount 1-16/40  Motorola MC 68000 16/16 10 —  512K/6M 512K, 1M 64K  1 8 DSDD 1.6M 90  1 84M 20 30MB 9-track tape  14-in. CRT (Kimtron, opt.)  25 x 80 7 x 9 — Inverse video, blinking, half intensity, underline Amber or green monochrome  Detachable  98 4-key row 10 Integral  11 4-16 — — —  Std (TTY, UUCP) — NA  UNIX System V  — COBOL, FORTRAN, BASIC, FORTH, Pascal  Two units, each: 7 x 17.75 x 21.5 139 115 VAC, 60 Hz  1983/1983 Direct, distributor Factory, Braegan \$19,990 (w/512KB RAM, 84MB disk, 1.2MB diskette drive, UNIX, C)  NA	<b>E &amp; U Engel Consulting</b> Angel-1 Desktop or console 1-16/1-16  Intel 80186 16/— 6 Up to 16 Intel 80186 or 48 Zilog Z80 slave processors  256K/1M 256K 2K-34K  1 8 DSDD 1.2M —  1 20M  17MB-100MB cartridge tape backup (opt.)  14-in. CRT (WYSE Y-50 terminal) 25 x 132 7 x 9 — — Monochrome  Detached (w/WYSE Y-50 terminal) — — — —  17 2 RS-232C, up to 32 (opt.) 1 Centronics, up to 16 (opt.) — — —  Opt.  CP/M-86; Concurrent DOS CP/M-86, TurboDOS 1.4, OASIS (opt.)  — CBASIC, MBASIC, FORTRAN, COBOL, Pascal, FORTH  22 x 19 x 12.25 70 115 VAC, 60 Hz; 220 VAC, 50 Hz (opt.)  October 1978 Direct Direct \$5,990 (w/18 I/O slots, 1 diskette, 1 Winchester drive, 36 cps daisywheel printer)  NA	<b>E &amp; U Engel Consulting</b> Baby-Angel 80 Desktop 1-8/8  Zilog Z80 8/— 6 Up to 21 Zilog Z80 slave processors  64K/2.5M 64K 2K, 16K (opt.)  1-2 8 DSDD 1.2M —  1 10M-360M  Cartridge tape backup (opt.)  14-in. CRT (WYSE Y-52 terminal) 25 x 132 7 x 9 — — —  Detachable (w/WYSE Y-50 terminal) — — — —  5 up to 9 opt. 2 RS-232C, up to 48 opt. 1 Centronics, up to 9 opt. — — —  Opt.  CP/M-80; TurboDOS 1.4 (opt.)  NewWord CBASIC, MBASIC, FORTRAN, COBOL, FORTH, Pascal  19 x 17 x 7 40 115 VAC, 60 Hz; 220 VAC, 50 Hz (opt.)  April 1982 Direct Direct \$3,490 (w/6 I/O slots, dual diskette drives, 36 cps daisywheel printer)  NA
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Notes:  
NA Not applicable  
— Information unavailable at press time





Vendor	E & U Engel Consulting	Fujitsu Systems of America	Fujitsu Systems of America
<b>Model</b>	Baby-Angel 86	Micro 16S	Micro 16SX
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	1-8/1-8	1-5/255	1-5/255
<b>Main Unit</b>			
Main Processor	Intel 80186	Zilog Z80, Intel 8086	Intel 8086
Word Size (bits)	16/—	16/8, 16/16	16/16
Clock Rate (MHz)	6	4, 8	8
Other Processors	Up to 8 Intel 80186 slave processor, or 21 Zilog Z80 slave processors	Intel 8087 coprocessor, graphics processor, keyboard processor	Intel 8087 coprocessor, graphics processor, keyboard processor
<b>Memory</b>			
RAM Min/Max (bytes)	256K/9M	128K/1M	384K/1M
RAM Increments (bytes)	256K	128K, 256K, 512K	128K, 256K, 512K
ROM (bytes)	2K-18K	10K	10K
<b>Diskette Storage</b>			
No. of Drives	1	2	1
Size (in.) & Format	8 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	1.2M	320K	320K
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1	NA	1
Capacity (bytes)	10M-360M	NA	10M, 20M
Access Time (msec)	—	NA	—
<b>Other Storage</b>	17MB cartridge tape backup (opt.)	10MB, 20MB external disk drive	10MB or 20MB external disk
<b>Display</b>			
Size and Type	14-in. CRT (WYSE Y-50 terminal)	12-in. CRT, RGB	12-in. CRT, RGB
Text Display (lines x col)	25 x 132	25 x 40/80	25 x 40/80
Character Matrix (dots)	7 x 9	8 x 8	8 x 8
Resolution (pixels)	—	600 x 200	600 x 200
Screen Attributes	—	Blinking, reverse video	Blinking, reverse video
Colors (simul/palette)	—	Monochrome, 8/8 RGB	8/16 RGB
<b>Keyboard</b>			
Keyboard Type	Detached (WYSE Y-50 terminal)	Detachable	Detachable
No. of Keys	—	98	98
Cursor Control	—	4-key cluster	4-key cluster
No. of Function Keys	—	16	16
Numeric Pad	—	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	5, up to 9 opt.	4	5
Serial Ports	2 RS-232C, up to 18 opt.	1-5 RS-232C	1-5 RS-232C
Parallel Ports	1 Centronics, up to 9 opt.	1	1
Special Output Ports	—	1 RGB, 1 analog to digital	1 RGB, 1 analog/digital
Special Input Ports	—	Mouse, light pen	Mouse, light pen
<b>Data Communications</b>			
Asynchronous	—	Std (TTY)	Std (TTY)
Synchronous	—	Std (IBM bisync, SDLC)	Std (IBM bisync, SDLC)
Internal Modem	Opt.	NA	NA
<b>Software</b>			
Operating Systems	CP/M 86	CP/M-86, MS-DOS; Concurrent CP/M (opt.)	CP/M-86, MS-DOS; Concurrent CP/M (opt.)
Bundled Applications	—	WordStar, SuperCalc 2	WordStar, SuperCalc 2
Languages	CBASIC, FORTRAN, MBASIC, COBOL, Pascal, FORTH	BASIC, COBOL	BASIC, COBOL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	19 x 17 x 7	19.25 x 14.5 x 5.75	19.25 x 14.5 x 5.75
Weight (lbs)	45	36.7	36.7
Power Supply	115 VAC, 60 Hz; 220 VAC, 50 Hz (opt.)	50/60 Hz	50/60 Hz
<b>Sales and Service</b>			
Announced/Delivered	April 1982	1983/1983	1984/1984
Sales Channels	Direct	Direct, dealer	Direct, dealer
Service Channels	Direct	TRW	TRW
<b>Pricing</b>	\$5,490 (w/36 cps daisywheel printer, 6 I/O slots, diskette drive, 10MB Winchester drive)	\$2,350 (w/128KB RAM, dual diskette drive, keyboard)	\$4,250 (w/384KB RAM, diskette drive, 10MB disk drive)
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time



Vendor	General Automation	General Automation	General Automation
<b>Model</b>	Zebra 1750	Zebra 2500	Zebra 3500
<b>Class</b>	Desktop	Desktop	Floor standing
<b>Users/Tasks</b>	6/9	10/13	26/29
<b>Main Unit</b>			
Main Processor	Motorola MC 68000	Motorola MC 68000	Motorola MC 68000
Word Size (bits)	32/16	32/16	32/16
Clock Rate (MHz)	10	10	10
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	128K/1M	256K/256K	256K/1M
RAM Increments (bytes)	128K, 512K	NA	768K
ROM (bytes)	8K	8K	8K
<b>Diskette Storage</b>			
No. of Drives	NA	NA	NA
Size (in.) & Format	NA	NA	NA
Capacity (bytes)	NA	NA	NA
Access Time (msec)	NA	NA	NA
<b>Hard Disk Storage</b>			
No. of Drives	1-3	1	1-4
Capacity (bytes)	20M, 40M (formatted)	64M (formatted)	64M (formatted)
Access Time (msec)	60	42	42
<b>Other Storage</b>	5MB removable disk or 45MB .25-in. cartridge tape	45MB .25-in. cartridge tape, .5-in. streaming tape	45MB .25-in. cartridge tape; .5-in. streaming tape (opt.)
<b>Display</b>			
Size and Type	12-in. or 14-in. CRT (opt.)	12-in. or 14-in. CRT (opt.)	12-in. or 14-in. CRT (opt.)
Text Display (lines x col)	25 x 80	25 x 80	25 x 80
Character Matrix (dots)	7 x 10	7 x 10	7 x 10
Resolution (pixels)	—	—	—
Screen Attributes	Blinking, blank, reverse video, reduced intensity	Blank, blinking, reverse video, reduced intensity	Blank, blinking, reverse video, reduced intensity
Colors (simul/palette)	Monochrome	Monochrome	Monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable (opt.)	Detachable	Detachable
No. of Keys	84 or 107	84 or 107	84 or 107
Cursor Control	5-key cluster	5-key cluster	5-key cluster
No. of Function Keys	4-16	4-16	4-16
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	5	1	5
Serial Ports	6-12 RS-232C	10 RS-232C	10-26 RS-232C
Parallel Ports	1	—	—
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	Std (TTY)
Synchronous	Opt. (IBM 2780/3780)	Opt. (IBM 2780/3780)	Opt. (IBM 2780/3780)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	PICK	PICK	PICK
Bundled Applications	Spreadsheet, graphics, WP	Spreadsheet, graphics, WP	Spreadsheet, graphics, WP
Languages	BASIC, PROC	BASIC, PROC	BASIC, PROC
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	17.5 x 16 x 5.5	23.25 x 17.75 x 7.25	24 x 22 x 30
Weight (lbs)	35	65	190
Power Supply	110/220 VAC, 50/60 Hz, 330 watts	110/240 VAC, 50/60 Hz, 550 watts	110/240 VAC, 50/60 Hz, 860 watts
<b>Sales and Service</b>			
Announced/Delivered	March 1984/September 1984	November 1982/April 1983	November 1982/April 1983
Sales Channels	Dealer	Dealer	Dealer
Service Channels	Sorbus, dealer	Sorbus, dealer	Sorbus, dealer
<b>Pricing</b>	\$9,950 (w/128KB RAM, 20MB disk drive, 5MB rem. disk drive)	\$19,900 (w/256KB RAM, 64MB disk drive, 1/4-in. streaming cartridge tape)	\$25,500 (w/256KB RAM, 64MB disk drive, 1/4-in. streaming tape, 10 serial ports)
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time

Vendor	General Automation	General Automation	General Robotics
<b>Model</b>	Zebra 5500	Zebra 6700	Gemini
<b>Class</b>	Floor standing	Floor standing	Desktop
<b>Users/Tasks</b>	50/53	64/Multi	32/—
<b>Main Unit</b>			
Main Processor	Motorola MC 68000	Motorola MC 68000	Digital Equipment LSI 11/73
Word Size (bits)	32/16	32/16	16/16
Clock Rate (MHz)	10	10	13-20
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	1.25M/2M	1.25M/3.25M	256K/4M
RAM Increments (bytes)	—	1M	128K
ROM (bytes)	8K	—	—
<b>Diskette Storage</b>			
No. of Drives	NA	NA	2
Size (in.) & Format	NA	NA	5.25, 8 SSSD, DSSD, SSDD, DSDD
Capacity (bytes)	NA	NA	256K-1M
Access Time (msec)	NA	NA	—
<b>Hard Disk Storage</b>			
No. of Drives	1-4	1-4	2
Capacity (bytes)	146M (formatted)	292M	10M, 40M
Access Time (msec)	40	20	—
<b>Other Storage</b>	.5-in. streaming tape; .25-in. 45MB streaming cartridge tape (opt.)	.5-in. magnetic tape	20M, 40M tape cartridge
<b>Display</b>			
Size and Type	12-in. or 14-in. CRT (opt.)	Third party	Third party
Text Display (lines x col)	25 x 80	NA	NA
Character Matrix (dots)	7 x 10	NA	NA
Resolution (pixels)	—	NA	NA
Screen Attributes	Blinking, blank, reverse video, reduced intensity	NA	NA
Colors (simul/palette)	Monochrome	NA	NA
<b>Keyboard</b>			
Keyboard Type	Detachable	Third party	Third party
No. of Keys	84 or 107	NA	NA
Cursor Control	5-key cluster	NA	NA
No. of Function Keys	4-16	NA	NA
Numeric Pad	Integral	NA	NA
<b>Input/Output</b>			
Open I/O Slots	7	21	13
Serial Ports	10-50 RS-232C	16-64	1-16
Parallel Ports	—	—	2
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std	Std (TTY)
Synchronous	Opt. (IBM 2780/3780)	Opt.	—
Internal Modem	NA	NA	—
<b>Software</b>			
Operating Systems	PICK	PICK	RSTS/E, RT-11, RSX11-M; TSX, UNIX, CP/M (opt.)
Bundled Applications Languages	Spreadsheet, graphics, WP BASIC, PROC	Spreadsheet, graphics, WP BASIC	COBOL, FORTRAN, C, BASIC, Pascal, PL/1
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	24 x 22 x 42	—	10.5 x 17 x 22
Weight (lbs)	320	—	80
Power Supply	100/240 VAC, 50/60 Hz, 860 watts	—	104-127/217-253 VAC, 47-63 Hz
<b>Sales and Service</b>			
Announced/Delivered	November 1982/April 1983	March 1985/May 1985	1976
Sales Channels	Dealer	Dealer	Direct, distributor
Service Channels	Dealer, Sorbus, factory-trained service	Sorbus, dealer	Vendor, 3rd party
<b>Pricing</b>	\$53,500 (1.25MB RAM, 146MB disk drive, 1/2-in. streaming tape, 10 serial ports)	\$86,500-\$99,500 (w/1.25MB RAM, 16 serial ports)	\$13,000-\$16,000
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time



<b>Vendor</b> <b>Model</b> <b>Class</b> <b>Users/Tasks</b> <b>Main Unit</b> Main Processor Word Size (bits) Clock Rate (MHz) Other Processors <b>Memory</b> RAM Min/Max (bytes) RAM Increments (bytes) ROM (bytes) <b>Diskette Storage</b> No. of Drives Size (in.) & Format Capacity (bytes) Access Time (msec) <b>Hard Disk Storage</b> No. of Drives Capacity (bytes) Access Time (msec) <b>Other Storage</b> <b>Display</b> Size and Type Text Display (lines x col) Character Matrix (dots) Resolution (pixels) Screen Attributes Colors (simul/palette) <b>Keyboard</b> Keyboard Type No. of Keys Cursor Control No. of Function Keys Numeric Pad <b>Input/Output</b> Open I/O Slots Serial Ports Parallel Ports Special Output Ports Special Input Ports <b>Data Communications</b> Asynchronous Synchronous Internal Modem <b>Software</b> Operating Systems Bundled Applications Languages <b>Physical and Electrical</b> Size (L x W x H, in.) Weight (lbs) Power Supply <b>Sales and Service</b> Announced/Delivered Sales Channels Service Channels <b>Pricing</b> <b>Comments</b>	<b>General Robotics</b> Hercules Desktop 64/— Digital Equipment LSI 11/73 16/16 13–20 — 1M/4M 256K — 2 5.25, 8 SSSD, DSSD, SSDD, DSDD 256K–1M — 2 40M, 300M — 40MB–100MB tape cartridge Third party NA NA NA NA NA NA Third party NA NA NA NA NA NA RT-11, RSX11-M, RSTS/E; TSX, UNIX, CP/M (opt.) — COBOL, FORTRAN, C, BASIC, Pascal, PL/I 10.5 x 19 x 27 90 104–127/217–253 VAC, 47–63 Hz 1983 Direct, distributor Vendor, 3rd party \$20,000–\$30,000 NA	<b>General Robotics</b> Scorpio Desktop 8/— Digital Equipment LSI 11/23 16/16 13–20 — 128K/256K 128K — 2 5.25, 8 SSSD, DSSD, SSDD, DSDD 256K–1M — 2 10M, 40M — 20MB–40MB cartridge tape Third party NA NA NA NA NA NA NA Third party NA NA NA NA NA NA RT-11, RSTS/E, RSX11-M; TSX, UNIX, CP/M (opt.) — COBOL, FORTRAN, C, BASIC, Pascal, PL/I, Assembly 6.75 x 15.5 x 15 70 104–127 or 217–253 VAC, 47–63 Hz 1981 Direct, distributor Vendor, 3rd party \$9,000–\$12,500 NA	<b>GIMIX</b> GMX 020 Desktop 3–21/64 Motorola MC 68020 32/32 12.5 I/O processors, MC 68881 Floating Point coprocessor 256K/1M 256K 128K 1 5.25 DSDD 1M 94 1 85M 28 — Third party NA NA NA NA NA NA Third party NA NA NA NA NA NA Std (TTY) — — — UniFLEX VM (Virtual Memory) — BASIC, C, COBOL, Franz LISP, ADA, FORTRAN, PROLOG 12 x 18 x 7 50 — July 1985 Direct Factory \$13,680 NA
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Notes:  
 NA Not applicable  
 — Information unavailable at press time



<b>Vendor</b>	<b>GIMIX</b>	<b>Heurikon</b>	<b>Heurikon</b>
<b>Model</b>	GMX III	814/68010	Minibox
<b>Class</b>	Desktop	Desktop, rackmount	Desktop, floor model
<b>Users/Tasks</b>	3-21/64	1-16/Multi	1-16/Multi
<b>Main Unit</b>			
Main Processor	Motorola 6809	Motorola MC 68000/68010	Motorola MC 68000/68010
Word Size (bits)	16/8	32/16	32/16
Clock Rate (MHz)	2	10	10
Other Processors	I/O processors	Communications, graphics, Sky Floating Point, Ethernet and image processing, CP/MSHELL (opt.)	Communications, graphics, Sky Floating Point, Ethernet, and image processing (opt.)
<b>Memory</b>			
RAM Min/Max (bytes)	64K/1M	256K/16M	256K/16M
RAM Increments (bytes)	64K	256K, 512K, 1M	256K, 512K, 1M
ROM (bytes)	4K	0-128K	0-128K
<b>Diskette Storage</b>			
No. of Drives	1	0-4	1-2
Size (in.) & Format	5.25 DSDD	8 SSDD, DSDD; 5.25 DSDD	5.25 DSDD
Capacity (bytes)	1M	1.2M (8-in.); 670K (5.25-in.)	670K
Access Time (msec)	94	94	94
<b>Hard Disk Storage</b>			
No. of Drives	1	0-4	0-2
Capacity (bytes)	19M, 85M	30M, 65M, 140 + M	30M, 65M, 140 + M
Access Time (msec)	28	30	30
<b>Other Storage</b>	—	40MB reel-to-reel or 65MB streaming magnetic tape	65MB streaming magnetic tape
<b>Display</b>			
Size and Type	Third party	Third party	Third party
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Resolution (pixels)	NA	NA	NA
Screen Attributes	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Third party
No. of Keys	NA	NA	NA
Cursor Control	NA	NA	NA
No. of Function Keys	NA	NA	NA
Numeric Pad	NA	NA	NA
<b>Input/Output</b>			
Open I/O Slots	NA	3-13	5
Serial Ports	Up to 21	1-16 (RS-232C, 0-4 RS-422)	1-16 + (RS-232C, RS-422)
Parallel Ports	2	2	2
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std	Std
Synchronous	—	Std (IBM bisync, IBM SDLC, HDLC)	Std (IBM bisync, IBM SDLC, HDLC)
Internal Modem	—	NA	NA
<b>Software</b>			
Operating Systems	OS-9 or UNIFLEX; FLEX (opt.)	UNIX System V (Uniplus +); VRTX, C-Executive, Regulus, and CP/M-68K (opt.)	UNIX System V (Uniplus +); VRTX, C-Executive, Regulus, and CP/M-68 (opt.)
Bundled Applications Languages	— BASIC, C	— Pascal, FORTRAN, ADA, APL, BASIC, C, ASM-68K, COBOL	— Pascal, FORTRAN, ADA, APL, BASIC, C, ASM-68K, COBOL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	12 x 18 x 7	20.5 x 19 x 5.5	20.5 x 10.5 x 13.9
Weight (lbs)	50	25	44
Power Supply	—	110/120 VAC, 50/60 Hz, 200/400 watts	110/120 VAC, 50/60 Hz, 200/400 watts
<b>Sales and Service</b>			
Announced/Delivered	1980	1982	1982
Sales Channels	Direct	Direct, manufacturers' reps	Direct, manufacturers' reps
Service Channels	Factory	Direct	Direct
<b>Pricing</b>	\$8,800 and up	\$14,075 (w/4-6 slot multibus, 512KB RAM, 30MB disk, 5.25-in. diskette, 4 serial ports)	\$13,875 (w/512KB RAM, 6-slots, 30MB disk, 5.25-in. diskette, 4 serial ports)
<b>Comments</b>	NA	Designed to function well in both single or multiuser configurations.	Designed to function well in single or multiuser configuration.

## Notes:

NA Not applicable

— Information unavailable at press time



Vendor	IBC/Integrated Business Computers	IBC/Integrated Business Computers	IBC/Integrated Business Computers
<b>Model Class</b>	Ensign	IBC System 68 Desktop	MegaStar
<b>Users/Tasks</b>	Floor model 32/—	8-16/Multi	Floor model, desktop 16 (floor model), 11/Multi (desktop)
<b>Main Unit</b>			
Main Processor	Motorola MC 68010	Motorola MC 68010	Zilog Z80H
Word Size (bits)	32/16	32/16	8/8
Clock Rate (MHz)	12.5	10	8
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	1M/8M	1M/4M	512K/1M
RAM Increments (bytes)	2M, 4M, 8M	1M, 2M, 4M	512K
ROM (bytes)	—	—	—
<b>Diskette Storage</b>			
No. of Drives	1	1	1
Size (in.) & Format	8 DSDD	8 DSDD	5.25
Capacity (bytes)	985K (formatted)	985K	655K, 985K (formatted)
Access Time (msec)	91	91	—
<b>Hard Disk Storage</b>			
No. of Drives	1-2	1	1-2
Capacity (bytes)	73, 146M (formatted)	43.2M, 67.9M	21M, 43M, 68M (formatted)
Access Time (msec)	20, 25	33	85
<b>Other Storage</b>	11.5MB-57.6MB cartridge tape drive, 9-track reel-to-reel tape drive	11.5-57.6MB cartridge tape drive, 9-track reel-to-reel tape drive	11.5MB-57.6MB cartridge tape drive, 10MB cartridge disk drive
<b>Display</b>			
Size and Type	Third party	Third party	Third party
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Resolution (pixels)	NA	NA	NA
Screen Attributes	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Third party
No. of Keys	NA	NA	NA
Cursor Control	NA	NA	NA
No. of Function Keys	NA	NA	NA
Numeric Pad	NA	NA	NA
<b>Input/Output</b>			
Open I/O Slots	—	—	—
Serial Ports	16-32	8-16 RS-232C	11 (desktop), 16 (floor model)
Parallel Ports	1-2	1-2	1 Centronics
Special Output Ports	NA	NA	NA
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	—	—	—
Synchronous	—	—	—
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	UNIX System V	UNIX System V	OASIS
Bundled Applications	Opt.	Opt.	NA
Languages	Opt.	Opt.	—
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	22 x 15 x 35	17.8 x 30 x 9.5	20 x 12 x 6.75 (desktop), 22 x 8.5 x 22.8 (floor model)
Weight (lbs)	110	102	37.5, 65
Power Supply	115/230 VAC, 47-63 Hz	115/230 VAC, 47-63 Hz	115/230 VAC, 47-63 Hz
<b>Sales and Service</b>			
Announced/Delivered	December 1983/—	December 1983/—	May 1985/—
Sales Channels	Dealers	Dealers	Dealers
Service Channels	Factory, 3rd party	Factory, third party	Authorized service centers, factory
<b>Pricing</b>	\$23,995 and up	\$15,995 and up	\$6,996-\$10,795 (floor model) \$6,395-\$9,595 (desktop)
<b>Comments</b>	NA	NA	NA

Notes:  
 NA Not applicable  
 — Information unavailable at press time



Vendor	IBC/Integrated Business Computers	IBC/Integrated Business Computers	IBM
<b>Model</b>	MultiStar	Super Cadet	Personal Computer AT
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	6/Multi	8-16/Multi	3/Multi
<b>Main Unit</b>			
Main Processor	Zilog Z80H	Zilog Z80H	Intel 80286
Word Size (bits)	8/8	8/8	16/16
Clock Rate (MHz)	8	8	6
Other Processors	Add'l Zilog Z80H w/disk controller	—	Intel 80287 (opt.)
<b>Memory</b>			
RAM Min/Max (bytes)	256K/256K	320K/640K	256K/3M
RAM Increments (bytes)	NA	320K, 640K	256K, 512K
ROM (bytes)	—	—	40K
<b>Diskette Storage</b>			
No. of Drives	1-2	1-2	1-2
Size (in.) & Format	5.25	8	5.25 DS high density
Capacity (bytes)	655K, 985K (formatted)	985K (formatted)	1.2M
Access Time (msec)	91, 94	91	94
<b>Hard Disk Storage</b>			
No. of Drives	1-2	1-2	0-2
Capacity (bytes)	15M, 33.5M, 68M	73M, 146M (formatted)	20M
Access Time (msec)	72, 45, 33	20, 25	40
<b>Other Storage</b>	11.5MB-57.6MB cartridge tape (opt.)	11.5MB-57.6MB cartridge tape drive, 9-track reel-to-reel tape drive (opt.)	360KB diskette drive (opt.)
<b>Display</b>			
Size and Type	Third party	Third party	11.5-in. CRT; 13-in. RGB CRT
Text Display (lines x col)	NA	NA	25 x 40/80
Character Matrix (dots)	NA	NA	—
Resolution (pixels)	NA	NA	640 x 350 (RGB)
Screen Attributes	NA	NA	—
Colors (simul/palette)	NA	NA	16/64 (RGB)
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Detachable
No. of Keys	NA	NA	84
Cursor Control	NA	NA	4-key cluster in numeric pad
No. of Function Keys	NA	NA	10
Numeric Pad	NA	NA	Integral
<b>Input/Output</b>			
Open I/O Slots	—	—	7
Serial Ports	6	8-16	1 RS-232C
Parallel Ports	1 Centronics	1 Centronics	1
Special Output Ports	NA	NA	—
Special Input Ports	NA	NA	—
<b>Data Communications</b>			
Asynchronous	—	—	Opt.
Synchronous	—	—	Opt. (IBM BSC, SDLC, SNA & RJE 3270/3770, 3101)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	OASIS	OASIS	PC DOC 3.0; XENIX, PC/IX (opt.)
Bundled Applications	NA	NA	—
Languages	—	—	APL, BASIC, COBOL, FORTRAN, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	20 x 12 x 6.75	30 x 17.8 x 9.5	21.3 x 17.3 x 6.4
Weight (lbs)	37.5	81	37-42
Power Supply	115/230 VAC, 47-63 Hz	115/230 VAC ± 10%, 47-63 Hz	190-259 VAC, 50/60 Hz, 192 watts
<b>Sales and Service</b>			
Announced/Delivered	1982/1982	—/September 1983	August 1984
Sales Channels	Dealers	Dealers	Direct, dealer
Service Channels	Authorized service centers, factory	Authorized service centers	Direct, dealer
<b>Pricing</b>	\$4,495-\$8,495	\$13,395 and up	\$3,995 (w/256KB RAM, 1 diskette drive) \$5,798 (w/512KB RAM, 1 diskette & 20MB disk drives) Display not incl in price Can be upgraded to Personal Computer AT/370
<b>Comments</b>	Redesigned, enhanced version of IBC Middi-Cadet microcomputer	NA	

**Notes:**

NA Not applicable

— Information unavailable at press time



Vendor	IBM	ICL Computers	IMS International
<b>Model</b>	Personal Computer AT/370	DRS 20	1600 Series, Model 1610
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	3/Multi	16/4	4/—
<b>Main Unit</b>			
Main Processor	Intel 80286	Intel 8085 or 8086	Intel 80186
Word Size (bits)	16/16	8/8	16/16
Clock Rate (MHz)	6	5	8
Other Processors	AT/370 processor card (std); Intel 80287 (opt.)	Intel 8086	Intel 80186 or Zilog Z80B dedicated proc per user
<b>Memory</b>			
RAM Min/Max (bytes)	1M/2M	64K/256K per user	256K/1M
RAM Increments (bytes)	256K, 512K	64K, 128K	256K
ROM (bytes)	40K	NA	4K
<b>Diskette Storage</b>			
No. of Drives	1-2	1-2	2
Size (in.) & Format	5.25 DS high density	8, 5.25 DSDD	5.25 DSQD
Capacity (bytes)	1.2M	1M, 800K	800K
Access Time (msec)	94	—	—
<b>Hard Disk Storage</b>			
No. of Drives	0-2	1-48 (0, 1 or 2 per user)	1
Capacity (bytes)	20M	10M, 27M	85M; 40M, 140M (opt.)
Access Time (msec)	40	—	—
<b>Other Storage</b>	360KB diskette drive (opt.)	20MB tape, 1MB bubble memory	60MB standalone tape backup (opt.)
<b>Display</b>			
Size and Type	11.5-in. CRT; 13-in. RGB CRT	12-in. CRT	12-in. CRT
Text Display (lines x col)	25 x 40/80	25 x 80	24 x 80/132
Character Matrix (dots)	—	7 x 9	9 x 12
Resolution (pixels)	640 x 350 (RGB)	—	720 x 300
Screen Attributes	—	Blink, blank, underline, reverse	Rev video, underline, blank/ blink comb.
Colors (simul/palette)	16/64 (RGB)	Monochrome	Monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	84	100	—
Cursor Control	4-key cluster in numeric pad	12-key cluster	—
No. of Function Keys	10	16	—
Numeric Pad	Integral	Integral	—
<b>Input/Output</b>			
Open I/O Slots	7	—	7
Serial Ports	1 RS-232C	1-4 per user	2 RS-232C, 2 RS-232C/ RS-422 boards
Parallel Ports	1	NA	1 opt.
Special Output Ports	—	Ethernet, IEEE LAN	NA
Special Input Ports	—	NA	NA
<b>Data Communications</b>			
Asynchronous	Opt.	Opt. (TTY)	Std (TTY)
Synchronous	Std (3278/79); opt. (IBM BSC, SDLC, SNA & RJE 3270/3770, 3101)	Opt. (ICL FU11 XBM, X.25, 3270/3780, SNA)	Opt. (IBM 3270, 3780)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	PC DOS, VM/PC; XENIX, PC/IX (opt.)	DRX; CP/M, CCP/M and PC Mode (opt.)	TurboDOS, Concurrent DOS or MS-DOS
Bundled Applications	—	NA	NA
Languages	APL, BASIC, COBOL, FORTRAN, Pascal	BASIC, Pascal, COBOL	C, BASIC, FORTRAN, COBOL, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	21.3 x 17.3 x 6.4	—	21 x 11.5 x 12
Weight (lbs)	37-42	—	40
Power Supply	190-259 VAC, 50/60 Hz, 192 watts	—	—
<b>Sales and Service</b>			
Announced/Delivered	August 1984	1981/1981	1985/1985
Sales Channels	Direct, dealer	Direct, distributor, dealer	Dealer, OEM
Service Channels	Direct, dealer	Vendor, dealer	Dealer
<b>Pricing</b>	Approx \$9,800 (w/1MB RAM, 1 diskette & 20MB disk drive Display not incl in price	Contact vendor	\$9,420 (includes DMA Winchester controller, F-100 + high speed networking bus, TurboDOS operating system)
<b>Comments</b>	Functions as Personal Computer AT and System/370 workstation	NA	NA

**Notes:**

NA Not applicable

— Information unavailable at press time



<b>Vendor</b>	<b>IMS International</b>	<b>IMS International</b>	<b>IMS International</b>
<b>Model</b>	1600 Series, Model 1620	1600 Series, Model 1630	1600 Series, Model 1640
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	8/—	8/—	20/—
<b>Main Unit</b>			
Main Processor	Intel 80186	Intel 80186	Intel 80186
Word Size (bits)	16/16	16/16	16/16
Clock Rate (MHz)	8	8	8
Other Processors	Intel 80186 or Zilog Z80B dedicated processor per user	Intel 80186 or Zilog Z80B dedicated processor per user	Intel 80186 or Zilog Z80B dedicated processor per user
<b>Memory</b>			
RAM Min/Max (bytes)	256K/1M	256K/1M	256K/1M
RAM Increments (bytes)	256K	256K	256K
ROM (bytes)	4K	4K	4K
<b>Diskette Storage</b>			
No. of Drives	2	2	2
Size (in.) & Format	5.25 DSQD	5.25; 8 (opt.)	5.25, 8 (opt.)
Capacity (bytes)	800K	800K; 1.2M (8-in.)	800K; 1.2M (8-in.)
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	85M; 40M, 140M (opt.)	85; 40, 140 (opt.)	85M; 40M, 140M (opt.)
Access Time (msec)	—	—	—
<b>Other Storage</b>	60MB standalone tape backup (opt.)	60MB standalone tape backup (opt.)	60MB standalone tape backup (opt.)
<b>Display</b>			
Size and Type	12-in. CRT	12-in. CRT	12-in. CRT
Text Display (lines x col)	24 x 80/132	24 x 80/132	24 x 80/132
Character Matrix (dots)	9 x 12	9 x 12	9 x 12
Resolution (pixels)	720 x 300	720 x 300	720 x 300
Screen Attributes	Reverse video, underline, blank and blink combinations	Reverse video, underline, blank and blink combinations	Reverse video, underline, blank and blink combinations
Colors (simul/palette)	Monochrome	Monochrome	Monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	—	—	—
Cursor Control	—	—	—
No. of Function Keys	—	—	—
Numeric Pad	—	—	—
<b>Input/Output</b>			
Open I/O Slots	12	12	24
Serial Ports	2 RS-232C, 2 RS-232C/RS-422 interface boards	2 RS-232C, 2 RS-232C/ RS-422 interface boards	2 RS-232C, 2 RS-232C/RS-422 interface boards
Parallel Ports	1 (opt.)	1 opt.	1 (opt.)
Special Output Ports	NA	NA	NA
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	Std (TTY)
Synchronous	Opt. (IBM 3270, 3780)	Opt. (IBM 3270, 3780)	Opt. (IBM 3270, 3780)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	TurboDOS, Concurrent DOS or MS-DOS	TurboDOS, Concurrent DOS or MS-DOS	TurboDOS, Concurrent DOS or MS-DOS
Bundled Applications	NA	NA	NA
Languages	C, BASIC, FORTRAN, COBOL, Pascal	C, BASIC, FORTRAN, COBOL, Pascal	C, BASIC, FORTRAN, COBOL, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	21 x 11.5 x 12	21 x 11.5 x 12	21 x 11.5 x 12
Weight (lbs)	40	40	40
Power Supply	—	—	—
<b>Sales and Service</b>			
Announced/Delivered	1985/1985	1985/1985	1985/1985
Sales Channels	Dealer, OEM	Dealer, OEM	Dealer, OEM
Service Channels	Dealer	Dealer	Dealer
<b>Pricing</b>	\$8,620 (w/3 full-width drive slots, TurboDOS system, DMA Winchester controller, F-100+ high speed networking bus)	\$9,020 (w/2 full-width drive slots, TurboDOS operating system, DMA Winchester controller, F-100+ high speed networking bus)	\$10,420 (includes TurboDOS operating system, DMA Winchester controller, F-100+ high speed networking bus)
<b>Comments</b>	NA	NA	Magnetic tape can be integrated inside unit

**Notes:**

NA Not applicable

— Information unavailable at press time



<b>Vendor</b> <b>Model</b> <b>Class</b> <b>Users/Tasks</b> <b>Main Unit</b> Main Processor Word Size (bits) Clock Rate (MHz) Other Processors  <b>Memory</b> RAM Min/Max (bytes)  RAM Increments (bytes) ROM (bytes) <b>Diskette Storage</b> No. of Drives Size (in.) & Format Capacity (bytes) Access Time (msec) <b>Hard Disk Storage</b> No. of Drives Capacity (bytes) Access Time (msec) <b>Other Storage</b>  <b>Display</b> Size and Type Text Display (lines x col) Character Matrix (dots) Resolution (pixels) Screen Attributes  Colors (simul/palette) <b>Keyboard</b> Keyboard Type No. of Keys Cursor Control No. of Function Keys Numeric Pad <b>Input/Output</b> Open I/O Slots Serial Ports  Parallel Ports Special Output Ports Special Input Ports <b>Data Communications</b> Asynchronous Synchronous Internal Modem <b>Software</b> Operating Systems Bundled Applications Languages  <b>Physical and Electrical</b> Size (L x W x H, in.) Weight (lbs) Power Supply <b>Sales and Service</b> Announced/Delivered Sales Channels Service Channels <b>Pricing</b>  <b>Comments</b>	<b>IMS International</b> 800 Series, Model 810 Desktop 1-5/—  Zilog Z80B 8/8 6 Intel 80186 or Zilog Z80B dedicated processor per user  128K/1M (80186), 128K/128K (Z80) — —  1 5.25 800K DSQD —  1 85M; 40M, 140M (opt.) — 60MB standalone tape backup (opt.)  12-in. CRT 24 x 80/132 9 x 12 720 x 300 Reverse video, underline, blank and blink combinations Monochrome  Detachable — — — —  8 2 RS-232C, 2 RS-232C/RS-422 interface boards 1 opt. NA NA  Std (TTY) Opt. (IBM 3270, 3780) NA  TurboDOS NA C, BASIC, FORTRAN, COBOL, Pascal  21 x 11.5 x 12 40 —  1984/1984 Dealer, OEM Dealer \$5,195 (w/DMA Winchester controller and F-100 + high speed networking bus)  NA	<b>IMS International</b> 800 Series, Model 820 Desktop 9/—  Zilog Z80B 8/8 6 Intel 80186 or Zilog Z80B dedicated processor per user  128K/1M (80186), 128K/128K (Z80) — —  1 5.25 800K DSQD —  1 85M; 40M, 140M (opt.) — 60MB standalone tape backup (opt.)  12-in. CRT 24 x 80/132 9 x 12 720 x 300 Reverse video, underline, blank and blink combinations Monochrome  Detachable — — — —  12 2 RS-232C, 2 RS-232C/RS-422 interface boards 1 (opt.) NA NA  Std (TTY) Opt. (IBM 3270, 3780) NA  TurboDOS NA C, BASIC, FORTRAN, COBOL, Pascal  21 x 11.5 x 12 40 —  1984/1984 Dealer, OEM Dealer \$4,395 (w/DMA Winchester controller, F-100 + high speed networking bus, 3 full-width drive slots)  NA	<b>IMS International</b> 800 Series, Model 830 Desktop —  Zilog Z80B 8/8 6 Intel 80186 or Zilog Z80B dedicated processor per user  128K/1M (80186), 128K/128K (Z80) — —  1 5.25; 8 (opt.) 800K; 1.2M (8-in.) —  1 85M; 40M, 140M (opt.) — 60MB standalone tape backup (opt.)  12-in. CRT 24 x 80/132 9 x 12 720 x 300 Reverse video, underline, blank and blink combinations Monochrome  Detachable — — — —  12 2 RS-232C, 2 RS-232C/RS-422 interface boards 1 (opt.) NA NA  Std (TTY) Opt. (IBM 3270, 3780) NA  TurboDOS NA C, BASIC, FORTRAN, COBOL, Pascal  21 x 11.5 x 12 40 —  1984/1984 Dealer, OEM Dealer \$4,795 (w/DMA Winchester controller, F-100 + high speed networking bus, 2 full-width drive slots)  NA
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Notes:  
 NA Not applicable  
 — Information unavailable at press time



Vendor	IMS International	Independent Business Systems	Independent Business Systems
<b>Model Class</b>	800 Series, Model 840 Desktop	Ultraframe/16 Desktop	Ultraframe/8 Desktop
<b>Users/Tasks</b>	20/—	16/16	16/16
<b>Main Unit</b>			
Main Processor	Zilog Z80B	Intel 80186	Zilog Z80B
Word Size (bits)	8/8	16/16	—
Clock Rate (MHz)	6	8	6
Other Processors	Intel 80186 or Zilog Z80B dedicated processor per user	16 80186 application processors	16 Z80B application processors
<b>Memory</b>			
RAM Min/Max (bytes)	128K/1M (80186), 128K/128K (Z80)	512K/17M	128K/2.1M
RAM Increments (bytes)	—	256K	64K
ROM (bytes)	—	2K-4K	2K-4K
<b>Diskette Storage</b>			
No. of Drives	1	1	1
Size (in.) & Format	5.25; 8 (opt.)	8 DSDD	8 DSDD
Capacity (bytes)	800K; 1.2M (8-in.)	1.2M	1.2M
Access Time (msec)	—	103	103
<b>Hard Disk Storage</b>			
No. of Drives	1	1-2	1-2
Capacity (bytes)	85M; 40M, 140M (opt.)	11M-300M	11M-300M
Access Time (msec)	—	25-70	25-70
<b>Other Storage</b>	60MB standalone tape backup (opt.)	256KB-1MB RAM disk	256KB-1MB RAM disk
<b>Display</b>			
Size and Type	12-in. CRT	Third party	Third party
Text Display (lines x col)	24 x 80/132	NA	NA
Character Matrix (dots)	9 x 12	NA	NA
Resolution (pixels)	720 x 300	NA	NA
Screen Attributes	Reverse video, underline, blank and blink combinations	NA	NA
Colors (simul/palette)	Monochrome	NA	NA
<b>Keyboard</b>			
Keyboard Type	Detachable	Third party	Third party
No. of Keys	—	NA	NA
Cursor Control	—	NA	NA
No. of Function Keys	—	NA	NA
Numeric Pad	—	NA	NA
<b>Input/Output</b>			
Open I/O Slots	24	8 or 16	8 or 16
Serial Ports	2 RS-232C, 2 RS-232C/RS-422 interface boards	Up to 18	Up to 18
Parallel Ports	1 (opt.)	1 Centronics	1 Centronics
Special Output Ports	NA	4 IEEE-488	4 IEEE-488 (opt.)
Special Input Ports	NA	Video tape	Video tape
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std	Std
Synchronous	Opt. (IBM 3270, 3780)	Opt.	Opt.
Internal Modem	NA	Opt.	Opt.
<b>Software</b>			
Operating Systems	TurboDOS	TurboDOS 1.41; IBS p-Net (opt.)	TurboDOS 1.41; IBS p-Net (opt.)
Bundled Applications	NA	—	—
Languages	C, BASIC, FORTRAN, COBOL, Pascal	All CP/M-compatible languages	All CP/M-compatible languages
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	21 x 11.5 x 12	26 x 22 x 8	26 x 22 x 8
Weight (lbs)	40	85	85
Power Supply	—	110/220 VAC, 50/60 Hz, 350 watts	110/220 VAC, 50/60 Hz, 350 watts
<b>Sales and Service</b>			
Announced/Delivered	1984/1984	March 1985/March 1985	October 1983/October 1983
Sales Channels	Dealer, OEM	OEM, dealer	OEM, Dealer
Service Channels	Dealer	Dealer	Dealer
<b>Pricing</b>	\$6,195 (includes four full width drive slots)	\$8,540	\$6,995
<b>Comments</b>	NA	Multiprocessor design, optional file server; configured for PC network	Multiprocessor design, optional file server; configured for PC network

**Notes:**

NA Not applicable

— Information unavailable at press time



<b>Vendor</b>	<b>Intecolor</b>	<b>Intecolor</b>	<b>Intel</b>
<b>Model</b>	Datavue DV 3000	Datavue DV 4000	286/310
<b>Class</b>	Desktop	Desktop	Desktop, floor model, rackmount
<b>Users/Tasks</b>	1-8/Multi	1-24/Multi	16/Multi
<b>Main Unit</b>			
Main Processor	Zilog Z80	Intel 80186, Zilog Z80	Intel 80286
Word Size (bits)	8/8	16/16, 8/8	16/16
Clock Rate (MHz)	4	6, 8, 10	6
Other Processors	NA	Opt.	Intel 80287 math coprocessor
<b>Memory</b>			
RAM Min/Max (bytes)	64K per user	256K per user	512K/6M
RAM Increments (bytes)	—	256K	1M, 2M
ROM (bytes)	8K	8K	—
<b>Diskette Storage</b>			
No. of Drives	1	1-2	1
Size (in.) & Format	5.25 DSQD	5.25 DSQD	5.25 DSDD
Capacity (bytes)	1M	1M	320K
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1-2	0-1
Capacity (bytes)	Up to 19M	6M-106M	12M, 19M, 40M
Access Time (msec)	68	—	—
<b>Other Storage</b>	—	20MB tape backup (opt.)	45MB streaming tape (opt.)
<b>Display</b>			
Size and Type	Third party	Third party	Third party
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Resolution (pixels)	NA	NA	NA
Screen Attributes	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Third party
No. of Keys	NA	NA	NA
Cursor Control	NA	NA	NA
No. of Function Keys	NA	NA	NA
Numeric Pad	NA	NA	NA
<b>Input/Output</b>			
Open I/O Slots	—	—	3-4
Serial Ports	—	—	2-10 RS-232C
Parallel Ports	—	—	1
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	—
Synchronous	Opt.	Opt.	—
Internal Modem	NA	Opt.	NA
<b>Software</b>			
Operating Systems	CP/M; MP/M (opt.)	Concurrent DOS, CP/M 80, CP/M-86, MP/M II, MS-DOS	iRMX, XENIX; MS-DOS (opt.)
Bundled Applications	—	—	ITIS productivity tools
Languages	—	—	BASIC, C, COBOL, FORTRAN, PASCAL, PL/M, Assembler
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	7 x 14 x 22	7 x 14 x 15/22	22 x 17 x 6.5
Weight (lbs)	50	26	50
Power Supply	110/220 VAC, 50/60 Hz	100/220 VAC, 50/60 Hz	88-132/180-264 VAC, 47/63 Hz
<b>Sales and Service</b>			
Announced/Delivered	July 1983/August 1983	April 1984/June 1984	Fall 1983
Sales Channels	Distributor, dealer	OEM, distributor, dealer	Direct, OEM, VAR
Service Channels	Dealer, Decision Data, factory	OEM, Decision Data, factory	Direct
<b>Pricing</b>	\$7,395 (4-user system w/19MB disk drive)	\$10,155 (4-user w/19MB disk drive)	\$16,500 approx.
<b>Comments</b>	NA	NA	Expansion chassis supports add'l. peripherals

**Notes:**

- NA Not applicable
- Information unavailable at press time



Vendor Model Class	Intel 86/310 Desktop, floor model, rackmount —/Multi	Intertec Data Systems HeadStart ATS-286 Desktop	Intertec Data Systems HeadStart ATS-86 Desktop
<b>Users/Tasks</b>		1-255/Multi	1-255/Multi
<b>Main Unit</b>			
Main Processor	Intel 8086	Intel 80286	Intel 8086
Word Size (bits)	16/16	16/16	16/16
Clock Rate (MHz)	5	8	8
Other Processors	Intel 8087 math coprocessor	Intel 80287 (opt.)	Intel 8087 (opt.)
<b>Memory</b>			
RAM Min/Max (bytes)	128K/896K	256K/3M	256K/3M
RAM Increments (bytes)	128K	256K, 768K, 3M	256K, 768K, 3M
ROM (bytes)	—	—	—
<b>Diskette Storage</b>			
No. of Drives	1	2 ext. (opt.)	2 ext. (opt.)
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	320K	360K	360K
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	0-1	1 ext. (opt. w/network)	1 ext. (opt.)
Capacity (bytes)	12M, 19M	25M, 50M, 225M	25M, 50M, 225M
Access Time (msec)	—	—	35
<b>Other Storage</b>	45MB streaming tape (opt.)	25M disk cartridge (opt.)	25MB disk cartridge (opt.)
<b>Display</b>			
Size and Type	Third party	12-in. CRT	12-in. CRT
Text Display (lines x col)	NA	25 x 80	25 x 80
Character Matrix (dots)	NA	9 x 14	9 x 14
Resolution (pixels)	NA	640 x 200	640 x 200
Screen Attributes	NA	Blinking, reverse video, half-intensity	Blinking, reverse video, half intensity
Colors (simul/palette)	NA	Monochrome	Monochrome
<b>Keyboard</b>			
Keyboard Type	Third party	Detachable	Detachable
No. of Keys	NA	104	104
Cursor Control	NA	4-key cluster	4-key cluster
No. of Function Keys	NA	18	18
Numeric Pad	NA	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	4-6	1	1
Serial Ports	1 RS-232C	1 RS-449/RS-232C	1 RS-449/RS-232C
Parallel Ports	1	1 Centronics	1 Centronics
Special Output Ports	—	NA	—
Special Input Ports	—	NA	NA
<b>Data Communications</b>			
Asynchronous	—	Opt.	Opt.
Synchronous	—	Opt.	Opt.
Internal Modem	NA	—	—
<b>Software</b>			
Operating Systems	iRMX, XENIX; MS-DOS (opt.)	MS-DOS; PC-DOS (opt.)	MS-DOS; PC DOS (opt.)
Bundled Applications	ITIS productivity software	NA	NA
Languages	BASIC, C, COBOL, FORTRAN, PASCAL, PL/M, Pascal	FORTRAN, COBOL, BASIC, APL	FORTRAN, COBOL, BASIC, APL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	22 x 17 x 6.5	15.75 x 12.75 x 11.30	15.75 x 12.75 x 11.30
Weight (lbs)	50	30	30
Power Supply	88-132/180-264 VAC, 47/63 Hz	110/220 VAC	110/220 VAC
<b>Sales and Service</b>			
Announced/Delivered	Fall 1983	March 1985/March 1985	March 1985/September 1985
Sales Channels	Direct, OEM, VAR	VARs	VARs
Service Channels	Direct	VARs	VARs, dealers, factory
<b>Pricing</b>	\$4,995-\$9,500	\$2,495 (w/256KB RAM) \$595 for diskette drive.	\$1,995 (w/256KB RAM) \$595 for diskette drive.
<b>Comments</b>	NA	NA	Available with portable keyboard. MultiLAN network supports up to 255 users.

**Notes:**

NA Not applicable  
— Information unavailable at press time



<b>Vendor Model</b>	<b>Ironics</b> IV 1600/DUM VMEbus Development System	<b>Isotron</b> OSI-345	<b>Isotron</b> OSI-710
<b>Class</b>	Desktop or rackmount	Desktop	Floor model
<b>Users/Tasks</b>	4/—	8/16	5–15/Unlimited
<b>Main Unit</b>			
Main Processor	Motorola MC 68000/68010	Zilog Z80A	Motorola MC 68010
Word Size (bits)	32/16	8/8	32/16
Clock Rate (MHz)	8, 10 or 12.5	4	10
Other Processors	NEC 7220 graphics coprocessor	Zilog Z80A application processors	Zilog Z80 communications processors
<b>Memory</b>			
RAM Min/Max (bytes)	756K/35M	124K/572K	2M/8M
RAM Increments (bytes)	64K, 256K	64K	2M
ROM (bytes)	16K	4K	EEPROM
<b>Diskette Storage</b>			
No. of Drives	1	1	1
Size (in.) & Format	5.25 DSDD	8 SD and DD	8 DSDD
Capacity (bytes)	680K (formatted)	243K SD; 622K DD	1M
Access Time (msec)	—	NA	NA
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	30M (formatted)	13M–80M	20M–120M
Access Time (msec)	—	30	25–80
<b>Other Storage</b>	—	Cartridge tape and 9-in. reel-to-reel IBM-compatible tape drives	Streaming magnetic tape
<b>Display</b>			
Size and Type	13- or 19-in. CRT	14-in. CRT	14-in. CRT
Text Display (lines x col)	80 x 48	24 x 80	24 x 80
Character Matrix (dots)	7 x 10	7 x 11	7 x 11
Resolution (pixels)	800 x 600, 1024 x 1024	NA	—
Screen Attributes	Blink, underline	High/low intensity, reverse video, blank and underline	High/low intensity, reverse video, blank and underline
Colors (simul/palette)	Monochrome, 16/4,096 RGB	Green monochrome	Green monochrome
<b>Keyboard</b>			
Keyboard Type	Third party	Detachable	Detachable
No. of Keys	NA	89	89
Cursor Control	NA	4-key row	4-key row
No. of Function Keys	NA	11	11
Numeric Pad	NA	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	—	2 common, 2 dedicated per user	6–16
Serial Ports	4 RS-422/RS-232	2	1 RS-232/V24
Parallel Ports	1 Centronics	1 Centronics	—
Special Output Ports	IEEE-488, 1 RGB, 1 composite video (opt.)	1 SASI and network	SASI, network, sync; IEEE-488 (opt.)
Special Input Ports	Light pen, mouse, serial I/O keyboard	—	—
<b>Data Communications</b>			
Asynchronous	Std	Std (TTY)	Std (TTY)
Synchronous	—	NA	Opt. (3270, 2780/3780, 3770, BSC/SNA, and Univac UTS 400)
Internal Modem	NA	—	—
<b>Software</b>			
Operating Systems	UNIX System V; PSOS, CP/M (opt.)	TurboDOS 1.41	RTIX; XENIX (opt.)
Bundled Applications	—	—	Uniplex 11, Mimer, OSI BASIC
Languages	All UNIX V-compatible	Keybasic	C, Pascal, FORTRAN-77, COBOL, APL, and Assembler
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	8.75 x 8.75 x 17	24.5 x 19 x 8.75	24 x 10 x 25.5
Weight (lbs)	70	95	88
Power Supply	—	115/230 VAC, 50/60 Hz	115/230 VAC, 47–440 Hz
<b>Sales and Service</b>			
Announced/Delivered	1983	1983	May 1985/May 1985
Sales Channels	Direct, sales reps	Dealer	Dealer
Service Channels	Factory repair	Dealer	Dealer
<b>Pricing</b>	\$16,435	\$7,495–\$12,495 (single-user system)	\$10,500
<b>Comments</b>	NA	NA	NA

**Notes:**

- NA Not applicable
- Information unavailable at press time



Vendor	JC Information Systems	JC Information Systems	JC Information Systems
<b>Model</b>	JCS 4X	JCS 507	JCS 807
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	1-4/-	1-128/1-128	1-128/1-128
<b>Main Unit</b>			
Main Processor	Zilog Z80B, Z80H, or Intel 80186	Zilog Z80B, Z80H, or Intel 80186	Zilog Z80B, Z80H, or Intel 80186
Word Size (bits)	8/8; 16/16 (80186)	8/8; 16/16 (80186)	8/8; 16/16 (80186)
Clock Rate (MHz)	6 or 8	6 or 8	6 or 8
Other Processors	One processor per user	One processor per user	—
<b>Memory</b>			
RAM Min/Max (bytes)	64K/1M	64K/1M	64K/1M
RAM Increments (bytes)	64K	64K	64K
ROM (bytes)	—	—	—
<b>Diskette Storage</b>			
No. of Drives	1-2	1-2	1
Size (in.) & Format	5 DSQD	5 DSQD	8, DSDD
Capacity (bytes)	20M, 36M, 50M, 70M	1M	1.2M
Access Time (msec)	30	30	30
<b>Hard Disk Storage</b>			
No. of Drives	1-2	1-2	1-2
Capacity (bytes)	20M, 36M, 50M, 70M	20M, 36M, 50M, 70M	20M, 36M, 50M, 70M
Access Time (msec)	20	30	30, 45
<b>Other Storage</b>	20MB magnetic tape	20MB tape	20MB magnetic tape
<b>Display</b>			
Size and Type	12-in. or 14-in. CRT	12-in or 14-in. CRT	12-in. or 14-in. CRT
Text Display (lines x col)	24 x 80	24 x 80	24 x 80
Character Matrix (dots)	7 x 9; 9 x 11	7 x 9; 9 x 11	7 x 9; 9 x 11
Resolution (pixels)	—	—	—
Screen Attributes	—	—	—
Colors (simul/palette)	Amber or green monochrome	Amber or green monochrome	Amber or green monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	65	65	65
Cursor Control	Cluster	Cluster	Cluster
No. of Function Keys	10	10	10
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	7	7	7
Serial Ports	Up to 128 RS-232C	Up to 128 RS-232C	Up to 128 RS-232C
Parallel Ports	Up to 32 Centronics	Up to 32 Centronics	Up to 32 Centronics
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Std	Std	Std
Internal Modem	—	—	—
<b>Software</b>			
Operating Systems	CP/M-80, CP/M-86; TurboDOS (opt.)	CP/M-80, CP/M-86; TurboDOS (opt.)	CP/M-80, CP/M-86; TurboDOS (opt.)
Bundled Applications	—	—	—
Languages	All CP/M-compatible	All CP/M-compatible	All CP/M-compatible
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	—	—	—
Weight (lbs)	—	—	—
Power Supply	120/220 VAC	120/240 VAC	120/240 VAC
<b>Sales and Service</b>			
Announced/Delivered	—	—	—
Sales Channels	Dealer, distributor	Dealer, distributor	Dealer, distributor
Service Channels	Dealer, direct	Dealer, direct	Dealer, direct
<b>Pricing</b>	All systems are custom configured	All systems are custom configured	All systems are custom configured
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable  
 — Information unavailable at press time



	JC Information Systems	Kaypro	Logical Business Machines
<b>Vendor Model</b>	JCS 810	286i	Adam III
<b>Class</b>	Desktop	Desktop	Floor model
<b>Users/Tasks</b>	1-128/1-128	Multi/Multi	4/4
<b>Main Unit</b>			
Main Processor	Zilog Z80B, Z80H, or Intel 80186	Intel 80286	Intel 8086
Word Size (bits)	8/8; 16/16 (80186)	16/16	16/16
Clock Rate (MHz)	6 or 8	6	8
Other Processors	—	80287 math coprocessor (opt.)	—
<b>Memory</b>			
RAM Min/Max (bytes)	64K/1M	512K/15M	128K/256K
RAM Increments (bytes)	64K	64K, variable increments of memory cards	128K
ROM (bytes)	—	32K	NA
<b>Diskette Storage</b>			
No. of Drives	1-2	2	NA
Size (in.) & Format	8 DSDD	5.25 DSDD	NA
Capacity (bytes)	1.2M	1.2M	NA
Access Time (msec)	30	80	NA
<b>Hard Disk Storage</b>			
No. of Drives	1-2	NA	1
Capacity (bytes)	20M, 36M, 50M, 70M	NA	20M
Access Time (msec)	30, 45	NA	28
<b>Other Storage</b>	20MB magnetic tape	NA	20MB streaming tape
<b>Display</b>			
Size and Type	12-in. or 14-in. CRT	14-in. CRT (opt.)	12-in. CRT
Text Display (lines x col)	24 x 80	25 x 80	25 x 80
Character Matrix (dots)	7 x 9; 9 x 11	—	7 x 9
Resolution (pixels)	—	640 x 200 monochrome; 320 x 200 RGB	—
Screen Attributes	—	—	Reverse Monochrome
Colors (simul/palette)	Amber or green monochrome	Black and white monochrome; 16/16 RGB	—
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	65	84	83
Cursor Control	Cluster	4-key cluster	4-key cluster
No. of Function Keys	10	—	19
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	10	5	12
Serial Ports	Up to 128 RS-232C	1 RS-232C	12 RS-232C/RS-422
Parallel Ports	Up to 32 Centronics	2	NA
Special Output Ports	—	1 RGB	NA
Special Input Ports	—	NA	NA
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Std	Std	NA
Internal Modem	—	NA	NA
<b>Software</b>			
Operating Systems	CP/M-80, CP/M-86; TurboDOS (opt.)	MS-DOS	Proprietary
Bundled Applications	—	WordStar, Mailmerge, InfoStar + , CalcStar, Tutors and Lessons	—
Languages	All CP/M-compatible	GWBASIC	Diplomat Natural
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	—	21.25 x 17 x 6.38	24 x 15.5 x 29.5
Weight (lbs)	—	38	155
Power Supply	120/240 VAC	110/240 VAC, 50/60 Hz	120/240 VAC, 50/60 Hz, 200 watts
<b>Sales and Service</b>			
Announced/Delivered	—	February 1985/March 1985	June 1982
Sales Channels	Dealer, distributor	Kaypro dealer network	Dealer networks
Service Channels	Dealer, direct	Kaypro dealer network	Dealer networks
<b>Pricing</b>	All systems are custom configured	\$4,550	\$16,000-\$22,000
<b>Comments</b>	NA	NA	Built-in power failure backup system.

Notes:  
 NA Not applicable  
 — Information unavailable at press time





Vendor	Logical Business Machines	MAI Basic Four Information Systems	Micro Five
<b>Model</b>	Goliath	MAI 2000	Series 1000
<b>Class</b>	Floor model	Desktop	Desktop
<b>Users/Tasks</b>	1-20/Multi	14/14	4-12/20
<b>Main Unit</b>			
Main Processor	Intel 8086	Motorola MC 68010	Intel 8088-2
Word Size (bits)	16/16	32/16	16/8
Clock Rate (MHz)	8	8MHz	8
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	128K/256K	768K/1.5M	128K/512K
RAM Increments (bytes)	128K	256K	128K
ROM (bytes)	NA	—	16K
<b>Diskette Storage</b>			
No. of Drives	NA	1	1
Size (in.) & Format	NA	5.25 DSDD	5.25 DSDD
Capacity (bytes)	NA	660K	1M
Access Time (msec)	NA	120	204
<b>Hard Disk Storage</b>			
No. of Drives	1	1-2	1
Capacity (bytes)	20M, 40M, 80M	22M, 43M-120M	12.8M, 19M, 40M, 80M
Access Time (msec)	28	30	85, 45
<b>Other Storage</b>	20MB streaming tape	—	20MB streaming tape cartridge (opt.)
<b>Display</b>			
Size and Type	12-in. CRT	12-in. CRT; 14-in. CRT (opt.)	Third party
Text Display (lines x col)	25 x 80	24 x 80; 24 x 80/132 (opt.)	NA
Character Matrix (dots)	7 x 9	7 x 9	NA
Resolution (pixels)	—	—; 640 x 300 (opt.)	NA
Screen Attributes	Reverse	Reduced intensity, blink, underline, reverse video	NA
Colors (simul/palette)	Monochrome	Green monochrome	NA
<b>Keyboard</b>			
Keyboard Type	Detached	Detachable	Third party
No. of Keys	83	91-109	NA
Cursor Control	4-key cluster	4-key cluster	NA
No. of Function Keys	19	—	NA
Numeric Pad	Integral	Integral	NA
<b>Input/Output</b>			
Open I/O Slots	4, 12, or 20	4	—
Serial Ports	4-20	14 RS-232C	4-12 RS-232C
Parallel Ports	NA	1 Centronics	—
Special Output Ports	NA	14 composite video	—
Special Input Ports	NA	NA	—
<b>Data Communications</b>			
Asynchronous	Std	Std (TTY)	Std (TTY)
Synchronous	NA	Opt. (IBM 2780/3780)	—
Internal Modem	NA	—	—
<b>Software</b>			
Operating Systems	Proprietary	BOSS/IX	CP/M-86, MP/M-86, SMC, Business BASIC, STARDOS; BOS-MICROBOL (opt.)
Bundled Applications	NA	—	—
Languages	Proprietary	BASIC and COBOL	BASIC, COBOL, FORTRAN, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	24 x 15.5 x 29.5	24 x 14 x 6	17 x 16.2 x 6.7
Weight (lbs)	155	35	26
Power Supply	117 VAC, 240 watts	115/230 VAC, 50/60 Hz, 261 watts	115/230 VAC
<b>Sales and Service</b>			
Announced/Delivered	March 1980	November 1984/December 1984	November 1982/November 1985
Sales Channels	Dealer networks	Direct, dealer	Dealer, distributor
Service Channels	Dealer networks	Sorbus	Dealer, General Electric
<b>Pricing</b>	\$18,000-\$24,000	\$14,420 (CPU w/768KB RAM, 22MB fixed disk, diskette, printer, and operating system)	\$4,995-\$12,995
<b>Comments</b>	Built-in power failure backup system	NA	NA

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Vendor</b>	<b>Micro Five</b>	<b>Molecular Computer</b>	<b>Molecular Computer</b>
<b>Model</b>	Turbo 1700	Durango Poppy 186	Durango Poppy 286/186
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	4-16/24	1-8/1-32	1-12/1-96
<b>Main Unit</b>			
Main Processor	Intel 80186	Intel 80186	Intel 80286/80186 dual processor
Word Size (bits)	16/16	16/16	16/24
Clock Rate (MHz)	8	8	6
Other Processors	—	Intel 80186 graphics processor	Intel 80287, Intel 80186 graphics processors
<b>Memory</b>			
RAM Min/Max (bytes)	256K/768K	128K/1,152K	640K/2,304K
RAM Increments (bytes)	256K	128K, 256K, 512K	256K, 512K
ROM (bytes)	16K	32K	32K
<b>Diskette Storage</b>			
No. of Drives	1	1-2	Up to 3
Size (in.) & Format	5.25 DSDD	5.25 DS	5.25 DS
Capacity (bytes)	1M	1.2M, 819K	1.2M, 819K
Access Time (msec)	204	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1-2	1-3	1-3
Capacity (bytes)	72M	10M, 20M, 40M	20M, 40M
Access Time (msec)	30	43	43
<b>Other Storage</b>	60MB streaming cartridge tape	19.5MB streaming tape	19.5MB streaming tape
<b>Display</b>			
Size and Type	Third party	14-in. CRT; RGB (opt.)	14-in. CRT; RGB (opt.)
Text Display (lines x col)	NA	27 x 80/132	27 x 80/132
Character Matrix (dots)	NA	9 x 13	9 x 13
Resolution (pixels)	NA	720 x 300 monochrome; 640 x 400 (RGB)	720 x 300 monochrome; 640 x 400 (RGB)
Screen Attributes	NA	Blinking, inverse video, smooth or jump scroll	Blinking, inverse video, smooth or jump scroll
Colors (simul/palette)	NA	Monochrome; 8/16 (RGB)	Monochrome; 8/16 (RGB)
<b>Keyboard</b>			
Keyboard Type	Third party	Detachable	Detachable
No. of Keys	NA	94	94
Cursor Control	NA	4-key cluster	4-key cluster
No. of Function Keys	NA	40	40
Numeric Pad	NA	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	—	3	2
Serial Ports	4-1 RS-232C	Up to 14 RS-232C or RS-422	Up to 14 RS-232C or RS-422
Parallel Ports	0-4 Centronics	2 Centronics	2 Centronics
Special Output Ports	—	Up to 3 RGB, up to 3 composite video	Up to 3 RGB, up to 3 composite video
Special Input Ports	—	Up to 3	Up to 3
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	Std (TTY)
Synchronous	—	Std (3271/3275 bisync, 2780/3780 bisync, 3274/3276 SNA/SDLC)	Std (3271/3275 bisync, 2780/3780 bisync, 3274/3276 SNA/SDLC)
Internal Modem	—	NA	NA
<b>Software</b>			
Operating Systems	STARDOS or SMC, Business BASIC	MS-DOS 3.0; Concurrent DOS 3.1, MBOS/5 (opt.)	XENIX 3.1; MS-DOS 3.0; Concurrent DOS 3.1 (opt.)
Bundled Applications	—	—	—
Languages	BASIC	BASIC, C, FORTRAN, RM/COBOL, Pascal	BASIC, C, FORTRAN, RM/COBOL, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	18.8 x 16.2 x 6.7	18 x 19 x 5.5	18 x 19 x 5.5
Weight (lbs)	26	38	38
Power Supply	115/230 VAC	110/120 VAC, 60 Hz or 220/240 VAC, 50 Hz; 130 watts	110/120 VAC, 60 Hz or 220/240 VAC, 50 Hz, 130 watts
<b>Sales and Service</b>			
Announced/Delivered	—	April 1983/June 1983	April 1983/December 1983
Sales Channels	Dealer, distributor	VARs, OEM	VARs, OEM
Service Channels	Dealer, General Electric	VARs, Dow Jones	VARs, Dow Jones
<b>Pricing</b>	\$17,995-\$22,495	\$3,345 (Poppy 186/52) \$4,420 (Poppy 186/53) \$4,820 (Poppy 186/54) \$6,095 (Poppy 186/55)	\$6,995 (Poppy 286/186/104) \$8,270 (Poppy 286/186/105)
<b>Comments</b>	NA	NA	NA

Notes:  
 NA Not applicable  
 — Information unavailable at press time



Vendor	Monroe Systems for Business	Motorola/Four-Phase Systems	Motorola/Four-Phase Systems
<b>Model</b>	MS 2000	Series 2000, Model 240	Series 2000, Model 260
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	5/4	1-8/Multi	1-8/Multi
<b>Main Unit</b>			
Main Processor	Intel 80186	Motorola MC 6809	Motorola MC 68010
Word Size (bits)	16/16	16/8	32/16
Clock Rate (MHz)	8	2	8
Other Processors	Zilog Z80A	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	128K/896K	384K/768K	512K/1M
RAM Increments (bytes)	128K, 256K	64K	64K
ROM (bytes)	—	18K	18K
<b>Diskette Storage</b>			
No. of Drives	1-2	1-2 (opt.)	2 (opt.)
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	720K, 640K	.65M	.65M
Access Time (msec)	170	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1-7	1-7
Capacity (bytes)	10M	15M, 52M	52M
Access Time (msec)	155	85, 30	30
<b>Other Storage</b>	38MB external disk, 5MB removable cartridge disk	60MB streaming tape	60MB streaming tape
<b>Display</b>			
Size and Type	12-in. CRT; 14-in. RGB (opt.)	15-in. CRT	15-in. CRT
Text Display (lines x col)	25 x 80	25 x 80	25 x 80
Character Matrix (dots)	7 x 9	7 x 9	7 x 9
Resolution (pixels)	640 x 400	300 x 720	300 x 720
Screen Attributes	Reverse video, blinking, underline, normal and high intensity	Blinking, high/low intensity, inverse video, underline	Blinking, high/low intensity, inverse video, underline
Colors (simul/palette)	Monochrome; 16/16 (RGB)	Amber or green monochrome	Amber or green monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	—	95	95
Cursor Control	4-key cluster	4-key row	4-key row
No. of Function Keys	14	12	12
Numeric Pad	Separate	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	—	—	—
Serial Ports	2 RS-232C	6-12	6-12
Parallel Ports	1	NA	NA
Special Output Ports	1 RGB, 1 composite video	ANSI SCSI bus	ANSI SCSI bus
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY, ASCOM)	Std (TTY)	Std (TTY)
Synchronous	Std (3270 SNA)	Std (SNA/BSC)	Std (SNA/BSC)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	MS-DOS 2.0, CP/M-86 DPX; Concurrent CP/M-86 (opt.)	ISOS II; Mumps (opt.)	Unix System V; MUMPS (opt.)
Bundled Applications	NA	DBMS, WP, spreadsheet, Sequel, Query-by-FORMS	DBMS, WP, spreadsheet, Sequel, Query-by-FORMS
Languages	GWBASIC	C, COBOL, BASIC	C, COBOL, BASIC, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	22.5 x 19.5 x 16.63	15 x 9 x 14	15 x 9 x 14
Weight (lbs)	54.5	25	25
Power Supply	115 VAC	—	—
<b>Sales and Service</b>			
Announced/Delivered	November 1983/January 1984	June 1983	June 1983
Sales Channels	Direct	Direct, VARs	Direct, VARs
Service Channels	Direct	Direct	Direct
<b>Pricing</b>	\$46,000	\$7,235	\$10,495
<b>Comments</b>	NA	Complete set of office and communications software available.	Complete set of office and communications software offered

**Notes:**

NA Not applicable

— Information unavailable at press time



Vendor	Motorola/Four-Phase Systems	Motorola/Four-Phase Systems	Motorola Semiconductor Products
<b>Model</b>	Series 6000, System 6300	Series 6000, System 6600	VME/10
<b>Class</b>	Floor model	Floor model	Desktop
<b>Users/Tasks</b>	1-8/—	16+ /—	1-3/—
<b>Main Unit</b>			
Main Processor	Motorola MC 68010	Motorola MC 68010	Motorola MC 68010
Word Size (bits)	32/16	32/16	32/16
Clock Rate (MHz)	10	10	10
Other Processors	NA	80186 I/O processors	MC 68451 memory management unit
<b>Memory</b>			
RAM Min/Max (bytes)	512K/2M	512K/4M	384K/20.8M
RAM Increments (bytes)	512K	512K, 1M	128K to 4M
ROM (bytes)	NA	NA	32K
<b>Diskette Storage</b>			
No. of Drives	1	NA	1
Size (in.) & Format	5.25 DSDD	NA	5.25 DSDD
Capacity (bytes)	655K	NA	655K
Access Time (msec)	94	NA	80
<b>Hard Disk Storage</b>			
No. of Drives	1	4 per enclosure	1
Capacity (bytes)	37M	37M	15M
Access Time (msec)	30	30	30
Other Storage	NA	45MB streaming tape	NA
<b>Display</b>			
Size and Type	12-in. CRT	12-in. CRT	15-in. CRT; 14-in. RGB (opt.)
Text Display (lines x col)	29 x 80	29 x 80	25 x 80
Character Matrix (dots)	9 x 12	9 x 12	8 x 16
Resolution (pixels)	720 x 348	720 x 348	600 x 800
Screen Attributes	Blinking, blank, underline, dual intensity, reverse video	Blank, blinking, underline, dual intensity, reverse video	Inverse video, underline, blink
Colors (simul/palette)	Green monochrome	Green monochrome	Monochrome (7 gray levels); 7/7 (RGB)
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	98	98	106
Cursor Control	Cluster	Cluster	4-key cluster
No. of Function Keys	10	10	16
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	NA	Up to 36	5 VMEbus, 4 I/O channel
Serial Ports	2 RS-232C	Custom configurable	4 RS-232C (opt.)
Parallel Ports	1 Centronics	Custom configurable	4 Centronics (opt.)
Special Output Ports	1 RS-422	1 RS-422	10MB Ethernet, SASI (opt.)
Special Input Ports	—	—	Analog conversion (opt.)
<b>Data Communications</b>			
Asynchronous	Std (UUCP, CU)	Std (UUCP, CU)	Opt. (TTY)
Synchronous	Std (3270 BSC, 3270 SNA, 2780/3780)	Std (2780/3780, BSC, 3270 SNA)	—
Internal Modem	NA	NA	—
<b>Software</b>			
Operating Systems	UNIX-derived	UNIX-derived; RTOS (opt.)	VERSAOS; UNIX System V, CP/M-68K, Concurrent DOS (opt.)
Bundled Applications	NA	NA	—
Languages	BASIC, COBOL, Pascal, C	BASIC, COBOL, Pascal, C	C, Pascal, CBASIC, FORTRAN-77
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	23 x 7 x 22.5	28 x 16 x 29	46 x 19 x 20
Weight (lbs)	60	150-200	55
Power Supply	110/220 VAC, 50/60 Hz, 220 watts	110/220 VAC, 50/60 Hz, 1100 watts	60 Hz, 90-132 VAC, 550 watts
<b>Sales and Service</b>			
Announced/Delivered	February 1984/March 1984	February 1984/April 1984	May 1983/July 1983
Sales Channels	Direct, VARs	Direct, VAR	Direct, distributor
Service Channels	Direct	Direct	Direct
<b>Pricing</b>	\$24,468 (w/8 workstations, 37MB disk storage, 1MB RAM 1 character printer, Unix-based O.S.)	\$69,877 (w/8 workstations, 74MB disk drive, 1MB RAM, character printer, line printer, UNIX-based O.S.)	\$12,995 (w/384KB RAM, 655KB diskette, 15MB Winchester disk)
<b>Comments</b>	NA	NA	NA

**Notes:**

- NA Not applicable
- Information unavailable at press time



<b>Vendor</b>	<b>NCR</b>	<b>NCR</b>	<b>NCR</b>
<b>Model</b>	I-Tower	MiniTOWER	PC8
<b>Class</b>	Floor model	Floor model	Desktop
<b>Users/Tasks</b>	16/Multi	2-8/Multi	16/Multi
<b>Main Unit</b>			
Main Processor	Motorola MC 68000	Motorola 68010	Intel 80286
Word Size (bits)	32/16	32/16	16/16
Clock Rate (MHz)	10	10	6
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	512K/2M	512K/2M	256K/4M
RAM Increments (bytes)	512K	512K	128K, 256K, 1M
ROM (bytes)	—	64K	—
<b>Diskette Storage</b>			
No. of Drives	1-2	1-2	1
Size (in.) & Format	5.25 DS	5.25	5.25
Capacity (bytes)	1M	2M	1.2M
Access Time (msec)	147	181	—
<b>Hard Disk Storage</b>			
No. of Drives	1 (int.); 1 (ext.)	1	0-1
Capacity (bytes)	46M; 84M	25M or 46M	20M-40M
Access Time (msec)	—	85 (25MB); 33 (46MB)	—
<b>Other Storage</b>	20MB streaming tape	45MB cartridge tape drive	—
<b>Display</b>			
Size and Type	Supports NCR 7900, 7901, 7910 & 7930 terminals	Supports NCR 7900, 7901, 7910, & 7930 terminals	15-in. CRT; 14-in. RGB CRT (opt.)
Text Display (lines x col)	—	—	25 x 80
Character Matrix (dots)	—	—	—
Resolution (pixels)	—	—	640 x 400
Screen Attributes	—	—	—
Colors (simul/palette)	—	—	Monochrome; 16 color (RGB)
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Detachable
No. of Keys	NA	NA	—
Cursor Control	NA	NA	Separate pad
No. of Function Keys	NA	NA	30
Numeric Pad	NA	NA	Integral
<b>Input/Output</b>			
Open I/O Slots	7	8	8
Serial Ports	8 RS-232C (8 more opt.)	8	2 RS-232C
Parallel Ports	—	1 (opt.)	2 Centronics
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Opt. (TTY)	Std (TTY)	NA
Synchronous	Opt. (IBM 2780/3780)	Std (SDLC, 2780/3780, 3270, X.25)	NA
Internal Modem	—	—	NA
<b>Software</b>			
Operating Systems	RM/COS	Tower Operating System V (UNIX)	NCR DOS 3.1; XENIX (Opt.)
Bundled Applications	—	NA	—
Languages	RM/COBOL, BASIC, Pascal, C, FORTRAN, Micro Focus COBOL, SVS BASIC	RM/COBOL, BASIC, Pascal, C, FORTRAN, Micro Focus COBOL, SVS BASIC	GWBASIC
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	27 x 7 x 29	25.5 x 5 x 24	16.5 x 21.1 x 6.1
Weight (lbs)	96-136	82	50
Power Supply	90-136 VAC	100-127/220-240 VAC, 50/60 Hz	—
<b>Sales and Service</b>			
Announced/Delivered	February 1984	April 1985/—	April 1985/—
Sales Channels	Direct	Direct	Dealer, VARs, OEMs, Direct
Service Channels	Direct	Direct	Dealer, Direct
<b>Pricing</b>	\$21,495 (CPU w/.5MB memory, 46MB disk storage, diskette, 8 serial ports, RM/COS software, & cartridge tape)	\$6,995 (CPU w/512KB memory, disk controller, 1MB diskette drive, 25MB disk drive and 8 channel I/O controller)	\$3,795 (CPU w/256KB RAM, 1.2MB diskette drive) \$5,505 (CPU w/512KB RAM, 1.2MB diskette drive, 20MB disk drive)
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable

— Information unavailable at press time



<b>Vendor</b>	<b>NCR</b>	<b>NCR</b>	<b>Nixdorf Computer</b>
<b>Model</b>	TOWER 1632	TOWER XP	8870 Micro 7
<b>Class</b>	Floor model	Floor model	Desktop
<b>Users/Tasks</b>	16/Multi	16/Multi	2/2
<b>Main Unit</b>			
Main Processor	Motorola MC 68000	Motorola MC 68010	Nixdorf
Word Size (bits)	32/16	32/16	16/16
Clock Rate (MHz)	10	10	6
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	512K/2M	1M/8M	256K/256K
RAM Increments (bytes)	256K, 512K, 1M	2M, 4M	NA
ROM (bytes)	32K	—	—
<b>Diskette Storage</b>			
No. of Drives	1-2	1-2	1
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25
Capacity (bytes)	1M	1M	800M
Access Time (msec)	137	—	91
<b>Hard Disk Storage</b>			
No. of Drives	0-2	—	1
Capacity (bytes)	32M, 84M	46M	10M
Access Time (msec)	—	—	85
<b>Other Storage</b>	20MB streaming tape	45MB cartridge tape, 2KB cache memory	—
<b>Display</b>			
Size and Type	Supports NCR 7900, 7901, 7910 & 7930 terminals	Supports NCR 7900, 7901, 7910 & 7930 terminals	12-in. CRT
Text Display (lines x col)	—	—	25 x 80
Character Matrix (dots)	—	—	7 x 9
Resolution (pixels)	—	—	—
Screen Attributes	—	—	Intensity adjustment
Colors (simul/palette)	—	—	Amber monochrome
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Detachable
No. of Keys	NA	NA	—
Cursor Control	NA	NA	—
No. of Function Keys	NA	NA	—
Numeric Pad	NA	NA	Integrated
<b>Input/Output</b>			
Open I/O Slots	16	9	8
Serial Ports	8 (std), 8 (opt.)	8 RS-232C	4 RS-232C
Parallel Ports	NA	1	4
Special Output Ports	NA	—	—
Special Input Ports	NA	—	—
<b>Data Communications</b>			
Asynchronous	Opt. (TTY)	Std (TTY)	Std (Nixdorf)
Synchronous	Opt. (IBM 2780/3780, SDLC; UNET)	Opt. (IBM 3270 BSC, 2780/3780, SNA/RJE, X.25)	Opt. (2780/3780)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	NCR Tower O.S. (UNIX)	NCR Tower O.S. 5 (UNIX System V)	NIROS/TAMOS
Bundled Applications Languages	—	—	Report Writer Business BASIC
	BASIC, C, COBOL, FORTRAN, Pascal, RM/COBOL, Micro Focus COBOL, SVS BASIC	RM/COBOL, BASIC, C, Pascal, FORTRAN, Micro Focus COBOL, SVS BASIC	
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	27 x 7 x 29	27 x 7 x 29	—
Weight (lbs)	96-116	—	—
Power Supply	100/120/127 VAC, 50/60 Hz	—	—
<b>Sales and Service</b>			
Announced/Delivered	March 1983	October 1984	1984
Sales Channels	Direct	Direct, distributor	Direct
Service Channels	Direct	Direct	Manufacturer
<b>Pricing</b>	\$6,995 (CPU w/1MB diskette drive, 8 channel I/O controller)	\$19,495 (w/1MB RAM, 1M diskette drive, 46MB disk, 45MB cartridge tape)	\$89,995 (CPU, 256KB RAM, 10MB disk, VDT, 800KB diskette)
<b>Comments</b>	NA	Software compatible with and upgradeable to the Tower 1632	NA

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Vendor</b>	<b>NNC Electronics</b>	<b>NNC Electronics</b>	<b>NNC Electronics</b>
<b>Model</b>	M/20	M/40	Model 520
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	3/3	3/3	10/Multi
<b>Main Unit</b>			
Main Processor	Zilog Z80B	Zilog Z80B	Zilog Z80B
Word Size (bits)	8/8	8/8	8/8
Clock Rate (MHz)	6	6	6
Other Processors	NA	NA	—
<b>Memory</b>			
RAM Min/Max (bytes)	192K/192K	192K/192K	320K/832K
RAM Increments (bytes)	NA	NA	256K
ROM (bytes)	—	—	2K-4K
<b>Diskette Storage</b>			
No. of Drives	1	1	1
Size (in.) & Format	5.25 DS	5.25 DS	5.25 DSDD
Capacity (bytes)	1M	1M	1M
Access Time (msec)	—	—	3
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	20M	40M	20M (formatted)
Access Time (msec)	—	—	70
<b>Other Storage</b>	Streaming tape or start-stop tape drive (opt.)	Streaming tape or start-stop tape drive (opt.)	Streaming tape or start-stop tape drive (opt.)
<b>Display</b>			
Size and Type	Third party	Third party	Third party
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Resolution (pixels)	NA	NA	NA
Screen Attributes	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Third party
No. of Keys	NA	NA	NA
Cursor Control	NA	NA	NA
No. of Function Keys	NA	NA	NA
Numeric Pad	NA	NA	NA
<b>Input/Output</b>			
Open I/O Slots	NA	NA	8
Serial Ports	4 RS-232C	4 RS-232C	10 RS-232C
Parallel Ports	1 Centronics	1 Centronics	2
Special Output Ports	NA	NA	—
Special Input Ports	NA	NA	—
<b>Data Communications</b>			
Asynchronous	Std	Std	Std (TTY)
Synchronous	Std	Std	—
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	OASIS	OASIS	OASIS; CP/M (opt.)
Bundled Applications	NA	NA	—
Languages	BASIC	BASIC	BASIC, C, COBOL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	14 x 14 x 4.5	14 x 14 x 4.5	17.87 x 18.75 x 7
Weight (lbs)	25	25	50
Power Supply	—	—	110/120 VAC, 60 Hz
<b>Sales and Service</b>			
Announced/Delivered	1984/1984	1984/1984	1983/1983
Sales Channels	Distributors, dealers	Distributors, dealers	Dealer, OEM, distributor
Service Channels	Factory	Factory	NNC
<b>Pricing</b>	\$5,385	\$7,230	\$7,685
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable  
— Information unavailable at press time



<b>Vendor</b> <b>Model</b> <b>Class</b> <b>Users/Tasks</b> <b>Main Unit</b> Main Processor Word Size (bits) Clock Rate (MHz) Other Processors <b>Memory</b> RAM Min/Max (bytes) RAM Increments (bytes) ROM (bytes) <b>Diskette Storage</b> No. of Drives Size (in.) & Format Capacity (bytes) Access Time (msec) <b>Hard Disk Storage</b> No. of Drives Capacity (bytes) Access Time (msec) <b>Other Storage</b>  <b>Display</b> Size and Type Text Display (lines x col) Character Matrix (dots) Resolution (pixels) Screen Attributes Colors (simul/palette) <b>Keyboard</b> Keyboard Type No. of Keys Cursor Control No. of Function Keys Numeric Pad <b>Input/Output</b> Open I/O Slots Serial Ports Parallel Ports Special Output Ports Special Input Ports <b>Data Communications</b> Asynchronous Synchronous Internal Modem <b>Software</b> Operating Systems Bundled Applications Languages <b>Physical and Electrical</b> Size (L x W x H, in.) Weight (lbs) Power Supply <b>Sales and Service</b> Announced/Delivered Sales Channels Service Channels <b>Pricing</b> <b>Comments</b>	<b>NNC Electronics</b> Model 540 Desktop 10/Multi  Zilog Z80B 8/8 6 — 320K/832K 256K 2K-4K 1 5.25 DSDD 1M 3 1 40M 30 Streaming tape drive or start-stop tape drive (opt.) Third party NA NA NA NA NA NA Third party NA NA NA NA NA 8 10 RS-232C 2 — — Std (TTY) — NA OASIS; CP/M (opt.) — BASIC, C, COBOL 17.88 x 18.75 x 7 50 110-120 VAC, 60 Hz 1983/1983 Dealer, OEM, distributor NNC \$8,915 NA	<b>NNC Electronics</b> Model 820 Desktop 10/Multi  Zilog Z80B 8/8 6 — 320K/832K 256K 2K-4K 1 8 DSDD 1M 3 1 20M (formatted) 70 Streaming tape drive or start-stop tape drive (opt.) Third party NA NA NA NA NA NA Third party NA NA NA NA NA 8 10 RS-232C 2 — — Std (TTY) — — OASIS; CP/M (opt.) — BASIC, C, COBOL 17.88 x 18.75 x 7 50 110-120 VAC, 60 Hz 1983/1983 Dealer, OEM, distributor NNC \$7,685 NA	<b>NNC Electronics</b> Model 840 Desktop 10/Multi  Zilog Z80B 8/8 6 — 320K/832K 256K 2K-4K 1 8 DSDD 1M 3 1 40M (formatted) 30 Streaming tape drive or start-stop tape drive (opt.) Third party NA NA NA NA NA NA Third party NA NA NA NA NA 8 10 RS-232C 2 — — Std (TTY) — — OASIS; CP/M (opt.) — BASIC, COBOL, C 17.88 x 18.75 x 7 50 110-120 VAC, 60 Hz 1983/1983 Dealer, OEM, distributor NNC \$8,915 NA
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Notes:  
 NA Not applicable  
 — Information unavailable at press time





Vendor	NoHALT COMPUTERS	North Star Computers	North Star Computers
<b>Model</b>	RELIANT	DIMENSION	HORIZON 8/16
<b>Class</b>	Floor model	Floor model	Desktop
<b>Users/Tasks</b>	64/16	1-12/Multi	1-8/Multi
<b>Main Unit</b>			
Main Processor	Zilog Z80B	Intel 80186 in central server	Intel 8088-2
Word Size (bits)	8/8	16/16	16/8
Clock Rate (MHz)	9.8	6	8
Other Processors	Up to 16 Z80B or Intel 8086 processors	Intel 8088-2 in each workstation	Zilog Z80A (1 per each user)
<b>Memory</b>			
RAM Min/Max (bytes)	64K (per Z80B), 128K (per 8086), 512K	256K/512K (server); 128K/384K (workstation)	128KB/2M; add'l. 64K per each Z80Z
RAM Increments (bytes)	—	256K (server); 128, 384K (workstation)	—
ROM (bytes)	8 x 16K (opt.)	—	1K EPROM (opt.)
<b>Diskette Storage</b>			
No. of Drives	1	1-2	1-2
Size (in.) & Format	5.25	5.25	5.25 DS
Capacity (bytes)	5MB	360K	360
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	2 (mirrored)	1-2	0-1
Capacity (bytes)	33MB-140MB	15M, 30M	5M, 15M, 30M
Access Time (msec)	30	—	—
<b>Other Storage</b>	Streaming tape (opt.)	45MB tape back-up	13.4MB tape cartridge
<b>Display</b>			
Size and Type	Third party	12-in. CRT (3rd party)	Third party
Text Display (lines x col)	NA	25 x 80	NA
Character Matrix (dots)	NA	8 x 16	NA
Resolution (pixels)	NA	640 x 200/400	NA
Screen Attributes	NA	—	NA
Colors (simul/palette)	NA	—	NA
<b>Keyboard</b>			
Keyboard Type	Third party	Detachable (3rd party)	Third party
No. of Keys	NA	83	NA
Cursor Control	NA	—	NA
No. of Function Keys	NA	10	NA
Numeric Pad	NA	—	NA
<b>Input/Output</b>			
Open I/O Slots	—	13 total	8
Serial Ports	4 RS-232C per processor	2	2-10 RS-232C
Parallel Ports	1 per processor	1	1
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Std (IBM 2780/3780, 3270, SDLC, HDLC)	Std (IBM 2780/3780, 3270 BSC, 3270/3770 SDLC and SNA)	Std
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	NHDOS (prop.), CP/M-compatible	Version of MS-DOS	CP/M, TSS/C, TSS/A, TurboDOS
Bundled Applications	—	—	—
Languages	COBOL, BASIC, PL/1, C, Pascal, FORTRAN	BASIC, FORTRAN, COBOL, Pascal	BASIC, COBOL, FORTRAN, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	34 x 11.5 x 29	20 x 12 x 24	19 x 17 x 7
Weight (lbs)	200	60	50
Power Supply	110/220 VAC, 50/60 Hz	115/230 VAC, 50/60 Hz, 450 watts	115/230, 50/60 Hz, 250 watts
<b>Sales and Service</b>			
Announced/Delivered	1982	Fall 1983/March 1985	1983
Sales Channels	Direct, OEM	Dealer, distributor, OEM	Dealer, distributor, OEM
Service Channels	3rd party	MAI Sorbus, dealer	MAI Sorbus, dealers
<b>Pricing</b>	Under \$30,000 (w/1 application processor, 2 file processors, back-up power supply, 2 controllers and power distribution cards, 2 disks)	\$7,350 (2-user system w/128KB RAM, 15MB disk) \$1,500 (each add'l. user)	\$6,300-\$7,700
<b>Comments</b>	Fault-tolerant system	NA	NA

**Notes:**

NA Not applicable

— Information unavailable at press time



<p><b>Vendor</b>  <b>Model</b>  <b>Class</b>  <b>Users/Tasks</b>  <b>Main Unit</b>  Main Processor  Word Size (bits)  Clock Rate (MHz)  Other Processors  <b>Memory</b>  RAM Min/Max (bytes)  RAM Increments (bytes)  ROM (bytes)  <b>Diskette Storage</b>  No. of Drives  Size (in.) &amp; Format  Capacity (bytes)  Access Time (msec)  <b>Hard Disk Storage</b>  No. of Drives  Capacity (bytes)  Access Time (msec)  <b>Other Storage</b>    <b>Display</b>  Size and Type  Text Display (lines x col)  Character Matrix (dots)  Resolution (pixels)  Screen Attributes  Colors (simul/palette)    <b>Keyboard</b>  Keyboard Type  No. of Keys  Cursor Control  No. of Function Keys  Numeric Pad  <b>Input/Output</b>  Open I/O Slots  Serial Ports    Parallel Ports    Special Output Ports  Special Input Ports  <b>Data Communications</b>  Asynchronous  Synchronous    Internal Modem  <b>Software</b>  Operating Systems    Bundled Applications  Languages    <b>Physical and Electrical</b>  Size (L x W x H, in.)  Weight (lbs)  Power Supply  <b>Sales and Service</b>  Announced/Delivered  Sales Channels  Service Channels  <b>Pricing</b>    <b>Comments</b></p>	<p><b>Northern Telecom</b>  565  Floor model  4/32    Intel 8085  8/8  6  NA  256K/512K  128K  4K  NA  NA  NA  NA  1  22M  —  1 external disk (up to 385MB), 15MB cartridge tape, 800/1600 bpi magnetic tape    15-in. CRT  24 x 80  7 x 9  —  Green monochrome    Detachable  78  4-key  18  Integral  —  2 RS-232C    1 Centronics    NA  NA  Opt. (TTY, VT100)  Opt. (bisync, IBM 2770, 2780/3780, 3270, 3774, SDLC)  NA  4.1 Omnitask; CP/M (opt.)    NA  COBOL, TAL 2000    29 x 15.2 x 36  300  1060 watts  1983  Direct  Vendor  \$15,000 (w/256K RAM, 22MB disk)  Supplied on an as-ordered basis</p>	<p><b>Northern Telecom</b>  585  Floor model  16/32    Intel 8085  8/8  6  NA  256K/512K  128K  4K  NA  NA  NA  NA  1  65M  —  1 external disk, up to 385MB, 15MB cartridge tape, 800/1600 bpi magnetic tape    15-in. CRT  24 x 80  7 x 9  —  Green monochrome    Detachable  78  4-key  18  Integral  —  2-4 RS-232C    1 Centronics    NA  NA  Opt. (TTY, VT100)  Opt. (bisync, IBM 2770, 2780/3780, 3270, 3774, SDLC)  NA  4.1 Omnitask; CP/M (opt.)    NA  COBOL, TAL 2000    29 x 15.2 x 36  300  1060 watts  1981  Direct  Vendor  \$20,000 (w/256K RAM, 65MB disk)  Supplied on an as-ordered basis</p>	<p><b>Northern Telecom</b>  Meridian DV-1  Floor model  35/35    Motorola MC 68010  32/16  —  Intel 80286  128K/1.1M (per workstation)  1M per processor; 128KB per workstation  —  —  —  —  —  1  40M, 80M, 200M  —  48MB cartridge tape    12-in. CRT  25 x 80/132  —  351 x 720  Windowing, soft keys  Black on white; white on black (opt.)    Detachable  109  4-key cluster  46  Integral  —  2 RS-232C per Lanlink Interface Unit  1 Centronics per Lanlink Interface Unit  Voice handset/speaker phone  —  Std  Opt. (3270 bisync, SNA)    Opt.  XMS; DVIX, Concurrent DOS (opt.)  Q-Office, Informix  COBOL, BASIC, Pascal, C, FORTRAN    19 x 11 x 36.5 (each cabinet)  —  —  February 1985/May 1985  Direct, distributors  Dealers  —  NA</p>
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Notes:  
NA Not applicable  
— Information unavailable at press time



Vendor Model	Onyx Systems Onyx 5010 OASIS Business Systems	Onyx Systems Onyx 5012 Series	Onyx Systems Onyx 6001 Series
<b>Class</b>	Desktop (5010D), floor model (5010V)	Desktop (5012D), floor model (5012V)	Desktop
<b>Users/Tasks</b>	5-7/Multi	5 (5012D), 11 (5012V/Multi)	6/Multi
<b>Main Unit</b>			
Main Processor	Zilog Z80B	Zilog 8001	Intel 80186
Word Size (bits)	8/8	16/16	16/16
Clock Rate (MHz)	6	6	8
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	384K/896K	512K/512K (5012D), 512K/1M (5012V)	256K/768K
RAM Increments (bytes)	64K	256K	256K
ROM (bytes)	—	—	—
<b>Diskette Storage</b>			
No. of Drives	NA	NA	1-2
Size (in.) & Format	NA	NA	5.25 DSDD
Capacity (bytes)	NA	NA	1M
Access Time (msec)	NA	NA	87.3
<b>Hard Disk Storage</b>			
No. of Drives	1 internal; 2 external (opt.)	1-2	1
Capacity (bytes)	14M, 21M, 40M, 46M	14M, 21M, 40M, 46M	18M, 40M, 46M
Access Time (msec)	—	—	68
<b>Other Storage</b>	12MB magnetic tape	12MB tape cartridge	12MB magnetic tape
<b>Display</b>			
Size and Type	14-in. CRT	14-in. CRT	14-in. CRT
Text Display (lines x col)	24 x 80	24 x 80	24 x 80
Character Matrix (dots)	7 x 9	7 x 9	7 x 9
Resolution (pixels)	—	—	—
Screen Attributes	Blinking, reverse video, underline, half-intensity scrolling	Blinking, reverse video, underline, half-intensity scrolling	Blinking, reverse video, underline, half-intensity scrolling
Colors (simul/palette)	Monochrome	Monochrome	Monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	104	104	104
Cursor Control	4-key cluster	4-key cluster	4-key cluster
No. of Function Keys	28	28	28
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	—	—	—
Serial Ports	5 (5010D), 11 (5010V)	6 (5012D), 5 or 11 (5012V) RS-232C	6 RS-232C
Parallel Ports	1 Centronics	1 Centronics	1 Centronics
Special Output Ports	1 disk expansion	1 expansion disk	1 disk expansion
Special Input Ports	—	—	NA
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Opt. (IBM 2780/3780)	Std (IBM 2780/3780)	Opt. (IBM 2780/3780)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	OASIS	ONYX System III (UNIX)	OASIS 16, Concurrent DOS, THOROUGHbred/OS
Bundled Applications	—	The Onyx Office	—
Languages	BASIC, COBOL	BASIC, C, COBOL, FORTRAN, Pascal	C, BASIC, COBOL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	20 x 16 x 5.5 (5010D), 27.4 x 6.2 x 24.8 (5010V)	20 x 16 x 5.5 (5012D), 27 x 24 x 6 (5012V)	20 x 16 x 5.5
Weight (lbs)	40 (5010D), 85 (5010V)	40 (5012D), 85 (5012V)	40
Power Supply	110/220 VAC, 50/60 Hz, 200 watts	110/220 VAC, 50/60 Hz, 200 watts (5012D), 220 watts (5012V)	110/220 VAC, 50/60 Hz, 200 watts
<b>Sales and Service</b>			
Announced/Delivered	1984/1984	1983/1984	1983/1984
Sales Channels	Direct, dealer, distributor	Direct, distributor, dealer	Direct, distributor, dealer
Service Channels	Vendor, RCA	Vendor, RCA	Vendor, RCA
<b>Pricing</b>	—	—	—
<b>Comments</b>	Expected to merge with and operate as Corvus Systems, Inc. in June 1985	Expected to merge with and operate as Corvus Systems, Inc. in June 1985	Expected to merge with and operate as Corvus Systems, Inc. in June 1985

**Notes:**

NA Not applicable

— Information unavailable at press time



Vendor Model	Onyx Systems Onyx 6810 Series Business Computers	OSM Computer Zeus 3X	OSM Computer Zeus 4
<b>Class</b>	Desktop (6810D), floor model (6810V)	Desktop	Desktop
<b>Users/Tasks</b>	14/—	2-32/—	2-4/—
<b>Main Unit</b>			
Main Processor	Motorola MC 68010	1 Zilog Z80A per user	1 Zilog Z80A per user
Word Size (bits)	32/16	8/—	8
Clock Rate (MHz)	8	—	—
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	1M/6M (6810D), 8M (6810V)	64K per user, 64K for master	64K per user, 64K for master
RAM Increments (bytes)	—	NA	NA
ROM (bytes)	—	—	—
<b>Diskette Storage</b>			
No. of Drives	NA	1 (opt.)	1
Size (in.) & Format	NA	8 SSSD	5.25
Capacity (bytes)	NA	250K	250K
Access Time (msec)	NA	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1-2	1-2	1
Capacity (bytes)	18M, 40M, 46M	12.6M, 65M	10M, 12M, 20M
Access Time (msec)	—	—	—
<b>Other Storage</b>	12MB cartridge tape	20MB tape cartridge	20MB tape (opt.)
<b>Display</b>			
Size and Type	14-in. CRT	Third party	Third party
Text Display (lines x col)	24 x 80	NA	NA
Character Matrix (dots)	7 x 9	NA	NA
Resolution (pixels)	—	NA	NA
Screen Attributes	Blinking, reverse video, underline, half-intensity, scrolling	NA	NA
Colors (simul/palette)	Monochrome	NA	NA
<b>Keyboard</b>			
Keyboard Type	Detachable	Third party	Third party
No. of Keys	104	NA	NA
Cursor Control	4-key cluster	NA	NA
No. of Function Keys	28	NA	NA
Numeric Pad	Integral	NA	NA
<b>Input/Output</b>			
Open I/O Slots	—	2 per user	2 per user
Serial Ports	6 (6810D), 14 (6810V)	2 per user, 2 for master	1 RS-232C
Parallel Ports	1 Centronics	1 for master	1 per user, 1 for master
Special Output Ports	1 disk expansion	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Opt. (IBM BSC 2780/3780)	—	—
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	ONYX System V (UNIX)	MUSE	MUSE
Bundled Applications	The ONYX Office	—	—
Languages	BASIC, C, COBOL, FORTRAN, Pascal	—	—
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	20 x 17.7 x 5.5 (6810D), 27.2 x 6.2 x 24.8 (6810V)	27 x 19 x 10	15 x 13 x 8
Weight (lbs)	40 (6810D), 85 (6810V)	60	25
Power Supply	110/220 VAC, 50/60 Hz, 200 watts (6810D), 300 watts (6810V)	115 VAC, 60 Hz	115 VAC, 60 Hz
<b>Sales and Service</b>			
Announced/Delivered	—	1982	1982
Sales Channels	Direct, distributor, dealer	Distributors, VARs, dealers	Distributors, VARs, dealers
Service Channels	Vendor, RCA	Distributors, VARs, dealers	Third party, vendor
<b>Pricing</b>	—	\$9,995 (4 user system w/25MB disk drive)	\$4,995 (4 user system w/20MB Winchester)
<b>Comments</b>	NA	Primarily marketed to OEMs	Primarily marketed to OEMs

**Notes:**

NA Not applicable  
 — Information unavailable at press time



Vendor	Pacific Microcomputers	Perkin-Elmer	Pertec Computer
<b>Model</b>	PM200	7350A Supermicro	3215C
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	18/20 per user	5/20 per user	1-16/Multi
<b>Main Unit</b>			
Main Processor	Motorola MC 68000/68010	Motorola MC 68000	Motorola MC 68000
Word Size (bits)	32/16	32/16	32/16
Clock Rate (MHz)	10-12	8	10
Other Processors	NA	NA	—
<b>Memory</b>			
RAM Min/Max (bytes)	2M/4M	512K/3M	256K/1.5M
RAM Increments (bytes)	1M	1M	256K, 512K
ROM (bytes)	128K	—	16K
<b>Diskette Storage</b>			
No. of Drives	1	1	1
Size (in.) & Format	5.25 DSDD	5.25 SSSD	5.25 DSDD
Capacity (bytes)	1M	320K	1M
Access Time (msec)	3	200	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	85M	40M	13.33M, 26.66M, 53.33M
Access Time (msec)	33	35	98
<b>Other Storage</b>	30MB .25-in. cartridge tape	17.2KB streaming cartridge tape	—
<b>Display</b>			
Size and Type	Third party	12-in. or 15-in. CRT	14-in. CRT
Text Display (lines x col)	NA	24 x 80	25 x 80/132
Character Matrix (dots)	NA	9 x 12	7 x 9
Resolution (pixels)	NA	720 x 256/300	—
Screen Attributes	NA	—	Underline, blinking, reverse video, half intensity
Colors (simul/palette)	NA	Amber or green monochrome or RGB graphics	Green monochrome, 8/8 shades (opt.)
<b>Keyboard</b>			
Keyboard Type	Third party	Detachable	Detachable
No. of Keys	NA	106	90/113
Cursor Control	NA	Cluster and bezel soft keys	—
No. of Function Keys	NA	16 and 8 bezel keys	10
Numeric Pad	NA	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	8	2 full size, one half size	8 (std), 19 (opt.)
Serial Ports	18	4 RS-232C	4
Parallel Ports	1 Versatec (SASI)	1	NA
Special Output Ports	—	1 IEEE-488	5-16 (opt.)
Special Input Ports	—	NA	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY, Ethernet)	Std (TTY)
Synchronous	Opt. (bisync)	NA	Opt. (2750, 3780, 3270)
Internal Modem	—	—	NA
<b>Software</b>			
Operating Systems	UNIX System V	UNIPLUS	O/S 3200, UNIX V; PICK (opt.)
Bundled Applications	Programmers Workbench, Writers Workbench	NA	—
Languages	FORTRAN, C, BASIC, ADA, COBOL	C, RM/COBOL, FORTRAN-77, SIBOL, BASIC-PLUS	BASIC, COBOL, FORTRAN, Pascal, C, ASM 68000
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	—	19 x 20.25 x 6.25	—
Weight (lbs)	50	43	51
Power Supply	115 VAC, 60 Hz, 225 watts	60 Hz	110/115/200/240 VAC, 50/60 Hz, 300 watts
<b>Sales and Service</b>			
Announced/Delivered	1982/1982	1985/1985	—
Sales Channels	Direct, agent	Direct	Distributor, dealer
Service Channels	Factory	Direct	RCA
<b>Pricing</b>	\$15,500-\$15,900	\$8,250 (CPU w/512KB RAM, 40MB disk, and operating system)	\$7,370 (w/512KB RAM, 9 ports, diskette drive, 13.33MB disk drive)
<b>Comments</b>	NA	NA	NA

## Notes:

NA Not applicable

— Information unavailable at press time



<p><b>Vendor</b>  <b>Model</b>  <b>Class</b>  <b>Users/Tasks</b>  <b>Main Unit</b>  Main Processor  Word Size (bits)  Clock Rate (MHz)  Other Processors  <b>Memory</b>  RAM Min/Max (bytes)  RAM Increments (bytes)  ROM (bytes)  <b>Diskette Storage</b>  No. of Drives  Size (in.) &amp; Format  Capacity (bytes)  Access Time (msec)  <b>Hard Disk Storage</b>  No. of Drives  Capacity (bytes)  Access Time (msec)  <b>Other Storage</b>  <b>Display</b>  Size and Type  Text Display (lines x col)  Character Matrix (dots)  Resolution (pixels)  Screen Attributes  Colors (simul/palette)  <b>Keyboard</b>  Keyboard Type  No. of Keys  Cursor Control  No. of Function Keys  Numeric Pad  <b>Input/Output</b>  Open I/O Slots  Serial Ports  Parallel Ports  Special Output Ports  Special Input Ports  <b>Data Communications</b>  Asynchronous  Synchronous  Internal Modem  <b>Software</b>  Operating Systems  Bundled Applications  Languages  <b>Physical and Electrical</b>  Size (L x W x H, in.)  Weight (lbs)  Power Supply  <b>Sales and Service</b>  Announced/Delivered  Sales Channels  Service Channels  <b>Pricing</b>  <b>Comments</b></p>	<p><b>Pertec Computer</b>  3220C  Desktop  1-16/Multi  Motorola MC 68000  32/16  10  —  256K/1.5M  256K, 512K  16K  NA  NA  NA  NA  1  26.66M, 53.33M  98  48.6MB streaming tape  14-in. CRT  25 x 80/132  7 x 9  —  Underline, blinking, reverse  video, half intensity  Green monochrome, 8/8  shades (opt.)  Detachable  90/113  —  10  Integral  8 (std), 19 (opt.)  4  NA  5-16 (opt.)  —  Std (TTY)  Opt. (2780, 3780, 3270)  NA  O/S 3700, UNIX 5; PICK opt.  —  BASIC, COBOL, FORTRAN,  Pascal, C, ASM 68000  —  51  110/115/200/240 VAC, 50/60  Hz, 300 watts  —  Distributor, dealer  RCA  \$13,290 (w/512KB RAM, 9  ports, 48.6MB streaming  cartridge tape, 26.66MB  disk)  NA</p>	<p><b>Pertec Computer</b>  3230C  Floor model  1-16/Multi  Motorola MC 68000  32/16  10  —  1M/4M  512K  16K  1 (opt.)  8 DSDD  1.5  —  2  70M  50  48.6MB streaming cartridge  tape backup  14-in. CRT  25 x 80/132  7 x 9  —  Underline, blink, reverse  video, half intensity  Green monochrome, 8/8  shades (opt.)  Detachable  90/115  —  10  Integral  34  Up to 19 RS-232C  NA  16 coax  NA  Std (TTY)  Opt. (27XX, 37XX, 3270)  NA  O/S 3200, UNIX V; PICK  (opt.)  —  BASIC, COBOL, FORTRAN,  Pascal, C, ASM 8600  32 x 15 x 30  175  110/115/200/240 VAC, 50/60  Hz, 100 watts  —  Distributor, dealer  RCA  \$28,300 (w/512KB RAM, 20  ports, 48.6MB streaming  cartridge tape, 70MB disk  drive)  NA</p>	<p><b>Pertec Computer</b>  3240C  Floor model  1-32/Multi  Motorola MC 68000  32/16  10  —  1M/4M  512K  16K  1 (opt.)  8 DSDD  1.5M  —  2  70M  50  48.6MB streaming cartridge  tape  14-in. CRT  25 x 80/132  7 x 9  —  Underline, blinking, reverse  video, half intensity  Green monochrome, 8/8  shades (opt.)  Detachable  90/113  —  10  Integral  50  Up to 19 RS-232C  NA  32 coax  NA  Std (TTY)  Opt. (27XX, 37XX, 3270)  NA  O/S 3200, UNIX V; PICK opt.  —  BASIC, COBOL, FORTRAN,  Pascal, C, ASM 8600  32 x 15 x 30  175  110/115/200/240 VAC, 50/60  Hz, 1000 watts  —  Distributor, dealer  RCA  \$32,900 (w/1MB RAM, 36  ports, 48.6MB streaming  cartridge tape, 70MB disk  drive)  NA</p>
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Notes:  
NA Not applicable  
— Information unavailable at press time



Vendor	Plexus Computers	Plexus Computers	Plexus Computers
<b>Model</b>	P/15	P/35	P/60
<b>Class</b>	Desktop or under desk	Desktop	Floor model
<b>Users/Tasks</b>	1-8/1-100	1-16/1-100	1-40/1-100
<b>Main Unit</b>			
Main Processor	Motorola MC 68010	Motorola MC 68000	Motorola MC 68000
Word Size (bits)	32/32	32/32	32/32
Clock Rate (MHz)	10	12.5	—
Other Processors	1 MC 68010 I/O processor	2 to 5 additional MC 68000 processors for I/O and communications	2-7 additional MC 68000 processors for I/O and communications
<b>Memory</b>			
RAM Min/Max (bytes)	512K/2M	512K/2M	512K/4M
RAM Increments (bytes)	512K	512K	512K, 1M
ROM (bytes)	64K	64K	128K
<b>Diskette Storage</b>			
No. of Drives	1	NA	NA
Size (in.) & Format	5.25 DSDD	NA	NA
Capacity (bytes)	1M	NA	NA
Access Time (msec)	94	NA	NA
<b>Hard Disk Storage</b>			
No. of Drives	2	3	2 or 4
Capacity (bytes)	12M-152M	22M-435M	72M-1.2G
Access Time (msec)	83, 30	38, 28	20 (8-in.); 27 (14-in.)
<b>Other Storage</b>	45MB streaming cartridge tape	45MB streaming cartridge tape	1600 bpi, 9-track streaming tape
<b>Display</b>			
Size and Type	Third party	Third party	Third party
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Resolution (pixels)	NA	NA	NA
Screen Attributes	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Third party
No. of Keys	NA	NA	NA
Cursor Control	NA	NA	NA
No. of Function Keys	NA	NA	NA
Numeric Pad	NA	NA	NA
<b>Input/Output</b>			
Open I/O Slots	8	16	40
Serial Ports	8	16	40
Parallel Ports	NA	2	5
Special Output Ports	NA	—	—
Special Input Ports	NA	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	Std (TTY)
Synchronous	Std (BSC HASP/3780/3270)	Std (BSC, HASP, 3780/3270)	Std (BSC, HASP, 3780/3270)
Internal Modem	—	—	—
<b>Software</b>			
Operating Systems	UNIX System 5.2	UNIX	UNIX
Bundled Applications	—	—	—
Languages	COBOL, C, BASIC, FORTRAN, Pascal	COBOL, C, BASIC, FORTRAN, Pascal	COBOL, C, BASIC, FORTRAN, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	24 x 9.75 x 24	24 x 19 x 10.5	33.5 x 21.5 x 55
Weight (lbs)	70	65	485
Power Supply	115/230 VAC	115/230 VAC	115/230 VAC
<b>Sales and Service</b>			
Announced/Delivered	November 1984/March 1985	November 1982/1983	November 1982/1983
Sales Channels	Direct (U.S.); distributor (outside the U.S.)	Direct (U.S.); distributors (outside the U.S.)	Direct (U.S.); distributor (outside the U.S.)
Service Channels	Vendor	Vendor	Vendor
<b>Pricing</b>	\$10,950 (w/Dual MC 68010 processors, 512KB memory, 1MB diskette, 12MB disk, 8 serial ports, and UNIX)	\$16,950 (Multiprocessor w/512KB memory, Multibus backplane, 22MB disk, streaming cartridge tape, 8 serial ports, 1 parallel port)	\$42,950 (Multiprocessor w/512KB memory, 9-track tape drive, 72MB disk, 12-slot Multibus backplane, 8 serial ports, 1 parallel port)
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable

— Information unavailable at press time



<b>Vendor Model Class</b>	<b>Point 4</b> Mark 2 Desktop	<b>QDP</b> 300 Desktop	<b>QDP</b> 400 Desktop
<b>Users/Tasks</b>	7/—	1-4/1	1-8/1
<b>Main Unit</b>			
Main Processor	Proprietary	Zilog Z80B	Zilog Z80B
Word Size (bits)	16/16	8/8	8/8
Clock Rate (MHz)	15	6	6
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	64K/128K	128K/768K	128K/768K
RAM Increments (bytes)	64K	256K	256K
ROM (bytes)	1K	2-16K	2K-16K
<b>Diskette Storage</b>			
No. of Drives	1	1-2	1-2
Size (in.) & Format	5.25 DSDD	8 DSDD	8 DSDD
Capacity (bytes)	1M	1.2M	1.2M
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	13M	15M, 32M	15M, 32M, 55M
Access Time (msec)	80	330, 110	110, 85, 45
<b>Other Storage</b>	—	—	—
<b>Display</b>			
Size and Type	12-in. CRT	Third party	Third party
Text Display (lines x col)	24 x 80	NA	NA
Character Matrix (dots)	7 x 10	NA	NA
Resolution (pixels)	—	NA	NA
Screen Attributes	Underline, blinking reverse video	NA	NA
Colors (simul/palette)	Green or amber monochrome	NA	NA
<b>Keyboard</b>			
Keyboard Type	Detachable	Third party	Third party
No. of Keys	84	NA	NA
Cursor Control	4-key cluster	NA	NA
No. of Function Keys	18	NA	NA
Numeric Pad	Integral	NA	NA
<b>Input/Output</b>			
Open I/O Slots	6	6	3
Serial Ports	7 RS-232C	2-6 RS-232C	2-6 RS-232C
Parallel Ports	NA	2 Centronics	2 Centronics
Special Output Ports	NA	1	1
Special Input Ports	NA	—	NA
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	NA	NA	NA
Internal Modem	NA	Opt.	Opt.
<b>Software</b>			
Operating Systems	IRIS; BLIS/COBOL	CP/M-80; MP/M II (opt.)	TurboDOS
Bundled Applications	—	—	—
Languages	BASIC, COBOL	C, BASIC, COBOL, FORTH, FORTRAN, Pascal, PL/1	C, BASIC, COBOL, FORTH, FORTRAN, Pascal, PL/1
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	—	—	—
Weight (lbs)	55	—	—
Power Supply	—	—	—
<b>Sales and Service</b>			
Announced/Delivered	1983/1984	January 1983/February 1983	January 1984/April 1984
Sales Channels	Distributors, dealers	Dealer	Dealer
Service Channels	Dealer, 3rd party	Dealer	Dealer
<b>Pricing</b>	\$8,995-\$11,195	\$3,295 (includes 2 diskette drives) \$4,495 (includes 15MB disk drive, diskette drive)	\$7,695 (2-user system includes 1 diskette, 15MB disk)
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable  
— Information unavailable at press time



<b>Vendor</b>	<b>Quay</b>	<b>Quay</b>	<b>Quay</b>
<b>Model</b>	500 Series	520	540
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	1-4/—	1-4/—	1-4/—
<b>Main Unit</b>			
Main Processor	Zilog Z80A	Zilog Z80A	Zilog Z80A
Word Size (bits)	8/8	8/8	8/8
Clock Rate (MHz)	4	4	4
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	64K/208K	64K/208K	64K/208K
RAM Increments (bytes)	16K	—	—
ROM (bytes)	1-14K	1-14K	1-14K
<b>Diskette Storage</b>			
No. of Drives	1-2	2	2
Size (in.) & Format	5.25 DSDD	5.25 DSDD	DD
Capacity (bytes)	400K, 800K	400K	800K
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1-4	1-4	1-4
Capacity (bytes)	10M, 36M	10M, 30M	10M-36M
Access Time (msec)	—	—	—
<b>Other Storage</b>	—	—	—
<b>Display</b>			
Size and Type	12-in. CRT	12-in. CRT	12-in. CRT
Text Display (lines x col)	24 x 80	24 x 80	24 x 80
Character Matrix (dots)	7 x 11	7 x 11	7 x 11
Resolution (pixels)	—	—	108
Screen Attributes	—	—	—
Colors (simul/palette)	Green monochrome	Green monochrome	Green monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	92	92	92
Cursor Control	—	—	—
No. of Function Keys	8	8	8
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	8	8	8
Serial Ports	1-6	1-6	1-6
Parallel Ports	1	—	—
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	Std (TTY)
Synchronous	Std	Std	Std
Internal Modem	—	—	—
<b>Software</b>			
Operating Systems	CP/M 2.2; MP/M (opt.)	CP/M 2.2; MP/M (opt.)	CP/M 2.2; MP/M (opt.)
Bundled Applications	—	—	—
Languages	BASIC, FORTRAN, COBOL, Pascal	BASIC, FORTRAN, COBOL, Pascal	BASIC, FORTRAN, COBOL, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	18.1 x 16.2 x 6.8	10.1 x 16.2 x 6.8	18.1 x 16.2 x 6.8
Weight (lbs)	40	40	40
Power Supply	120 VAC	120 VAC	120 VAC
<b>Sales and Service</b>			
Announced/Delivered	—	—	—
Sales Channels	Distributor, direct, dealer	Distributor, dealer, direct	Distributor, dealer, direct
Service Channels	Third party, factory	Third party	Third party
<b>Pricing</b>	\$1,695	\$2,395	\$2,995
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable

— Information unavailable at press time



<b>Vendor</b>	<b>Quay</b>	<b>Quay</b>	<b>Quay</b>
<b>Model</b>	900	900/33	910
<b>Class</b>	Desktop	Desktop, rackmount	Desktop
<b>Users/Tasks</b>	1-4/—	1-4/—	4
<b>Main Unit</b>			
Main Processor	Zilog Z80A	Zilog Z80A	Zilog Z80A
Word Size (bits)	8/8	8/8	8/8
Clock Rate (MHz)	4	4	4
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	64K/208K	64K/208K	208K/208K
RAM Increments (bytes)	—	16K	NA
ROM (bytes)	1-14K	1-14K	1-14K
<b>Diskette Storage</b>			
No. of Drives	2	2	1
Size (in.) & Format	8 DSDD	8 DSDD	8 DSDD
Capacity (bytes)	1.25M	1.25M	1.25M
Access Time (msec)	—	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1-4	1-4	1-4
Capacity (bytes)	10M-36M	10M, 36M	10M-36M
Access Time (msec)	—	—	—
<b>Other Storage</b>	—	—	—
<b>Display</b>			
Size and Type	12-in. CRT	12-in. CRT	12-in. CRT
Text Display (lines x col)	24 x 80	24 x 80	24 x 80
Character Matrix (dots)	7 x 11	7 x 11	7 x 11
Resolution (pixels)	—	—	—
Screen Attributes	Green monochrome	—	—
Colors (simul/palette)	—	Green monochrome	Green monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	92	92	92
Cursor Control	—	—	—
No. of Function Keys	8	8	8
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	8	8	8
Serial Ports	1-6	1-6	6
Parallel Ports	1	1	1
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	Std (TTY)
Synchronous	Std	Std	Std
Internal Modem	—	—	—
<b>Software</b>			
Operating Systems	CP/M 2.2; MP/M (opt.)	CP/M 2.2; MP/M (opt.)	MP/M
Bundled Applications	—	—	—
Languages	BASIC, FORTRAN, Pascal, COBOL	BASIC, FORTRAN, COBOL, Pascal	BASIC, COBOL, FORTRAN, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	22.1 x 17.8 x 7.8	22 x 17.8 x 7.8	22.1 x 17.8 x 7.8
Weight (lbs)	60	60	70
Power Supply	120 VAC	120 VAC	120 VAC
<b>Sales and Service</b>			
Announced/Delivered	—	—	—
Sales Channels	Direct, distributor, dealer	Distributor, direct, dealer	Direct
Service Channels	3rd party, factory	Third party, factory	3rd party factory
<b>Pricing</b>	\$3,495	\$9,890	\$8,495
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable

— Information unavailable at press time

<b>Vendor</b>	<b>Rexon Business Machines</b>	<b>Rexon Business Machines</b>	<b>Rexon Business Machines</b>
<b>Model</b>	Rexon RX 100	Rexon RX 105	Rexon RX 200
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	8/8	8/80	12/—
<b>Main Unit</b>			
Main Processor	Intel 8086-2	Intel 80286	Intel 8086-2 based
Word Size (bits)	16/16	16/16	16/16
Clock Rate (MHz)	7.2	6	7.3
Other Processors	1 coprocessor (opt.)	Intel 80287	Intel 8086-2 coprocessor
<b>Memory</b>			
RAM Min/Max (bytes)	256K/960K	512K/1792K	128K/960K
RAM Increments (bytes)	128K	512K	128K
ROM (bytes)	4K	8K	4K
<b>Diskette Storage</b>			
No. of Drives	1	1	1 (opt.)
Size (in.) & Format	8 DSDD	5.25 DSDD	8 SSDD, SSSD, DSDD, DSSD
Capacity (bytes)	1.2M	1.2M	1.2M
Access Time (msec)	91	93	—
<b>Hard Disk Storage</b>			
No. of Drives	1-2	1	1-2
Capacity (bytes)	15M	40M	28M
Access Time (msec)	77	40	—
<b>Other Storage</b>	20MB tape cartridge	Internal 45MB cartridge tape; 9-track magnetic tape (opt.)	20MB streaming cartridge tape
<b>Display</b>			
Size and Type	12-in. CRT (opt.)	12-in. CRT (opt.)	12-in. CRT (opt.)
Text Display (lines x col)	25 x 80	25 x 80	25 x 80
Character Matrix (dots)	7 x 11	7 x 11	7 x 11
Resolution (pixels)	300 x 720	300 x 720	300 x 720
Screen Attributes	High/low intensity, normal/reverse, blink/blank, graphics, high contrast Green monochrome	High/low intensity, normal/reverse, blink/blank, graphics, high contrast Green monochrome	High/low intensity, normal/reverse, blink/blank, graphics, high contrast Green monochrome
Colors (simul/palette)			
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	100	100	100
Cursor Control	4-key row	4-key row	4-key row
No. of Function Keys	25	25	25
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	2	5	2
Serial Ports	8 RS-232C	8 RS-232C	4-12
Parallel Ports	4 Centronics	4 Centronics	2-4
Special Output Ports	—	NA	NA
Special Input Ports	—	NA	NA
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	Std
Synchronous	Opt. (IBM 2780/3780)	Opt.	Opt. (2780/3780)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	RECAP; MP/M-86 (opt.)	XENIX 3.2	RECAP; MP/M-86 (opt.)
Bundled Applications	IDOL, DBMS	Informix	Opt.
Languages	Business BASIC	C, SMC BASIC, Micro Focus, COBOL	NA
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	18 x 18 x 10.5	18 x 18 x 10.5	18 x 18 x 10.5
Weight (lbs)	46	50	49
Power Supply	50 Hz	100/115/230 VAC, 50/60 Hz, 400 watts	110/115/230 VAC, 50/60 Hz
<b>Sales and Service</b>			
Announced/Delivered	—/October 1982	May 1984/November 1984	—
Sales Channels	Dealer, distributor	Dealer	—
Service Channels	Dealer, TRW	Direct, TRW	—
<b>Pricing</b>	\$10,900 (w/256KB RAM, 15MB disk)	\$14,900 (CPU with 512KB, 40MB disk, 4 serial and 2 parallel ports)	\$13,400 (w/128KB RAM)
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable

— Information unavailable at press time



	Rexon Business Machines Rexon RX 205	Rexon Business Machines Rexon RX 400	Rexon Business Machines Rexon RX 405
<b>Vendor</b>	Rexon Business Machines	Rexon Business Machines	Rexon Business Machines
<b>Model</b>	Rexon RX 205	Rexon RX 400	Rexon RX 405
<b>Class</b>	Desktop	Floor model	—
<b>Users/Tasks</b>	12/80	16/16	16/—
<b>Main Unit</b>			
Main Processor	Intel 80286	Intel 8086-2	Intel 80286
Word Size (bits)	16/16	16/16	16/16
Clock Rate (MHz)	6	7.2	6
Other Processors	Intel 80287	2 coprocessors (opt.)	Intel 80287 math coprocessor
<b>Memory</b>			
RAM Min/Max (bytes)	512K/1,792K	256K/960K	512K/2M
RAM Increments (bytes)	512K	128K	128K, 512K
ROM (bytes)	8K	4K	—
<b>Diskette Storage</b>			
No. of Drives	1	1	1 (opt.)
Size (in.) & Format	5.25 DSDD	8 DSDD	5.25
Capacity (bytes)	1.2M	1.2M	1.2M
Access Time (msec)	93	91	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1-2	1-2
Capacity (bytes)	70M	56M-280M	165M
Access Time (msec)	25	45	—
<b>Other Storage</b>	45MB cartridge tape; 9-track magnetic tape (opt.)	20MB cartridge tape	45MB streaming cartridge tape; .5-in. magnetic tape (opt.)
<b>Display</b>			
Size and Type	12-in. CRT (opt.)	12-in. CRT (opt.)	12-in. CRT (opt.)
Text Display (lines x col)	25 x 80	25 x 80	25 x 80
Character Matrix (dots)	7 x 11	7 x 11	7 x 11
Resolution (pixels)	300 x 720	300 x 720	300 x 720
Screen Attributes	High/low intensity, normal/reverse, blink/blank, graphics, high contrast	High/low intensity, normal/reverse, blink/blank, graphics, high contrast	High/low intensity, normal/reverse, blink/blank, graphics, high contrast
Colors (simul/palette)	Green monochrome	Green monochrome	Green monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	100	100	100
Cursor Control	4-key row	4-key row	4-key row
No. of Function Keys	25	25	25
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	5	5	5
Serial Ports	12 RS-232C	16 RS-232C	4-16
Parallel Ports	4 Centronics	4 Centronics	2-4
Special Output Ports	NA	—	NA
Special Input Ports	NA	—	NA
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	Std
Synchronous	Opt.	Opt. (IBM 2780/3780)	Opt. (2780/3780)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	XENIX 3.2	RECAP; MP/M-86 (opt.)	XENIX 3.0
Bundled Applications	Informix	IDOL, DBMS	—
Languages	C, SMC BASIC, Micro Focus, COBOL	Business BASIC	Opt.
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	18 x 18 x 10.5	31.5 x 15 x 26.5	15 x 31.5 x 26.5
Weight (lbs)	50	160	—
Power Supply	100/115/230 VAC, 50/60 Hz, 400 watts	50 Hz	100/115/230 VAC, 50/60 Hz
<b>Sales and Service</b>			
Announced/Delivered	May 1984/November 1984	May 1982	—
Sales Channels	Dealer	Dealer, distributor	—
Service Channels	Rexon/TRW	Dealer, TRW	—
<b>Pricing</b>	\$18,500 (CPU w/512KB, 70MB disk, 4 serial and 2 parallel ports)	\$20,980 (w/256KB RAM, 56MB disk)	\$25,900
<b>Comments</b>	NA	NA	NA

Notes:  
 NA Not applicable  
 — Information unavailable at press time



Vendor Model Class Users/Tasks Main Unit	Rexon Business Machines Rexon RX 450	Rexon Business Machines Rexon RX 50	SBE S200/300 Series Desktop, rackmount 1-16/—
<b>Main Processor</b>	Intel 8086-2 based	Intel 8086-2 based	Motorola MC 68000, MC 68010
Word Size (bits)	16/16	16/16	32/16
Clock Rate (MHz)	7.3	7.3	10, 12
Other Processors	Intel 8086-2 coprocessors (2)	Intel 8086-2 coprocessor	M68COM communications processor (opt.)
<b>Memory</b>			
RAM Min/Max (bytes)	128K/960K	128K/256K	128K/1M (200), 128K/8M (300)
RAM Increments (bytes)	128K	128K	512K
ROM (bytes)	—	4K	128K (200), 64K (300)
<b>Diskette Storage</b>			
No. of Drives	1 (opt.)	1	1-3
Size (in.) & Format	8 SSDD, SSSD, DSDD, DSSD	8 SSDD, SSSD, DSDD, DSSD	5.25
Capacity (bytes)	1.2M	1.2M	750K
Access Time (msec)	—	—	40
<b>Hard Disk Storage</b>			
No. of Drives	1-2	1-2	1-3
Capacity (bytes)	56M, 140M	10M, 15M	10M, 40M, 140M
Access Time (msec)	—	—	40
<b>Other Storage</b>	45MB streaming cartridge tape; 5-in. magnetic tape (opt.)	NA	—
<b>Display</b>			
Size and Type	12-in. CRT (opt.)	12-in. CRT (opt.)	Third party
Text Display (lines x col)	25 x 80	25 x 80	NA
Character Matrix (dots)	7 x 11	7 x 11	NA
Resolution (pixels)	300 x 720	300 x 720	NA
Screen Attributes	High/low intensity, normal/reverse, blink/blank, graphics, high contrast	High/low intensity, normal/reverse, blink/blank, graphics, high contrast	NA
Colors (simul/palette)	Green monochrome	Green monochrome	NA
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Third party
No. of Keys	100	100	NA
Cursor Control	4-key row	4-key row	NA
No. of Function Keys	25	25	NA
Numeric Pad	Integral	Integral	NA
<b>Input/Output</b>			
Open I/O Slots	5	2	Up to 18
Serial Ports	8-32	4	—
Parallel Ports	4	2	Up to 16
Special Output Ports	NA	NA	NA
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Opt. (2780/3780)	Opt. (2780/3780)	Std (X.25, HDLC, SDLC, SNA)
Internal Modem	NA	NA	Opt.
<b>Software</b>			
Operating Systems	RECAP	RECAP; MP/M-86 (opt.)	UNIX (Regulus); CP/M-68K (opt.)
Bundled Applications	—	Opt.	—
Languages	Opt.	—	FORTRAN, COBOL, DIBOL, BASIC, FORTH
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	30 x 31.5 x 26.5	18 x 18 x 10.5	20 x 19 x 8.75
Weight (lbs)	—	49	40
Power Supply	110/115/230 VAC, 50/60 Hz	110/115/230 VAC, 50/60 Hz	200 watts
<b>Sales and Service</b>			
Announced/Delivered	—	—	1983/1983
Sales Channels	—	—	Distributor
Service Channels	—	—	Distributor, factory
<b>Pricing</b>	\$32,150	\$7,900	\$5,230 and up
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Vendor</b>	<b>SBE</b>	<b>Sentinel Computer</b>	<b>Sentinel Computer</b>
<b>Model</b>	S250/350 Series	DS-130	DS-140
<b>Class</b>	Tabletop	Desktop	Floor model
<b>Users/Tasks</b>	1-16/—	5/64	32/64
<b>Main Unit</b>			
Main Processor	Motorola MC 68000, MC 68010	Intel 8086	Intel 8086
Word Size (bits)	32/16	16/16	16/16
Clock Rate (MHz)	10, 12	8	8
Other Processors	M68COM communications processor (opt.)	2 CPU coprocessors, 1 disk I/O processor	2 CPU coprocessors, 1 disk I/O processor
<b>Memory</b>			
RAM Min/Max (bytes)	128K/3.5M (250), 128K/8M (350)	128K/1M	160K/1M
RAM Increments (bytes)	512K	128K	128K
ROM (bytes)	128K (250), 64K (350)	64K	64K
<b>Diskette Storage</b>			
No. of Drives	2	4	4
Size (in.) & Format	5.25	8 DSDD	8 DSDD
Capacity (bytes)	750K	1.6M	1.6M
Access Time (msec)	40	91	91
<b>Hard Disk Storage</b>			
No. of Drives	2	4	4
Capacity (bytes)	10M, 40M, 140M	72M	72M
Access Time (msec)	40	30	30
<b>Other Storage</b>	—	100MB tape cartridge	100MB cartridge tape
<b>Display</b>			
Size and Type	Third party	12-in. CRT	12-in. CRT
Text Display (lines x col)	NA	24 x 80	24 x 80
Character Matrix (dots)	NA	7 x 9	7 x 9
Resolution (pixels)	NA	—	—
Screen Attributes	NA	—	—
Colors (simul/palette)	NA	Green monochrome	Green monochrome
<b>Keyboard</b>			
Keyboard Type	Third party	Detachable	Detachable
No. of Keys	NA	95	95
Cursor Control	NA	4-key cluster	4-key cluster
No. of Function Keys	NA	6	6
Numeric Pad	NA	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	Up to 18	3	9
Serial Ports	—	5 RS-232	32 RS-232C
Parallel Ports	Up to 16	NA	NA
Special Output Ports	NA	NA	NA
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	Std	Std (TTY)	Std (TTY)
Synchronous	Std (X.25, HDLC, SDLC, SNA)	Opt. (2780/3780)	Opt. (2780/3780)
Internal Modem	Opt.	—	—
<b>Software</b>			
Operating Systems	UNIX (Regulus); CP/M-68K (opt.)	DBOS	DBOS
Bundled Applications Languages	—	NA	NA
	FORTRAN, COBOL, DIBOL, BASIC, FORTH	BASIC, COBOL, Pascal, FORTRAN, DBL	BASIC, COBOL, Pascal, FORTRAN, DBL
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	20 x 17 x 5.25	18.1 x 19.6 x 6	29 x 10 x 24
Weight (lbs)	30	60	140
Power Supply	200 watts	110/220 VAC, 50/60 Hz, 145 watts	110/220 VAC, 50/60 Hz, 145 watts
<b>Sales and Service</b>			
Announced/Delivered	1983/1983	January 1984/January 1984	January 1984/January 1984
Sales Channels	Distributor	Distributor	Distributor
Service Channels	Distributor, factory	Distributor	Distributor
<b>Pricing</b>	\$5,230 and up	\$16,700 (w/128KB RAM, 1.6MB diskette drive, 19.1MB disk drive)	\$21,200 (w/160KB RAM, 1.6MB diskette drive, 51.4MB Winchester drive)
<b>Comments</b>	NA	Functions as data base system.	Functions as a data base system.

**Notes:**

NA Not applicable  
— Information unavailable at press time

<b>Vendor</b>	<b>Sentinel Computer</b>	<b>Sentinel Computer</b>	<b>SGS Semiconductor</b>
<b>Model</b>	DS-170	DS-180	Samson
<b>Class</b>	Floor model	Floor model	Desktop
<b>Users/Tasks</b>	32/64	32/64	1-34/—
<b>Main Unit</b>			
Main Processor	Intel 8086	Intel 8086	Zilog Z8003
Word Size (bits)	16/16	16/16	32, 16/16
Clock Rate (MHz)	8	8	6
Other Processors	2 CPU coprocessors, 1 disk I/O processor	2 CPU coprocessors, 1 disk I/O processor	Zilog z8001, Z8015
<b>Memory</b>			
RAM Min/Max (bytes)	288K/1M	288K/1M	512K/6M
RAM Increments (bytes)	128K	128K	512K
ROM (bytes)	64K	64K	16K
<b>Diskette Storage</b>			
No. of Drives	4	4	NA
Size (in.) & Format	8 DSDD	8 DSDD	NA
Capacity (bytes)	1.6M	1.6M	NA
Access Time (msec)	91	91	NA
<b>Hard Disk Storage</b>			
No. of Drives	4	4	1-8
Capacity (bytes)	168.5M	80M	85M
Access Time (msec)	20	38	—
<b>Other Storage</b>	100MB tape cartridge	100MB cartridge tape	67MB cartridge tape
<b>Display</b>			
Size and Type	12-in. CRT	12-in. CRT	14-in. CRT
Text Display (lines x col)	24 x 80	24 x 80	24 x 80/132
Character Matrix (dots)	7 x 9	7 x 9	7 x 9
Resolution (pixels)	—	—	—
Screen Attributes	—	—	Blinking
Colors (simul/palette)	Green monochrome	Green monochrome	Green monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	95	95	94
Cursor Control	4-key cluster	4-key cluster	4-key cluster
No. of Function Keys	6	6	16
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	7	8	—
Serial Ports	32 RS-232C	32 RS-232C	34 RS-232C
Parallel Ports	NA	NA	1 Centronics
Special Output Ports	NA	NA	1 RS-422 Ethernet disk
Special Input Ports	NA	NA	—
<b>Data Communications</b>			
Asynchronous	Std (TTY)	Std (TTY)	Std (TTY)
Synchronous	Opt. (2780/3780)	Opt. (2780/3780)	Opt. (IBM 3780, Telex, Ethernet)
Internal Modem	—	—	NA
<b>Software</b>			
Operating Systems	DBOS	DBOS	UNIX III
Bundled Applications	NA	NA	—
Languages	BASIC, COBOL, Pascal, FORTRAN, DBL	BASIC, COBOL, PASCAL, FORTRAN, DBL	—
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	18.1 x 19.6 x 6	29 x 10 x 24	31 x 18 x 9
Weight (lbs)	140	475	88
Power Supply	110/220 VAC, 50/60 Hz, 145 watts	110/220 VAC, 50/60 Hz, 145 watts	95-132 VAC, 60 Hz; 190-260 VAC, 50 Hz
<b>Sales and Service</b>			
Announced/Delivered	June 1984	January 1984	November 1983
Sales Channels	Distributor	Distributor	Manufacturer's representatives
Service Channels	Distributor	Distributor	—
<b>Pricing</b>	\$39,700 (w/288KB RAM, 1.6MB diskette drive, 168.5MB Winchester drive, cartridge tape)	\$36,500 (w/288KB RAM, 1.6MB diskette drive, 80MB removable cartridge tape)	\$24,900 (w/512KB RAM, 85MB disk, 67MB cartridge tape, 10 serial ports)
<b>Comments</b>	Functions as a data base system.	Functions as a data base system.	NA

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Vendor</b> <b>Model</b> <b>Class</b> <b>Users/Tasks</b> <b>Main Unit</b> Main Processor Word Size (bits) Clock Rate (MHz) Other Processors <b>Memory</b> RAM Min/Max (bytes) RAM Increments (bytes) ROM (bytes) <b>Diskette Storage</b> No. of Drives Size (in.) & Format Capacity (bytes) Access Time (msec) <b>Hard Disk Storage</b> No. of Drives Capacity (bytes) Access Time (msec) <b>Other Storage</b> <b>Display</b> Size and Type Text Display (lines x col) Character Matrix (dots) Resolution (pixels) Screen Attributes Colors (simul/palette) <b>Keyboard</b> Keyboard Type No. of Keys Cursor Control No. of Function Keys Numeric Pad <b>Input/Output</b> Open I/O Slots Serial Ports Parallel Ports Special Output Ports Special Input Ports <b>Data Communications</b> Asynchronous Synchronous Internal Modem <b>Software</b> Operating Systems Bundled Applications Languages <b>Physical and Electrical</b> Size (L x W x H, in.) Weight (lbs) Power Supply <b>Sales and Service</b> Announced/Delivered Sales Channels Service Channels <b>Pricing</b> <b>Comments</b>	<b>Smoke Signal</b> VAR/68 Desktop 8-16/16 max Motorola MC 68B09 16/8 2 NA 128K/1M 128K 20K 2-3 5.25 DSDD 750K 160 2 5M-110M 86 20MB-60MB streaming magnetic tape 12-in. CRT 24 x 80 7 x 9 — Blank, underline, reverse video, half intensity Green monochrome Detachable 102 — 19 — NA 8-16 RS-232C 1-2 — — Std Opt. — OS9-L2, S-DOS, FLEX, Regulus (UNIX), OS9/68K (opt.) NA BASIC, COBOL, Pascal, C, DIBOL, FORTRAN 13 x 10 x 14 41 115 VAC, 60 Hz; 220 VAC; 50 Hz May 1983/July 1983 OEM, VARs Manufacturer \$4,325 (w/128KB RAM, dual diskette drive, 8 ports) NA	<b>Smoke Signal</b> VAR/68K Desktop 8-16/16 Motorola MC68008 32/8 8 NA 512K/1M 128K 256K 2-3 5.25 DSDD 750K 160 2 5M-110M 21 20MB-60MB streaming magnetic tape 12-in. CRT 24 x 80 7 x 9 — Blank underline, blinking, reverse video, half intensity Green monochrome Detachable 102 19 — NA 8-16 RS-232C 1-2 — — Std Opt. — OS9-L2, S-DOS, FLEX, Regulus (UNIX) OS9/68K (opt.) NA BASIC, COBOL, Pascal, C, DIBOL, FORTRAN 13 x 10 x 14 41 115 VAC, 60 Hz; 220 VAC, 50 Hz July 1984/October 1984 VARs, dealers Manufacturer \$8,700 (w/1 diskette drive, 5MB disk drive, Regulus) NA	<b>Sperry</b> Series 5000, Model 20 Floor model 8/multi Motorola MC 60810 32/16 10 — 1M/2M 1M — 1-2 5.25 650K 147 1-2 46M 45 45MB streaming tape 12-in. CRT 24 x 80/132 7 x 9 — VT100 compatible Green monochrome Detachable 83 4-key cluster 4 Integral 3 1-8 RS-232C 1 NA NA Std Opt. (IBM 3270 BSC, SNA, 2780/3780 RJE; UTS, Omninet, Ethernet) NA UNIX System V — C, RM/COBOL, FORTRAN 77 28 x 5 x 20 85 100/120/127 VAC, 50/60 Hz November 1984 Direct Direct \$14,590 NA
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Notes:  
 NA Not applicable  
 — Information unavailable at press time





Vendor	Sperry	Sperry	Sperry
<b>Model</b>	Series 5000, Model 40	Series 5000, Model 60	Series 5000, Model 80
<b>Class</b>	Floor model	Floor model	Floor model
<b>Users/Tasks</b>	16/Multi	32/Multi	64/Multi
<b>Main Unit</b>			
Main Processor	Motorola MC 60810	1 or 2 Motorola MC 68000	1-4 Motorola MC 68000
Word Size (bits)	32/16	32/16	32/16
Clock Rate (MHz)	10	12.5	12.5
Other Processors	—	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	1M/8M	2M/8M	2M/16M
RAM Increments (bytes)	1M, 2M, 4M	1M, 2M, 4M	2M, 4M, 8M
ROM (bytes)	—	—	—
<b>Diskette Storage</b>			
No. of Drives	1-2	NA	NA
Size (in.) & Format	5.25	NA	NA
Capacity (bytes)	160K	NA	NA
Access Time (msec)	147	NA	NA
<b>Hard Disk Storage</b>			
No. of Drives	1-2	1-2	2 internal; 4 external (opt.)
Capacity (bytes)	46M	80M, 160M	80M, 160M
Access Time (msec)	45	20	20
<b>Other Storage</b>	2KB cache memory, 45MB streaming tape	4KB cache memory, 45MB streaming tape	4KB cache memory, 45MB streaming tape
<b>Display</b>			
Size and Type	12-in. CRT	12-in. CRT	12-in. CRT
Text Display (lines x col)	24 x 80/132	24 x 80/132	25 x 80/132
Character Matrix (dots)	7 x 9	7 x 9	7 x 9
Resolution (pixels)	—	—	—
Screen Attributes	VT100 capabilities	VT100 capabilities	VT100 capabilities
Colors (simul/palette)	Green monochrome	Green monochrome	Green monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	83	83	83
Cursor Control	4-key cluster	4-key cluster	4-key cluster
No. of Function Keys	4	4	4
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	7	6	12
Serial Ports	1-8 RS-232C	1-8 RS-232C	1-8 RS-232C
Parallel Ports	2	—	—
Special Output Ports	NA	NA	NA
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Opt. (IBM 3270 BSC, SNA, 2780/3780 RJE; UTS, Omninet, Ethernet)	Opt. (IBM 3270 BSC, SNA, 2780/3780 RJE; UTS, Omninet, Ethernet)	Opt. (IBM 3270 BSC, SNA, 2780/3780 RJE; UTS, Omninet, Ethernet)
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	UNIX System V	UNIX System V	UNIX System V
Bundled Applications	—	—	—
Languages	C, RM/COBOL, FORTRAN 77	C, RM/COBOL, FORTRAN 77	C, RM/COBOL, FORTRAN 77
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	27 x 7 x 29	28 x 14 x 54	34 x 21.5 x 55
Weight (lbs)	116	337	527
Power Supply	110/120/127 VAC, 50/60 Hz	115/220 VAC, 50/60 Hz	230 VAC, 50/60 Hz
<b>Sales and Service</b>			
Announced/Delivered	November 1984	November 1984	November 1984
Sales Channels	Direct	Direct	Direct
Service Channels	Direct	Direct	Direct
<b>Pricing</b>	\$18,245-\$28,175	\$61,710-\$85,000	\$65,000-\$96,635
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable

— Information unavailable at press time



Vendor	STAR Technologies	STM Electronics	Stride Micro
<b>Model</b>	STAR PC	STM AT	Stride 420
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	3/3	3/—	4/1-4
<b>Main Unit</b>			
Main Processor	Intel 8088	Intel 80286	Motorola MC 68000
Word Size (bits)	8/8	16/16	32/16
Clock Rate (MHz)	4.7	6	10; 12 (opt.)
Other Processors	—	Intel 80287	1 floating pt, 1 graphics (opt.)
<b>Memory</b>			
RAM Min/Max (bytes)	128K/640K	512K/3M	256K/2M
RAM Increments (bytes)	64K	296K	128K, 512K
ROM (bytes)	Up to 120K	64K-128K	16K-64K
<b>Diskette Storage</b>			
No. of Drives	2	1	1 (std), 1 (opt.)
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	360K	1.2M	640K
Access Time (msec)	—	—	120
<b>Hard Disk Storage</b>			
No. of Drives	1-2	1	NA
Capacity (bytes)	Up to 116M	20M	NA
Access Time (msec)	—	—	NA
<b>Other Storage</b>	45MB streaming tape	—	NA
<b>Display</b>			
Size and Type	12-in. CRT	CRT	14-in. CRT
Text Display (lines x col)	24 x 80	25 x 80	24 x 80/132
Character Matrix (dots)	—	—	7 x 13
Resolution (pixels)	640 x 400	—	784 x 325
Screen Attributes	Blinking, high and low intensity	—	Normal, blinking, reverse, blank, underline
Colors (simul/palette)	8/16 RGB	—	Green monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	84	—	101
Cursor Control	—	Cluster	4-key cluster
No. of Function Keys	10	10	16
Numeric Pad	—	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	3	5	1
Serial Ports	2	—	4 RS-232C
Parallel Ports	1	—	1 Centronics
Special Output Ports	1 RGB, 1 composite video	—	1 IEEE-488, 1 composite video (opt.)
Special Input Ports	—	—	Optical mouse (opt.)
<b>Data Communications</b>			
Asynchronous	Std (TTY)	—	Std (ASCII)
Synchronous	NA	—	NA
Internal Modem	—	—	—
<b>Software</b>			
Operating Systems	DOS	MS-DOS, UNIX	UCSD p-System; CP/M-68K, RM/COS, PDOS, BOS, UNIX System V and others (opt.)
Bundled Applications	Office automation	—	—
Languages	BASIC	—	30 including Pascal, Modula-2, and others
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	—	—	16.9 x 12.6 x 4.4
Weight (lbs)	—	—	30
Power Supply	—	—	65 watts
<b>Sales and Service</b>			
Announced/Delivered	—	May 1985/August 1985	September 1984
Sales Channels	Distributor, dealer	Direct, OEM	Domestic dealer network, direct, internal dist
Service Channels	Dealer	—	Stride Authorized Service centers, factory direct
<b>Pricing</b>	—	—	\$2,900 (256KB RAM, 1 diskette drive)
<b>Comments</b>	NA	NA	Omninet LAN hardware, Liaison LAN software, VME bus, real-time clock, and battery backup are std. Hands-free NOD cursor ctrl & memory mgt unit opt.

Notes:

- NA Not applicable
- Information unavailable at press time



<b>Vendor</b>	<b>Stride Micro</b>	<b>Stride Micro</b>	<b>Sykes Datatronics</b>
<b>Model</b>	Stride 440	Stride 460	Genus GC3
<b>Class</b>	Desktop	Floor model	Desktop
<b>Users/Tasks</b>	10-16/10-16	10, 16 or 22/10, 16 or 22	1-10/Single
<b>Main Unit</b>			
Main Processor	Motorola MC 68000	Motorola MC 68000	Intel 8086
Word Size (bits)	32/16	32/16	16/8
Clock Rate (MHz)	10; 12 (opt.)	10; 12 (opt.)	10
Other Processors	1 floating pt, 1 graphics (opt.)	1 floating pt, 1 graphics (opt.)	Zilog Z80, Intel 8089
<b>Memory</b>			
RAM Min/Max (bytes)	256K/8M	256K/12M	512K/1M
RAM Increments (bytes)	128K, 512K	128K, 512K	—
ROM (bytes)	16K-64K	16K-64K	128K
<b>Diskette Storage</b>			
No. of Drives	1 (std), 1 (opt.)	1 (std), 1 (opt.)	1
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	640K	640K	1M
Access Time (msec)	120	120	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1-4	1
Capacity (bytes)	10.2M, 33M	20M, 33M, 67M, 112M, 224M or 448M	20M, 40M
Access Time (msec)	30	30	—
<b>Other Storage</b>	45MB or 60MB streaming cartridge tape	45MB or 60MB streaming cartridge tape	1MB tape backup
<b>Display</b>			
Size and Type	14-in. CRT	14-in. CRT	13-in. CRT
Text Display (lines x col)	24 x 80/132	24 x 80/132	24 x 80/132
Character Matrix (dots)	7 x 13	7 x 13	10 x 13
Resolution (pixels)	784 x 325	784 x 325	800 x 325
Screen Attributes	Normal, blinking, reverse, blank, underline	Normal, blink, reverse, blank, underscore	Blinking, underline, bold, double height/width
Colors (simul/palette)	Green monochrome	Green monochrome	Green monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Detachable	Detachable
No. of Keys	101	101	—
Cursor Control	4-key cluster	4-key cluster	4-key cluster
No. of Function Keys	16	16	16
Numeric Pad	Integral	Integral	Integral
<b>Input/Output</b>			
Open I/O Slots	1	4 (2 Eurocard)	9
Serial Ports	10-16 RS-232C	22 RS-232C	1-10
Parallel Ports	1 Centronics	1 Centronics	NA
Special Output Ports	1 IEEE-488, 1 composite video (opt.)	1 IEEE-488, 1 composite video	1-10 composite video, 1 external disk and tape
Special Input Ports	Optical mouse (opt.)	Optical mouse (opt.)	NA
<b>Data Communications</b>			
Asynchronous	Std (ASCII)	Std (ASCII)	Std
Synchronous	NA	NA	Std
Internal Modem	—	—	NA
<b>Software</b>			
Operating Systems	UCSD p-System; CP/M-68K, RM/COS, PDOS, BOS, Unix System V and 10 others	UCSD p-System-Liaison; CP/M-68K, RM/COS, PDOS, BOS, UNIX System V and 10 others (opt.)	XENIX
Bundled Applications Languages	UCSD p-System IV.21 30 incl Pascal, Modula-2	— 30 incl Pascal, Modula-2	— C, BASIC, COBOL, Pascal, FORTRAN
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	18.9 x 16.9 x 5.7	18.2 x 9.1 x 27.3	18 x 16.88 x 6
Weight (lbs)	45	65	33
Power Supply	150 watt switching	150 or 300 watt switching	115/220 VAC, 60/50 Hz
<b>Sales and Service</b>			
Announced/Delivered Sales Channels	September 1984 Domestic dealer network, direct, internal dist	September 1984 Domestic dealer network, direct, internal dist	— Direct
Service Channels	Stride Authorized Service Centers, factory direct	Stride Authorized Service Center, factory direct	Direct
<b>Pricing</b>	\$5,900 (256KB RAM, diskette, 10M Winchester)	\$8,900 (256KB RAM, diskette, 20M Winchester)	\$16,850
<b>Comments</b>	Omninet LAN hardware, Liaison LAN software, VME bus, real-time clock, and battery backup std. Hands-free NOD cursor ctrl & memory mgt unit opt.	Omninet LAN hardware, Liaison LAN software, VME bus, real-time clock, and battery backup std. Hands-free NOD cursor ctrl, memory mgt unit opt.	3270 and 3780 emulation available

**Notes:**

NA Not applicable  
— Information unavailable at press time



<b>Vendor</b>	<b>Tandy</b>	<b>TeleVideo Systems</b>	<b>TeleVideo Systems</b>
<b>Model</b>	Tandy 6000	Personal Mini	TS 804
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	Multi/—	8/—	4/Multi
<b>Main Unit</b>			
Main Processor	Motorola MC 68000	Intel 80186, Zilog Z80A	Zilog Z80
Word Size (bits)	32/16	16/16, 8/8	8/8
Clock Rate (MHz)	8	—	4
Other Processors	Zilog Z80	—	—
<b>Memory</b>			
RAM Min/Max (bytes)	512K/1M	256K/512K	320K/320K
RAM Increments (bytes)	512K	256K	NA
ROM (bytes)	—	12K EPROM	8K EPROM
<b>Diskette Storage</b>			
No. of Drives	1-2	1	1
Size (in.) & Format	8 DSDD	5.25 DSQD	5.25
Capacity (bytes)	1.2M	720K	737K (formatted)
Access Time (msec)	—	164	94
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	35M	40M	10M (formatted)
Access Time (msec)	—	45	155
<b>Other Storage</b>	(4) 35MB disk, (2) 1.2MB diskette drives (opt.)	—	14MB cartridge tape, 15MB (formatted) disk
<b>Display</b>			
Size and Type	12-in. CRT	Third party	14-in. CRT
Text Display (lines x col)	24 x 40/80	NA	24 x 80
Character Matrix (dots)	—	NA	7 x 8
Resolution (pixels)	—	NA	—
Screen Attributes	—	NA	Blinking, blank, underline, half intensity, reverse video
Colors (simul/palette)	Green monochrome	NA	Green monochrome
<b>Keyboard</b>			
Keyboard Type	Detachable	Third party	Detached
No. of Keys	82	NA	—
Cursor Control	—	NA	—
No. of Function Keys	—	NA	16
Numeric Pad	Integral	NA	—
<b>Input/Output</b>			
Open I/O Slots	—	—	—
Serial Ports	2 RS-232C	2 RS-232C, 8 RS-422	2 RS-232C
Parallel Ports	1	1 DB25 (Centronics)	1
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	—	Std	Std
Synchronous	—	Opt.	NA
Internal Modem	Opt.	NA	NA
<b>Software</b>			
Operating Systems	XENIX, TRSDOS	Infoshare	MP/M II; CP/M Plus (opt.)
Bundled Applications	—	—	—
Languages	BASIC	—	—
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	13.5 x 21.5 x 28.13	16.8 x 17.5 x 7.2	19 x 14 x 14.5
Weight (lbs)	—	35	45
Power Supply	120 VAC, 60 Hz	115/230 VAC	115/230 VAC, 50/60 Hz, 100 watts
<b>Sales and Service</b>			
Announced/Delivered	February 1985/February 1985	May 1984/June 1984	1984/1984
Sales Channels	Radio Shack Computer Centers	Distributor, dealer	Distributor, dealers
Service Channels	Radio Shack Computer Centers	—	—
<b>Pricing</b>	\$4,499	\$8,995	\$4,495
<b>Comments</b>	NA	IBM PC compatible	NA

Notes:  
 NA Not applicable  
 — Information unavailable at press time



Vendor	TeleVideo	TeleVideo Systems	Universal Data Research
<b>Model</b>	TS 806/20	TS 816/40	Model 2200
<b>Class</b>	Desktop	Desktop	Desktop/Industrial
<b>Users/Tasks</b>	6/—	1-16/Multi	6/Multi
<b>Main Unit</b>			
Main Processor	Zilog Z80A	Zilog Z80A	Dual Motorola 68B09
Word Size (bits)	8/8	8/8	16/8
Clock Rate (MHz)	4	4	2-8
Other Processors	—	NA	NA
<b>Memory</b>			
RAM Min/Max (bytes)	64K/64K	128K/128K	256K/768K
RAM Increments (bytes)	NA	NA	256K
ROM (bytes)	4K (EPROM)	4K EPROM	32K
<b>Diskette Storage</b>			
No. of Drives	1	—	Up to 4
Size (in.) & Format	5.25 DSDD	—	5.25 DSDD
Capacity (bytes)	368.6K	—	1.6M
Access Time (msec)	84	—	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1	1
Capacity (bytes)	15M (formatted)	33.2M (formatted)	105M
Access Time (msec)	84	70	21
<b>Other Storage</b>	NA	14.5MB (formatted) tape cartridge backup	NA
<b>Display</b>			
Size and Type	Third party	Third party	12-in. or 14-in. CRT (opt.)
Text Display (lines x col)	NA	NA	25 x 80/132
Character Matrix (dots)	NA	NA	—
Resolution (pixels)	NA	NA	—
Screen Attributes	NA	NA	—
Colors (simul/palette)	NA	NA	Monochrome
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Detachable (opt.)
No. of Keys	NA	NA	NA
Cursor Control	NA	NA	4-key cluster
No. of Function Keys	NA	NA	32
Numeric Pad	NA	NA	Integral
<b>Input/Output</b>			
Open I/O Slots	NA	NA	5
Serial Ports	2 RS-232C	1 modem, 1 printer	6 RS-232C
Parallel Ports	1 Centronics-compatible	1 Centronics	NA
Special Output Ports	6 RS-422 network ports	NA	—
Special Input Ports	NA	NA	—
<b>Data Communications</b>			
Asynchronous	Std	Std	NA
Synchronous	NA	—	NA
Internal Modem	NA	—	Opt.
<b>Software</b>			
Operating Systems	MmmOST with CP/M	MmmOST with CP/M	UNIX
Bundled Applications	NA	—	Accounting
Languages	CP/M, TeleVideo COBOL	CP/M, TeleVideo COBOL	—
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	17.5 x 16.88 x 7.25	21 x 17.5 x 7.25	15 x 19 x 7
Weight (lbs)	50	52	20
Power Supply	115/230 VAC, 50/60 Hz, 130 watts	115/230 VAC, 50/60 Hz, 200 watts	110 VAC
<b>Sales and Service</b>			
Announced/Delivered	1981	1981	September 1984/September 1984
Sales Channels	Distributor	Distributor	Direct
Service Channels	TRW Customer Service Center	TRW Customer Service Center	Direct
<b>Pricing</b>	\$6,995	\$12,995	\$7,000 and up
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable

— Information unavailable at press time



<b>Vendor</b>	<b>Universal Data Research</b>	<b>Vector Graphic</b>	<b>VIASYN</b>
<b>Model</b>	Model 2400	Vector MX Series	CompuPro 286
<b>Class</b>	—	Desktop	Desktop
<b>Users/Tasks</b>	12/Multi	1-3/Multi	Multi/—
<b>Main Unit</b>			
Main Processor	Motorola 68B09	Zilog Z80; Intel 8086	Intel 80286
Word Size (bits)	16/8	8/8; 16/16	16/16
Clock Rate (MHz)	2-8	6; 8	6
Other Processors	NA	Intel 8087 (opt.)	Zilog Z80
<b>Memory</b>			
RAM Min/Max (bytes)	256K/1M	384K/896K	512K/—
RAM Increments (bytes)	256K	128K, 256K	—
ROM (bytes)	48K	—	512K
<b>Diskette Storage</b>			
No. of Drives	Up to 4	1	1
Size (in.) & Format	8 DSDD	5.25	5.25 DSDD
Capacity (bytes)	1.6M	737M	800K
Access Time (msec)	—	—	.91
<b>Hard Disk Storage</b>			
No. of Drives	Up to 4	1	1
Capacity (bytes)	Up to 400MB	5M, 10M, 28M, 36M, 112M	40M
Access Time (msec)	21	—	.91
<b>Other Storage</b>	45MB magnetic tape, bubble memory	Streaming tape backup (opt.)	10MB tape drive
<b>Display</b>			
Size and Type	12-in. or 14-in. CRT (opt.)	12-in. CRT; 14-in. CRT (opt.)	Third party
Text Display (lines x col)	25 x 80/132	24 x 80; 24 x 80/132	NA
Character Matrix (dots)	—	16 x 13; 7 x 13	NA
Resolution (pixels)	—	640 x 312	NA
Screen Attributes	—	Tilt, swivel, blinking, reverse image	NA
Colors (simul/palette)	Monochrome	4 or 16 levels of intensity	NA
<b>Keyboard</b>			
Keyboard Type	Detachable (opt.)	Detached	Third party
No. of Keys	NA	91	NA
Cursor Control	4-key	—	NA
No. of Function Keys	32	14	NA
Numeric Pad	Integral	Integral	NA
<b>Input/Output</b>			
Open I/O Slots	11	3	—
Serial Ports	12 RS-232C	2 RS-232C	5
Parallel Ports	1	2	1 Centronics, 1 parallel
Special Output Ports	1 audio output, 2 RS-232C	RGB	—
Special Input Ports	NA	—	—
<b>Data Communications</b>			
Asynchronous	NA	Opt.	—
Synchronous	NA	Opt.	—
Internal Modem	Opt.	—	—
<b>Software</b>			
Operating Systems	UNIFLEX, FLEX	Concurrent CP/M-86, 8-bit CP/M Simulator; MS-DOS (opt.)	—
Bundled Applications	Accounting	GSX-86 Graphic System, SCOPE Text Editor	dBase II, SuperCalc 2, NewWord, WRITE, Friday
Languages	C, Pascal, BASIC, FORTRAN	RM/COBOL, C, BASIC, Pascal/MT, COBOL	—
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	20 x 20 x 23	25 x 19 x 14	21.9 x 19.6 x 7.08
Weight (lbs)	80	42.5	60
Power Supply	110 VAC	—	—
<b>Sales and Service</b>			
Announced/Delivered	1978/1978	June 1984	—
Sales Channels	Direct	Dealer; distributor (international)	Dealers, Full Service CompuPro System Centers
Service Channels	Direct	Dealer	Full Service CompuPro System Centers; Micro Support (software)
<b>Pricing</b>	\$13,000 and up	From \$7,280 (w/384KB RAM, diskette & 5MB disk drive) to \$19,380 (w/384KB RAM, diskette & 112MB disk drive)	\$9,995 and up, depending on options
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable  
 — Information unavailable at press time

<b>Vendor</b>	<b>VIASYN</b>	<b>VIASYN</b>	<b>VIASYN</b>
<b>Model</b>	CompuPro 816/10 + 2	CompuPro 816/10 + 40	CompuPro 816/C
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	2/Multi	4/Multi	Multi/Multi
<b>Main Unit</b>			
Main Processor	Intel 8088	Intel 8088	Intel 8085, 8088
Word Size (bits)	16/8	16/8	8/8, 16/18
Clock Rate (MHz)	8	6	6, 8
Other Processors	Zilog Z80	4 Zilog Z80's	—
<b>Memory</b>			
RAM Min/Max (bytes)	256K/—	256K/—	512K/1M
RAM Increments (bytes)	256K	256K	—
ROM (bytes)	32K	32K	512K
<b>Diskette Storage</b>			
No. of Drives	2	1	1 external
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25, 8 (opt.); DSDD
Capacity (bytes)	800K	800K	800K
Access Time (msec)	.91	.91	.91
<b>Hard Disk Storage</b>			
No. of Drives	—	1	1 external (opt.)
Capacity (bytes)	—	40M	20M, 40M, 80M
Access Time (msec)	—	—	.91
<b>Other Storage</b>	10MB tape backup	10MB tape backup (opt.)	512KB-4MB MDRIVE/H solid state disk storage, 10MB tape backup (opt.)
<b>Display</b>			
Size and Type	Third party	Third party	Third party
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Resolution (pixels)	NA	NA	NA
Screen Attributes	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Third party
No. of Keys	NA	NA	NA
Cursor Control	NA	NA	NA
No. of Function Keys	NA	NA	NA
Numeric Pad	NA	NA	NA
<b>Input/Output</b>			
Open I/O Slots	—	—	—
Serial Ports	2 RS-232C	3 RS-232C, 4 terminal ports	20
Parallel Ports	1 Centronics	1 Centronics	9
Special Output Ports	Modem port (serial)	—	1 Centronics
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	—	—	—
Synchronous	—	—	—
Internal Modem	—	—	—
<b>Software</b>			
Operating Systems	—	Concurrent CP/M 8-16	Concurrent DOS 8-16
Bundled Applications	—	SuperCalc 2, NewWord, WRITE, Friday	dBase II, SuperCalc 2, NewWord, WRITE
Languages	—	—	—
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	22 x 19.7 x 7.5	7.5 x 19.7 x 22	19.7 x 17 x 7.07
Weight (lbs)	54	54	97
Power Supply	—	—	—
<b>Sales and Service</b>			
Announced/Delivered	April 1985	December 1983	Fall 1982
Sales Channels	Dealer	Dealer	Dealer
Service Channels	Dealer; Micro Support (software)	Dealer; Micro Support (software)	Dealer; Micro Support (software)
<b>Pricing</b>	\$3,995	\$6,995	\$6,895 and up, depending on options
<b>Comments</b>	NA	NA	

**Notes:**

NA Not applicable

— Information unavailable at press time



Vendor	VIASYN	VIASYN	VIASYN
<b>Model</b>	CompuPro 816/D	CompuPro 816/E	CompuPro 816/F
<b>Class</b>	Desktop	Desktop	Desktop
<b>Users/Tasks</b>	Multi/—	NA	Multi/Multi
<b>Main Unit</b>			
Main Processor	Intel 8086	Motorola 68000	Intel 80268
Word Size (bits)	16/16	32/16	16/16
Clock Rate (MHz)	10	10	6
Other Processors	Intel 80287 math coprocessor (opt.)	Intel 80287 math coprocessor (opt.)	Intel 80287 math processor (opt.)
<b>Memory</b>			
RAM Min/Max (bytes)	512K/1M	512K/1M	512K/1M
RAM Increments (bytes)	—	—	—
ROM (bytes)	512K	512K	512K
<b>Diskette Storage</b>			
No. of Drives	1 external	1 external	1 external
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity (bytes)	800K	800K	800K
Access Time (msec)	.91	.91	.91
<b>Hard Disk Storage</b>			
No. of Drives	1 external (opt.)	1 external (opt.)	1 external (opt.)
Capacity (bytes)	20M, 40M, 80M	20M, 40M, 80M	20M, 40M, 80M
Access Time (msec)	.91	.91	.91
<b>Other Storage</b>	512KB-4MB MDRIVE/H solid state disk storage, 10MB tape backup (opt.)	512KB-4MB MDRIVE/H solid state disk storage, 10MB tape backup (opt.)	512KB-4MB MDRIVE solid state disk storage, 10MB tape backup (opt.)
<b>Display</b>			
Size and Type	Third party	Third party	Third party
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Resolution (pixels)	NA	NA	NA
Screen Attributes	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Third party
No. of Keys	NA	NA	NA
Cursor Control	NA	NA	NA
No. of Function Keys	NA	NA	NA
Numeric Pad	NA	NA	NA
<b>Input/Output</b>			
Open I/O Slots	20	20	20
Serial Ports	12	4	12
Parallel Ports	1 parallel, 1 Centronics	1 parallel, 1 Centronics	1 Centronics, 1 parallel
Special Output Ports	—	—	—
Special Input Ports	—	—	—
<b>Data Communications</b>			
Asynchronous	—	—	—
Synchronous	—	—	—
Internal Modem	—	—	—
<b>Software</b>			
Operating Systems	Concurrent DOS 8-16	CP/M 68K	Concurrent DOS 8-16
Bundled Applications	SuperCalc 2, NewWord	MapFORTH 68K	dBase II, SuperCalc 2, NewWord
Languages	—	—	—
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	19.7 x 17 x 7.07	19.7 x 17 x 7.07	19.7 x 17 x 7.07
Weight (lbs)	97	97	97
Power Supply	—	—	—
<b>Sales and Service</b>			
Announced/Delivered	Fall 1982	Fall 1982	Fall 1982
Sales Channels	Dealer	Dealer	Dealership, Full Service CompuPro Service Centers
Service Channels	Full Service/CompuPro System Centers; Micro Support (software)	Full Service CompuPro System Centers; Micro Support (for software)	Full Service CompuPro Service Centers; Micro Support (software)
<b>Pricing</b>	—	—	\$7,995 and up, depending on options
<b>Comments</b>	NA	NA	NA

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Vendor</b>	<b>VIASYN</b>	<b>Visual Technology</b>	<b>Wicat Systems</b>
<b>Model</b>	CompuPro 816/G	V2000	System 150
<b>Class</b>	Desktop	Floor model	Desktop
<b>Users/Tasks</b>	Multi/Multi	6-16/250	8/Multi
<b>Main Unit</b>			
Main Processor	National Semiconductor 32016	Intel 80286	Motorola MC 68000L8
Word Size (bits)	32/16	16/16	32/16
Clock Rate (MHz)	6	6	8
Other Processors	—	Intel 80287; Zilog Z80 (I/O)	NA
<b>Memory</b>			
RAM Min/Max (bytes)	512K/16M	512K/8M	512K/1.5M
RAM Increments (bytes)	—	512K	512K
ROM (bytes)	512K	128K-286K	16K-32K
<b>Diskette Storage</b>			
No. of Drives	1 external	1	1
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25
Capacity (bytes)	800K	800K	630K (formatted)
Access Time (msec)	.91	—	132
<b>Hard Disk Storage</b>			
No. of Drives	1 external (opt.)	1-4	1
Capacity (bytes)	20M, 40M, 80M	19M, 40M, 72M	10M, 39M
Access Time (msec)	.91	72, 40, 30	33, 87
<b>Other Storage</b>	15KB-4MB MDRIVE/H solid state disk storage, 10MB tape backup (opt.)	45MB streaming tape	Cartridge tape drive (opt.)
<b>Display</b>			
Size and Type	Third party	Third party	12-in. CRT
Text Display (lines x col)	NA	NA	25 x 80
Character Matrix (dots)	NA	NA	7 x 9
Resolution (pixels)	NA	NA	400 x 300
Screen Attributes	NA	NA	—
Colors (simul/palette)	NA	NA	Green monochrome
<b>Keyboard</b>			
Keyboard Type	Third party	Third party	Detachable
No. of Keys	NA	NA	82
Cursor Control	NA	NA	4-key row
No. of Function Keys	NA	NA	—
Numeric Pad	NA	NA	Integral
<b>Input/Output</b>			
Open I/O Slots	20	1	6
Serial Ports	12	6-18 RS-232C	2-8 RS-232C
Parallel Ports	1 parallel, 1 Centronics	1-3 Centronics	1
Special Output Ports	—	—	NA
Special Input Ports	—	2 async/sync (mainframe connect)	NA
<b>Data Communications</b>			
Asynchronous	—	Std	Std
Synchronous	—	Opt. (SNA/SDLC, BSC)	Opt.
Internal Modem	—	NA	NA
<b>Software</b>			
Operating Systems	js FORTH 32016	XENIX 3.3	WMCS; UniPlus + (opt.)
Bundled Applications	—	Informix, XED, 20/20, FILET IT, Real World Accounting	
Languages	—	RM/COBOL, SOFTBOL, SMC BASIC, TOM BASIC, C, FORTRAN, Pascal	APL, 68000, W-BASIC, C, RM/COBOL, LEVEL II COBOL, FORTRAN, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	19.7 x 17 x 7.07	21.5, 7.8 x 24.5	19.7 x 18 x 14.5
Weight (lbs)	97	55	50
Power Supply	—	110/220 VAC, 50/60 Hz, 250 watts	90-132/180-264 VAC, 47-440 Hz
<b>Sales and Service</b>			
Announced/Delivered	Fall 1982	June 1984/February 1985	1978/1979
Sales Channels	Dealers, Full Service CompuPro Service Centers	Distributor	Direct, distributor, dealer
Service Channels	Full Service CompuPro Centers; Micro Support (software)	Distributor, dealer, Sorbus	Direct
<b>Pricing</b>	\$6,895 and up, depending on options	\$8,990 (512KB RAM, 6 async ports, 1 Centronics port, 19MB disk drive, 800KB diskette drive)	\$11,000
<b>Comments</b>	NA	NA	LAN (opt.)

**Notes:**

NA Not applicable

— Information unavailable at press time



	Wicat Systems System 155 Floor model 16/—	Wicat Systems System 160 Rackmount 16/—	Wicat Systems System 200 Rackmount 32/—
<b>Vendor</b>			
<b>Model</b>			
<b>Class</b>			
<b>Users/Tasks</b>			
<b>Main Unit</b>			
Main Processor	Motorola MC 68000L8	Motorola MC 68000L8	MC 68000L8
Word Size (bits)	32/16	32/16	32/16
Clock Rate (MHz)	8	8	8
Other Processors	NA	NA	NA
<b>Memory</b>			
RAM Min/Max (bytes)	512K/4.5M	512K/4.5M	512K/4M
RAM Increments (bytes)	512K	512K	1M
ROM (bytes)	16K-32K EPROM	16K-32K	16K-32K
<b>Diskette Storage</b>			
No. of Drives	1 (opt.)	1	NA
Size (in.) & Format	5.25	5.25	NA
Capacity (bytes)	630K (formatted)	630K (formatted)	NA
Access Time (msec)	132	132	NA
<b>Hard Disk Storage</b>			
No. of Drives	1-2	1; add'l. (opt.)	1
Capacity (bytes)	10M, 39M	10M-39M, 80M, 160M, 474M	80M, 160M, 474M
Access Time (msec)	33, 87	20, 27	—
<b>Other Storage</b>	.25-in. cartridge tape (opt.)	9 track tape drive, .25-in. cartridge tape drive (opt.)	9-track tape drive, .25-in. cartridge tape drive (opt.)
<b>Display</b>			
Size and Type	Opt., avail. from vendor	Opt., avail. from vendor	Opt., avail. from vendor
Text Display (lines x col)	—	—	—
Character Matrix (dots)	—	—	—
Resolution (pixels)	—	—	—
Screen Attributes	—	—	—
Colors (simul/palette)	—	—	—
<b>Keyboard</b>			
Keyboard Type	Opt., avail. from vendor	Opt., avail. from vendor	Opt., avail. from vendor
No. of Keys	—	—	—
Cursor Control	—	—	—
No. of Function Keys	—	—	—
Numeric Pad	—	—	—
<b>Input/Output</b>			
Open I/O Slots	12	12	8
Serial Ports	1-16 RS-232C	1-16 RS-232C	8-32 async; 4-8 sync (opt.)
Parallel Ports	1-2 parallel	1-2	1-2
Special Output Ports	NA	NA	NA
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Opt.	Opt.	Opt.
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	MCS; UniPlus+, CP/M Emulator (opt.)	MCS; UniPlus+, CP/M emulation (opt.)	MCS; UniPlus+, CP/M emulation (opt.)
Bundled Applications	—	—	—
Languages	APL, 68000, W-BASIC, C, RM/COBOL, LEVEL II COBOL, FORTRAN, Pascal	APL 68000, W-BASIC, SMC-BASIC, C, RM/COBOL, LEVEL II COBOL, FORTRAN, Pascal	APL, 68000, W-BASIC, SMC-BASIC, C, RM/COBOL, LEVEL II COBOL, FORTRAN, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	23 x 10 x 25	33 x 21 x 43	33 x 21 x 43
Weight (lbs)		170	170
Power Supply	95-130/190-260 VAC, 47-440 Hz, 400 watts	95-130/190-260 VAC, 400 watts	95-130/190-260 VAC, 400 watts
<b>Sales and Service</b>			
Announced/Delivered	1983/1983	1982/1982	1981/1981
Sales Channels	Direct, distributor, dealer	Direct, distributor, dealer	Direct, distributor, dealer
Service Channels	Direct	Direct	Direct
<b>Pricing</b>	\$13,500-\$25,000	\$14,000-\$40,000	\$40,000-\$75,000
<b>Comments</b>	NA	NA	NA

Notes:  
 NA Not applicable  
 — Information unavailable at press time



Vendor	Wicat Systems	Wicat Systems	Zenith Data Systems
<b>Model</b>	System 220	System 2220	Z-200 ADVANCED PC
<b>Class</b>	Rackmount	Rackmount	Desktop
<b>Users/Tasks</b>	32/—	64/—	8/Multi
<b>Main Unit</b>			
Main Processor	MC 68000L8	Motorola MC 68000	Intel 80286
Word Size (bits)	32/16	32/16	16/16
Clock Rate (MHz)	8	12.5	6
Other Processors	NA	Floating point coprocessor	Intel 80287 (opt.)
<b>Memory</b>			
RAM Min/Max (bytes)	512K/12M	1M/12M	512K/16M
RAM Increments (bytes)	1M	1M	1.5M
ROM (bytes)	16K-32K	16K-32K	64K
<b>Diskette Storage</b>			
No. of Drives	NA	NA	1-2
Size (in.) & Format	NA	NA	5.25 DSHD
Capacity (bytes)	NA	NA	1.2M
Access Time (msec)	NA	NA	—
<b>Hard Disk Storage</b>			
No. of Drives	1	1-4	1-3
Capacity (bytes)	80M, 160M, 474M	80M, 160M, 474M	10M, 20M, 112M
Access Time (msec)	20, 30, 18	20, 27, 18	40
<b>Other Storage</b>	9-track tape drive, 5.6M,-12.7M cartridge tape drive (opt.)	4KB cache memory; 12.7MB cartridge tape, 9-track tape drive (opt.)	—
<b>Display</b>			
Size and Type	Opt., avail. from vendor	Opt., avail. from vendor	Supports Zenith Z-22 and Z-39 terminals and high- resolution ZVM 1220, 1230, & 1240 monitors
Text Display (lines x col)	—	—	—
Character Matrix (dots)	—	—	—
Resolution (pixels)	—	—	—
Screen Attributes	—	—	—
Colors (simul/palette)	—	—	—
<b>Keyboard</b>			
Keyboard Type	Opt., avail. from vendor	Opt., avail. from vendor	Available with Zenith terminal or monitor
No. of Keys	—	—	—
Cursor Control	—	—	—
No. of Function Keys	—	—	—
Numeric Pad	—	—	—
<b>Input/Output</b>			
Open I/O Slots	20	15	6
Serial Ports	8-48 async, 4-8 sync	8-64 async, 4-8 sync	1
Parallel Ports	1-3	1-4	1
Special Output Ports	NA	NA	1 video
Special Input Ports	NA	NA	NA
<b>Data Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Opt.	Opt.	Opt.
Internal Modem	NA	NA	NA
<b>Software</b>			
Operating Systems	MCS; UniPlus + and CP/M emulation (opt.)	WMCS; UniPlus + (UNIX V) (opt.)	MS-DOS
Bundled Applications Languages	— APL, 68000, W-BASIC, C, RM/COBOL, COBOL, FORTRAN, Pascal	— APL, 68000, W-BASIC, C, RM/COBOL, COBOL, FORTRAN, Pascal	— APL, BASIC, COBOL, FORTRAN, Pascal
<b>Physical and Electrical</b>			
Size (L x W x H, in.)	31 x 22 x 53	31 x 22 x 53	—
Weight (lbs)	140	140	—
Power Supply	92-138/184-260 VAC, 49/63 Hz, 800 watts	92-138/184-260 VAC, 49/63 Hz, 800 watts	200 watts
<b>Sales and Service</b>			
Announced/Delivered	1981/1981	1984/1985	May 1985/June 1985
Sales Channels	Direct, distributor, dealer	Direct, distributor, dealer	Dealer, distributor, Direct
Service Channels	Direct	Direct	Direct
<b>Pricing</b>	\$45,000-\$80,000	\$50,000-\$120,000	\$3,999
<b>Comments</b>	NA	Can be adapted to accept Multibus cards.	IBM Personal Computer AT-compatible

**Notes:**

NA Not applicable  
— Information unavailable at press time



<p><b>Vendor</b>  <b>Model</b>  <b>Class</b>  <b>Users/Tasks</b>  <b>Main Unit</b>  Main Processor  Word Size (bits)  Clock Rate (MHz)  Other Processors</p> <p><b>Memory</b>  RAM Min/Max (bytes)  RAM Increments (bytes)  ROM (bytes)</p> <p><b>Diskette Storage</b>  No. of Drives  Size (in.) &amp; Format  Capacity (bytes)  Access Time (msec)</p> <p><b>Hard Disk Storage</b>  No. of Drives  Capacity (bytes)  Access Time (msec)</p> <p><b>Other Storage</b></p> <p><b>Display</b>  Size and Type  Text Display (lines x col)  Character Matrix (dots)  Resolution (pixels)  Screen Attributes  Colors (simul/palette)</p> <p><b>Keyboard</b>  Keyboard Type  No. of Keys  Cursor Control  No. of Function Keys  Numeric Pad</p> <p><b>Input/Output</b>  Open I/O Slots  Serial Ports  Parallel Ports  Special Output Ports  Special Input Ports</p> <p><b>Data Communications</b>  Asynchronous  Synchronous  Internal Modem</p> <p><b>Software</b>  Operating Systems  Bundled Applications  Languages</p> <p><b>Physical and Electrical</b>  Size (L x W x H, in.)  Weight (lbs)  Power Supply</p> <p><b>Sales and Service</b>  Announced/Delivered  Sales Channels  Service Channels</p> <p><b>Pricing</b></p> <p><b>Comments</b></p>	<p><b>Zentec</b>  Series 2000  Desktop  1-12/—</p> <p>Intel 8086  16/8  8  Intel 8087</p> <p>256K/1024K  256K, 512K, 1024K  —</p> <p>1-4  5.25 DSDD  738K  105</p> <p>1-4  20M-40M  30  Cartridge tape</p> <p>12-in. CRT  25 x 80/132  7 x 9  —  Blinking, blank, bold, reverse video, underline  Monochrome</p> <p>Detachable  103  4-key  16  Integral</p> <p>—  2-14 RS-232C  NA  —  —</p> <p>Std (TTY)  —</p> <p>—</p> <p>XENIX  Uniplex  COBOL, C, BASIC</p> <p>17 x 18 x 14.5  —  —</p> <p>1983/1983</p> <p>Direct  Factory, third party</p> <p>\$9,500 (single-user, base system w/256KB RAM, diskette drive, 20MB-disk)  NA</p>	<p><b>Zilog</b>  System 8000/12  Floor model  8-16/Up to 255</p> <p>Zilog Z8001  32/8 or 16  11.1  —</p> <p>512K/2M  512K  64K</p> <p>NA  NA  NA  NA</p> <p>1-2  52M  28  23MB cartridge tape</p> <p>14-in. CRT  24 x 80/132  12 x 15  —  Blinking, reverse video  Monochrome</p> <p>Detachable  102  4-key  25  Integral</p> <p>7 (minimum)  1 RS-232C  1 Centronics  NA  NA</p> <p>Std (TTY)  Opt. (2780/3780, 3270 SNA, X.25)  NA</p> <p>UNIX System III  NA  C, FORTRAN, COBOL, DIBOL, ADA, Pascal, SMC  BASIC, INFORMIX, ACE  COBOL</p> <p>18 x 18 x 26  95  110-115/220-260 VAC, 47-63 Hz</p> <p>September 1984/September 1984  Distributor  Direct</p> <p>\$16,950 (8-user system w/512KB RAM, 52MB disk drive)  NA</p>	<p><b>Zilog</b>  System 8000/22  Floor model  8-40/Up to 255</p> <p>Zilog Z8001  32/8 or 16  11.1  Floating point coprocessor (opt.)</p> <p>512K/4M  512K, 1M  64K</p> <p>NA  NA  NA  NA</p> <p>1-4  52M  28  23MB cartridge tape</p> <p>14-in. CRT  24 x 80/132  12 x 15  —  —  Monochrome</p> <p>Detachable  102  4-key  25  Integral</p> <p>7 (minimum)  1 RS-232C  1 Centronics  NA  NA</p> <p>Std (TTY)  Opt. (2780/3780, 3270 SNA, X.25)  NA</p> <p>UNIX System III  NA  C, FORTRAN, COBOL, DIBOL, ADA, Pascal, SMC  BASIC, INFORMIX, ACE  COBOL</p> <p>24 x 19 x 33  250  110-115/220-240 VAC, 47-63 Hz</p> <p>September 1984/September 1984  Distributor  Direct</p> <p>\$23,950 (8-user system w/512KB RAM, 52MB disk drive)  NA</p>
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Notes:  
NA Not applicable  
— Information unavailable at press time



<p><b>Vendor</b>  <b>Model</b>  <b>Class</b>  <b>Users/Tasks</b>  <b>Main Unit</b>  Main Processor  Word Size (bits)  Clock Rate (MHz)  Other Processors</p> <p><b>Memory</b>  RAM Min/Max (bytes)  RAM Increments (bytes)  ROM (bytes)</p> <p><b>Diskette Storage</b>  No. of Drives  Size (in.) &amp; Format  Capacity (bytes)  Access Time (msec)</p> <p><b>Hard Disk Storage</b>  No. of Drives  Capacity (bytes)  Access Time (msec)</p> <p><b>Other Storage</b></p> <p><b>Display</b>  Size and Type  Text Display (lines x col)  Character Matrix (dots)  Resolution (pixels)  Screen Attributes  Colors (simul/palette)</p> <p><b>Keyboard</b>  Keyboard Type  No. of Keys  Cursor Control  No. of Function Keys  Numeric Pad</p> <p><b>Input/Output</b>  Open I/O Slots  Serial Ports  Parallel Ports  Special Output Ports  Special Input Ports</p> <p><b>Data Communications</b>  Asynchronous  Synchronous  Internal Modem</p> <p><b>Software</b>  Operating Systems  Bundled Applications  Languages</p> <p><b>Physical and Electrical</b>  Size (L x W x H, in.)  Weight (lbs)  Power Supply</p> <p><b>Sales and Service</b>  Announced/Delivered  Sales Channels  Service Channels</p> <p><b>Pricing</b></p> <p><b>Comments</b></p>	<p><b>Zilog</b>  System 8000/32  Floor model  8-40/Up to 255</p> <p>Zilog Z8001  32/8 or 16  11.1  Floating point coprocessor  (opt.)</p> <p>512K/4M  512K, 1M  64K</p> <p>NA  NA  NA  NA</p> <p>1-4  168M  20</p> <p>23MB 9-track cartridge tape  (opt.)</p> <p>14-in. CRT  24 x 80/132  12 x 15  —  Blinking, reverse video  Monochrome</p> <p>Detachable  102  4-key  25  Integral</p> <p>7 (minimum)  1 RS-232C  1 Centronics  NA  NA</p> <p>Std (TTY)  Opt. (2780/3780, 3270 SNA,  X.25  NA</p> <p>UNIX System III  NA  C, FORTRAN, COBOL,  DIBOL, ADA, Pascal, SMC  BASIC, INFORMIX, ACE  COBOL</p> <p>24 x 19 x 33  250  110-115/220-240 VAC, 47-63  Hz</p> <p>September 1984/September  1984  Distributor  Direct</p> <p>\$29,950 (8-user system  w/512KB RAM, 168MB disk  drive)  NA</p>		
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**Notes:**

NA Not applicable

— Information unavailable at press time



# MULTIUSER MICROCOMPUTERS

## Product Briefs

227.0050.001

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**Action Computer Enterprise Inc**

430 N Halstead St  
Pasadena CA 91107

(818) 351-5451

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**Discovery 500**

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**Overview** The Discovery 500 is a multiprocessor, multiuser desktop system that can be used for either office or engineering applications. The operating system—dpc/os—supports 8- and 16-bit software. The computer includes built-in diskette drives and Winchester disk storage, supports up to 17 serial and 5 parallel I/O ports, and accommodates up to 7 users.

The Discovery 500 is marketed through dealers and distributors, value-added retailers, and OEMs. Field service is available through Bell & Howell.

**System Design** The architecture of the Discovery 500 is based on the IEEE-696 and S-100 standards. The computer incorporates a Zilog Z80A 64KB service processor and up to 7 user processors.

Any combination of 8-bit Z80 processors (for Digital Research CP/M-80 or CP/M-Plus applications) and 16-bit Intel 8086 or 8087 processors (for CP/M-86 applications) can be used as user processors. Memory is 64KB or 96KB for the 8-bit processors and 128KB to 1MB for the 16-bit processors. Up to 17 serial and 5 parallel ports can be attached. The system also features a 12MB or 26MB Winchester drive, and one or two 5-1/4-inch diskette drives, each with 1MB capacity. Up to 3 additional Winchester drives can be attached.

The operating system for the service processor is dpc/os, which coordinates the operation of the multiuser system and manages such user functions as private and shared file access, print spooling, print queue management, file and record locking, and interprocessor communications. The user processors supports CP/M-80, CP/M-86, and CP/M-Plus, thus making a range of applications software available to the user. The system permits the simultaneous operation of 8- and 16-bit software.

**Competition & Pricing** The Discovery 500 competes with the CompuPro 816/G and the OSM Zeus 3X/16.

A Discovery 500 system with 26MB of Winchester storage and 1 diskette drive costs \$7,640; a system with 26MB of Winchester storage and 2 diskette drives costs \$8,240.

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**Action Computer Enterprise Inc**

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(818) 351-5451

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**Discovery 1600**

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**Overview** The tabletop Discovery 1600 is a multiuser microcomputer system that accommodates up to 16 users and various mass storage and backup subsystems. The system supports Digital Research CP/M-Plus for 8-bit applications or Digital Research CP/M-86 for 16-bit applications. Business as well as scientific and engineering applications are suitable for the Discovery 1600.

The system is marketed through a network of OEMs, dealers, distributors, and value-added retailers. Service is provided by Bell & Howell.

**System Design** The Discovery 1600 incorporates IEEE-696 and S-100 standard architecture and has separate service and user processors. The dpc-283 service processor (a Zilog Z80A board with 96KB of data storage and 1 parallel and 2 serial ports) communicates with the user processors and peripheral controllers. The user processors may be selected according to the user's requirements. The standard user processor is the Z80-based dpc-83U, which has 96KB of data storage and 2 asynchronous serial ports. The dpc-83U has no built-in DMA logic and can be used only as a user processor. The dpc-183 and dpc-186 are optional user processors. The former incorporates a Z80A microprocessor with 96KB of RAM (32KB of which is bank switchable), DMA logic for faster interprocessor communications, and 2 serial ports; this processor can also be used as a service processor because it has the M-60 multiprocessing expansion bus. The dpc-186 is based on the 16-bit Intel 8086 or 8087 microprocessor and features 128KB to 1MB of RAM and 2 asynchronous serial ports.

The Discovery 1600 supports up to 36 serial and 8 parallel ports, 2 peripheral controllers, CP/M-Plus, and dpc/os 3.0. An optional 1604 Storage Array, with 5-1/4-inch disk and diskette drives, or a Priam drive, with dual 8-inch diskettes, can be configured.

Software for the Discovery 1600 consists of the dpc/os multiprocessing operating system and CP/M-Plus for 8-bit or CP/M-86 for 16-bit applications. During system initialization, a copy of CP/M is downloaded to each user, allowing each to execute standard, unmodified CP/M programs.

**Competition & Pricing** Competing systems include the OSM Zeus 3X/16, Televideo 816/40, and Computer Automation Omnix 186.

The basic version of the Discovery 1600 is available for \$3,885; a rack-mountable version costs \$3,960.

**Alpha Micro**

17332 Von Karman  
PO Box 18347  
Irvine CA 92714

(714) 957-8500

**Alpha Micro**

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**AM-1000, AM-1000E**

**Overview** Alpha Micro's AM-1000 Series comprises 6 models that support from 7 to 40+ users: AM-1000, AM-1000E, AM-1042E, AM-1072, AM-1082, and AM-1092. The AM-1000 and AM-1000E are 16-/32-bit desktop systems that support up to 7 users. All AM-1000 Series systems are software compatible; software developed on the AM-1000 or AM-1000E can also run on the AM-1092.

The AM-1000 model can be configured with up to 384KB of memory; the AM-1000E supports up to 512KB. Both systems support Winchester disk storage and a minimum 800KB of diskette storage.

Maintenance and support for the AM-1000 and AM-1000E are available through Alpha Micro's nationwide network of authorized dealers and distributors. Third-party maintenance is available through the AlphaSERV service network.

**System Design** All AM-1000 Series systems are based on the Motorola MC 68000 microprocessor with 32-bit registers, a 16-bit data path, and 24-bit memory addressing. Both the AM-1000 and AM-1000E feature a real-time clock with battery backup. The AM-1000 is available in several configurations that support from 128KB to 384KB of main memory. The configurations can include two 800KB diskette drives, a 10MB Winchester disk, or a 10MB Winchester disk and an 800KB diskette drive.

The AM-1000E includes 256KB of memory, expandable to 512KB. This model includes a 30MB Winchester and VCR backup capability. An 800KB diskette drive is optional. Both the AM-1000 and AM-1000E are configured with 3 RS-232C ports; I/O expansion provides 4 additional RS-232C ports and a Centronics port. The AM-1000 handles up to 70MB of disk storage; the AM-1000E supports up to 120MB of Winchester disk storage.

Software for both models includes the multiuser, multitasking AMOS/L operating system; AlphaBASIC, COBOL, FORTRAN-77, and macroassembler programming languages; the AlphaWRITE WP program; and AlphaRJE communications program offering IBM 2780/3780 bisynchronous communications.

**Competition & Pricing** The Callan Data Systems Unistar 100 and 200, Instrumentation Laboratory Pixel 80/AP, and Tandy Corporation TRS-80 Model 16B provide competition for the Alpha Micro systems.

Pricing ranges from \$5,850 for the dual diskette AM-1000 to \$12,850 for the AM-1000E with an 800KB diskette drive.

**AM-1042E, AM-1072**

**Overview** The Alpha Micro AM-1042E and AM-1072—the midlevel systems in the 6-model AM-1000 Series—are 16-/32-bit systems. The AM-1042E is a tabletop microcomputer that supports 26 users; the AM-1072 desk-sized microcomputer supports more than 40 users. All AM-1000 Series systems are software compatible. Software developed on the AM-1042E and AM-1072 can run on the AM-1000 and AM-1092. AM-1000 Series systems are designed for business and professional applications.

AM-1042E configurations support up to 3MB of main memory, and the AM-1072 up to 4MB of memory. Both models support Winchester disk storage and a 20MB streamer tape or a VCR interface for backup to a video cassette.

Alpha Micro's nationwide network of authorized dealers provides maintenance and support. AlphaSERV service network provides third-party maintenance.

**System Design** Both systems are built around the Motorola MC 68000 with 24-bit addressing in a 16MB DMA range, 32-bit registers, a 16-bit data path, and 8 vectored interrupt levels.

The AM-1042E includes 512KB of main memory, expandable to 3MB in increments of 128KB and 512KB. This system includes a 60MB Winchester disk drive and supports a maximum 1.4G bytes of Winchester disk storage. AM-1042E includes 2 RS-232C asynchronous serial ports; I/O expansion provides up to 26 serial ports. The AM-1072 features 512KB of memory that can be expanded to 4MB in increments of 128KB and 512KB. From 70MB to 560MB of Winchester disk storage is supported on the system. Two RS-232C asynchronous serial ports are standard with the system; an expanded system can support 60 serial I/O ports.

Both systems support a 20MB streamer tape or a VCR interface for backup to a video cassette using a video cassette recorder.

Software available for the AM-1042E and AM-1072 includes the AMOS/L multiuser operating system. Programming languages include AlphaBASIC, COBOL, FORTRAN-77, and a macroassembler. Communications software include AlphaRJE. Applications include the AlphaWRITE WP program.

**Competition & Pricing** Both systems compete with the the Wicat System 300 and Pertec SYSTEM 3200.

AM-1042E prices range from \$21,665 to \$25,500. AM-1072 prices range from \$30,500 to \$35,000.



**Alpha Micro**

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**AM-1082, AM-1092**

**Overview** The AM-1082 and AM-1092, the high-end models of the 6-model AM-1000 Series, are 16-/32-bit microcomputers that stand about the height of a file cabinet. Both systems support more than 40 users and are designed for business and professional applications. All AM-1000 Series systems are software compatible with each other.

Both the AM-1082 and AM-1092 handle up to 4MB of main memory, Winchester disk storage, and a 1/2-inch magnetic tape or VCR interface for backup to a video cassette.

Maintenance and support for Alpha Micro systems are provided by Alpha Micro dealers and distributors. Third-party maintenance is provided by the AlphaSERV service network.

**System Design** AM-1082 and AM-1092 computers are based on the Motorola MC 68000 microprocessor, which features 512KB of main memory, a 16-bit data path, 32-bit registers, 8 vectored interrupt levels, and 24-bit addressing in a 16MB DMA range.

Both models support from 512KB to 4MB of main memory, expandable in 128KB or 512KB increments. Two RS-232C serial ports are standard with each system; I/O expansion provides up to 60 serial ports.

The AM-1082 is configured with 140MB of Winchester disk storage that can be expanded to 560MB. The AM-1092 is configured with 400MB of Winchester disk storage and can be expanded to a maximum 3.2GB. Both systems can be configured with either a VCR interface for backup to a video cassette using a standard video cassette recorder or a 1/2-inch magnetic tape.

AMOS/L, the proprietary operating system, is a multiuser, multitasking, time-sharing disk-based system that includes a 3-pass assembler, linkage editor, symbol file generator, and symbolic debug routine. AlphaBASIC, COBOL, FORTRAN-77, and a macroassembler are supported by both models. The AlphaRJE communications package provides IBM 2780/3780 bisynchronous communications. The AlphaWRITE WP program is also available for these systems.

**Competition & Pricing** Competing with these two AM-1000 Series models are the Pertec SYSTEM 3200 and Wicat Systems System 300.

AM-1082 prices range from \$48,000 to \$60,600; AM-1092 prices range from \$56,000 to \$68,600.

**Altos Computer Systems**

2360 Bering Dr  
San Jose CA 95131

(408) 946-6700

**ACS 8600 Series**

**Overview** The ACS 8600 is a family of 16-bit microcomputers designed to support 8 concurrent users. The ACS 8600 systems are targeted for OEMs, system houses, and end users.

Available in 7 models, the ACS 8600 offers from 128KB to 1MB of main memory, 1MB of diskette storage, and up to 80MB of hard disk storage.

Four operating systems are supported: XENIX, Microsoft's multiuser version of the AT&T UNIX; Digital Research CP/M-86 and MP/M-86; and Phase One Oasis-16.

Altos Computer Systems offers a 90-day end-user warranty, as well as on-site maintenance from a third-party vendor and depot maintenance service.

**System Design** The ACS 8600 features 3 Intel microprocessors: the 8086 for system and application control, the 8087 for floating-point arithmetic, and the 8089 for DMA and I/O processing.

Special software drivers allow Zilog Z80 programs written for CP/M-86, MP/M-86, and Oasis-16 systems to be recompiled on the ACS 8600. Programming languages supported on the ACS 8600 include Microsoft versions of BASIC, COBOL, Pascal, and FORTRAN, as well as CIS-COBOL, RM-COBOL, Pascal/M-86, and C-BASIC-86.

A basic configuration for an entry-level system (e.g., the ACS 8600-15) features 128KB of memory, 3 I/O ports, and a 1MB diskette drive. The other 6 ACS 8600 models offer 512KB of RAM (expandable to 1MB), 10 I/O ports, from 10MB to 40MB of Winchester disk storage, and 1MB of diskette storage.

**Competition & Pricing** Competition for the Altos ACS 8600 includes the Sage Computer Sage IV and Micro Five Series 1000.

Prices for the ACS 8600 Series systems range from \$9,000 to \$19,000.



**Altos Computer Systems**2360 Bering Dr  
San Jose CA 95131

(408) 946-6700

**Altos 586**

**Overview** The Altos 586, a 16-bit microcomputer designed for small businesses, is a 5-user system that can be upgraded to support 8 users. The system supports up to 1MB of main memory, 20MB of Winchester disk storage, and 2MB of diskette storage as well as 4 multiuser/communications technologies: multiple users on a single computer; high-speed, twisted-pair networking; Xerox Ethernet; and mainframe communications.

Software supported on the Altos 586 includes XENIX, numerous operating systems, and various high-level languages.

Altos Computer Systems offers a 90-day end-user warranty as well as on-site maintenance from a third-party vendor and depot maintenance service.

**System Design** A 16-bit Intel 8086 microprocessor provides the Altos 586 with 256KB or 512KB of RAM, which can be expanded to 1MB. Additional features include a battery-operated clock and calendar, multibus-type architecture, memory management, and power failure detection.

In addition to XENIX—a microcomputer implementation of the AT&T UNIX operating system—the Altos 586 supports Microsoft MS-DOS, Pick and Associates PICK, Digital Research CP/M-86 and MP/M-86, and Phase One Systems OASIS-16. Languages include BASIC, COBOL, FORTRAN, Pascal, and C. Applications software includes the ABS/86 business package of accounting, WP, spreadsheet, and tutorial applications.

Altos 586 features 6 RS-232C ports; 4 additional ports can be added through an integral communications board. Communications protocols include IBM 2780/3780 (synchronous), 3270, SNA/SDLC, and X.25. The communications board also offers an autodial and autoanswer modem. Networking is provided through AltosNet or Xerox Ethernet facilities.

Altos 586 is available in 2 configurations: the 586-2 and 586-10. The 586-2 offers dual 5-1/4-inch, 1MB diskette drives; the 586-10 features a 10MB Winchester disk drive and 1MB of diskette storage. Both models can be configured with 20MB of Winchester disk storage.

**Competition & Pricing** The Altos 586 competes with the Sage Computer Sage IV, Micro Five Series 1000, Future Computers-FX Series, and TeleVideo Personal Mini.

Model	Price \$
586-2	4,990
586-10	7,990

**Altos Computer Systems**2360 Bering Dr  
San Jose CA

(408) 946-6700

**Series 5**

**Overview** The Series 5, announced in March 1982, is a multitasking microcomputer designed to concurrently perform various business or scientific applications.

The Series 5 is based on the Zilog Z80A and features 196KB of main memory. The Series 5 is available in 2 models: Model 5-15D, which features two 5-1/4-inch diskettes with 1MB of storage each, and Model 5-5D, which features a 5-1/4-inch Winchester drive with 5MB of storage and a 1MB diskette drive. Both models are compatible with the Digital Research CP/M and MP/M and Phase One Oasis operating systems.

Altos Computer Systems offers a 90-day end-user warranty, as well as on-site maintenance from a third-party vendor and depot maintenance service.

**System Design** Models 5-15D and 5-5D are modular in design and support up to 3 users. Both models feature 196KB of RAM; 48KB are reserved for operating system utility programs. Model 5-15D features two 5-1/4-inch diskette drives with 1MB of storage each. Model 5-5D has a 5-1/4-inch Winchester drive with 5MB of storage. Both models can be field upgraded with an additional 5MB Winchester drive.

Four RS-232C serial ports and a parallel I/O port are standard components of both models. One serial port in each model can be configured as an 800K-bps multidrop network port, while another port can be used for asynchronous or synchronous data communications. Both ports feature independently selectable transmission rates.

Software supported on the Series 5 includes the CP/M, MP/M, and Oasis operating systems, as well as the Altos BI-280, CBASIC, CB-80, Microsoft BASIC and COBOL, R/M COBOL, and MT+ Pascal programming languages. CP/M-, MP/M-, and Oasis-compatible application programs, as well as Altos application packages, are supported. Available Altos packages include accounting packages, word processing software, and financial analysis software.

**Competition & Pricing** Competition for the Altos Series 5 includes the Onyx Systems Sundance II, Vector Graphic Vector MX, Applied Digital Data Systems Multivision, and Dynabyte Business Computers 6000.

Prices for Series 5 systems range from \$4,000 to \$7,000.



**Applied Digital Data Systems Inc**100 Marcus Blvd  
Hauppauge NY 11787

(516) 231-5400

**Multivision 1 Model 8-5**

**Overview** The Applied Digital Data Systems (ADDS) Multivision 1 Model 8-5 is the first in a family of desktop microcomputer systems featuring a multiuser operating system compatible with Digital Research's CP/M, 64KB of main memory, 700KB of disk storage, 2 serial RS-232C data ports, and 2 parallel printer ports.

Maintenance for the Multivision 1 computer system is performed by ADDS authorized system distributors.

**System Design** The ADDS Multivision 1 is based on the Intel 8085A-2 microprocessor with 64KB of RAM. Direct memory access provides memory-to-memory data transfer. In addition, Multivision 1 has a 4KB shadow ROM, which provides power-up diagnostics and program boot. There are 256 bytes of nonvolatile memory provided by battery-powered CMOS memory elements. All peripheral interfacing is done via I/O commands, keeping the 64KB of RAM free for programming functions.

Up to 700KB of disk storage, provided on two 5-1/4-inch disk drives, is available on the Multivision 1 Model 8-5 system.

The Multivision 1 Model 8-5 is equipped with 2 serial RS-232C ports and 2 parallel printer ports. Data communications up to 9.6K bps are supported by 1 of the serial ports.

A CP/M-compatible multiuser, multitasking operating system (MUON) is standard. MUON supports a proprietary word processing package, an ADDS extended Microsoft BASIC interpreter, and several programming languages, including BASIC, COBOL, FORTRAN-77, and Pascal.

**Competition & Pricing** Competition for the Multivision 1 Model 8-5 includes the Altos Computer Systems Series 5, Onyx Systems Sundance II, and Vector Graphic Vector MX.

Price data is available upon request from Applied Digital Data Systems.

**Applied Digital Data Systems Inc**100 Marcus Blvd  
Hauppauge NY 11787

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**Multivision 2 Model 8-5**

**Overview** The Applied Digital Data Systems (ADDS) Multivision 2 Model 8-5 is the second in the Multivision series of desktop microcomputer systems featuring a multiuser operating system compatible with Digital Research's CP/M, 64KB of RAM, up to 10MB of Winchester disk storage, 700KB of diskette storage, 2 serial RS-232C ports, and 2 parallel printer ports.

ADDS authorized system distributors provide maintenance and support for the Multivision 2 computer system.

**System Design** The ADDS Multivision 2 is based on the Intel 8085A-2 microprocessor with 64K bytes of RAM main memory. Direct memory access provides memory-to-memory and memory-to-disk data transfer. In addition, the Multivision 2 has a 4KB shadow ROM, which provides power-up diagnostics and program boot. All peripheral interfacing is done through I/O commands, freeing the 64KB of RAM for programming functions. Up to 256 bytes of nonvolatile memory is provided by battery-powered CMOS memory elements.

Winchester disk storage is provided by 5MB and 10MB drives; two 5-1/4-inch diskette drives provide 700KB of storage.

The Multivision 2 is equipped with 2 serial RS-232C ports and 2 parallel printer ports. Data communications of up to 9.6K bps are supported by an RS-232C serial port.

A CP/M-compatible multiuser, multitasking operating system (MUON) is standard for the Multivision 2. MUON supports a proprietary word processing package, an ADDS extended Microsoft BASIC interpreter, and several programming languages, including BASIC, COBOL, FORTRAN-77, and Pascal.

**Competition & Pricing** Competition for the Multivision 2 includes the Altos Computer Systems Series 5, Onyx Systems Sundance II, and Vector Graphic Vector MX.

Price data is available upon request from Applied Digital Data Systems.

**Applied Digital Data Systems Inc**100 Marcus Blvd  
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**Multivision 3 Model 8-5**

**Overview** The Applied Digital Data Systems (ADDS) Multivision 3 Model 8-5 is the high-end model of the Multivision Series. Multivision 3 systems support 256KB of main memory, up to 10MB of Winchester disk storage, and 700KB of diskette storage.

A multiuser operating system compatible with Digital Research's CP/M is standard with the Multivision 3 Model 8-5.

Maintenance is provided by ADDS authorized system distributors.

**System Design** The ADDS Multivision 3 is based on the Intel 8085A-2 microprocessor with 64KB of RAM, which can be expanded to 256KB. A 4KB shadow ROM provides power-up diagnostics and program boot. There are 256 bytes of nonvolatile memory provided by battery-powered CMOS memory elements. The Multivision 3 can be configured to support from 2 to 4 users; each user requires a separate 64KB of memory. Two 5-1/4-inch diskette drives provide up to 700KB of storage. Two 8-inch Winchester disk drives with 5MB or 10MB capacities are also available.

Peripheral interfacing is accomplished through I/O commands, keeping the 64KB of RAM free for programming functions.

The Multivision 3 is equipped with 4 serial RS-232C ports and 2 parallel printer ports. A data communications rate of up to 9.6K bps is supported by the RS-232C serial ports.

Multivision 3 systems run under a CP/M-compatible multiuser, multitasking operating system (MUON). MUON supports a proprietary word processing package, an ADDS extended Microsoft BASIC interpreter, and several programming languages, including BASIC, COBOL, FORTRAN-77, and Pascal.

**Competition & Pricing** The Altos Computer Systems Series 5, Onyx Systems Sundance II, Dynabyte Business Computers Model 6000, and Pertec Computer 6000 computer systems provide the competition for the Multivision 3 Model 8-5.

Price data is available upon request from Applied Digital Data Systems.

**AT&T**295 N Maple Ave  
Basking Ridge NJ 07920

(201) 221-2000

**3B2/300**

**Overview** AT&T entered the microcomputer market with the March 1984 introduction of the 3B2 desktop microcomputer. Only one model, the 3B2/300, is currently available. The 3B2 is a multiuser, multitasking system designed for office, laboratory, and manufacturing applications. The 3B2 can be used as a single-user desktop development system.

The system supports up to 2MB of main memory, 720KB of diskette storage, and 32MB of Winchester disk storage. Several Teletype terminals, dot matrix printers, and letter-quality printers are supported. The 3B2 microcomputer runs under a multitasking, multiuser operating system.

AT&T provides maintenance and support for the 3B2/300.

**System Design** The 3B2/300 is based on the AT&T Western Electric WE 32000 microprocessor, which performs 8-, 16-, or 32-bit operations. The system includes virtual addressing; 32KB of ROM for self-test, automatic configuration, and bootstrapping functions; and 512KB of dual-port dynamic RAM.

Several configurations of the 3B2/300 are available. A basic system includes 512KB of main memory, a 10MB Winchester disk drive, and a 720KB diskette. The 3B2/300 standard configuration includes 1MB of main memory, a 32MB Winchester disk drive, a 720KB diskette, 2 serial ports, and a parallel port. The 3B2/300 can also be configured with 7 serial ports in an expanded configuration.

I/O expansion includes optional feature cards with 4 RS-232C serial ports and a Centronics-compatible parallel printer interface.

The 3B2/300 supports full-duplex, serial asynchronous communications at data rates of 9.6K bps. The system also supports the AT&T 3BNET local area network with a 10M-bit Ethernet-compatible protocol with microprocessor support for faster host loading.

AT&T has not yet developed applications software for its 3B2 microcomputer. Applications software for the UNIX System V operating system has been developed by third-party vendors.

**Competition & Pricing** Competing with the 3B2 are the NCR Tower 1632, Callan Data Systems Unistar 100, Plexus Computers P/35 and P/60, and Pertec Computer SYSTEM 3200.

Model	Price \$
Basic Configuration	9,950
Standard Configuration	15,125
Expanded Configuration	15,510



**Cado Systems Corp**2771 Toledo St  
Torrance CA 90503

(213) 320-9660

**C.A.T. II**

**Overview** The Cado C.A.T. II is a multiterminal desktop microcomputer with 48KB of RAM, 4KB of PROM, and 4 I/O ports. The C.A.T. II can be configured with two 1.26MB diskette drives or a 5-1/4-inch 15MB Winchester disk drive.

Cado Systems Corporation provides maintenance and support to users through its network of full-service distributors in more than 180 cities located in 40 countries.

**System Design** The Cado C.A.T. II is a multitasking system featuring Intel 8085-based microprocessors with 48KB of dynamic RAM and 4KB of PROM. The C.A.T. II supports 2 CRT terminals or 1 CRT display terminal and 2 printers. Two 1.26MB dual-diskette drives or a dual-sided 5-1/4-inch Winchester disk drive with 15MB of storage can be supported.

Software included with the C.A.T. II includes the multitasking operating system, business accounting packages, word processing packages, and CADOL, a high-level application language. The Cado C.A.T. II can run any Cado application program.

The Cado C.A.T. II supports asynchronous communications at speeds up to 9.6K bps and bisynchronous communications at 19.2K bps over TWX/telex, DDD, and private networks.

**Competition & Pricing** Competition for the Cado C.A.T. II includes the Altos Computer Series 5 and Vector Graphic Vector MX.

Model	Storage MB	Price \$
Cado C.A.T. II	2.52	14,990
Cado C.A.T. II	15.0	22,740

**Cado Systems Corp**2771 Toledo St  
Torrance CA 90503

(213) 320-9660

**C.A.T. III**

**Overview** The Cado C.A.T. III is a multiterminal microcomputer designed for multitasking operations. The C.A.T. III features 64KB of RAM, 4KB of PROM, 4 I/O ports, and either two 1.26MB dual-diskette drives or a 5-1/4-inch 15MB Winchester disk drive.

For maintenance and support, C.A.T. III users can contact one of Cado's full-service distributors available in more than 180 cities throughout 40 countries.

**System Design** The C.A.T. III features an Intel 8085 processor with 64KB of dynamic RAM and 4KB of PROM. Expansion to a 4-port multiterminal system is accomplished by adding a single I/O expansion board.

The C.A.T. III is available with two 1.26MB dual-diskette drives or a dual-sided 5-1/4-inch Winchester disk drive with 15MB of storage. A 55-cps word processing printer and 150-cps matrix printer are optionally available.

The Cado C.A.T. III can run virtually any business accounting, word processing, or other Cado application program. CADOL, a high-level application language, is provided with the system.

Asynchronous communications at speeds up to 9.6K bps and bisynchronous communications at 19.2K bps over TWX/telex, DDD, and private networks are supported.

**Competition & Pricing** The Cado C.A.T. III competes with the OSM Computer Zeus 4, North Star Horizon, and Pertec Computer 2000.

Model	Storage MB	Price \$
Cado C.A.T. III	2.5	8,990
Cado C.A.T. III	15.0	21,065

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**Cado Systems Corp**2771 Toledo St  
Torrence CA 90503(213) 320-9660

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**TIGER ATS**

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**Overview** The Cado Tiger ATS (Adaptive Transactional System)<sup>™</sup> consists of 2 trilevel microcomputer systems, the ATS 32 and ATS 64. Both models employ multiple 16-bit microprocessors.

Cado's proprietary Multi-Master/Interpretive Operating System (MM/IOS) supports the Tiger ATSs. Both CADOL and COBOL programming languages and a range of horizontal and vertical applications are accommodated.

Maintenance and support is provided by Cado's worldwide network of independent distributors.

**System Design** The ATS 32 and ATS 64 employ the same trilevel microprocessor architecture: a transaction processor, intranet processor, and control biprocessor.

Each transaction processor incorporates a 16-bit Intel 8086-2 microprocessor for short-duration transactions between up to 8 terminal devices, each operating at up to 19.2K bps. The transaction processor supports concurrent asynchronous or bisynchronous communications with a full data set interface.

The intranet processor also features an Intel 8086-2 processor and serves as a system resource manager and resource scheduler. Featuring 32KB of dedicated RAM and up to 16KB of dedicated PROM, the intranet processor performs long tasks assigned to it by a transaction processor.

The third processor, the control biprocessor, uses a 16-bit Intel 8089 dual-channel processor, which interfaces to the storage devices. With its 8KB I/O buffer, the control biprocessor transfers a full track from a disk to global memory in a single revolution.

The ATSs feature 256KB to 1MB of main memory. The ATS 32 accommodates up to 60MB of Winchester disk storage, and the ATS 64, up to 1.1GB. A global memory feature provides full track buffering for each user's disk I/O (up to 1MB). System backup is provided by a 1/4-inch streaming tape cartridge or an 8-inch diskette drive.

CADOL and COBOL programming languages run under MM/IOS. MM/IOS permits multilingual operator interfaces to application programs.

**Competition & Pricing** Competition for the Cado Tiger ATS includes the Point 4 MART 2T, Digital Equipment Corporation MICRO/PDP-11, and Micro Five Computers Series 1000.

Tiger ATSs range in price from \$25,000 to \$250,000, depending on the configuration.

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**Callan Data Systems**2637 Townsgate Rd  
Westlake Village CA 91361(213) 991-9156

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**Unistar 100**

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**Overview** The Unistar 100 is a desktop microcomputer designed to support up to 16 users.

Consisting of a 32-bit CPU with 256KB of RAM, 10MB Winchester disk drive, 600KB diskette drive, and 12-inch monitor, the Unistar 100 is completely compatible with the AT&T UNIX operating system.

The Unistar 100 is marketed through OEM distributors domestically and in several foreign countries.

Maintenance is provided through a factory repair service agreement available from Callan Data Systems.

**System Design** The Unistar 100 workstation is based on a 32-bit Motorola MC 68000 microprocessor featuring 512KB of dual-port RAM. The Unistar 100 features 2-level memory management with a fast-processing, context switch capability to support up to 16 users. With the addition of multibus-compatible memory modules, system memory can be expanded to 2MB.

Under the UNIX operating system, the Unistar 100 supports APL, BASIC, C, COBOL, FORTRAN-77, Pascal, and MC 68000 ASM software. In addition, the system incorporates such enhancements as C-shell, Diftid, Head, and Last.

A Unistar 100 configuration includes a CPU, 512KB of main memory, a 21MB Winchester disk drive, a 5-1/4-inch 616KB diskette, an 8-slot multibus card cage, a 12-inch-diagonal CRT monitor, and an ANSI-compatible video controller. The system also features 2 RS-423 multiprotocol serial ports and a Centronics parallel printer port.

Planned Unistar 100 enhancements include the AT&T UNIX System III with programmer workbench utilities, an AT&T 212 integral modem, a graphics controller, an Ethernet interface controller, and an 8-channel serial interface.

**Competition & Pricing** Competition for the Unistar 100 workstation includes the AT&T 3B2/300, Digital Equipment Corporation MICRO/PDP-11, and Plexus Computers P/35.

Unistar 100 prices range from \$11,450 to \$15,650.



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**Callan Data Systems**2637 Townsgate Rd  
Westlake Village CA 91361(213) 991-9156

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**Unistar 200**

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**Overview** The multiuser Unistar 200, from Callan Data Systems, is a UNIX-based microcomputer system for business, scientific, industrial, and commercial applications. The Unistar 200 supports up to 2MB of main memory, 600KB of diskette storage, and 21MB of Winchester disk storage. The integrated desktop Unistar 200 supports up to 9 additional users.

System software supported by the Unistar 200 system includes a multiuser, multiprocessing operating system, a programming language, and a variety of applications software.

Callan Data Systems provides maintenance and support for the Unistar 200 through a factory repair service agreement.

**System Design** Callan Data Systems designed the Unistar 200 around the Motorola MC 68000 32-bit microprocessor. The MC 68000 CPU features 768KB of dual-port local memory, which can be expanded to 2MB. Because the Unistar 200 uses local memory, the MC 68000 is not hindered by wait states that occur under system memory.

The Unistar 200 includes a 5-1/4-inch Winchester disk drive with 21MB of formatted storage, 5-1/4-inch diskette drives with 600KB of storage, a 12-inch-diagonal green phosphorous CRT, and a detachable keyboard.

Unistar 200 runs under the AT&T UNIX Version 7 multiuser, multiprocessing operating system, which is written in the C programming language. Under UNIX, the Unistar 200 supports a text-processing system that features a document formatter, spelling program, and full-screen editor. The system also incorporates enhancements originated by the University of California, Berkeley, such as C-shell, Diffidir, Head, and Last.

**Competition & Pricing** The AT&T 3B2/300, Digital Equipment Corporation MICRO/PDP-11, and Plexus Computers P/35 provide competition for Unistar 200.

Prices for the Unistar 200 range from \$13,950 to \$18,950.

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**Charles River Data Systems Inc**983 Concord St  
Framingham MA 01701(617) 626-1000

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**Universe 2203**

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**Overview** Introduced in 1984, the Universe 2203 is a 32-bit supermicrocomputer designed for OEMs or end users that require high performance. The system features the Motorola MC 68000 microprocessor and is built around the VMEbus. Either the proprietary UN/System V or UNOS can be used for the operating system. The 2-board standalone CPU is also available separately as the VCP2000.

Three field service programs are offered: on-call service provided by Inforex Inc, a time-and-materials contract for users located more than 200 miles from a service center, and a depot maintenance contract for customers who can diagnose problems and exchange faulty boards.

**System Design** The Universe 2203 uses the 12.5MHz Motorola MC 68000 microprocessor and VMEbus architecture; a 4KB cache memory allows the processor to execute programs without time-consuming wait states. The Universe 2203 includes memory allocation and protection and a 35MB Winchester disk. System backup is provided by a diskette or 1/4-inch streaming tape drive. The VMEbus is a high-speed, 32-bit data path that incorporates gas-tight connections between printed circuit boards and cables.

The VCP2000 CPU provides 1.25MIPS performance. It supports up to 16MB of main memory and has the same memory allocation and protection features as the Universe 2203.

The systems offer a choice of the UN/System V or UNOS operating system. UN/System V is the vendor's proprietary version of AT&T's UNIX and includes reliability and performance features not found in the original. UNOS is a proprietary real-time operating system compatible with UNIX that executes real-time and run-time applications more quickly than UNIX. Universe 2203 supports five programming languages: C, Pascal, FORTRAN, COBOL, and BASIC.

**Competition & Pricing** The Universe 2203 competes with the AT&T 3B2/300, Callan Data Systems Unistar Series, NCR Corporation Tower 1632, and Fortune Systems Fortune 32:16.

Prices for the Universe 2203 range from \$15,000 to \$20,000, depending on the memory configuration. The 2-board VCP2000 is priced at \$4,000.

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**Codata Systems Corp**285 N Wolfe Rd  
Sunnyvale CA 94086

(408) 735-1744

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**3300**

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**Overview** The Codata 3300 is a 16-/32-bit multibus system that supports 10 or more users. The 3300 features 320KB of RAM and online storage with either a Winchester disk drive or diskette subsystem. Codata 3300 is a UNIX-based system that supports numerous programming languages.

Codata maintains a customer response center during standard business hours. Codata customers are provided a toll-free number.

**System Design** Codata 3300 is based on the Motorola MC 68000 multibus system with 320KB of parity-protected RAM. Main memory can be expanded to 1.5MB. Disk storage is available in an integral 12MB or 33MB Winchester disk. An optional 84MB disk is stored in a separate enclosure. The 33MB and 84MB disks feature a voice coil design that provides fast access and improved system performance. The disks can be upgraded by adding another disk of the same size.

The 3300 features 2 serial ports connected directly to the central processor board; 2 intelligent serial controllers can be added. These controllers handle operations on 8 ports, respectively. Individual port speeds can be adjusted from 50 to 19.2K bps. Terminals, printers, and other serial peripherals can be interfaced to the system through the I/O ports.

UNISIS, Codata's version of AT&T UNIX Version 7, is the operating system for the 3300 and is delivered with the C compiler. Program development is also available for such programming languages as FORTRAN, BASIC, APL, COBOL, and Pascal.

The Codata 3300 supports 2 serial I/O cards for a total of 18 serial ports. Additional options include a 10MB cartridge tape and 9-track 800-/1,600-bpi magnetic tape system.

**Competition & Pricing** Competition for the Codata 3300 includes the AT&T 3B2/300, Digital Equipment Corporation MICRO/PDP-11, and Plexus Computers P/35.

Codata 3300 system prices begin at \$9,600.

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**Columbia Data Products**8990 Rte 108  
Columbia MD 21045

(301) 992-3400

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**Commander Computer 964 Plus**

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**Overview** The Commander Computer 964 Plus is a multiuser desktop microcomputer system designed for multitasking operations. Based on dual Zilog Z80A microprocessor architecture and IEEE bus controllers, the system features up to 256KB of RAM and 1.6MB of disk storage.

The Commander 964 Plus is supported by the Digital Research CP/M operating system.

Maintenance and support are provided by authorized distributors of Columbia Data Products.

**System Design** The Commander 964 Plus features dual Zilog Z80A microprocessors with up to 256KB of RAM and direct memory access, dual 5-1/4-inch diskette drives with 1.6MB of storage, 4 RS-232C serial ports, 4 parallel ports, and an RS-170 composite video interface. An integral 12-inch-diagonal display provides 512-by-256-pixel graphics. A full-function ASCII keyboard directs all system operations.

The Commander 964 Plus features the CP/M operating system for single-user applications and the MP/M operating system for multiuser applications. All standard CP/M-based applications software and high-level languages, such as BASIC-80, FORTRAN-80, COBOL-80, Algol, and C, are supported.

Optional features available include an automatic program unit, DMA, IEEE bus controller, and extended disk capacity.

**Competition & Pricing** Competition for the Columbia Commander Computer 964 Plus includes the Altos Computer Systems Series 5, Onyx Systems Sundance II, and Dynabyte Business Computers Model 6000.

Prices for the system are \$5,495 with 128KB memory and \$5,995 with 256KB.



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**Columbia Data Products**8990 Rte 108  
Columbia MD 21045

(301) 992-3400

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**Concept 1000**

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**Overview** The Concept 1000 is a multitasking microcomputer system designed to support up to 16 users. Each user has a fully dedicated microprocessor system with dual RS-232C or RS-422 serial ports.

Other Concept 1000 system resources are controlled by a 64KB master microcomputer with 32KB of EPROM and 3 RS-232C serial interfaces. A modified multibus supports optional tape cartridges, diskettes, and a Winchester disk drive. Digital Research MP/M and CP/Net operating systems manage the master Concept 1000 microcomputer.

Maintenance is provided by authorized distributors of Columbia Data Products.

**System Design** Based on a master Zilog Z80A microprocessor with 64KB of RAM and 32KB of EPROM, the Concept 1000 supports up to 16 users via fully dedicated Z80A satellite microprocessors running under CP/M. Each satellite processor features 2 RS-232C or RS-422 serial ports, which support asynchronous and synchronous data communications up to 19.2K bps. All standard CP/M-based applications software and high-level languages, including BASIC-80, FORTRAN-80, COBOL-80, Algol, and C, are supported.

The Concept 1000 master microcomputer can be configured with a variety of optional storage devices through a modified multibus. These include a 17MB tape storage drive, dual diskette drives with 16MB of storage, and a Winchester disk controller system for 10MB, 20MB, and 40MB of storage. Three RS-232C serial interfaces and a Centronics parallel printer interface are available. Both synchronous and asynchronous data communications up to 9,600 bps are supported.

All Concept 1000 master microcomputer system resources are controlled by Digital Research MP/M and CP/Net operating systems.

**Competition & Pricing** Competition for the Columbia Concept 1000 includes the OSM Zeus 3 and Tele-video TS 816 multiuser microcomputer systems.

Prices are available from Columbia Data Products upon request.

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**CompuPro**3506 Breakwater Ct  
Hayward CA 94545

(415) 786-0909

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**CompuPro 10**

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**Overview** The CompuPro 10, introduced in 1983, is a 4-user multiprocessor microcomputer that features concurrent 8- and 16-bit processing. The system is targeted for business users and is sold to OEMs, systems integrators, and end users through wholesale distributors and more than 50 CompuPro system centers worldwide. The CompuPro 10 supports WP, DP, and communications functions through a shared data base.

The CompuPro 10 includes up to 768KB of main memory, up to 2.4MB of diskette storage, and a 40MB Winchester disk drive. The company bundles several software packages with the system.

CompuPro warrants the CompuPro 10 for 12 months from the date of purchase. The warranty includes nationwide on-site maintenance through the Xerox Service Group Americare third-party service program.

**System Design** The CompuPro 10 is based on an 8 MHz, 16-bit Intel 8088 microprocessor with 768KB of main memory. In addition, there are four 8-bit Zilog Z80B user processors, each with 64KB of RAM. The CompuPro 10 is based on master-slave architecture; the 8088 processor handles system resources and diskette, printer, and communications links, while the Z80B processors act as individual task processors. In a standard configuration, each terminal can access its own Z80B processor and dedicated memory when running 8-bit application programs.

Standard features of the CompuPro 10 also include 7 serial ports, including a modem port, Centronics-compatible parallel printer port, 384KB of disk memory, and dual 5-1/4-inch diskette drives storing 1MB per diskette.

Hardware options include a math coprocessor, up to 4MB of disk emulation, 2.4MB dual diskette drives, and an internal 40MB Winchester disk drive. The Net 10 network option uses Datapoint's ARCNET protocol and DRNET software for networking 4 CompuPro 10 systems together.

The CompuPro 10 runs under an enhanced version of the CompuPro MP/M 8-16, which is based on Digital Research's CP/M. In addition to MP/M 8-16, CompuPro 10 comes bundled with financial spreadsheet, WP, and data base management software.

**Competition & Pricing** Competing with the CompuPro 10 are the Applied Digital Data Systems Multivision and Dynabyte Business Computers Model 6000.

The basic CompuPro 10 without terminals is priced at \$4,995.



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**CompuPro**3506 Breakwater Ct  
Hayward CA 94545(415) 786-0909

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**CompuPro 816/B**

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**Overview** The CompuPro 816/B is a multiuser system designed for business environments and suited for such applications as WP, business and financial planning, and data base management. The system is similar to the 816/A but supports more peripheral devices as well as workstations for up to 3 users.

The system is marketed to OEMs, system integrators, and such end users as software developers and computer manufacturers. The system has a limited 12-month warranty on the boards and main unit and a 6-month warranty on the disk drive.

On-site service is provided by the Xerox Service Group.

**System Design** The CompuPro 816/B includes CompuPro's Intel 8085/8088 CPU board, which allows concurrent execution of both 8-bit and 16-bit programs and operates at clock rates of 6MHz and 8MHz, respectively. The basic system also has 256KB of RAM, 9 serial ports, 1 parallel and 1 Centronics printer port, and two 8-inch diskette drives.

Software available for the system includes the CompuPro MP/M 8-16 operating system, Proteus Engineering WRITE, Sorcim SuperCalc-86, Summit Software Hyper Typer, Gensoft Field Companion, and Ashton-Tate dBase II. MP/M 8-16 is a proprietary implementation of Digital Research's MP/M-86, which is a 16-bit operating system that relegates 8-bit applications to the 8-bit Intel 8085 processor for execution.

**Competition & Pricing** The 816/B competes with the Altos Series 5 and 586, OSM Zeus 4/16, and Vector Graphic Vector MX.

A multiuser system 816/B costs \$6,995.

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**CompuPro**3506 Breakwater Ct  
Hayward CA 94545(415) 786-0909

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**CompuPro 816/C**

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**Overview** The CompuPro 816/C is a multiuser system that supports up to 7 user workstations as well as a range of mass storage systems. The system is suitable for use in business, scientific, and industrial applications.

The system is marketed to OEMs, system integrators, and such end users as software developers and computer manufacturers. CompuPro offers a 12-month limited warranty on the processor boards and system enclosure and a 6-month warranty on the disk drives. On-site service is provided by the Xerox Service Group.

**System Design** The CompuPro 816/C incorporates 512KB of RAM, expandable to 1MB; 9 serial ports; 1 parallel and 1 Centronics-compatible printer port; and two 8-inch diskette drives that store 2.4MB. The system can be expanded to include up to 4.8MB of diskette storage and 320MB of disk storage. Also included in the basic configuration are a clock/calendar, interrupt controller, and interval timer. A math coprocessor is optional.

Software for the 816/C includes the MP/M 8-16 operating system, which is an implementation of Digital Research's MP/M-86 designed to execute both 8-bit and 16-bit programs, as well as Proteus Engineering WRITE, Sorcim SuperCalc-86, Summit Software Hyper Typer, Gensoft Field Companion, and Ashton-Tate dBase II. Programming languages supported include Assembler, BASIC, Pascal, FORTRAN, and COBOL, as well as CP/M-based programming tools.

**Competition & Pricing** Competing systems include the Altos ACS 8600 and 586, OSM Zeus 4, and Micro Five Series 1000.

The basic CompuPro 816/C configuration is priced at \$8,995.



**CompuPro**3506 Breakwater Ct  
Hayward CA 94545

(415) 786-0909

**CompuPro 816/D, 816/Dd**

**Overview** The CompuPro 816/D is a 16-bit, multiuser system that supports up to 5 user workstations. The CompuPro 816/Dd is similar to the 816/D but has less storage capacity in the basic configuration. Both systems are designed for business, industrial, and scientific applications.

The systems are marketed to OEMs, system integrators, and such end users as software developers and computer manufacturers. CompuPro provides a 12-month warranty on the boards and system enclosure and a 6-month warranty on the disk drives. On-site service is available from the Xerox Service Group.

**System Design** The CompuPro 816/D is configured with a 10MHz Intel 8086 microprocessor and an optional 8087 math coprocessor. It includes 512KB of memory (expandable to 1 MB), 12 serial ports, 1 parallel and 1 Centronics-compatible printer port, 2.4MB of diskette storage, and 1.5MB of M Drive/H solid-state disk storage. The 816/Dd, on the other hand, is based on an 8MHz 8086 CPU and incorporates 512KB of 16-bit RAM (expandable to 1 MB), two 8-inch diskette drives with 2.4 MB of storage, 4 serial ports, and 1 parallel and 1 printer port.

Software for the systems includes the Digital Research CP/M-86 and MP/M-86 operating systems, Summit Software Hyper Typer, and Gensoft Field Companion. The 816/Dd also features Sorcim SuperCalc-2; the 816/D, Sorcim SuperCalc-86 and SuperWriter-86.

**Competition & Pricing** Competing systems include the OSM Zeus 4 and the MicroFive Series 1000.

The basic configuration of the 816/D with a 2.4MB diskette drive is priced at \$13,995. The basic 816/Dd configuration with 20MB of disk storage costs \$7,995. Configurations of the 816/Dd with the 8-inch diskette drive cost \$9,495 (with 20MB of disk storage), \$9,995 (with 40MB of disk storage), and \$13,995 (with 80MB of disk storage).

**CompuPro**3506 Breakwater Ct  
Hayward CA 94545

(415) 786-0909

**CompuPro 816/Ee**

**Overview** The CompuPro 816/Ee is a multiuser version of the CompuPro 816/E, a 32-bit system designed for applications in business, industry, and science.

The 816/Ee is marketed to OEMs, system integrators, and such end-users as software developers and computer manufacturers. CompuPro offers a limited 12-month warranty on the processor boards and system enclosure and a 6-month warranty on the disk drive. On-site service is available through the Xerox Service Group.

**System Design** The 816/Ee conforms to the IEEE-696 standard and is based on a 10MHz Motorola MC 68000 CPU. The system has 256KB of 16-bit RAM (expandable to 16MB), two 8-inch diskette drives with a storage capacity of 2.4MB, 4 serial ports, 1 printer port, and 1 parallel port. It can support a 20MB, 40MB, or 80MB Winchester fixed disk drive. It is not available with the M Drive/H supported by the 816/E single-user model.

The 816/Ee runs the Digital Research CP/M-68K operating system and is packaged with a C language compiler and MapFORTH. CP/M-68K permits application programs written in C under the AT&T UNIX operating system to be transferred to a CP/M environment.

**Competition & Pricing** The 816/Ee competes with the Callan Data Systems Unistar 100 and the Stride Micro Stride 440.

Model	Price \$
CompuPro 816/Ee Basic Configuration	6,495
CompuPro 816/Ee w/20MB fixed disk	8,485
CompuPro 816/Ee w/40MB fixed disk	8,995
CompuPro 816/Ee w/80MB fixed disk	12,995

**CompuPro**3506 Breakwater Ct  
Hayward CA 94545

(415) 786-0909

**CompuPro 816/F**

**Overview** The CompuPro 816/F, a multiuser computer system introduced in the first quarter of 1984, is compatible with the IEEE-696 standard and is built on a 16-bit Intel 80286 CPU.

The system is marketed to OEMs, system integrators, and such end users as software developers and computer manufacturers. CompuPro offers a limited 12-month warranty on the processors and system enclosure and a 6-month warranty on the disk drive. On-site service is provided by the Xerox Service Group.

**System Design** The CompuPro 816/F is configured around a 6MHz Intel 80286 CPU and an Intel 80287 math coprocessor. The basic configuration includes 512KB of static memory (expandable to 16MB), 12 serial ports; 1 Centronics printer port, 1 parallel port; an 8-inch, 1.2MB diskette drive; 40MB of storage on a 5-1/4-inch disk; and the M DRIVE/H disk emulator, which has 1.5MB of RAM-based storage. The system also includes a clock/calendar, interrupt controllers, interval timers, and battery-powered backup RAM.

CompuPro 816/F operates under the Digital Research CP/M-86 or MP/M-86 operating system.

**Competition & Pricing** Competing systems include the Altos ACS 8600, Computer Automation Omnix 186, and OSM Zeus 3X/16.

The base price for the 816/F is \$14,995.

**CompuPro**3506 Breakwater Ct  
Hayward CA 94545

(415) 786-0909

**CompuPro 816/G, 816/Gg**

**Overview** The CompuPro 816/G and 816/Gg, both introduced in the summer of 1984, are built around National Semiconductor's 32-bit NS32016 microprocessor. The systems are designed for DP-intensive environments, software development, and multiuser business applications.

The systems are marketed to OEMs, system integrators, and end users such as software developers and computer manufacturers. CompuPro offers a 12-month warranty on the processor boards and main unit and a 6-month warranty on the disk drive. On-site service is provided by the Xerox Service Group.

**System Design** Both the 816/G and the 816/Gg are fully compatible with the IEEE-696 and S-100 standards. The systems incorporate the NS32016 microprocessor, which features 32-bit internal architecture and a 16-bit external data bus. They also have an NS32082 memory management unit (MMU) and an NS32081 floating-point unit (FPU). The MMU maximizes throughput and provides memory protection for all users; the FPU handles 32- and 64-bit floating-point calculations.

The basic 816/G configuration includes 1MB of static RAM (expandable to 16MB); 2MB of solid-state disk memory; two 8-inch, 1.2MB diskette drives; 12 serial ports; 1 printer port; and 1 parallel port.

The basic 816/Gg configuration is similar but includes only 512KB of static RAM and 1MB of solid state disk memory. Both systems operate under the FORTH operating system.

**Competition & Pricing** Competing systems include the Alpha Micro AM 1000, Wicat System 100, and Datamedia 932.

Model	Price \$
816/G w/dual diskette	17,495
816/G w/diskette & 20MB disk	19,495
816/G w/diskette & 40MB disk	19,995
816/G w/diskette & 80MB disk	23,995
816/Gg w/dual diskette	12,495
816/Gg w/diskette & 20MB disk	14,495
816/Gg w/diskette & 40MB disk	14,995
816/Gg w/diskette & 80MB disk	18,995



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**Computer Automation**1800 Jay Ell Dr  
Richardson TX 75081(214) 783-0993

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**Omnix**

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**Overview** The Computer Automation Omnix is a family of 16-bit desktop microcomputers designed for multiuser, multitasking applications. The Omnix series features 2 models containing up to 128KB of RAM as well as diskette drives and/or a Winchester disk drive.

Omnix systems run under Computer Automation's proprietary operating system and a BASIC programming language.

Omnix systems can be packaged with CRT displays and serial printers.

Computer Automation provides maintenance and support for Omnix.

**System Design** The Omnix multiuser business system is available in 2 models: Omnix-2 and Omnix-11.

Omnix-2 is based on the Computer Automation 16-bit Naked Mini 4/04 processor with 64KB or 128KB of RAM and a 9-slot card cage with 2 power supplies. Two 5-1/4-inch diskette drives with 1MB of storage per drive are standard; a diskette controller can support 2 additional drives. Also included are 4 RS-232C serial interface channels. A parallel I/O interface is optional. Omnix-2 supports 3 terminal workstations and 1 printer (expandable to 8 devices).

Omnix-11 is based on the Computer Automation 16-bit Naked Mini 4/08 processor with 128KB or RAM and a 9-slot card cage with 2 power supplies. A 5-1/4-inch diskette drive with 1MB of storage and 10MB Winchester disk drive are standard. Four RS-232C serial interface channels are included with the system. A parallel I/O interface is optional. The Omnix-11 supports 3 terminal workstations and a printer (expandable to 16 devices).

An optional 64KB configuration with the Naked Mini 4/04 processor is also available.

The OPUS-1 multitasking operating system and TRANS-BASIC programming language support Omnix computers. A complete set of menu-driven system utilities include set time and date, disk initialization, source editor, and delete and view. Omnix applications software is available under a choice of licensing plans.

**Competition & Pricing** Competition for the Omnix includes the Digital Equipment Corporation MICRO/PDP-11, NEC ASTRA, and OSM Computer Zeus 3X/16.

The vendor declined to provide price data.

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**Corona Data Systems Inc**275 E Hillcrest Dr  
Thousand Oaks CA 91360(805) 495-5800

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**Corona MEGA PC**

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**Overview** The Corona MEGA PC is a multiuser microcomputer system that is compatible with the IBM Personal Computer XT and designed for business applications. Up to 8 terminals can operate concurrently in different modes. All software written for the IBM Personal Computer and Personal Computer XT can be run on the MEGA PC without modification.

Released in fall 1984, the MEGA PC is marketed through OEMs, value-added retailers, and retail dealers.

**System Design** The MEGA PC system unit houses the main file server board, which incorporates a 16-bit Intel 8088 microprocessor and 256KB of RAM (expandable to 512KB); this server board controls all I/O activity and performs all system housekeeping and overhead functions. The system unit contains a second board with 11 IBM-compatible bus expansion slots. Up to 8 of these slots are available for application processor cards (APCs), each incorporating an 8MHz 8088-2 microprocessor and 256KB to 512KB of internal RAM.

The main file server incorporates a disk controller with clock/calendar; a 10MB, 20MB, or 40MB Winchester disk drive; a 16KB ROM BIOS (basic input/output system) that bootstrap loads data to disk storage; a diskette drive 1 serial port; and 1 parallel port. Options include a second Winchester drive, a 10MB removable cartridge Winchester disk drive, and a 43MB streaming tape drive. If not used for APC workstation cards, the expansion slots can be used for any IBM bus-compatible card.

Each workstation terminal has a monitor with a 14-inch nonglare, green phosphor screen and 640-by-400-pixel resolution. The detachable keyboard has the IBM Personal Computer layout; indicator lights signal caps and number lock.

Bundled software for the MEGA PC includes Microsoft's MS-DOS operating system and GW-BASIC programming language, as well as an integrated productivity package. Software written for the IBM Personal Computer or Personal Computer XT can be run on the system without modification.

**Competition & Pricing** Competing systems include the North Star Dimension and the TeleVideo Personal Mini.

A 2-user MEGA PC system with a 10MB disk drive costs \$7,805. Additional workstations are available for \$1,495 each.

**Datamedia Corp**7401 Central Hwy  
Pennsauken NJ 08109

(609) 665-5400

**Datamedia 932**

**Overview** The Datamedia 932 is a multiuser micro-computer system featuring 16/32-bit architecture and 128KB of RAM expandable to 2.1MB. The system can be configured with up to 124MB of Winchester disk storage and 16 terminal ports.

Controlled by a virtual operating system, the Model 932 features a relational DBMS and an English-like data base query language and can run under software that is compatible with the Microdata Reality and Ultimate systems, Honeywell Level 6, and Prime Computer Information Systems computers.

**System Design** The Datamedia 932 is based on the Motorola MC 68000 16-/32-bit microprocessor, which provides 128KB of RAM expandable to 2.1MB. The entire memory is addressable by the system. Battery backup prevents data from being lost in a power failure. Datamedia's uninterrupted power supply (UPS) feature provides an alarm message that warns even remote terminal users.

The system features from 12MB to 124MB of Winchester disk storage, 80MB of magnetic tape backup, from 6 to 16 terminal ports, 2 printer ports, and 1 IEEE-488-compatible port. All Model 932 asynchronous ports support 20mA current-loop and RS-232C serial interfaces. The I/O interface includes multiple Intel 8085 data communications processors that control communications and I/O tasks.

Model 932 operates under the Pick and Associates PICK disk-based virtual operating system, which automatically shifts data between real main memory and virtual storage on disk. The operating system's relational data base management software features the sharing of data among multiple users, 4 dictionary-based hierarchical levels, and security and retrieval lock codes to prevent unauthorized use of the system. Data communications software includes bisynchronous IBM 2780/3780 emulation and asynchronous communications.

**Competition & Pricing** Competition for the Datamedia 932 includes the Pertec Computer SABRE, NCR I-Tower, and Syte Information Technology Series 3000 Model 300.

The price for a 9-port system with the PICK operating system is \$16,740.

**Datapoint Corp**9725 Datapoint Dr  
San Antonio TX 78284

(800) 334-1122

**1560 Series**

**Overview** The 1560 Series processors are multifunction systems that operate in an ARC local area network. They are suited for such business applications as WP, electronic mail, and financial spreadsheets. The desktop systems have a detached keyboard, an optional tiltable and rotatable base, and a CRT screen.

**System Design** The 1560 processor is based on a Zilog Z80A CPU and has 128KB of main memory. It is connected to the ARC local area network through an internal resource interface module. Each system includes a printer interface, a keyboard with a 55-key typewriter keypad and function and numeric keys, and a 12-inch-diagonal VDU that display 24 rows of 80 columns each plus one status line.

Communications protocols supported include IBM 2780, 3780, 3270, and SNA/SDLC; Teletype emulation; and Datapoint DATAPOLL.

The 1560 Series supports the Datapoint DOS operating system and Digital Research CP/M. Languages supported include DATABUS/DATASHARE, BASIC-PLUS, and FORTRAN.

The systems are available in standalone or networked configurations with 1MB diskette drives, 10MB or 20MB Winchester disk drives, 40MB fixed disk drives, and 10MB removable cartridge disk drives.

**Competition & Pricing** Competing systems include the Televideo TS816/40 and the OSM Zeus 4 and Zeus 3X.

Prices for 1560 Series begin at \$2,400.



**Datapoint Corp**

9725 Datapoint Dr  
San Antonio TX 78284

(800) 334-1122

**VISTA-STATION-82, VISTA-STATION-84**

**Overview** The VISTA-STATION-84 is an applications processor designed for DP functions and such office automation tasks as WP, electronic mail, financial modeling, and windowing within an ARC local area network. The VISTA-STATION-82 terminal operates in conjunction with the VISTA-STATION-84 to form a dual-workstation configuration. Both products offer fast response times and compatibility with VISTA-VIEW software, which simultaneously manages multiple tasks anywhere in the ARC network.

**System Design** The VISTA-STATION-84 incorporates a 16-bit Intel 80286 microprocessor, from 512KB to 1MB of RAM, an RS-232C communications interface to a local serial printer, and an RS-232C or RS-422 serial communications interface to support terminal operations.

The VISTA-STATION-82 incorporates 1 RS-422 or RS-232C interface for terminal connection and 1 RS-232C interface for a local serial printer.

Both systems use the same type of VDU and keyboard. The VDU has a 12-inch-diagonal amber-on-gray screen and an optional tiltable and rotatable base. The keyboard has a 55-key typewriter keypad, an 11-key numeric pad, and 21 function keys for user-defined and preprogrammed functions.

Both systems include the Resource Management System (RMS) operating system, both are compatible with VISTA-VIEW windowing software, and both perform such business applications as WP, electronic mail, spreadsheet analysis, DP, and data communications.

**Competition & Pricing** Competing systems include the OSM Zeus 4/16, Honeywell microSystem 6/20, and Burroughs B 25.

A single VISTA-STATION-82 workstation is priced at \$2,295. The VISTA-STATION-84 applications processor costs \$8,550 with 512KB of memory and \$10,300 with 1MB of memory.

**Digital Computer Corp**

7430 Trade St  
San Diego CA 92121

(619) 566-8500

**OMNI Computer**

**Overview** The OMNI Computer is available in 5 multiuser, multiprocessor models. The systems are based on the S-100 bus architecture and, depending on the model, support from 5 to 32 users. Each model includes OMNI-data, a financial accounting package.

The OMNI Computer is marketed through a nationwide network of distributors and dealers. Each system is covered by a 1-year warranty.

**System Design** The OMNI Computer is built around a version of the S-100 bus. Users are allocated disk storage from anywhere on the disk, rather than from a limited partitioned area. Programs can be designated as global to eliminate duplicate storage for repetitive tasks performed by multiple users.

The Series 1000 is a desktop model that supports up to 5 simultaneous users. The unit incorporates 64KB of RAM, a 4MHz Zilog Z80A master processor, and 2 double-sided, dual-density 8-inch diskette drives with 1.6MB of storage each. The Series 1000, like all other OMNI Computer systems, has ports for a terminal, serial printer, and parallel printer. The 1000 is equipped with the Digital Research CP/M operating system and can optionally run the CP/M-compatible Software 2000 Inc TurboDOS operating system.

The Series 2000 supports up to 10 users. The basic configuration includes 64KB of RAM, a 6MHz Zilog Z80B master processor, an 8-inch diskette, and 3 ports. It is prewired to accommodate one or two 5-1/4-inch disks that store from 13MB to 288MB each. The system includes TurboDOS Version 1.3.

The System 3000 has the same configuration as the Series 2000 but supports up to 16 users.

The Series 4000 supports up to 32 users. It is prewired to accommodate up to four 5-1/4-inch disks storing from 26MB to 576MB. The basic unit is equipped with TurboDOS version 1.3, 64KB of RAM, a Z80B master processor, an 8-inch diskette drive, and 3 ports.

The Series 5000 is similar in configuration to the Series 4000 but includes the Link Control Network, which allows it to be linked with up to 127 other Series 5000 computers.

**Competition & Pricing** Competing systems include the Altos 586, Computer Automation Omnix 186, and OSM Zeus 3X/16. The Series 1000 costs \$3,995; the Series 2000, \$6,450; the Series 3000, \$8,950; the Series 4000, \$11,295; and the Series 5000, \$15,490.

**Digital Equipment Corp**146 Main St  
Maynard MA 01754

(617) 897-5111

**MICRO/PDP-11**

**Overview** The MICRO/PDP-11 is the entry-level member of a microcomputer family based on Digital's LSI-11 bus architecture. The basic MICRO/PDP-11 provides a direct migration path to other Digital products. The MICRO/PDP-11 supports a multitasking environment as well as time-sharing and business applications.

Maintenance for the MICRO/PDP-11 is provided by Digital Equipment Corporation's nationwide network of field engineers.

**System Design** The MICRO/PDP-11 CPU is a 16-bit microprogrammed processor positioned in the low-end LSI-11 bus space. The CPU offers a standard instruction set of 91 instructions. An optional microcoded floating chip provides 46 instructions for single-precision floating-point data. An optional floating-point processor provides faster execution of instructions generated by the microcoded chip. A commercial instruction set (CIS) microcoded chip is also available for business applications requiring fast COBOL program execution.

MICRO/PDP-11 users can address up to 4MB of parity MOS memory. The integral memory management unit allows the 16-bit MICRO/PDP-11 to extend memory addresses to 22 bits. The unit provides mapping relocation of 4MB of physical memory and contains a segmentation operation to facilitate program and data sharing; sharing can be assigned on a segment basis.

A 5-1/4-inch Winchester disk drive with 10MB of storage and a 5-1/4-inch dual diskette drive with 800KB of storage can be configured.

Software support for the MICRO/PDP-11 consists of the Digital Equipment RSX-11M-PLUS, RSTS/E, RT-11, CTS-300, MicroPower/Pascal, and DSM-11 operating systems as well as a version of AT&T UNIX. These operating systems are complemented by many utilities, including RMS-11K, DATATRIEVE 11, and FMS-11. MICRO/PDP-11 operating systems also support such programming languages as APL, MACRO-11, COBOL-11, BASIC-11, BASIC-PLUS, BASIC-PLUS-2, DIBOL, FORTRAN IV, FORTRAN IV-PLUS, and FORTRAN-77.

In addition, the MICRO/PDP-11 supports the DECnet network communications facility.

**Competition & Pricing** MICRO/PDP-11 competition includes the Data General DESKTOP GENERATION Series, Computer Automation Omnix, Plexus Computers P/25, and Zentec Series 2000.

MICRO/PDP-11 prices begin at \$7,300.

**Digital Equipment Corp**146 Main St  
Maynard MA 01754

(617) 897-5111

**PDP-11/23-PLUS**

**Overview** The PDP-11/23-PLUS is a 16-bit microcomputer system designed for multiuser, multitasking applications. Featuring up to 4MB of MOS main memory, the PDP-11/23-PLUS can be configured with 2 disk drives, a CRT display terminal, 2 serial lines, and a full complement of system software. The system is available in a cabinet or rack-mounted version.

Many Digital operating systems, programming languages, and communications facilities are supported on the system.

Digital Equipment Corporation provides maintenance for the system through its nationwide network of field engineers.

**System Design** The PDP-11/23-PLUS CPU is a 16-bit microprogrammed processor based on the extended LSI-11 bus with expanded addressing capability. Up to 1MB of parity memory is addressable through the extended bus. Integral to the system is the NMOS microprocessor chip set used by the PDP-11/23, LSI-11/23, and PDP-11/24 processors. Memory can be expanded to a maximum 4MB through the system's memory management facility.

The CPU module contains the CPU, memory management unit, line frequency clock, bootstrap/diagnostic ROM, and 2 serial line units.

Software support for the system consists of the Digital RSX-11M, RSX-11M-PLUS, RSTS/E, and CTS-500 operating systems. These operating systems are complemented by RMS-11K, a set of file-handling routines for developing data files; DATATRIEVE-11, an inquiry language for file updating and report generation; and FMS-11, a forms management system that enables application programs to perform formatted video terminal I/O.

PDP-11/23-PLUS operating systems support MACRO-11, COBOL-11, COBOL-81, BASIC-PLUS, BASIC-PLUS-2, DIBOL, FORTRAN IV, FORTRAN IV-PLUS, and CORAL-66. In addition, the PDP-11/23-PLUS supports DECnet and DECnet/E, Digital Equipment's network communications products.

**Competition & Pricing** The PDP-11/23-PLUS competes with the NEC ASTRA Series and Data General microNOVA.

Prices for the PDP-11/23-PLUS begin at \$9,800.



**Dynabyte Business Computers**521 Cottonwood Dr  
Milpitas CA 95035

(408) 263-1221

**Models 6000, 6000T**

**Overview** The Dynabyte Monarch 6000 and 6000T are 8-bit multiuser microcomputers that support 4 users and provide 4 additional serial ports for peripheral devices. Monarch 6000 and 6000T are designed for the small business computer market for data management and WP applications. Software for the systems includes a multiuser operating system, high-level programming languages, and various applications programs.

Dynabyte Business Computers provides support and maintenance through its field service personnel and authorized dealers.

**System Design** Monarch 6000 and 6000T CPUs are based on the 8-bit Zilog Z80B processor. The standard Monarch 6000 includes the CPU, 256KB of main memory, a 19MB Winchester disk drive, an 800KB diskette drive, 8 RS-232C asynchronous ports, a parallel port, and the MP/M-II operating system. The Monarch 6000T includes all features of the 6000 plus a 1/4-inch 17MB cartridge tape drive for backup.

Monarch 6000 and 6000T run under Digital Research's factory-loaded MP/M-II operating system. The Digital Research CP/M-80 and Phase One OASIS-8 are optional. MP/M-II supports several programming languages, including BASIC, COLOR, FORTRAN, PL/1, and Pascal. The system supports several application programs for accounting, financial planning, and WP functions.

**Competition & Pricing** Competition for the Monarch 6000 and 6000T includes the Applied Digital Data Systems Multivision, CompuPro 10, Dynabyte Business Computers Model 6000, and OSM Computers Zeus 4.

Model	Price \$
Monarch 6000	5,995
Monarch 6000T	7,995

**Esprit Computer Products**Welsh Rd & Park Dr  
PO Box 425  
Montgomeryville PA 18936

(215) 628-4810

**DBS 16**

**Overview** Esprit Computer Products (formerly DBSInternational), an independent manufacturer and supplier of desktop microcomputers, has introduced the DBS 16, a multiuser, multiprocessor business computer.

The DBS 16 supports up to 3.5MB of dynamic RAM, up to 80MB of Winchester disk storage, 820KB of diskette storage, and an optional 20MB cartridge tape drive. DBS 16 supports up to 28 users. The system includes a workstation and detached keyboard.

Software for the system includes operating systems from Digital Research, several programming languages, and application programs.

DBSInternational provides on-site service through Indeserv, a nationwide service organization of independent service companies.

**System Design** The DBS 16 is based on the 16-bit Intel 80186 microprocessor. A standard configuration supports up to 4 users and is configured with an RS-232C serial port and a Centronics-compatible parallel printer. A multibus-compatible expansion chassis that includes from 1 to 6 additional 80186 processors allows the DBS 16 to support up to 28 users. Each processor handles 256KB or 512KB of RAM for a total of 3.5MB.

The system can be configured with dual 360KB diskette drives; dual 820KB diskette drives; 6MB Winchester disk drive and a 360KB or 820KB diskette drive; a 12MB Winchester disk and 360KB or 820KB of diskette storage; a 40MB Winchester with 360KB or 820KB diskettes; or dual 40MB Winchester disks and a 360KB or 820KB diskette drive.

Terminals available for the system include a 14-inch-diagonal green phosphor monitor with a 128-character ASCII keyboard with programmable function keys.

The DBS 16 runs under the Digital Research MP/M-86 or Concurrent CP/M-86 operating system. Both systems support several programming languages, including CBASIC-86 and CB86. The DBS 16 supports MP/M-86- and Concurrent CP/M-86-compatible application programs.

**Competition & Pricing** Competition for the DBS 16 includes the OSM Zeus 3X, Televideo Systems Personal Mini, and Molecular Computer Supermicro 32.

Prices for the DBS 16 range from \$6,395 to \$12,995.



**Fortune Systems Corp**

1501 Industrial Rd  
San Carlos CA 94070

(415) 595-8444

**Fortune 32:16**

**Overview** The Fortune 32:16 is a desktop microcomputer designed for single-user, multiuser, or multitasking applications. Based on the Motorola MC 68000 microprocessor, the system features from 128KB to 1MB of RAM and uses an enhanced version of the AT&T UNIX operating system. Various peripheral devices and programming languages are supported on the Fortune 32:16 system.

Fortune Systems offers on-site maintenance service through Decision Data or a user-selected repair service.

**System Design** The Fortune 32:16 features 16-/32-bit chip architecture and a central processor with from 4KB to 16KB of PROM and 128KB of RAM. Main memory can be expanded to 1MB.

The Fortune 32:16 supports from 1 to 4 diskettes with 800KB of storage and from one to four 5-1/4-inch Winchester disk drives with 5MB, 10MB, or 20MB capacity. The system also supports a 12-inch monochrome or 13-inch color display with data, word, and graphics processing capabilities.

Asynchronous communications at speeds up to 19.2K bps, bisynchronous batch and interactive communications, and Xerox Ethernet network communications are standard.

Software for the Fortune 32:16 includes an enhanced version of the UNIX operating system that supports COBOL, FORTRAN-77, C, BASIC, CBASIC-16, and Pascal programming languages. Applications software available for the 32:16 includes the Fortune Systems FOR:WORD word processing system, Microsoft Multiplan budget and modeling programs, IMJ Software FIN-GRAPH, and Science Management Business BASIC and IDOL data base management systems. The 32:16 also supports ITI's RUBIX DBMS.

**Competition & Pricing** The Fortune 32:16 competes with the Altos ACS 8600, Instrumentation Laboratory Pixel Series, NCR Tower 1632, and Wicat System 155.

Prices range from \$6,000 to \$14,000.

**Future Computers**

PO Box 306  
Purley, Surrey  
England

01-689-4341

**FX Series**

**Overview** Future Computers, a British company backed by a consortium led by the British Technology Group and the APA Venture Capital Fund, designs and manufactures the FX family of microcomputers for the business market.

The FX Series is compatible with the IBM Personal Computer and consists of 5 processor models—the FX 20, 30, 40, 50/50, and 50/300—and 2 terminals—the FX 0 and FX 10, which has 128KB of RAM. Main memory on the FX systems ranges from 128KB to 16MB. Auxiliary storage ranges from 1.6MB of diskette storage to 300MB of Winchester disk storage. FX systems support up to 16 terminals.

Operating systems include Digital Research CP/M-86-Plus, Concurrent CP/M, MP/M-86, and MP/M-286 and Microsoft MS-DOS and XENIX. A range of application packages are also available.

Maintenance is provided by Future Computers, and each system comes with a 2-year warranty. Check-Guard, a diagnostic software tool, provides constant hardware monitoring to give advance warning of impending failure.

**System Design** The CPU on the FX 10, 20, 30, and 40 features an 8MHz Intel 8088 microprocessor; the FX 50/50 and 50/300 have an Intel iAPX 286 microprocessor. Data communications capabilities are provided through RS-232C (V.24), X.21, RS-422, and local area network interfaces. Data communications software enables FX terminals to emulate IBM 3780, 3270, HASP, and SNA protocols. The FX is IBM compatible and supports the IBM Personal Computer bus and cards.

FX systems are field upgradable. The FX 20 and 30 can function as standalone microcomputers. The FX 40, 50/50, and 50/300 are network processors that support multiple terminals and act as a data base for a network of FX 10, 20, and 30 systems.

**Competition & Pricing** The FX Series competes with the IBM Personal Computer, Altos Computer Systems Altos 586, TeleVideo Systems Personal Mini, and North Star Dimension.

Model	Price £
FX 0	395
FX 10	1,175
FX 20	1,875
FX 30	2,800-3,800
FX 40	4,850
FX 50/50	8,200
FX 50/300	15,500



**General Automation Inc**

1045 S East St  
Anaheim CA 92803

(714) 778-4800

**Zebra Series**

**Overview** The Zebra Series includes 7 microcomputer models. Each features a 10MHz Motorola MC 68000 or 68010 16-/32-bit microprocessor, main memory, a Winchester disk, a backup disk device, a Multibus chassis, and serial I/O ports. The XENIX-based systems also features a hardware memory management unit.

The systems are marketed through a nationwide network of dealers and distributors. All hardware and software is covered by a 90-day warranty. On-site or carry-in service is available through Sorbus Service.

**System Design** The desktop Zebra 700 is the smallest Zebra system; the basic configuration includes 256KB of RAM, a 10MB disk, a 5MB removable cartridge disk drive, 6 serial I/O ports, 1 parallel printer port, the Microsoft XENIX operating system, Relational Data Base Systems Inc C/ISAM file manager, Quadratron Systems Inc Q-One word processing package, and Q-Menu, and a C language compiler.

The Zebra 750 includes the same hardware as the 700 plus a 20MB disk in the basic configuration. Software for the 750 includes the Pick and Associates PICK operating system, WP, graphics, and Interactive Systems COMPU-SHEET spreadsheet.

The Zebra 1500 uses the same software as the 750. The basic hardware configuration includes 256KB of RAM, a 20MB disk, a cartridge tape, and 10 serial I/O ports. The sole difference between the Zebra 1500 and 2500 is that the 2500 includes a 32MB disk in the standard configuration.

The Zebra 3000 comes with 1MB of RAM, a 64MB disk, a cartridge tape, 10 serial I/O ports, the XENIX operating system, C-ISAM file manager, C language compiler, Q-One word processing, and Q-Menu.

The Zebra 3500 features 256KB of RAM, a 64MB disk, a cartridge tape, 10 serial I/O ports, an uninterruptible battery backup power supply, the PICK operating system, WP, ACCU-PLOT graphics, and COMPU-SHEET spreadsheet. The Zebra 5500 is similar to the 3500 but has 1MB of RAM, a 142MB disk, and a 1,600-bpi streaming tape drive.

**Competition & Pricing** Competition for the Zebra Series includes the AT&T 3B2/300, Callan Data Systems Unistar series, NCR Corporation Tower 1632, and Plexus P/35 and P/60.

Model	Price \$
700	9,100
750	9,950
1500	13,500
2500	16,500
3000	28,900
3500	25,500
5500	48,000

**Honeywell Information Systems**

200 Smith St  
Waltham MA 02154

(617) 895-3658

**microSystem 6/20**

**Overview** Honeywell introduced the microSystem 6/20, a multiuser version of the microSystem 6/10, in July 1983. The microSystem 6/20 supports transaction processing, data entry, office automation, terminal emulation, program development, and data communications. The microSystem 6/20 operates as a standalone system or as part of a Honeywell or IBM network.

The microSystem 6/20 supports up to 4 users, 1MB of main memory, 650KB of diskette storage, and 80MB of Winchester disk storage.

Software for the microSystem 6/20 includes the GCOS 6 MOD 400 operating system, FORTRAN and other high-level programming languages, and various office automation and data entry packages.

Maintenance and support are provided through Honeywell's Customer Assisted Maintenance Program (CAMP) or other Honeywell maintenance programs. Annual maintenance fees range from \$800 to \$1,500.

**System Design** The CPU of the microSystem 6/20, like that of the 6/10, is based on the 16-bit Honeywell Micro 6 microprocessor; the 6/20 can therefore run much of the software available for Honeywell minicomputers and the microSystem 6/10. Micro 6, a firmware-controlled 16-bit microprocessor implementing LSI technology, is compatible with the DPS 6 instruction set.

The GCOS 6 MOD 400 operating system is the same as that running on DPS 6 computers. GCOS 6 provides users with program development capabilities, including a full-screen editor. Languages supported under GCOS 6 include BASIC, COBOL, FORTRAN, and Pascal. Office automation packages are based on Honeywell's OAS packages; integrated data entry packages are based on the Data Entry Facility II.

The microSystem 6/20 supports Honeywell's Distributed Systems Architecture (DSA), IBM's systems network architecture (SNA) and BSC, and electronic mail and teletype emulation capabilities.

A basic microSystem 6/20 configuration features the Micro 6 processor, 512KB of main memory, a 650KB diskette, 40MB Winchester disk, diskette controller, 5 RS-422 ports, and an option slot.

**Competition & Pricing** The microSystem 6/20 competes with the CompuPro 10, Digital Equipment MICRO/PDP-11, and Data General DESKTOP GENERATION.

The microSystem 6/20 is priced at \$17,000.

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**Integrated Business Computers**

21592 Marilla St  
Chatsworth CA 91311

(213) 882-9007

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**Cadet Series**

**Overview** The Cadet Series consists of three 8-bit business computers that operate in a multiuser, multi-tasking environment: the Super Cadet, the Middi Cadet, and the High Performance Middi Cadet. Each comes with various software packages and utilities and runs under the Phase One OASIS operating system.

IBC systems are available from a network of dealers, OEMs, and system integrators.

**System Design** The Super Cadet supports up to 16 users and features memory management capabilities. The system includes an 8MHz Zilog Z80H CPU with 256KB of memory, a 1MB diskette drive, an 85MB 8-inch disk drive, 8 serial I/O ports, a Centronics port, and a 30-inch desktop cabinet.

The Middi Cadet is a smaller version of the Super Cadet, incorporating a 6MHz Z80B CPU with 256KB of RAM, a 20MB 5-1/4-inch disk drive, a 1MB 5-1/4-inch diskette drive, 10 serial ports, and a Centronics port. Options include an additional 256KB of memory, a cartridge tape, and a bisynchronous communications port.

The High Performance Middi Cadet is similar to the Middi Cadet but includes 40MB of disk storage, 512KB of RAM, and a high-speed 8MHz Z80H CPU.

All Cadet systems are compatible with the OASIS and Digital Research MP/M operating systems, and all are bundled with a package of software that includes an OASIS-compatible DBMS, Logic eXtension Resources multiCALC spreadsheet, and 40 additional utilities. The systems can be interconnected through the DOPS utility, which allows users at different locations to have access to the same data.

**Competition & Pricing** Competing systems include the TeleVideo TS816/40 and Digilog System 1850.

The basic configuration of the Super Cadet sells for \$15,095. The Middi Cadet costs \$7,495, while the High Performance Middi Cadet costs \$10,995.

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**IBM Corp**

1133 Westchester Ave  
White Plains NY 10604

(914) 696-1900

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**Personal Computer AT**

**Overview** Introduced in August 1984, the Personal Computer AT is the most advanced personal computer in the IBM product line. It comes in 2 models that support multitasking and up to 3 users. It operates under IBM PC DOS 3.0, IBM PC/IX, and IBM PC XENIX and runs most software written for the other IBM personal computers.

The Personal Computer AT is suitable for groups requiring extensive graphics capabilities, data and numeric processing, data bases, WP, and spreadsheet applications.

The Personal Computer AT is available through authorized IBM Personal Computer retailers. Maintenance and support is provided by IBM's nationwide service network.

**System Design** The Personal Computer AT features the 16-bit 6MHz Intel 80286 microprocessor and supports an Intel 80287 math coprocessor. The base model comes with 256KB of RAM, the enhanced model with 512KB. Memory on both models can be expanded to 3MB. Each system includes a 5-1/4-inch, 1.2MB diskette drive capable of reading (but not writing to) standard 160KB, 180KB, 320KB and 360KB diskettes. A dual-sided 360KB diskette drive can be installed to provide read and write capabilities in two formats, thus allowing the Personal Computer AT to exchange diskettes with other IBM personal computers. The enhanced model has a 20MB Winchester drive. Both models support 2 diskette and 2 Winchester drives.

The keyboard consists of 84 keys, including 10 function keys and a 10-key numeric pad that contains the cursor control keys. IBM offers the monochrome, color, and enhanced color displays as options.

Each model comes with 8 expansion slots. One slot is occupied by the diskette and disk drive adapter. On the enhanced model, the serial and parallel adapter occupies another slot.

With the proper add-on features, the Personal Computer AT can support asynchronous, BSC, and SDLC communications; the IBM PC Network; and the PC Cluster Configuration. The AT/370 Option Kit provides additional memory, microprocessors, and the IBM 3278/79 Emulator Adapter, enabling the Personal Computer AT to interact with System/370 mainframes.

**Competition & Pricing** The Personal Computer AT surpasses all IBM-compatible microcomputers in terms of processing speed and potential for expansion. Its closest competitors include the Compaq Computer COMPAQ DESKPRO and the Wang Laboratories Inc Professional Computer.

The base model is priced at \$3,995, and the enhanced model at \$5,795. The AT/370 Option Kit costs \$3,095. All displays are extra.



**Instrumentation Laboratory Inc**264 Fordham Rd  
Wilmington MA 01887

(617) 657-8720

**Pixel 80/AP**

**Overview** The Pixel 80/AP is a supermicrocomputer identical in design to the Pixel 100/AP, which was introduced in early 1982. Available in 2 models, a general-purpose commercial system and interactive graphics system, the Pixel 80/AP features hardwired virtual memory expandable to 6MB. The Pixel 80/AP runs a complete multiuser version of the AT&T UNIX operating system and supports a maximum 420MB of Winchester disk storage. Cartridge disk and tape drives are available for backup.

A 12-inch-diagonal CRT display with a 2,000-character capacity and detachable keyboard are standard.

Software for the system includes various utilities, application programs, and high-level programming languages.

Complete maintenance service is available from 125 nationwide service centers. Pixel guarantees 24-hour response time.

**System Design** The Pixel 80/AP is an extension of the Pixel 100/AP and features Motorola's 32-bit MC 68000 microprocessor. The system is supported by a virtual memory that incorporates a 50-nsec address translation unit fully overlapped by memory access. Up to 6MB of virtual memory is provided. A 16-bit Texas Instruments 9900 processor handles all I/O and coordinates the activities of all processors.

The Pixel 80/AP supports three 5-1/4-inch Winchester disk drives with up to 140MB of storage capacity each, a 20MB cartridge tape drive, and a 5MB cartridge disk drive. Dual diskette drives provide 1.2MB of storage.

A 12-inch-diagonal CRT display with 2,000-character capacity and a detachable keyboard with multiple fonts are standard. A high-resolution, bit-mapped graphics display is supported by the Pixel 80G graphics option. The 80/AP supports 8 RS-232C serial ports and 2 Centronics-compatible printer ports.

Completely software compatible with the 100/AP, the 80/AP implements the UNIX operating system with multiuser time-sharing facilities, C-Shell Command Interpreter, and text processor; the Pixel Word Processor program; and the Pixel Spreadsheet Utility. Various third-party software is also available through Pixel.

**Competition & Pricing** Competition for the 80/AP includes the Intel 86/380x, Altos Computer Systems ACS 8600, Digital Equipment MICRO/PDP-11, Fortune Systems Fortune 32:16, and NCR Tower 1632.

The Pixel 80/AP costs approximately \$14,000.

**Instrumentation Laboratory Inc**264 Fordham Rd  
Wilmington MA 01887

(617) 657-8720

**Pixel 100/AP**

**Overview** The Pixel 100/AP microcomputer system, based on the Motorola MC 68000, has hardwired virtual memory expandable to 6MB and supports up to 160MB of Winchester disk storage. Single- and dual-diskette drives, with a total of 630KB of storage, are also provided.

CP/VMS, Pixel's proprietary multiprocessor control system, provides I/O support, memory management, and page-fault handling.

The Pixel 100/AP can support up to 8 RS-232C serial ports and 2 Centronics-compatible printer ports.

Complete maintenance service is available from 125 Instrumentation Laboratory service centers nationwide.

**System Design** The Pixel 100/AP main processor is a Motorola MC 68000 microprocessor. Up to 6MB of virtual memory is provided.

The Pixel 100/AP can support up to four 8-inch Winchester disk drives with a 5MB, 10MB, 20MB, 30MB, or 40MB capacity. Single and dual diskette drives with 630KB of storage can also be configured with the system.

A 12-inch-diagonal CRT with a 2,000-character capacity and detachable keyboard are standard.

A variety of operating system and application software can be used. CP/VMS, a multiprocessor control system that provides I/O support, memory management, and page-fault handling is available. Also available are a multiuser version of the Softech UCSD p-System, complete with Pascal and BASIC; COMMJOB, a synchronous communications utility that allows intelligent pass-through for distributed processing and networking applications; DB-SYS, relational data base management system that provides selection sets, a data dictionary, and a query language; UNIX System III and Programmers Workbench control system from AT&T; and the Pixel spreadsheet package. Languages supported by the 100/AP supermicro system include COBOL, FORTRAN-77, Pascal, and PL/1.

**Competition & Pricing** The Fortune Systems Fortune 32:16, Intel 86/380x, Digital Equipment MICRO/PDP-11, and NCR Tower 1632 provide the competition for the Pixel 100/AP.

The Pixel 100/AP costs approximately \$16,000.

**Intel Corp**

3065 Bowers Ave  
Santa Clara CA 95051

(408) 987-8086

**System 86/330x**

**Overview** The Intel Corporation System 86/330x is a fully integrated microcomputer system with 320KB of main memory, 35MB Winchester disk drive, and a 1MB double-density diskette drive. Intel is marketing the System 86/330x to OEMs and volume end users.

The System 86/330x runs under a real-time operating system, which supports a number of programming languages.

Field engineering service for the System 86/330x is provided by Intel Corporation in most major metropolitan areas.

**System Design** System 86/330x is based on the Intel 16-bit 8086 microprocessor, which features 320KB of dynamic RAM and 8-, 16-, or 32-bit instructions. Main memory can be expanded to a total of 1MB. The System 86/330x architecture is based on the industry-standard Multibus (IEEE-796) system bus. Two board slots are provided to accommodate system and peripheral interfaces.

The System 86/330x runs under the Intel iRMX real-time multiprogramming, multitasking operating system. System utilities and diagnostic programs are provided with iRMX. Programming languages supported by System 86/330x include C and Assembler-86.

**Competition & Pricing** The Intel System 86/330x competes with the Plexus P/25, Digital Equipment Corporation MICRO/PDP-11, and Applied Digital Data Systems Multivision microcomputer systems.

The vendor declined to provide price data.

**Intel Corp**

3065 Bowers Ave  
Santa Clara CA 95051

(408) 987-8086

**System 86/380x**

**Overview** The Intel System 86/380x is an integrated microcomputer system with 320KB of RAM memory expandable to 1MB, a 35MB Winchester disk drive, and a 1MB double-density diskette drive.

Software for the Intel system includes a real-time operating system and programming languages.

Maintenance and support for the System 86/380x is provided by Intel Corporation through its field engineering service organization.

**System Design** Based on the Intel 16-bit 8086 microprocessor, the System 86/380x features 320KB of dynamic RAM and 8-, 16-, or 32-bit instructions. Main memory can be expanded to a maximum of 1MB.

System 86/380x architecture is based on the industry-standard Multibus system bus. System and peripheral interfaces are provided through the 10 board slots available in the System 86/380x CPU.

The System 86/380x operates under the Intel iRMX real-time multiprogramming, multitasking operating system, which supports the C and Assembler-86 programming languages. A full complement of system utilities and diagnostic programs are provided with iRMX.

**Competition & Pricing** The Intel System 86/380x competes with the Plexus P/25, Digital Equipment Corporation MICRO/PDP-11, and Applied Digital Data Systems Multivision.

The vendor declined to provide price data.



**Intertechnique**78370 Plaisir  
France

(3)055.82.00

**IN 55 Series**

**Overview** The Intertechnique IN 55 features the OA-SIS operating system, 64KB of main memory, extended BASIC, and disk management and supports up to 4 users. Available software includes a text editor and processor, diagnostic and conversion utilities, communications software, and systems development aids.

**System Design** The IN 55 is based on a Zilog Z80A microprocessor and an S-100 bus and provides 64KB or 96KB of dynamic RAM, expandable to 128KB in 16KB increments. I/O facilities for all models include 1 serial synchronous or asynchronous V.24 channel supporting communications from 110 to 9,600 baud and a Centronics-compatible parallel channel. Four more serial V.24 channels can be added. An integrated keyboard display with cursor control keys and separate numeric keypad is standard. From 1 to 4 local or remote units can be added, and bidirectional printers with speeds of 45 to 180 cps are available.

Single-user Models 1, 2, 3, and 4 provide 64KB of main memory and an asynchronous V.24 line. Model 1 has an 8-inch diskette unit with 0.5MB; Model 3 has dual diskette units with 1MB. A synchronous IBM 2780/3780 communications port is optional. Models 2 and 4 are identical to Models 1 and 3 except that Model 2 has a single 1MB diskette unit, while Model 4 has two. A second workstation can be added if memory is increased by 16KB.

Model 4 can be upgraded to Model 10—a multiuser system with 96KB of memory, two 8-inch 1MB diskettes, and 5 serial asynchronous V.24 lines. Options include 1 or 2 workstations, printers, and an IBM 2780/3780 port. Model 20 is a single-user system with 64KB of memory; Model 25 is a multiuser system with 128KB of memory and 5 serial V.24 lines. Both models include an 8-inch 1MB diskette and an 8-inch 8.4MB hard disk. Up to 4 workstations as well as all Model 10 options can be added.

**Competition & Pricing** The IN 55 competes with the Altos Computer Systems Series 5, Dynabyte Business Computers Model 6000, Onyx Systems Sundance II, and Philips Data Systems P3500.

Prices for the IN 55 Series range from \$10,000 to \$25,000.

**Micro Five Computers**3560 Hyland Ave  
Costa Mesa CA 92626

(714) 957-1517

**Series 1000**

**Overview** The Micro Five Series 1000 product line includes 16-bit multiuser, multitasking computers that allow users to perform several simultaneous tasks (e.g., WP, financial planning, accounting, and printing forms and documents). A fully configured Series 1000 system supports up to 10 users, 512KB of RAM, and up to 80MB of disk storage.

Series 1000 systems support several industry standard operating systems, including the Digital Research CP/M-86 and MP/M-86. These operating systems support numerous third-party application programs.

Micro Five markets the Series 1000 through a worldwide network of dealers. The company also provides both maintenance and support through its authorized dealer network. Micro Five dealers have access to an extensive parts support network.

**System Design** Series 1000 features a 16-bit, 8MHz Intel 8088 microprocessor with 128KB of RAM, 16KB of PROM, 2 RS-232C serial ports, a diskette controller, power supply, and a cooling fan. Main memory can be expanded to 512KB in increments of 128KB.

Series 1000 is available in several models that differ in the type and size of mass storage devices. Model 1050 is configured with two 1MB diskette drives; the 1440 is configured with a 1MB diskette and 12.5MB Winchester disk drive; the 1540 features a 1MB diskette and 19MB Winchester disk drive; the 1640 is configured with a 1MB diskette drive, 40MB Winchester disk drive, and 20MB streaming tape; and the 1740 is configured with a 1MB diskette drive, 80MB Winchester disk drive, and 20MB streaming tape drive.

Software supported on Series 1000 systems includes the Digital Research CP/M-86 and MP/M-86, BOS National MBOS/5, and Stardos—an operating system developed by Micro Five. Programming languages include Business BASIC, COBOL, DIBOL, and FORTRAN. Available applications include an integrated accounting system, WP, and data base/report writer.

**Competition & Pricing** Competition for the system includes the Future Computers FX Series, OSM Zeus Series, and Televideo Systems TS 816/40.

Model	Price \$
1050	4,495
1440	7,095
1540	7,995
1640	16,495
1740	19,995

**Morrow Inc**

600 McCormick St  
San Leandro CA 94577

(415) 430-1970

**Tricep**

**Overview** The Tricep is a multiuser computer system design to run AT&T UNIX System V operating system and support 4 to 8 users. It uses a 3-point DMA architecture that allows 3 intelligent controllers—for I/O, a disk drive, and a diskette drive—to address areas of main memory directly through the bus.

The Tricep is Morrow's first entry into the OEM and system integrator market; the system will also be distributed through the company's chain of mass retailers.

**System Design** Tricep hardware includes a Motorola MC 68000 CPU running at up to 10MHz and an on-board MC 68451 memory management unit; 512KB of main memory, expandable to 2MB; an I/O controller with 4 to 8 RS-232C serial ports; a Centronics-compatible parallel printer port; DMA disk and diskette controllers; and Intel 80188-based slave processors with 128KB or 512KB of on-board dual-port RAM. All of the boards are plugged into the 14-slot IEEE-696 (S-100) bus. Mass storage includes up to four 16MB or 32MB 5-1/4-inch Winchester disk drives, an optional 5MB removable disk cartridge drive; up to four 400KB 5-1/4-inch diskette drives; and up to four 1.3MB 8-inch diskette drives.

The Tricep runs the UNIX System V operating system, and includes a C compiler; other available languages are BASIC, COBOL, FORTRAN-77, Ada, and Pascal.

**Competition & Pricing** Competing systems include the NCR Corporation Tower 1632, Callan Data Systems Unistar 200, and Wicat System 155.

The Tricep costs less than \$9,000 retail and less than \$5,500 in OEM quantities.

**Motorola Inc**

Box 20912  
Phoenix AZ 85036

(602) 244-5723

**VMC 68/2**

**Overview** The VMC 68/2 is a 16-/32-bit microcomputer system designed by Motorola primarily for industrial process control, automated testing, data acquisition, and lab automation applications. Based on the Motorola MC 68000 microprocessor, the VMC 68/2 features the VERSAbus system bus, 384KB of dynamic RAM, 8MB each of fixed and removable disk storage, and industry-standard peripheral interfaces for disk, terminal, and printer devices.

Software support includes the Motorola VERSAdos real-time multitasking operating system and high-level programming languages.

Motorola offers 3 types of maintenance: on-site service with factory-warranty extensions; time and material repairs; and factory exchange service.

**System Design** The VMC 68/2 microcomputer system is based on the MC 68000-based VERSAmodule monoboard microcomputer, with 128KB of dual-port controlled RAM and 384KB of system memory. System diagnostics, including VERSAbug firmware, self-test, and up/downline load and disk bootstrap, are standard.

System storage consists of a 16MB SMD-compatible disk drive and an 8MB fixed disk drive, as well as an 8MB removable Lark cartridge disk drive for backup.

In addition, the VMC 68/2 can be configured with 2 RS-232C serial I/O ports for terminals or modem use, with either asynchronous or synchronous byte-oriented, or HDLC/SDLC bit-oriented, protocol capability; 2 Centronics parallel printer interface ports; and 2 SMD interface disk drive ports.

The VERSAdos operating system that supports the VMC 68/2 includes all file and system generation utilities. Development software includes a structured macro assembler, linkage editor, CRT text editor, and Pascal and FORTRAN compilers. The VMC 68/2 VERSAdos operating system and attendant software are compatible with the Motorola EXORmacs microprocessor development system.

Options available for the VMC 68/2 include the Motorola EXORterm 155 video terminal, EXORdisk II and III diskette drives, and the Model 703 printer.

**Competition & Pricing** The Motorola VMC 68/2 microcomputer system competes with the Digital Equipment Corporation MICRO/PDP-11 and IBM 9000 Series.

Motorola declined to provide pricing information.







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**North Star Computers**14440 Catalina St  
San Leandro CA 94577

(415) 357-8500

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**Horizon**

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**Overview** The North Star Horizon is an 8-bit microcomputer aimed at business, industrial, scientific, and educational computer markets. The system is marketed through North Star's network of authorized retail dealers, wholesale distributors, and OEMs.

North Star configures its basic Horizon system with 32KB of RAM, 360KB of diskette storage, and a terminal and printer. The TSS/5 and TSS/18 systems support up to 5 concurrent users and incorporate the Horizon single-user chassis.

Software available for Horizon systems includes operating systems, an applications support program, several high-level programming languages, and various application programs.

Maintenance is provided by factory-trained North Star dealers. MAI Sorbus Service provides third-party maintenance on a national basis for North Star Horizon computers and their hard disk systems. On-site service is offered during the standard 90-day and extended warranty periods.

**System Design** Horizon systems feature an 8-bit Zilog Z80A microprocessor joined with the S-100 bus by a processor board.

The North Star single-user system consists of the Z80A CPU with 1KB of optional PROM, 16KB to 64KB of RAM, a disk controller to support a total of 4 diskette drives with 1.4MB of storage, 2 serial and 1 parallel port, and a 12-slot mother board.

The TSS/5 multiuser system consists of the single-user system with 64KB of RAM, up to 360KB of diskette storage, a 5MB Winchester disk drive, a 4-port serial board, and 1 64KB RAM board per user. The TSS/18 features an 18MB Winchester disk drive and an optional 13.4MB tape cartridge for backup. The TSS/5 and 18 also feature 2 RS-232C or 20mA current-loop serial ports and a standard S-100 bus.

The North Star DOS and HDOS operating systems run the single-user Horizon; TSS/A, B, and C multiuser operating systems run the TSS/5 and TSS/18. Languages supported on the computers include BASIC, COBOL, FORTRAN, and Pascal.

Applications software is available from North Star and third-party vendors. Proprietary applications include word processing, a mailing list, and an information manager.

**Competition & Pricing** The North Star Horizon competes with the Cado Systems C.A.T. II, Altos Computer Systems Series 5, and OSM Computer Zeus 4.

Prices range from \$2,800 to \$7,700.

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**Onyx Systems Inc**25 E Trimble Rd  
San Jose CA 95131

(408) 946-6330

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**Onyx 186 Series**

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**Overview** Onyx 186 Series systems are single- and multiuser microcomputers designed for the small business user. As a multiuser system, the Onyx 186 Series supports a maximum of 6 users.

Onyx 186 Series systems are configured with a maximum of 768KB of main memory, up to 80MB of Winchester disk storage, 2MB of diskette storage, and a 12MB cartridge tape drive.

The Onyx 186 runs under several operating systems, including Onyx System's implementation of Concurrent DOS for multiuser, multitasking applications. In addition to operating system support, several programming languages are available.

Onyx Systems warrants the Onyx 186 Series for 90 days. Maintenance and support are provided through the company's system support organization.

**System Design** Onyx 186 Series CPUs are designed around the 16-bit, 6MHz Intel 80186 microprocessor. The CPU includes 3 interval timers and 2 DMA channels. The system is initially configured with 256KB of dynamic RAM; main memory can be expanded to 768KB. There are 6 serial I/O ports, a Centronics-compatible 8-bit parallel port, and cartridge tape and Winchester disk expansion ports configured with the system.

Either 1 or 2 dual-sided, dual-density 1MB diskettes can be included with the system; a 12MB cartridge tape drive can be used in place of 1 of the diskette drives. A 6MB, 12MB, 18MB, or 40MB Winchester disk drive provides mass storage. An optional expansion cabinet contains a power supply and a second Winchester or cartridge tape drive.

The typewriter-style keyboard includes 16 function keys and a numeric keypad. The 14-inch-diagonal screen on the Onyx terminal features a 24-line-by-80-column display format. The character set includes business graphics characters for applications requiring bar charts and graphs.

Operating systems for the Onyx 186 Series include the Digital Research Concurrent DOS, Phase One System OASIS-16, and Science Management Corporation THOROUGHbred/OS. Programming languages for the system are BASIC, C, and COBOL.

**Competition & Pricing** Competing with the Onyx 186 Series are the DBS International DBS 16, OSM Zeus 4, and Altos Computer Systems Series 5.

Prices range from \$7,495 to \$14,195.



**OSM Computer Corp**665 Clyde Ave  
Mountain View CA

(415) 961-8680

**Zeus 3X, Zeus 3X/16**

**Overview** The Zeus 3X is a multiuser, multiprocessor system designed to support 4–32 users. The Zeus 3X/16 supports 2–16 users. For each user, Zeus dedicates a single-board user module, consisting of a Zilog Z80A processor (3X) or a Z80A and Intel 8088 processor (3X/16), 64KB to 128KB of memory, and 2 I/O ports.

The proprietary multiuser executive operating system, MUSE, designed exclusively for Zeus systems, is compatible with Digital Research CP/M and MP/M; a password security system is standard.

RCA Service Company, a division of RCA Corporation, provides maintenance and on-site service for the Zeus systems. RCA maintains more than 190 nationwide office locations with service personnel available 24 hours a day, 7 days a week.

**System Design** A single-board user module for the 3X includes a Z80A processor with 64KB of main memory, 2 serial ports, 1 parallel port, and a synchronous port. Each user module for the 3X/16 includes a Z80A and an 8088 processor, 64KB or 128KB of main memory, 2 serial ports, 1 parallel port, and a synchronous port. Both models support 12.6MB–65MB of Winchester disk storage, a 20MB cartridge tape drive, and a 250KB diskette drive. Main memory can be expanded to 2.1MB.

All system components are housed in a desktop enclosure. The CPU features a user module and the master processor module, which is based on a Zilog Z80A. The separate user modules can be connected to the high-speed interprocessor data channel.

The MUSE operating system can run both 8- or 16-bit software individually or both concurrently. MUSE supports a variety of programming languages, such as BASIC, COBOL, FORTRAN, and Pascal.

**Competition and Pricing** Competition for the Zeus 3X and 3X/16 includes the Computer Automation Omnix, Micro Five Computers Series 1000, and TeleVideo Systems TS 816/4.

Zeus 3X and 3X/16 prices begin at \$10,800.

**OSM Computer Corp**665 Clyde Ave  
Mountain View CA 94043

(415) 961-8680

**Zeus 4, Zeus 4/16**

**Overview** The Zeus 4 and Zeus 4/16 are multiuser, multiprocessor systems. Zeus 4 supports 2 to 4 users; Zeus 4/16 supports 1 or 2 users. For each user, the systems dedicate a single-board user module, consisting of a Zilog Z80A processor on the Zeus 4 and a Z80A and an Intel 8088 processor on the Zeus 4/16.

Software for the Zeus systems includes MUSE, the proprietary multiuser executive operating system. MUSE is compatible with Digital Research's CP/M and MP/M operating systems.

Maintenance for Zeus 4 and 4/16 is provided by RCA Service Company, a division of RCA Corporation. RCA maintains more than 190 nationwide office locations with service personnel available 24 hours a day, 7 days a week.

**System Design** A single-board module for the Zeus 4 includes a Z80A processor with 64KB of main memory. A module for the 4/16 includes a Z80A and an 8088 processor with 64KB or 128KB of main memory. Both modules include 2 serial ports; a parallel port is standard with the Zeus 4, and a synchronous port is standard with the Zeus 4/16. Up to 25MB of Winchester disk storage and 1MB of diskette storage are available. Maximum main memory for the systems is 320KB.

System components are housed in a desktop enclosure. The CPU features a user module and the master processor module, which is based on a Z80A. The separate user modules can be connected to a high-speed interprocessor data channel.

Asynchronous communications are supported at data rates of 300 to 9.6K bps.

**Competition & Pricing** Competing with the Zeus 4 and Zeus 4/16 systems are the Altos Series 5, Dynabyte Business Computers Model 6000, and Onyx Systems Sundance II.

Prices for the Zeus 4 and 4/16 range from \$6,500 to \$9,000.

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**Perkin-Elmer**2 Crescent Pl  
Oceanport NJ 07757

(201) 870-4712

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**Model 7500**

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**Overview** Perkin-Elmer entered the desktop computing market in May 1983 with the introduction of the Model 7500 scientific computer. The Model 7500 is based on the Motorola MC 68000 microprocessor and supports several users in program development, data acquisition, data reduction, and graphic display environments.

The Model 7500 supports 640KB of main memory and 10MB of Winchester disk storage. Both color and monochrome versions of the system can be configured as part of the Perkin-Elmer Programmer's Workstation or Scientist's Workstation.

Model 7500 computers run under the Whitesmiths Ltd Idris operating system and support various programming languages, such as FORTRAN and C.

Perkin-Elmer provides maintenance and support for the Model 7500. The basic service agreement provides scheduled visits, emergency repair services, and replacement parts for a fixed monthly charge.

**System Design** Based on the Motorola MC 68000, the Model 7500 has 32-bit data and address registers and a 16-bit data bus. The system includes a detachable ASCII keyboard with 32 function keys, numeric keypad, cursor control, screen control, and a keyboard overlay. The 7500 also features 2 RS-232C serial ports and support for a 13-inch-diagonal monochrome or color display. The color system displays 16 colors from a palette of 27.

The Idris operating system is similar to the UNIX system developed by AT&T and supports FORTRAN-77, BASIC, and C. IDRIS provides a menu-driven help system for obtaining online documentation on the operating system. The PECOWRITER text processing system for document preparation and many application packages based on UNIX run under IDRIS.

A basic monochrome configuration includes 416KB of memory, and the color version features 640KB of memory; both models have 640KB of diskette storage. Options include a 10MB Winchester disk and a color or black-and-white printer.

**Competition & Pricing** Model 7500 competitors include the AT&T 3B2/300, Callan Data Systems Unistar Series, Plexus Computer P/35, and Wicat System 155.

The basic monochrome Model 7500 costs \$8,400; the basic color version, \$10,800.

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**Pertec Computer Corp**17112 Armstrong Ave  
Irvine CA 92713-9602

(714) 660-0488

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**SABRE**

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**Overview** In November 1983, Pertec Computer changed the name of its System 4200 to SABRE because potential users confused this product line with Pertec's SYSTEM 3200 family. SABRE comprises 3 models, the 4210, 4220, and 4240, all of which are 16-/32-bit multitasking computers based on the PICK operating system from Pick Systems.

SABRE systems support a maximum 2MB of main memory and 420MB of Winchester disk storage. SABRE 4210 and 4220 are desktop systems; SABRE 4240 is a floor-cabinet model.

In addition to the PICK operating system, SABRE systems run the Pertec SYSTEM BUILDER application generator.

Pertec provides maintenance and support for its SABRE systems through a worldwide network of distributors and dealers.

**System Design** The SABRE models are built around the 16-/32-bit Motorola MC 68000 microprocessor with built-in diagnostics. The 4210 comes with 256KB RAM, expandable to 1MB; one 5-1/4-inch diskette drive, and a 13MB or 53MB Winchester disk drive. The 4220 desktop system is configured with 256KB of main memory, expandable to 1.5MB, and includes 3 integral RS-232C serial ports that can be expanded to 11 ports. Disk storage includes a 5-1/4-inch Winchester disk with 13MB or 53MB of storage; an additional drive is optional.

The 4240 floor-cabinet model supports from 256KB to 4MB of main memory. The 4240 includes 3 RS-232C serial ports that can be expanded to 35. Disk storage includes an 8-inch Winchester disk drive with 140MB of storage; a second drive can be added to the cabinet. Four additional drives can be added to the system in expansion cabinets. The 4240 system also includes a 21MB cartridge tape drive.

The PICK operating system is a memory-based, multiuser relational DBMS that includes an English-like query language, an extended version of BASIC, a test editor and WP, and a procedure processor. SYSTEM BUILDER is an application generator that allows users to create, use, and maintain an application.

**Competition & Pricing** Competition for SABRE systems includes the Wicat System 155, NCR Tower 1632, and Syte Series 3000.

Prices for the SABRE system range from \$9,000 to \$30,000.



**Pertec Computer Corp**

17112 Armstrong Ave  
Irvine CA 92713-9602

(714) 660-0488

**SYSTEM 3200**

**Overview** The SYSTEM 3200 family of multiuser microcomputers, introduced in 1983, includes 3 desktop models and 1 floor-cabinet model. The desktop models support up to 16 users; the floor model up to 32. Main memory on the SYSTEM 3200 can be expanded to a maximum of 1MB on the desktop models and 4MB on the floor model. Mass storage includes 2MB of diskette storage and up to 420MB of Winchester disk storage.

Maintenance and support for the SYSTEM 3200 are provided by Pertec's worldwide network of distributors and dealers.

**System Design** SYSTEM 3200 computers are based on the Motorola MC 68000 microprocessor and 3 major buses: the main system bus, I/O channel bus, and serial interface bus. All models include 16KB of ROM for self-test diagnostics and initial load functions.

The desktop Model 3205 includes 256KB of RAM expandable to 1MB, 4 RS-232C ports, two 5-1/4-inch diskette drives with 1MB of storage each, and an integrated intelligent workstation with adjustable monitor and detachable keyboard. The desktop Model 3215 has the same features as the 3205 except with a 1MB diskette drive and a Winchester disk drive with up to 53MB of storage. The desktop Model 3220 supports 512KB to 1MB of RAM, a 26MB or 53MB Winchester disk drive, and a streaming cartridge tape.

Model 3230 is a floor-cabinet system that includes 512KB of RAM expandable to 4MB, 4 RS-232C ports, a 21MB streaming cartridge tape drive, and an 8-inch 35MB Winchester disk. An optional 1.6MB diskette drive is available. Model 3230 supports a maximum 420MB of Winchester disk storage. Workstations are attached by multidrop coaxial lines and can execute CP/M applications.

Software includes OS/3200, the AT&T UNIX System III, and support for Digital Research CP/M-based applications. Programming languages include a Basic Four-compatible BASIC and RM/COBOL as well as SVS FORTRAN-77, SVS Pascal, and SVS BASIC-PLUS.

**Competition & Pricing** Competition for the SYSTEM 3200 includes the Wicat Systems System 155, AT&T 3B2/300, Callan Data Systems Unistar Series, and Instrumentation Laboratory Pixel 80/AP.

SYSTEM 3200 prices range from \$5,000 to \$35,000.

**Philips Data Systems**

PO Box 245  
Apeldoorn The Netherlands

055-230123

**P3500**

**Overview** The Philips P3500 microcomputer is a multiuser, multiprocessor system designed for small businesses or departments within large corporations. The P3500 supports up to 320KB of RAM, 40KB of ROM, and 20MB of Winchester disk storage. The system supports from 1 to 4 workstations.

P3500 microcomputers run under the Software 2000 Inc TurboDOS operating system and support numerous program development languages.

Philips Data Systems provides maintenance and support services through an extensive network of service centers. All software supplied by Philips is supported and guaranteed.

**System Design** The P3500 features from 2 to 5 processors that communicate over a system bus based on the Intel Multibus. Each processor board features a 4MHz version of the Zilog Z80A microprocessor. The master processor board manages shared storage and printers and the secondary storage controller board. Each slave processor board is dedicated to a workstation and supports an optional printer or data communications equipment. Each processor board includes 64KB of RAM, 8KB of ROM, and 2 RS-232C V.24 interfaces.

Main memory on the system ranges from 128KB of RAM and 16KB of ROM to 320KB of RAM and 40KB of ROM.

The TurboDOS operating system is a multiuser, multitasking system that supports shared-resource functions, including file and record management, file sharing, record locking, data communications, and program loading. It also supports a multiuser network of interconnected Z80A-based systems that can share a common pool of mass storage, printers, and other peripheral devices. TurboDOS is compatible with the Digital Research CP/M and MP/M operating systems. Languages supported by TurboDOS include RM/COBOL, Multi-BASIC, and BASIC-80. CP/M- and MP/M-compatible programming languages can also run under TurboDOS.

Applications software for the P3500 includes Micro-Pro WordStar, MailMerge, SpellStar, DataStar, Super-Soft, and CalcStar.

**Competition & Pricing** The competition for the P3500 includes the Cado Systems C.A.T. II, and OSM Computer Zeus 3 and 4.

The P3500 is priced at 53,000 Dutch guilders.

**Plexus Computers**

3833 N First St  
San Jose CA 95134

(408) 943-9433

**P/25**

**Overview** The Plexus P/25 is a UNIX-based desktop microcomputer featuring up to 2MB of main memory. P/25 supports up to 16 interactive users simultaneously, an 8-inch Winchester disk drive with up to 72MB of storage, 8 serial I/O ports, and a parallel printer port.

P/25 operates under the AT&T version of UNIX III.

P/25 features self-test diagnostics and a system diagnostic port to facilitate fault isolation and maintenance. Plexus Computers provides maintenance and support for the system.

**System Design** The P/25 is based on the 16-bit Zilog Z8000 microprocessor with 512KB of error-correcting main memory expandable to 2MB. Up to 16 interactive users can be supported simultaneously. In a typical P/25 configuration, the job processor and two I/O processors are linked. During operation, the job processor performs computation and operating system functions, while I/O processors handle disk, tape, and serial I/O. A battery-operated real-time clock gives the job processor continuous access to the actual date and time of day.

P/25 includes an intelligent mass storage processor (IMSP) that has its own 16-bit processor and 128KB of local memory. The IMSP controls up to four 22MB, 36MB, or 72MB Winchester disk drives and a 1/4-inch streaming cartridge tape drive with a 20MB capacity.

The 8 serial ports are RS-232C compatible and feature modem control lines to support standard asynchronous and synchronous modems. Each port handles asynchronous or bisynchronous protocols at software-selectable rates up to 19.2K bps. The parallel port is designed to support a line printer with a Centronics-type parallel interface.

P/25 can also be linked with a Xerox Ethernet LAN to form an integrated processing complex.

P/25 operates under UNIX III. Programs developed in C, COBOL, BASIC, FORTRAN, and Pascal are source code compatible across the Plexus Computers product line.

**Competition & Pricing** Competition for the P/25 includes the Computer Automation Omnix 186, Intel 86/300x, and Molecular Computer Supermicro 16.

The P/25 is priced at \$14,950.

**Plexus Computers**

3833 N First St  
San Jose CA 95134

(408) 943-9433

**P/35**

**Overview** P/35 is a 16-/32-bit desktop microcomputer supporting up to 2MB of main memory. The P/35 supports up to 16 interactive simultaneous users, a Winchester disk drive, 8 serial I/O ports, and a parallel printer port. A 1/4-inch streaming cartridge tape drive provides storage backup.

P/35 operates under the AT&T UNIX III. Written in C, UNIX also supports several high-level programming languages.

Self-test diagnostics and a system diagnostic port facilitates fault isolation and maintenance for the P/35. Maintenance is provided by Plexus Computers.

**System Design** P/35 is based on the 16-/32-bit Motorola MC 68000 processor with a 4KB cache memory, on-board RAM bank, high-speed memory map, and 512KB of error-correcting memory. Processor memory is expandable to 2MB. Data moves between the cache and main memory over a 32-bit dedicated memory bus. P/35 supports up to 16 simultaneous users.

P/35 includes an intelligent mass storage processor (IMSP) that has its own 16-bit processor and 128KB of local memory. The IMSP controls up to four 8-inch 22MB, 36MB, or 72MB Winchester disk drives and a 1/4-inch streaming cartridge tape drive with a 20MB capacity.

The 8 serial ports are RS-232C compatible and feature modem control lines to support standard asynchronous and synchronous modems. Each port handles asynchronous or bisynchronous protocols at software-selectable rates up to 19.2K bps. The parallel port is designed to support a line printer with a Centronics-type parallel interface.

P/35 can also be linked with a Xerox Ethernet LAN to form an integrated processing complex.

P/35 operates under UNIX III. Programs developed in C, COBOL, BASIC, FORTRAN, and Pascal are source code compatible across the Plexus Computers product line.

**Competition & Pricing** Competition for the P/35 includes the Callan Data Systems Unistar 100, AT&T 3B2/300, and Pertec Computer SYSTEM 3200.

The P/35 is priced at \$16,950.



**Plexus Computers**

3833 N First St  
San Jose CA 95134

(408) 943-9433

**P/40**

**Overview** P/40 is a UNIX-based supermicrocomputer designed to support up to 40 interactive users. The P/40 features up to 4MB of main memory, 14-inch Winchester disk drives, serial I/O ports, and a parallel printer port.

P/40 operates under AT&T version of UNIX III. Written in C, UNIX also supports BASIC, COBOL, FORTRAN, and Pascal.

P/40 features self-test diagnostics and a system diagnostic port to facilitate fault isolation and maintenance. Maintenance and support are provided by Plexus Computers.

**System Design** P/40 is based on the 16-bit Zilog Z8000 microprocessor with 512KB of error-correcting memory expandable to 4MB. Up to 40 interactive users can be supported simultaneously. In a typical P/40 configuration, the job processor and 2 I/O processors are linked. During operation, the job processor performs computation and operating system functions while the I/O processors handle disk, tape, and serial I/O. A battery-operated real-time clock gives the job processor continuous access to the actual date and time of day.

P/40 includes an intelligent mass storage processor (IMSP) that has its own 16-bit processor and 128KB of local memory. The IMSP controls up to four 14-inch 72MB or 145MB Winchester disk drives and a 1/2-inch, 9-track, 1,600-bpi tape drive.

The 8 serial ports are RS-232C compatible and feature modem control lines to support standard asynchronous and synchronous modems. Each port handles asynchronous or bisynchronous HDLC protocols at software-selectable rates up to 19.2K bps. The parallel port is designed to support line printer with a Centronics-type parallel interface.

P/40 can also be linked with a Xerox Ethernet LAN to form an integrated processing complex.

P/40 operates under UNIX III. Programs developed in C, COBOL, or other high-level programming languages are source code compatible across the Plexus Computers product line.

**Competition & Pricing** P/40 systems compete with the Callan Data Systems Unistar 100 and Pertec Computer SYSTEM 3200.

The P/40 is priced at \$37,950.

**Plexus Computers**

3833 N First St  
San Jose CA 95134

(408) 943-9433

**P/60**

**Overview** P/60 is a 16-/32-bit supermicrocomputer featuring up to 4MB of error-correcting main memory. The P/60 supports up to 40 interactive users, 290MB of Winchester disk storage, 8 serial I/O ports, and a parallel printer port.

P/60 operates under the AT&T UNIX III. Written in C, UNIX also supports BASIC, COBOL, FORTRAN, and Pascal.

P/60 features self-test diagnostics and a system diagnostic port to facilitate fault isolation and maintenance. Plexus Computers provides maintenance and support for the P/60.

**System Design** P/60 is based on the 16-/32-bit Motorola MC 68000 processor with a 4KB cache memory, on-board RAM bank, high-speed memory map, and 512KB of memory. The processor memory is expandable to 4MB. Data moves between the cache and main memory over a 32-bit dedicated memory bus.

P/60 includes an intelligent mass storage processor (IMSP) that has its own 16-bit processor and 128KB of local memory. The IMSP controls up to four 14-inch 72MB or 145MB Winchester disk drives and 1/2-inch, 9-track, 1,600-bpi magnetic tape for system backup.

The 8 serial ports are RS-232C compatible and feature modem control lines to support standard asynchronous and synchronous modems. Each port handles asynchronous or bisynchronous protocols at software-selectable rates up to 19.2K bps. The parallel port is designed to support a line printer with a Centronics-type parallel interface.

P/60 can also be linked with a Xerox Ethernet LAN to form an integrated processing complex.

P/60 operates under UNIX III. Programs developed in C, COBOL, or other high-level languages are source code compatible across the Plexus Computers product line.

**Competition & Pricing** Competition for the P/60 includes the Callan Data Systems Unistar Series and Pertec Computer SYSTEM 3200.

The P/60 is priced at \$42,950.

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**POINT 4 Data Corp**2569 McCabe Way  
Irvine CA 92714(702) 322-6868

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**MARK 2T**

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**Overview** The MARK 2T is POINT 4's entry-level multiuser computer system. The desktop system supports up to 7 users and provides compatibility with the larger MARK 5 and MARK 9 systems. Based on a proprietary 16-bit processor, the MARK 2T includes a Winchester disk and cartridge tape backup; it supports the POINT 4 IRIS (Interactive Real-Time Information System) operating system.

POINT 4 Data Corporation systems are sold and supported through a worldwide network of value-added resellers.

**System Design** The MARK 2T is based on a bipolar bit-sliced MSI processor that is software compatible with POINT 4's larger processors. Main memory is 64KB, expandable to 128KB. An integral 5-1/4-inch Winchester disk drive provides from 19MB to 46MB of unformatted storage. An integral 1/4-inch streaming cartridge tape drive provides 20MB of backup storage. An optional 45MB cartridge tape drive is also available. A QIC-2 interface is provided for industry-standard 1/4-inch streaming tape drives.

The MARK 2T standard configuration includes 4 workstation ports; the largest configuration includes 7. A DMA multiplexor manages communications between the workstations and the CPU, providing faster response time in a multiuser environment. The maximum transfer rate through the multiplexed lines is 9.6K bits per second.

The MARK 2T is supported by IRIS, the same multiuser time-sharing operating system used on the MARK 5 and MARK 9 minicomputer systems. Applications software for IRIS is developed in Business BASIC. A range of commercial applications software is available from value-added resellers of POINT 4 systems. Software developed on the MARK 2T can be run on POINT 4's larger systems.

**Competition and Pricing** No competing machines use the proprietary IRIS operating system; however, machines with similar hardware capabilities include the Pertec Computer SYSTEM 3200, Zentec Series 2000, and Alpha Micro AM-1000 and AM-1000E.

Prices for the MARK 2T range from \$8,995 for the basic system with 19MB of Winchester disk storage and 20MB of tape storage to \$13,395 for a system with 46MB of Winchester disk storage and 45MB of tape storage. Workstations are provided at extra cost.

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**RAIR Ltd**6-9 Upper St Martins La  
London WC2H 9EQ  
England

(01) 836 6821

4101 Burton Dr  
Santa Clara CA 95050(408) 988-1790

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**SuperMicro**

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**Overview** The RAIR SuperMicro is a high-performance desktop system that combines the Intel iAPX VSLI microprocessors, up to 2MB of high-speed memory, 100MB of fast-access disk storage, an integral tape streamer, a diskette drive, 16 multiprotocol ports, an IEEE-488 instrumentation bus, and an Ethernet local area network controller.

**System Design** The SuperMicro has an iAPX 286 applications processor and an iAPX 287 numeric coprocessor; both are interfaced to a multichannel DMA controller, prioritized interrupt system, real-time clock, and up to 2MB of high-speed memory. Permanent storage consists of one or two 5-1/4-inch Winchester disk drives, each with a capacity of 50MB. A 5-1/4-inch streaming tape drive provides backup for the Winchester drives. A 5-1/4-inch diskette drive is used for program loading, low-volume backup, and program and data interchange between systems; the recording mode is double sided and quad density; the unformatted storage capacity is 1MB. Up to 16 serial devices, such as video displays, printers, and modems can be connected. Operating speed and protocol for these devices are fully programmable. The SuperMicro can operate as a requestor and/or server on the Ethernet local area network.

The system supports both Digital Research Concurrent DOS and AT&T UNIX System V operating systems. The SuperMicro also supports a range of software development tools and applications—including language compilers for BASIC, COBOL, FORTRAN, Pascal, and C—plus graphics, data base, and communications utilities and applications.

**Competition & Pricing** Competing systems include the Altos 586 and IBM Personal Computer AT.

The standard SuperMicro configuration, including 512KB of RAM, 50MB of disk storage, 45MB of streaming tape storage, 1MB of diskette storage, and 8 I/O ports, is priced at £10,750 in the UK. In the U.S., it is priced at \$15,500.



**SCI-COM Computer Systems**

981 Rte 22  
PO Box 6050  
Bridgewater NJ 08807

(201) 685-0070

**Seiko Series 8600**

**Overview** The Seiko Series 8600 is a multiuser small-business computer system equipped to support accounting, financial planning, word processing, data base management, graphics, and communications. Available accounting programs encompass payroll, accounts payable, accounts receivable, inventory control, purchasing, fixed assets, and order-entry applications.

The Seiko Series 8600 offers extensive self-diagnostics. Maintenance for SCI-COM Computer Systems equipment is provided through a nationwide network of dealers.

**System Design** Based on a 16-bit Intel 8086 microprocessor, the Series 8600 features 128KB to 512KB of main memory, a real-time clock, 14 vectored interrupts, a 16KB ROM, and a 5MHz four-channel DMA. The 12-inch-diagonal screen displays P-31 green-phosphor characters in a 10-by-14-dot matrix with full descenders.

A 640KB diskette is standard; options include dual 5-1/4-inch diskette drives featuring a 250K-bps transfer rate and a 95-msec average access time. A 5-1/4-inch hard disk drive is optionally available, providing a total capacity of 10MB, 20MB, or 40MB. A second 40MB hard disk and a 13.4MB cartridge tape backup system are also supported. An intelligent disk controller relieves the CPU from disk-management tasks, including error detection and correction.

A total of 6 operating systems are available for the Seiko Series 8600. The 2 single-user operating systems are the MS-DOS from Microsoft and CP/M-86 from Digital Research. The four multiuser operating systems are the Science Management Corporation UNIDOL, Phase One Systems OASIS-16, Digital Research MP/M-86, and Basic Four MBOS. High-level languages supported by the Series 8600 include C, CBASIC, MBASIC, COBOL, FORTRAN, and Pascal.

**Competition & Pricing** Competition for the Series 8600 includes the Fortune System 32:16, OSM Computer Zeus 4/16, Altos Computer Systems Series 5, and Onyx Systems Sundance II.

Model	Price \$
8600 Series (1 user)	8,900
8600 Series (3 users)	12,890

**Southwest Technical Products Corp**

219 W Rhapsody  
San Antonio TX 78216

(512) 344-0241

**X-12 +**

**Overview** The X-12+ is a standalone computer capable of supporting up to 3 simultaneous users. Standard features include disk storage, multitasking and multiprocessing capability. Various programming languages and operating systems are available.

**System Design** The X-12+ is built around a Motorola MC 68B09 processor with extended addressing, an optional TMS 320 32-bit processor for floating-point operations, and 256KB of dynamic RAM (expandable to 1MB). The system offers buffered disk I/O to reduce redundant disk read operations, 2 RS-232C ports for additional terminals, and 1 parallel port for communications with a loop network. The X-12+ features a 12-inch CRT screen and a detachable 91-key keyboard. The display is controlled by a separate MC 6809 processor. An on-board vocabulary of 255 words is spoken by the standard voice processor.

Software for the system includes the UniFLEX operating system for the multiuser configuration or FLEX+ for the single-user configuration. The system supports BASIC, FORTRAN, Pascal, C, COBOL, and a relocating assembler. UniFLEX provides the same file structure and shell facility as those available with UNIX.

**Competition & Pricing** Competing systems include the IBM Personal Computer AT, Altos 586, and AT&T 3B2/300.

An X-12+ multiuser configuration with 256KB of RAM, a CRT screen, a detached keyboard, voice and sound synthesizers, 3 parallel ports, 4 serial ports, 1.25MB of diskette storage, 20MB of Winchester disk storage, and the UniFLEX operating system is priced at \$6,595. A single-user system with dual 1.25MB diskettes, the FLEX+ operating system, a CRT terminal, and BASIC costs \$4,495.



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**Stride Micro**4905 Energy Way  
Reno NV 89502(702) 322-6868

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**Stride 420**

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**Overview** The Stride 420 microcomputer is a desktop system designed to be operated simultaneously by 1 or 2 users. Stride 420 can be configured with one or two 5-1/4-inch diskette drives and up to 512KB of main memory. Various display terminals can be interfaced to the system.

Stride 420 operates under the UCSD p-System operating system, which is fully supported by several industry-standard programming languages. A full complement of independent third-party applications software packages are optional.

Stride Micro warrants parts and labor for Stride 420 for 90 days. Maintenance is available through Stride Micro and its distributors and dealers.

**System Design** Stride 420 is based on the 16-/32-bit Motorola MC 68000 processor operating at 10MHz or 12MHz with 256KB of RAM (expandable to 512KB). One or 2 low-profile diskette drives with 640KB of storage each are offered with the system. The diskettes are interrupt driven. Four RS-232C serial ports, a Centronics-compatible parallel port, and OMNINET networking hardware are provided. Floating-point hardware and a memory management unit are optional.

The Wyse WY-50 terminal is offered with all Stride Micro systems. The terminal features 80 or 132 characters per line and 38.4Kbps data transfer.

Software consists of the Liaison operating system (the UCSD p-System with LAN software). Digital Research CP/M-86, Ryan-McFarland RM/COS, and Whitesmiths Ltd Idris are also available. Languages include COBOL, HyperFORTH-Plus, Volition Systems Modula-2, BASIC, FORTRAN-77, and Pascal. Application programs include the Timberline Spreadsheet, WORD/7 WP, Stoneware Advanced DB Master, and a number of accounting packages. The Arizona Computer Systems Data Tree DBMS helps users organize, retrieve, update, select, and report from data base files.

**Competition & Pricing** Competition for the Stride 420 microcomputer includes the IBM PC/AT, Computer Automation Omnix 186, and Apple Lisa.

The Stride 420 with one diskette drive is priced at \$2,900.

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**Stride Micro**4905 Energy Way  
Reno NV 89502(702) 322-6868

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**Stride 440**

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**Overview** Stride 440 microcomputers are 16-/32-bit desktop systems designed to support up to 16 simultaneous users. Featuring up to 2MB of main memory, the Stride 440 can be configured with one or two 5-1/4-inch diskette drives and up to 33MB of Winchester disk storage.

The system can be used as a high-performance scientific or engineering workstation or as a multiuser business system.

Stride Micro warrants parts and labor for the Stride 440 for 90 days. Maintenance is available through Stride Micro and its distributors and dealers.

**System Design** The Stride 440 is based on a 10MHz or 12MHz Motorola MC 68000 processor with 256KB of RAM (expandable to 2MB). One 5-1/4-inch diskette drive is standard. The system also supports an integral 5-1/4-inch Winchester disk drive with 10MB, 15MB, or 33MB of storage. Floating-point hardware and a memory management unit are optional.

Ten RS-232C serial interface ports (expandable to 16), a Centronics-compatible parallel printer port, and OMNINET networking hardware are configured with the system.

The Wyse WY-50 terminal is offered with all Stride Micro systems. The terminal features 80 or 132 characters per line and 38.4Kbps data transfer.

Software for the Stride 440 includes the Liaison operating system (UCSD-p System with LAN software). AT&T UNIX System V, Digital Research CP/M-86, and Whitesmiths Ltd Idris are also available. Languages include BASIC, FORTRAN, Pascal, HyperFORTH-Plus, and Volition Systems Modula-2.

**Competition & Pricing** Competing with the Stride 440 are the AT&T 3B2/300, IBM Personal Computer AT, and Computer Automation Omnix.

Stride 440 prices range from \$5,900 to \$8,800, depending on the amount of disk storage.



**Stride Micro**4905 Energy Way  
Reno NV 89502

(702) 322-6868

**Stride 460**

**Overview** The Stride 460 microcomputer is a 16-/32-bit desktop system that supports up to 22 users. Featuring up to 3MB of main memory, the Stride 460 can be configured with a 640KB diskette drive and up to 448MB of Winchester disk storage. Add-on VMEbus boards provide such capabilities as data acquisition, process control, and mainframe access.

Stride Micro warrants parts and labor for 90 days. Maintenance is available through Stride Micro and its distributors and dealers.

**System Design** The Stride 460 is based on a 10MHz or 12MHz Motorola MC 68000 processor with 256KB of RAM (expandable to 3MB). One 5-1/4-inch diskette drive is provided. Multiple 5-1/4-inch Winchester disk drives providing 448MB can be configured. Floating-point hardware and a memory management unit are optional. Ten to 22 RS-232C serial ports, a Centronics-compatible parallel port, and OMNINET networking hardware are configured with the system.

The Wyse WY-50 terminal is offered with all Stride Micro systems. The terminal features 80 or 132 characters per line and 38.4Kbps data transfer.

Software for the Stride 640 includes the Liaison operating system (UCSD p-System with LAN software). The AT&T UNIX System V, Digital Research CP/M-86, and Whitesmiths Ltd Idris are also available. Languages include COBOL, HyperFORTH-Plus, Volition Systems Modula-2, BASIC, FORTRAN-77, and Pascal. Applications software packages include Stoneware Advanced DB Master, and Timberline Spreadsheet, Word/7, and Spell/7.

**Competition & Pricing** Competing with the Stride 640 are the AT&T 3B2/300, Fortune Systems Fortune 32:16, and Computer Automation Omnix.

Model	Price \$
Stride 640 w/15MB Winchester disk storage	8,900
Stride 640 w/33MB Winchester disk storage	11,200
Stride 640 w/52MB Winchester disk storage	14,200
Stride 640 w/112MB Winchester disk storage	18,200
Stride 640 w/224MB Winchester disk storage	29,000
Stride 640 w/448MB Winchester disk storage	49,000

**Tandy Corp**1800 One Tandy Ctr  
Fort Worth TX 76102

(817) 390-3700

**Radio Shack TRS-80 Model 16B**

**Overview** Tandy Corporation introduced the Radio Shack TRS-80 Model 16B in October 1983. Tandy markets the Model 16B to small businesses and professionals through its 7,000 Radio Shack retail stores.

Model 16B is a multiuser system that supports up to 512KB of main memory, 1.2MB of diskette storage, and 27MB of disk storage. Model 16B contains 2 microprocessors: the Motorola MC 68000 and Zilog Z80A. Options available for the system provide communications with an IBM host as well as resource sharing among 255 Model 16Bs through Datapoint ARCNET local networking facilities.

Model 16B runs under the Tandy TRS-XENIX™ operating system. Model 16B systems can also run TRS-80 Models II, 12, and 16 software programs in a single-user environment.

Tandy provides maintenance and support for Model 16B through its Radio Shack retail stores. Users can return faulty equipment to their local store, which then forwards the equipment to the nearest service center for repair. On-site service contracts are also available through Radio Shack.

**System Design** Model 16B, like Model 16, uses the Motorola MC 68000 single-board HMOS-based microprocessor as its CPU and 8-bit Zilog Z80A processor as a peripheral controller. The standard Model 16B features 256KB of main memory, which can be expanded to a maximum of 512KB.

When Model 16B is operating under TRS-XENIX, all data can be stored on disk. Files can be shared by all users in the system or restricted to certain users. Peripherals can be shared by all system users. Various multi-user software programs are available for Model 16B as well as programs used for Models II, 12, and 16.

The basic Model 16B configuration includes 256KB of main memory, a high-resolution 12-inch-diagonal video display, a detachable keyboard with numeric keypad, 2 RS-232C serial interfaces, a parallel printer interface, a user-accessible card cage, 4 plug-in expansion slots, and a 1.2MB diskette drive.

**Competition & Pricing** Model 16B competes with the Digital Equipment Corporation Professional 300 Series and Fortune System 32:16.

Model 16B prices range from \$3,400 to \$5,600.

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**TeleVideo Systems Inc**1170 Morse Ave  
Sunnyvale CA 94088

(800) 538-8725

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**TeleVideo Systems Inc**1170 Morse Ave  
Sunnyvale CA 94086

(800) 538-8725

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**Personal Mini**

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**Overview** The TeleVideo Personal Mini is a multiuser microcomputer system that comprises a central processor—with a Winchester disk and a diskette drive—and up to 16 workstations (IBM-compatible personal computers or TeleVideo PM Workstations). The Personal Mini runs single-user PC DOS, MS-DOS, or TeleDOS programs, or it accesses multiuser programs running on the central unit. TeleVideo systems are sold and supported by a worldwide network of sales offices and authorized distributors.

**System Design** The central unit of the Personal Mini system, the PM/16, is based on a 16-bit Intel 80186 microprocessor and an 8-bit Zilog Z80A microprocessor. Data is stored on one or two 40MB Winchester disk drives. Main memory ranges from 256KB to 512KB. An optional 14.5MB cartridge tape drive provides disk backup. The basic system supports up to 8 users; the second disk drive includes ports for 8 additional workstations. An RS-232C port, a parallel port, and a system console port are included.

The PM/16 supports the TeleVideo PM Workstation or any IBM-compatible microcomputer as a workstation. The PM Workstation, a diskless microcomputer based on the Intel 8088 processor, contains 256KB of RAM and built-in business graphics. Workstations can access files and programs stored on the PM/16 disk drives, share printers, and broadcast messages to other workstations. The PM/16 multiuser file system includes shareable and nonshareable files to ensure system security.

The PM/16 supports the InfoShare operating system, which allows single-user PC DOS applications to be executed concurrently by several users while also providing access to multiuser programs. Security features include password-based log-in and file security at the directory, user, and group levels.

**Competition and Pricing** Competition for the Personal Mini includes the Corona MegaPC, Altos 586, OSM Zeus 3X/16, and Onyx 186 Series.

The PM/16 with one 40MB disk drive costs \$8,995; the PM Workstation, \$2,195; and the 14.5MB cartridge tape, \$2,995.

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**TS 816/40**

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**Overview** The TeleVideo TS 816/40 desktop microcomputer is designed to support up to 16 users. It is an 8-bit system featuring 128KB of main memory, 4KB of EPROM, and 40MB of Winchester disk storage.

The TS 816/40 uses the Digital Research CP/M 2.2 operating system, complemented by the TeleVideo MmmOST service operating system.

Maintenance for the TS 816/40 is provided by TRW's customer service division in the U.S. and by local TeleVideo distributors overseas.

**System Design** The TeleVideo TS 816/40 is based on the Zilog Z80A microprocessor, which features 128KB of RAM, 4KB of EPROM for system diagnostics, and direct memory access. Up to 16 TeleVideo user stations can be supported concurrently in an online environment.

Storage available with the TS 816/40 includes a 17.2MB 1/4-inch magnetic tape drive and a 24MB 8-inch Winchester disk drive.

The Digital Research CP/M operating system and TeleVideo MmmOST service operating system run on the TS 816/40. MmmOST handles all scheduling and file/record locking between the user stations and shared disk files. Available programming languages include BASIC and COBOL.

The system supports 2 RS-232C serial ports, or 16 RS-422 high-speed ports, and 1 Centronics printer port. Intersatellite data communications are provided at speeds of up to 800K bps.

**Competition & Pricing** Competition for the TeleVideo TS 816/40 system includes the Molecular Computer Supermicro 32, OSM Computer Zeus 3X, and North Star Horizon.

TS 816/40 prices begin at \$6,995.



**Vector Graphic**

500 N Ventu Park Rd  
Thousand Oaks CA 91320

(805) 499-5831

**Vector MX**

**Overview** The Vector MX was introduced in September 1984 as a replacement for the Vector 5E MultiShare and as a multiuser upgrade for users of the Vector SX. Like the SX, the MX uses dual processors. The system supports up to 3 workstations in addition to the main console and performs 7 simultaneous tasks (4 on the main console). An optional cartridge tape drive provides backup for the standard diskette and Winchester disk drives.

**System Design** The Vector MX CPU is equipped with a 6MHz, 8-bit Zilog Z80A processor and an 8MHz, 16-bit Intel 8086 processor. Memory ranges from 384KB to 896KB. Interfaces are included for a serial and a parallel printer, RS-232C communications, and an RGB monitor; 3 S-199 slots are also provided.

Four models are offered, each with a 720KB diskette. *Disk drives that store 5MB, 10MB, 28MB, and 36MB of data are provided on models MX-2500, MX-3000, MX-4500, and MX-5000, respectively.* The central console features a 12-inch-diagonal, green-phosphor screen and a detached keyboard with a dedicated microprocessor. Two workstations are offered: the MT75 is compatible with a subset of the ANSI 3.64 and Digital Equipment Corporation VT100 communications standard; the MT-50 provides compatibility with TeleVideo 910 and 925 terminals and several others. Both models feature a 14-inch-diagonal, green-phosphor screen and a detached keyboard. An RS-232C printer port is provided.

The Vector MX uses the Digital Research Concurrent CP/M-86 multitasking operating system to provide a multiuser environment. The main console can concurrently run 1 program in 8-bit mode and 3 in 16-bit mode. The MX runs standard Vector software, including the MEMORITE word processor and ExecuPlan spreadsheet, and it can be attached to Vector's LINC local area network.

**Competition and Pricing** The Vector MX competes with the OSM Zeus 3X/16, Altos ACS 8600 and 586, Applied Digital Data Systems Multivision, and CompuPro 10.

Sample prices for the MX are \$8,580 for a 2-user system with 384KB RAM and a 10MB disk drive and \$14,520 for a 4-user system with 512KB RAM and a 36MB disk drive.

**Wicat Systems Inc**

1875 S State St  
Orem UT 84057

(801) 224-6400

**System 100**

**Overview** The Wicat System 100 is a 16-/32-bit micro-computer designed around a proprietary bus. Based on the Motorola MC 68000 microprocessor, the System 100 offers from 512KB to 6MB of dynamic RAM.

Wicat's real-time Multi User Control System (MCS) supports several industry-standard programming languages, data management facilities, and communications.

Wicat Systems markets the System 100 through 70 major OEMs and directly to Fortune 1000 firms.

Maintenance programs are available through OEMs and directly from Wicat Systems.

**System Design** Based on the Motorola MC 68000 microprocessor, the System 100 employs 16-/32-bit chip architecture and 512KB of dynamic RAM expandable to 6MB in the standard system cabinet. Both 16KB and 32KB EPROM modules are provided. The System 100 also includes an intelligent I/O controller that buffers input and handles virtually all output, freeing the MC 68000 controller for data processing.

The System 100 can be configured with either 20MB or 40MB Winchester disk drives with a cartridge tape backup, or with SMD-compatible drives with up to 464MB of storage and a 9-track tape-drive backup.

The standard configuration also includes 8 RS-232C serial interface ports and 1 16-bit parallel port, which support a variety of terminals, printers, and peripheral devices.

Data communications speeds range from 50 to 19.2K bps.

The System 100 operates under Wicat's MCS operating system, which supports APL 68000, BASIC, C, COBOL, FORTRAN-77, and Assembler programming languages. User interface with the System 100 is provided by the Command Interpreter Program (CIP).

Available software packages include the UltraCalc (a 16-bit version of VisiCalc) spreadsheet program; an accounting package; a DBMS, a mainframe data base management facility; and WISE, Wicat's writing system.

**Competition & Pricing** Competition for the Wicat System 100 includes the Intel 86/380x, Instrumentation Laboratory Pixel 100/AP, and Fortune Systems 32:16.

Wicat declined to provide pricing information.

**Wicat Systems Inc**

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**System 155**

**Overview** The Wicat System 155 features a Motorola MC 68000 microprocessor with up to 4.5MB of RAM and 45MB of Winchester disk storage and a cartridge tape subsystem.

Wicat Systems markets the System 155 to major end users.

The System 155 supports UniPlus+, a Wicat version of the AT&T UNIX operating system; the Multi User Control System (MCS); and a CP/M emulator. A variety of applications software and programming languages run on the System 155.

Maintenance for the System 155 is available from Wicat offices nationwide.

**System Design** The Wicat System 155 is based on the Motorola MC 68000 microprocessor, which features 16-/32-bit architecture. Standard system memory is 512KB of dynamic ECC RAM and can be expanded to 4.5MB. Mass storage devices include two 5-1/4-inch Winchester disk drives with 10MB, 15MB, 35MB, or 45MB storage capacities and a cartridge tape subsystem. Floating-point hardware, a video disk interface, and battery backup are optionally available.

The System 155 uses the UniPlus+ operating system and the real-time MCS. Up to 9 programming languages—APL.68000, SMC BASIC, Coherent BASIC, C, RM/COBOL, CIS COBOL, FORTRAN-77, Pascal, and Assembler—are supported.

Applications software available with the System 155 includes Sequitur, a relational DBMS; WISE, an educational software development system; UltraCalc, an electronic spreadsheet; and OIS, an office information system.

RS-232C serial interface ports, which support asynchronous and synchronous communications and attach peripherals, are standard. Planned system enhancements include host computer communications and local networking.

**Competition & Pricing** Competition for the Wicat System 155 includes the Fortune Systems 32:16, AT&T 3B2/300, Plexus Computer P/35, and Instrumentation Laboratory Pixel Series.

The System 155 base price is \$10,000.

**Wicat Systems Inc**

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**System 200**

**Overview** The Wicat System 200 is a 16-/32-bit micro-computer that supports up to 32 users concurrently. Built on a proprietary bus, the System 200 offers up to 5MB of main memory and can be configured with up to 474MB of storage and a 9-track tape drive backup. The System 200 supports UniPlus+, a Wicat version of the AT&T UNIX operating system; the Multi User Control System (MCS); and a CP/M emulator. A variety of applications software and programming languages run on the System 200.

Wicat Systems markets the System 200 to major end users and provides maintenance service from 14 offices nationwide.

**System Design** Based on Motorola's MC 68000 microprocessor, the System 200 employs 16-/32-bit chip architecture and supports 512KB to 5MB of dynamic parity RAM in the standard system cabinet. The System 200 also includes an intelligent I/O controller that buffers input and handles output, thus freeing the MC 68000 controller for DP.

The System 200 can be configured with storage module device standard (SMD)-compatible drives providing 80MB, 160MB, or 474MB of storage; a 9-track, 1,600- or 3,200-bpi tape drive; and a cartridge tape subsystem.

The standard configuration also includes 8 asynchronous interface ports (expandable to 32), 4 synchronous interface ports (expandable to 8), and a master control port for a variety of terminals, printers, and peripheral devices. IBM 3270 and 2780/3780 BSC are also supported.

The System 200 uses the UniPlus+ operating system and the real-time MCS. Programming languages supported by the System include APL.68000, SMC BASIC, Coherent BASIC, C, RM/COBOL, CIS COBOL, FORTRAN-77, Pascal, and Assembler.

Applications software packages offered for the System 200 are Sequitur, a relational DBMS; WISE, an educational software development system; UltraCalc, an electronic spreadsheet; and OIS, an office information system.

Enhancements planned for the system include host computer communications and local area networking.

**Competition & Pricing** Competition for the Wicat System 200 includes the AT&T 3B/200, Pertec Computer SYSTEM 3200, and Plexus Computers P140.

A basic System 200 configuration costs \$27,000.



**Wicat Systems Inc**

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(801) 224-6400

**System 220**

**Overview** The Wicat System 220 is a 16-/32-bit micro-computer designed to support up to 64 concurrent users. The System 220 features a proprietary bus and offers up to 14MB of main memory. A 20-slot chassis allows memory expansion to 16MB.

The System 220 can be configured with up to 474MB of disk storage and a 9-track tape drive for backup. The standard System 220 configuration also includes communications interfaces and a master control port.

Software support on the System 220 includes UniPlus+, a Wicat version of the AT&T UNIX operating system; the Multi User Control System (MCS); and a CP/M emulator. Various applications software and programming languages run on the System 220.

Maintenance and support are available from Wicat's 14 nationwide offices.

**System Design** Based on the Motorola MC 68000 microprocessor, the System 220 employs 16-/32-bit chip architecture and supports 512KB of dynamic parity RAM, which can be expanded to 5MB in the standard system cabinet. The System 220 also includes an intelligent I/O controller that buffers input and handles output, freeing the MC 68000 controller for DP.

The System 220 can be configured with 84MB, 168MB, or 474MB disk drives; a 9-track, 1,600- or 3,200-bpi tape drive; and a cartridge tape subsystem.

The standard System 220 configuration includes 8 asynchronous interface ports, which can be expanded to 32, and 4 synchronous interface ports expandable to 8. A master control port, which supports a variety of terminals, printers, and peripheral devices is also standard. IBM 3270 and 2780/3780 BSC are supported.

The System 220 features the proprietary UniPlus+ operating system and the real-time MCS. APL.68000, SMC BASIC, Coherent BASIC, C, RM/COBOL, CIS COBOL, FORTRAN-77, Pascal, and Assembler programming languages are supported.

Application packages for the System 220 include Sequitur, a relational DBMS; WISE, an educational software development system; and UltraCalc, an electronic spreadsheet.

**Competition & Pricing** Competition for the Wicat System 220 includes the Pertec Computer SYSTEM 3200 and the Plexus Computers P/60.

The base price for the System 220 is \$32,000.

**Wicat Systems Inc**

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**System 300**

**Overview** The Wicat System 300 is a 16-/32-bit micro-computer designed specifically for educational and administrative use in schools. The System 300 supports up to 30 student terminal workstations with graphics, animation, and audio capabilities. Based on the Motorola MC 68000 microprocessor, the System 300 features up to 4MB of main memory and supports 474MB of disk storage and a 9-track magnetic tape drive for backup. The standard System 300 configuration includes a master control terminal and RS-232C expander board. Operating under Multi User Control System (MCS), the System 300 supports a variety of educational and applications software.

Wicat Systems markets the System 300 to major end users and provides maintenance service from 14 nationwide offices.

**System Design** Based on the MC 68000 microprocessor, the System 300 uses 16-/32-bit architecture and 2MB of dynamic parity RAM, expandable to 4MB in the standard system cabinet. The System 300 also includes an intelligent I/O controller that buffers input and handles output, freeing the MC 68000 controller for DP.

Disk storage available on the System 300 consists of storage module device standard (SMD)-compatible drives with 84MB or 474MB of storage. A 9-track, 1,600- or 3,200-bpi tape drive is provided for backup.

Up to 30 student workstations consisting of 12-inch-diagonal CRT display terminals with 320-by-192-pixel graphics resolution are supported by the System 300.

The System 300 operates under the real-time MCS and supports such programming languages as APL.68000, BASIC, C, COBOL, and Assembler.

Educational software available for the System 300 includes WISE, an educational system for program development; Reading K-3; Reading Comprehension 2-10; Math K-6; Math Games; Math 7-8; and a speed editor.

Standard applications software includes Sequitur, a relational DBMS; UltraCalc, an electronic spreadsheet; and OIS, an office information system.

**Competition & Pricing** The Wicat System 300 competes with the Pertec Computer SYSTEM 3200 and Plexus Computers P/60.

Wicat Systems declined to provide price data for the System 300.

**Zentec**

2400 Walsh Ave  
Santa Clara CA 95050

(408) 727-7662

**Series 2000**

**Overview** The Zentec Series 2000 is a family of multiuser microcomputer systems featuring from 256KB to 1MB of dynamic RAM, a direct memory access interface, two 738KB diskette drives, and from 5MB to 60MB of Winchester disk storage. Up to 12 users can be supported concurrently.

Terminal workstations are available, with a choice of 12-inch- or 15-inch-diagonal displays with 16KB to 64KB of user memory. Two 180 to 400 cps matrix printers are available from Zentec.

The Series 2000 operates under control of a UNIX-based operating system. Maintenance is provided by Zentec or its authorized distributors.

**System Design** The Series 2000 is based on a 16-bit Intel 8086 microprocessor with an external memory management unit that organizes memory into 2KB pages. The main processor is available with up to 1MB of memory.

An Intel 8087 arithmetic coprocessor can be added for extensive computational requirements. A multibus option within the main processor provides support for an Ethernet disk subsystem.

A total of four 5-1/4-inch Winchester disk drives, diskette drives, or streaming tape drives can be supported.

Terminal workstations provide 103-key detachable keyboards and 12-inch- or 15-inch-diagonal displays. Each workstation is controlled by a Zilog Z80A microprocessor with 8KB of ROM and 32KB or 64KB of RAM. Two RS-232C serial interfaces are included.

The UNIX-based operating system supports the UNIPLEX software package, which combines WP, spreadsheet, and data base management capabilities in an integrated, menu-driven system.

**Competition & Pricing** The Zentec Series 2000 competes with the NCR Tower 1632, Pertec Computer SYSTEM 3200, and Altos Computer Systems ACS 8600.

Series 2000 purchase prices range from \$10,000 to \$20,000, depending on system configurations.

**Zilog Inc**

1315 Dell Ave  
Campbell CA 95008

(408) 370-8000

**System 8000**

**Overview** The Zilog System 8000 is a general-purpose multiuser time-sharing computer system available in 4 models. Based on the Zilog Z8001A 16-bit microprocessor, the System 8000 supports from 8 to 24 users concurrently, features 256KB of error-correcting controlled (ECC) memory expandable to 4MB, and from 18MB to 320MB of Winchester disk storage.

Software support consists of Zilog's version of the AT&T UNIX operating system. A variety of high-level programming languages is available.

Zilog service contracts provide parts and labor, priority response, and on-site warranty service.

**System Design** The System 8000 is based on the Z8001A microprocessor, which supports separate code and data address spaces. The system also features 3 Z8010A memory management units that support an address space of up to 8MB and 1.5MB of ECC main memory.

The System 8000 is available in 4 models with varying amounts of disk storage and memory.

Software support includes Zeus—the Zilog version of UNIX—which features interactive data manipulation programs and system utilities, including a command interpreter, status inquiry, system accounting programs, and data communications. Zeus supports BASIC, C, COBOL, FORTRAN-77, Pascal, and PLZ/SYS programming languages. Communications support consists of the Zilog Z-NET II baseboard communications network.

**Competition & Pricing** Competition for the Zilog System 8000 includes the Altos Computer Systems ACS 8600 and 586, Digital Equipment MICRO/PDP-11, NCR Tower 1632, and Plexus Computers P/25.

Prices range from \$16,950 to \$29,950.



# MULTIUSER MICROCOMPUTERS

## Product Briefs

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### Alpha Micro

17332 Von Karman  
PO Box 18347  
Irvine CA 92714

(714) 957-8500

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### AM-680 Series ELS

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**Overview** Introduced in September 1984, the AM-680 Series ELS (Entry Level System) is based on 2 processors enabling the system to run both MicroSoft Corporation's MS-DOS and Alpha Micro's AMOS multiuser operating systems. It is a desktop system that supports up to 3 users, 640KB of RAM, 360KB of diskette storage, and a 10MB disk drive.

The AM-680 Series ELS is available from Alpha Micro dealers and OEMs. Service is provided by Alpha Micro Service dealers.

**System Design** The AM-680 Series ELS is based on the 16-bit Intel 8088 for running MS-DOS and on the 32-bit Motorola MC 68000 coprocessor for running AMOS. The 8088 runs at 4.7MHz, and the MC 68000 runs at 8MHz.

The system has 256KB of RAM for running MS-DOS applications and 128KB of RAM that can be used for both AMOS and MS-DOS applications. MS-DOS memory can be expanded to 640KB; AMOS memory can be expanded to 256KB.

The system also comes with an internal 5.25-inch, double-sided, double-density, 360KB diskette drive and a 10MB Winchester disk drive that can be partitioned between the 2 operating systems.

The AM-680 Series ELS is available with a 12-inch-diagonal monochrome or a 13-inch-diagonal color monitor. Each monitor has a display format of 24 lines by 80 columns and a resolution of 320 by 200 pixels. The color monitor displays 16 colors simultaneously from a palette of 16. The IBM Personal Computer-style keyboard features 83 keys, 10 programmable function keys, and cursor control within the 10-key numeric keypad.

Both Alpha Micro and IBM Corporation expansion cards can be installed in the 2 (out of 8) available expansion slots. The system also includes 1 serial, 1 parallel, and 1 main monitor port.

MS-DOS, AMOS, and GW-BASIC come bundled with the system. Text files created under one operating system can be transferred to and used by the other operating system. Lotus Development Corporation's Lotus 1-2-3, Ashton Tate's dBASE II, and several other MS-DOS-based applications have been tested and approved on the AM-680.

**Competition & Pricing** The AM-680 Series ELS competes with the IBM Personal Computer AT and Personal Computer AT-compatible systems, such as the COMPAQ Corporation DESKPRO 286 and the Kaypro Corporation 286i. It also competes with the AT&T Information Systems UNIX PC Model 7300.

The AM-680 Series ELS costs \$6,870 with the monochrome monitor and \$7,340 with the color monitor.

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### Altos Computer Systems

2641 Orchard Pkwy  
San Jose CA 95134

(408) 946-6700

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### Altos 2086

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**Overview** Just announced in June 1985, the Altos 2086 is a floor-standing supermicrocomputer that supports up to 20 active users. The system is designed for Altos resellers who sell to end users in medium-sized businesses and specific vertical markets. The 2086 is software compatible with all Altos 1- to 9-user Intel-based computers as well as with the IBM Personal Computer AT. The system can be run in a standalone environment or act as a node on a distributed network through WorkNet, Altos's local area network.

The vendor offers remote diagnostics via modem. Service is also available from the factory.

**System Design** Altos 2086 is based on an 8MHz 32-bit Intel 80286 processor and has an optional Intel 80287 floating-point processor. The system also includes a 2-board File Processor Subsystem. One board contains storage device controllers, and the other has an Intel 8086 microprocessor and RAM to provide control of file accessing. Two Serial Communications Subsystems, each with 10 user ports, an Intel 8086 microprocessor, and 32KB of RAM, are also available. One more communications subsystem can be added.

Memory ranges from 2MB to 8MB in 2MB or 4MB increments. One 5.25-inch 1.2MB diskette drive and up to three 65MB disk drives are supported. A 9-track 60MB streaming tape drive is also available.

The system supports the Altos III terminal, a 14-inch green phosphor display with 26 rows by 80 or 132 columns and a standard typewriter-style detachable keyboard.

The Serial Communications Subsystem offers 4 configurable synchronous ports and 1 configurable network port. 3270 and 3780 bisynchronous protocols are supported. 3270/SNA, remote diagnostics, and X.25 communications are options and will become available in the fourth quarter of 1985.

The 2086 operates under Microsoft Corporation's XENIX 3.0, which is available in 3 modules: XENIX Run Time I for users 1 to 16, XENIX Run Time II for users 17 to 32, and XENIX Development System. Languages supported include BASIC, COBOL, C, FORTRAN, and Pascal.

**Competition and Pricing** The Convergent Technologies Inc MiniFrame Plus, Digital Equipment Corporation MicroVAX II, and NCR Corporation TOWER 1632 and TOWER XP compete with the Altos 2086.

A basic system with 2MB of main memory, a 1.2MB diskette drive, an 80MB disk drive, a 60MB streaming tape drive, and an Altos III terminal costs \$19,990. The XENIX Run Time I module is \$795, the XENIX Run Time II upgrade module is \$1,495, and the XENIX Development System is \$995.



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**Altos Computer Systems**2641 Orchard Pkwy  
San Jose CA 95134

(408) 946-6700

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**Altos 3068**

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**Overview** The Altos 3068, marketed as a multiuser supermicrocomputer, was introduced in March 1985. It supports up to 30 users and can run as a standalone general-purpose computer or be networked to other Altos multiuser systems or mainframes. The Altos 3068 is marketed through Altos dealers and distributors and through OEMs. Buyers include computer service companies, telecommunications companies, and the government. The systems are serviced through the factory. Remote diagnosis via modem to the factory is a standard feature.

**System Design** The Altos 3068 is based on the 32-bit Motorola MC 68020 microprocessor. The base configuration, which supports 10 users, includes 1MB of RAM, expandable to 16MB in increments of 1MB, 2MB, and 4MB. This model also comes with a 1.2MB diskette drive and a 20MB fixed disk drive; 20MB, 60MB, and 80MB disk drives are also available. A streaming tape drive providing up to 60MB of backup storage can also be added to the system.

An Altos II intelligent terminal comes with the system. It has a 14-inch-diagonal green phosphor display screen with 25 lines by 80 or 132 columns and a resolution of 800 by 325 pixels. The detachable keyboard has a standard typewriter layout, 16 programmable function keys, a 10-key numeric keypad, 6 editing keys, and 5 cursor keys.

Additional boards can be installed in 4 of the 8 expansion slots to support more users, more memory, or additional functions.

The Altos 3068 runs under the AT&T Bell Laboratories UNIX System V operating system, which supports demand-paged virtual memory enabling the system to run programs that exceed physical memory. Several applications are available, including the Altos office automation package, AOE. The Altos 3068 supports BASIC, C, COBOL, FORTRAN, and Pascal.

The system can be networked to other Altos systems via Altos's WorkNet local area network and can act as a file server and communications gateway for personal computer users. It can also communicate with mainframe computers via 3270 bisynchronous SNA, X.25, and 3780 communications options.

**Competition and Pricing** The Altos 3068 competes with the Digital Equipment Corporation MicroVAX I, the Convergent Technologies Inc MiniFrame, the Plexus Computers Inc Plexus P/35, and the NCR Corporation TOWER XP.

The Altos 3068 is available for less than \$7,000 in OEM quantities.

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**AT&T Information Systems**1 Speedwell Ave  
Morristown NJ 07960

(201) 898-2000

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**3B2/400**

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**Overview** Introduced in June 1985, the 3B2/400 is a multiuser, multitasking system geared toward office automation, engineering, scientific, and vertical markets. The system is configured in a desktop enclosure and supports from 10 to 25 users in an AT&T Bell Laboratories UNIX environment. The 3B2/400 is between AT&T's 3B2/300 and 3B5 in processing and storage capabilities. Diskette, disk, and streaming tape storage facilities are available.

AT&T provides maintenance and support for the 3B2/400.

**System Design** The Western Union 10MHz, 32-bit WE32100 processor is the base of the 3B2/400 system. A WE32106 math coprocessor is optional. Memory ranges from 1MB to 4MB and is expandable in 1MB and 2MB increments. An integral 720KB diskette drive is provided. One or two internal disk drives can be added through external disk controller boards for a maximum disk capacity of 720MB. A 23MB streaming tape backup is also integrated with the system.

Terminals are available through third-party sources.

The 3B2/400 includes 6 RS-232 ports for connecting such devices as terminals, printers, and modems. Ten I/O expansion cards can be added via the 10 expansion slots on the backplane. Each card contains 4 RS-232 ports and 1 parallel port for a maximum of 46 RS-232 and 11 parallel ports. Terminal emulators, SNA and BSC 3270 interfaces, and the AT&T PC Interface for connection to MS-DOS-based systems, are supported.

The 3B2/400 operates under UNIX System V Release 2.0.3 Version 2 with swapped memory capabilities. Numerous applications, including business and office automation packages, are offered by AT&T.

**Competition & Pricing** The 3B2/400 competes with the Altos 2086 and 3068 from Altos Computer Systems, the NCR Corporation TOWER XP, and the Plexus Computers Inc P/20 system.

The 3B2/400 is available in 4 models ranging from \$19,950 to \$34,950. The floating-point models cost from \$21,550 to \$36,550.



**AT&T Information Systems**

1 Speedwell Ave  
Morristown NJ 07960

(201) 898-2000

**UNIX PC Model 7300**

**Overview** Introduced in early 1985, the UNIX PC Model 7300 is a desktop system that supports up to 3 users and runs under the AT&T Bell Laboratories UNIX System V operating system. The UNIX PC cannot run Microsoft Corporation's MS-DOS or IBM Corporation's PC DOS, but it can read data from MS-DOS and PC DOS diskettes.

The UNIX PC is available directly from AT&T and through authorized dealers, VARs, and OEMs. The system carries a 90-day warranty, and 6 post-warranty maintenance plans are available. Service is provided by the AT&T Information Systems Service Organization or authorized dealers.

**System Design** The UNIX PC Model 7300 is based on the Motorola MC 68010 CPU, which has 32-bit internal/16-bit external architecture and runs at 10MHz. The base model includes 512KB of RAM, which can be expanded to 2MB through installation of 512KB expansion boards in the 3 available expansion slots.

Each of the 4 models comes with one 5.25-inch, double-sided, double-density, 320KB diskette drive and a 10MB or 20MB disk drive.

The standard monitor is a 12-inch-diagonal, green monochrome, bit-mapped display with a 29-line-by-80-column format and a resolution of 720 by 348 pixels. The 103-key detachable keyboard has the traditional QWERTY (typewriter) layout, function keys, a numeric keypad, and cursor control keys. System control keys perform such functions as displaying of windows, messages, and help requests. The 3-button mouse can be used to call up and enter commands, select menu functions, and select and mark text to be manipulated.

In addition to the 3 expansion slots, the system includes an RS-232C serial port, a Centronics parallel printer port, and an internal modem.

Included with the system are the UNIX System V, the Telephone Manager for simultaneous voice and data communications, the user interface, asynchronous communications software, remote console support, Graphic Software Systems drivers, and a diagnostics diskette. WP, business graphics, electronic mail, accounting software, the Microsoft Corporation Microsoft Multiplan and Microsoft Word, the Ashton-Tate dBASE III, and the Graphic Software Systems GSS-CHART are also available. The UNIX PC Model 7300 supports BASIC; FORTRAN; LPI-COBOL, LPI-C, and LPI-Pascal from Language Processors Inc; and Ryan-McFarland Corporation RM/COBOL.

**Competition and Pricing** The UNIX PC Model 7300 competes with the IBM Personal Computer AT and Personal Computer AT-compatible systems, such as the COMPAQ Corporation DESKPRO 286 and Kaypro Corporation 286i.

Prices for the system range from \$5,095 to \$6,095.

**Callan Data Systems**

2645 Townsgate Rd  
Westlake Village CA 91361

(800) 235-7055

**Unistar 300**

**Overview** The Unistar 300 is a floor-standing, multi-user supermicrocomputer that supports from 4 to 8 users. The system supports both diskette and Winchester disk storage as well as a streaming tape system as backup. One or two peripheral expansion modules can be added to increase disk space, perform daily backup, or act as a file server.

Service is provided by ITT Courier.

**System Design** The Unistar 300 is based on a 10MHz Motorola MC 68010 processor. A floating-point accelerator is optional. The basic configuration supports 4 users and has 512KB of main memory, expandable to 2MB; a 5.25-inch, 616KB diskette drive; a 43MB Winchester drive; and a 45MB streaming tape drive. An 8-user configuration includes 1MB of main memory, a 616KB diskette drive, two 43MB Winchester drives, and a 45MB streaming tape drive. More than 1GB of Winchester storage is provided in a maximum configuration. Memory can be increased to 2MB in 512KB and 1MB increments.

The system supports the Unistar 300/CWS Color Graphics Workstation, which is based on an 8MHz Intel 8088 processor and has from 512KB to 2MB of display RAM. The terminal has a 14-inch display with a resolution of 640 by 480 pixels and the ability to display up to 256 colors simultaneously out of a palette of 4,096 colors. The detachable low-profile keyboard has 82 keys.

Four serial ports are provided, and the system supports up to 20. One Centronics parallel port is available. A 12-slot Multibus backplane is included with 7 open slots for expansion.

The Unistar 300 operates under AT&T Bell Laboratories UNIX System V with Berkeley enhancements. Programming languages supported include BASIC, C, Ada, COBOL, FORTRAN-77, and Assembler.

**Competition and Pricing** The Unistar 300 competes with the Convergent Technologies Inc MiniFrame Plus, the Plexus Computers Inc P/35, and the TOWER 1632 from NCR Corporation.

A 4-user system with 512KB of main memory, diskette and tape storage, a 43MB disk drive, and UNIX operating system costs \$23,900.

**Charles River Data Systems Inc**983 Concord St  
Framingham MA 01701

(617) 626-1000

**Universe 2402F, 2403FT**

**Overview** The Universe 2400 family of systems use the industry-standard 32-bit bus VME and operate in an AT&T Bell Laboratories UNIX-compatible environment. The family consists of the 2402F and the 2403FT, which were announced in April 1985. The multiuser, multitasking systems are available in tower-, rack-, wall-, or table-mountable configurations. Storage is provided through diskette, disk, and tape facilities.

The systems are marketed directly by the vendor, and service is available through either the vendor or a third party.

**System Design** The Universe 2400 systems are based on a 12.5MHz Motorola MC 68000 processor. An MC 68000 processor is available in the optional Communications Controller. Memory ranges from 512KB to 10MB of RAM and can be added in 1MB, 2MB, or 4MB increments. Four kilobytes of high-speed cache memory are also provided.

The 2402F and 2403FT provide 320KB of diskette storage on 5.25-inch drives and 20MB of disk storage, expandable to 360MB. The 2403FT also includes a 45MB, 0.25-inch streaming tape drive. Terminals are available through third-party sources. The basic units include 4 serial ports, 1 of which includes a modem. Through the optional Communications Controller, 72 serial ports and 7 parallel ports are provided. The system's standard VME bus provides 12 slots on the backplane.

The Universe 2400 systems operate under the UN/ System V operating system, which is derived from UNIX System V. All Bell Laboratories and Berkeley facilities are supported. The UNOS operating system, developed by Charles River Data Systems, is also available. The system supports independent UNIX-compatible run-time and development environments. The Universe 2400 systems support C, FORTRAN-77, RM/COBOL, BASIC-11, and Pascal.

**Competition & Pricing** The Universe 2400 family competes with the Altos 3068 from Altos Computer Systems, the Callan Data Systems Unistar 300, and the Plexus Computers Inc P/15 and P/20.

The Universe 2402F basic unit costs \$9,999. The Universe 2403FT basic unit costs \$17,000.

**Charles River Data Systems Inc**983 Concord St  
Framingham MA 01701

(617) 626-1000

**Universe 68/05, 68/35**

**Overview** The Universe 68/05 and 68/35 are multiuser, multitasking microcomputers that support up to 64 users. Both systems are configured in either 7-inch-high desktop or rack-mountable enclosures and operate in an AT&T Bell Laboratories UNIX-compatible environment. A nonproprietary 32-bit Motorola VERSAbus and integral 5-slot VERSAbus backplane are standard. Storage is provided through diskette and disk facilities.

The systems are marketed directly by the vendor, and service is available through either the vendor or a third party.

**System Design** The Universe 68/05 and 68/35 are based on a 12.5MHz Motorola MC 68000 central processor. A 6.25MHz Motorola MC 68000 acts as an I/O processor. Memory ranges from 256KB to 3MB on the 68/05, with 256KB, 512KB, and 1MB increments available, and from 512KB to 3MB on the 68/35, with 512KB and 1MB increments available. 4KB of high-speed cache memory are also provided.

Both systems offer an 8-inch, double-sided, double density, 1.25MB diskette drive. The 68/05 supports 10MB to 170MB of disk storage; the 68/35 supports 35MB to 195MB. Terminals are available through third-party sources. Four serial ports are standard on each system, and up to sixty-four ports are available through an optional communications board.

The 68/05 and 68/35 operate under UNOS, a UNIX-compatible operating system developed by Charles River Data Systems. Languages supported include C, BASIC, FORTRAN, Pascal, and Assembler.

**Competition & Pricing** The Universe 68/05 and 68/35 compete with the Altos 3068 from Altos Computer Systems, the Callan Data Systems Unistar 300, and the Plexus Computers Inc P/15 and P/20.

The basic 68/05 unit with a CPU, 256KB of RAM, a diskette drive, a 10MB disk drive, and 4 serial ports costs \$15,000. A 68/35 configuration with a CPU, 1MB of RAM, a diskette drive, a 35MB disk drive, and 4 serial ports costs \$16,700.



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**Charles River Data Systems Inc**983 Concord St  
Framingham MA 01701(617) 626-1000

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**Universe 68/67T, 68/137T**

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**Overview** The Universe 68/67T and 68/137T are multiuser, multitasking microcomputers that support up to 64 users and operate in an AT&T Bell Laboratories UNIX-compatible environment. The systems can be configured in either desktop or rack-mountable enclosures. The memory capacities of the 68/67T and 68/137T make the systems well suited for multitasking time-sharing environments. A nonproprietary 32-bit Motorola VERSAbus and integral 7-slot VERSAbus backplane are standard. Storage is provided through disk and tape facilities.

The systems are marketed directly by the vendor, and service is available through either the vendor or a third party.

**System Design** The 68/67T and 68/137T are based on a 12.5MHz Motorola MC 68000 central processor. A 6.25MHz Motorola MC 68000 acts as a communications processor. Both systems support 512KB to 5MB of main memory, expandable in 512KB or 1MB increments. 4KB of high-speed cache memory are also provided.

The Universe 68/67T supports 60MB to 320MB of Winchester storage; the 68/137T supports 120MB to 360MB. Both support a 45MB, 0.25-inch streaming cartridge tape drive as backup. Terminals are available through third-party sources. Four serial ports are standard, and optional communications boards enable expansion to 64 serial ports and 7 parallel ports.

The 68/67T and 68/137T systems operate under UNOS and UN/System V operating systems. Both are UNIX compatible. UNOS, developed by Charles River Data Systems, supports independent UNIX-compatible run-time and development environments. UN/System V provides all popular UNIX tools along with Berkeley enhancements.

**Competition & Pricing** The Universe 68/67T and 68/137T compete with the Altos 3068 from Altos Computer Systems, the Callan Data Systems Unistar 300, and the Plexus Computers Inc P/15 and P/20.

A 68/67T configuration with 1MB of RAM, 60MB of disk storage, a 45MB cartridge tape drive, and 4 serial ports costs \$26,700. The 68/137T with 1MB of RAM, 120MB of disk storage, a 45MB cartridge tape drive, and 4 serial ports costs \$28,700.

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**Convergent Technologies Inc**Data Systems Div  
30 East Plumeria St  
San Jose CA 95134(408) 945-8877

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**MiniFrame 1, MiniFrame Plus**

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**Overview** The MiniFrame systems are multiuser, multitasking systems that support up to 16 users in an AT&T Bell Laboratories UNIX-compatible environment. Both systems are floor-standing models with optional terminals available. Storage facilities include diskette, Winchester disk, and tape drives, depending on the configuration.

Convergent Technologies markets the MiniFrame systems strictly to OEMs, VARs, and systems houses.

**System Design** Both the MiniFrame 1 and MiniFrame Plus are based on a 10MHz Motorola MC 68010 processor. Memory ranges from 512KB to 2MB and is expandable in 512KB increments. The MiniFrame 1 supports one 5.25-inch, 640KB diskette drive and one 26MB, 50MB, or 85MB Winchester disk drive. The MiniFrame Plus supports two 50MB or 85MB Winchester disk drives and a .25-inch, 55MB streaming tape drive.

Convergent Technologies offers the PT and GT intelligent terminals for the MiniFrame systems. The PT terminal is based on an Intel 8088 processor and includes 64KB of RAM, an RS-422 port for communicating with the MiniFrame system, and an RS-232 printer port. The GT terminal is a graphics display based on an Intel 80186 processor. It includes 128KB of RAM, 8KB of ROM, an RS-422 port, and dual RS-232 printer ports. Both terminals have 12-inch displays with 98-key keyboards.

Up to 10 RS-232 ports are available through optional expansion boards. An Ethernet expansion module is also available for networking MiniFrame systems.

The MiniFrame systems operate under the CTIX Operating System developed by Convergent Technologies. CTIX is a virtual memory version of the UNIX System V operating system. Programming languages supported include BASIC, COBOL, C, FORTRAN-77, and Pascal. Data management facilities as well as WP, financial spreadsheet, and electronic mail applications are available.

**Competition & Pricing** The MiniFrame systems compete with Altos 3068 from Altos Computers, the AT&T Information Systems 3B2/300, the Digital Equipment Corporation MicroVAX II, and the NCR Corporation TOWER series.

The MiniFrame 1 costs about \$5,000. The MiniFrame Plus costs from \$8,000 to \$14,000, depending on the configuration.

**Data General**4400 Computer Dr  
Westboro MA 01581

(617) 366-8911

**DESKTOP GENERATION Series**

**Overview** Data General announced the DESKTOP GENERATION Series of professional desktop microcomputers in July 1983. The series is marketed as commercial multiuser computers or as part of Data General's distributed DP or Comprehensive Electronic Office (CEO) office automation systems. The Series includes Models 10, 10/SP, 20, 30, and 45.

Software for the DESKTOP GENERATION Series includes various operating systems, programming languages, and data communications and applications software.

Data General provides both hardware and software service options for the computers.

**System Design** Models 10 and 10/SP include a Data General microECLIPSE and Intel 8086 microprocessor. The microECLIPSE processor controls all I/O operations and executes Data General operating systems and languages. The 8086 processor performs MS-DOS- and CP/M-86-based applications. Models 20 and 30 are microECLIPSE based; Model 30 features a floating-point hardware card. Model 45 is based on the Motorola MC 68000 and the microECLIPSE processors.

Models 10 and 10/SP run under Microsoft MS-DOS, Digital Research CP/M-86, or Data General AOS or RDOS operating systems; the systems can run CP/M-86 or MS-DOS concurrently with AOS or RDOS. Models 20 and 30 support RDOS and AOS. Model 45 runs DESKTOP/UX. Languages supported on the systems include FORTRAN-77, COBOL, Business BASIC, and Pascal. Myriad application packages are available for the series.

Data communications systems supported by the series include the Data General XODIAC network and IBM X.25, HASP, RJE 80, and 3270.

The entry-level, dual-processor Model 10 features 128KB to 1.75MB of main memory; Model 10/SP, 256KB to 1.75 MB; Model 20, 256KB to 2MB; and Model 30, 512KB to 2MB. Storage for the systems includes one or two 368KB diskettes, one or two Winchester disks for a maximum total capacity of 142MB, and an 18MB cartridge tape.

**Competition & Pricing** Among DESKTOP GENERATION Series competitors are the Altos Computer Systems Altos 586, Victor 9000, Burroughs Corporation B 25, and Honeywell Information Systems Inc micro-Systems 6/10 and 6/20.

Model	Price \$
10	11,705
10/SP	4,200-13,955
20	8,520-18,770
30	11,570-21,820
40	11,845

**Digital Equipment Corp**146 Main St  
Maynard MA 01754

(617) 897-5111

**MicroVAX I**

**Overview** The MicroVAX I offers VAX minicomputer architecture in a 32-bit microcomputer system. It is software compatible with larger VAX systems and is well suited for real-time applications, office automation, and general-purpose programming. The system is configured as a desktop, rack-mounted, or floor-standing unit. Up to 12 users are supported in a multitasking environment. Diskette and Winchester storage facilities are offered.

The MicroVAX I is available through the vendor as well as through dealers and OEMs.

**System Design** The MicroVAX I CPU consists of 2 modules that are inserted into the Q-bus backplane. The first board is a memory management and cache memory module. The second is the CPU module, which provides the 32-bit data path, microsequencer, and control store. The system processor is a Digital Equipment KD 32. Memory ranges from 512KB to 4MB and is expandable in 256KB, 512KB, and 1MB increments. Two 5.25-inch, 400KB diskette drives and one 11MB or 31MB Winchester drive are supported.

The MicroVAX I supports a 12-inch monochrome CRT with a detachable 83-key keyboard.

The Q-bus backplane includes 8 slots, 5 of which are available for expansion. Communications supported include TTY, IBM Corporation 2780/3780, and SNA protocols. Other features include support of X.25, DecNet, and Ethernet networks.

MicroVAX I operates under MicroVMS, VAXELN, or ULTRIX-32 operating systems. ULTRIX-32 is an AT&T Bell Laboratories UNIX-compatible system. Programming languages supported include APL, BASIC, COBOL, C, FORTRAN, and Pascal.

**Competition & Pricing** The MicroVAX I, like the new IBM System/36 PC, reflects a logical path for minicomputer vendors to take: implementation of a popular minicomputer architecture on a microcomputer system. Few vendors have this advantage.

The system costs about \$10,000.



**Digital Equipment Corp**

146 Main St  
Maynard MA 01754

(617) 897-5111

**MicroVAX II**

**Overview** Unveiled in May 1985, the MicroVAX II 32-bit supermicrocomputer is a single-chip implementation of the VAX minicomputer architecture. The system delivers nearly all the processing power of the VAX-11/780 CPU and is software compatible with larger VAX systems. It is well suited for applications that require manipulation of large amounts of data. The system is configured as a floor-standing unit. Up to 30 users are supported in a multitasking environment. Diskette, Winchester disk, and tape storage facilities are offered.

The MicroVAX II is available through the vendor as well as through dealers and OEMs.

**System Design** The MicroVAX II is based on a Digital Equipment MicroVAX 78032 processor. The system also includes a MicroVAX 78132 floating-point coprocessor. Memory ranges from 1MB to 9MB and is expandable in 1MB, 2MB, and 4MB increments. One internal 10MB, 31MB, or 71MB Winchester drive and one external drive are supported. Either two 5.25-inch, 400KB diskette drives or a 95MB streaming tape drive is featured.

The system supports a 12-inch monochrome CRT with a detachable 83-key keyboard.

The MicroVAX II is available in 2 packaged configurations. One features an 8-slot Q-bus backplane and the other a 12-slot backplane. Communications supported include TTY, IBM Corporation 2780/3780, and SNA protocols. In addition, X.25, DecNet, and Ethernet networks are supported.

The system operates under MicroVMS, VAXELN, or ULTRIX-32m operating systems. ULTRIX-32m is an AT&T Bell Laboratories UNIX-compatible system. Programming languages supported include APL, BASIC, COBOL, C, FORTRAN, and Pascal. Applications available include WP, electronic mail, and office management.

**Competition & Pricing** Like the MicroVAX I, the MicroVAX II features a minicomputer architecture implementation on a microcomputer system. IBM has entered this area with the recent introduction of the System/36 PC. Few other vendors have this avenue of entry into the microcomputer market.

The MicroVAX II costs from \$18,840 to \$43,000.

**IBM Corp**

1133 Westchester Ave  
White Plains NY 10604

(914) 696-1900

**System/36 PC**

**Overview** The long-awaited System/36 PC was announced in June 1985. It consists of the new 5364 System Unit and a directly attached IBM Personal Computer (PC), PC XT, or PC AT. The System/36 PC can act as a system console, System/36 workstation, or standalone PC. The new system unit is available as a desktop or floor-standing configuration. The System/36 PC supports up to 4 local and 64 remote workstations in a multitasking environment.

The System/36 PC will be marketed through IBM's National Accounts, National Marketing, and National Distribution divisions. The distribution channels include selected value-added dealers and IBM Product Centers. The System/36 PC is the only System/36 processor available through retail channels.

**System Design** The 5364 System Unit features a multiprocessor architecture. The main-storage processor contains 256KB of main memory, expandable to 512KB. Working with this processor is a control-storage processor that provides the microcoded control function for I/O processors and interfaces. A 5.25-inch, 40MB disk drive is standard; a second drive is optional. A 5.25-inch, 1.2MB diskette drive is also standard.

A System/36 PC configuration must include a directly attached PC and a systems printer. The remaining 2 slots can be used for attachment of PCs, System/36 workstations, PC printers, and System/36 printers in any combination. The directly attached PC must have at least 256KB of main storage but not more than 512KB.

The 5364 supports a single communications line interface for either BSC or SDLC protocols, provided through the directly attached PC.

The System/36 PC operates under the System Support Program (SSP). All IBM and third-party application programs written for the System/36 and the PC are supported. IBM has released lower-priced versions of its Business Management Accounting System (BMAS) and Business Report/Application Development System (BRADS).

**Competition & Pricing** IBM has entered a new arena with the System/36 PC. In system design and configuration, the system is unlike any other on the market. However, Digital Equipment Corporation has accomplished the implementation of a popular minicomputer architecture on a microcomputer with its MicroVAX systems.

The System/36 PC with 256KB of RAM and a 40MB disk drive costs \$5,995. The same system with 80MB of disk storage costs \$8,090. SSP has a one-time charge per release of \$995.

**Intel**

3065 Bowers Ave  
Santa Clara CA 95051

(408) 987-8080

**286/310**

**Overview** The 286/310 is a multiuser, multitasking microcomputer ideal for commercial and technical markets. The system is Multibus-based and AT&T Bell Laboratories UNIX compatible and can be configured as a desktop, rack-mounted, or floor-standing system. The 286/310 is available in 4 models, the 286/310-4, 286/310-17, 286/310-40, and 286/310-41. The models differ in memory, storage, and expansion capabilities. Diskette and Winchester storage facilities are available.

Intel markets the 286/310 to OEMs, VARs, and systems houses through its applications engineering organization.

**System Design** The 286/310 is based on a 6MHz Intel 80286 processor. A 4MHz Intel 80287 numeric coprocessor is also included. Memory ranges from 512KB to 4MB on the 286/310-4 and 286/310-17 and from 1MB to 4MB on the 286/310-40 and 286/310-41. All models except the 286/310-4 include a 5.25-inch, 320KB diskette drive and either a 19MB or a 40MB Winchester drive. The 286/310-4 does not support a Winchester drive.

Terminals are available through third-party sources.

Models 286/310-4, 286/310-17, and 286/310-40 include 2 RS-232 ports and 1 Centronics port. The 286/310-41 features 10 RS-232 ports and 1 Centronics port. For expansion, the systems are configured with Multibus expansion slots. The 286/310-4 has 5 slots, the 286/310-17 and 286/310-40 have 4 slots, and the 286/310-41 has 3 slots.

The 286/310 systems are supported by XENIX and MS-DOS operating systems from Microsoft Corporation as well as by Intel's iRMX operating system. Programming languages supported include COBOL, C, PL/M, FORTRAN, and Pascal.

**Competition & Pricing** The 286/310 competes with the Altos 2086 from Altos Computer Systems and the CompuPro 816/F from VIASYN.

The system costs about \$16,500.

**Intel**

3065 Bowers Ave  
Santa Clara CA 95051

(408) 987-8080

**86/310x**

**Overview** The 86/310x is a multiuser, multitasking system well suited for commercial and technical applications. The 86/310x, which operates in the AT&T Bell Laboratories UNIX environment, can be configured as a desktop, rack-mounted, or floor-standing system. The system is available in 5 models, the 86/310-1; 86/310-2 and 86/310-2A; and 86/310-3 and 86/310-3A. The models differ in memory and storage capabilities. Diskette and Winchester storage facilities are supported.

The 86/310x is marketed to OEMs, VARs, and systems houses through Intel's applications engineering organization.

**System Design** The 86/310x is based on a 5MHz Intel 8086 processor. A 5MHz 8087 numeric coprocessor is included in all models except the 86/310-1. Memory ranges from 128KB to 896KB on the 86/310-1; 256KB to 896KB on the 86/310-2 and 86/310-2A; and 640KB to 896KB on the 86/310-3 and 86/310-3A. All models support a 5.25-inch, 320KB diskette drive. The 86/310-2 and 86/310-3 support a 12MB Winchester drive; the 86/310-2A and 86/310-3A provide 19MB of Winchester storage.

Terminals are available through third-party sources.

Each model includes 1 RS-232 and 1 Centronics parallel port. For expansion, the systems are configured with Multibus expansion slots. The 86/310-1 includes 6 slots, the 86/310-2 and 86/310-2A include 5 slots, and the 86/310-3 and 86/310-3A include 4 slots.

The systems are supported by XENIX and MS-DOS operating systems from Microsoft Corporation as well as by Intel's iRMX operating system. Programming languages supported include COBOL, C, PL/M, FORTRAN, and Pascal.

**Competition & Pricing** The 86/310x competes with the Altos 586 from Altos Computer Systems and the Data General Corporation DESKTOP GENERATION series.

Prices for the 86/310x models range from \$4,995 to \$9,500.



**Intertec**

2300 Broad River Rd  
Columbia SC 29210

(803) 798-9100

**HeadStart ATS**

**Overview** Introduced in March 1985, the HeadStart ATS is a multitasking system that can be configured as a workstation in a multiuser network. It is designed as a desktop unit but can be easily transported with a carrying handle and has an optional portable keyboard that snaps on over the display screen. The HeadStart ATS is IBM Personal Computer compatible and can be networked with other HeadStart ATS systems and IBM Personal Computers via the Intertec MultiLan network. Intertec markets and supports the HeadStart ATS through a network of independent dealers and OEMs.

**System Design** The HeadStart ATS is available in 2 models. The ATS-86 is based on the 16-bit Intel 8086 central processor; the ATS-286 is based on the 16-bit Intel 80286 central processor. Both models have 256KB of memory, expandable to 3MB. As a single-user workstation, the HeadStart can also be equipped with 2 optional 360KB, 5-1/4-inch, double-sided, double-density diskette drives. The 12-inch-diagonal CRT supports a 25-line-by-80-character format and a resolution of 640 by 200 pixels. The standard keyboard has 104 keys, including 4 cursor control and 18 programmable function keys, and a 10-key numeric keypad. The portable keyboard has 70 keys and an embedded numeric keypad.

The system unit has 1 available expansion slot that can only be used for memory expansion. Also included are an RS-449/RS-232C serial port, a Centronics-compatible parallel port, a data bus interface to attach a diskette drive, and the network interface for connection to the MultiLan network.

The MultiLan network consists of the HeadStart MultiLan Storage System (MSS), which has an Intel 80186 processor and 25MB to 725MB of Winchester disk storage. The PCN-255 network adapter card enables connection of IBM Personal Computers in MultiLan.

The HeadStart ATS runs the MS-DOS operating system modified to enable IBM PC DOS compatibility. HeadStart MultiLan DOS supports up to 255 users.

**Competition & Pricing** The HeadStart ATS competes with the IBM Personal Computer line and other multiuser systems such as the Altos 586 from Altos Computer Systems.

Pricing is as follows:

Model	Price \$
HeadStart ATS-86	1,995
HeadStart ATS-286	2,495
5-1/4-in. diskette drive	595
25MB MultiLan Storage System	2,495
50MB MultiLan Storage System	6,995
225MB MultiLan Storage System	8,995

**Isotron**

140 Sherman St  
Fairfield CT 06430

(203) 255-7443

**OSI 720**

**Overview** The Isotron OSI 720 is an AT&T Bell Laboratories UNIX- and XENIX-compatible Ohio Scientific multiuser microcomputer offering real-time processing. The system supports a Winchester drive and an optional magnetic tape drive. The OSI 720, through its multiprocessor architecture, solves the common problem of reduced speed found on UNIX-based machines when the number of users is increased. The system supports up to 32 users.

The OSI 720, which was announced in May 1985, is a floor-standing model.

**System Design** The OSI 720 uses 3 microprocessors: a Motorola 68010 or 68020, a Motorola 68000, and a Motorola 68008 coprocessor. The 68010 system processor, includes from 512KB to 2MB of main memory. The 68020 system processor includes 2MB of main memory and will be available in the first quarter of 1986. The 68000 block-oriented I/O processor includes 256KB of main memory. The 68008, a character-oriented I/O processor, includes from 128KB to 256KB of main memory, 14 asynchronous ports, 2 synchronous/asynchronous serial ports, and 1 Centronics port. Additional 68010 system processors, as well as floating-point and array processors, can be added. The addition of processors is limited by the number of slots available. Each system processor supports up to 16MB of main memory.

The system supports 5.25-inch, double-sided, double-density, IBM-compatible diskette drives and from 50MB to 150MB of Winchester storage. An optional 4-track, 0.25-inch magnetic tape cartridge is available for additional memory backup. Any third-party ANSI terminal can be supported. OSI 720 is compatible with the OSI 710 as well as with minicomputers and mainframes through IBM 3270 BSC/SNA, 2780/3780, 3770, and Univac UTS 400 protocols.

Ohio Scientific's RTIX operating system is the standard operating system on the OSI 720. XENIX from Microsoft Corporation and Uniplus+ System V from Unisoft Corporation are optional. The system is bundled with 2 software packages, Uniplex II from Redwood Software, and MIMER from Isotron. Uniplex II is an integrated package that includes a relational data base, a spreadsheet, a word processor, menu and screen builders, a print spooler, and IBM-compatible electronic mail programs. MIMER is a relational DBMS that supports an optional program generator. Languages include Ohio Scientific BASIC and Pascal, C, APL, COBOL, FORTRAN-77, and Assembler.

**Competition & Pricing** The system competes with the Alpha Micro AM-1000E and AM-1000X, the Charles River Data Systems Inc Universe systems, and IBC systems.

The system costs \$14,000.





**Kaypro Corp**

533 Stevens Ave  
Solana Beach CA 92075

(619) 481-4300

**286i**

**Overview** Announced in February 1985, the Kaypro 286i is a multiuser, multitasking desktop microcomputer compatible with the IBM Personal Computer AT. The system is based on an Intel 80286 processor. Storage is provided through high-density diskette drives. The 286i is available through independent dealers.

**System Design** The 286i is based on a 6MHz Intel 80286 microprocessor and has an additional socket available for an Intel 80287 math coprocessor that provides support for engineering and scientific applications. System memory ranges from 512KB to 640KB on the main board and can be increased to 15MB through expansion boards. Two 5.25-inch, 1.2MB, double-sided, high-density diskette drives are supported.

An optional 14-inch black-and-white monochrome CRT is available. A color graphics card with RGB output is standard and supports a screen resolution of 640 by 200 pixels. The layout of the detachable keyboard is identical to that of the IBM Personal Computer AT keyboard. The keyboard has 84 keys and an integral keypad. The system has 8 I/O expansion slots, 5 of which are available for such system options as memory boards and workstations. Two parallel ports and one serial port are standard.

The 286i operates under Microsoft Corporation's MS-DOS operating system. The system is bundled with software from MicroPro International, including WordStar, Mailmerge, InfoStar Plus, CalcStar, and Tutors and Lessons. GW-BASIC from Microsoft Corporation is also bundled with the system.

**Competition & Pricing** The 286i competes with the IBM Personal Computer AT, the AT&T Information Systems UNIX PC Model 7300, the COMPAQ Computer DESKPRO 286, and the Texas Instruments Business-Pro.

The 286i costs \$4,550.

**NCR Corp**

1700 S Patterson Blvd  
Dayton OH 45479

(513) 445-2075

**MiniTOWER**

**Overview** Released in April 1985, the MiniTOWER system is a multiuser, multitasking microcomputer that supports up to 8 users and operates in an AT&T Bell Laboratories UNIX-compatible environment. This floor-standing system is software compatible with all NCR TOWER systems. Winchester disk storage and either diskette or tape facilities are supported on the MiniTOWER.

NCR will market the MiniTOWER through its direct marketing organization to the end user and through its OEM Systems Division to distributors, dealers, and VARs.

**System Design** The MiniTOWER is based on a 10MHz Motorola MC 68010, which is housed in the Processor Memory Controller (PMC). The PMC provides 64KB of ROM and 2 RS-232C communications channels. From 512KB to 2MB of main memory, expandable in 512KB increments, are supported. Either two 5.25-inch, 1MB diskette drives or one 5.25-inch, 45MB cartridge tape drive is supported. The system supports one 5.25-inch, 25MB or 46MB Winchester disk drive.

The MiniTOWER supports NCR model 7900, 7901, 7910, and 7930 terminals.

One IEEE-796 Standard Multibus is provided for connecting the PMC and up to 3 Multibus-compatible controllers. An I/O controller with 8 RS-232C ports for connecting nonintelligent terminals and printers is available. A serial I/O controller with a 10MHz Motorola MC 68010 processor, 128KB of RAM, 8 RS-232C ports, and 1 Centronics-type parallel port is also available. A communications controller supporting BSC, SNA/SDLC, and X.25 protocols is also offered.

The MiniTOWER runs under the TOWER Operating System V, Release 3.0, derived from UNIX System V. Programming languages supported include BASIC, C, FORTRAN, Pascal, Micro Focus COBOL, and SVS BASIC.

**Competition & Pricing** The NCR MiniTOWER competes with the Convergent Technologies Inc Mini-Frame systems, the Perkin-Elmer 7350A, and the Plexus Computers Inc P/15.

A MiniTOWER configuration with 512KB of main memory, a 1MB diskette drive, a 25MB disk drive, and an I/O controller costs \$6,995.



**NCR Corp**

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Dayton OH 45479

(513) 445-2075

**PC8**

**Overview** Announced in April 1985, the PC8 computer can be used as a standalone unit; a multiuser, multitasking system; or a network file server. The PC8 is IBM Personal Computer AT compatible. Configured as a floor-standing unit, the system provides support for 16 users. When utilizing NCR's personal computer network, the PC8 can connect 63 personal computers. Diskette and disk storage facilities are supported.

The PC8 will be sold through NCR's personal computer dealers, VARs, and a direct sales force. The business and professional markets will be targeted.

**System Design** The PC8 is based on a 6MHz, 16-bit Intel 80286 processor. An optional 16-bit Intel 80287 arithmetic coprocessor is available. Memory ranges from 256KB to 4MB and is expandable in 128KB, and 1MB increments. Up to 640MB can be provided on the main board. Diskette storage is available in 5.25-inch, 1.2MB drives; disk storage is provided in 5.25-inch, 20MB drives. Systems can be configured with 1 or 2 diskette drives, 1 diskette and 1 disk, or 2 diskettes and 1 disk.

An optional 15-inch monochrome CRT and 14-inch color CRT with 16-color capability are supported. The keyboard has 30 programmable function keys and separate cursor and numeric keypads.

Eight IBM-compatible expansion slots are standard. An RS-232C interface and parallel printer interface are included with the PC8 enhanced system configuration.

The NCR-DOS 3.1 single-user operating system is standard on the PC8. The system also supports the XENIX operating system from Microsoft Corporation for multiuser, multitasking operations. GW-BASIC, also developed by Microsoft Corporation, is standard on the PC8.

**Competition & Pricing** The PC8 competes with the Alpha Micro AM-680 Series ELS, the AT&T Information Systems UNIX PC Model 7300, and the Kaypro Corporation 286i as well as the IBM Personal Computer AT.

The PC8 is sold in basic and enhanced system configurations. The basic system has 256KB of RAM, a 1.2MB diskette drive, a keyboard, and NCR-DOS and GW-BASIC software and costs \$3,795. The enhanced system features 512KB of RAM, a 1.2MB diskette drive, a 20MB disk drive, a keyboard, an RS-232C interface, a parallel printer interface, and NCR-DOS and GW-BASIC software and costs \$5,505.

**NCR Corp**

1700 S Patterson Blvd  
Dayton OH 45479

(513) 445-2075

**TOWER XP**

**Overview** The TOWER XP, announced in October 1984, is a high-performance version of the TOWER 1632. The higher-level processors and increased I/O capabilities of the TOWER XP are the major differences between the two systems. The TOWER XP is a floor-standing unit that supports up to 16 users in an AT&T Bell Laboratories UNIX-compatible environment. Diskette, disk, and tape facilities are available.

The system is marketed to resellers by NCR's OEM Systems Division and to major customers by the Special Purpose systems Division.

**System Design** The TOWER XP is based on a 10MHz Motorola MC 68010 processor, which is housed in the Processor Memory Controller (PMC) along with 2KB of cache memory and 2 RS-232C ports. The maximum system memory is 8MB, available in 2MB and 4MB modules that use 256KB chips. Only 2 memory modules are supported on the TOWER XP. One or two 5.25-inch, 1MB diskette drives; one or two 5.25-inch, 46MB disk drives; and one 0.25-inch, 45MB cartridge tape drive are supported.

The TOWER XP supports NCR model 7900, 7901, 7910, and 7930 terminals.

An IEEE-796 Standard Multibus with 7 slots is standard on the TOWER XP. A serial I/O controller with a 10MHz Motorola MC 68010 processor, 128KB of RAM, and a UNIX TTY subsystem provides 8 serial ports and 1 parallel port. A communications controller supporting IBM 2780/3780, TTY, and BSC protocols is also available.

The TOWER XP runs on the TOWER Operating System V, derived from UNIX System V. Programming languages supported include BASIC, C, FORTRAN, Pascal, Micro Focus COBOL, and SVS BASIC.

**Competition & Pricing** The TOWER XP competes with the Altos Computer Systems 2086 and 3068, the Convergent Technologies Inc MiniFrame systems, and the Plexus Computers Inc P/20.

The TOWER XP with 1MB of RAM, a 1MB diskette drive, a 46MB disk drive, and a 45MB cartridge tape drive costs \$19,495.

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**North Star Computers**

14440 Catalina St  
San Leandro CA 94577

(415) 357-8500

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**DIMENSION**


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**Overview** Announced in the fall of 1983, the North Star DIMENSION is an IBM Personal Computer-compatible desktop microcomputer. This multiuser, multitasking system supports up to 12 users. DIMENSION features a main server processor as well as a processor in each workstation. North Star's operating system, NS-DOS, uses the memory provided by the main server as cache memory to increase the system's processing performance.

The system provides storage through diskette and Winchester drives and a tape backup. Marketing channels include dealers, distributors, and OEMs.

**System Design** The central server in the DIMENSION system is based on a 6MHz, 16-bit Intel 80186 processor that includes 256KB of main memory, expandable to 512KB. In addition, each workstation is based on a 7MHz Intel 8088-2 processor. The memory capacity of each workstation is 128KB to 384KB. DIMENSION supports two 5.25-inch, 360KB diskette drives and two Winchester disk drives with capacities of either 15MB or 30MB each. An optional 45MB tape system is available for backup storage.

The DIMENSION workstation is an ergonomic 12-inch monochrome CRT with a 25-line-by-80-character text display. Screen resolution is 640 by 400 pixels when the system is operating in high-resolution mode and 640 by 200 pixels when it is operating in IBM-compatible graphics mode. The system can display characters and graphics simultaneously. The detachable keyboard is IBM compatible.

DIMENSION has an IBM-compatible bus with 13 slots available for workstations and IBM add-in boards. An RS-232 serial port, a multiprotocol serial port, and a Centronics parallel port are standard. Each workstation provides a local RS-232 serial port. Communications is provided through optional IBM 2780/3780, 3270 BSC, and 3270/3770 SDLC/SNA protocols.

DIMENSION operates under North Star's NS-DOS 1.1 operating system, which is compatible with MS-DOS from Microsoft Corporation. Programming languages supported include BASIC, FORTRAN, COBOL, and Pascal.

**Competition & Pricing** The DIMENSION competes with the IBM Personal Computer, the Corona Data Systems MEGA PC, and the Future Computer FX Series.

DIMENSION is priced at \$7,350 for a 2-user system with 128KB of RAM per workstation, a 360KB diskette drive, and a 15MB Winchester drive. Additional workstations are \$1,500 each.

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**Perkin-Elmer**

Data Systems Group  
2 Crescent Pl  
Oceanport NJ 07757

(201) 870-4712

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**7350A Supermicro**


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**Overview** The 7350A Supermicro is a desktop or floor-standing computer that supports up to 5 users, runs both business and technical applications, and offers optional graphics hardware and software.

The system is centered around a Motorola MC 68000 processor and Unisoft Corporation's Uniplus+, an AT&T Bell Laboratories UNIX-compatible operating system. Integral diskette and Winchester drives are offered, and a streaming cartridge tape is optional.

The system was announced in December 1984 and is marketed primarily through OEMs and VARs.

**System Design** The 7350A is based on a 32-bit, 8MHz Motorola MC 68000 processor. A basic configuration includes 512KB of RAM, expandable to 3MB with 512KB or 1MB expansion boards; a 320KB diskette drive; and a 15MB or 40MB Winchester drive.

The 7350A supports the Perkin-Elmer PE 6100 Conversational and PE 6312 Editing terminals as well as monochrome and color graphics monitors. The 12-inch green monochrome CRT and 15-inch green or amber monochrome CRT both have a screen resolution of 720 by 256 pixels. The 13-inch color monitor has a resolution of 720 by 300 pixels and displays 16 colors simultaneously from a 27-color palette. The keyboard is ergonomic and has a full ASCII character set, 16 user-definable function keys, cursor and system control keys, a numeric keypad, and 8 soft keys.

A parallel port is standard. I/O capabilities are provided through 4 RS-232C ports with software-selectable speeds of 300 to 9,600 bits per second. An Ethernet interface and IEEE-488 bus are optional. The standard operating system for the 7350A is Uniplus+. Available as a single- or multiuser package, UNIX extensions include text processing capabilities and a C program development facility including a compiler and associated utilities. Additional programming languages include Ryan McFarland Corporation's RM/COBOL, Software Ireland's SIBOL, FORTRAN-77, and BASIC-PLUS from Silicon Valley Software. Data base programs include a personal and a relational DBMS. A spreadsheet and word processor as well as C- and FORTRAN-callable graphics libraries are also available.

**Competition & Pricing** The 7350A competes with the AT&T Information Systems 3B2/300, the Altos Computer Systems Altos 586 and 986, the Convergent Technologies Inc MiniFrame Plus, the IBM Personal Computer AT, and the NCR Corporation MiniTOWER.

A basic system starts at \$5,115.



**Plexus Computers Inc**

3833 N First St  
San Jose CA 95134

(408) 943-9433

**P/15**

**Overview** In November 1984, Plexus introduced the P/15, an entry-level AT&T Bell Laboratories UNIX-based supermicrocomputer that supports up to 8 users and is fully compatible with other Plexus systems. The system supports up to 2MB of RAM, 76MB of disk storage, and a diskette drive. The P/15 is marketed through VARs and OEMs. Maintenance and support are provided by Plexus Computers.

**System Design** The P/15 is based on the 32-bit Motorola MC 68010 CPU; a second MC 68010 handles I/O functions. Both processors run at 10MHz. A base configuration includes 512KB of RAM, expandable to 2MB in 512KB increments. The system can also be configured with one 12MB, 24MB, 28MB, 49MB, or 76MB Winchester disk drive. The 5.25-inch, double-sided, double-density diskette drive is standard but can be replaced with a 45MB cartridge tape. Terminals are available through third-party sources.

The P/15 features 8 RS-232C serial ports for support of both synchronous and asynchronous communications. Eight expansion slots are standard.

The P/15 runs the AT&T Bell Laboratories UNIX System 5.2. It also supports COBOL, C, Pascal, BASIC, and FORTRAN.

**Competition & Pricing** The P/15 competes with the NCR Corporation TOWER series and the Convergent Technologies Inc MiniFrame.

The P/15 costs \$8,950.

**Plexus Computers Inc**

3833 N First St  
San Jose CA 95134

(408) 943-9433

**P/20**

**Overview** Announced in June 1985, the P/20 features dual microprocessors and supports up to 16 users in an AT&T Bell Laboratories UNIX-compatible environment. The system is best suited for office automation, transaction processing, and industrial applications. The P/20 is a floor-standing model with diskette, Winchester disk, and tape storage facilities available.

The P/20 is available through VARs and OEMs. The system's modular design enables easy service and repairs.

**System Design** The P/20 is based on dual 10MHz Motorola MC 68010 processors with one acting as the job processor and the other as the I/O processor. Up to 2MB of main memory and 152MB of Winchester storage on 2 drives is supported. A 5.25-inch, 640KB diskette drive and 45MB streaming cartridge drive are also supported. Terminals are available through third-party sources.

The P/20 provides 8 RS-232C serial ports as standard. An optional communications subsystem provides 8 additional RS-232C ports and 1 Centronics-type parallel port.

The P/20 operates under the Sys5.2 run-time operating system, the Plexus implementation of UNIX System V. Languages supported include C, COBOL, BASIC, FORTRAN, and Pascal.

**Competition & Pricing** Competing systems include the Convergent Technologies Inc MiniFrame Plus and the NCR Corporation TOWER series.

An 8-user system with 512KB of main memory, a 24MB Winchester disk, and diskette storage costs \$10,950.

**Tandy Corp**

1800 One Tandy Center  
Fort Worth TX 76102

(817) 390-3700

**Tandy 6000**

**Overview** Announced in February 1985, the Tandy 6000 is a single- or multiuser, multitasking system that is software compatible with the Tandy Model 12. It is geared toward the small business environment and supports up to 6 users.

The system supports both internal and external diskette and disk storage. The Tandy 6000 is available through Radio Shack retail outlets.

**System Design** The Tandy 6000 is based on an 8MHz, 16- or 32-bit Motorola MC 68000 system processor and a 4MHz, 8-bit Zilog Z80A I/O processor. Main memory ranges from 512KB to 1MB and is added in 512KB increments. The Tandy 6000 is configured with either 2 internal 8-inch, 1.25MB, double-sided, double-density diskette drives or 1 diskette drive and one 35MB disk drive. External storage expansion includes up to 2 diskette drives and 4 disk drives.

A 12-inch-diagonal green monochrome CRT display is standard on the 6000. The text display size is 24 lines of 40 or 80 characters each. The detachable keyboard has 82 keys with 8 function keys and an integral numeric keypad.

Two RS-232C serial ports and a parallel port are standard on the 6000. An optional RS-232C card allows the system to support up to 6 users. An internal modem is also available.

The XENIX operating system from Microsoft Corporation provides the Tandy 6000 with multiuser capabilities. Languages supported include BASIC, COBOL, FORTRAN, and Pascal. Optional communications software supports IBM Corporation 3270 and 3780 terminal emulation on the Tandy 6000. In addition, all software available for the Tandy Model 12 runs on the 6000.

**Competition & Pricing** The Tandy 6000 competes with the Alpha Micro AM-1000E, the NCR Corporation MiniTOWER, and the 7350A Supermicro from Perkin-Elmer.

A basic system with 512KB of main memory and dual diskette drives costs \$4,499. The Tandy 6000 with 512KB of main memory, 1 internal diskette drive and 1 internal disk drive, 2 data terminals, and the XENIX operating system costs \$7,089.

**Wicat Systems**

PO Box 539  
1875 S State  
Orem UT 84058

(801) 224-6400

**System 150**

**Overview** The System 150 workstation can operate as a dedicated personal computer in a small business or as a node within a network. The system is configured as a desktop unit and runs in an AT&T Bell Laboratories UNIX-compatible environment. Up to 8 users and multitasking operations are supported. An optional graphics version is offered. Storage facilities include diskette, Winchester disk, and cartridge tape.

Wicat systems are available through a direct sales force as well as dealers and distributors. The vendor offers numerous maintenance programs.

**System Design** The System 150 is based on an 8MHz Motorola MC 68000L8 processor. Memory ranges from 512KB to 1.5MB and is expandable in 512KB increments. 16KB to 32KB of ROM are supported. A 5.25-inch, 630KB diskette drive and a 5.25-inch, 10MB or 39MB Winchester disk drive are built into the system. An optional cartridge tape drive is available.

The terminal is a 12-inch-diagonal green monochrome CRT with a 25-line-by-80-column text display. The detachable keyboard has 82 keys and an integral numeric pad.

From 2 to 8 RS-232C serial interfaces and one 16-bit parallel printer port are offered.

The System 150 operates under the WICAT Multiuser Control System (WMCS), a multiuser, multitasking operating system. Unisoft Corporation UniPlus+, a UNIX System V-compatible operating system, is also offered. W-BASIC, C, COBOL, Pascal, Assembler, and APL.68000 from The Computer Company are supported. Applications include WP, electronic spreadsheets, and a relational DBMS.

**Competition & Pricing** The System 150 competes with the MiniTOWER from NCR Corporation, the Plexus Computer Inc P/15, and the Tandy Corporation 6000.

The System 150 costs about \$11,000.



**Wicat Systems**

PO Box 539  
1875 S State  
Orem UT 84058

(801) 224-6400

**System 160**

**Overview** The System 160, announced in 1982, supports up to 16 users and operates in an AT&T Bell Laboratories UNIX-compatible environment. The system is configured as a rack-mounted unit. Diskette, Winchester, and Winchester SMD drives are supported. Additional storage facilities are provided through tape subsystems.

Wicat systems are marketed through a direct sales force as well as by dealers and distributors. The vendor offers numerous maintenance programs.

**System Design** The System 160 is based on an 8MHz Motorola MC 68000L8 processor. Memory ranges from 512KB to 4.5MB and is expandable in 512KB increments. 16KB to 32KB of ROM are supported. A 5.25-inch, 630KB diskette drive is supported, as is a 10MB or 39MB, 5.25-inch Winchester drive. Eight-inch Winchester SMD drives with capacities of 80MB, 160MB, and 474MB are also offered. A 9-track tape drive and 0.25-inch cartridge tape drive are available as options.

The vendor offers an optional display terminal. Users can also purchase terminals through third-party sources.

An IEEE-796 Standard Multibus provides 12 slots. From 1 to 16 RS-232C serial ports and 1 or 2 parallel printer ports are featured. 2780/3780 and 3275 BSC protocols are supported.

The System 160 operates under the WICAT Multiuser Control System (WMCS), a multiuser, multitasking operating system. Unisoft Corporation UniPlus+, a UNIX System V-compatible operating system, is also offered. W-BASIC, C, COBOL, Pascal, Assembler, and APL.68000 from The Computer Company are supported. Applications include office automation, spreadsheets, and educational programs.

**Competition & Pricing** The System 160 competes with the MiniFrame Plus from Convergent Technologies Inc, the NCR Corporation TOWER XP, and the Plexus Computer Inc P/20.

Prices range from \$14,000 to \$40,000.

**Wicat Systems**

PO Box 539  
1875 S State  
Orem UT 84058

(801) 224-6400

**System 2220**

**Overview** The System 2220, announced in 1984, represents the top of Wicat's product line. The system supports up to 64 users with no wait states and operates in an AT&T Bell Laboratories UNIX-compatible environment. The 2220 is configured as a rack-mounted unit. It is hardware and software compatible with all Wicat systems. Winchester and tape storage facilities are supported.

Wicat systems are available through a direct sales force as well as through dealers and distributors. The vendor offers numerous maintenance programs.

**System Design** The System 2220 is based on a 12.5MHz Motorola MC 68000 processor, and an optional floating-point coprocessor is available. Memory ranges from 1MB to 12MB and is expandable in 1MB increments. 16KB to 32KB of ROM and 4KB of cache memory are also supported. Disk storage is provided through Winchester SMD drives with capacities of 80MB, 160MB, and 474MB each. Up to 4 drives are supported. A 9-track tape drive and a 0.25-inch, 12.7MB cartridge tape drive are also supported.

The vendor offers an optional display terminal. Users can also purchase terminals through third-party sources.

The systems proprietary bus provides 15 slots. From 8 to 64 asynchronous ports, 4 to 8 synchronous ports, and 1 to 4 parallel ports are supported. 2780/3780 and 3270 BSC protocols are handled by the 2220.

The System 2220 operates under the WICAT Multiuser Control System (WMCS), a multiuser, multitasking operating system. Unisoft Corporation UniPlus+, a UNIX System V-compatible operating system, is also offered. W-BASIC, C, COBOL, Pascal, Assembler, and APL.68000 from The Computer Company are supported. Applications include WP, electronic spreadsheets, and a relational DBMS.

**Competition & Pricing** The System 2220 competes with the Alpha Micro AM-1082 and AM-1092; the Charles River Data System Inc 68/05, 68/35, 68/67T, and 68/137T; and the P/60 from Plexus Computers Inc.

Prices range from \$50,000 to \$120,000.

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**Zenith Data Systems**1000 Milwaukee Ave  
Glenview IL 60025(312) 391-8949

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**Z-200 Advanced PC**

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**Overview** Introduced in May 1985, the Z-200 Advanced PC is a desktop, multiuser, multitasking microcomputer that is compatible with the IBM Personal Computer AT. The system is geared toward business, engineering, and scientific markets. Diskette and Winchester disk storage facilities are offered.

The system is marketed through Zenith Data Systems' direct sales force as well as the vendor's Canadian distributors. In addition, the system will also be available through Canadian Heath/Zenith Computers & Electronics Centers and over 1,000 dealers in North America.

**System Design** The Z-200 is based on a 6MHz Intel 80286 processor. Memory ranges from 512KB to 16MB and is expandable in 512KB increments. One or two 5.25-inch, double-density, 1.2MB diskette drives are supported. Up to three 20MB Winchester drives can be attached on the enhanced system configuration.

The terminal and keyboard are optional system features. Zenith's Z-22 and Z-39 terminals and ZVM 1220, 1230, and 1240 high-resolution monitors are supported.

The system is equipped with 10 bus slots, 7 of which are available for system expansion. One RS-232C serial port, one Centronics-compatible parallel port, and a video interface are standard.

MS-DOS and XENIX operating systems from Microsoft Corporation are supported on the Z-200. BASIC, COBOL, APL, FORTRAN, and Pascal programming languages are supported.

**Competition & Pricing** In addition to competing with the IBM Personal Computer AT, the Z-200 Advanced PC competes with the UNIX PC Model 7300 from AT&T Information Systems and the 286i from Kaypro Corporation.

The standard version of the Z-200 includes 512KB of RAM, a 1.2MB diskette drive, and the MS-DOS operating system and costs \$3,999. The enhanced version features 512KB of RAM and a 20MB Winchester drive and costs \$5,599.



# DESKTOP MICROCOMPUTERS

## Company Directory

228.0032.001

Vendor	Address/Telephone	Model
Anderson Jacobson	521 Charcot Ave San Jose CA 95131 (408) 263-8520	AJ Passport MBA AJ Passport PHD
Apple Computer	20525 Mariani Ave Cupertino CA 95014 (408) 996-1010	Apple IIe Macintosh XL
AT&T Information Systems	One Speedwell Ave Morristown NJ 07960 (201) 898-2000	PC 6300
Beehive	4910 Amelia Earhart Dr PO Box 25668 Salt Lake City UT 84125 (801) 355-6000	TOPPER TOPPER II
Burroughs	Burroughs PI Detroit MI 48232 (313) 972-7000	B 25
Canon USA	Systems Div 1 Canon Plaza Lake Success NY 11042 (516) 488-6700	Canon Personal Computer
Casio	15 Gardner Rd Fairfield NJ 07006 (201) 575-7400	FP-1000
Commodore Business Machines	1200 Wilson Drive West Chester PA 19380 (215) 431-9100	C128 CBM-8032
COMPAQ Computer	20333 FM 149 Houston TX 77070 (713) 370-7040	COMPAQ DESKPRO COMPAQ DESKPRO 286
Compucorp	2211 Michigan Ave Santa Monica CA 90404 (213) 829-7453	745 775 790
Corona Data Systems	275 E Hillcrest Dr Thousand Oaks CA 91360 (805) 495-5800	Corona PC
Cromemco	280 Bernardo Ave PO Box 7400 Mountain View CA 94039 (415) 964-7400	C-10-SP
CYB Systems	6448 Hwy 290 E Suite D-106 Austin TX 78723 (512) 458-3224	Unite 1i
Datapoint	9725 Datapoint Dr San Antonio TX 78284 (800) 334-1122	VISTA-PC/1200 VISTA-PC/1201 VISTA-PC/1202 VISTA-PC/1204





Vendor	Address/Telephone	Model
Decision Data	400 Horsham Rd Horsham PA 19044-0996 (215) 674-3300	5020/21
Digital Equipment	146 Main St Bldg PK3-1 Maynard MA 01754 (617) 897-5111	DECmate II DECmate III Professional 325 Professional 350 Professional 380 Rainbow 100 + Rainbow 100B Rainbow 190 VAXstation 1
Digital Microsystems	1840 Embarcadero St PO Box 2040 Oakland CA 94606 (415) 261-1034	DMS 816
Docutel/Olivetti	PO Box 660203 Dallas TX 75266-0203 (214) 258-5400	M18DT PC M24
E & U Engel Consulting	1719 S Carmelina Ave Los Angeles CA 90025 (213) 820-4231	Mighty-Angel
Eagle Computer	7100 Chapman Ave Garden Grove CA 92641 (714) 891-2665	Eagle Turbo 2 Eagle Turbo GT Eagle Turbo XL
Electro Design	690 Rancheros Dr San Marcos CA 92069 (619) 471-0680	IMP-12 IMP-18
Epson America	2780 Lomita Blvd Torrance CA 90505 (213) 539-9140	QX-10
Ericsson Information Systems	PO Box 2522 Greenwich CT 06836-2522 (203) 661-1666	Ericsson PC
Heurikon	3201 Latham Dr Madison WI 53713 (608) 271-8700	814/MLZ
Hewlett-Packard	Information Systems Div 11000 Wolf Road Cupertino CA 95014 (408) 257-7000	HP 200 Series, Model 216 HP 200 Series, Model 220 HP 200 Series, Model 226 HP 200 Series, Model 236A HP 200 Series, Model 236C HP-85B HP-86B Touchscreen Personal Computer (Model 150)
Honeywell Information Systems	200 Smith St Waltham MA 02154 (617) 895-6000	microSystem 6/10 microSystem PC

Vendor	Address/Telephone	Model
IBM	1133 Westchester Ave White Plains NY 10604 (914) 696-1900	3270 Personal Computer 3270-PC/G 3270-PC/GX 5531 Industrial Computer PCjr Personal Computer Personal Computer XT Personal Computer XT/370 System 9000
Industrial Computer Designs	31264 La Baya Dr Westlake Village CA 91362 (818) 889-3179	Vantage Point Computer
ISI International	1275 Hammerwood Ave Sunnyvale CA 94089 (408) 743-4300	5160 6160
ITT	2041 Lundy Ave San Jose CA 95131 (408) 945-8950	XTRA
Kaypro	PO Box N Del Mar CA 92014 (619) 481-4300	Robie
Leading Edge Products	110 Cedar St Wellesley MA 02181 (617) 239-3500	Personal Color FXD Personal Computer
Lee Data	7075 Flying Cloud Dr Eden Prairie MN 55344 (612) 828-0300	LDC Series 70 Personal Workstation LDC Series 700 Personal Workstation
Logical Business Machines	264 Santa Ana Ct Sunnyvale CA 94086 (408) 737-1911	L-XT
MAD Computer	2950 Zanker Rd San Jose CA 95134 (408) 943-1711	MAD-1
Matrox Electronic Systems	1055 St Regis Blvd Dorval Quebec H9P 2T4 (514) 685-2630	MACS-86/D MACS-86/R
Megadata	35 Orville Dr Bohemia NY 11716 (516) 589-6800	8188-7
Monolithic Systems	84 Inverness Circle E Englewood CO 80112 (303) 790-7400	MSC 8801-07 MSC 8802-16
NCR	Personal Computer Div 1700 S Patterson Dayton OH 45479 (513) 449-2000	Decision Mate V NCR Personal Computer Model 4 PC 6 WorkSaver 300

Vendor	Address/Telephone	Model
NEC Home Electronics	1401 Estes Ave Elk Grove Village IL 60007-5463 (312) 228-5900	PC-8801
NEC Information Systems	1414 Massachusetts Ave Boxborough MA 01719 (617) 264-8000	Advanced Personal Computer (APC) Advanced Personal Computer III (APC III)
Nelma Data	5170A Timberlea Blvd Mississauga Ontario CD L4W 2S5 (416) 624-0334	Persona Persona 16
Nixdorf Computer	300 Third Ave Waltham MA 02154 (617) 890-3600	8810/65 SPC
Northern Telecom	PO Box 1222 Minneapolis MN 55440 (612) 932-8000	Model 503
Olympia USA	PO Box 22 Somerville NJ 08876 (201) 722-7000	People
OSM	665 Clyde Ave Mountain View CA 94043 (415) 961-8680	Zeus PC Zeus V.I.PC Zeus XPC
Phaze Information Machines	7650 E Redfield Scottsdale AZ 85260 (602) 991-6855	P9020
PRONTO Computer	3730 Skypark Dr Torrance CA 90505 (213) 539-6400	Series 16
QDP	10330 Brecksville Rd Cleveland OH 44141 (216) 526-0838	16
Regency Systems	3200 Farber Dr Champaign IL 61821 (217) 398-8067	R2-B R2-C
Sanyo Business Systems	51 Joseph St Moonachie NJ 07074 (201) 440-9300	MBC 555-2 MBC 880
Seequa Computer	8305 Telegraph Rd Odenton MD 21113 (301) 672-3600	Cobra Seequa/PC Seequa/XT
Solaris	1994 Tarob Ct Milpitas CA 95035 (408) 943-1818	Solaris 1000

Vendor	Address/Telephone	Model
Sperry	PO Box 500 Blue Bell PA 19424 (215) 542-4011	Sperry Personal Computer
Sykes Datatronics	375 Orchard St Rochester NY 14606 (716) 458-8000	Comm-stor II Comm-stor III
Tandy	1800 One Tandy Center Fort Worth TX 76102 (817) 390-3011	Radio Shack TRS-80 Model 12 Radio Shack TRS-80 Model 4 Tandy 1000 Tandy 1200 HD Tandy 2000
TeleVideo Systems	550 E Brokaw Rd San Jose CA 95112 (408) 971-0255	Tele-PC PLUS Tele-XT PLUS TS 1603 TS 800A TS 802 TS 802H
Telex Computer Products	6422 E 41st St Tulsa OK 74135 (918) 627-1111	Telex 1186
Texas Instruments	Data Systems Group PO Box 402430 Dallas TX 75240 (800) 527-3500	Professional Computer
Toshiba America	Information Systems Div 2441 Michelle Dr Tustin CA 92680 (714) 730-5000	T300
Vector Graphic	500 N Ventu Park Rd Thousand Oaks CA 91320 (805) 499-5831	Vector SX
VIASYN (CompuPro)	3605 Breakwater Ct Hayward CA 94545 (415) 786-0909	CompuPro 816/A CompuPro 816/Z
Wang Laboratories	One Industrial Ave Lowell MA 01851 (617) 459-5000	Professional Computer
Xerox	Information Products Div 1301 Ridgeview Dr Lewisville TX 75067 (214) 420-7200	Xerox 16/8 Xerox 820-II
XYCOM	750 N Maple Rd Saline MI 48176 (313) 429-4971	3941-IB II



Vendor	Address/Telephone	Model
Zaisan	PO Box 4327 Houston TX 77210-4327 (713) 580-6191	ES.1 ES.3
Zenith Data Systems	1000 Milwaukee Ave Glenview IL 60025 (312) 391-8860	Z-100 Z-150 PC Series

# DESKTOP MICROCOMPUTERS

## Specifications Chart Guide

The Microcomputer Specifications Chart summarizes the significant characteristics of microcomputers. The information is presented in a chart to facilitate the evaluation and comparison of alternative systems. The chart lists available microcomputers in alphabetical order by manufacturer.

### VENDOR AND MODEL

This section identifies the microcomputer vendor by name and the product model number and name.

### CLASS

This section identifies the size category into which the microcomputer falls. A portable model will be designated as handheld (up to 3 pounds), portable (3 to 10 pounds), or transportable (10 to 35 pounds). A single- or multiuser nonportable system will be designated as desktop, floor standing, or rackmounted.

### USERS/TASKS

This section indicates whether the model is a single- or multiuser computer and whether it is a single- or multitasking machine.

### MAIN UNIT

This section describes the characteristics of the central processing unit.

- **Main Processor**—This entry identifies the central processor vendor and the processor model number or name.
- **Word Size**—This entry indicates the number of bits handled as a unit both internally and externally. The entry is listed as internal/external.
- **Clock Rate**—This entry, expressed in MHz, indicates the rate at which a word is transferred from one internal computer element to another.
- **Other Processors**—This entry identifies by vendor and model number any additional coprocessors (e.g., math and graphics) that are standard or optional on the system.

### MEMORY

This section describes, in bytes, the minimum and maximum amounts of RAM, the available RAM increments, and the amount of ROM available.

### DISKETTE STORAGE

This section describes the characteristics of the diskette

drives and media.

- **No. of Drives**—This entry indicates the number of internal diskette drives. External and optional drives may also be noted.
- **Size and Format**—This entry indicates the diameter (in inches) of the diskettes used and the format of the diskettes: single- or double-sided (SS or DS), and single-, double-, or quad-density (SD, DD, or QD).
- **Capacity**—This entry indicates the amount of storage, in bytes, available on each diskette.
- **Access Time**—This entry indicates, in milliseconds, the interval between the time information is called from storage and the time at which data is available.

### FIXED DISK STORAGE

This section describes the characteristics of disk storage. The entries are similar to those given under Diskette Storage.

### OTHER STORAGE

This section indicates type and capacity of any other type of mass storage (e.g., tape cartridge, bubble memory).

### DISPLAY

This section describes the characteristics of standard and optional displays.

- **Size and Type**—This entry indicates the diagonal size of the display screen (in inches) and describes the technology (e.g., CRT, LCD, RGB).
- **Text Display**—This entry indicates how many lines and characters the screen can display.
- **Character Matrix**—This entry indicates the number of dots available within a character block to form a character.
- **Resolution**—This entry indicates, horizontally by vertically, the number of pixels (picture elements) available on the screen for forming images.
- **Screen Attributes**—This entry indicates any special features (e.g., underlining or reverse video) that make the display suitable for specific applications, such as word processing or graphics.
- **Colors**—This entry indicates the number of colors that can be displayed simultaneously and the number of colors available in the entire palette.

### KEYBOARD

This section describes the characteristics of the standard keyboard.

- **Keyboard Type**—This entry indicates whether the key-

board is detachable from or integral to (nondetachable) the system unit or display.

- **No. of Keys**—This listing indicates the number of keys, including function, numeric, and cursor control keys.
- **Cursor Control**—This entry indicates how the cursor is controlled.
- **No. of Function Keys**—This entry indicates the total number of dedicated and programmable function keys.
- **Numeric Pad**—This entry indicates whether the numeric keypad is integral, detached, embedded, optional, or not available.

## INPUT/OUTPUT

This section describes the characteristics of the input/output section of the computer.

- **No. of Open I/O Slots**—This entry indicates the number of card slots available for expansion after installation of boards for the display and one diskette drive.
- **Serial Ports**—This entry indicates the number and type of serial ports.
- **Parallel Ports**—This entry indicates the number and type of parallel ports.
- **Special Output Ports**—This entry indicates any other type of output ports included, such as IEEE-488, RGB, composite video, or audio.
- **Special Input Ports**—This entry indicates any special input ports for such devices as a light pen, bar code reader, mouse, tablet, or other graphics devices.

## DATA COMMUNICATIONS

This section indicates whether asynchronous and/or synchronous communications are standard, optional, or not avail-

able. If available, emulation protocols are given. An internal modem will also be indicated as standard, optional, or not available.

## SOFTWARE

This section indicates which operating systems are standard and optional, which applications software is included with the cost of the system, and which languages will run on the system.

## PHYSICAL AND ELECTRICAL

This section describes the physical dimensions (length, width, height, and weight) of the system as well as the power requirements (Hz, VAC, watts).

## SALES AND SERVICE

This section indicates the announcement and delivery dates of the system as well as sales and service channels.

## PRICING

This section gives the price of the system and may specify its various configurations and indicate the number of diskettes, disk capacity, and amount of RAM included.

## COMMENTS

This section allows the vendor to list any special features provided by the unit.

# SPECIFICATIONS CHART

## Desktop Microcomputers

228.0045.001

<b>Manufacturer Model</b> <b>Classification</b> <b>Tasks</b> <b>Main Processor Model</b> <b>Internal Word Size (bits)</b> <b>Clock Rate (MHz)</b> <b>Additional Processors</b> <b>RAM</b> <b>Standard RAM (bytes)</b> <b>Min/Max RAM (bytes)</b> <b>RAM Increments (bytes)</b> <b>Std Diskette Storage</b> <b>No of Drives</b> <b>Size (in) &amp; Format</b> <b>Capacity per Diskette (bytes)</b> <b>Std Disk Storage</b> <b>No of Drives</b> <b>Size (in)</b> <b>Capacity per Disk (bytes)</b> <b>Other Storage (Std)</b> <b>Other Storage (Opt)</b>  <b>Display</b> <b>Size &amp; Type</b> <b>Resolution (pixels)</b> <b>Text Display (lines x col)</b> <b>Character Matrix (dots)</b> <b>Colors (simul/palette)</b> <b>Keyboard</b> <b>Type</b> <b>No of Programmable Function Keys</b> <b>Special Features</b>  <b>No of Avail I/O Slots</b> <b>Interfaces</b> <b>Serial</b> <b>Parallel</b> <b>Other</b>  <b>Communications</b> <b>Asynchronous</b> <b>Synchronous</b> <b>Software</b> <b>Std Operating System</b> <b>Opt Operating System</b> <b>Bundled Software</b> <b>Languages</b> <b>Sales &amp; Service</b> <b>First Delivered</b> <b>Sales Channels</b> <b>Service Channels</b> <b>Pricing</b> <b>Comments</b>	<b>Apple Computer</b> <b>Apple IIe</b> <b>Desktop</b> <b>Single</b>  <b>Synertek 65C02</b> <b>8/8</b> <b>—</b> <b>NA</b>  <b>128K</b> <b>64K/1M</b> <b>64K, 256K</b>  <b>NA</b> <b>NA</b> <b>NA</b> <b>NA</b>  <b>NA</b> <b>NA</b> <b>NA</b> <b>NA</b>  <b>5.25-in 140KB diskette drive,</b> <b>5.25-in 5MB or 10MB disk</b> <b>drive</b>  <b>12-in CRT</b> <b>280 x 160/192</b> <b>24 x 80</b> <b>5 x 7</b> <b>Green monochrome</b>  <b>Integral</b> <b>—</b>  <b>Cursor keys; mouse, digital</b> <b>input pad (opt)</b> <b>7</b>  <b>NA</b> <b>NA</b> <b>Speaker, joystick, cassette,</b> <b>RF modulator, numeric</b> <b>keypad</b>  <b>—</b> <b>—</b>  <b>ProDOS 3.3</b> <b>—</b> <b>NA</b> <b>—</b>  <b>January 1983</b> <b>Direct, dealer</b> <b>Dealer</b> <b>\$945 w/o monitor</b> <b>Opt color monitor avail</b>	<b>Apple Computer</b> <b>Macintosh 512K</b> <b>Desktop</b> <b>Single</b>  <b>Motorola MC 68000</b> <b>16/32</b> <b>7.83</b> <b>NA</b>  <b>512K</b> <b>512K/512K</b> <b>NA</b>  <b>1</b> <b>3.5 SS</b> <b>400K</b>  <b>NA</b> <b>NA</b> <b>NA</b> <b>NA</b>  <b>3.5-in 400KB diskette drive,</b> <b>3.5-in 20MB disk drive</b>  <b>9-in CRT</b> <b>512 x 342</b> <b>24 x 80</b> <b>—</b> <b>Black &amp; white monochrome</b>  <b>Detachable</b> <b>—</b>  <b>Mouse; digital input pad,</b> <b>numeric keypad (opt)</b> <b>NA</b>  <b>2</b> <b>NA</b> <b>Keyboard, mouse, disk</b>  <b>—</b> <b>—</b>  <b>Macintosh</b> <b>NA</b> <b>MacWrite, MacPaint</b> <b>—</b>  <b>January 1984</b> <b>Direct, dealer</b> <b>Dealer</b> <b>\$1,999</b> <b>512KB Memory Expansion Kit</b> <b>upgrade avail for Macintosh</b> <b>128K</b>	<b>Apple Computer</b> <b>Macintosh Plus</b> <b>Desktop</b> <b>Single</b>  <b>Motorola MC 68000</b> <b>16/32</b> <b>12</b> <b>NA</b>  <b>1M</b> <b>1M/1M</b> <b>NA</b>  <b>1</b> <b>3.5 DS</b> <b>800K</b>  <b>NA</b> <b>NA</b> <b>NA</b> <b>NA</b>  <b>3.5-in 800KB diskette drive,</b> <b>5.25-in 20MB disk drive</b>  <b>9-in CRT</b> <b>512 x 342</b> <b>Varies according to font</b> <b>Varies according to font</b> <b>Black &amp; white monochrome</b>  <b>Detachable</b> <b>78 (all keys prgmbl)</b>  <b>Cursor keys, numeric keypad</b>  <b>NA</b>  <b>2 RS-232/RS-422</b> <b>NA</b> <b>SCSI, mouse, disk</b>  <b>Std</b> <b>NA</b>  <b>Macintosh</b> <b>NA</b> <b>NA</b> <b>BASIC, C, Pascal, Assembly</b>  <b>January 1986</b> <b>Direct, dealer</b> <b>Direct, dealer</b> <b>\$2,599</b> <b>Incl RAM cache,</b> <b>clock/calendar</b>
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**Notes:**

NA Not applicable  
 — Information unavailable at press time





Manufacturer	AT&T Information Systems	AT&T Information Systems	Atari
<b>Model</b>	PC 6300	PC 6300 Plus	1040 ST & 520 ST
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Single; multi (opt)	Single
<b>Main Processor</b>			
Model	Intel 8086	Intel 80286	Motorola MC 68000
Internal Word Size (bits)	16/16	16/16	—
Clock Rate (MHz)	8	6	8
<b>Additional Processors</b>	Intel 8087-2 math coprocessor (opt)	Intel 80287 math coprocessor (opt)	Atari graphics processor, DMA channel processor, system timing coprocessor
<b>RAM</b>			
Standard RAM (bytes)	128K (diskette model); 256K/512K (disk models)	512K	1M (1040 ST); 512KB (520 ST)
Min/Max RAM (bytes)	128K/640K	512K/7M	1M/4M (1040 ST), 512K/4M (520 ST)
RAM Increments (bytes)	384K	2M	512K, 1M, 2M, 4M, 8M
<b>Std Diskette Storage</b>			
No of Drives	2 (diskette model); 1 (disk models)	2 (diskette model); 1 (disk model)	1 (1040 ST)
Size (in) & Format	5.25 DSDD	5.25 DSDD	3.5 DSDD
Capacity per Diskette (bytes)	360K	360K (diskette model); 1.2M (diskette and disk models)	720K
<b>Std Disk Storage</b>			
No of Drives	1 (disk models)	1 (disk model)	NA
Size (in)	5.25	5.25	NA
Capacity per Disk (bytes)	10M, 20M	20M	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	NA	NA	1-2 3.5-in 720KB diskette drives, up to 8 5.25-in 20MB or 30MB disk drives
<b>Display</b>			
Size & Type	12-in CRT	12-in CRT	12-in color CRT
Resolution (pixels)	640 x 400	640 x 400	640/320 x 200
Text Display (lines x col)	25 x 80	25 x 80	—
Character Matrix (dots)	—	—	8 x 8
Colors (simul/palette)	Green monochrome	Green monochrome	512/512 color
<b>Keyboard</b>			
Type	Detachable	Detachable	Integral
No of Programmable Function Keys	10	10	96 (all keys prgmbl)
Special Features	Cursor keys, numeric keypad; mouse (opt)	Cursor keys, numeric keypad; mouse (opt)	Cursor keys, mouse
<b>No of Avail I/O Slots</b>	7 (diskette model); 6 (disk models)	7 (diskette model); 6 (disk model)	NA
<b>Interfaces</b>			
Serial	1 RS-232C	1 RS-232C	2
Parallel	1 Centronics	1 Centronics	1
Other	Video display; mouse (opt)	Video display; mouse (opt)	DMA channel, disk drive
<b>Communications</b>			
Asynchronous	Std (TTY, VT 100)	Std (TTY, VT 100)	Std
Synchronous	Std (2780/3780, 3270 BSC, 3270 SDLC)	Std (2780/3780, 3270 BSC, 3270 SDLC)	Std
<b>Software</b>			
Std Operating System	MS-DOS 2.11	MS-DOS 3.1	Atari TOS
Opt Operating System	MS-DOS 3.1, XENIX	UNIX System V	—
Bundled Software	NA	NA	WP, BASIC, LOGO
Languages	Avail through 3rd-party vendors	Avail through 3rd-party vendors	C, BASIC, FORTRAN, FORTH, Pascal
<b>Sales &amp; Service</b>			
First Delivered	June 1984	October 1985	March 1986 (1040 ST); April 1985 (520 ST)
Sales Channels	Direct, distributor, dealer	Direct, distributor, dealer	Direct, distributor, dealer
Service Channels	Direct, dealer	Direct, dealer	Direct, distributor, dealer
<b>Pricing</b>	\$2,300 (128KB RAM, dual diskette drives); \$3,975 (256KB RAM, diskette drive, 10MB disk drive); \$4,975 (512KB RAM, diskette drive, 20MB disk drive)	\$5,095 (512KB RAM, 360KB & 1.2MB diskette drives); \$6,320 (512KB RAM, 1.2MB diskette drive, 20MB disk drive)	\$1,199 (1040 ST); \$999 (520 ST)
<b>Comments</b>	IBM PC compatible, opt color monitor avail	IBM PC compatible, opt color monitor avail	Prices w/opt monochrome monitor: \$999 (1040 ST), \$700 (520 ST); opt expansion box supports 16MB RAM

**Notes:**

NA Not applicable

— Information unavailable at press time



Manufacturer	Canon USA	Commodore Business Machines	Commodore Business Machines
<b>Model</b>	A-200	Amiga	C128
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Multi	Multi
<b>Main Processor</b>			
Model	Intel 8086	Motorola MC 68000	Commodore 6510 & 8502, Zilog Z80
Internal Word Size (bits)	16/16	16/32	8/8 (all processors)
Clock Rate (MHz)	4.77	7.16	2 (6510 & 8502); 4 (Zilog Z80)
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt)	3 specialized proprietary coprocessors	NA
<b>RAM</b>			
Standard RAM (bytes)	256K	256K user-avail RAM plus 256K for operating system	128K
Min/Max RAM (bytes)	256K/640K	256K/512K	128K/512K
RAM Increments (bytes)	256K	256K	128K, 256K
<b>Std Diskette Storage</b>			
No of Drives	2	1	1
Size (in) & Format	5.25 DSDD	3.5 DSDD	5.25
Capacity per Diskette (bytes)	360K	880K	340K
<b>Std Disk Storage</b>			
No of Drives	1	NA	NA
Size (in)	5.25	NA	NA
Capacity per Disk (bytes)	10MB	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	NA	3.5-in or 5.25-in external 360KB diskette drive; 10MB, 20MB, or 40MB external disk drive	1-2 external 340KB diskette drives
<b>Display</b>			
Size & Type	12-in CRT	12-in CRT	13-in CRT
Resolution (pixels)	720 x 350	640/320 x 400/200	640/320 x 200
Text Display (lines x col)	25 x 80	25/50 x 40/80	25 x 40/80
Character Matrix (dots)	9 x 14	Varies according to font	8 x 8
Colors (simul/palette)	Green monochrome	4,096 max (16-32 recommended)/4,096 color	16/16 color
<b>Keyboard</b>			
Type	Detachable	Detachable	Integral
No of Programmable Function Keys	10	10	8
Special Features	Cursor keys, numeric pad; mouse (opt)	Cursor keys, numeric keypad, mouse; digital input pad (opt)	Numeric keypad
<b>No of Avail I/O Slots</b>	4	NA	NA
<b>Interfaces</b>			
Serial	1; 2 (opt)	1 (can be daisy chained)	1
Parallel	1; 2 (opt)	1 (can be daisy chained)	1 (opt)
Other	—	RGB analog, RGB digital, composite video, 2 joysticks, RF modulator, split video	2 joysticks or mouse, RGB, composite video, cassette cartridge
<b>Communications</b>			
Asynchronous	Opt (TTY)	—	Std
Synchronous	Opt (2780/3780, 3270 BSC, 3270 SDLC)	—	NA
<b>Software</b>			
Std Operating System	MS-DOS	Commodore Intuition	Commodore BASIC 7.0, CP/M
Opt Operating System	NA	NA	NA
Bundled Software	BASIC	Workbench, Amiga DOS, BASIC, tutorial, Icon Editor	NA
Languages	BASIC, Pascal, C, Assembler	C, Assembler, Pascal, LISP, FORTH, FORTRAN, COBOL, LOGO	BASIC
<b>Sales &amp; Service</b>			
First Delivered	November 1984	October 1985	August 1985
Sales Channels	Dealer	Dealers	Dealer
Service Channels	Dealer	Dealers	Dealer
<b>Pricing</b>	\$2,195	\$1,295	\$897
<b>Comments</b>	System costs \$2,695 w/opt 12-in 640 x 200 color monitor	Built in speech synthesis; opt digitizer, answering machine/modem, & NTSC image overlay interface	Preprogrammed function keys can be reprogrammed

**Notes:**

NA Not applicable

— Information unavailable at press time

Manufacturer Model	COMPAQ Computer COMPAQ DESKPRO (Models 1, 2, 3, 4, & 5) Desktop	COMPAQ Computer COMPAQ DESKPRO 286 (Models 1, 2, & 3) Desktop	CompuPro 816/E2 System Floor/table model (or rack mount) Multi
<b>Tasks</b>	Single	Single	
<b>Main Processor</b>	Intel 8086	Intel 80286	Motorola MC 68000
Model	16/16	16/16	16/16
Internal Word Size (bits)	4.77, 7.14	6, 8	10
Clock Rate (MHz)	Intel 8087-2 math coprocessor (opt)	Intel 80287 math coprocessor (opt)	NA
<b>Additional Processors</b>			
<b>RAM</b>			
Standard RAM (bytes)	128K (Model 1); 256K (Models 2 & 3); 640K (Models 4 & 5)	256K (Model 1); 512K (Models 2 & 3)	512K
Min/Max RAM (bytes)	128K/640K	128K/8.3M	512K/16M
RAM Increments (bytes)	128K, 512K	128K, 512K	64K, 128K, 256K
<b>Std Diskette Storage</b>			
No of Drives	1 (Models 1, 3, 4, & 5); 2 (Model 2)	1	1
Size (in) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity per Diskette (bytes)	360KB	1.2MB	800K
<b>Std Disk Storage</b>			
No of Drives	1 (Models 3, 4, & 5)	1 (Models 2 & 3)	1
Size (in)	5.25	5.25	5.25
Capacity per Disk (bytes)	10MB (Models 3 & 4); 30MB (Model 5)	30MB	20M
<b>Other Storage (Std)</b>	10MB magnetic tape drive (Models 4 & 5)	10MB magnetic tape drive (Model 3)	NA
<b>Other Storage (Opt)</b>	5.25-in 360KB diskette drive, 10MB magnetic tape drive, 5.25-in 10MB or 30MB disk drive	360KB diskette drive, 20MB or 70MB disk drive, 10MB magnetic tape drive	8-in 1.2MB diskette drive, 3 5.25-in 40MB or 80MB disk drives, 10MB cassette magnetic tape drive
<b>Display</b>			
Size & Type	12-in CRT	12-in CRT	3rd party
Resolution (pixels)	640 x 200	640 x 200	NA
Text Display (lines x col)	25 x 40/80	25 x 40/80	NA
Character Matrix (dots)	—	—	NA
Colors (simul/palette)	Monochrome	Monochrome	NA
<b>Keyboard</b>			
Type	Detachable	Detachable	3rd party
No of Programmable Function Keys	10	10	NA
Special Features	Numeric keypad	Numeric keypad	NA
<b>No of Avail I/O Slots</b>	6 (Models 1 & 2); 4 (Models 3, 4, & 5)	5 (Model 1); 4 (Models 2 & 3)	—
<b>Interfaces</b>			
Serial	1	1	9; 8 (opt)
Parallel	1	1	2 (opt)
Other	RGB, composite video, RF modulator, light pen	RGB, composite video, RF modulator, light pen	IEEE-696; RGB, mouse (opt)
<b>Communications</b>			
Asynchronous	Std (Models 3, 4, & 5); opt (Models 1 & 2)	Std	Std (TTY)
Synchronous	Opt	Opt	NA
<b>Software</b>			
Std Operating System	NA	NA	CP/M-68K
Opt Operating System	MS-DOS 3.0	MS-DOS 3.0	NA
Bundled Software	NA	NA	NA
Languages	—	—	—
<b>Sales &amp; Service</b>			
First Delivered	June 1984	April 1985	Fall 1982
Sales Channels	Dealer	Dealer	OEM, VAR, distributors
Service Channels	Dealer	Dealer	OEM, VAR, distributors, factory, 3rd party vendors
<b>Pricing</b>	\$2,495 (Model 1); \$2,899 (Model 2); \$4,499 (Model 3); \$5,799 (Model 4); \$6,699 (Model 5)	\$4,499 (Model 1); \$6,254 (Model 2); \$6,754 (Model 3)	\$8,095
<b>Comments</b>	IBM PC and PC XT compatible	IBM PC AT compatible	NA

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<p><b>Manufacturer Model Classification</b></p> <p><b>Tasks</b></p> <p><b>Main Processor Model</b></p> <p>Internal Word Size (bits)</p> <p>Clock Rate (MHz)</p> <p><b>Additional Processors</b></p> <p><b>RAM</b></p> <p>Standard RAM (bytes)</p> <p>Min/Max RAM (bytes)</p> <p>RAM Increments (bytes)</p> <p><b>Std Diskette Storage</b></p> <p>No of Drives</p> <p>Size (in) &amp; Format</p> <p>Capacity per Diskette (bytes)</p> <p><b>Std Disk Storage</b></p> <p>No of Drives</p> <p>Size (in)</p> <p>Capacity per Disk (bytes)</p> <p><b>Other Storage (Std)</b></p> <p><b>Other Storage (Opt)</b></p> <p><b>Display</b></p> <p>Size &amp; Type</p> <p>Resolution (pixels)</p> <p>Text Display (lines x col)</p> <p>Character Matrix (dots)</p> <p>Colors (simul/palette)</p> <p><b>Keyboard</b></p> <p>Type</p> <p>No of Programmable Function Keys</p> <p>Special Features</p> <p><b>No of Avail I/O Slots</b></p> <p><b>Interfaces</b></p> <p>Serial</p> <p>Parallel</p> <p>Other</p> <p><b>Communications</b></p> <p>Asynchronous</p> <p>Synchronous</p> <p><b>Software</b></p> <p>Std Operating System</p> <p>Opt Operating System</p> <p>Bundled Software Languages</p> <p><b>Sales &amp; Service</b></p> <p>First Delivered</p> <p>Sales Channels</p> <p>Service Channels</p> <p><b>Pricing</b></p> <p><b>Comments</b></p>	<p><b>CompuPro</b></p> <p>816/G2 System</p> <p>Floor/table model (or rack mount)</p> <p>Multi</p> <p>National Semiconductor 32016</p> <p>32</p> <p>6</p> <p>NA</p> <p>512K</p> <p>512K/16M</p> <p>64K, 128K, 256K</p> <p>1</p> <p>5.25 DSDD</p> <p>800K</p> <p>1</p> <p>5.25</p> <p>20MB</p> <p>NA</p> <p>8-in 1.2MB diskette drive; 3 5.25-in 40MB or 80MB disk drives, 10MB cassette magnetic tape drive</p> <p>3rd party</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>3rd party</p> <p>NA</p> <p>NA</p> <p>14</p> <p>9; 8 (opt)</p> <p>2 (opt)</p> <p>IEEE-696; RGB, mouse (opt)</p> <p>Std (TTY)</p> <p>NA</p> <p>jsFORTH/32016</p> <p>NA</p> <p>NA</p> <p>—</p> <p>Fall 1982</p> <p>OEM, VAR, distributors</p> <p>OEM, VAR, distributors, factory, 3rd party vendors</p> <p>\$8,495</p> <p>NA</p>	<p><b>Computer Systems</b></p> <p>PC/286</p> <p>Desktop; rack mount (opt)</p> <p>Single; multi (opt)</p> <p>Intel 80286</p> <p>16/16</p> <p>6, 8, or 10</p> <p>Intel 80287 math coprocessor; Intel 80286 (opt)</p> <p>256K, 512K</p> <p>128K/2M</p> <p>64K, 128K</p> <p>1-2</p> <p>5.25 DS</p> <p>360K, 1.2M</p> <p>0-1</p> <p>5.25</p> <p>30M, 40M</p> <p>360KB-1.2MB bubble memory or 360KB-1.2MB RAM disk</p> <p>3-, 5.25-, or 8-in 1MB diskette drives; opt disk drives to 110MB</p> <p>13-in CRT</p> <p>1,024 x 1,024 or 640 x 480</p> <p>25 x 80</p> <p>7 x 9</p> <p>Monochrome or 16-256/4,096 color</p> <p>Detachable</p> <p>12</p> <p>Cursor keys, numeric keypad; mouse, digital input pad, touchscreen, light pen (opt)</p> <p>12</p> <p>1; 32 (opt)</p> <p>1; 16 (opt)</p> <p>RGB, video; IEEE-488 (opt)</p> <p>Std (TTY); opt (IBM SDLC, BSC, Ethernet)</p> <p>Opt (2780/3780, 3270 BSC, 3270 SDLC, X.25, Ethernet)</p> <p>DOS (IBM compatible)</p> <p>UNIX</p> <p>Business Systems</p> <p>Pascal, C, BASIC, Macro, COBOL, FORTRAN, PL/1</p> <p>1985</p> <p>Direct, dealer</p> <p>Direct, 3rd-party vendors</p> <p>\$1,500-\$15,000</p> <p>IBM PC AT compatible; multiuser w/opt UNIX operating system</p>	<p><b>Computer Systems</b></p> <p>PC/88</p> <p>Desktop; rack mount (opt)</p> <p>Single; multi (opt)</p> <p>Intel 8088-2</p> <p>8/16</p> <p>4.7 or 8</p> <p>Intel 8087; Intel 8088 (opt)</p> <p>128K, 256K</p> <p>64K/1M</p> <p>64K, 128K</p> <p>1-2</p> <p>5.25 DSDD</p> <p>360K</p> <p>0-1</p> <p>5.25</p> <p>10M, 20M</p> <p>360KB bubble memory or 360KB RAM disk</p> <p>Dual 3-in 400KB or 8-in 1MB diskette drives; opt disk drives to 110MB</p> <p>13-in CRT</p> <p>640 x 480/200</p> <p>25 x 80</p> <p>7 x 9</p> <p>Monochrome or 16-256/4,096 color</p> <p>Detachable</p> <p>10</p> <p>Cursor keys, numeric keypad; mouse, digital input pad, touchscreen (opt)</p> <p>8</p> <p>1; 16 (opt)</p> <p>1; 8 (opt)</p> <p>Color, composite video; IEEE-488 (opt)</p> <p>Std (TTY); opt (VT 100; IBM SNA, BSC, LAN)</p> <p>Opt (2780/3780, 3270 BSC, 3270 SDLC, X.25, LAN, Ethernet)</p> <p>DOS (IBM compatible)</p> <p>UNIX</p> <p>—</p> <p>BASIC, C, COBOL, FORTRAN, Pascal, Macro, PL/1</p> <p>1984</p> <p>Direct, dealer</p> <p>Direct, 3rd-party vendor</p> <p>\$500-\$2,500</p> <p>IBM PC XT compatible; multiuser w/opt UNIX operating system, opt color graphics monitor avail</p>
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Notes:  
 NA Not applicable  
 — Information unavailable at press time



<b>Manufacturer</b>	<b>Cordata</b>	<b>Cordata</b>	<b>Cordata</b>
<b>Model</b>	ATD	Mega PC	PC-400
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Multi	Single
<b>Main Processor</b>			
Model	Intel 80286	Intel 8088-2	Intel 8088
Internal Word Size (bits)	8/16	8/16	8/16
Clock Rate (MHz)	8	8	4.77
<b>Additional Processors</b>	Intel 80287 coprocessor	6845 graphics coprocessor; Intel 8087-2 math coprocessor (opt)	6847 graphics coprocessor; Intel 8087 math coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	640K	512K	256K
Min/Max RAM (bytes)	640K/6M	512K/512K	256K/640K
RAM Increments (bytes)	—	NA	128K
<b>Std Diskette Storage</b>			
No of Drives	1	1	2
Size (in) & Format	5.25 QD	5.25 DSDD	5.25 DSDD
Capacity per Diskette (bytes)	1.2M	360K	360K
<b>Std Disk Storage</b>			
No of Drives	1	1	NA
Size (in)	5.25	5.25	NA
Capacity per Disk (bytes)	20M	40M	NA
<b>Other Storage (Std)</b>	NA	NA	—
<b>Other Storage (Opt)</b>	1.2MB diskette drive, 40MB disk drive, 60MB magnetic tape drive	10MB or 20MB disk drive, 60MB streaming tape drive	10MB disk drive
<b>Display</b>			
Size & Type	14-in CRT	14-in CRT	14-in CRT
Resolution (pixels)	640 x 400	640 x 400	640 x 400
Text Display (lines x col)	25 x 80	25 x 80	25 x 80
Character Matrix (dots)	16 x 16	16 x 16	16 x 16
Colors (simul/palette)	Green monochrome	Green monochrome	Green monochrome
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable Function Keys	10	10	10
Special Features	Cursor keys	Cursor keys, numeric keypad	Cursor keys, numeric keypad
<b>No of Avail I/O Slots</b>	6	11	4
<b>Interfaces</b>			
Serial	1 RS-232C	1; others opt on Applications Processing Cards	1
Parallel	1 Centronics	1	1
Other	—	—	—
<b>Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	—	—	—
<b>Software</b>			
Std Operating System	MS-DOS 3.XX	MS-DOS 3.XX	MS-DOS 2.11
Opt Operating System	NA	—	NA
Bundled Software	GW-BASIC 3.X	MSNET	GW-BASIC 2.X
Languages	GW-BASIC 3.X	—	GW-BASIC 2.X
<b>Sales &amp; Service</b>			
First Delivered	December 1985	—	January 1985
Sales Channels	Distributor, VAR, OEM, private label	Distributor, VAR, OEM, private label	Distributor, VAR, OEM, private label
Service Channels	—	—	—
<b>Pricing</b>	\$3,995	Declined to provide	\$1,495
<b>Comments</b>	Processor w/no wait states; opt 14-in 16/16 color monitor avail; Cordata aka Corona Data Systems	Supports up to 8 users w/MSNET software; Cordata aka Corona Data Systems	Cordata aka Corona Data Systems

**Notes:**

NA Not applicable  
— Information unavailable at press time



<b>Manufacturer Model</b>	<b>Cromemco</b> C-10-SP	<b>Datapoint</b> STARPORT	<b>Datapoint</b> VISTA-PC/1200 (Models 1211 & 1212)
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	—	Multi
<b>Main Processor Model</b>	Zilog Z80A	Intel 80286	Intel 80186
<b>Internal Word Size (bits)</b>	8/8	16	16/16
<b>Clock Rate (MHz)</b>	4	8 or 6	8
<b>Additional Processors</b>	NA	Intel 80287 math coprocessor (opt)	NA
<b>RAM</b>			
<b>Standard RAM (bytes)</b>	64K	512K	256K (Model 1211); 512K (Model 1212)
<b>Min/Max RAM (bytes)</b>	64K/64K	512K/16M	256K/1M
<b>RAM Increments (bytes)</b>	NA	1M	256K
<b>Std Diskette Storage</b>			
<b>No of Drives</b>	1	1	2 (Model 1211); 1 (Model 1212)
<b>Size (in) &amp; Format</b>	5.25 DSDD	5.25 DSDD	5.25 DSDD
<b>Capacity per Diskette (bytes)</b>	390K	1.2M	630K
<b>Std Disk Storage</b>			
<b>No of Drives</b>	NA	1	1 (Model 1212)
<b>Size (in)</b>	NA	5.25	5.25
<b>Capacity per Disk (bytes)</b>	NA	20M	10M
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	5.25-in 390KB diskette drive	5.25-in 20MB or 60MB disk drive	5.25-in 10MB or 20MB disk drives, 1GB-2GB shared file server (in Datapoint ARC LAN)
<b>Display</b>			
<b>Size &amp; Type</b>	12-in CRT	14-in CRT	Opt
<b>Resolution (pixels)</b>	—	640 x 400	NA
<b>Text Display (lines x col)</b>	25 x 80	25 x 80	NA
<b>Character Matrix (dots)</b>	—	—	NA
<b>Colors (simul/palette)</b>	Green monochrome	Green monochrome	NA
<b>Keyboard</b>			
<b>Type</b>	Detachable	Detachable	Detachable
<b>No of Programmable Function Keys</b>	20	30	10
<b>Special Features</b>	Cursor keys, numeric keypad	Cursor keys, numeric keypad	Cursor keys, numeric keypad
<b>No of Avail I/O Slots</b>	NA	5	5
<b>Interfaces</b>			
<b>Serial</b>	1 RS-232C	1 RS-232C	2 RS-232C, 2 RS-422
<b>Parallel</b>	1 Centronics	1 Centronics	1 Centronics
<b>Other</b>	NA	NA	NA
<b>Communications</b>			
<b>Asynchronous</b>	Std	Std (PC 8220 opt w/software)	Std (TTY, EM 8220, async terminal emulator)
<b>Synchronous</b>	Std	NA	Std (DATAPOLL, 3270 SDLC, 3270 BSC, 377X, 2780/3780, X.25)
<b>Software</b>			
<b>Std Operating System</b>	CDOS	MS-DOS	MS-DOS, CTOS
<b>Opt Operating System</b>	—	XENIX	NA
<b>Bundled Software</b>	WP, spreadsheet (w/standalone model)	GW-BASIC, DATABUS, system diagnostics, introductory learning program	GW-BASIC
<b>Languages</b>	BASIC, RATFOR, COBOL, FORTRAN	GW-BASIC, DATABUS, COBOL, C, FORTRAN, Pascal	GW-BASIC, DATABUS, COBOL, FORTRAN, BASIC, Pascal
<b>Sales &amp; Service</b>			
<b>First Delivered</b>	September 1982	December 1985	August 1984
<b>Sales Channels</b>	Direct, distributor, dealer	OEM, direct	Direct, OEM
<b>Service Channels</b>	Dealer, TRW, factory	Interlogic Trace	Interlogic Trace
<b>Pricing</b>	\$1,785 (standalone model)	\$5,995	\$3,195 (Model 1211); \$4,995 (Model 1212)
<b>Comments</b>	Functions as standalone PC or worksta on Cromemco Systems 100, 300, & 400	IBM PC AT compatible; multiuser capability w/DATABUS software	Opt 15-in 8/64 color monitor or 12-in monochrome monitor avail

**Notes:**

NA Not applicable  
— Information unavailable at press time



	<b>Decision Data Computer</b>	<b>Digital Equipment</b>	<b>Digital Equipment</b>
<b>Manufacturer</b>			
<b>Model</b>	5020 & 5021	DECmate II	DECmate III
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Single	Single
<b>Main Processor</b>			
Model	Intel 8088	6120 CMOS	6120 CMOS
Internal Word Size (bits)	8/16	12/—	12/—
Clock Rate (MHz)	4.77	8	8
<b>Additional Processors</b>	NA	NA	Zilog Z80A coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	256K	96K	96K
Min/Max RAM (bytes)	128K/640K	96K/96K	96K/96K
RAM Increments (bytes)	64K	NA	NA
<b>Std Diskette Storage</b>			
No of Drives	2	2	2
Size (in) & Format	5.25 DSDD	5.25	5.25
Capacity per Diskette (bytes)	360K	400K	400K
<b>Std Disk Storage</b>			
No of Drives	1	NA	NA
Size (in)	5.25	NA	NA
Capacity per Disk (bytes)	10M	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	NA	5.25-in 800KB dual diskette drive, 10MB integral disk drive, 5MB Winchester disk drive	NA
<b>Display</b>			
Size & Type	12-in CRT	Opt	12-in CRT
Resolution (pixels)	320 x 200	NA	—
Text Display (lines x col)	24 x 80	NA	24 x 80/132
Character Matrix (dots)	—	NA	7 x 9
Colors (simul/palette)	Green monochrome	NA	—
<b>Keyboard</b>			
Type	Detachable	Opt	Detachable
No of Programmable Function Keys	10	NA	20
Special Features	Cursor keys, numeric keypad	NA	Numeric keypad
<b>No of Avail I/O Slots</b>	4	3	3
<b>Interfaces</b>			
Serial	1 RS-232C	1 RS-232	1 RS-232
Parallel	1 Centronics	NA	NA
Other	NA	—	NA
<b>Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Std (IBM 5250 Terminal Emulation 5021 only)	Std	NA
<b>Software</b>			
Std Operating System	MS-DOS	NA	NA
Opt Operating System	NA	DECmate II WPS, COS-310, CP/M-80	COS-310, CP/M-80
Bundled Software	5250 Terminal Emulation (5021 only) GW-BASIC	NA	DECmate/WPS WP
Languages	—	—	—
<b>Sales &amp; Service</b>			
First Delivered	May 1984	—	—
Sales Channels	Direct	Direct	Direct
Service Channels	Direct	Direct	Direct
<b>Pricing</b>	\$2,355 (5020); \$2,835 (5021)	\$2,675	\$2,695
<b>Comments</b>	Opt monochrome & color monitors avail	CP/M Option Module incl Zilog Z80A processor, 64KB RAM, & CP/M-80 operating system; opt keyboard & monitor avail	Opt integral modem; Zilog Z80A option incl 64KB RAM

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Manufacturer Model Classification Tasks</b>	<b>Digital Equipment Professional 325</b> Desktop Single	<b>Digital Equipment Professional 350</b> Desktop Single	<b>Digital Equipment Professional 380</b> Desktop Single
<b>Main Processor</b>	Digital Equipment F-11	Digital Equipment F-11	Digital Equipment J-11
Model	16/16	16/16	16/16
Internal Word Size (bits)	13.8	13.8	10
Clock Rate (MHz)	NA	NA	NA
<b>Additional Processors</b>			
<b>RAM</b>			
Standard RAM (bytes)	512K	512K	512K
Min/Max RAM (bytes)	512K/768K	512K/1M	512K/2MB
RAM Increments (bytes)	256K	256K	256K, 512K
<b>Std Diskette Storage</b>			
No of Drives	2	2	2
Size (in) & Format	5.25	5.25	5.25
Capacity per Diskette (bytes)	400K	400K	400K
<b>Std Disk Storage</b>			
No of Drives	NA	NA	NA
Size (in)	NA	NA	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	NA	5MB, 10MB, or 33MB disk drives	5MB, 10MB, or 33MB disk drive
<b>Display</b>			
Size & Type	12-in monochrome or 13-in color CRT	12-in monochrome or 13-in color CRT	Opt
Resolution (pixels)	960 x 240	960 x 240	NA
Text Display (lines x col)	24 x 80/132	24 x 80/132	NA
Character Matrix (dots)	7 x 9	7 x 9	NA
Colors (simul/palette)	White, amber, or green monochrome or 4 or 16 color	White, amber, or green monochrome or 4 or 16 color	NA
<b>Keyboard</b>			
Type	Detachable	Detachable	Opt
No of Programmable Function Keys	20	20	NA
Special Features	Numeric keypad	Numeric keypad	NA
<b>No of Avail I/O Slots</b>	1	3	5
<b>Interfaces</b>			
Serial	1 RS-232C	1 RS-232C	1 RS-232C
Parallel	NA	NA	NA
Other	Video, network	Video, network	Video, network
<b>Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	Std	Std	Std
<b>Software</b>			
Std Operating System	NA	NA	NA
Opt Operating System	P/OS, RT-11, CTS-300, p-System, PRO/VENIX, Idris, XENIX, Mumps, CP/M, MS-DOS	P/OS, RT-11, CTS-300, p-System, PRO/VENIX, Idris, XENIX, Mumps, CP/M, MS-DOS	P/OS, RT-11, CTS-300, p-System, PRO/VENIX, Idris, XENIX, Mumps, CP/M, MS-DOS
Bundled Software Languages	NA	NA	NA
	BASIC, COBOL, FORTRAN, DIBOL, Pascal	BASIC, COBOL, FORTRAN, DIBOL, Pascal	BASIC, COBOL, FORTRAN, DIBOL, Pascal
<b>Sales &amp; Service</b>			
First Delivered	May 1982	May 1982	September 1984
Sales Channels	Direct	Direct	Direct
Service Channels	Direct	Direct	Direct
<b>Pricing</b>	Declined to provide	Declined to provide	\$6,025
<b>Comments</b>	CP/M expansion card incl Zilog Z80 processor	CP/M expansion card incl Zilog Z80 processor	CP/M expansion card incl Zilog Z80 processor; monochrome & color monitors opt; various keyboards avail

**Notes:**

NA Not applicable  
— Information unavailable at press time



Manufacturer Model Classification Tasks Main Processor Model Internal Word Size (bits) Clock Rate (MHz) Additional Processors RAM Standard RAM (bytes) Min/Max RAM (bytes) RAM Increments (bytes) Std Diskette Storage No of Drives Size (in) & Format Capacity per Diskette (bytes) Std Disk Storage No of Drives Size (in) Capacity per Disk (bytes) Other Storage (Std) Other Storage (Opt) Display Size & Type Resolution (pixels) Text Display (lines x col) Character Matrix (dots) Colors (simul/palette) Keyboard Type No of Programmable Function Keys Special Features No of Avail I/O Slots Interfaces Serial Parallel Other Communications Asynchronous Synchronous Software Std Operating System Opt Operating System Bundled Software Languages Sales & Service First Delivered Sales Channels Service Channels Pricing Comments	Digital Equipment Rainbow 100 + Desktop Single Intel 8088, Zilog Z80A 8/16, 8/8 5, 4 Intel 8087 math coprocessor (opt) 128K 128K/896K 128K, 256K 2 5.25 400K 1 — 20M NA NA Opt NA NA NA NA Opt NA NA NA NA Opt NA NA NA 2 1 RS-232/RS-423 NA NA Std Std NA CP/M-80/86, MS-DOS NA BASIC, COBOL, FORTRAN, DIBOL, Pascal 1983 Direct Direct \$4,315 Opt monochrome & color monitors, various keyboards avail	Digital Equipment Rainbow 100B Desktop Single Intel 8088, Zilog Z80A 8/16, 8/8 5, 4 Intel 8087 math coprocessor (opt) 128K 128K/896K 128K, 256K 2 5.25 400K NA NA NA NA 800KB dual diskette drive, 20MB disk drive Opt NA NA NA NA Opt NA NA NA 3 1 RS-232/RS-423 NA NA Std Std NA CP/M-80/86, MS-DOS NA BASIC, COBOL, FORTRAN, DIBOL, Pascal — Direct Direct \$2,415 Opt monochrome & color monitors, various keyboards avail	Digital Equipment Rainbow 190 Desktop Single Intel 8088, Zilog Z80A 8/16, 8/8 5, 4 Intel 8087 math coprocessor (opt) 640K 640K/896K 128K, 256K 2 5.25 400K 1 — 20M NA NA 12-in CRT 800 x 240 24 x 80/132 7 x 9 White, amber, or green monochrome Detachable 20 Numeric keypad 2 1 RS-232/RS-423 NA NA Std Std MS-DOS 2.11 NA Rainbow Office Workstation, WPS-PLUS/Rainbow word processor BASIC, COBOL, FORTRAN, DIBOL, Pascal July 1985 Direct Direct \$6,495 NA

## Notes:

NA Not applicable  
— Information unavailable at press time



<p><b>Manufacturer</b>  <b>Model</b>  <b>Classification</b>  <b>Tasks</b>  <b>Main Processor</b>  Model  Internal Word Size (bits)  Clock Rate (MHz)  <b>Additional Processors</b>  <b>RAM</b>  Standard RAM (bytes)  Min/Max RAM (bytes)  RAM Increments (bytes)  <b>Std Diskette Storage</b>  No of Drives  Size (in) &amp; Format  Capacity per Diskette (bytes)  <b>Std Disk Storage</b>  No of Drives  Size (in)  Capacity per Disk (bytes)  <b>Other Storage (Std)</b>  <b>Other Storage (Opt)</b>  <b>Display</b>  Size &amp; Type  Resolution (pixels)  Text Display (lines x col)  Character Matrix (dots)  Colors (simul/palette)  <b>Keyboard</b>  Type  No of Programmable  Function Keys  Special Features  <b>No of Avail I/O Slots</b>  <b>Interfaces</b>  Serial  Parallel  Other  <b>Communications</b>  Asynchronous  Synchronous  <b>Software</b>  Std Operating System  Opt Operating System  Bundled Software  Languages  <b>Sales &amp; Service</b>  First Delivered  Sales Channels  Service Channels  <b>Pricing</b>  <b>Comments</b></p>	<p><b>Eagle Computer</b>  Eagle Turbo 2  Desktop  Single  Intel 8086  16/16  8  Intel 8087 math coprocessor (opt)  256K  256K/640K  256K  2  5.25 DSDD  360K  NA  NA  NA  NA  NA  12-in CRT  720 x 350  25 x 80  14 x 9  Monochrome  Detachable  10, or 24  Numeric keypad  5  4 RS-232C (opt)  1 Centronics  1 RGB, 1 composite video, 1 audio (opt)  Opt  NA  MS-DOS 2.11  —  BASIC, BASICA  BASIC, BASICA  March 1985  Dealer, distributor  Bell &amp; Howell, distributor  \$1,995  Opt 4/16 color monitor; discontinued model, avail from dealer inventory only</p>	<p><b>Eagle Computer</b>  Eagle Turbo GX-V  Floor model  Single  Intel 8086  16/16  8  Intel 8087 math coprocessor (opt)  640K  640K/640K  NA  1  5.25 DSDD  360K  1  —  31.9M  NA  5.25-in 360KB diskette drive, 1/8-in magnetic tape drive  12-in CRT  720 x 350  25 x 80  14 x 9  Monochrome  Detachable  10, or 24  Numeric keypad  4  1 RS-232C  1 Centronics  1 RGB, 1 composite video, 1 audio (opt)  Std  NA  MS-DOS 2.11  PICK  BASIC, BASICA  BASIC, BASICA  November 1985  Dealer, distributor  Bell &amp; Howell, distributor  \$3,995  Multiuser capability w/opt PICK operating system; opt color monitor avail; discontinued model, avail from dealer inventory only</p>	<p><b>Eagle Computer</b>  Eagle Turbo XL  Desktop  Single  Intel 8086  16/16  8  Intel 8087 math coprocessor (opt)  256K  256K/640K  256K  1  5.25 DSDD  360K  1  —  10.16M  NA  NA  12-in CRT  720 x 350  25 x 80  14 x 9  Monochrome  Detachable  10, or 24  Numeric keypad  4  4 RS-232C (opt)  1 Centronics  1 RGB, 1 composite video, 1 audio (opt)  Opt  NA  MS-DOS 2.11  —  BASIC, BASICA  BASIC, BASICA  April 1984  Dealer, distributor  Bell &amp; Howell, distributor  \$2,795  Opt 4/16 color monitor; discontinued model, avail from dealer inventory only</p>
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**Notes:**  
NA Not applicable  
— Information unavailable at press time



Manufacturer	Epson America	Epson America	Epson America
<b>Model</b>	Equity I	Equity II	Equity III
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Single	Multi
<b>Main Processor</b>	Intel 8088	NEC V30	Intel 80286
Model	8/16	16/16	16/16
Internal Word Size (bits)	4.77	4.77 or 7.16	6
Clock Rate (MHz)	Intel 8087 math coprocessor (opt)	Intel 8087 math coprocessor (opt)	Intel 80287
<b>Additional Processors</b>			
<b>RAM</b>	256K	640K	640K
Standard RAM (bytes)	256K/640K	640K/640K	640K/15.5M
Min/Max RAM (bytes)	256K	NA	—
RAM Increments (bytes)			
<b>Std Diskette Storage</b>	1	1	1
No of Drives	5.25 DSDD	5.25 DSDD	5.25 DS high density
Size (in) & Format	360K	360K	1.2M
Capacity per Diskette (bytes)			
<b>Std Disk Storage</b>	NA	NA	NA
No of Drives	NA	NA	NA
Size (in)	NA	NA	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	360KB 5.25-in diskette drive,	5.25-in 360KB, 1.2MB	5.25-in 360KB or 1.2MB
<b>Other Storage (Opt)</b>	20MB disk drive	diskette drives; 20MB disk drive	diskette drive, 20MB or 40MB disk drives
<b>Display</b>	Opt	Opt	Opt
Size & Type	NA	NA	NA
Resolution (pixels)	NA	NA	NA
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>	Detachable	Detachable	Detachable
Type	10	10	10
No of Programmable Function Keys	Cursor keys, numeric keypad; mouse (opt)	Cursor keys, numeric keypad; mouse (opt)	Cursor keys, numeric keypad; mouse (opt)
Special Features	3	5	8
<b>No of Avail I/O Slots</b>	1 RS-232C	1 RS-232C	1 RS-232C
<b>Interfaces</b>	1 Centronics	1 Centronics	1 Centronics
Serial	NA	NA	NA
Parallel			
Other	Std (TTY)	Std (TTY)	Std (TTY)
<b>Communications</b>	Opt	Opt	NA
Asynchronous	MS-DOS 2.11	MS-DOS 3.1	MS-DOS 3.1
Synchronous	NA	NA	NA
<b>Software</b>	GW-BASIC	GW-BASIC	GW-BASIC
Std Operating System	GW-BASIC	GW-BASIC	GW-BASIC
Opt Operating System			
Bundled Software			
Languages	November 1985	February 1986	February 1986
<b>Sales &amp; Service</b>	Dealer, distributor	Dealer, distributor	Dealer, distributor
First Delivered	Dealer	Dealer	Dealer
Sales Channels	\$995	\$1,695	\$3,495
Service Channels	IBM PC compatible; opt	IBM PC XT compatible; opt	Opt monochrome & color
<b>Pricing</b>	monochrome & color monitors	monochrome & color monitors avail	capability w/3rd-party software
<b>Comments</b>			

**Notes:**

NA Not applicable

— Information unavailable at press time



Manufacturer Model	Ericsson Ericsson PC	Esprit Computer Products 9310	Franklin Computer ACE 2000 Series (Models 2000, 2100, & 2200)
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Single	Single
<b>Main Processor</b>			
Model	Intel 8088	Intel 8088	GTE 65SC02
Internal Word Size (bits)	8/16	8/16	8/8
Clock Rate (MHz)	4.77	4.77	—
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt)	NA	NA
<b>RAM</b>			
Standard RAM (bytes)	256K	256K	128K
Min/Max RAM (bytes)	256K/640K	—/640K	128K/576K
RAM Increments (bytes)	64K	128K	512K
<b>Std Diskette Storage</b>			
No of Drives	1-2	1	1 (Model 2100); 2 (Model 2200)
Size (in) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity per Diskette (bytes)	360K	365K	164K
<b>Std Disk Storage</b>			
No of Drives	0-1	1	NA
Size (in)	5.25	5.25	NA
Capacity per Disk (bytes)	10M	20M	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	NA	NA	NA
<b>Display</b>			
Size & Type	12-in CRT	14-in CRT	Opt
Resolution (pixels)	640 x 400	—	NA
Text Display (lines x col)	25 x 80	24 x 80	NA
Character Matrix (dots)	9 x 16	7 x 11	NA
Colors (simul/palette)	Amber on brown monochrome	Amber or green monochrome	NA
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable Function Keys	10	10	12
Special Features	Cursor keys, numeric keypad	Cursor keys	Numeric keypad, special BASIC edit keys
<b>No of Avail I/O Slots</b>	6	3 (opt)	2
<b>Interfaces</b>			
Serial	1 RS-232C	2	NA
Parallel	1 Centronics	1	1
Other	NA	—	2 game
<b>Communications</b>			
Asynchronous	Opt (VT 100)	Std (TTY)	NA
Synchronous	Opt (3270 BSC, 3270 SNA, 3770 SNA, 3780 BSC)	NA	NA
<b>Software</b>			
Std Operating System	MS-DOS 2.11	MS-DOS	FRANKLIN DOS 2
Opt Operating System	CP/M	—	NA
Bundled Software	NA	—	NA
Languages	BASIC, Pascal, C	—	BASIC, CP/M, ProDOS, Pascal
<b>Sales &amp; Service</b>			
First Delivered	November 1984	September 1983	September 1985
Sales Channels	Direct	Distributor, dealer	Dealer
Service Channels	Direct, dealer, third-party vendor	Dealer, 3rd-party vendor	Dealer
<b>Pricing</b>	\$2,325 (dual diskette drive, graphics board); \$3,625 (diskette drive, disk drive, graphics board)	\$1,995	\$699 (ACE 2000); \$849 (ACE 2100); \$999 (ACE 2200)
<b>Comments</b>	Opt 16/16 color monitor avail; diskette controller integral to motherboard	IBM PC compatible	Apple II compatible; opt monochrome monitor avail

**Notes:**

NA Not applicable

— Information unavailable at press time



<b>Manufacturer</b>	<b>Fujitsu</b>	<b>Hewlett-Packard</b>	<b>Hewlett-Packard</b>
<b>Model</b>	Micro 16S & 16SX	Integral PC	Series 80 HP-85B
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single (w/CP/M-86 or MS-DOS); multi (w/Concurrent)	Multi	Single
<b>Main Processor</b>			
Model	Proprietary	Motorola MC 68000	Proprietary
Internal Word Size (bits)	16/16	16/32	—
Clock Rate (MHz)	8	8	—
<b>Additional Processors</b>	Zilog Z80A, Fujitsu MB 88401, Fujitsu 6809 display processor	Graphics processor	—
<b>RAM</b>			
Standard RAM (bytes)	128K (16S); 384K (16SX)	512K	32K
Min/Max RAM (bytes)	128K/1M (16S); 384K/1M (16SX)	512K/2.5M	32K/32K
RAM Increments (bytes)	128K, 265K, 512K	—	NA
<b>Std Diskette Storage</b>			
No of Drives	2 (16S); 1 (16SX)	1	NA
Size (in) & Format	5.25 DSDD	3.5	NA
Capacity per Diskette (bytes)	360K	710K	NA
<b>Std Disk Storage</b>			
No of Drives	1 (16SX)	NA	NA
Size (in)	5.25	NA	NA
Capacity per Disk (bytes)	13M, 26M	NA	NA
<b>Other Storage (Std)</b>	NA	NA	Cartridge tape drive
<b>Other Storage (Opt)</b>	13MB or 26MB disk drives (4 for 16S, 3 for 16SX)	—	3.5-in 710KB diskette drives, 10MB or 20MB disk drives
<b>Display</b>			
Size & Type	CRT	9-in electrolum	5-in CRT
Resolution (pixels)	640 x 200	256 x 512	256 x 196
Text Display (lines x col)	25 x 80	24 x 80	16 x 32
Character Matrix (dots)	8 x 8	—	—
Colors (simul/palette)	8/— color	Amber monochrome	—
<b>Keyboard</b>			
Type	Detachable	Detachable	Integral
No of Programmable Function Keys	30	8	8
Special Features	Cursor keys, numeric keypad	Numeric keypad; mouse (opt)	Numeric keypad
<b>No of Avail I/O Slots</b>	4	2	4
<b>Interfaces</b>			
Serial	1; 8 (opt)	NA	NA
Parallel	1	TPIL	NA
Other	Light pen	2 HP-HIL, 1 HP-IB	GPIL
<b>Communications</b>			
Asynchronous	Std	Opt	Opt
Synchronous	Std (2780/3780 BSC, 360/20, HASP, multileaving, IBM SNA/SDLC protocols)	NA	NA
<b>Software</b>			
Std Operating System	NA	HP UX V (UNIX)	Enhanced HP BASIC
Opt Operating System	CP/M-86, MS-DOS, Concurrent	—	NA
Bundled Software	NA	HP PAM (Personal Applications Manager), HP Windows	—
Languages	CBASIC, Pascal, PL/1, C, COBOL, FORTRAN, Algol, Assembler	C, BASIC	BASIC, Assembler
<b>Sales &amp; Service</b>			
First Delivered	1982	January 1985	July 1983
Sales Channels	Dealer	Direct, dealer	Direct, dealer
Service Channels	Dealer	Direct, dealer	Direct, dealer
<b>Pricing</b>	\$2,350 (Model 16S); \$4,250 (Model 16SX w/13MB disk drive); \$4,950 (Model 16SX w/26MB disk drive)	\$4,995	\$3,495
<b>Comments</b>	Multiuser capability w/opt Concurrent operating system	Integral printer, internal clock; bus expanders support up to 7MB RAM	Integral printer; 32KB Hewlett-Packard Electronic Disc memory

**Notes:**

NA Not applicable  
 — Information unavailable at press time



Manufacturer Model	Hewlett-Packard Series 80 HP-86B	Hewlett-Packard Touchscreen II & Touchscreen MAX II Desktop	Hewlett-Packard Vectra PC Desktop
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	—	—
<b>Main Processor</b>	Proprietary	Intel 8088	Intel 80286
Model	—	8/16	16/16
Internal Word Size (bits)	—	8	8
Clock Rate (MHz)	—	Intel 8087 math coprocessor (opt)	Intel 80287 math coprocessor (opt)
<b>Additional Processors</b>	—	—	—
<b>RAM</b>	128K	256K	256K, 640K
Standard RAM (bytes)	128K/640K	256K/640K	256K/3.6M
Min/Max RAM (bytes)	—	—	—
RAM Increments (bytes)	—	—	—
<b>Std Diskette Storage</b>	NA	2 (MAX II)	1
No of Drives	NA	3.5 DS	5.25
Size (in) & Format	NA	710K	360K, 1.2M
Capacity per Diskette (bytes)	NA	—	—
<b>Std Disk Storage</b>	NA	1 (MAX II)	NA
No of Drives	NA	—	NA
Size (in)	NA	10M, 20M, 40M	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	1-2 3.5-in 710KB diskette drives, 10MB or 20MB disk drives	3.5-in 710KB diskette drives, 10MB, 20MB, or 40MB disk drives (Touchscreen II); magnetic tape drive (Touchscreen II & MAX II)	360KB or 1.2MB diskette drives, 20MB or 40MB disk drives
<b>Display</b>	9-in/12-in CRT	12-in CRT	12-in CRT
Size & Type	544 x 240	512 x 390 graphics; 640 x 378 text	640 x 400
Resolution (pixels)	—	27 x 80	24 x 80
Text Display (lines x col)	24 x 80	6 x 9 in 8 x 14 cell	—
Character Matrix (dots)	—	Monochrome	Monochrome or color
Colors (simul/palette)	—	—	—
<b>Keyboard</b>	Integral	Detachable	Detachable
Type	14	12	18
No of Programmable	—	—	—
Function Keys	Numeric keypad	Numeric keypad	Graphics tablet, mouse, bar-code wand (opt)
Special Features	—	—	7
<b>No of Avail I/O Slots</b>	4	4	7
<b>Interfaces</b>	NA	1 RS-232C/RS-422, 1 RS-232C	1-2 (opt)
Serial	NA	NA	1 (opt)
Parallel	GPIL	1 HP-IB, 1 HP-HIL	HP-IL, HP-IB
Other	—	—	—
<b>Communications</b>	Opt	Opt (HP 2623A, VT 100)	Opt (HP 2392A, VT 100)
Asynchronous	NA	Opt (3278)	Opt (3278)
Synchronous	—	—	—
<b>Software</b>	Enhanced HP BASIC	MS-DOS 2.11	MS-DOS 3.1
Std Operating System	CP/M	—	Vectra DOS (MS-DOS 3.1 plus HP Personal Applications Manager)
Opt Operating System	—	—	—
<b>Bundled Software</b>	—	HP PAM (Personal Applications Manager)	—
<b>Languages</b>	BASIC, Assembler	BASIC, COBOL, FORTRAN, GW-BASIC, C Compiler, Pascal	BASIC, MS-DOS, Macro Assembler
<b>Sales &amp; Service</b>	July 1983	April 1985	September 1986
First Delivered	Direct, dealer	Direct, dealer	Direct, dealer
Sales Channels	Direct, dealer	Direct, dealer	Direct, dealer
Service Channels	\$1,990-\$2,290	\$2,830 (Touchscreen II); \$5,070-\$7,370 (Touchscreen MAX II)	\$3,199 (256KB RAM, 360KB diskette drive); \$3,399 (256KB RAM, 1.2MB diskette drive); \$3,599 (640KB RAM, 1.2MB diskette drive)
<b>Pricing</b>	—	—	—
<b>Comments</b>	96KB Hewlett-Packard Electronic Disc memory incl; opt modem	Touch-sensitive screen	NA

**Notes:**

NA Not applicable  
 — Information unavailable at press time

Manufacturer	Honeywell Information Systems	Honeywell Information Systems	Honeywell Information Systems
<b>Model</b>	AP Series	EP Series	microSystem 6/10
<b>Classification</b>	Desktop	Desktop	Desktop, floor model
<b>Tasks</b>	Single	Single	Multi
<b>Main Processor</b>			
Model	Intel 80286	Intel 8088-2	Honeywell LSI6
Internal Word Size (bits)	16/16	8/16	16/16
Clock Rate (MHz)	8	4.77 or 8	—
<b>Additional Processors</b>	Intel 80287 math coprocessor (opt)	Intel 8087-2 math coprocessor (opt)	Intel 8086 (opt)
<b>RAM</b>			
Standard RAM (bytes)	256K, 512K	256K	128K, 640K
Min/Max RAM (bytes)	256K/4M	256K/640K	128K/1.5M
RAM Increments (bytes)	128K, 1M	640K (replacement board)	512K, 896K
<b>Std Diskette Storage</b>			
No of Drives	1	1-2	1
Size (in) & Format	5.25 DSDD	5.25 DSDD	5.25
Capacity per Diskette (bytes)	360K, 1.2M	360K	650K
<b>Std Disk Storage</b>			
No of Drives	1	1	1
Size (in)	5.25	5.25	5.25
Capacity per Disk (bytes)	20M	10M	15M
<b>Other Storage (Std)</b>	45MB or 60MB cartridge tape drive	NA	NA
<b>Other Storage (Opt)</b>	—	NA	5.25-in 650KB diskette drive, 15MB or 28MB disk drive, .25-in 64MB cartridge tape
<b>Display</b>			
Size & Type	Opt	Opt	12-in CRT
Resolution (pixels)	NA	NA	720 x 300
Text Display (lines x col)	NA	NA	25 x 80
Character Matrix (dots)	NA	NA	7 x 9
Colors (simul/palette)	NA	NA	Green or amber monochrome
<b>Keyboard</b>			
Type	Opt	Opt	Detachable
No of Programmable Function Keys	NA	NA	12
Special Features	NA	NA	Numeric keypad
<b>No of Avail I/O Slots</b>	8	4	4
<b>Interfaces</b>			
Serial	NA	1 (opt)	1 RS-232C, 1 RS-232C/RS-422
Parallel	NA	1	NA
Other	—	—	Composite video, SDLC/HDLC
<b>Communications</b>			
Asynchronous	Std	Opt	Std (TTY, 730X)
Synchronous	Opt (7300 & 7800 emulation, Honeywell KERMIT)	Opt (7300 & 7800 emulation, Honeywell KERMIT)	Opt (SDLC, HDLC, PVE, BSC)
<b>Software</b>			
Std Operating System	MS-DOS 3.1	MS-DOS 2.1	GCOS6 MOD 400
Opt Operating System	NA	NA	MS-DOS, UCOS III
Bundled Software	GW-BASIC, introduction to MS-DOS, user diagnostics	Honeywell Menu Manager, GW-BASIC, tutorials, diagnostics	Compass
<b>Languages</b>	GW-BASIC	—	BASIC, C, COBOL, FORTRAN, Pascal, GW-BASIC, CBASIC
<b>Sales &amp; Service</b>			
First Delivered	November 1985	February 1986	April 1983
Sales Channels	Direct	Direct	Direct, distributor
Service Channels	Direct	Direct	Direct
<b>Pricing</b>	\$3,565-\$6,970	\$1,550 (diskette drive); \$1,945 (dual diskette drives); \$2,650 (diskette drive & 10MB disk drive)	\$6,995 (640KB RAM)
<b>Comments</b>	IBM PC AT compatible; incl clock/calendar; various monitors & keyboards avail	IBM PC, PC XT compatible; opt color & monochrome displays & keyboards avail	Multiuser capability for up to 3 users w/both GCOS6 MOD 400 & opt UCOS III operating systems

**Notes:**

NA Not applicable

— Information unavailable at press time



Manufacturer	Honeywell Information Systems	IBM	IBM
<b>Model Classification</b>	XP Series Desktop Single	Personal Computer Desktop	Personal Computer AT Desktop
<b>Tasks</b>		—	Multi
<b>Main Processor</b>			
Model	Intel 8088-2	Intel 8088	Intel 80286
Internal Word Size (bits)	8/16	8/16	16/16
Clock Rate (MHz)	4.77, 8	4.77	6
<b>Additional Processors</b>	Intel 8087-2 math coprocessor (opt)	Intel 8087 math coprocessor (opt)	Intel 80287 math coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	256K, 512K	64K, 256K	256K, 512K
Min/Max RAM (bytes)	256K/640K	64K/640K	256K/3M
RAM Increments (bytes)	640K (replacement board)	64K, 256K	128K, 256K, 512K
<b>Std Diskette Storage</b>			
No of Drives	1-2	0-2	1
Size (in) & Format	5.25 DSDD	5.25 DS	5.25 DS high density
Capacity per Diskette (bytes)	360K	360K	1.2M
<b>Std Disk Storage</b>			
No of Drives	1	NA	1
Size (in)	5.25	NA	5.25
Capacity per Disk (bytes)	20M	NA	20M, 30M
<b>Other Storage (Std)</b>	10MB cartridge tape	NA	NA
<b>Other Storage (Opt)</b>	—	Dual 5.25-in 360KB diskette drives, dual 10MB disk drives	5.25-in 1.2MB diskette drive, 20MB or 30MB disk drive
<b>Display</b>			
Size & Type	Opt	Opt	Opt
Resolution (pixels)	NA	NA	NA
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Type	Opt	Detachable	Detachable
No of Programmable Function Keys	NA	10	10
Special Features	NA		
<b>No of Avail I/O Slots</b>	8	Numeric keypad 5	Numeric keypad 8
<b>Interfaces</b>			
Serial	1	1 RS-232C	1 RS-232C (opt w/single-diskette-drive model)
Parallel	1	1	1 (opt w/single-diskette-drive model)
Other	—	NA	—
<b>Communications</b>			
Asynchronous	Std	Opt (TTY, 3101)	Opt
Synchronous	Opt (7300 & 7800 emulation, Honeywell KERMIT)	Opt (3270 BSC or SDLC, 3278/79 BSC or SDLC, 3770 SNA/RJE)	Opt (3270 BSC or SDLC, 3278/79 BSC or SDLC, 3770 SNA/RJE)
<b>Software</b>			
Std Operating System	MS-DOS 2.1	PC-DOS	PC-DOS 3.0
Opt Operating System	NA	UCSD p-System, CP/M-86, PC/IX	XENIX, PC/IX
<b>Bundled Software</b>	Menu Manager, HELP, RAM disk, GW-BASIC, diagnostics	—	—
<b>Languages</b>	GW-BASIC	BASIC, COBOL, FORTRAN, Pascal, APL, Macroassembler	APL, BASIC, COBOL, FORTRAN, Pascal
<b>Sales &amp; Service</b>			
First Delivered	November 1985	August 1981	August 1984
Sales Channels	Direct	Direct, dealer	Direct, dealer
Service Channels	Direct	Direct	Direct, dealer
<b>Pricing</b>	\$2,300 (256KB RAM, dual diskette drive); \$3,760 (256KB RAM, diskette drive, 20MB disk drive); \$5,300 (512KB RAM, diskette drive, 20MB disk drive, tape drive)	\$1,265 (64KB RAM, no disk or diskette drives); \$1,995 (256KB RAM, single diskette drive); \$2,420 (256KB RAM, dual diskette drive)	\$3,995 (256KB RAM, diskette drive); \$5,795 (512KB RAM, diskette drive, 20MB disk drive, serial & parallel ports); \$5,995 (w/30MB instead of 20MB disk drive)
<b>Comments</b>	IBM PC & PC XT compatible; opt monitors & keyboards avail	Opt monochrome & color monitors avail	Upgradable to PC AT/370; opt monochrome & color monitors avail

Notes:  
 NA Not applicable  
 — Information unavailable at press time





Manufacturer	IBM	IBM	IBM
<b>Model</b>	Personal Computer AT/370	Personal Computer XT	Personal Computer XT/370
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Multiple	—	—
<b>Main Processor</b>	Intel 80286	Intel 8088	Intel 8088
Model	16/16	8/16	8/16
Internal Word Size (bits)	6	4.77	4.77
Clock Rate (MHz)	AT/370 processor card; Intel 80287 math coprocessor (opt)	Intel 8087 math coprocessor (opt)	PC/370-P card
<b>Additional Processors</b>			
<b>RAM</b>			
Standard RAM (bytes)	640K (PC mode); 480K (System/370 mode)	128K, 256K	640K (PC mode); 480K (System/370 mode)
Min/Max RAM (bytes)	640K/2M	128K/640K	256K/768K
RAM Increments (bytes)	256K, 512K	64K, 256K	512K
<b>Std Diskette Storage</b>			
No of Drives	1	1	1
Size (in) & Format	5.25 DS high density	5.25 DSDD	5.25 DSDD
Capacity per Diskette (bytes)	1.2M	360K	360K
<b>Std Disk Storage</b>			
No of Drives	1	0-1	1
Size (in)	5.25	5.25	5.25
Capacity per Disk (bytes)	20M, 30M	10M	10M
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	5.25-in 1.2MB diskette drive, 20MB or 30MB disk drive	5.25-in 360KB diskette drive, 10MB disk drive	360KB diskette drive, 10MB disk drive
<b>Display</b>			
Size & Type	Opt	Opt	Opt
Resolution (pixels)	NA	NA	NA
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable Function Keys	10	10	10
Special Features	Numeric keypad	Numeric keypad	Numeric keypad
<b>No of Avail I/O Slots</b>	2	8	2
<b>Interfaces</b>			
Serial	1 RS-232C	1	1 RS-232C
Parallel	1	1	1
Other	—	NA	NA
<b>Communications</b>			
Asynchronous	Opt	Opt (TTY, 3101)	Std (TTY, 3101)
Synchronous	Std (3270 BSC or SDLC); opt (3278/79 BSC or SDLC, 3770 SNA/RJE)	Opt (3270 BSC or SDLC, 3278/79 BSC or SDLC, 3770 SNA/RJE)	Std (3270 BSC or SDLC); 3278/79 BSC or SDLC, 3770 SNA/RJE (opt)
<b>Software</b>			
Std Operating System	PC-DOS	PC-DOS	PC-DOS
Opt Operating System	VM/PC, XENIX, PC/IX	PC/IX	VP/PC, PC/IX
Bundled Software	—	—	—
Languages	APL, BASIC, COBOL, FORTRAN, Pascal	BASIC, COBOL, FORTRAN, Pascal, APL, Macroassembler	BASIC, COBOL, FORTRAN, Pascal, APL, Macroassembler
<b>Sales &amp; Service</b>			
First Delivered	August 1984	March 1983	October 1983
Sales Channels	Direct, dealer	Direct, dealer	Direct, dealer
Service Channels	Direct, dealer	Direct, dealer	Direct, dealer
<b>Pricing</b>			
Standard Configuration	\$9,795 (480K/640K RAM, 1.2MB diskette drive, 20MB disk drive); \$9,995 (48K/640K RAM, 1.2MB diskette drive, 30MB disk drive)	\$2,270 (256KB RAM, 1 diskette drive); \$2,570 (256KB RAM, 2 diskette drives); \$3,775 (128KB RAM, 1 diskette drive, 10MB disk drive); \$3,895 (256KB RAM, 1 diskette drive, 10MB disk drive)	\$7,895 (480KB/640KB RAM, diskette drive, 10MB disk drive)
<b>Comments</b>	Opt monochrome & color monitors avail	Opt monochrome & color monitors avail	Opt monochrome & color monitors avail

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<p><b>Manufacturer</b>  <b>Model</b>  <b>Classification</b>  <b>Tasks</b>  <b>Main Processor</b>        Model        Internal Word Size (bits)        Clock Rate (MHz)  <b>Additional Processors</b>  <b>RAM</b>        Standard RAM (bytes)        Min/Max RAM (bytes)        RAM Increments (bytes)  <b>Std Diskette Storage</b>        No of Drives        Size (in) &amp; Format        Capacity per Diskette (bytes)  <b>Std Disk Storage</b>        No of Drives        Size (in)        Capacity per Disk (bytes)  <b>Other Storage (Std)</b>  <b>Other Storage (Opt)</b>    <b>Display</b>        Size &amp; Type        Resolution (pixels)        Text Display (lines x col)        Character Matrix (dots)        Colors (simul/palette)  <b>Keyboard</b>        Type        No of Programmable        Function Keys        Special Features  <b>No of Avail I/O Slots</b>  <b>Interfaces</b>        Serial        Parallel        Other    <b>Communications</b>        Asynchronous        Synchronous  <b>Software</b>        Std Operating System        Opt Operating System        Bundled Software        Languages  <b>Sales &amp; Service</b>        First Delivered        Sales Channels        Service Channels  <b>Pricing</b>    <b>Comments</b></p>	<p><b>ITT Information Systems</b>          ITT XTRA (Models II, III, &amp; V)          Desktop          Single            Intel 8088          8/16          4.77          Intel 80287 math coprocessor (opt)            256K          256K/640K          128K            2 (Model II); 1 (Models III &amp; V)            5.25 DSDD          360K            1 (Models III &amp; V)          5.25          10M (Model III); 20M (Model V)          NA          NA            Opt          NA          NA          NA          NA          Detachable          10          Cursor keys, numeric keypad          5            1 RS-232C          1          NA            Opt (TTY)          Opt (2780/3780, 3270 SDLC)            MS-DOS 3.1          —          —          BASIC, FORTRAN            May 1984          VAR          Servcom (ITT), dealer          \$1,595 (Model II); \$2,595 (Model III); \$3,195 (Model V)            Opt amber &amp; green monochrome monitors avail</p>	<p><b>ITT Information Systems</b>          ITT XTRA XP (Models III &amp; V)          Desktop          Single            Intel 80286          16/16          6          Intel 80287 math coprocessor (opt)            512K          512K/1.6M          64K, 256K            1            5.25 DSDD          360K            1          5.25          10MB (Model III); 20MB (Model V)          NA          NA            Opt          NA          NA          NA          NA          Detachable          10          Cursor keys, numeric keypad          5            1 RS-232C          1          NA            —          —            ITT DOS 3.1          —          —          BASIC, FORTRAN            August 1985          Dealer, VAR          ITT Servcom          \$3,995 (Model III); \$4,595 (Model V)            Opt amber &amp; green monochrome monitors avail</p>	<p><b>Kaypro</b>          286i Model A          Desktop          Multi            Intel 80286          16/16          6          Intel 80287            512K          512K/15M          64K            1            5.25 DS high density          1.2M            NA          NA          NA            NA          5.25-in 1.2MB &amp; 360KB diskette drives, 10MB &amp; 20MB disk drives, 60MB microcassette drive            Opt          NA          NA          NA          NA          Detachable          10          Cursor keys, numeric keypad          7            1 RS-232 (opt)          1 Centronics (opt)          1 RGB, 1 monochrome, 1 composite (opt)            —          —            MS-DOS          NA          GW-BASIC            March 1985          Dealer          Dealer          \$2,995            Opt 16/16 color monitor avail; multiuser capability w/3rd-party software</p>
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**Notes:**  
 NA Not applicable  
 — Information unavailable at press time



	<b>Kaypro 286i Model B Desktop Multi</b>	<b>Kaypro 286i Model C Desktop Multi</b>	<b>Kaypro 286i Model D Desktop Multi</b>
<b>Manufacturer</b>			
<b>Model</b>			
<b>Classification</b>			
<b>Tasks</b>			
<b>Main Processor</b>			
Model	Intel 80286	Intel 80286	Intel 80286
Internal Word Size (bits)	16/16	16/16	16/16
Clock Rate (MHz)	6	6	6
<b>Additional Processors</b>	Intel 80287 math coprocessor (opt)	Intel 80287 math coprocessor (opt)	Intel 80287 math coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	512K	512K	512K
Min/Max RAM (bytes)	512K/15M	512K/15M	512K/15M
RAM Increments (bytes)	64K	64K	64K
<b>Std Diskette Storage</b>			
No of Drives	2	1	1
Size (in) & Format	5.25 DSHD	5.25 DSHD	5.25 DS high density
Capacity per Diskette (bytes)	1.2M	1.2M	1.2M
<b>Std Disk Storage</b>			
No of Drives	NA	1	1
Size (in)	NA	—	—
Capacity per Disk (bytes)	NA	20M	20M
<b>Other Storage (Std)</b>	NA	NA	60MB microcassette
<b>Other Storage (Opt)</b>	5.25-in 360KB & 1.2MB diskette drives; 10MB & 20MB disk drives	5.25-in 360KB & 1.2MB diskette drives; 60MB microcassette	5.25-in 360KB & 1.2MB diskette drives
<b>Display</b>			
Size & Type	Opt	Opt	Opt
Resolution (pixels)	NA	NA	NA
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable Function Keys	10	10	10
Special Features	Cursor keys, numeric keypad	Cursor keys, numeric keypad	Cursor keys, numeric keypad
<b>No of Avail I/O Slots</b>	5	6	5
<b>Interfaces</b>			
Serial	1 RS-232	1 RS-232	1 RS-232
Parallel	1 Centronics	1 Centronics	1 Centronics
Other	Composite video, RGB; monochrome (opt)	Composite video, RGB, monochrome (opt)	Composite video, RGB; monochrome (opt)
<b>Communications</b>			
Asynchronous	—	—	—
Synchronous	—	—	—
<b>Software</b>			
Std Operating System	MS-DOS	MS-DOS	MS-DOS
Opt Operating System	—	—	—
Bundled Software	WordStar, traveling expense manager, Mite, Polywindows	NA	WordStar, Mite, Polywindows, KDesk
Languages	GW-BASIC	GW-BASIC	GW-BASIC
<b>Sales &amp; Service</b>			
First Delivered	May 1985	June 1985	September 1985
Sales Channels	Dealer	Dealer	Dealer
Service Channels	Dealer	Dealer	Dealer
<b>Pricing</b>	\$4,550	\$4,795	\$5,995
<b>Comments</b>	Opt 16/16 color monitor avail; multiuser capability w/opt 3rd-party software; discontinued model, avail from dealer inventory only	Opt 16/16 color monitor avail; multiuser capability w/opt 3rd-party software	Opt 16/16 color monitor avail; multiuser capability w/opt 3rd-party software; discontinued model, avail from dealer inventory only

**Notes:**

NA Not applicable

— Information unavailable at press time



	<b>Kaypro</b>	<b>Kaypro</b>	<b>Leading Edge</b>
<b>Manufacturer</b>	Kaypro PC	New Robie	Model D
<b>Model</b>	Desktop	Desktop	Desktop
<b>Classification</b>	Single	Single	Single
<b>Tasks</b>			
<b>Main Processor</b>			
Model	Intel 8088	Zilog Z80A	Intel 8088
Internal Word Size (bits)	8/16	8/8	16
Clock Rate (MHz)	4.77	4	4.77
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt)	NA	Intel 8087 math coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	256K	64K	256K
Min/Max RAM (bytes)	256K/640K	64K/64K	256K/640K
RAM Increments (bytes)	64K	NA	256K
<b>Std Diskette Storage</b>			
No of Drives	2	2	2
Size (in) & Format	5.25 DSDD	5.25 DS high density	5.25 DSDD
Capacity per Diskette (bytes)	360K	2.6M	360K
<b>Std Disk Storage</b>			
No of Drives	NA	NA	NA
Size (in)	NA	NA	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	NA	—
<b>Other Storage (Opt)</b>	10MB disk drive	NA	—
<b>Display</b>			
Size & Type	12-in CRT	9-in CRT	12-in CRT
Resolution (pixels)	640/320 x 200	100 x 160	720 x 350
Text Display (lines x col)	25 x 40/80	25 x 80	25 x 80
Character Matrix (dots)	—	—	7 x 9
Colors (simul/palette)	Green monochrome	Green monochrome	Amber or green monochrome
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable Function Keys	10	18	10
Special Features	Cursor keys, numeric keypad	Cursor keys, numeric keypad	Cursor keys, numeric keypad
<b>No of Avail I/O Slots</b>	6	NA	4
<b>Interfaces</b>			
Serial	1 RS-232C	2 RS-232	1 RS-232C
Parallel	1 Centronics	1 Centronics	1 Centronics
Other	1 monochrome, 1 RGB, 1 composite video	NA	RGB, TTL mono
<b>Communications</b>			
Asynchronous	—	Std (TTY)	Std
Synchronous	—	—	NA
<b>Software</b>			
Std Operating System	MS-DOS	CP/M	MS-DOS
Opt Operating System	NA	NA	—
Bundled Software	WordStar, Polywindows, KDesk	WordStar, CalcStar, InfoStar, Microplan, Mite	Leading Edge WP, GW-BASIC
Languages	GW-BASIC	CBASIC, SBASIC, MBASIC 80	GW-BASIC
<b>Sales &amp; Service</b>			
First Delivered	October 1985	January 1985	July 1985
Sales Channels	Dealer	Dealer	Dealer
Service Channels	Dealer	Dealer	Dealer
<b>Pricing</b>	\$1,595	\$1,995	\$1,495
<b>Comments</b>	Opt 16/16 color monitor avail	NA	NA

**Notes:**

- NA Not applicable
- Information unavailable at press time



	<b>Lobo Systems</b>	<b>Micro Five</b>	<b>Mohawk Data Sciences</b>
<b>Manufacturer</b>	MAX-80	Series 5000	MDS Hero
<b>Model</b>	Desktop	Desktop; floor mount (opt)	Desktop
<b>Classification</b>	Single	Single; multi (opt)	Multi
<b>Tasks</b>			
<b>Main Processor</b>	Zilog Z80B	Intel 80286	Intel 80186
Model	8/8	16/16	16/16
Internal Word Size (bits)	5	8	—
Clock Rate (MHz)	NA	Intel 80287 math coprocessor	Intel 80186 or 80286 coprocessor (opt)
<b>Additional Processors</b>			
<b>RAM</b>	128K	512K	256K
Standard RAM (bytes)	64K/128K	512K/16M	256K/1,024K
Min/Max RAM (bytes)	64K	256K, 1M	256K
RAM Increments (bytes)			
<b>Std Diskette Storage</b>	NA	1	NA
No of Drives	NA	5.25 DS high density	NA
Size (in) & Format	NA	1.2M	NA
Capacity per Diskette (bytes)	NA		NA
<b>Std Disk Storage</b>	NA	1	NA
No of Drives	NA	5.25	NA
Size (in)	NA	20M, 30M, 45M, 71M, 116M	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	5.25-in 1.2MB or 360KB	1–2 5.25-in DSDD 630KB
<b>Other Storage (Opt)</b>	Max of eight 5.25-in 180KB or 8-in 560KB (SS)/1.2MB (DS) diskette drives; max of four 5.25-in 5MB, 10MB, or 20MB disk drives	diskette drives, 5.25-in 20MB, 30MB, 45MB, 71MB, or 116MB disk drives, 60MB cartridge tape drive	diskette drives, 1–4 5.25-in 5MB, 10MB, 20MB, 32MB, or 80MB internal disk drives, external 675MB disk drive, .25-in cartridge streaming tape drive, 9-track tape drive
<b>Display</b>	12-in CRT	Opt	12-in CRT
Size & Type	640 x 225	NA	720 x 348
Resolution (pixels)	24 x 80	NA	29 x 80
Text Display (lines x col)	8 x 8	NA	9 x 12
Character Matrix (dots)	Monochrome	NA	Green monochrome
Colors (simul/palette)			
<b>Keyboard</b>	Integral	Detachable	Detachable
Type	4	10	10
No of Programmable Function Keys	Cursor keys, digital input pad, numeric keypad	Cursor keys, numeric keypad	Cursor keys, numeric keypad; mouse (opt)
Special Features	1	9	NA
<b>No of Avail I/O Slots</b>			
<b>Interfaces</b>			
Serial	2 RS-232C	1; 15 (opt)	1 RS-422, 2 RS-232; 4 RS-232C (opt)
Parallel	1 Centronics	1; 5 (opt)	1 Centronics
Other	5.25-in diskette port, 8-in diskette port, 5.25-in disk port	NA	NA
<b>Communications</b>	Std	Std (TTY)	Opt
Asynchronous	Std	NA	Opt (BSC, SDLC, 3270 SNA/BSC)
Synchronous			
<b>Software</b>	CP/M	MS-DOS	Proprietary (HOS)
Std Operating System	LDOS, MultiDOS	XENIX	MS-DOS
Opt Operating System	WP, accounting	NA	NA
Bundled Software	BASIC, FORTRAN, JRT	GW-BASIC, C	COBOL, FORTRAN, BASIC, Pascal
Languages	Pascal, MACRO 80, DRI MAC		
<b>Sales &amp; Service</b>	1978	July 1985	March 1984
First Delivered	Direct, distributor, dealer	VAR	Direct
Sales Channels	Direct	Dealer	Direct
Service Channels	Declined to provide	\$3,695 (incl hard disk controller w/o disk)	\$2,695–\$8,995
<b>Pricing</b>		IBM PC AT compatible; multiuser capability w/opt XENIX operating system; features processor w/DMA & no wait states; opt displays avail from 3rd-party vendors	Uses snap-on-modules for addition of peripheral devices; up to 16 MDS Hero systems can be networked via MDS SUPER 21 Communications processor
<b>Comments</b>	Opt monochrome monitor avail		

**Notes:**

- NA Not applicable  
 — Information unavailable at press time



<p><b>Manufacturer</b></p> <p><b>Model</b></p> <p><b>Classification</b></p> <p><b>Tasks</b></p> <p><b>Main Processor</b></p> <p>Model</p> <p>Internal Word Size (bits)</p> <p>Clock Rate (MHz)</p> <p><b>Additional Processors</b></p> <p><b>RAM</b></p> <p>Standard RAM (bytes)</p> <p>Min/Max RAM (bytes)</p> <p>RAM Increments (bytes)</p> <p><b>Std Diskette Storage</b></p> <p>No of Drives</p> <p>Size (in) &amp; Format</p> <p>Capacity per Diskette (bytes)</p> <p><b>Std Disk Storage</b></p> <p>No of Drives</p> <p>Size (in)</p> <p>Capacity per Disk (bytes)</p> <p><b>Other Storage (Std)</b></p> <p><b>Other Storage (Opt)</b></p> <p><b>Display</b></p> <p>Size &amp; Type</p> <p>Resolution (pixels)</p> <p>Text Display (lines x col)</p> <p>Character Matrix (dots)</p> <p>Colors (simul/palette)</p> <p><b>Keyboard</b></p> <p>Type</p> <p>No of Programmable Function Keys</p> <p>Special Features</p> <p><b>No of Avail I/O Slots</b></p> <p><b>Interfaces</b></p> <p>Serial</p> <p>Parallel</p> <p>Other</p> <p><b>Communications</b></p> <p>Asynchronous</p> <p>Synchronous</p> <p><b>Software</b></p> <p>Std Operating System</p> <p>Opt Operating System</p> <p>Bundled Software</p> <p>Languages</p> <p><b>Sales &amp; Service</b></p> <p>First Delivered</p> <p>Sales Channels</p> <p>Service Channels</p> <p><b>Pricing</b></p> <p><b>Comments</b></p>	<p><b>Monroe Systems for Business</b></p> <p>MS2111, MS2112, MS2121, &amp; MS2122</p> <p>Desktop</p> <p>Multi</p> <p>Intel 80186</p> <p>16/16</p> <p>8</p> <p>Zilog Z80A (opt)</p> <p>128K (MS2111, MS2121); 256K (MS2112, MS2122)</p> <p>128K/896K (MS2111, MS2121); 256K/896K (MS2112, MS2122)</p> <p>128K, 256K</p> <p>1</p> <p>5.25 DSDD</p> <p>640K (CP/M-86); 720K (MS-DOS)</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>External 15MB or 38MB disk drive</p> <p>12-in CRT (MS2111, MS2112); 13.5-in RGB CRT (MS2121, MS2122)</p> <p>640 x 400</p> <p>25 x 80</p> <p>7 x 9</p> <p>Amber monochrome (MS2111, MS2112); 16/16 RGB (MS2121, MS2122)</p> <p>Detachable</p> <p>10</p> <p>Cursor keys, numeric keypad</p> <p>5</p> <p>2 RS-232C; 4 RS-232C (opt)</p> <p>1 Centronics</p> <p>NA</p> <p>Std (TTY, VT 100)</p> <p>Std (2780/3780, 3270 BSC, 3270 SDLC, 3270 SNA)</p> <p>CP/M-86, MS-DOS</p> <p>CP/M-80</p> <p>NA</p> <p>GW-BASIC</p> <p>September 1984</p> <p>Direct</p> <p>Direct</p> <p>Declined to provide</p> <p>NA</p>	<p><b>Monroe Systems for Business</b></p> <p>MS2211, MS2212, MS2221, &amp; MS2222</p> <p>Desktop</p> <p>Multi</p> <p>Intel 80186</p> <p>16/16</p> <p>8</p> <p>Zilog Z80A (opt)</p> <p>128K (MS2211, MS2221); 256K (MS2212, MS2222)</p> <p>128/896K (MS2211, MS2221); 256K/896K (MS2212, MS2222)</p> <p>128K, 256K</p> <p>2</p> <p>5.25 DSDD</p> <p>640K (CP/M-86); 720K (MS-DOS)</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>External 15MB or 38MB disk drive</p> <p>12-in CRT (MS2211, MS2212); 13.5-in RGB CRT (MS2221, MS2222)</p> <p>640 x 400</p> <p>25 x 80</p> <p>7 x 9</p> <p>Amber monochrome (MS2211, MS2212); 16/16 RGB (MS2221, MS2222)</p> <p>Detachable</p> <p>10</p> <p>Cursor keys, numeric keypad</p> <p>5</p> <p>2 RS-232C; 4 RS-232C (opt)</p> <p>1 Centronics</p> <p>NA</p> <p>Std (TTY, VT 100)</p> <p>Std (2780/3780, 3270 BSC, 3270 SDLC, 3270 SNA)</p> <p>CP/M-86, MS-DOS</p> <p>CP/M-80</p> <p>NA</p> <p>GW-BASIC</p> <p>September 1984</p> <p>Direct</p> <p>Direct</p> <p>Declined to provide</p> <p>NA</p>	<p><b>Monroe Systems for Business</b></p> <p>MS2311, MS2312, MS2321, &amp; MS2322</p> <p>Desktop</p> <p>Multi</p> <p>Intel 80186</p> <p>16/16</p> <p>8</p> <p>Zilog Z80A (opt)</p> <p>128K (MS2311, MS2321); 256K (MS2312, MS2322)</p> <p>128K/896K (MS2311, MS2321); 256K/896K (MS2312, MS2322)</p> <p>128K, 256K</p> <p>1</p> <p>5.25 DSDD</p> <p>640K (CP/M-86); 720K (MS-DOS)</p> <p>1</p> <p>5.25</p> <p>10M</p> <p>NA</p> <p>External 15MB or 38MB disk drive</p> <p>12-in CRT (MS2311, MS2312); 13.5-in RGB CRT (MS2321, MS2322)</p> <p>640 x 400</p> <p>25 x 80</p> <p>7 x 9</p> <p>Amber monochrome (MS2311, MS2312); 16/16 RGB (MS2321, MS2322)</p> <p>Detachable</p> <p>10</p> <p>Cursor keys, numeric keypad</p> <p>4</p> <p>2 RS-232C; 4 RS-232C (opt)</p> <p>1 Centronics</p> <p>NA</p> <p>Std (TTY, VT 100)</p> <p>Std (2780/3780, 3270 BSC, 3270 SDLC, 3270 SNA)</p> <p>CP/M-86, MS-DOS</p> <p>CP/M-80</p> <p>NA</p> <p>GW-BASIC</p> <p>September 1984</p> <p>Direct</p> <p>Direct</p> <p>Declined to provide</p> <p>NA</p>
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**Notes:**

- NA Not applicable
- Information unavailable at press time



Manufacturer Model	NCR PC4i	NCR PC6 (Models 1012, 1014, & 1015)	NEC information Systems APC
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Single	Single
<b>Main Processor</b>			
Model	Intel 8088	Intel 8088-2	NEC 8086
Internal Word Size (bits)	8/16	8/16	16/16
Clock Rate (MHz)	4.77	4.77 or 8	5
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt)	Intel 8087 math coprocessor (opt)	NEC 7220 graphics processor; Intel 8087 math coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	256K	256K (1012, 1014); 512K (1015)	128K
Min/Max RAM (bytes)	256K/640K	256K/640K (1012, 1014); 512K/640K (1015)	128K/512K
RAM Increments (bytes)	—	64K, 256K	128K
<b>Std Diskette Storage</b>			
No of Drives	1-2	1 (1014, 1015); 2 (1012)	1
Size (in) & Format	5.25	5.25 SS/DSDD	8 DSDD
Capacity per Diskette (bytes)	360K	180K, 360K	1M
<b>Std Disk Storage</b>			
No of Drives	1 (single-diskette version only)	1 (1014, 1015)	NA
Size (in)	5.25	5.25	NA
Capacity per Disk (bytes)	10M	10M (1015); 20M (1014, 1015)	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	NA	10MB integral tape drive	8-in 1MB DSDD diskette drive; 1-2 5.25-in 10MB disk drives
<b>Display</b>			
Size & Type	12-in CRT	Opt	12-in CRT
Resolution (pixels)	640 x 400	NA	640 x 475
Text Display (lines x col)	25 x 80	NA	—
Character Matrix (dots)	—	NA	8 x 16
Colors (simul/palette)	Gray monochrome or 16-color RGB	NA	Green monochrome
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable Function Keys	10	10	20 (w/2 shift states)
Special Features	Cursor keys, numeric keypad	Cursor keys, numeric keypad	Cursor keys, numeric keypad
<b>No of Avail I/O Slots</b>	8	8	4
<b>Interfaces</b>			
Serial	NA	1 RS-232C	1 (opt)
Parallel	1 printer	1 Centronics	1
Other	NA	NA	—
<b>Communications</b>			
Asynchronous	Std	Std	Opt (TTY, VT 100)
Synchronous	NA	NA	Opt (2780/3780 BSC, 3270 SDLC)
<b>Software</b>			
Std Operating System	NCR-DOS	NCR-DOS	MS-DOS 2.11, CP/M-86
Opt Operating System	NA	NA	—
Bundled Software	GW-BASIC, NCR PAL, NCR TUTOR	GW-BASIC, NCR PAL, NCR TUTOR	—
Languages	GW-BASIC	GW-BASIC	—
<b>Sales &amp; Service</b>			
First Delivered	October 1985	August 1985	August 1982
Sales Channels	Direct, dealer, VAR	Direct	Direct, distributor, dealer
Service Channels	Direct, dealer, VAR	Direct	Dealer, NECIS
<b>Pricing</b>	\$2,485 (entry-level configuration)	\$2,585 (1012)—\$5,505 (1015)	\$2,748 (std configuration); \$3,498 w/opt 8/8 color monitor
<b>Comments</b>	IBM PC & PC XT compatible	IBM PC XT compatible; various monitors avail from NCR & 3rd-party vendors	NA

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<p><b>Manufacturer</b>  <b>Model</b>  <b>Classification</b>  <b>Tasks</b>  <b>Main Processor</b>  Model  Internal Word Size (bits)  Clock Rate (MHz)  <b>Additional Processors</b></p> <p><b>RAM</b>  Standard RAM (bytes)  Min/Max RAM (bytes)  RAM Increments (bytes)</p> <p><b>Std Diskette Storage</b>  No of Drives  Size (in) &amp; Format  Capacity per Diskette (bytes)</p> <p><b>Std Disk Storage</b>  No of Drives  Size (in)  Capacity per Disk (bytes)</p> <p><b>Other Storage (Std)</b>  <b>Other Storage (Opt)</b></p> <p><b>Display</b>  Size &amp; Type  Resolution (pixels)  Text Display (lines x col)  Character Matrix (dots)  Colors (simul/palette)</p> <p><b>Keyboard</b>  Type  No of Programmable  Function Keys  Special Features</p> <p><b>No of Avail I/O Slots</b></p> <p><b>Interfaces</b>  Serial  Parallel  Other</p> <p><b>Communications</b>  Asynchronous  Synchronous</p> <p><b>Software</b>  Std Operating System  Opt Operating System  Bundled Software  Languages</p> <p><b>Sales &amp; Service</b>  First Delivered  Sales Channels  Service Channels</p> <p><b>Pricing</b>  <b>Comments</b></p>	<p><b>NEC Information Systems</b>  APC III  Desktop  Single; multi (opt)</p> <p>NEC 8086-2  16/16  8  2 NEC 7220 graphics processors; Intel 8087-2 numeric coprocessor (opt)</p> <p>128K  128K/640K  128K</p> <p>1  5.25 DSDD  360K</p> <p>1  5  10M  NA</p> <p>5.25-in 360KB DSDD diskette drive, 1-2 10MB or 20MB disk drives</p> <p>14-in CRT  640 x 400  25 x 80  8 x 16  Green monochrome</p> <p>Detachable  12 (w/5 shift states)</p> <p>Cursor keys, numeric keypad</p> <p>4</p> <p>1; 2 (opt)  1  RGB, composite video; IEEE-488 (opt)</p> <p>Std (TTY); opt (VT 100)  Opt (2780/3780 BSC, 3270 BSC, 3270 SDLC)</p> <p>MS-DOS 2.11  PC-UX (UNIX III)  GW-BASIC  —</p> <p>August 1984  Dealer  Dealer, NECIS  \$2,695  Opt color and monochrome monitors avail</p>	<p><b>Nixdorf Computer</b>  8810/25 CPC  Desktop  Single</p> <p>Intel 8088  8/16  4.77  Intel 8087 math coprocessor</p> <p>256K  256K/640K  256K</p> <p>2  5.25 DSDD  360K</p> <p>1  5.25  10M  NA  NA</p> <p>9-in CRT  —  25 x 80  7 x 9  Amber monochrome</p> <p>Detachable  10</p> <p>Cursor keys, numeric keypad; mouse (opt)</p> <p>2</p> <p>1  1  RGB</p> <p>Std (TTY, VT 100)  Std (2780/3780, 3270 BSC, 3270 SDLC, X.25)</p> <p>MS-DOS 2.11  —  GW-BASIC  GW-BASIC</p> <p>—  Direct  Direct  \$2,500  Opt 12-in 16-color monitor avail</p>	<p><b>Nixdorf Computer</b>  8810/65 SPC  Desktop  Multi</p> <p>Intel 80186  16/16  8  NA</p> <p>512K  256K/1M  256K</p> <p>2  5.25 DSDD  512K</p> <p>1  5.25  10M  NA  1MB diskette drive</p> <p>12-in CRT  640 x 200  24 x 80, 27 x 132  7 x 9  Amber or green monochrome</p> <p>Detachable  10</p> <p>Cursor keys, numeric keypad; mouse (opt)</p> <p>NA</p> <p>2  NA  3 SAS (Nixdorf proprietary)</p> <p>Std (TTY, VT 100)  Std (2780/3780, 3270 BSC, 3270 SDLC, 3770 SDLC)</p> <p>Concurrent DOS 3.1  —  NA  —</p> <p>September 1984  Direct  Direct  Declined to provide  Opt 15-in monochrome monitor avail; system features DMA</p>
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**Notes:**  
NA Not applicable  
— Information unavailable at press time





	Northern Telecom	Olivetti USA	Osborne Computer
<b>Manufacturer</b>	Northern Telecom	Olivetti USA	Osborne Computer
<b>Model</b>	Model 503	M24 Personal Computer	2100
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Multi	Single	Multi
<b>Main Processor</b>			
Model	Intel 8085	Intel 8086-2	Intel 8088
Internal Word Size (bits)	8/8	16/16	8/16
Clock Rate (MHz)	6	8	—
<b>Additional Processors</b>	NA	—	Intel 8087 numeric coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	256K	256K, 640K	640K
Min/Max RAM (bytes)	256K/256K	128K/640K	256K/640K
RAM Increments (bytes)	NA	128K	64K
<b>Std Diskette Storage</b>			
No of Drives	2	2	2
Size (in) & Format	5.25 DSDD	5.25	5.25 DSDD
Capacity per Diskette (bytes)	800K	360K	360K
<b>Std Disk Storage</b>			
No of Drives	NA	1	NA
Size (in)	NA	5.25	NA
Capacity per Disk (bytes)	NA	10M	NA
<b>Other Storage (Std)</b>	NA	—	NA
<b>Other Storage (Opt)</b>	Dual 5.25-in 800KB diskette drives, 5.25-in 10MB disk drive	—	1-2 5.25-in 10MB or 20MB disk drives
<b>Display</b>			
Size & Type	15-in CRT	12-in CRT	Opt
Resolution (pixels)	—	640/320 x 200/400	NA
Text Display (lines x col)	24 x 80	25 x 40/80	NA
Character Matrix (dots)	7 x 9	—	NA
Colors (simul/palette)	Green monochrome	Green monochrome or color	NA
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable	18	10	10
Function Keys			
Special Features	Numeric keypad	Cursor keys, numeric keypad	Cursor keys, numeric keypad
<b>No of Avail I/O Slots</b>	1	7	5
<b>Interfaces</b>			
Serial	2 RS-232C	1	1 RS-232C
Parallel	1	1	1 Centronics
Other	NA	—	—
<b>Communications</b>			
Asynchronous	Opt (TTY)	Std	—
Synchronous	Opt (IBM 2770, 2780/3780, 3270, 3774, 360/20, 3274 SDLC)	Std	—
<b>Software</b>			
Std Operating System	Omnitask	MS-DOS 2.11	MS-DOS 2.11
Opt Operating System	CP/M	—	NA
Bundled Software	NA	GW-BASIC	NA
Languages	COBOL, TAL 2000 (CP/M-compatible BASIC-80)	GW-BASIC	—
<b>Sales &amp; Service</b>			
First Delivered	1981	1984	September 1985
Sales Channels	Direct	Direct, distributor, dealer	Dealer, distributor
Service Channels	Direct	Dealer, TRW	Dealer
<b>Pricing</b>	\$5,870	\$2,000-\$5,000	\$1,698
<b>Comments</b>	NA	Incl clock/calendar w/battery	Opt monochrome & color monitors avail; discontinued model, avail from dealer inventory only; Osborne forced into liquidation in February 1986

**Notes:**

NA Not applicable  
 — Information unavailable at press time



Manufacturer	Quay	Regency Systems	Sanyo
<b>Model</b>	500 Series (500, 520, & 540)	R2-C Family	MBC-885
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Single	Single
<b>Main Processor</b>			
Model	Zilog Z80A	Zilog Z80B	Intel 8088-2
Internal Word Size (bits)	8/8	8/8	8/16
Clock Rate (MHz)	4	4	4.77, 8
<b>Additional Processors</b>	NA	NEC 7220 graphics & 823A floating-point math coprocessor	Intel 8087 math coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	64K	64K	256K
Min/Max RAM (bytes)	64K/128K	256K/1M	256K/640K
RAM Increments (bytes)	64K	—	64K
<b>Std Diskette Storage</b>			
No of Drives	1 (500); 2 (520, 540)	1-2	2
Size (in) & Format	5.25 DSDD (500, 520); 5.25 DSQD (540)	5.25 DSQD	5.25 DSDD
Capacity per Diskette (bytes)	400K (500, 520); 800K (540)	1M	360K
<b>Std Disk Storage</b>			
No of Drives	NA	NA	NA
Size (in)	NA	NA	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	5.25-in 400KB diskette drive (500); 5.25-in 10MB or 36MB disk drive	5.25-in 10MB or 1.8GB disk drive	NA
<b>Display</b>			
Size & Type	12-in CRT	12-in CRT	Opt
Resolution (pixels)	—	512 x 512	NA
Text Display (lines x col)	24 x 80	64 x 32	NA
Character Matrix (dots)	7 x 11	8 x 16	NA
Colors (simul/palette)	Green monochrome	16/256 color	NA
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable	8	79	10
Function Keys			
Special Features	Cursor keys, numeric keypad	Cursor keys, touchscreen, numeric keypad; digital input pad (opt)	Cursor keys, numeric keypad
<b>No of Avail I/O Slots</b>	8	3 (opt)	7
<b>Interfaces</b>			
Serial	1-6 RS-232C	3 RS-232C	1-4 RS-232C (opt)
Parallel	1 Centronics	1 Centronics	1; 1-2 (opt)
Other	NA	1 RS-485	RGB composite
<b>Communications</b>			
Asynchronous	Std (TTY)	Std	Opt (VT 100)
Synchronous	Std (2780/3780)	Std	Opt (2780/3780 BSC, 3270 BSC, 3270 SDLC, X.25)
<b>Software</b>			
Std Operating System	CP/M 2.2	Regency USE	MS-DOS 2.11
Opt Operating System	MP/M	—	CP/M-86, XENIX, MS-DOS 3.0, 3.1
Bundled Software	Insurance agency management & auto rating	RCG II, CMI, USE	WordStar 3.3, CalcStar
Languages	BASIC, COBOL, FORTRAN, Pascal	USE	—
<b>Sales &amp; Service</b>			
First Delivered	January 1975	November 1983	April 1985
Sales Channels	Direct, distributor, dealer	Direct, distributor	Direct, distributor
Service Channels	3rd-party vendor	Direct, distributor, 3rd-party vendor	Dealer, manufacturer
<b>Pricing</b>	\$1,695-\$2,200 (500); \$2,395-\$3,200 (520); \$2,795-\$3,600 (540)	Declined to provide	\$1,499
<b>Comments</b>	Multuser capability w/opt MP/M operating system	NA	IBM PC compatible; opt monochrome & color monitors avail

**Notes:**

NA Not applicable  
 — Information unavailable at press time

Manufacturer	Sanyo	Seequa Computer	Seequa Computer
<b>Model</b>	MBC-885 HD 20	Seequa/PC	Seequa/XT
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Single	Single
<b>Main Processor</b>			
Model	Intel 8088-2	Intel 8088, & Zilog Z80	Intel 8088, Zilog Z80
Internal Word Size (bits)	16	8/16 (8088); 8/8 (Z80)	8/16 (8088); 8/8 (Z80)
Clock Rate (MHz)	4.77 or 8	5 (8088); 2.5 (Z80)	5 (8088); 2.5 (Z80)
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt)	Intel 8087 math coprocessor (opt)	Intel 8087 math coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	256K	128K	256K
Min/Max RAM (bytes)	256K/640K	128K/640K	256K/640K
RAM Increments (bytes)	64K	—	—
<b>Std Diskette Storage</b>			
No of Drives	2	2	1
Size (in) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity per Diskette (bytes)	360K	320K, 360K	320K, 360K
<b>Std Disk Storage</b>			
No of Drives	1	NA	1
Size (in)	5.25	NA	5.25
Capacity per Disk (bytes)	20M	NA	10M
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	NA	10MB or 20MB disk drive	5.25-in 320KB or 360KB diskette drive, 20MB disk drive
<b>Display</b>			
Size & Type	Opt	12-in CRT	12-in CRT
Resolution (pixels)	NA	640 x 200	640 x 200
Text Display (lines x col)	NA	25 x 40/80	25 x 40/80
Character Matrix (dots)	NA	—	—
Colors (simul/palette)	NA	Monochrome	Monochrome
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable Function Keys	10	10	14
Special Features	Cursor keys, numeric keypad	Numeric keypad	Numeric keypad
<b>No of Avail I/O Slots</b>	6	5	4
<b>Interfaces</b>			
Serial	1-4 RS-232 (opt)	1; 3 (opt)	1; 3 (opt)
Parallel	1; 1-2 (opt)	1	1
Other	RGB composite	IEEE-488, joystick, light pen, analog/digital interface (opt)	IEEE-488, joystick, light pen, analog/digital interface (opt)
<b>Communications</b>			
Asynchronous	Opt (VT 100)	Opt (TTY, VT 100, VT 52)	Opt (TTY, VT 100, VT 52)
Synchronous	Opt (2780/3780 BSC, 3270 BSC, 3270 SDLC, X.25)	Opt (3270, 3271, SDLC, HDLC)	Opt (3270, 3271, SDLC, HDLC)
<b>Software</b>			
Std Operating System	MS-DOS 2.11	MS-DOS	MS-DOS
Opt Operating System	CP/M-86, XENIX, MS-DOS 3.0, 3.1	CP/M-80, CP/M-86, Concurrent CP/M-86	CP/M-80, CP/M-86, Concurrent CP/M-86
Bundled Software	WordStar 2000	WordStar, SuperCalc 3, GW-BASIC	WordStar, SuperCalc 3, Condor I, GW-BASIC
Languages	—	GW-BASIC, FORTRAN, Pascal, Ada, COBOL	GW-BASIC, FORTRAN, Pascal, Ada, COBOL
<b>Sales &amp; Service</b>			
First Delivered	January 1986	March 1983	March 1983
Sales Channels	Direct, distributor	Dealer	Dealer
Service Channels	Direct, manufacturer	Dealer	Dealer
<b>Pricing</b>	\$2,599	\$1,595	\$2,495
<b>Comments</b>	IBM PC compatible; opt monochrome & color monitors avail	Opt 4/16 color monitor avail	Opt 4/16 color monitor avail

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Manufacturer</b>	<b>Sony</b>	<b>Sony</b>	<b>Sord Computer of America</b>
<b>Model</b>	M35	SMC 2000	M68MX (mark 20 & mark 41)
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Single	Single
<b>Main Processor</b>			
Model	Intel 80C88	Intel 80186	Motorola MC68000
Internal Word Size (bits)	8/16	16/16	16/32
Clock Rate (MHz)	4.77	6	10
<b>Additional Processors</b>	NA	HD46505 & 7220A graphics processors	NA
<b>RAM</b>			
Standard RAM (bytes)	640K	256K	512K
Min/Max RAM (bytes)	640K/640K	256K/512K	512K/2.5M (mark 20); 512K/3.5M (mark 41)
RAM Increments (bytes)	NA	256K	256K, 1M
<b>Std Diskette Storage</b>			
No of Drives	2	1	1 (mark 20); 2 (mark 41)
Size (in) & Format	3.5 DSDD	3.5 DSDD	5.25
Capacity per Diskette (bytes)	720K	720K	1.2M
<b>Std Disk Storage</b>			
No of Drives	NA	NA	1 (mark 20)
Size (in)	NA	NA	5.25
Capacity per Disk (bytes)	NA	NA	20M
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	5.25-in 360KB diskette drive, 3.5-in 20MB disk drive	3.5-in 720KB diskette drive, external 5.25-in 10MB or 30MB disk drives	5.25-in 1.2MB diskette drives, 20MB disk drive
<b>Display</b>			
Size & Type	Opt	Opt	12-in CRT (mark 41); 14-in CRT (mark 20)
Resolution (pixels)	NA	NA	640 x 500 (w/opt color graphics board)
Text Display (lines x col)	NA	NA	25 x 80
Character Matrix (dots)	NA	NA	—
Colors (simul/palette)	NA	NA	Yellow monochrome (mark 41), 16-color RGB (mark 20)
<b>Keyboard</b>			
Type	Integral	Detachable	Detachable
No of Programmable Function Keys	10	10	19
Special Features	Cursor keys, numeric keypad; mouse (opt)	Cursor keys; mouse, digital input pad, touchscreen, numeric keypad (opt)	Cursor keys, numeric keypad
<b>No of Avail I/O Slots</b>	NA	3	3
<b>Interfaces</b>			
Serial	1	1 RS-232C; 3 RS-232C (opt)	NA
Parallel	1	1	1 Centronics
Other	Mouse, expansion bus, diskette drive, analog RGB modem, acoustic coupler, handset	IEEE-488, SCSI, disk drive (opt)	Diskette
<b>Communications</b>			
Asynchronous	—	Std	—
Synchronous	—	Std	—
<b>Software</b>			
Std Operating System	MS-DOS	MS-DOS	CP/M-68K V. 1.2
Opt Operating System	NA	NA	NA
Bundled Software	Communicate, Tutor	NA	Spelling verifier
Languages	—	BASIC, C, Pascal, COBOL, FORTRAN	BASIC, SVS-FORTRAN, RM-COBOL, SVS-Pascal, C
<b>Sales &amp; Service</b>			
First Delivered	November 1985	June 1985	May 1985
Sales Channels	Dealer	Dealer, VAR	Direct, distributor, OEM, VAR
Service Channels	Dealer, auth service centers	Dealer, VAR, auth service centers	Direct
<b>Pricing</b>	\$2,495 (w/o monitor)	\$4,625 (w/o monitor)	\$4,800 (mark 20); \$2,990 (mark 41)
<b>Comments</b>	IBM PC, PC XT compatible; opt LCD or 9-in, 12-in, or 13-in color monitors avail	Incl Sony video disk player & RGB Superposer (enables video disc NTSC image to be overlaid w/RGB monitor signals on display monitor); opt 2-in & 19-in color monitors avail	Designed for scientific applications

**Notes:**

- NA Not applicable  
— Information unavailable at press time



Manufacturer	Sperry	Sperry	Stearns Computer Systems
<b>Model</b>	PC/HT	PC/IT	The Great Communicator
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	—	—	Single
<b>Main Processor</b>	—	—	—
Model	Intel 8088-2	Intel 80286	Intel 80286
Internal Word Size (bits)	8/16	16/16	16/16
Clock Rate (MHz)	4.77 or 7.16	6, 7.16 or 8	6, 8
<b>Additional Processors</b>	Intel 8087-2 math coprocessor	Intel 80287 math coprocessor (opt)	Intel 80287 math coprocessor (opt)
<b>RAM</b>	—	—	—
Standard RAM (bytes)	256K	512K, 1M	512K
Min/Max RAM (bytes)	256K/640K	512K/5M	256K/18M
RAM Increments (bytes)	128K	512K, 2M	256K
<b>Std Diskette Storage</b>	—	—	—
No of Drives	1	1	1
Size (in) & Format	5.25 DSDD	5.25	5.25 DSDD
Capacity per Diskette (bytes)	320K, 360K	1.2M	1.2M
<b>Std Disk Storage</b>	—	—	—
No of Drives	1	1	1
Size (in)	—	44.6M	5.25
Capacity per Disk (bytes)	20M	NA	20M, 40M
<b>Other Storage (Std)</b>	—	NA	NA
<b>Other Storage (Opt)</b>	—	360KB diskette drive, 60MB tape backup	360KB or 1.2MB diskette drive, 20MB or 40MB disk drives (max of 4 devices)
<b>Display</b>	—	—	—
Size & Type	Opt	Opt	12-in CRT
Resolution (pixels)	NA	NA	720 x 364
Text Display (lines x col)	NA	NA	26 x 80
Character Matrix (dots)	NA	NA	9 x 14
Colors (simul/palette)	NA	NA	Amber monochrome
<b>Keyboard</b>	—	—	—
Type	Opt	Opt	Detachable
No of Programmable Function Keys	NA	NA	10
Special Features	NA	NA	Cursor keys, numeric keypad; mouse, digital input pad (opt)
<b>No of Avail I/O Slots</b>	6 (5 w/disk drive model)	8 (7 w/disk drive models)	4
<b>Interfaces</b>	—	—	—
Serial	—	2 RS-232C	1 RS-232C
Parallel	—	1	1 Centronics
Other	—	—	NA
<b>Communications</b>	—	—	—
Asynchronous	Opt (VT 52/100/102/220)	—	Opt (TTY, VT 100)
Synchronous	Opt	—	Opt (3rd party)
<b>Software</b>	—	—	—
Std Operating System	MS-DOS 2.11	MS-DOS 3.1	DOS 3.1
Opt Operating System	—	XENIX	NA
Bundled Software	GW-BASIC, diagnostics	GW-BASIC, diagnostics	NA
Languages	GW-BASIC	GW-BASIC	Avail through 3rd-party vendors
<b>Sales &amp; Service</b>	—	—	—
First Delivered	Direct	Direct, dealer	September 1985
Sales Channels	—	—	Direct, distributor, dealer
Service Channels	—	—	Dealer, NCS
<b>Pricing</b>	—	—	—
Standard	\$2,169 (diskette drive, 6 expansion slots); \$2,551 (dual diskette drives, 6 expansion slots); \$4,383 (diskette drive, 20MB disk drive, 5 expansion slots)	\$3,650 (512KB RAM, diskette drive, 8 expansion slots); \$5,300 (512KB RAM, diskette drive, 44.6MB disk drive, 7 expansion slots); \$5,795 (1MB RAM, diskette drive, 44.6MB disk drive, 7 expansion slots)	\$2,595-\$6,195
<b>Comments</b>	IBM PC XT compatible; incl clock; monochrome & color monitors opt; various keyboards avail	IBM PC AT compatible; incl clock; opt monochrome & color monitors & keyboards avail; multiuser capabilities for 9 users 2/opt XENIX operating system	IBM PC AT compatible

**Notes:**

NA Not applicable

— Information unavailable at press time



Manufacturer	Stearns Computer Systems	Tandy	Tandy
<b>Model</b>	The Informer	Model 4D	Tandy 1000/1000 HD
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	—	—
<b>Main Processor</b>			
Model	Intel 8088	Zilog Z80A	Intel 8088
Internal Word Size (bits)	8/16	8/8	8/16
Clock Rate (MHz)	4.77	4	4.77
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt)	—	—
<b>RAM</b>			
Standard RAM (bytes)	256K	64K	128K
Min/Max RAM (bytes)	256K/640K	64K/128K	128K/640K
RAM Increments (bytes)	64K	64K	128K, 256K, 512K
<b>Std Diskette Storage</b>			
No of Drives	1	2	1
Size (in) & Format	5.25 DSDD	5.25 DS	5.25 DSDD
Capacity per Diskette (bytes)	360K	368K	360K
<b>Std Disk Storage</b>			
No of Drives	1	NA	1 (1000 HD)
Size (in)	5.25	NA	—
Capacity per Disk (bytes)	10M, 20M	NA	10M
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	360KB diskette drive, 10MB or 20MB disk drives (max of 3 devices)	5.25-in 184KB diskette drive, 10MB or 15MB disk drive	5.25-in 360KB diskette drive, 10MB disk drive or cartridge disk drive, 48MB cartridge tape drive
<b>Display</b>			
Size & Type	12-in CRT	12-in CRT	Opt
Resolution (pixels)	720 x 364	—	NA
Text Display (lines x col)	26 x 80	24 x 80	NA
Character Matrix (dots)	9 x 14	—	NA
Colors (simul/palette)	Amber monochrome	Green monochrome	NA
<b>Keyboard</b>			
Type	Detachable	Integral	Detachable
No of Programmable Function Keys	10	3	12
Special Features	Cursor keys, numeric keypad; mouse, digital input pad (opt)	Cursor keys, numeric keypad	Cursor keys, numeric keypad; digital input pad, mouse, joystick (opt)
<b>No of Avail I/O Slots</b>	6	—	3
<b>Interfaces</b>			
Serial	2 RS-232C	1	—
Parallel	1 Centronics	1	1
Other	NA	—	Joystick, light pen
<b>Communications</b>			
Asynchronous	Opt (TTY, VT 100)	—	—
Synchronous	Opt (3rd party)	—	—
<b>Software</b>			
Std Operating System	DOS 2.1/3.1	TRSDOS 6	MS-DOS 2.11
Opt Operating System	NA	—	—
Bundled Software	NA	DeskMate	DeskMate, BASIC
Languages	Avail through 3rd-party vendors	Microsoft 5.0 BASIC	BASIC
<b>Sales &amp; Service</b>			
First Delivered	November 1985	1986	November 1984
Sales Channels	Direct, distributor, dealer	Direct, dealer	Direct, dealer
Service Channels	Dealer, NCS	Direct, dealer	Direct, dealer
<b>Pricing</b>	\$1,495-\$2,595	\$1,199	\$999 (1000); \$1,999 (1000 HD)
<b>Comments</b>	IBM PC XT compatible; opt color monitor avail	NA	IBM PC compatible; opt monochrome & color monitors avail

**Notes:**

NA Not applicable  
 — Information unavailable at press time



Manufacturer Model Classification Tasks	Tandy Tandy 1200/1200 HD Desktop —	Tandy Tandy 2000/2000 HD Desktop —	Tandy Tandy 3000/3000 HD Desktop Single (MS-DOS); multi (XENIX)
<b>Main Processor</b>			
Model	Intel 8088	Intel 80186	Intel 80286
Internal Word Size (bits)	8/16	16/16	16/16
Clock Rate (MHz)	4.7	8	8
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt)	Intel 8087 math coprocessor (opt)	Intel 80287 math coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	256K	256K	512K
Min/Max RAM (bytes)	256K/640K	256K/768K	512K/640K
RAM Increments (bytes)	384K	128K, 256K, 512K	128K
<b>Std Diskette Storage</b>			
No of Drives	2 (1200); 1 (1200 HD)	2 (2000); 1 (2000 HD)	1 (3000 & 3000 HD)
Size (in) & Format	5.25 DSDD	5.25 DSDD	5.25
Capacity per Diskette (bytes)	360K	720K	1.2M
<b>Std Disk Storage</b>			
No of Drives	1 (1200 HD)	1 (2000 HD)	1 (3000 HD)
Size (in)	—	—	—
Capacity per Disk (bytes)	10M	10M	20M
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	10MB disk drive (1200)	—	360KB or 1.2MB diskette drive, 5.25-in 20MB disk drive, 48MB cartridge tape drive or 10MB cartridge disk drive
<b>Display</b>			
Size & Type	Opt	Opt	Opt
Resolution (pixels)	NA	NA	NA
Text Display (lines x col)	NA	NA	NA
Character Matrix (dots)	NA	NA	NA
Colors (simul/palette)	NA	NA	NA
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable Function Keys	10	12	10
Special Features	Cursor keys, numeric keypad	Numeric keypad, cursor keys; mouse (opt)	Cursor keys, numeric keypad; mouse (opt)
<b>No of Avail I/O Slots</b>	5	4	8
<b>Interfaces</b>			
Serial	—	1 RS-232C	1
Parallel	1	1	1
Other	—	—	—
<b>Communications</b>			
Asynchronous	—	—	—
Synchronous	—	—	—
<b>Software</b>			
Std Operating System	NA	MS-DOS 2.11	NA
Opt Operating System	MS-DOS 2.11	—	MS-DOS 3.1, XENIX V
Bundled Software	NA	BASIC	BASIC, Deskmate (MS-DOS 3.1)
Languages	GW-BASIC	BASIC	BASIC (MS-DOS 3.1)
<b>Sales &amp; Service</b>			
First Delivered	September 1984	November 1983	November 1985
Sales Channels	Direct, dealer	Direct, dealer	Direct, dealer
Service Channels	Direct, dealer	Direct, dealer	Direct, dealer
<b>Pricing</b>	\$1,499 (1200); \$1,999 (1200 HD)	\$1,599 (2000); \$2,499 (2000 HD)	\$2,599 (3000); \$3,599 (3000 HD)
<b>Comments</b>	IBM PC XT compatible; opt monochrome & color monitors avail	Opt monochrome & color monitors avail	IBM PC AT compatible; clock/calendar incl; opt monochrome & color monitors avail; capabilities for 6 users w/opt XENIX operating system

**Notes:**

NA Not applicable

— Information unavailable at press time



	<b>TeleVideo Systems</b>	<b>TeleVideo Systems</b>	<b>TeleVideo Systems</b>
<b>Manufacturer</b>	Tele-PC PLUS	Tele-XT PLUS	TeleColor-PC
<b>Model</b>	Desktop	Desktop	Desktop
<b>Classification</b>	Single	Single	Single
<b>Tasks</b>			
<b>Main Processor</b>			
Model	Intel 8088	Intel 8088	Intel 8088
Internal Word Size (bits)	8/16	8/16	8/16
Clock Rate (MHz)	4.77	4.77	5
<b>Additional Processors</b>	NA	NA	NA
<b>RAM</b>			
Standard RAM (bytes)	256K	256K	256K
Min/Max RAM (bytes)	256K/640K	256K/640K	256K/640K
RAM Increments (bytes)	—	—	—
<b>Std Diskette Storage</b>			
No of Drives	1-2	1	2
Size (in) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity per Diskette (bytes)	360K	360K	360K
<b>Std Disk Storage</b>			
No of Drives	NA	1	NA
Size (in)	NA	5.25	NA
Capacity per Disk (bytes)	NA	10M	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	NA	NA	NA
<b>Display</b>			
Size & Type	14-in CRT	14-in CRT	12-in CRT
Resolution (pixels)	640 x 200	640 x 200	—
Text Display (lines x col)	24 x 80	24 x 80	—
Character Matrix (dots)	—	—	8 x 9
Colors (simul/palette)	Green monochrome	Green monochrome	16 colors (text mode); 4 colors (graphics mode)
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable Function Keys	10	10	10
Special Features	Numeric keypad	Numeric keypad	Numeric keypad
<b>No of Avail I/O Slots</b>	1	1	1
<b>Interfaces</b>			
Serial	1 RS-232C	1 RS-232C	1 RS-232C
Parallel	1 Centronics	1 Centronics	1 Centronics
Other	Composite video, color	Composite video, color	Composite video
<b>Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	NA	NA	NA
<b>Software</b>			
Std Operating System	MS-DOS 2.11	MS-DOS 2.11	TeleDOS
Opt Operating System	NA	NA	NA
Bundled Software	GW-BASIC, WP, spreadsheet, DBMS	GW-BASIC, WP, spreadsheet, DBMS	GW-BASIC, WP, spreadsheet, DBMS
Languages	GW-BASIC	GW-BASIC	GW-BASIC
<b>Sales &amp; Service</b>			
First Delivered	1983	1983	—
Sales Channels	Distributor, dealer	Distributor, dealer	Distributor, dealer
Service Channels	TRW, distributor, dealer	TRW, distributor, dealer	TRW, distributor, dealer
<b>Pricing</b>	\$2,295 (360KB diskette drive); \$2,595 (dual 360KB diskette drives)	\$3,995	\$2,995
<b>Comments</b>	IBM PC compatible; incl 16KB video graphics memory	IBM PC XT compatible; incl 16KB video graphics memory	IBM PC compatible; incl 16KB video graphics memory

**Notes:**

NA Not applicable  
 — Information unavailable at press time





<b>Manufacturer</b>	<b>TeleVideo Systems</b>	<b>TeleVideo Systems</b>	<b>Texas Instruments</b>
<b>Model</b>	TeleColor-XT	TeleVideo AT (Models 1 & 2)	Business-Pro
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Single	—
<b>Main Processor</b>			
Model	Intel 8088	Intel 80286	Intel 80286
Internal Word Size (bits)	8/16	16/16	16/16
Clock Rate (MHz)	5	8	6
<b>Additional Processors</b>	NA	Intel 80287 math coprocessor (opt)	Intel 80287 math coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	256K	256K (Model 1); 512K (Model 2)	512K
Min/Max RAM (bytes)	256K/640K	256K/640K (Model 1); 512K/640K (Model 2)	512K/15M
RAM Increments (bytes)	—	—	512K
<b>Std Diskette Storage</b>			
No of Drives	1	1	1
Size (in) & Format	5.25 DSDD	5.25	5.25
Capacity per Diskette (bytes)	360K	1.2M	1.2M
<b>Std Disk Storage</b>			
No of Drives	1	1 (Model 2)	1
Size (in)	3.5	—	5.25
Capacity per Disk (bytes)	20M	44.5M	20M
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	NA	5.25-in 1.2MB diskette drive, 44.5 MB disk drive	5.25-in 360KB & 5.25-in 1.2MB diskette drives (max of 4), 5.25-in 20MB, 40MB, & 72MB disk drives (max of 2 internal & 2 external)
<b>Display</b>			
Size & Type	12-in CRT	Opt	12-in monochrome or 13-in color CRT
Resolution (pixels)	640 x 200 (1 color); 320 x 200 (4 colors)	NA	640 x 200, 720 x 300
Text Display (lines x col)	—	NA	25 x 80
Character Matrix (dots)	8 x 9	NA	7 x 9
Colors (simul/palette)	16 colors (text mode); 4 colors (graphics mode)	NA	Green monochrome or 4/16 color
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable	10	10	12
Function Keys			
Special Features	Numeric keypad	Numeric keypad	Cursor keys, numeric keypad; mouse (opt)
<b>No of Avail I/O Slots</b>	1	6	11
<b>Interfaces</b>			
Serial	1 RS-232C	1 RS-232C	1 RS-232C; 2nd RS-232C (opt)
Parallel	1 Centronics	1 Centronics	1 Centronics; 2nd Centronics (opt)
Other	Composite video	NA	Mouse
<b>Communications</b>			
Asynchronous	Std	Std	Opt (TTY, VT 100, TI931)
Synchronous	NA	NA	Opt (IBM 2780/3780, 3270 BSC, 3270 SDLC)
<b>Software</b>			
Std Operating System	TeleDOS	NA	MS-DOS 3.1
Opt Operating System	NA	MS-DOS 3.1	XENIX V
Bundled Software	GW-BASIC, WP, spreadsheet, DBMS	NA	NA
Languages	GW-BASIC	GW-BASIC	BASIC, C, COBOL, FORTRAN, Pascal
<b>Sales &amp; Service</b>			
First Delivered	—	—	June 1985
Sales Channels	Distributor, dealer	Distributor, dealer	Dealer, VAR
Service Channels	TRW, distributor, dealer	TRW, distributor, dealer	Direct
<b>Pricing</b>	\$4,595	\$3,395 (Model 1); \$5,795 (Model 2)	\$3,995–\$5,235 (20MB disk drive, color monitor)
<b>Comments</b>	IBM PC XT compatible; incl 16KB video graphics memory	IBM PC AT compatible; opt Disk Controller Card supports dual diskette & dual disk drives	IBM PC AT compatible; multiuser capability for up to 9 users w/opt XENIX

**Notes:**

NA Not applicable  
 — Information unavailable at press time



Manufacturer	Texas Instruments	United Computer Technology	Vector Graphic
<b>Model</b>	Professional Computer	U-Convert	VSX Series Model 3000
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Single	Multi
<b>Main Processor</b>			
Model	Intel 8088	Hitachi 64180	Zilog Z80B & Intel 8086
Internal Word Size (bits)	8/16	8	8/8 (Z80B); 16/16 (8086)
Clock Rate (MHz)	5	8	6 (Z80B); 8 (8086)
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt)	Zilog Z80B or Zilog Z80H (opt)	Intel 8087 math coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	128K	512K	640K
Min/Max RAM (bytes)	128K/768K	64K/512K	128K/896K
RAM Increments (bytes)	64K, 256K	—	128K, 256K
<b>Std Diskette Storage</b>			
No of Drives	1	4	1
Size (in) & Format	5.25	5.25 DSDD (3 drives); 8 (1 drive)	5.25 DSDD
Capacity per Diskette (bytes)	320K	1.2M, 960K, or 360K (5.25 in); 1.2M (8 in)	737K
<b>Std Disk Storage</b>			
No of Drives	NA	NA	1
Size (in)	NA	NA	—
Capacity per Disk (bytes)	NA	NA	10M
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	5.25-in 320KB diskette drive; 10MB, 18.2MB, or 21MB disk drive	3.5-in diskette drive, 5.25-in 20MB disk drives	5.25-in 737KB diskette drive; 5MB, 10MB, 28MB, 36MB, or 122MB disk drives; 45MB streaming tape drives
<b>Display</b>			
Size & Type	12-in monochrome or 13-in color CRT	Opt	12-in CRT
Resolution (pixels)	720 x 300	NA	640/320/160 x 312
Text Display (lines x col)	25 x 80	NA	24 x 80
Character Matrix (dots)	7 x 9	NA	16 x 13
Colors (simul/palette)	Monochrome or 8-color RGB	NA	Green monochrome
<b>Keyboard</b>			
Type	Detachable	—	Detachable
No of Programmable Function Keys	12	—	14
Special Features	—	—	Numeric keypad
<b>No of Avail I/O Slots</b>	5	2	3
<b>Interfaces</b>			
Serial	1 RS-232C (opt)	2	2
Parallel	1	1	1
Other	NA	—	NA
<b>Communications</b>			
Asynchronous	Opt (TTY, T1931)	Std (TTY)	Opt (TTY)
Synchronous	Opt (IBM 3101, 3780, 3276 SNA)	—	Opt (3277, 2780/3780)
<b>Software</b>			
Std Operating System	MS-DOS 2.1	CP/M 2.2	CP/M-86
Opt Operating System	CP/M-86, Concurrent CP/M-86, UCSD p-System	—	Concurrent CP/M-86, MS-DOS
Bundled Software	NA	U-Convert multifomat software	NA
Languages	BASIC, C, COBOL, FORTRAN, Pascal	—	C, BASIC, COBOL, FORTRAN, Pascal
<b>Sales &amp; Service</b>			
First Delivered	1983	November 1985	March 1984
Sales Channels	Dealers	Direct	Dealer
Service Channels	Direct, dealers	—	Dealer
<b>Pricing</b>	\$2,395-\$3,365	\$3,495-\$4,495	\$5,995
<b>Comments</b>	IBM PC XT compatible	Monitors avail from 3rd-party vendors; United Computer Technology previously ACT Systems	Discontinued model, avail from dealer inventory only

**Notes:**

NA Not applicable

— Information unavailable at press time

Manufacturer Model	Wang Laboratories Advanced Professional Computer	Wang Laboratories Professional Computer (Group 1 models, Group 2 models)	Xerox 6064/6065
<b>Classification</b>	Desktop	Desktop	Desktop
<b>Tasks</b>	Single	Single	Single
<b>Main Processor</b>			
Model	Intel 80286	Intel 8086	Intel 8086-2
Internal Word Size (bits)	16/16	16/16	16/16
Clock Rate (MHz)	8	6	8
<b>Additional Processors</b>	Intel 80287 math coprocessor (opt)	NA	NA
<b>RAM</b>			
Standard RAM (bytes)	512K	256K	256K
Min/Max RAM (bytes)	512K/2M	256K/640K	256K/640K
RAM Increments (bytes)	512K	128K, 256K	128K, 256K, 384K
<b>Std Diskette Storage</b>			
No of Drives	1	1-2	2 (6064); 1 (6065)
Size (in) & Format	5.25	5.25	5.25 SSDD
Capacity per Diskette (bytes)	360K, 1.2M	360K	360K
<b>Std Disk Storage</b>			
No of Drives	0-1	0-1	1 (6065)
Size (in)	3.5, 5.25	5.25	5.25
Capacity per Disk (bytes)	20M, 30M, 67M	10M, 30M	10M
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	5.25-in 360KB or 1.2MB diskette drive	NA	NA
<b>Display</b>			
Size & Type	Opt	12-in CRT (Group 2)	12-in CRT
Resolution (pixels)	NA	—	640 x 400
Text Display (lines x col)	NA	—	25 x 80
Character Matrix (dots)	NA	—	—
Colors (simul/palette)	NA	Monochrome	Black & white monochrome
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable	16	16	10
Function Keys			
Special Features	Numeric keypad	Numeric keypad	Cursor keys, numeric keypad, mouse
<b>No of Avail I/O Slots</b>	5-slot chassis or 8-slot chassis	5 (Group 1); 8(Group 2)	7 (6064); 6 (6065)
<b>Interfaces</b>			
Serial	1 RS-232C	1 RS-232C	1
Parallel	1 Centronics	1 Centronics	1
Other	NA	NA	NA
<b>Communications</b>			
Asynchronous	Std	Std	Opt (TTY, VT 100)
Synchronous	Opt	Opt	Opt (2780/3780, 3270 BSC, 3270 SDLC)
<b>Software</b>			
Std Operating System	MS-DOS	MS-DOS	MS-DOS 3.1
Opt Operating System	XENIX (incl C Compiler)	UCSD p-System Runtime Operating System, CP/M-80	MS-DOS earlier versions
<b>Bundled Software Languages</b>	Interpretive BASIC, BASIC, COBOL, FORTRAN, Pascal	BASIC-86, BASIC, COBOL, C, FORTRAN, Pascal	Screenmate, GW-BASIC
<b>Sales &amp; Service</b>			
First Delivered	July 1985	May 1982	May 1985
Sales Channels	Direct, dealer	Direct, dealer	Direct, dealer, VAR
Service Channels	Direct	Direct	Direct, Americare
<b>Pricing</b>	\$3,465-\$8,895	\$2,445-\$5,040 (Group 1); \$3,300-\$5,050 (Group 2)	\$2,885-\$3,950 (6064); \$4,485-\$5,550 (6065)
<b>Comments</b>	IBM PC compatible; multiuser capability for 4 users w/opt XENIX operating system; opt monitors avail	IBM PC compatible; monitor opt w/Group 1 models; opt color monitor avail	Opt color monitor avail

**Notes:**

NA Not applicable  
 — Information unavailable at press time



Manufacturer Model Classification	Xerox 6068 Desktop	Xerox 6085 Desktop (display and keyboard); floor model (processor)	Zenith Data Systems Z-148 Desktop
<b>Tasks</b>	Single	Multi	Single
<b>Main Processor</b>			
Model	Intel 8086-2	Xerox Mesa	Intel 8088
Internal Word Size (bits)	16/16	—/48	8/16
Clock Rate (MHz)	8	8	4.77, 8
<b>Additional Processors</b>	NA	Intel 80186 (opt)	Intel 8087 math coprocessor (opt)
<b>RAM</b>			
Standard RAM (bytes)	512K	1.1M	256K
Min/Max RAM (bytes)	512K/640K	1.1M/3.7M	256K/640K
RAM Increments (bytes)	128K	512K	256K
<b>Std Diskette Storage</b>			
No of Drives	1	NA	1-2
Size (in) & Format	5.25 SSDD	NA	5.25 DSDD
Capacity per Diskette (bytes)	360K	NA	360K
<b>Std Disk Storage</b>			
No of Drives	1	1	NA
Size (in)	5.25	5.25	NA
Capacity per Disk (bytes)	10M	10M	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt)</b>	NA	5.25-in 360KB diskette drive; 20MB, 40MB, or 80MB disk drives	NA
<b>Display</b>			
Size & Type	12-in CRT	15-in CRT	Opt
Resolution (pixels)	640 x 400	697 x 880	NA
Text Display (lines x col)	25 x 80	—	NA
Character Matrix (dots)	—	Variable	NA
Colors (simul/palette)	Black & white monochrome	Monochrome	NA
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No of Programmable Function Keys	19	20	10
Special Features	Cursor keys, numeric keypad, mouse, WP keyboard	Cursor keys, numeric keypad, mouse	Cursor keys, numeric keypad
<b>No of Avail I/O Slots</b>	6	1	1 (opt)
<b>Interfaces</b>			
Serial	1	2 RS-232C	1
Parallel	1	NA	1 Centronics
Other	NA	NA	NA
<b>Communications</b>			
Asynchronous	Opt (TTY, VT 100)	Std	—
Synchronous	Opt (2780/3780, 3270 BSC, 3270 SDLC)	Std	—
<b>Software</b>			
Std Operating System	MS-DOS 3.1	—	MS-DOS 2.11
Opt Operating System	MS-DOS earlier versions	MS-DOS	NA
Bundled Software	Writer II	NA	—
Languages	GW-BASIC	—	—
<b>Sales &amp; Service</b>			
First Delivered	November 1985	October 1985	September 1985
Sales Channels	Direct, dealer, VAR	Direct	Direct, distributor, dealer
Service Channels	Direct, Americare	Direct	Direct, dealer
<b>Pricing</b>	\$5,645	\$4,995	\$1,499 (diskette drive); \$1,799 (dual diskette drives)
<b>Comments</b>	Opt color monitor avail	Requires Xerox PC option board to support PC software applications; operates in network w/opt software	IBM PC compatible; opt monochrome & color monitors avail

**Notes:**

NA Not applicable

— Information unavailable at press time

<b>Manufacturer</b>	Zenith Data Systems	Zenith Data Systems	
<b>Model</b>	Z-158	Z-200 Advanced PC	
<b>Classification</b>	Desktop	Desktop	
<b>Tasks</b>	Single	Single	
<b>Main Processor</b>			
Model	Intel 8088	Intel 80286	
Internal Word Size (bits)	8/16	16/16	
Clock Rate (MHz)	4.77 or 8	6	
<b>Additional Processors</b>	Intel 8087 math coprocessor	Intel 80287 math coprocessor (opt)	
<b>RAM</b>			
Standard RAM (bytes)	256K	516K	
Min/Max RAM (bytes)	256K/640K	516K/16M	
RAM Increments (bytes)	256K	1.5M	
<b>Std Diskette Storage</b>			
No of Drives	1-2	1	
Size (in) & Format	5.25 DSDD	5.25 DSDD	
Capacity per Diskette (bytes)	360K	1.2M	
<b>Std Disk Storage</b>			
No of Drives	1	1	
Size (in)	5.25	5.25	
Capacity per Disk (bytes)	20M	20M	
<b>Other Storage (Std)</b>	NA	NA	
<b>Other Storage (Opt)</b>	NA	5.25-in 360KB diskette drive; 5.25-in 40MB disk drive	
<b>Display</b>			
Size & Type	Opt	Opt	
Resolution (pixels)	NA	NA	
Text Display (lines x col)	NA	NA	
Character Matrix (dots)	NA	NA	
Colors (simul/palette)	NA	NA	
<b>Keyboard</b>			
Type	Detachable	Detachable	
No of Programmable Function Keys	10	10	
Special Features	Cursor keys, numeric keypad	Cursor keys, numeric keypad	
<b>No of Avail I/O Slots</b>	5 IBM compatible, 1 Zenith video	7	
<b>Interfaces</b>			
Serial	1	1	
Parallel	1	1	
Other	NA	NA	
<b>Communications</b>			
Asynchronous	Std (TTY, VT 100)	Std	
Synchronous	Opt (2780/3780, 3270 BSC, Sperry VTS-40, Honeywell)	Std	
<b>Software</b>			
Std Operating System	MS-DOS 2.11	MS-DOS 3.1	
Opt Operating System	NA	XENIX	
Bundled Software	Windows std w/hard disk model	Microsoft Windows (w/hard disk model)	
Languages	—	BASIC, C, COBOL, FORTRAN, Pascal, Assembler	
<b>Sales &amp; Service</b>			
First Delivered	September 1985	October 1985	
Sales Channels	Direct, distributor, dealer	Direct, distributor, dealer	
Service Channels	Direct, dealer	Direct, dealer	
<b>Pricing</b>	\$2,299 (diskette drive); \$2,499 (dual diskette drives); \$3,699 (diskette drive, 20MB disk drive)	\$3,699 (diskette drive); \$5,499 (diskette drive, 20MB disk drive)	
<b>Comments</b>	IBM PC compatible; opt monochrome & color monitors avail	IBM PC AT compatible; main processor w/no wait states; opt monochrome & color monitors avail; multiuser capability w/opt XENIX operating system	

**Notes:**

NA Not applicable

— Information unavailable at press time



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### Apricot PC

**Overview** The Apricot PC system features three operating systems, bundled business software, mouse cursor control, and the MicroScreen, which can be used to label programmable function keys or serve as a screen window for customers using the unit without a monitor. The Apricot PC unit weighs 17.5 pounds without the monitor and has a handle for easy carrying.

**System Design** The 16-bit Apricot PC incorporates an Intel 8086 main processor, 8089 I/O processor, and optional 8087 mathematics processor; these processors provide extensive processing power. Memory size is expandable from 256KB to 768KB. Storage includes 2 Sony 3.5-inch double-sided, double-density diskette drives for a maximum of 1.44MB. Communications and I/O facilities include an optional internal modem with autodialer, 1 synchronous or asynchronous RS-232C port, and an 8-bit parallel port. A 9-inch green-phosphor display provides 25 lines of 80 characters and 800-by-400-pixel graphics resolution. Eight fixed function keys, 6 programmable keys labeled by the MicroScreen, and cursor control and numeric keys complement the standard typewriter keyboard.

Included with the system are the Microsoft MS-DOS and Digital Research Concurrent CP/M-86 operating systems; also available are the UCSD p-System and BOS (from MPSTL). Interpretive BASIC and Personal BASIC are included; Pascal, FORTRAN, COBOL, and C are optional. Asynchronous communications software is bundled with the system.

**Competition & Pricing** Offering some of the advantages of a portable and bundled software, Apricot PC competes with the IBM Personal Computer and such compatible systems as the COMPAQ and Corona Portable Computer, and the Apple Macintosh and Apple IIc.

The base price for the Apricot PC with 256KB RAM is \$2,195. The monitor costs \$295.

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### Action Instruments Inc

8601 Aero Dr  
San Diego CA 92123

(619) 279-5726

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### Action 5531 Industrial Computer

**Overview** Manufactured for Action by IBM, the 5531 Industrial Computer is a highly ruggedized version of the IBM Personal Computer XT. It can operate in environments that subject it to wide temperature fluctuation, shock and vibration, voltage surges, dirt, and excessive humidity. It supports 256KB of memory expandable to 640KB, a diskette drive, a fixed disk drive, and IBM PC DOS.

**System Design** The Action 5531 Industrial Computer is based on the 16-bit Intel 8088 central processor that runs at 4.77MHz. A socket is provided for an Intel 8087 math coprocessor. The system includes 256KB RAM that can be expanded to 640KB in 64KB or 256KB increments. Also included are 40KB of ROM. Storage consists of a 5-1/4-inch, 360KB double-sided, double-density diskette drive and a 10MB fixed disk drive.

The optional color monitor features a 13-inch screen that displays 16 colors and a resolution of 640 by 200 pixels. The keyboard includes the full 128 ASCII character set plus graphics and control characters for a total of 256 keys. Ten programmable function keys can support 40 possible functions.

The system unit includes 8 expansion slots (6 long and 2 short). Three long slots are used for the diskette and fixed disk drives and the color monitor adapters. The Combination Adapter occupies a short slot. The remaining slots can be used to attach various process sensors for measuring and controlling temperature, flow, and pressure. An expansion chassis will provide 6 additional slots.

The Combination Adapter provides an asynchronous communications port, a parallel port, a battery-backed clock, and a thermal sensor interface.

**Competition & Pricing** The Action 5531 Industrial Computer competes with the IBM 5531 Industrial Computer and the ISI International 6160.

The Action 5531 Industrial Computer costs \$6,675.

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**Apple Computer**20525 Mariani Ave  
Cupertino CA 95014(408) 996-1010

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**Apple Computer**20525 Mariani Ave  
Cupertino CA 95014(408) 996-1010

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**Apple IIe**

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**Overview** The Apple IIe, introduced in January 1983, is the latest revision of the Apple II, which was introduced in 1977. Apple IIe (the "e" refers to enhanced) supports up to 128KB of RAM, 840KB of diskette storage, a 10MB fixed disk, 16KB of ROM, and high-resolution graphics.

Apple IIe systems run under the DOS 3.3 operating system, which is the same operating system available for the Apple II and Apple II+. In addition to the existing base of Apple II programming languages and applications software, Apple IIe supports a new WP program and a DBMS.

Although Apple IIe succeeds the Apple II and II+ systems, Apple Computer continues to support the older systems with service and parts. Apple Computer's network of dealers and service centers provide maintenance and support for Apple IIe.

**System Design** The Apple IIe CPU is an 8-bit Synertek 6502A microprocessor implementing LSI technology. The microprocessor features 5 standard registers and floating-point and decimal arithmetic functions.

Apple IIe is designed to be hardware and software compatible with Apple II and II+ systems. Apple IIe can therefore run existing Apple II and II+ software and many peripheral devices currently available for those systems.

An Apple IIe Professional system includes the Apple IIe computer with 7 expansion slots, 64KB of RAM, and a dual diskette subsystem with 140KB of diskette storage. The starter system also includes a 12-inch-diagonal display and the Apple 80-column card for an 80-column text display. The Apple IIe keyboard houses the system unit and features a typewriter-style layout with 63 keys.

Apple's DOS 3.3 provides sequential and random-access retrieval methods and file housekeeping routines. Programming languages that run under DOS 3.3 include Applesoft BASIC, Apple Business BASIC, and FORTRAN. Several application packages are available for Apple IIe, including Apple Writer II, Software Arts VisiCalc, Apple Plot, and Apple Post (a mailing list system). Hundreds of additional applications are available from independent vendors.

**Competition & Pricing** Apple IIe systems compete with the Franklin Computer Ace 1000, Tandy Radio Shack TRS-80 Model III, and NEC PC-8000.

Apple IIe prices range from \$895 to \$3,495.

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**Macintosh XL**

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**Overview** The Macintosh XL was formerly marketed as the Lisa 2/10, the 10MB fixed disk version of the Lisa 2 Series. The other Lisa models, the Lisa 2 and 2/5 are no longer produced, and all systems currently in stock will be upgraded to the Lisa 2/10 configuration and sold as the Macintosh XL.

The Macintosh XL is a response to demands for a Macintosh with a larger screen and enhanced internal capacity for running more complex applications. The Macintosh XL also plays a key role in Apple's new line of business products, the Macintosh Office.

**System Design** The Macintosh XL is based on the Motorola MC68000 microprocessor, which features a 32-bit internal and 16-bit external data bus. It also includes 512KB RAM expandable to 1MB, a 3.5-inch, 400KB diskette drive, and an internal 10MB fixed disk drive.

The Macintosh uses a 12-inch-diagonal display and supports a multiwindow environment. It also uses a mouse for cursor control, and the user interface is based on display screen symbols that represent objects found in an office (e.g., file folder, wastebasket, memo pad).

The Macintosh XL runs The Finder, the same operating system as the Macintosh. It can also run the Lisa Series Office System by installing the Lisa 7/7 operating system.

The Macintosh XL can run the software that runs on the Macintosh. This includes the Lotus Development Jazz and Microsoft Word and the Odesta Helix data base package and more than 350 other existing application packages. The Macintosh XL can also participate in the AppleTalk Personal Network and use the LaserWriter printer.

**Competition & Pricing** The Macintosh XL competes with the IBM Personal Computer XT, Sperry Corporation Personal Computer, and the Wang Laboratories Professional Computer.

The Macintosh XL sells for \$3,995.



**AT&T Information Systems**

1 Speedwell Ave  
Morristown NJ 07960

(201) 898-2000

**AT&T Personal Computer 6300**

**Overview** AT&T introduced the IBM-compatible Personal Computer 6300 in 1984. Manufactured for AT&T Information Systems by Olivetti, the 6300 is sold in Europe as the Olivetti M24. In addition to the desktop model, AT&T offers a portable version. Through the PC Interface, the 6300 can be linked to AT&T's 3B2/300 32-bit microcomputer for file and printer sharing and access to UNIX applications.

**System Design** AT&T Personal Computer, the 6300 is based on the 16-bit Intel 8086-2 processor, which has a faster processing speed than the Intel 8088 used in the IBM Personal Computer. An 8087 mathematics coprocessor can be added. The 16KB ROM includes diagnostics and BIOS. A color graphics video interface is standard. The system can be configured with 128KB to 640KB of RAM; in addition, one or two 360KB half-height diskette drives or a diskette drive and a 10MB Winchester disk can be configured. Seven IBM-compatible expansion slots are provided; 3 of these can accommodate 16-bit boards.

The system features an 83-key keyboard similar to that on the IBM Personal Computer. The monitor has an 80-column-by-25-line text display and 320-by-200-, 640-by-200-, or 640-by-400-pixel graphics modes. An RS-232C serial port and a Centronics-compatible parallel port are standard.

The 6300 supports Microsoft MS-DOS, Digital Research Concurrent CP/M-86, and UCSD p-System operating systems. Applications software includes various packages developed for the IBM Personal Computer.

**Competition & Pricing** The AT&T Personal Computer 6300 competes with the IBM Personal Computer, COMPAQ DESKPRO, Wang Professional Computer, and other IBM compatibles.

The system costs \$2,235 with 128KB of RAM and 1 diskette drive, \$2,545 with 128KB of RAM and 2 diskette drives, and \$4,690 with 256KB of RAM, 1 diskette drive, and 1 Winchester disk.

**Burroughs Corp**

Burroughs PI  
Detroit MI 48232

(313) 972-7000

**B 25**

**Overview** Burroughs, well known as a mainframe and minicomputer manufacturer, introduced its first microcomputer, the B 21 in May 1982. A high-performance standalone or multiuser desktop microcomputer—the B 25—introduced in May 1984 replaces the B 21 and B 22. The B 25 is a 16-bit microcomputer with 1M bytes of RAM, a keyboard, a video display, and a power module. Like its predecessor, the B 25 is designed for use in a business environment.

Burroughs-supplied software for the B 25 includes operating systems, programming languages, and application packages.

Burroughs warrants the B 25 and its software for 90 days. Site or depot maintenance and extension of the warranty on program products to a full year are optional.

**System Design** B 25 systems are based on the Convergent Technologies NGEN hardware and use the 16-bit Intel 80186 microprocessor. The CPU houses the processor, main memory, I/O slots, video circuitry, and power regulator.

Main memory can be expanded from 256KB to 1MB of RAM in increments of 256KB. Each 256KB increment is enclosed in a sealed module, which is user-installable. Maximum ROM storage is 16KB.

Several B 25 models are available. The dual-diskette model features two 5.25-in. diskette drives with 630KB of storage each; the hard disk and diskette models contain one 5.25-inch, 10MB Winchester disk drive and a 630KB diskette drive. The workstation model does not include disk storage. The hard disk upgrade includes a 10MB Winchester disk drive, and the disk expansion option includes a 5.25-inch, 10MB Winchester disk drive.

The B 25 includes a 98-key typewriter-style keyboard with a 14-key numeric keypad and 10 programmable function keys.

All B 25 systems include 2 RS-232C ports, a Centronics-compatible parallel interface, and an RS-422 cluster interface.

Software for the B 25 includes a real-time, multitasking operating system (BTOS); standard programming languages, such as COBOL, FORTRAN, and Pascal; program development tools, data management facilities; and standard communications protocol emulation. Additional operating systems include the Microsoft MS-DOS and the Digital Research CP/M-86.

**Competition & Pricing** Competition for the systems includes the Datapoint VISTA-PC, NCR WorkSaver 300, and IBM PC AT.

The price for the basic B 25 system is less than \$4,000.



**Canon U.S.A.**

Systems Div  
1 Canon Plaza  
Lake Success NY 11042

(516) 488-6700

**AS-100**

**Overview** The AS-100, a 16-bit desktop microcomputer with 128KB of RAM, is available in 2 models, one featuring a monochrome display and the other a color display. Both models include dual 5-1/4- or 8-inch diskette drives. A Winchester disk drive is also available. A full-function ASCII-style detachable keyboard is standard.

The AS-100 functions as a standalone system or as part of a local area network for file and peripheral sharing.

The AS-100 supports industry-standard operating systems, various applications software packages, and high-level programming languages.

Canon provides maintenance and support through its nationwide network of field service engineers.

**System Design** The AS-100 microcomputer is based on the Intel 8088 microprocessor, which features a 16-bit architecture and 128KB of RAM expandable to 512KB. Dual 5-1/4-inch diskette drives with 1.2MB of storage or dual 8-inch diskette drives with 2MB of storage can be configured with the system. A 5-1/4-inch 10MB Winchester disk drive is also available.

The AS-100 is available in two models: AS-100M and AS-100C. The 2 models differ in the type of display. The AS-100M features a 12-inch-diagonal monochrome CRT display with a 2,000-character capacity, while the AS-100C includes a 12-inch-diagonal, 8-color CRT with a 2,000-character capacity and 640-by-400-dot graphic matrix.

The AS-100 typewriter-style keyboard is detachable and has 12 user-definable function keys and a 10-key numeric keypad.

A 40-cps color printer and 120-cps dot matrix printer can be added to the system. Additional peripherals include a Centronics-type parallel interface, memory boards, and a communications interface.

Software support for the AS-100 includes the CP/M-86 operating system from Digital Research and MS-DOS from Microsoft. Programming languages include Canon BASIC, GWBASIC, RM/COBOL, and Level-II COBOL. Application packages include the MicroPro WordStar, MailMerge, CalcStar, DataStar, and SpellStar.

**Competition & Pricing** Competition for the AS-100 includes the NEC Advanced Personal Computer and Zenith Z-100 Series.

Model	Price \$
AS-100M	2,995
AS-100C	3,495

**Canon U.S.A.**

Systems Div  
1 Canon Plaza  
Lake Success NY 11042

(516) 488-6700

**Canon Personal Computer**

**Overview** Introduced in 1984, the Canon Personal Computer is hardware and software compatible with the IBM Personal Computer and can run most IBM software without modification. It features a 16-bit Intel 8086 processor, 5 IBM-compatible expansion slots, and an 83-key keyboard layout similar to that of the IBM Personal Computer; the keyboard includes 10 function keys.

**System Design** The standard configuration of the Canon Personal Computer includes 256KB of memory, two 360KB diskette drives, a monitor, a serial interface, and a parallel interface. Microsoft MS-DOS and GW-BASIC are bundled with the system.

The parallel and serial interfaces and the diskette controller are built in; thus, 4 expansion slots are available for optional peripherals and add-on boards. Two monitors are available—a monochrome monitor and a color monitor that supports 640-by-200-pixel resolution in monochrome graphics and 320-by-200 pixel resolution in 4-color graphics.

Canon manufactures several printers that can be used with the Personal Computer, including 80- and 156-column dot matrix printers, a color ink-jet printer, a thermal printer, and a compact laser beam printer.

The Microsoft MS-DOS 2.1 operating system, GW-BASIC 2.0 and a tutorial package are included in the basic system. Most IBM-compatible software can run on the system, including Lotus 1-2-3, Sorcim Supercalc<sup>3</sup>, and Ashton-Tate dBase II.

**Competition & Pricing** Competition for the Canon Personal Computer includes the IBM Personal Computer and such IBM-compatible systems as the Corona PC, Columbia personal computer family, COMPAQ DESKPRO, MAD Computer MAD-1, and Sperry Personal Computer.

The price for the basic Canon system is \$2,495. With the color display, the system costs \$2,995.



**Canon USA**

System Div  
One Canon Plaza  
Lake Success NY 11042

(516) 488-6700

**TX-50**

**Overview** The Canon TX-50 is a desktop turnkey system for specialized applications, such as loan, mortgage, or insurance calculations, sales credit calculations, and customer management. This compact system includes a CPU, keyboard, CRT, diskette drive, and dot matrix printer.

**System Design** The TX-50 incorporates a 16-bit Intel 8088 microprocessor with 128KB of memory, expandable to 256KB. The system features a built-in 3-inch diskette drive with a capacity of 180KB per side. Two slots for optional expansion boards are included; a slot can be either 2 serial ports or 1 parallel port.

The TX-50 keyboard is not alphanumeric but has 50 function keys with LED indicators, a separate numeric keypad, and cursor control keys. The CRT is a flat, 7-inch monochrome unit that can display 30 characters by 10 lines, 15 characters by 5 lines, or 80 characters by 25 lines; it has a resolution of 480 by 200 pixels. The dot matrix printer can print 30 characters per line at 1.2 lines per second and will print on a roll of paper similar to that used in an adding machine.

System software includes the Microsoft MS-DOS operating system and BASIC.

**Competition & Pricing** The TX-50 is a unique computer with no comparable competitors at this time.

The TX-50 sells for \$1,295.

**Centurion Computer Corp**

1111 S Sherman  
Richardson TX 75081

(800) 527-4266

**MicroPlus 700 Series**

**Overview** The single-user desktop MicroPlus 700 Series features built-in color capability and full IBM PC-DOS compatibility; the basic system includes 256KB of RAM. The microcomputer is available through dealers and is marketed primarily as an intelligent workstation for use with a Centurion mini-computer.

**System Design** The MicroPlus 700 Series runs on the Intel 8088 and will support the optional Intel 8087 math coprocessor. The basic system includes 256KB of RAM, expandable to 640KB; a keyboard with numeric keypad and 10 function keys; a parallel printer and two RS-232C serial ports; a speaker for synthesized voice and music applications; and support for 9 expansion slots. Two 5-1/4-inch, 360KB diskette drives are standard, and a 10MB or 20MB Winchester disk is available. The system can operate in a standalone mode or can serve as a terminal to a host computer, such as the Centurion 7000 minicomputer series, using asynchronous, synchronous, or bisynchronous IBM protocols. Two serial ports and 1 parallel port are standard. The built-in graphics feature includes 32 colors, highlighting, underlining, and reverse imaging. The MicroPlus 700 Series runs the Microsoft MS-DOS operating system and most MS-DOS-compatible software.

**Competition & Pricing** The MicroPlus 700 Series competes with the IBM Personal Computer and IBM-compatible systems.

Model	Price \$
700 w/2 diskette drives	2,885
702 w/a diskette & 10MB disk	4,260
704 w/a diskette & 20MB disk	4,760



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**Commodore Business Machines**1200 Wilson Dr  
West Chester PA 19380(215) 431-9100

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**B128-80**

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**Overview** The B128-80 is an 8-bit desktop system designed for the small business computer market.

Standard features of the B128-80 include 128KB of main memory, an ergonomically designed keyboard, and a display.

Service and support for the B128-80 is provided by Commodore Business Machines local dealers and by several vendor-operated regional service centers.

**System Design** The B128-80 is based on the 8-bit Synertek 6509 microprocessor. The processor features bipolar TTL and MOS technology as well as an instruction set similar to that of the Synertek 6502, which was used in some earlier Commodore models.

The system is configured with 128KB of RAM and 24KB of ROM; the ROM contains the B128-80 operating system and the BASIC language interpreter. The system addresses more memory than most conventional 8-bit processors because the CPU can perform bank-switching operations.

An IEEE-488 and an RS-232C interface are standard, as are a cartridge port for ROM-based software, an internal 8-bit user port, and an audio and video port. A parallel interface is optional. Single and dual 5-1/4-inch diskette drives that store 170KB-2.1MB are available.

The B128-80 has a 93-key keyboard with a 19-key numeric keypad and 10 user-defined function keys. The system also features an 80-column-by-25-character display.

Software includes accounting systems, WP, DBMS packages, spreadsheet programs, communications packages, and utility packages for system programming and operation. Various third-party software packages are also available.

**Competition & Pricing** The Commodore B128-80 competes with the Sony SMC-70, Tandy Radio Shack TRS-80 Model 4P, and Apple IIe.

The B128-80 is priced at \$949.

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**Commodore Business Machines**1200 Wilson Dr  
West Chester PA 19380(215) 431-9100

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**CBM 8032**

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**Overview** The Commodore CBM 8032, equipped with keyboard, processor, and video display, is designed for business applications. Similar in many respects to the PET 4032, the CBM 8032 offers an optional circuit board for increased main memory.

Commodore computers are serviced by local dealers and 4 vendor-operated regional service centers.

**System Design** The CBM 8032 features an 80-character-by-25-line CRT, making it suitable for word processing applications. An alphanumeric keyboard with a separate calculator-style keypad, 32KB of RAM, and a BASIC interpreter stored in ROM are standard. The CBM 8032 also supports several versions of compiled BASIC.

RAM capacity can be expanded to 96KB, which enables the 8032 to run the UCSD Pascal operating system and associated language compiler.

The central processor of the CBM 8032 is the Syner-tek 6502 chip, which uses TTL bipolar and MOS technology. Operating in both decimal and binary arithmetic modes, the 6502 microprocessor has an 8-bit data bus, 151 standard instructions, interrupt request and non-maskable interrupt levels, stack pointer, and an on-chip clock circuit.

Single and dual 5-1/4-inch diskette drives range in total storage capacity from 170KB to 2.1MB. A 5MB and a 7.5MB Winchester disk drive are available with the system.

Applications software includes OZZ, a data management and retrieval system; Wordcraft 80, a word processing package; a tax preparation system; the Dow Jones Portfolio Management System; accounts receivable; and an inventory management system. Other software packages are available for the CBM 8032 from third-party vendors.

**Competition & Pricing** In competition with the CBM 8032 are the North Star Horizon, Xerox 820-II, and Apple IIe.

A basic CBM 8032 configuration is priced at \$1,495.



**Commodore Business Machines**1200 Wilson Dr  
West Chester PA 19380

(215) 431-9100

**SP9000 SuperPET**

**Overview** The SP9000 SuperPET supports an array of programming language interpreters, making it suitable for computer science education, as well as business and professional applications. The system is based on the CBM 8032 and will run any application that runs on the unexpanded 8032.

Service for the SP9000 is provided by local dealers and 4 vendor-operated regional service centers.

**System Design** The SP9000 has 96KB of RAM and 36KB of ROM and uses dual 8-bit microprocessors. The MOS 6502 processor supports compiled or interpreted BASIC and Assembler. The Motorola MC 6809 supports language interpreters developed by the University of Waterloo, Ontario, for BASIC, FORTRAN, Pascal, APL, and COBOL, and an Assembler development system. The SP9000 runs under the proprietary operating system CBM.

Diskette storage for the SP9000 ranges from the single-drive 170KB unit to the dual-drive 2.1MB system. Either 5MB or 7.5MB of storage is available on Winchester disk drives.

The SP9000 features a 20-column-by-25-line monochrome CRT display, suitable for word processing applications, and an alphanumeric keyboard with a separate calculator keypad.

A number of applications packages for the SP9000 are available from Commodore, including OZZ, a data management and retrieval system; Wordcraft 80, a word processing package; a legal accounting package; an inventory system; and EasyCalc, EasyPlot, EasyTools, and EasyScan, a family of spreadsheet programs. Additional software is available from third-party software vendors.

**Competition & Pricing** The SP9000 SuperPET faces competition from the Tandy Radio Shack TRS-80 Model II, the Apple III, and the North Star Horizon.

The SP9000 is priced at \$1,995.

**COMPAQ Computer**12330 Perry Rd  
Houston TX 77070

(713) 370 7040

**COMPAQ DESKPRO**

**Overview** COMPAQ Computer is an established manufacturer of IBM-compatible portable computers, including the COMPAQ and COMPAQ Plus. The company entered the desktop computer market with the introduction of its DESKPRO family of IBM-compatible computers.

DESKPRO can run, without modification, all software and hardware developed for the IBM Personal Computer and Personal Computer XT.

DESKPRO is available in 4 models that offer a maximum main memory of 640KB, a 10MB fixed disk drive, and a 10MB fixed disk drive backup system. DESKPRO runs both high-resolution IBM Personal Computer-compatible text and graphics on the same system.

Support, training, consultation, and maintenance for the COMPAQ DESKPRO are provided by authorized retailers and dealers.

**System Design** An Intel 8086 microprocessor provides the basis for the DESKPRO CPU. The processor is equipped to run in 2 modes: one that operates at the standard Intel 8086 rate of 8MHz, and another mode that operates at a simulated Intel 8088 rate. An Intel 8087-2 math coprocessor is optional.

Each DESKPRO model includes an 83-key keyboard, a system unit, a 12-inch-diagonal dual-mode monitor, and the capabilities to expand main memory to 640KB.

Model 1 includes 128KB of RAM, a 360KB diskette drive, and 6 expansion slots. Model 2 features two 360KB diskette drives, 256KB of RAM, and 6 expansion slots. Model 3 has the same features as Model 2 except with 1 diskette, a 10MB fixed disk drive, an asynchronous communications/clock board, and 4 expansion slots. Model 4 includes 640KB of RAM, a 360KB diskette drive, a 10MB fixed disk drive, a 10MB fixed disk backup system, an asynchronous communications/clock board, and 4 expansion slots. A 30MB fixed disk drive is also available.

DESKPRO runs under the Microsoft MS-DOS operating system and can be programmed in BASIC. Numerous software packages are available for the DESKPRO because of its ability to run IBM-compatible software programs.

**Competition & Pricing** Competing with the DESKPRO are the IBM Personal Computer and Personal Computer XT, Eagle PC, Columbia MPC, and Tandy 2000.

Model	Price \$
1	2,495
2	2,995
3	4,995
4	7,195

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**COMPAQ Telecommunications Corp**15182 Marsh La  
Dallas TX 75244(214) 484-4200

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**TELECOMPAQ**

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**Overview** The TELECOMPAQ, announced in March 1985 and available in June 1985, combines the capabilities of a desktop microcomputer with telephone and electronic office routines. Six models are available with diskette and disk drives and connectivity to both analog and digital phone systems.

The systems will be marketed through PacTel Info-Systems, telecommunications subsidiaries, independent telephone companies, and PBX manufacturers. PacTel, AMERICARE, and Sorbus will service the TELECOMPAQ.

**System Design** The TELECOMPAQ is based on the 16-bit Intel 8086 microprocessor that will run at user-selectable speeds of 7.14MHz or 4.77MHz. An Intel 8087 math coprocessor is optional. A Zilog Z80 processor with 64KB memory handles all telephony and data communications functions. The system includes 384KB or 640KB of RAM, depending on the model. Mass storage configurations include three 360KB double-sided, double-density diskette drives or 2 diskette drives and a 10MB fixed disk.

The system also features 2 full-length expansion slots, an RS-232C serial port, a parallel port, an internal modem, a 9-inch monochrome text and graphics monitor, RGB and composite video ports for an external display, and an industry standard keyboard. Voice and data communications hardware includes a separate, movable phone unit that connects to analog and digital telephone lines.

Communications software supports simultaneous voice and data communications and TTY, and Digital Equipment VT100 and VT52 emulation, an electronic phone directory, and ASCII text transfer.

The Microsoft Corporation MS-DOS and GWBASIC are standard on the system.

**Competition & Pricing** The TELECOMPAQ competes with the Cygnet Technologies Communications CoSystem and the Rolm Cedar Personal Communications Computer.

Depending on the configuration, prices for the TELECOMPAQ range from \$4,195 to \$6,395.

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**Computer Automation**2181 Dupont Dr  
Irvine CA 92713(714) 833-8830

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**MicroSyFA**

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**Overview** Computer Automation's Commercial Systems Division introduced the MicroSyFA, the least expensive member of the SyFA Series of network processors, in April 1983. The MicroSyFA is marketed as a standalone desktop computer system that provides multifunction workstation capability. The MicroSyFA provides a growth path to a full broadband local area network (LAN). The network processor is being offered initially to insurance companies, large banks and savings institutions, and government agencies.

The MicroSyFA supports up to 256KB of main memory, 2MB of diskette storage, and 10MB of Winchester disk storage. The system features a video display unit with an 80-column-by-24-line nonglare screen, which provides reverse video, protected fields, underlining, and flashing.

Software for the MicroSyFA includes the Digital Research CP/M-86 operating system, high-level programming languages, application programs, and data communications software.

Computer Automation maintains and supports the MicroSyFA with both hardware and software maintenance programs.

**System Design** An Intel 8088 microprocessor is the CPU for the MicroSyFA. The 16-bit system supports 64KB to 256KB of main memory. The 8088 is a single-chip processor implementing LSI technology.

The MicroSyFA runs under CP/M-86 and supports the extensive library of application programs written in CP/M as well as SyBOL applications software. SyBOL is Computer Automation's COBOL-like business-oriented programming language. The MicroSyFA can be programmed in CP/M-compatible high-level programming languages, and it can access IBM systems network architecture (SNA), SDLC, or X.25 protocol. The system can also be used as a standalone workstation or as a task processor in Computer Automation's LAN.

A basic MicroSyFA configuration includes 64KB of MOS main memory, two 5-1/4-inch diskette drives with total storage of 2MB, 2 RS-232C ports, and a 15-inch-diagonal green phosphor display. The system can be expanded to 256KB of memory and 10MB of Winchester disk storage.

**Competition & Pricing** Competition for the MicroSyFA includes the Texas Instruments Professional Computer, IBM Personal Computer, Apple IIe, and Victor 9000.

A basic MicroSyFA configuration costs \$6,000.



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**Computer Consoles Inc**919 Third Ave  
28th Floor  
New York NY 10022(212) 371-8660

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**CCI PC**

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**Overview** Introduced in November 1984, the CCI PC is an IBM-compatible desktop computer that also serves as a terminal workstation in CCI's OFFICEPOWER office automation system. The CCI PC features a system unit that can be positioned horizontally or vertically up to 10 feet from the monitor.

**System Design** The CCI PC is based on the 8-/16-bit Intel 8088 processor used in the IBM Personal Computer and is claimed to be operationally compatible. Minimum RAM is 256KB, expandable to 640KB. One or two 360KB diskette drives make up the disk storage. The system features a tilt-swivel monochrome (green or amber) or color monitor. Graphics resolution is 720 by 384 or 640 by 400 pixels. The keyboard follows the 83-key IBM Personal Computer layout but is enhanced with indicator lights on numeric and caps lock keys.

The system includes 2 serial ports and 1 parallel port. Four I/O expansion slots are available even with a full 640KB RAM installed in the system.

The CCI PC consists of the Microsoft MS-DOS operating system, BASIC, and the OFFICEPOWER terminal emulation package. This package enables the CCI PC to function as a fully supported OFFICEPOWER terminal with integrated record and word processing capabilities and access to relational data base management software and user-defined forms. The link to OFFICEPOWER is the same soft-key interface provided by the CCI POWERTERMINAL package. File transfer between the PC and the OFFICEPOWER host is also supported.

**Competition & Pricing** The CCI PC is designed primarily for users of the OFFICEPOWER systems. It competes with the IBM Personal Computer and compatible systems.

Pricing for the CCI PC ranges from \$2,500 for a system with 1 diskette drive and a monochrome monitor to \$5,800 for a system with 1 diskette drive, 1 Winchester disk, a color monitor, and POWERTERMINAL software.

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**Control Data Corp**8100 34th Ave S  
Minneapolis MN 55440(612) 853-8100

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**PLATO Personal Training Station (PPTS)**

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**Overview** The PLATO Personal Training Station (PPTS) is an 8-color training station used for online and offline lesson delivery, instructional management, and MS-DOS applications. The system is compatible with the IBM Personal Computer and can emulate its color graphics. The PPTS supports up to 640KB RAM, 2 diskette drives, a 10MB disk drive, and high-resolution color graphics.

**System Design** The PPTS is based on the Intel 8088 microprocessor with 16-bit internal and 8-bit external architecture. An Intel 8087 math coprocessor is optional. The basic system has 320KB of RAM, expandable to 640KB in 64KB increments. Storage options include 1 or 2 diskette drives, or a single diskette drive and a 10MB fixed disk.

The 13-inch color monitor features a touch-sensitive screen and medium-resolution graphics with 2 graphics boards. An optional high-resolution graphics board will support a resolution of 512 by 512 pixels and 16-color display from a palette of 4,096 colors.

The detachable keyboard features 56 alphanumeric, 10 function, and 17 keyboard keys.

The system unit also features an RS-232C port that supports asynchronous communications and a Centronics-compatible parallel port.

The PPTS supports the Microsoft MS-DOS and GWBASIC.

**Competition & Pricing** The PPTS competes with the IBM Personal Computer, the COMPAQ DESKPRO, and the Columbia MPC.

The vendor declined to provide pricing.

**Corona Data Systems**275 E Hillcrest  
Thousand Oaks CA 91360

(805) 495-5800

**Corona PC**

**Overview** The Corona PC is a single-user desktop computer that is compatible with the IBM Personal Computer. It supports 128KB to 512KB of memory, 1 or 2 diskette drives, a 10MB Winchester disk drive, and 2 graphics display modes. The Corona is marketed through distributors and dealers. Service can be obtained through the distributor, dealer, or XEROX Service Centers.

**System Design** The Corona PC is based on the Intel 8088 central processor and has a clock speed of 4.77MHz. A socket is also available for the Intel 8087 math coprocessor. A high-resolution graphics coprocessor is standard.

The Corona PC is available in three models. The PC-11 consists of a 5-1/4-inch, 360KB, double-sided, double-density diskette drive and 128KB of memory. The PC-22 has 2 diskette drives and 256KB memory. The PCHD-2 comes with a diskette drive, a 10MB Winchester disk drive, and 256KB of memory. Memory can be expanded to 512KB in 128KB increments.

The 12-inch-diagonal display features a 25-line-by-80-character format and 2 graphics resolution modes. Low resolution displays 320 by 200 pixels and 4 shades of grey; high resolution displays 640 by 200 pixels and 2 colors (black and white).

A RS-232C serial port and a parallel port are included. The 4 available expansion slots can be used to support a color monitor, communications, networking, or a mouse. The Corona PC supports asynchronous and synchronous communication.

The Corona runs the Microsoft MS-DOS operating system as well as the Digital Research CP/M and the UCSD p-System. MS-DOS, the Multimate International Multi-Mate word processing system, and PC Tutor from Comprehensive Software Support are included in the cost of the system.

**Competition & Pricing** The Corona PC competes with the IBM Personal Computer and compatible systems including the IBM Personal Computer and Personal Computer XT, the COMPAQ Deskpro, and Sperry Personal Computer.

Model	Price
	\$
PC-11	1,950
PC-22	2,350
PCHD-2	3,850
12-inch display	245

**Corona Data Systems**275 E Hillcrest  
Thousand Oaks CA 91360

(805) 495-5800

**Personal Best**

**Overview** The Personal Best desktop is Corona's top-of-the-line IBM-compatible machine, boasting enhanced graphics, simultaneous text and graphics display, and increased main-board memory capacity. It is essentially an upgraded version of the Corona Personal Computer.

**System Design** Based on the 4.77MHz 8-/16-bit Intel 8088 processor, the Personal Best has 512KB of RAM on the main board and can address 1MB. Disk storage consists of 2 half-height 360KB diskette drives and a 10MB Winchester disk. The 12-inch green phosphor monochrome monitor features a graphics resolution of 640 by 400 pixels; the system can also be switched to the 640-by-200-pixel mode to run IBM-compatible software. Text characters are of very high resolution, featuring a 16-by-16-dot matrix. Text can overlay graphics on the screen. The keyboard follows the 83-key IBM layout enhanced with indicator lights for numeric and caps lock keys and a 6-foot cord that connects to the front of the system unit.

An RS-232C serial port and a Centronics-compatible parallel port are standard. Four expansion slots are provided; however, 1 of them is taken up by the Winchester disk controller. The diskette controller is built into the main system board.

The system price includes the Microsoft MS-DOS 2.0 operating system and GWBASIC, PC Tutor from Comprehensive Software Support, and Multimate word processing software from Multimate International.

**Competition & Pricing** The Corona Personal Best competes with the IBM Personal Computer XT and Winchester disk-based compatible systems, such as the Seequa Cobra, Sperry Personal Computer, and COMPAQ Deskpro.

Pricing for the Personal Best is \$4,795. The monitor costs an additional \$300.



**Corvus Systems**2100 Corvus Dr  
San Jose CA 95124

(408) 559-7000

**Datapoint Corp**9725 Datapoint Dr  
San Antonio TX 78284

(512) 699-7542

**Concept**

**Overview** Corvus Systems introduced Concept in early 1982 as a network workstation. Concept requires no additional hardware or software to plug into the Omninet network. The Omninet local network can connect up to 64 microcomputers with up to 4,000 feet of twisted-pair cable. Concept can also be used as a standalone system featuring extended graphics capabilities.

Concept supports up to 512KB of main memory, 80MB of Winchester disk storage, and 500KB of diskette storage. The system also features a 15-inch diagonal bit-mapped display of 720-by-560 pixels. Concept uses a dual-orientation display that allows it to be used in a vertical or horizontal position.

Software for the Concept includes an operating system, language compilers, and various application programs, including a WP package.

Corvus Systems warrants Concept for 6 months; extended warranties are available. Maintenance for Concept is available through authorized service centers.

**System Design** Concept features a Motorola MC 68000 microprocessor with 32-bit data and address registers and a 16-bit data bus. The system is configured with 256KB of RAM expandable to 512KB.

Concept runs under the Corvus Concept Operating System (CCOS), which supports a multifunction capability, and is compatible with the portable UCSD p-System as well as a CP/M emulator. Concept also supports FORTRAN and Pascal. Applications software for Concept includes the EdWord text editing and WP system and the Corvus LogiCalc electronic spreadsheet for planning and forecasting.

Concept supports asynchronous data communications at 19.2K bps. I/O is handled through 2 RS-232C serial ports, an RS-422 port, and an Omninet local network interface.

A basic Concept configuration includes the CPU with 256KB of RAM, 500KB of diskette storage, the display, an IBM Selectric-style keyboard, 2 RS-232C serial ports, an RS-422 port, Omninet local network interface, and the CORVUS operating system. An expanded system supports the same features except with 512KB of RAM and up to 80MB of hard disk storage.

**Competition & Pricing** Competition for Concept includes the IBM Personal Computer, Fortune System 32:16, and Tandy Radio Shack TRS-80 Model 16.

A basic Concept configuration is priced at \$4,995.

**VISTA-PC**

**Overview** Datapoint introduced its VISTA-PC professional color computer in June 1984 as part of its PRO-VISTA office automation system. The 16-bit system is available in 2 models and as a workstation.

VISTA-PC supports a maximum 1MB of main memory. All VISTA-PC models include a 15-inch-diagonal color monitor, low-profile keyboard, and color graphics module.

Integrated software solutions for the VISTA-PC include the Microsoft MS-DOS operating system (which supports industry-standard applications), and Datapoint proprietary software (which take advantage of the system's multitasking capabilities).

Datapoint's nationwide network of field service engineers provides maintenance and support for the VISTA-PC.

**System Design** VISTA-PC is designed around a 16-bit Intel 80186 microprocessor with 16KB of system ROM and 256KB of RAM. Main memory can be expanded to 1MB in 256KB increments. Standard interfaces include 2 RS-232C serial ports, a Centronics-compatible parallel interface, a bus interface for disk expansion units, and a cluster interface for connecting up to 5 VISTA-PC workstations or processors to a VISTA-PC.

Model 1201 includes a 15-inch color monitor, keyboard, CPU module with 256KB of RAM, color graphics module, disk controller, and two 630KB diskette drives. Model 1202 has the same features as the 1201 except with one 630KB diskette drive and a 10MB Winchester disk drive. The 1204 workstation has all the features of the 1201 but does not include any integral storage.

VISTA-PC runs under Microsoft MS-DOS, which supports Datapoint COLOR-PAC WP, Microsoft Multiplan, and industry-standard MS-DOS-compatible applications software. Available programming languages include GWBASIC, COBOL, FORTRAN, Pascal, and Datapoint DATABUS.

VISTA-PC can operate as part of the Resource Management System and ARCNET local area network or as part of the DATASHARE time-sharing system.

Communications protocols supported by VISTA-PC include X.25 and IBM 3270, 2780/3780, 3270, and 377x.

**Competition & Pricing** VISTA-PC competes with the ITT XTRA, Sperry Personal Computer, and Wang Professional Computer.

The vendor declined to provide current pricing.



**Digital Equipment Corp**146 Main St  
Maynard MA 01754

(617) 897-5111

**Professional 300 Series**

**Overview** The Professional 300 Series from Digital Equipment supports 512KB to 1MB of main memory, 800KB of diskette storage, and 5MB to 33MB of Winchester disk storage. Fortune 1000 companies are being targeted by Digital Equipment as the market for the Professional 300 Series. Marketing is being carried out through existing sales channels, including retail stores, terminal distributors, and authorized dealers.

Available software for the 300 Series includes the Digital Equipment P/OS, RT-11, and CTS-300 operating systems as well as the Digital Research CP/M-80, VenturCom PRO/VENIX, Microsoft MS-DOS, UCSD p-System, and Whitesmiths Ltd Idris. The Synergy package provides a windowing environment. Digital Equipment has a software producer's agreement with independent software vendors for applications programs.

Digital Equipment customer service engineers provide maintenance and support for the Professional 300 Series. Walk-in service centers are available for module repairs.

**System Design** Models 325 and 350 feature the F-11 microprocessor, the same CPU chip used in the Digital Equipment PDP-11 Series/23. Model 380 features the J-11 chip set, which implements the PDP-11/70 instruction set. The 380 features a 960-by-480-pixel display mode for engineering and design applications.

P/OS is a growth-oriented operating system derived from base-level RSX-11, the Digital Equipment real-time operating system for PDP-11 minicomputers. Integrated with P/OS is the Professional Memo Editor for preparing memos, letters, and brief reports. Professional 300 Series BASIC includes an online help facility, a single-line editor, debugging tools, and graphic control functions.

**Competition & Pricing** Competition for the 300 Series comes from the IBM Personal Computer, the Wang Professional Computer, and the Data General DESKTOP GENERATION.

Model	Price \$
Professional 325	3,595
Professional 350	4,595
Professional 380	6,595

**Digital Equipment Corp**146 Main St  
Maynard MA 01754

(617) 897-5111

**Rainbow 100B, 100 +**

**Overview** The Digital Equipment Rainbow 100B and 100+ systems are targeted toward professionals, including business managers of small companies, and are marketed through existing sales channels, such as retail stores, authorized terminal distributors, and Digital Equipment dealers. The systems are dual microprocessor-based personal computers capable of running both 8- and 16-bit software. They support from 128KB to 896KB of main memory, 1.6MB of diskette storage, and a 10MB Winchester disk drive.

The Rainbow 100 systems run under a hybrid version of the Digital Research CP/M operating system and Microsoft MS-DOS operating system. They support a number of high-level programming languages and a variety of 8- and 16-bit application programs.

Customer service engineers from Digital Equipment provide maintenance and support. A WATS line is available for software assistance on supported products; walk-in service centers are available for module repairs.

**System Design** The Rainbow 100 systems feature 2 microprocessors—an 8-bit Zilog Z80A and a 16-bit Intel 8088—linked together through an interrupt scheme. A dual bus architecture is used on the Rainbow systems, with a bus linked to each processor; both buses are connected to a shared RAM.

The Digital Research CP/M-80/86 operating system soft-senses the application program to be executed and automatically activates the appropriate 8- or 16-bit processor. The Rainbow systems run under the Microsoft MS-DOS operating system. Digital Equipment supports Microsoft MBASIC, GWBASIC, and BASIC and Mark William's C programming languages. A number of CP/M applications programs are supported, including word processing and an electronic spreadsheet.

Rainbow 100 systems support 2 data communications ports with industry-standard RS-232C and RS-422 interfaces. Data communications transmission rates are 1.92K bps.

**Competition & Pricing** The Rainbow computers compete with the Data General DESKTOP GENERATION, Wang Professional Computer, and Xerox 16/8.

Model	Price \$
Rainbow 100B	2,985
Rainbow 100 +	4,885



**Digital Equipment Corp**146 Main St  
Maynard MA 01754

(617) 897-5111

**Rainbow 190**

**Overview** The Rainbow 190, announced in March 1985 and available in July 1985, is the newest addition to the Rainbow family of single-user, desktop microcomputers. It is a complete hardware and software package offering users the flexibility of local WP, personal computing, and electronic mail, along with the resources of the Digital Equipment VAX/VMS-based systems and the ALL-IN-1 Office and Information System. The Rainbow 190 is compatible with the other Rainbow models, which can be upgraded to a Rainbow 190 configuration.

**System Design** The Rainbow 190 is based on the 8-bit Zilog Z80A and 16-bit Intel 8088 microprocessors. It features the same dual-bus architecture as the other Rainbow models, with a bus linked to each processor and both buses connected to a shared RAM. The Rainbow 190 includes 640KB of RAM, expandable to 896KB. The system also supports 2 400KB diskette drives and a 10MB fixed disk.

The Rainbow 190 supports a 12-inch monochrome or 13-inch color monitor with a display format of 25 lines by 80 or 132 characters. The Digital Equipment Goldkey keyboard is standard and features 105 keys with ALL-IN-1/WPS keycap labels.

The system unit includes two RS-232/423 ports for printer and communications support.

Bundled software includes the Rainbow Office Workstation, the WPS-PLUS/Rainbow word processing package, and the Microsoft MS-DOS operating system. The system will also support the Microsoft MBASIC, GWBASIC, and BASIC; Mark William's C programming languages; and the Digital Research CP/M-80/86 operating system.

**Competition & Pricing** The Rainbow 190 competes with the Data General DESKTOP GENERATION, Wang Laboratories Professional Computer, and Honeywell Information Systems microSystem 6/10.

The Rainbow 190 is priced at \$6,495.

**Digital Equipment Corp**146 Main St  
Maynard MA 01754

(617) 897-5111

**VAXstation I**

**Overview** The VAXstation I incorporates the MicroVAX I processor in a single-user workstation designed as an interactive, high-resolution graphics tool, particularly for engineering and manufacturing environments with an investment in VAX minicomputer systems.

**System Design** Based on the MicroVAX 32-bit processor, the VAXstation I includes 1MB of RAM, expandable to 2M, two 400KB 5-1/4-inch diskette drives, and a 31MB 5-1/4-inch Winchester disk. A 19-inch monochrome landscape monitor produces resolution of 960 by 864 pixels (noninterlaced). The keyboard features 15 function keys and is supplemented by a 3-button mouse.

An optional Ethernet interface and DECnet software allow the VAXstation I to be linked with other VAX processors. Terminal emulation software enables the system to function as a Digital Equipment VT100 or Tektronix 4014 terminal.

The VAXstation I runs the MicroVMS operating system, a subset of the VMS operating system offered on the larger VAX systems. Integrated into MicroVMS is window manager software, which enables the user to create multiple windows for 1 or more processes. Windows can be created, moved, and sized through use of the mouse. Graphics software supporting the Graphics Kernel System (GKS) standard is also built in.

**Competition & Pricing** The VAXstation I is targeted primarily at existing VAX customers. Similar capabilities, without VAX compatibility, can be obtained through use of the IBM Personal Computer AT with professional graphics adapter and monitor or from 32-bit graphics workstations.

Pricing for the system begins at \$21,095.

**Docutel/Olivetti Corp**

5615 Highpoint Dr  
Irving TX 75062  
PO Box 660203  
Dallas TX 75266-0203

(214) 258-5400

**M24**

**Overview** The Docutel/Olivetti Corporation, a major international supplier of data and WP equipment, markets the M24 desktop computer, which supports a monochrome display with high-resolution graphics, and a 10MB external disk option.

**System Design** The M24 is based on a 16-bit Intel 8086 processor and can support an Intel 8087 math coprocessor. The M24 includes a 16KB ROM with power-on diagnostics and BIOS. The system is configured with 256KB of RAM.

The M24 supports 1 or 2 360KB diskettes and a 10MB half-height Winchester disk option.

The M24 is available with an 83-key industry-standard keyboard with separate cursor controls and an extended numeric keypad.

The M24 monitor displays 80 columns by 25 lines with a graphics resolution of 640 by 400 pixels.

Standard communications features include a communications adapter chip, an asynchronous RS-232C serial port, and a Centronics-compatible parallel printer port.

M24 runs under Microsoft MS-DOS.

**Competition & Pricing** The M24 competes with the IBM Personal Computer.

The vendor declines to provide price data.

**Eagle Computer**

7100 Chapman Dr  
Garden Grove CA 92641

(714) 891-2665

**Eagle PC Plus**

**Overview** The Eagle PC Plus is a 16-bit desktop microcomputer that supports up to 640KB of main memory. Dual diskette drives with 360KB of storage are standard.

Both monochrome and medium-resolution color graphics are offered with the Eagle PC Plus. A detachable keyboard is standard.

Software for the system includes industry-standard operating systems and programming languages. Eagle PC Plus is compatible with most hardware and software available for the IBM Personal Computer.

Eagle Computer provides a 90-day limited warranty for labor and one year for parts for the Eagle PC Plus. Maintenance service is available either directly from Eagle Computer or on a third-party basis from Bell and Howell.

**System Design** Based on the 16-bit Intel 8088 microprocessor, the Eagle PC Plus features 256KB of RAM expandable to 512KB on the main CPU board. The 4 IBM Personal Computer-compatible expansion slots allow users to add peripheral devices. Dual diskette drives with 360KB of storage each are standard.

A 12-inch-diagonal CRT monitor with a 2,000-character capacity has both monochrome and medium-resolution color graphics. Medium-resolution color graphics consist of an 8-by-8-dot cell with 5-by-7-dot characters and 320 by 200 pixels at one color. The detachable Eagle PC Plus keyboard has 84 keys.

Software includes the Microsoft MS-DOS operating systems and GWBASIC programming language.

Eagle PC Plus can be linked with other Eagle PCs in the EagleNet local area network containing up to 64 systems.

**Competition & Pricing** Competition for the Eagle PC Plus includes the IBM Personal Computer, NEC Advanced Personal Computer, and Wang Professional Computer.

Model	Storage	Price \$
PC ± 2	256KB RAM & 2 diskettes	1,995
PC + XL	256KB RAM & 10MB disk	3,195



**Eagle Computer**

7100 Chapman Dr  
Garden Grove CA 92641

(714) 891-2665

**Eagle Turbo XL**

**Overview** Introduced in April 1984, the Eagle Turbo XL is the first system of the Eagle Turbo PC Series to be announced. Like previous Eagle Computer systems, the Turbo XL is compatible with the IBM Personal Computer.

The Eagle Turbo XL supports a maximum of 512KB of main memory, 360KB of diskette storage, and a 10MB Winchester disk drive.

Eagle Turbo XL is compatible with most software written for the IBM Personal Computer and Personal Computer XT.

Eagle Computer provides a limited warranty for the Eagle Turbo XL: 90 days for labor and 1 year for parts. Maintenance and support for the system are provided by Eagle Computer authorized dealers and distributors.

**System Design** The Eagle Turbo XL is based on a 16-bit Intel 8086 microprocessor. The processing speed of the system is switch selectable from 4.77MHz to 8MHz. The system includes 256KB of main memory expandable to 512KB, an IBM-compatible parallel port, a disk controller, a diskette controller, and an 84-key keyboard.

Each system includes a 5-1/4-inch diskette drive with 360KB of storage and a 10MB Winchester disk drive. The detached IBM Selectric-style keyboard includes 10 function keys and numeric keypad.

Options for the system include a 12-inch-diagonal monochrome screen with an 80-character-by-25-line display and a 13-inch-diagonal RGB color monitor with a resolution of 640 by 200 pixels.

The Turbo XL is designed to use the Eagle Computer EagleNet I local area network. EagleNet I can link computers and peripheral devices.

The Microsoft MS-DOS operating system and BASICA language are included with the Turbo XL system. BASICA allows the Turbo XL to run most off-the-shelf IBM BASICA programs and most software applications that make standard hardware calls.

**Competition & Pricing** Competing with the Turbo XL is the IBM Personal Computer XT, Columbia MPC, and Sperry Personal Computer.

The Turbo XL is priced at \$3,495. The Turbo GT with 512KB RAM and a 32MB Winchester disk costs \$5,495.

**Epson America**

2780 Lomita Blvd  
Torrance CA 90505

(213) 539-9140

**QX-10**

**Overview** The Epson QX-10 is a Zilog Z80A-based microcomputer designed for commercial and personal computing applications. Featuring 256KB of RAM, a separate display processor, and DMA controller, the QX-10 can be configured with dual 5-1/4-inch diskette drives, a CRT, and ASCII-style keyboard.

A proprietary operating system, VALDOCS, is standard; the QX-10 is also compatible with the Digital Research CP/M operating system.

Epson America provides maintenance for the QX-10.

**System Design** The QX-10 is based on the 8-bit Zilog Z80A microprocessor with 256KB of RAM. A 2KB RAM battery backup is also provided. The QX-10 can be configured with dual 5-1/4-inch diskette drives, each with 340KB of storage. A 10MB fixed disk is optional.

The standard, integral, 12-inch-diagonal CRT display features 2,000-character capacity and a separate display processor with 32KB or 128KB of dedicated video memory. A detachable Human Applications Standard Computer Interface (HASCI) keyboard with 4 blocks of functional control keys prompts the user to perform certain functions. HELP, STOP, and UNDO keys can be used at any time. A separate 10-key numeric pad functions as a calculator. Additional features include a built-in calendar/clock with battery backup and a light pen interface. An RS-232C serial interface supports synchronous and asynchronous communications, and a parallel interface accommodates an add-on printer.

Software support consists of Epson's proprietary VALDOCS operating system, which supports full-function WP, business graphics, information indexing, electronic mail, event timing, appointment and schedule keeping, and arithmetic calculations. CP/M 2.2 compatibility enables the QX-10 to run CP/M-developed programs. An optional add-on board enables the QX-10 to run MicroSoft Corporation MS-DOS.

**Competition & Pricing** Competition for the Epson QX-10 includes the Intertec CompuStar Model 20, NEC Advanced Personal Computer, Molecular Computer Supermicro 8, and Zenith Z-100.

The QX-10 costs \$2,495.

**Ericsson Information Systems**

Greenwich Office Park  
PO Box 2522  
Greenwich CT 06836

(203) 661-1666

**Ericsson PC**

**Overview** Ericsson Information Systems a division of Ericsson Inc, which is a joint venture between the Atlantic-Richfield Company and Swedish communications giant LM Ericsson, announced the availability of the Ericsson PC in November of 1984. This IBM-compatible desktop system features a number of ergonomic design features to improve ease of use. For example, to reduce cable clutter, the display screen connector and power cord are combined in 1 cable. The display features a stand that enables users to control height and angle of viewing. A specially designed high-resolution amber text character set reduces operator fatigue. The system unit can be positioned vertically on an optional stand to reduce the system's footprint.

**System Design** The Ericsson PC is based on the 8-/16-bit Intel 8088 processor used in the IBM Personal Computer. There is a socket for the Intel 8087 mathematics coprocessor. The system includes 8KB of ROM and 256KB of RAM, expandable to 640KB. Disk storage includes 1 or 2 5-1/4-inch, double-sided, double density diskette drives and an optional 10MB Winchester disk.

A 12-inch amber monochrome display with 640-by-400-pixel graphics and a 9-by-16-character matrix is standard. An optional 12-inch RGB color monitor features 640-by-200-pixel graphics and an 8-by-8-character matrix. The 84-key keyboard follows the IBM layout but has larger keys and indicator lights for numeric and caps lock keys. In addition to 1 serial and 1 parallel port, the system has 6 IBM-compatible expansion slots.

The Microsoft MS-DOS 2.11 operating system with GWBASIC are included with the system. The Digital Research Concurrent CP/M-86 is optional.

**Competition & Pricing** The Ericsson PC competes with the IBM Personal Computer, Personal Computer XT, and compatible systems.

Pricing for the Ericsson PC ranges from \$3,295 to \$5,695.

**Franklin Computer Corp**

1070 Busch Memorial Hwy  
Pennsauken NJ 08110

(609) 488-0600

**Ace 1000**

**Overview** The Franklin Ace 1000 is an Apple-compatible desktop microcomputer featuring 64KB of main memory and a typewriter-style keyboard with a numeric keypad and VisiCalc keys.

The Ace 1000 is completely compatible with all programs written for the Apple II and can be configured with any Apple-II-type peripheral.

Maintenance is available through authorized Franklin Computer dealers.

**System Design** The Franklin Ace 1000 is designed around the Synertek 6502 microprocessor, with 64KB of dynamic RAM and a 350 nanosecond access time.

The solid-state keyboard features 72 keys, a 12-key numeric keypad, and VisiCalc function keys. The Ace 1000 generates a full character set to an optional video display. A single-sided 5-1/4-inch diskette drive with 143KB of storage is available as an option. This diskette drive can be used in conjunction with any Apple II or Franklin disk controller.

The Ace 1000 can also be equipped to run on the Digital Research CP/M operating system via an optional plug-in card assembly. All programs written for the Apple II will run on the Franklin Ace 1000 without modification, including those programs using high- and low-resolution monochrome graphics.

**Competition & Pricing** Competition for the Franklin Ace 1000 includes the Apple II, Radio Shack TRS-80 Model II, and Atari 800 personal computer systems.

Model	Price \$
Ace 1000	450





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**Fujitsu Systems of America**

9841 Airport Blvd  
Los Angeles CA 90045

(213) 642-4706

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**16s**


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**Overview** The Fujitsu 16s is a multiprocessor desktop microcomputer designed for standalone applications. The 16s can also be used in a multitasking, multiuser environment. A maximum of 1MB of main memory is supported on the 16s, which also supports 640KB of diskette storage and up to 40MB of Winchester disk storage.

Several industry-standard 8- and 16-bit operating systems are available for the 16s. Because the system runs industry-standard operating systems, various application packages are also available for the 16s.

Maintenance and support for the 16s are provided by the TRW Customer Service Division from 200 locations throughout the U.S.

**System Design** The Fujitsu 16s features a dual-processor architecture based on the 16-bit Intel 8086 and 8-bit Zilog Z80A microprocessors. The 16s is initially configured with 128KB of main memory, which can be expanded to 1MB. The system also supports 52KB of video RAM.

Fujitsu 16s is configured with two 5-1/4-inch, 320KB diskette drives, a 221-character CRT, a detached keyboard, and several interfaces, including RS-232C, Centronics-compatible, color CRT, monochrome CRT, and light pen interfaces.

The CRT features an 8-by-8-dot matrix character generation with a display mode of 80 characters by 25 lines and can display up to 8 colors. A 640-by-200-pixel resolution for graphics display is supported by the system.

Peripheral devices available for the 16s include an 8-inch 1MB diskette drive, a monochrome or color CRT, an 80-cps dot matrix letter-quality printer, and a 10MB or 20MB Winchester disk drive. The 16s supports a maximum of 40MB of Winchester disk storage.

The Digital Research CP/M-86 operating system is the standard systems software for the 16s. Optional operating systems include the Digital Research Concurrent CP/M and Microsoft MS-DOS. Applications software for the system includes the Sorcim SuperCalc<sup>2</sup>, MicroPro WordStar, and GSX graphics from Digital Research.

**Competition & Pricing** Competition for the 16s includes the IBM Personal Computer, Eagle PC, Columbia MPC, and Xerox 16/8.

The 16s is priced at \$2,350.

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**Hewlett-Packard**

Telemarketing Dept  
1100 Wolf Rd  
Cupertino CA 95014

(800) 367-4772

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**HP 9800 Series 200**


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**Overview** The Hewlett-Packard HP 9800 Series of standalone technical computers is designed primarily for scientific and engineering applications, including statistical analysis and mathematical modeling, as well as for business management applications in computer-aided testing, engineering, and manufacturing. The 9800 Series systems are available as 6 models: the 216, 217, 220, 226, 236, and 237. Each model can be ordered with or without bundled software.

Memory for the 9800 Series varies with each model, ranging from 128KB to 2MB of RAM. Lower-end systems use tape cartridges for mass storage, while mid-range systems use diskettes and top-of-the-line systems use Winchester disks.

The 9800 Series features a ROM-based operating system that supports various high-level programming languages and applications programs.

Hewlett-Packard provides service and maintenance for the 9800 Series through a number of maintenance programs.

**System Design** The HP 9800 Series features the Motorola MC 68000 processor with a 32-bit internal and 16-bit external data path. Models 216 and 217 use an 8MHz version; Models 220, 226, 236, and 237 use a 12.5MHz version.

The 6 models consist of several configurations that provide various displays, expansion slots, interfaces, operating systems, languages, and capabilities.

Software for the systems includes the ROM-based operating system; HPL, BASIC, Assembly, Pascal, and FORTH programming languages; and such applications packages as Software Arts VisiCalc.

**Competition & Pricing** Major competition for the 9800 Series comes from the Data General micro-ECLIPSE S/20 and S/120 computers.

Prices range from \$3,985 to \$23,000.



**Hewlett-Packard**

Telemarketing Dept  
1100 Wolf Rd  
Cupertino CA 95014

(800) 367-4772

**HP Series 80**

**Overview** The Hewlett-Packard HP Series 80 systems are designed for engineers, scientists, and business executives who require powerful computational capabilities but prefer not to time-share a large computer. Hewlett-Packard markets the Series 80 through its own direct sales force, distributors, and such retail stores as Computerland.

HP Series 80 systems feature from 32KB to 640KB of RAM and up to 80KB of ROM. Storage capacities range from a 210KB magnetic tape cartridge to 270KB of diskette storage and a 5MB or 10MB 5-1/4-inch Winchester disk drive. The BASIC operating system and language is permanently stored in a 32KB ROM.

Maintenance agreements providing regular on-site service for Series 80 models and peripherals are offered through Hewlett-Packard service centers, computer stores, and authorized dealer repair centers.

**System Design** HP Series 80 systems are based on an 8-bit proprietary microprocessor that features decimal arithmetic, 11 interrupt levels, and 146 standard instructions. Series 80 systems are available as the HP 85, 86, 87, and 87XM.

The HP 85B features 32KB of main memory, a CRT, a keyboard, 4 I/O ports, an integral thermal printer, a 210KB magnetic tape cartridge, the BASIC language and operating system, and a graphics system. The HP 86B has a menu of HP 85B features but with 128KB of memory, a 9-inch-diagonal CRT, a dot matrix printer, and 270KB of diskette storage. The systems' capacities can be expanded by adding a 3-1/2- or 5-1/4-inch diskette drive or a 5MB or 10MB Winchester disk.

Software available for the systems includes the BASIC 80 language interpreter and operating system, Digital Research CP/M operating system, BASIC programming language, and various applications programs, such as general statistics and waveform analysis. Applications software is also available from independent software companies.

**Competition & Pricing** Series 80 systems compete with the NEC PC-8000, and North Star Advantage and Horizon systems.

Prices for the HP Series 80 range from \$1,890 to \$3,265.

**Hewlett-Packard**

Telemarketing Dept  
1100 Wolf Rd  
Cupertino CA 95014

(800) 364-4772

**Touchscreen Personal Computer**

**Overview** The Touchscreen Personal Computer, also known as the HP 150, is a 16-bit desktop microcomputer that occupies only 2.1 square feet of space. The system features 256KB of RAM, 160KB of ROM, and a 6KB screen-refresh RAM. The basic system has no disk storage but can be upgraded to one of three models with disk storage.

The Touchscreen Personal Computer is equipped with a touch-sensitive display, detachable keyboard, RS-232C serial ports, and an HP-IB port.

Software support consists of the Microsoft MS-DOS 2.0 operating system, Hewlett-Packard proprietary Personal Applications Manager (PAM), and Hewlett-Packard HP Touch facility.

Hewlett-Packard offers various maintenance plans, including field repair center service, on-site maintenance, dealer repair, or user maintenance.

**System Design** The Touchscreen Personal Computer is based on the 16-bit Intel 8088 microprocessor with 256KB of RAM, 160KB of ROM, and 6KB of RAM screen-refresh memory. The system can be used as a terminal and upgraded to a personal computer by adding two 3-1/2-inch diskette drives with 1.4MB of total storage, a 5MB fixed disk with 1 diskette, or a 14.7MB disk and 1 diskette drive.

The system includes a 9-inch-diagonal CRT with a 1,920-character capacity. Graphics resolution is 512 by 390 pixels. The Hewlett-Packard HP Touch (a software display facility) allows the user to touch the display screen soft key labels; the system reacts as if the user had typed that key. HP Touch uses light beams to trace the user's finger and can be disabled with a keystroke or host command.

The 107-key detachable keyboard has 12 soft keys and an 18-key numeric pad.

An RS-232C and an RS-232/RS-422 serial ports are standard and support data communications at speeds up to 19.2K bps. An HP-IB (IEEE-488) port is also provided.

The Touchscreen Personal Computer uses MS-DOS 2.0 as the standard operating system. Many third-party software packages have been developed for MS-DOS. Hewlett-Packard has enhanced MS-DOS so that the soft keys, HP Touch, and graphics display can be accessed through the operating system. In addition, PAM provides 4 disk facilities and utilities to simplify system operations.

**Competition & Pricing** Competition includes the Apple III, Eagle PC, IBM Personal Computer, and NEC Advanced Personal Computer.

The Touchscreen Personal Computer is priced at \$3,495.



**Honeywell Information Systems**

200 Smith St  
MS 486  
Waltham MA 02154

(617) 893-3658

**microSystem 6/10**

**Overview** The microSystem 6/10, introduced in April 1983, is marketed primarily for use in distributed DP and office automation environments. It has been enhanced to fully support the Honeywell DPS 6 operating system and application software. It is fully compatible with the multiuser DPS 6 minicomputer system.

The microSystem 6/10 is customer installable and maintainable through Honeywell's Customer Assisted Maintenance Program. Worldwide on-site maintenance and support is available through Honeywell's Customer Services Division.

**System Design** The microSystem 6/10 is based on the Honeywell 16-bit Micro 6 microprocessor, which is fully compatible with the DPS 6 instruction set. A separate processor controls I/O operations.

The microSystem 6/10 is available in 2 desktop models and 1 floor model. Each supports 1MB of RAM. The desktop models includes 640KB of RAM and two 640KB diskette drives or 640KB of RAM, 1 diskette drive, and a 15MB Winchester-type disk drive. The floor model has a 640KB RAM and 28MB disk drive.

Standard on each model are the 12-inch-diagonal monitor with 720-by-300 pixel resolution; a detachable keyboard; an RS-232C printer port; and an RS232C/RS422 asynchronous auxiliary port. Options include a synchronous communications controller; an Intel 8086 coprocessor with Microsoft's MS-DOS and GWBASIC software; bit-mapped graphics; a color monitor; dot-matrix, letter-quality, and graphics printers; a second 28MB disk drive; and a 64MB streamer tape unit.

The microSystem 6/10 uses Honeywell's multitasking GCOS 6 MOD 400 operating system, which includes COBOL, C, FORTRAN, BASIC, and Pascal compilers; a file management system that supports sequential and hierarchical databases; transaction processing; terminal emulation plus networking and communications capabilities that support Honeywell's Distributed Systems Architecture (DSA), IBM's SNA and BSC, and asynchronous communications.

**Competition & Pricing** The microSystem 6/10 competes with the IBM Personal Computer XT/370 and AT/370, the Data General Desktop Generation Model 10, and Digital Equipment Professional 300 Series.

Model	Price \$
microSystem 6/10 w/2 diskettes	3,995
microSystem 6/10 w/diskette/disk	6,995
microSystem 6/10 w/floor model	9,995

**Honeywell Information Systems**

200 Smith St  
MS 486  
Waltham MA 02154

(617) 893-3658

**microSystem NX**

**Overview** The microSystem NX is a multitasking single-user workstation running a version of the AT&T UNIX System III operating system. It is targeted primarily at engineering administration and support environments, application development professionals, and organizations that have selected UNIX as the standard operating system for applications processing.

**System Design** Based on the 32-bit Motorola MC68000 processor, the system includes 64KB of display memory, 512KB RAM, a 5-1/4-inch 655KB diskette drive, and a 5-1/4-inch 12MB or 18MB Winchester disk. The 15-inch bit-mapped monochrome (white or amber) display features graphics resolution of 720 by 560 pixels. The monitor includes a tilt-and-swivel pedestal. The separate keyboard has a 5-foot cable. A 3-button optical mouse is optional.

Two RS-232C asynchronous communications ports and an OMNINET local area network connector are standard. A clock and calendar unit with battery backup is also included.

The operating system for the microSystem NX is the UNIX System III with Berkeley 4.1 enhancements. Included with each system is the UniSoft UniPlus+ Runtime software package and window manager software to support multitasking in up to 6 windows. Font selection software is also provided. An application development software package provides a programming environment with a font editor for creating and modifying text fonts. Applications software includes Quadratron Systems Q-ONE (word processing) and Q-MENU (menu utility), Microsoft Multiplan (spreadsheet), and DDD Graphics.

**Competition & Pricing** The microSystem NX competes with the AT&T 3B2/300, the Callan Data Systems Unistar 100, and the Plexus P/35 and P/60.

Pricing for the system begins at \$8,895 for a system with a 12MB Winchester disk.



**IBM Corp**1133 West Chester Ave  
White Plains NY 10604

(914) 696-1900

**3270 Personal Computer**

**Overview** IBM expanded its personal computer offerings in October 1983 with the introduction of the IBM 3270 Personal Computer (3270-PC), a 16-bit system that combines the host-interactive functions of the IBM 3270 Information Display System and capabilities of the IBM Personal Computer. The 3270-PC is available with up to 640KB of main memory, 640KB of diskette storage, and 10MB of fixed disk storage.

The 3270-PC/G and PC/GX, introduced in June 1984, are graphics workstations featuring extended graphics support.

IBM provides maintenance and support for the 3270-PC. IBM warrants the 3270-PC for 3 months, and a 12-month maintenance agreement is available. Service programs available from IBM include customer carry-in repair and IBM on-site exchange.

**System Design** The 3270-PC is based on the 16-bit Intel 8088 single-chip microprocessor with HMOS technology. The system includes from 256KB to 640KB of main memory, a monochrome or color display, the 5271 122-key keyboard, 320KB or 640KB of diskette storage, and a 10MB fixed disk. The 3270-PC is an extension of the 3270 Information Display System and provides 3270 data stream compatibility with 3270 displays.

The 3270-PC/G features an 8-color graphics display. The 3270-PC/GX features a Motorola MC 6800-based graphics processor and a 16-color monitor displaying 1,024 by 1,024 pixels. The graphics models also support a large-screen plasma monitor.

The 3270-PC attaches to System/370 processors and processor complexes and 30xx processors through a 3274 device, and to the 4321, 4331, or 4361 systems through a display/printer adapter or a 3274 device.

The 3270-PC control program provides screen management functions that allow the user to select screen configurations, manipulate and interact with display information, and manage screen presentations. PC-DOS provides the interface between programs and hardware. PC-DOS supports BASIC, COBOL, and FORTRAN programming languages.

Data communications includes SNA, SDLC, and BSC.

Application programs running under PC DOS on the IBM Personal Computer are supported by the 3270-PC.

**Competition & Pricing** Competition includes the Digital Equipment Professional Computer 300 Series, and Wang Laboratories Professional Computer.

Pricing ranges from \$3,745 for the base 3270-PC to \$16,785 for the 3270-PC/GX.

**IBM Corp**1133 West Chester Ave  
White Plains NY 10604

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**5531 Industrial Computer**

**Overview** Announced in April 1984, the 5531 Industrial Computer is an industrialized version of the Personal Computer XT. It is of primary interest to manufacturers who need a personal computer that can operate in an environment with temperature extremes, vibrations, voltage surges, dust, and humidity. It is marketed through IBM branch offices and IBM marketing representatives. The system is warranted for 3 months for customer carry-in repair. The 3-month warranty option provides on-site repair. The 12-month maintenance agreement provides on-site and customer carry-in repair.

**System Design** The 5531 Industrial Computer is based on the 16-bit Intel 8088 microprocessor that runs at 4.77MHz. An Intel 8087 math coprocessor is optional. The system is available in 2 models, and each has 40KB of ROM; a 5.25-inch, 360KB double-sided diskette drive; and a 10MB fixed disk drive. Model 1 has a 128KB RAM, and Model 21 has a 256KB RAM. Each can be expanded to 640KB RAM.

The system unit features 8 expansion slots for the support of the diskette and disk drive adapters and optional 5532 Industrial Color Display or other video monitor. The 5531 Industrial Computer can also support the XT/370 Option Kit for communication with an IBM mainframe.

The 5532 Industrial Color Display features a 13-inch-diagonal screen, 25-line-by-40/80 character display format, a resolution of 640 by 200 pixels, and 16 colors. The 83-key keyboard is a ruggedized version of the standard Personal Computer keyboard.

The 5531 Industrial Computer operates under IBM PC-DOS and Personal Computer Interactive Executive (PC/IX), a single-user multitasking system based on AT&T Information System's UNIX. The system supports programming in BASIC, APL, COBOL, FORTRAN, Pascal, and the macroassembler.

The 5531 Industrial Computer can communicate asynchronously and synchronously with mainframes and other personal computers and emulates IBM 3270, 3770, 3101, SNA, BSC, and SDLC protocols.

**Competition & Pricing** The 5531 Industrial Computer competes with the ISI International 6160 and other industrialized personal computers.

Model 1 is priced at \$5,945, and Model 21, at \$6,065.

**IBM Corp**1133 West Chester Ave  
White Plains NY 10604

(914) 696-1900

**PCjr**

**Overview** In November 1983, IBM introduced the PCjr, the company's first computer for the home. In March 1985, IBM halted production of the PCjr but continues to market and support the system. The IBM PCjr is a small, low-cost system that is compatible with other members of the IBM Personal Computer family. The PCjr is available in two models: Model 4 and Model 67. Maximum main memory is 128KB.

PCjr runs under the PC DOS 2.1 operating system, which provides an interface for programs written for the BASIC interpreter or any high-level language supported by DOS on IBM Personal Computer systems.

IBM warrants the PCjr for 12 months; customer carry-in exchange service is provided during the warranty period. Warranty extensions for the PCjr are also available. Maintenance services offered by IBM include IBM on-site exchange, customer on-site exchange, customer carry-in exchange, and customer carry-in repair.

**System Design** PCjr is based on the 16-bit Intel 8088 microprocessor. A PCjr base system features 3 units: the system unit, a cordless keyboard, and a small transformer. Both models include 64KB of ROM. Model 4 includes 64KB of memory, 2 cartridge slots, and the transformer. Model 67 features 128KB of memory, 2 cartridge slots, a 360KB diskette drive, the transformer, and a 64KB memory and display expansion feature. This memory and display expansion feature provides an additional 64KB of memory as well as 80-column text display support. Memory can be expanded from 128KB to 512KB with one to three 128KB memory expansion attachments.

The improved cordless keyboard is battery powered and interfaces with the system unit through an infrared optical link. Mounted in the keyboard are two infrared-emitting diodes that transmit coded information to the system unit. The receiver card has an infrared sensing device that receives the signal transmitted from the keyboard. An optional keyboard cord connected to the system unit powers the keyboard and sends data to the system unit.

PCjr includes an internal modem that is compatible with the AT&T 103 Series. The modem provides an asynchronous communications function, error detection and diagnostics, and a maximum data rate of 300 bps.

Software for the PCjr includes the PC-DOS 2.1 operating system, the BASIC interpreter, and various application cartridges for both home and educational use.

**Competition & Pricing** PCjr competes with the Apple IIc and IIe.

Model	Price \$
4	599
67	999

**IBM Corp**1133 West Chester Ave  
White Plains NY 10604

(914) 696-1900

**Personal Computer**

**Overview** IBM designed the Personal Computer to accommodate a broad spectrum of needs. Software and peripheral offerings have been added to the Personal Computer since its introduction in August 1981, further broadening its appeal. It is currently the largest selling personal computer in the market.

The Personal Computer is marketed through retailers, including IBM-operated stores and such third-party retailers as Computerland and Sears.

Maintenance and support for the IBM Personal Computer are provided by IBM's nationwide service network. IBM provides various warranty programs and dealer service options for its personal computers. Service plans are available from the IBM Service/Exchange Center.

**System Design** The IBM Personal Computer is based on the 16-bit Intel 8088 single-chip microprocessor with HMOS technology, and is equipped with 40KB of ROM. RAM capacity ranges from 64KB to 640KB. The system will support two 360KB double-sided, double-density diskette drives.

Four operating systems are supported, including PC DOS, the UCSD p-System, Digital Research CP/M-86, and IBM Personal Computer Interactive Executive (PC/IX). Compilers for COBOL, FORTRAN, APL, Pascal, and Microsoft BASIC are available as well as a macroassembler. The Top View package provides a windowing environment for the Personal Computer.

Software includes the Personal Decision Series, Business Management Series, Displaywrite WP, and hundreds of packages from independent software vendors.

The Personal Computer offers data communications capabilities, such as SNA 3270 Emulation and RJE Support, IBM 3101 and 3278/3279 Emulation, TTY, and SDLC.

**Competition & Pricing** The IBM Personal Computer competes with the Digital Equipment Rainbow 100, Wang Laboratories Professional Computer, and dozens of compatible and nearly compatible systems.

Prices for the IBM Personal Computer range from \$1,390 to \$2,295.



**IBM Corp**1133 West Chester Ave  
White Plains NY 10604

(914) 696-1900

**Personal Computer XT**

**Overview** IBM's second entry into the microcomputer market was the Personal Computer XT introduced in March 1983. IBM is marketing the XT through its product centers, authorized Personal Computer retail dealers, the IBM National Accounts Division, and the National Marketing Division.

XT computers support up to 640KB of RAM, 720KB of diskette storage, and 10MB of fixed disk storage.

With the introduction of the XT, IBM also released DOS 2.0, an enhanced version of its disk operating system that supports a BASIC interpreter or any programming language supported by DOS Version 1.1 on the Personal Computer.

**System Design** A 16-bit Intel 8088 microprocessor implementing HMOS technology is the CPU for the XT. The Intel 8087 math coprocessor is optional.

The basic XT system is configured with 128KB of RAM, 360KB of diskette storage, a 10MB fixed disk drive, and an asynchronous communications adapter. The system also features an 83-key detachable keyboard and 8 system expansion slots. A monochrome or color monitor is available.

The XT supports the PC DOS operating system.

The Top View package provides a windowing environment for the XT. Applications software includes the Personal Decision Series, which includes data base, WP, graphics, report writing, and host connection programs, and the Business Management Series, which includes accounting and training packages.

**Competition & Pricing** Competition for the XT includes the TeleVideo Tele-XT PLUS, Sperry Personal Computer, and Columbia MPC.

The base price for the XT is \$3,775.

**IBM Corp**1133 West Chester Ave  
White Plains NY 10604

(914) 696-1900

**Personal Computer XT/370**

**Overview** The IBM Personal Computer XT/370, introduced in October 1983, is a desktop System/370 workstation that can run most CMS programs as well as Personal Computer programs. The Personal Computer XT/370 works directly with a host system running VM/CMS and allows the exchange of programs and data between the host and workstation. IBM has added 3 cards to the standard IBM Personal Computer XT with 256KB of memory to make the Personal Computer XT/370.

Personal Computer XT/370 systems support 768KB of main memory and up to 20MB of disk storage. The system runs under the Virtual Machine/Personal Computer (VM/PC) operating system.

IBM warrants the Personal Computer XT/370 for 3 months. Maintenance is offered by IBM and is available under the terms and conditions of the IBM Personal Computer Service Agreement and the IBM On-Site Amendment to that agreement.

**System Design** Personal Computer XT/370 systems are based on the 16-bit Intel 8088 microprocessor and configured with a System/370 memory card with 512KB, System/370 processor card, and 3278/79 emulation adapter. The Personal Computer XT/370 includes 256KB of RAM; a 360KB double-sided, double-density diskette drive; 10MB of fixed disk storage; 8 system expansion slots; and a BASIC language interpreter in ROM. The IBM Personal Computer Expansion Unit Model 3 provides a 10MB fixed disk and fixed disk adapter.

The VM/PC operating system is based on VM/SP Release 2. VM/PC permits interaction with the host as a nonintelligent terminal or an intelligent CMS workstation with access to host CMS files. The Personal Computer XT/370 runs under the IBM PC DOS operating system as well as VM/PC. Under PC DOS, the Personal Computer XT/370 can be programmed in BASIC and run a variety of applications software written for the IBM Personal Computer XT.

**Competition & Pricing** Competition includes the Digital Equipment Professional Computer 300 Series, Olivetti M20, and Data General DESKTOP GENERATION Series. The Personal Computer XT/370 is priced at \$7,895.

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**IBM Corp**

Information Systems Group  
1133 Westchester Ave  
White Plains NY 10604

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**System 9000**

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**Overview** IBM has renamed its Instruments Computer System 9000, adding a new model to the line in the process. The renamed System 9000 currently includes two models: the 9001 Bench-Top Computer (formerly the IBM Instruments Computer System 9000) and the new 9002 Desk-Top Computer. Occupying 288 square inches, the 9002 is suited to professional environments in which space is at a premium. It differs from the 9001 in size, keyboard, and printer attachment.

The system is warranted for 3 months; an optional 9-month warranty is also available. Service is provided under an IBM Instruments Maintenance Service Agreement or on a per-incident basis. A malfunctioning unit must be returned, prepaid, to IBM Instruments Customer Support Center in Danbury CT.

**System Design** The basic configuration of the 9002 Desk-Top Computer includes the Motorola 68000 8MHz processor with a hybrid keyboard, expansion feature, and general-purpose keypad overlay. The hybrid keyboard comprises an alphanumeric keyboard and pressure-sensitive keypad in 1 unit. The expansion feature provides 5 slots for additional cards. The system does not have an integral printer, as does the 9001, but will support the IBM Personal Computer Color Printer 5182 Model 1 or other user-provided system printers. The system display can be added with or without a diskette drive. The user can add, as options, a 1MB memory expansion card, a cabinet with 1 or 2 5-1/4- or 8-inch diskette drives, a hard disk controller, a cabinet with 1 or 2 10MB Winchester disks, an analog sensor board, and a printer cable.

**Competition & Pricing** The System 9000 competes with other computers designed to operate in a laboratory environment. These include the Hewlett-Packard 9800 Series and the Perkin-Elmer Model 7500.

The 9002 Desk-Top Computer with expansion feature and hybrid keyboard costs \$6,495. The Model 5182 Color Printer is available for \$1,995. The system display costs \$750.

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**ICL Computers**

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Putney Bridge  
Fulham London SW6 3JX  
England 01-788 7272

777 Long Ridge Rd  
Stamford CT 06902  
(203) 968-7200

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**ICL Personal Computer**

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**Overview** The ICL Personal Computer is a 16-bit microcomputer designed for small business and professional use. The system can also be used as the central component of a multiuser system.

The ICL Personal Computer is an expandable system that is available in 6 basic models: Models 6, 15, 16, 25, 26, 35, and 36. The Model 35 forms the basis of a flexible system that supports up to 8 peripherals, including visual display units and printers. Model 36 supports up to 4 users.

The Digital Research CP/M operating system is supported on Models 15 and 25, while Concurrent CP/M is supported on Models 6, 16, 26, 35, and 36. BASIC is supported on all ICL Personal Computers. WP, business, and professional applications software packages are available.

ICL provides maintenance and support through its worldwide network of distributors. Additional services provided by ICL include training programs conducted onsite or at ICL training centers. Advanced training is provided by ICL resident training courses.

**System Design** The ICL Personal Computer is based on either an Intel 8088 or 8085AH2 microprocessor, depending on the model. The microprocessors feature 4-level interrupts and 4-channel DMA.

Main memory for Models 15 and 25 is 64KB and 256KB for Models 6, 16, 26, 35, and 36. Maximum RAM capacity is 1MB, expandable in 256KB increments. Maximum diskette capacity for all models is 1MB of unformatted storage. Models 25 and 26 include a 5-1/4-inch 5MB Winchester disk drive. Models 35 and 36 use a 10MB formatted Winchester disk drive. Up to 2 additional 5MB Winchester disk drives can be added to all models.

All ICL Personal Computer models feature 4 RS-232C serial ports, which can be expanded to 8 ports. The asynchronous data transfer rate is 50 to 19,200 bps.

The ICL Personal Computer runs under either the CP/M or Concurrent CP/M operating system. Programming languages supported by the system include COBOL, FORTRAN, Pascal, and PL/1. Applications software includes the ICL HI-LINE comprehensive business software package, Ashton-Tate's dBASE II, and SuperCal2 from Sorcim.

**Competition & Pricing** Competition for the ICL Personal Computer includes the IBM Personal Computer, Wang Laboratories Professional Computer, and NEC APC III.

Prices for the ICL Personal Computer range from £1,995 to £5,125. This system is marketed only in Europe.



**ITT**

2041 Lundy Ave  
San Jose CA 95131

(408) 945-8950

**XTRA**

**Overview** ITT Information Systems extended its office automation and communications product line in May 1984 with the introduction of the XTRA personal computer. Designed for the business and professional section of the personal computer market, the ITT XTRA runs most 16-bit software programs and accommodates industry-standard hardware options. The ITT XTRA features an ergonomic design. A mouse-oriented interface is available.

ITT markets the XTRA through the Computerland nationwide network of franchised retail stores. Service and support for the ITT XTRA are provided by authorized retailers.

**System Design** The ITT XTRA is a 16-bit desktop microcomputer based on the Intel 8088 microprocessor and supports an Intel 8087 math coprocessor option.

The ITT XTRA is equipped with 256KB of RAM expandable to a maximum of 640KB. The standard 5-1/4-inch, double-sided diskette drive stores up to 360KB of data. Storage capacity can be increased with an additional diskette drive option or with a 10MB integral Winchester disk drive option.

The 14-inch-diagonal monochrome display screen is available in amber or green phosphor. Color graphics capabilities can be added through a 12-inch-diagonal RGB monitor. The detachable keyboard includes a typewriter-style layout with 10 programmable function keys and a numeric keypad.

The ITT XTRA comes standard with ITT DOS 2.11, which is MS-DOS-based and includes utilities written by ITT for systems setup and disk formatting. ITT DOS 2.11 is fully compatible with industry standards, thus providing a broad user base of applications software programs.

ITT Advanced BASIC programming language is also integrated as a standard feature. Optional software includes ITT VisuAll, which provides a user-friendly interface to ITT DOS 2.2 for using the optional 3-button mouse. Additional software includes ITT versions of WordStar, EasyWriter I, and Multiplan.

**Competition & Pricing** Competitive products include the IBM Personal Computer, Sperry Personal Computer, and Wang Professional Computer.

The ITT XTRA with 2 diskette drives is available for \$1,595. The system with 1 diskette and a 10MB fixed disk is available for \$2,595.

**Lanier Business Products**

1700 Chantilly Dr NE  
Atlanta GA 30324

(404) 329-8000

**Lanier Business Processor 1000**

**Overview** Lanier Business Products, a subsidiary of Harris Corporation, introduced the Lanier Business Processor 1000 in 1983. The Lanier Business Processor 1000 is a desktop system that can function as a personal computer, data communications terminal, network workstation, or standalone WP device. The Lanier Business Processor 1000 supports 256KB of main memory and is available in two models.

In addition to Lanier software, several industry-standard operating systems are supported by the Business Processor 1000.

Lanier warrants the system for 90 days. This warranty can be extended and includes on-site maintenance and periodic preventive maintenance. A 90-day support warranty provides Lanier owners with quarterly software update packages.

**System Design** The Lanier Business Processor 1000 is based on an 8-bit Zilog Z80B. A 16-bit Intel 8088 microprocessor is optional. The system can be configured with 192KB or 256KB of main memory.

Both models include a green-phosphor display with a format of 80 characters by 27 lines with a 7-by-9-dot matrix character generation. A detached keyboard includes a separate numeric keypad and 15 programmable function keys.

The Lanier Business Processor 1000 can be configured with a 5-1/4-inch diskette drive with 600KB of storage and 5-1/4-inch Winchester disk drive with a 10MB capacity. The system also supports 2 diskette drives with 294KB or 1.2MB of storage.

Several data communications capabilities are available, including IBM 3270 SNA 2780 SDLC, BSC, and 3780 communications; TTY ASCII; and Digital Equipment VT100.

Lanier TextSaver software allows files to be transferred from a Wang Laboratories VS system to a Lanier Business Processor 1000.

The Lanier Business Processor 1000 runs under the Lanier LEXS, Digital Research CP/M and Microsoft MS-DOS operating systems. Applications software available includes Lanier's ONE-STEP WP, EZ-SPELL, EZ-TASK, and Business BASIC and several packages from Peachtree Software.

**Competition & Pricing** Competition for the Lanier Business Processor 1000 includes the Vector Graphic 5E Series, Sord Computer of America M23 Series, and Xerox 16/8.

Prices for the Lanier Business Processor 1000 begin at \$2,995 for a system with 192KB of RAM and 1 diskette drive.

**Leading Edge Products Inc**225 Turnpike St  
Canton MA 02021

(800) 343-6833

**Personal Computer System**

**Overview** The Leading Edge Personal Computer, built by Mitsubishi, is an IBM PC-compatible model that has 128KB of memory, a monitor, and a keyboard. Software for the system includes Microsoft MS-DOS Version 1.25 and GW-BASIC as well as the Leading Edge Word Processing Program. The system can run a great variety of IBM PC software, including Lotus 1-2-3, Microsoft Multiplan, and Ashton-Tate dBASE II.

**System Design** The Personal Computer System incorporates an Intel 8088-2 microprocessor and an optional Intel 8087 to support 80-bit floating-point numbers. The main board on the entry-level system includes 128KB RAM, with up to a total of 640KB on the optional card. The system also includes 2 half-height 5-1/4-inch double-density, double-sided diskette drives with a 320KB capacity each, 7 IBM-compatible I/O slots, a parallel printer port, and a Centronics-compatible serial port. The system can also support a 10MB fixed disk.

The keyboard for the system includes 10 function, 16 keypad, and 57 typewriter keys. The monochrome monitor has a green phosphor screen and can display 80 columns by 25 lines and a resolution of 850 by 350 pixels. The color monitor has a resolution of 640 by 200 pixels and will display 16 colors simultaneously.

Software for the system includes MS-DOS Version 1.25, GWBASIC, and Leading Edge Word Processing Program. IBM PC DOS and PC software will run on the system.

**Competition & Pricing** The Leading Edge Personal Computer competes with the Sperry Personal Computer (also built by Mitsubishi), the IBM Personal Computer, and other systems compatible with the IBM Personal Computer.

Model	Price \$
Monochrome w/128KB, 2 diskettes	1,795
Monochrome w/256KB, 2 diskettes	1,995
Monochrome w/256KB, diskette/disk	2,995
Color w/256KB, 2 diskettes	2,495
Color w/256KB, diskette/disk	3,495

**MAD Computer Inc**2950 Zanker Rd  
San Jose CA 95134

(408) 943-1711

**MAD-1**

**Overview** MAD Computer Inc, which stands for Modular Advanced Design, markets a series of 7 modules that can be custom-configured into a variety of microcomputers, from a diskless workstation up to a multiuser, multitasking workstation with mass storage, networking, and communication capabilities. MAD markets the MAD-1 family of products exclusively to OEMs and value-added resellers.

**System Design** The Computing Module houses the CPU board, memory, video board, I/O interfaces, 1 expansion slot, and a clock and calander unit. The CPU is the 16-bit Intel 80186 microprocessor. Memory includes 16KB of ROM and 64KB to 512KB of RAM. I/O interfaces consist of an RS-232C serial port, an RS232/422 serial port, a Centronics-compatible parallel port, and keyboard and diskette drive interfaces. The video board supports monochrome, color, and graphics display.

The Floppy Disk Data Module includes two 5.25-inch, 360KB, double-sided, double-density diskette drive. The Hard Disk Module includes a 10MB fixed disk, and a 360KB diskette drive.

The Display Module features a 12-inch-diagonal screen with a 25-line-by-80-character display format. In monochrome mode, the display has a resolution of 720 by 350 pixels; in color mode, a resolution of 640 by 200 or 320 by 200 pixels. This module displays 16 foreground, 8 background, and 8 border colors. The graphics mode enables a high-resolution display of 640 by 200 pixels and 2 colors and a medium resolution display of 320 by 200 pixels and 4 colors.

The Keyboard Module features an 85-key keyboard including 10 function keys and a 14-key numeric pad.

The Expansion Module contains 4 expansion slots for additional communication interface network boards, an internal modem, a RAM disk, and other peripherals. The Power Supply Module is required on a diskless workstation.

Any configuration can communicate asynchronously and synchronously and can emulate SDLC and HDLC protocols.

The MAD-1 family supports MicroSoft MS-DOS, VenturCom VENIX, and IBM PC-DOS operating systems. It also supports the MicroSoft GWBASIC, IBM BASIC Compiler, IBM PC Pascal Compiler, IBM Macroassembler, Turbo Pascal, RM COBOL 1.5E, SuperSoft FORTRAN 1.07, and Lattice C Compiler 2.0Z languages.

**Competition & Pricing** The MAD-1 family competes with the IBM Personal Computer and Personal Computer XT, COMPAQ DESKPRO, Tandy 2000, and TeleVideo TS 803.

Standard pricing is unavailable.



**McDonnell Douglas Computer Systems**

4000 W MacArthur Blvd  
Newport Beach CA 92660

PO Box 19501  
Irvine CA 92713

(714) 250-1000

**MICRODATA 1000**

**Overview** Microdata, now known as McDonnell Douglas Computer Systems, introduced in January 1984 the MICRODATA 1000 line of intelligent workstations that provide users with microcomputing capabilities. MICRODATA 1000 can be used as a single workstation or linked with other MICRODATA 1000s to share disk storage, printers, and other peripheral devices.

MICRODATA 1000 is a 16-bit system that supports up to 1MB of main memory, 120MB of disk storage, and 1.3MB of diskette storage.

Software for MICRODATA 1000 includes WP, electronic spreadsheets, and business graphics.

Microdata provides maintenance and support for MICRODATA 1000. Maintenance contracts are also available from Microdata.

**System Design** MICRODATA 1000 features a modular housing that contains the CPU, main memory, diskette storage, and power supply. The CPU is based on a 16-bit Intel 80186 microprocessor operating at 8 MHz. CPU expansion is provided through an X-type bus that snaps onto the CPU housing. All MICRODATA 1000 configurations include 2 RS-232C serial ports, an RS-422 local area network connection, and a parallel printer interface.

The basic MICRODATA 1000 configuration includes a 12-inch-diagonal monochrome display, a detached keyboard, and up to 1MB of main memory. Options include 5-1/4-inch diskette drives with 630KB of storage; 10MB, 20MB, 40MB, and 80MB Winchester disk drives; 1/4-inch streaming tape drives; a color controller for a 15-inch-diagonal color display; color graphics plotters; and several letter-quality and dot matrix printers.

Video output is an 80-column-by-29-line monochrome display; the color format provides a resolution of 720 by 348 pixels.

Data communications protocols supported on the system include IBM SNA and bisynchronous 3270 emulation.

MICRODATA 1000 runs under MicroREALITY, the microcomputer version of Microdata's REALITY operating system. MicroREALITY provides an integral relational data base. MICRODATA 1000 can also run application packages that are compatible with the Microsoft MS-DOS operating system.

**Competition & Pricing** Competitive products include the Corvus Concept, Plexus P/25, and Computer Automation Omnix 186.

Prices for MICRODATA 1000 start at \$8,075.

**Memotech Ltd**

Station Ln  
Witney, Oxon OX8 6BX  
England

0993-2977

99 Cabot St  
Needham MA 02194

(617) 449-6614

**MTX Series**

**Overview** The Memotech MTX Series systems are desktop computers consisting of a processor unit with or without integral disk drives and a separate keyboard unit. Memory ranges from 32KB to 512KB. In addition to diskettes and Winchester disks, the MTX offers RAM silicon disks providing up to 32MB of fast semiconductor storage. Extensive graphics and communications facilities are provided.

**System Design** The MTX Series CPU includes a Zilog Z80A processor; real-time clock; 24KB ROM with MXT BASIC; a Z80 assembler/disassembler; and register, memory, and program display/manipulation routines. Two expansion boards (either RAM or a communications board) can be added internally. The communications board supports the disk drive bus and twin RS-232C interfaces for data transmission at up to 19.2K bps. MTX Series systems can be linked by using interrupt-driven communications software.

MTX supports a computer expansion board, 80-column color board, diskette controller board, parallel port for bus expansion, and 4 silicon disks (RAM boards that store up to 1MB of data and emulate CP/M disk drives). The FDX model includes one or two 347KB (formatted) 5-1/4-inch diskette drives; the HDX model includes 1 diskette and one 5MB, 10MB, or 20MB Winchester disk. A silicon disk controller supports up to 32 silicon disks, providing 32MB of storage.

The keyboard includes standard typewriter keys with numeric/cursor control keypad and 8 shiftable function keys. A color TV monitor provides the standard display of 25 lines of 40 characters with an 80-character option. Graphics facilities provide up to 256 by 192 pixels in 16 colors.

Software includes BASIC with enhancements for more structured programming and for including assembly language routines in BASIC programs. NODDY, an interactive screen manipulation routine, is also provided. The Digital Research CP/M operating system and CP/M-compatible applications software can be run.

**Competition & Pricing** The MTX Series competes with the Kaypro 10, North Star Advantage, Sanyo MBC 1150, and Sord M23.

Prices are \$995 for a single diskette system, \$1,690 for 2 diskettes, and \$1,995 for 256KB of memory with 1 diskette.



**Morrow Designs**

600 McCormick St  
San Leandro CA 94577

(415) 430-1970

**Micro Decision MD11**

**Overview** The Micro Decision MD11 is a desktop microcomputer featuring 128KB of RAM and 8KB of ROM. A 5-1/4-inch disk drive and 5-1/4-inch diskette drive provide data storage.

An integral CRT with detachable ASCII-style keyboard, serial ports, and a parallel port are standard features.

Software consists of industry-standard programming languages and WP and electronic spreadsheet application packages.

Maintenance and support is available from Morrow Designs dealers or through a third-party maintenance program with Xerox.

**System Design** The Micro Decision MD11 is based on a Zilog Z80A microprocessor with 128KB of RAM and 8KB of ROM. A 5-1/4-inch fixed-disk drive provides 11MB of online storage, while a 5-1/4-inch diskette drive offers 384KB of storage. A rotating memory controller (CMA) feature uses the system CPU to transfer data directly from disk to main memory.

The integral 12-inch-diagonal CRT has a 1,920-character display (24 lines of 80 characters each) and detachable ASCII-style keyboard with 91 keys, 9 function control keys, and numeric keypad.

The MD11 has 1 Centronics parallel port and 2 RS-232C serial ports. A third serial port can be added through a standard RS-232C serial connector or an on-board RS-422 connector. The RS-422 can run in high-speed synchronous serial mode at up to 500K bps.

Software includes the Digital Research CP/M Plus 3.0 operating system—an enhanced version of CP/M offering special user functions and addressing up to 128KB of RAM. Programming languages include Microsoft BASIC-80, a version of the industry-standard BASIC; BaZic, a North Star-compatible BASIC interpreter; and Pilot, an elementary programming language.

Applications software includes the New Word WP; Correct-It spelling checker; LogiCalc spreadsheet; and Personal Pearl relational data base manager.

**Competition & Pricing** Competing with the MD11 are the IBM Personal Computer, NEC Advanced Personal Computer, and Columbia Data MPC.

The MD11 is priced at \$2,495.

**Morrow Inc**

600 McCormick St  
San Leandro CA 94577

(415) 430-1970

**Morrow MD5-E**

**Overview** The Morrow MD5-E is a 5MB Winchester disk microcomputer system with word processing software. The system is part of the Micro Decision E series, which offers bundled word processing software as well as the ability to select other applications software as needed. It is aimed at professional writers who need faster response times than those generally available on diskette systems. The system is distributed through retailers.

**System Design** The MD5-E is based on a Zilog Z80A CPU running at 4MHz and has 128KB of RAM, 8KB of ROM, 3 serial ports, and a standard Centronics parallel port. It also includes a detachable keyboard and full-size display terminal with 80 columns by 25 lines. A 5MB Winchester disk is standard, as is a 5-1/4-inch diskette drive with 384KB of storage; another diskette and fixed disk may be added as options.

Software for the MD5-E includes the Digital Research CP/M Plus operating system, Morrow NewWord word processing software, and Correct-It spelling checker.

**Competition & Pricing** The MD5-E competes with the North Star Horizon, Sony Corporation SMC-70, Televideo Systems TS 802, and Xerox 820-II.

The MD5-E is priced at \$2,295.





**NCR Corp**1700 S Patterson Blvd  
Dayton OH 45479

(513) 449-2000

**NCR Personal Computer Model 4**

**Overview** NCR introduced the Personal Computer Model 4 in 1984 to provide an IBM-compatible personal computer for its customers. The system is available in diskette- and disk-based versions and supports the NCR-DOS operating system. NCR-DOS is compatible with Microsoft MS-DOS and runs software written for the IBM Personal Computer. The system includes an integrated 12-inch monochrome or color monitor.

**System Design** The NCR Personal Computer Model 4 is based on the 4.77MHz, 16-bit Intel 8088 processor, which is used in the IBM Personal Computer. Five IBM-compatible expansion slots are provided. Main memory is 128KB, expandable to 640KB. One parallel and 1 RS-232C serial port are standard. Both the color and monochrome monitors display 80 characters of 25 lines each; the color monitor supports a graphics resolution of 640 by 200 pixels. The keyboard features a layout similar to that of the IBM Personal Computer and has 10 programmable function keys.

The system can be configured with one or two 320KB or 360KB diskette drives or with one diskette drive and one 10MB Winchester disk drive.

The NCR-DOS operating system is MS-DOS compatible. Tutorial software is available. Microsoft's GWBASIC is also available from NCR.

**Competition & Pricing** The NCR Personal Computer Model 4 competes with the IBM Personal Computer and PC/XT and with such IBM-compatible personal computers as the COMPAQ DESKPRO, Texas Instruments Professional Computer, Sperry Personal Computer, Digital Equipment Rainbow 100, and Corona PC.

Prices for the NCR Personal Computer Model 4 range from \$2,300 to \$4,560.

**NCR Corp**1700 S Patterson  
Dayton OH 45479

(513) 449-2000

**WorkSaver 300**

**Overview** The NCR WorkSaver 300 is a desktop system with a detachable keyboard and a high-resolution, nonglare screen. The product is designed for the automated office and can operate as a standalone system or in conjunction with other terminals in a local cluster network. System components include a 12-inch high-resolution screen and a 15-inch color display, a 16-bit processor with 256KB to 1MB of RAM, a detached keyboard, and optional storage and printing devices.

A comprehensive training program, including workbooks and audio cassettes, is available for operators. The WorkSaver 300 includes free support for 90 days after installation; thereafter, ongoing support is available at a nominal charge for software and application development.

**System Design** Based on the Convergent Technologies N-GEN system, the WorkSaver 300 basic configuration is based on a 16-bit Intel 80186 processor and includes 256K of RAM, expandable to 1MB. Storage options include 1 or 2 diskette drives with 630KB of storage each, 1 or more disk drives in 10MB, 20MB, or 32MB capacities, and an expansion feature for more disk storage. Monochrome or color screens that can display 80 characters by 29 lines are available. Two serial ports and 1 Centronics printer port are incorporated in the design. Three letter-quality printers are available in speeds ranging from 20 to 55 characters per second. The system can operate in standalone mode or can be configured as a master or cluster station; depending on the model, the master station can support from 2 to 16 additional workstations. The system is set up for communications through emulation of TTY, IBM 2780, 3780, 3270, and various NCR terminals and through SNA/SDLC.

Software for the system includes either the Microsoft MS-DOS or Digital Research CP/M-86 operating system as well as NCR WordReady, MULTIPLAN, Records Processing, WordCheck, Spelling Dictionary, WorkGraph, Color and MonoGraphics, high-level languages, and communications programs.

**Competition & Pricing** Competing systems include other Convergent Technologies N-GEN-based systems, such as the Burroughs B 25 and Datapoint VISTA-PC. The WorkSaver 300 also competes with the IBM Personal Computer AT.

Prices for the WorkSaver 300 range from \$4,000 for a standalone unit to \$25,000 for a clustered configuration.



**NEC Information Systems**

1414 Massachusetts Ave  
Boxborough MA 01719

(617) 264-8000

**Advanced Personal Computer III**

**Overview** In May 1984, NEC Information Systems introduced the Advanced Personal Computer III (APC III) business and personal computer.

APC III provides UNIX and MS-DOS capabilities. The system is available in 3 basic models that support both diskette and Winchester disk storage.

A variety of software applications packages are available for APC III, including accounting, graphics, telecommunications, data base management, and WP. Several programming languages are also available.

Maintenance and support for the APC III are provided by NEC and its authorized distributors and dealers.

**System Design** The APC III is built around a 16-bit Intel 8086-based NEC microprocessor with 128KB of RAM, expandable to 640KB. APC III includes 32KB of ROM for system initialization, diagnostics, and ROM BIOS and 8 bytes of CMOS battery-protected memory.

I/O facilities include a Centronics-compatible parallel printer interface and an RS-232C port for asynchronous and synchronous communications. Monochrome and color (RGB) monitor interfaces are standard. Also available are additional RS-232C interfaces and IEEE-488 interfaces. A hardware/calendar clock and IBM-compatible character sets are also standard.

The APC III standard 61-key keyboard includes 4 cursor control keys and 12 programmable function keys. APC III supports both monochrome and color systems on a 25-line-by-80-column display with high-resolution graphics (640 by 400 pixels). Standard disk storage is contained on 1 or 2 integrated 5-1/4-inch diskette drives with 320KB of storage per diskette. An integrated 10MB disk is also available. The system interfaces to all NEC Spinwriter and Pinwriter printers, which are IBM compatible.

Because the APC III is compatible with MS-DOS 2.11 and features GWBASIC and UNIX as standard, the system can run a large library of software packages, including MicroPro WordStar, SpellStar, and MailMerge; dBASE II data base management programs from Ashton-Tate; MicroPro CalcStar and Sorcim SuperCalc<sup>3</sup> spreadsheet programs; and numerous applications from other third-party vendors.

**Competition & Pricing** Competing with the APC III are the IBM Personal Computer, Texas Instruments Professional Computer, and Digital Equipment Rainbow.

A basic APC III system is priced at \$1,995.

**Nelma Data Corp**

5170A Timberlea Blvd  
Mississauga Ontario  
Canada L4W 2S5

(416) 624-0334

**The PERSONA**

**Overview** The PERSONA is an 8-bit desktop micro-computer designed for business and personal computing applications. The PERSONA can generate and display charts, graphics, text, and numerical data as well as run business applications, such as accounts receivable and WP.

The PERSONA supports a maximum 320KB of main memory and 720KB of diskette storage as well as a 10MB Winchester disk drive. Nelma Data Corporation bundles several software packages with The PERSONA, including the CP/M Version 2.2 operating system from Digital Research.

Nelma Data warrants The PERSONA for 90 days. Maintenance and support for the system are provided by Nelma Data and its authorized dealers.

**System Design** The PERSONA is based on an 8-bit Zilog Z80A microprocessor that features a 4MHz clock speed. The system is initially configured with 64KB of RAM; main memory can be expanded to 320KB in increments of 64KB. The system also includes a 4KB static RAM CRT data buffer.

The PERSONA system is configured with two 5-1/4-inch diskette drives with 180KB of storage per drive, a 12-inch-diagonal green-phosphor monitor, and a detached typewriter-style keyboard. The PERSONA also includes a parallel printer interface, an RS-232C interface, and 4 expansion slots.

The 12-inch-diagonal display features 128 characters with a 7-by-10-dot matrix character frame in a 24-line-by-80-column screen format. The detached typewriter-style keyboard includes an 81-key layout, 10 user-programmable function keys, and an 11-key numeric keypad.

Asynchronous data communications is provided through the RS-232C serial interface at rates up to 9.6K bps.

Hardware options for the system include dual-sided diskettes with 360KB of storage, a 10MB Winchester disk drive, and a 16-bit Intel 8088 microprocessor.

In addition to CP/M 2.2, software bundled with the system includes the MicroPro WordStar and CalcStar as well as Modem 7, a communications program from Nelma Data. Optional packages include the MicroPro InfoStar, MailMerge, and SpellStar.

**Competition & Pricing** The PERSONA competes with the Morrow Designs Micro Decision MD11, Sord Computer of America M23 Series, and Epson America QX-10.

The PERSONA is priced at \$1,995.

**Nelma Data Corp**

5170A Timberlea Blvd  
Mississauga Ontario  
Canada L4W 2S5

(416) 624-0334

**The PERSONA 16**

**Overview** The PERSONA 16 is a 16-bit single-user desktop microcomputer that runs the Microsoft MS-DOS and Digital Research CP/M-86. It supports 512KB of RAM, a 640KB diskette, 10MB of fixed disk storage, and a 23MB streamer tape.

The PERSONA 16 is available through Nelma Data and authorized dealers. Service is provided by Control Data.

**System Design** The PERSONA 16 is based on the Intel 8088 CPU with a 16-bit internal and 8-bit external architecture. It runs at 5.2MHz. The basic configuration has 128KB of RAM, expandable to 512KB, and two 5-1/4-inch, 320KB, double-sided, double-density diskette drives. An optional 10MB fixed disk and 23MB streamer tape drive are also available.

The system supports a 12-inch-diagonal monochrome or color monitor with a text display of 25 lines by 80 characters and a resolution of 320 by 200 pixels (monochrome) or 640 by 200 pixels (color). The 84-key keyboard features 16 function keys and a numeric keypad.

The system unit features 5 expansion slots and up to 3 serial and parallel ports each, IEEE-488, RGB, composite video, and audio output ports.

Asynchronous and synchronous communications are optional and support TTY, Digital Equipment's VT100, and IBM's SNA and SDLC emulation protocols.

The system runs MS-DOS and CP/M-86. Programming can be done in BASIC, COBOL, and Pascal.

**Competition & Pricing** The PERSONA 16 competes with the IBM Personal Computer, COMPAQ DESKPRO, and Corona Data Systems PC.

The PERSONA 16 is available for \$2,395.

**Nixdorf Computer AG**

Fürstenallee 7  
4790 Paderborn  
West Germany

(05251) 15-0

**8810/30**

**Overview** Designed to be used as both a standalone system running CP/M software and a workstation connected to such larger Nixdorf systems as the 8870, the 8810/30 is a desktop system featuring German ergonomic design and extensive data communications software. The system is targeted primarily at Nixdorf's large-system customers who require personal computing facilities. Nixdorf offers 24-hour service, pool service (in which large-system users rent or buy extra systems in case of breakdown), or drop-off service.

**System Design** The 8810/30 system contains a processor unit with integral disk drives, a separate thin-profile keyboard, and a monitor mounted on a small-footprint base with adjustable height and vertical and horizontal angle. The monitor can be placed on top of the processor unit. The processor is an 8-bit Zilog Z80A and features 192KB of memory with parity checking. Two 5-1/4-inch 750KB (formatted) disk drives are standard. Direct memory access is supported.

The keyboard has separate numeric and function pads. The amber-on-black monitor displays 25 lines of 80 characters plus system commands and has a separate Zilog Z80 processor and 16KB RAM. Nixdorf supplies 80-, 100-, and 210-cps printers and an OCR reader for the 8810.

In addition to the Digital Research CP/M, the 8810/30 supports the CODIS (Compatibles Dialog System) operating system. CODIS is a dialogue-oriented menu-controlled system that is compatible with CP/M 2.2 and designed for the inexperienced user. CODIS is available with screen text in German, English, or French.

**Competition & Pricing** The 8810/30 is designed primarily for use with Nixdorf systems; however, competitive European products for the 8810/30 used as a standalone personal computer include the Siemens PC 16, Triumph Adler Alphatronic series, Bull Micral 90, Sirius 1 (Victor 9000), and ICL Personal Computer.

The vendor declined to provide pricing information.



**North Star Computers**14440 Catalina St  
San Leandro CA 94577

(415) 357-8500

**Northern Telecom**PO Box 1222  
Minneapolis MN 55440

(612) 932-8376

**ADVANTAGE**

**Overview** The North Star Computers ADVANTAGE, an integrated standalone desktop computer, offers graphics, data processing, and word processing capabilities to small businesses and technical professionals. The ADVANTAGE features 64KB of RAM main memory and 20KB of dedicated RAM for the display. Two 360KB diskettes or 1 diskette and a 15MB or 30MB Winchester disk can be configured. The ADVANTAGE is marketed through national and regional distributors and direct dealerships.

NorthNet, a local area network, enables 64 ADVANTAGE systems to share disk drives, files, and printers.

North Star Computers provides a 90-day warranty from date of purchase. Third-party maintenance is provided on a national basis by MAI Sorbus Service.

**System Design** The main CPU of the ADVANTAGE is a Zilog Z80A microprocessor. The system also uses an Intel 8035 auxiliary processor for keyboard and diskette function control. An optional ADVANTAGE-8/16 Intel 8088 coprocessor that can support 256KB of RAM, plugs into one of 6 expansion slots. The Z80A acts as an I/O processor for the 8088.

Operating systems include Graphics CP/M, Graphics MS-DOS, Net-CP/M, and Net-TBS. In addition to many CP/M and MS-DOS applications, North Star offers the ACCPAC business accounting programs, NorthWord II word processing package, and Info-Manager information management program.

**Competition & Pricing** Competition for the ADVANTAGE includes the IBM Personal Computer, Xerox 820 II, and Digital Equipment Rainbow 100.

Model	Price \$
ADVANTAGE w/2 diskettes	2,600
ADVANTAGE w/1 diskette & 15MB Winchester disk	5,200
ADVANTAGE w/1 diskette & 30MB Winchester disk	6,200
8088 coprocessor	300

**Model 503**

**Overview** Northern Telecom's Model 503 desktop microcomputer provides DP, WP, and communications capabilities. The system can also be used for RJE functions and as part of Northern Telecom's network control system, which supports automatic polling and selection of remote Model 503s and other distributed systems.

Northern Telecom introduced Model 503 in 1981. The system supports up to 256KB of main memory and either 3.2MB of diskette storage or a 10MB Winchester disk drive.

Software includes the Digital Research CP/M operating system, high-level programming languages, and application programs.

Maintenance is provided by Northern Telecom. Model 503 is equipped with built-in diagnostic features for power-on and general system testing.

**System Design** An 8-bit Intel 8085 microprocessor is the central processor for the Model 503. The system features 256KB of main memory and either 2 or 4 diskettes with 800KB of storage each. A 10MB Winchester disk drive can also be configured with the system; an 800KB diskette is available for backup.

Model 503 is compatible with the Northern Telecom Models 435, 445, 565, 585, and other 503 systems.

Model 503 runs under the vendor's OMNITASK operating system or CP/M. Languages supported by the system include BASIC, COBOL, and TAL 2000. Various application programs are available, including the Omniword WP package.

Model 503 supports data communications in asynchronous, bisynchronous, and IBM SDLC modes at speeds up to 9,600 bps. The system also supports IBM 2770 and 2780/3780 protocols in an interactive RJE application and a Digital Equipment VT100 emulator.

A basic Model 503 configuration includes 256KB of main memory, 1.6MB of diskette storage, a 15-inch-diagonal display, and a 78-key keyboard with a 10-key numeric pad.

**Competition & Pricing** Competition for Model 503 includes the Morrow Designs Micro Decision MD11, Sord Computer M23 Series, and Epson America QX-10.

The Model 503 price is \$9,900, including a 10MB Winchester disk drive, printer, and communications port.

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**Olympia USA**PO Box 22  
Somerville NJ 08876(201) 722-7000

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**People**

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**Overview** Olympia USA, a subsidiary of Olympia International, markets electronic office products and systems through a network of computer dealers and distributors throughout the U.S.

The Olympia People is a 16-bit microcomputer designed for the professional, small businesses, and departments within a large corporation. User memory is expandable to 896KB; screen memory can be expanded to a maximum of 384KB. A 10MB or 20MB Winchester disk drive is optional.

Software for the system includes several industry-standard operating systems, programming languages, and applications software.

Maintenance and support for the People computer are provided by Olympia's nationwide network of office equipment dealers.

**System Design** A 16-bit Intel 8086 microprocessor provides the basis for the People CPU. The 5MHz processor features a program-accessible clock and 128KB of main memory expandable to 896KB. The system is also configured with 128KB of screen memory expandable to 384KB.

The People is configured with dual 650KB diskettes for a total storage capacity of 1.3MB. A 10MB or 20MB Winchester disk drive is optional. The system is also configured with a 12-inch-diagonal, green-phosphor, 80-column-by-25-line display with a resolution of 640 by 475 pixels. The 91-key detached keyboard also includes 12 programmable function keys.

Asynchronous and synchronous communications are provided through a standard RS-232C serial interface. A Centronics-compatible parallel interface is also standard. Options include 2 RS-232C serial ports and an IEEE-488 interface.

The People runs under the Digital Research CP/M-86 and Concurrent DOS 3.1 and Microsoft MS-DOS operating systems. Available programming languages include CBASIC, CIS-COBOL, Level II COBOL, and Pascal MT+ with SPP. Among the application programs available for the People computer are general accounting packages from ADS software and a 7-package integrated accounting system from RealWorld.

**Competition & Pricing** Competing with the People are the Toshiba T300, MAD Computer MAD-1, Texas Instruments Professional Computer, and Digital Equipment Rainbow 100+.

Pricing for the People begins at \$2,995 for 128KB of main memory and 2 diskette drives. A system configured with a 10MB Winchester disk drive is priced at \$4,295. With a 20MB Winchester disk, the system is priced at \$5,295.

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**Panafacom Ltd**National Bldg, 17-15, Shinbashi  
6-chome, Minato-ku, Tokyo  
105 Japan03-438-0311

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**Duet-16**

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**Overview** The Duet-16 is a 16-bit business personal computer designed for office, laboratory, school, and factory applications. It features a 16-bit microprocessor, user memory that is expandable to 512KB, a high-resolution and color display, 2 5-1/4-inch diskette drives, and a disk.

The Duet-16 is sold through Sakata Shokai Ltd and its distributors. Maintenance and support is also provided by them.

**System Design** The Duet-16 is based on the Intel 8086 microprocessor running at 8MHz, with HMOS technology. It is equipped with 8KB of ROM and 128KB of RAM that can be expanded to 512KB. Three monitors are available for the Duet-16: a 12-inch monochrome monitor, a 12-inch color monitor, and a 5-1/2-inch monochrome monitor. A thermal printer is supplied with the system, but a dot-matrix or daisy wheel printer can be attached instead. Two 720KB diskette drives are incorporated as well as 3 types of disk: the expansion unit, the disk unit, and the expansion disk unit. The expansion unit houses a disk with an intelligent controller, 48KB cache memory, and 5 user slots for expansion. The disk unit is identical but has no expansion slots. The expansion disk unit allows for file expansion but is connected to an expansion or a disk unit rather than directly to the system.

The Duet-16 supports both Microsoft MS-DOS and Digital Research CP/M-86 operating systems and can use BASIC and COBOL languages. The system can run the Microsoft Multiplan, Micropro International WordStar, IBM 3270 emulation, and various business application software.

**Competition & Pricing** The Duet-16 competes with the IBM Personal Computer and compatible systems, Leading Edge Personal Computer, Wang Professional, and Sperry Personal Computer.

Pricing is available from Sakata Shokai on request.



**Philips Information Systems**

15301 Dallas Pkwy  
Suite 300  
Dallas TX 75248

(214) 980-2000

**P3100 Personal Computer**

**Overview** Philips, headquartered in the Netherlands, has followed other large communications companies in adding an IBM-compatible Personal Computer to their product line. This computer is actually manufactured by the U.S. firm Corona Data Systems.

**System Design** The Philips P3100 is based on the 8-/16-bit Intel 8088 processor used in the IBM Personal Computer. The basic system includes 256KB of memory, expandable to 512KB. It can be configured with one or two 5-1/4-inch double-sided, single-density diskette drives with a 320KB capacity per drive. A 10MB Winchester disk is optional. Built-in graphics support provides a resolution of 640 by 325 pixels.

The P3100 runs the Microsoft MS-DOS operating system and is operationally compatible with the IBM Personal Computer. Software supported by Philips for the P3100 includes the Samna Word I, Samna Word II, and Samna + word processing and office automation packages from Samna.

**Competition & Pricing** The Philips P3100 competes with the IBM Personal Computer and compatible systems such as the Columbia MPC, Corona Personal Computer Eagle XL, and Sperry Personal Computer.

Pricing for the P3100 begins at \$2,400.

**RC Computer**

Lautrupbjerg 1  
DK 2750 Ballerup  
Denmark

45 2 65 80 00

**Partner**

**Overview** The RC Computer Partner is a 16-bit microcomputer that supports and executes several jobs simultaneously. Partner can be linked in a local area network.

Partner's basic configuration includes such features as high-resolution graphics, a 256KB internal memory, communications and printer ports, and connections for a plotter and a mouse. Partner is modular in design and comprises a system unit, display, and keyboard.

Partner runs under an industry-standard operating system that supports third-party applications software, graphics software, and several programming languages.

Service and support for Partner are provided by RC Computer.

**System Design** A 16-bit Intel iAPX 186 is the main processor for the Partner, with Intel 82586 and 82730 acting as auxiliary processors. Also included in the CPU are intelligent controllers for attaching external units.

Partner is configured with 256KB of RAM, 16KB of ROM, 32KB of pixel memory, and 128KB of CMOS RAM with battery backup. Main memory can be expanded to 512KB or 768KB.

Partner is available in 4 models. Model 1 features no diskette storage, Model 2 includes a 1.2MB diskette drive, Model 3 is configured with two 1.2MB diskette drives, and Model 4 includes a 1.2MB diskette drive and a 10MB disk drive.

There are two displays available for Partner: a 12-inch-diagonal monochrome display with an amber background and a 14-inch-diagonal color display that features 16 colors. Graphics resolution is 720 by 350 pixels for the monochrome display and 360 by 350 pixels for the color display. Both monitors support an 80-column-by-25-line display.

The 98-key keyboard includes 19 function keys and connection for a mouse.

Partner runs under Digital Research Concurrent CP/M-86, which supports Graphics System Extension (GSX). Available programming languages include BASIC, COMAL, FORTRAN, C, PL/1, and Pascal.

Partner can be connected to several local area networks, including Ethernet, Cheapernet, or Mikronet.

**Competition & Pricing** Partner competes with the IBM Personal Computer, Wang Professional Computer, and Texas Instruments Professional Computer.

A 2-diskette system is priced at DKR. 41,900, and a single diskette system with a disk is priced at DKR. 59,800.



**Ricoh Company Ltd**

15-5, Minami-Aoyama  
1-Chome, Minato-ku, Tokyo  
107, Japan

(03) 479-3111

**Ricoh SBC-16**

**Overview** The SBC-16 is a desktop computer designed for the office environment; the basic configuration includes an Intel 80186 microprocessor, a keyboard and display, a diskette drive, and an optional Winchester disk. The RTC-1 is a CCITT-compatible Teletex adapter unit that allows the SBC-16 to be connected to a variety of networks.

**System Design** The SBC-16 incorporates an Intel 80186 microprocessor running at 8MHz, single or dual 5-1/4-inch diskette drives with a 720KB capacity each, 256KB of RAM that is expandable to 896KB, a 12-inch nonglare monochrome screen that can display 80 characters by 25 lines and 640-by-400-pixel graphics, a detachable keyboard, 2 RS-232C ports, a Centronics printer port, and 5 expansion slots. A 14-inch-diagonal color display is also available. Software for the system includes the Microsoft MS-DOS and GWBASIC. Options for the system include a 10MB Winchester disk drive, a mouse, IBM 3270 SNA, IBM 3770 and 3780 emulation software, a CP/M-86 operating system, and a RAM expansion board.

The RTC-1 features full Teletex compatibility and does not interfere with local computer processing. The CPU is an Intel 80186 with 64KB of RAM, expandable to 256KB. Available network interfaces (X.21 and V.24) allow connection to the circuit switched data networks, public switched data networks, and public switched telephone networks. Transmission functions such as multiaddress, transmit at specified time, and automatic retry are provided for improved productivity.

**Competition & Pricing** The Ricoh SBC-16 competes with the IBM Personal Computer and compatible systems, the Burroughs B 25, the NCR WorkSaver 300, the Datapoint VISTA-PC, and the Wang Professional Computer.

Prices for both systems are available from the vendor on request.

**Sanyo Business Systems**

51 Joseph St  
Moonachie NJ 07074

(201) 440-9300

**MBC 1100, MBC 1150**

**Overview** Sanyo's MBC 1100 and MBC 1150 are 8-bit, multiuser systems designed for small business applications. The systems include an integral display and a detachable keyboard. They differ only in the amount of diskette storage they support.

The Sanyo MBC 1100 and 1150 support up to 5 users and 3 printers. Maximum diskette storage supported by the system is 640KB; main memory is 64KB. Sanyo bundles several applications software packages with the MBC 1100 and 1150.

Maintenance and support for the MBC 1100 and 1150 are provided by Sanyo and its authorized distributors. The MBC 1100 and 1150 are warranted against defects in parts and labor for 1 year.

**System Design** MBC 1100 and 1150 systems are based on an 8-bit Zilog Z80A microprocessor with 64KB of main memory and 4KB of ROM. Both computers feature a detachable ASCII-style keyboard with 15 programmable function keys, a 12-inch-diagonal green-phosphor CRT with a display of 80 characters by 25 lines, and a 256-character set. The MBC 1100 and 1150 are configured with an RS-232C serial communications port and a Centronics-compatible parallel printer port. The systems support asynchronous communications at 75 to 4.8K bps.

The MBC 1100 is configured with a single 5-1/4-inch double-sided, double-density diskette drive with 320KB of storage. The MBC 1150 features 2 of these drives for a total diskette storage of 640KB.

Options include a 10MB disk drive, printers, and terminals.

Software for these Sanyo systems includes the Digital Research CP/M 2.2 operating system. The MBC 1100 and 1150 can be programmed in Sanyo BASIC, which is similar to Microsoft BASIC. Additional languages include BASIC-80, COBOL-80, FORTRAN-80, Pascal/M, and MACRO-80.

Applications software bundled with the MBC 1100 and 1150 include the MicroPro International WordStar, CalcStar, InfoStar, SpellStar, and MailMerge.

**Competition & Pricing** Competition for the Sanyo MBC 1100 and 1150 includes the Tandy Radio Shack TRS-80 Model 4P, Toshiba America T100, and Sony SMC-70.

Model	Price \$
MBC 1100	1,699
MBC 1150	2,099



**Sanyo Business Systems**

51 Joseph St  
Moonachie NJ 07074

(201) 440-9300

**MBC 1200, MBC 1250**

**Overview** The Sanyo Business Systems MBC 1200 and 1250 systems are 8-bit integrated computers that support full-function graphics. The MBC 1200 and 1250 systems support up to 5 users and 3 printers and feature integral displays and detachable keyboards. Both systems support a maximum 64KB of main memory. Up to 1.2MB of diskette storage is supported by the MBC 1250.

Sanyo warrants the MBC 1200 and 1250 against defects in parts and labor for 1 year. Sanyo Business Systems and its distributors provides maintenance and support.

**System Design** MBC 1200 and 1250 systems are based on dual 8-bit Zilog Z80A microprocessors with 64KB of main memory and 4KB of ROM. The MBC 1200 and 1250 are configured with a detachable ASCII-style keyboard and a 12-inch-diagonal, high-resolution CRT with a 640-by-400-dot matrix. The CRT includes a 256-character set and a display of 80 characters by 33 lines or 80 characters by 40 lines. Also configured with the MBC 1200 and 1250 are an RS-232C serial communications port and a Centronics-compatible parallel printer interface. MBC 1200 Series computers support asynchronous communications at data rates of 75 to 4.8K bps.

The MBC 1200 and 1250 differ only in the amount of diskette storage configured with the system. The MBC 1200 supports a single 5-1/4-inch double-sided, double-density diskette drive with a 640KB storage capacity. The 1250 supports 2 of these diskette drives for a total capacity of 1.2MB. A second diskette can be added to the MBC 1200.

Options include 14- and 16-cps printers and the Sanyo PR100XY plotter.

Software includes the Digital Research CP/M 2.2 operating system and Sanyo BASIC, which is similar to MicroSoft BASIC with graphics functions. Additional programming languages, including BASIC-80, COBOL-80, FORTRAN-80, and Pascal/M, are also available. Bundled with the MBC 1200 and 1250 is WordStar, InfoStar, CalcStar, MailMerge, and SpellStar from MicroPro International.

**Competition & Pricing** Competition for the systems include the BASIS 108, Hewlett-Packard HP 120, and IBM Personal Computer.

Model	Price \$
MBC 1200	1,999
MBC 1250	2,599

**Sanyo Business Systems**

51 Joseph St  
Moonachie NJ 07074

(201) 440-9300

**MBC 4000, MBC 4050**

**Overview** The Sanyo MBC 4000 and 4050 are 16-bit computers designed for standard business and professional applications. MBC 4000 and 4050 systems are configured with an integral CRT and a detachable keyboard. A maximum of 512KB main memory and 1.2MB of diskette storage is supported. The MBC 4000 and 4050 systems run under a variety of software available from Digital Research and MicroPro International.

Sanyo warrants the MBC 4000 and 4050 computers for 1 year against defects in labor and parts. Maintenance and support are provided by Sanyo Business Systems and its distributors.

**System Design** A 16-bit Intel 8086 microprocessor is the basis for the MBC 4000 and 4050. The systems are initially configured with 128KB of main memory, expandable to 512KB in 128KB increments. An Intel 8087 arithmetic coprocessor is optional.

The MBC 4000 and 4050 are configured with an RS-232C serial port, Centronics-compatible parallel printer interface, 12-inch-diagonal CRT with an 80-character-by-25-line display, and detachable ASCII-style keyboard with 15 programmable function keys. Asynchronous data communications are supported at speeds of 75 to 4.8K bps. An optional interface supports a 10MB disk drive.

The MBC 4000 differs from the MBC 4050 only in the amount of diskette storage configured. The MBC 4000 features a single double-sided, double-density diskette drive with 640KB of storage. The MBC 4050 is configured with two of these diskette drives for a total of 1.2MB of storage. An additional 640KB drive can be added to the MBC 4000.

MBC 4000 and 4050 systems run under the Digital Research CP/M-86 operating system. Programming languages include BASIC, GOAL (table information language), and several other languages that run under CP/M-86. Software bundled with the MBC 4000 and 4050 includes the MicroPro International WordStar, CalcStar, SpellStar, InfoStar, and MailMerge.

**Competition & Pricing** Competing with MBC 4000 and 4050 are the IBM Personal Computer, Wang Professional Computer, and Sperry Personal Computer.

Model	Price \$
MBC 4000	2,199
MBC 4050	2,699



**Sanyo Business Systems**51 Joseph St  
Moonachie NJ 07074

(201) 440-9300

**MBC 550, MBC 555**

**Overview** The MBC 550 and 555, introduced by Sanyo in 1983, are designed to run standard business and professional applications. MBC 550 and 555 computers are 16-bit desktop systems with high-resolution color displays and a detachable keyboard.

The MBC 550 and 555 support a maximum 256KB of main memory. The systems differ only in the amount of diskette storage available and in their bundled software. Software supported on the systems includes the Microsoft MS-DOS operating system. Sanyo also bundles several application packages with the systems.

Sanyo warrants the MBC 550 and 555 for 1 year against defects in parts and labor. Maintenance and support are provided by Sanyo and its authorized distributors.

**System Design** A 16-bit Intel 8088 microprocessor with 128KB of main memory is the basis of the MBC 550 and 555. Main memory can be expanded to 256KB in increments of 64KB; the systems also support 8KB of ROM. Both computers include a Centronics-compatible printer interface. The MBC 550 is configured with a 160KB diskette drive; a second 160KB diskette drive is optional. The MBC 555 is configured with 2 diskette drives for 320KB of total storage.

A color or monochrome monitor is supported by the MBC 550 and 555. The 13-inch-diagonal monitor displays 8 colors in a field of 640 by 200 pixels. The 12-inch-diagonal monochrome display also features a resolution of 640 by 200 pixels.

The MBC 550 and 555 features a detachable keyboard with 5 programmable function keys.

Software for the computers includes the Microsoft MS-DOS operating system and a number of application packages bundled with the systems. Software bundled with the MBC 550 are WordStar and CalcStar from MicroPro International and EasyWriter 2 from IUS. The MBC 555 includes WordStar, CalcStar, InfoStar, MailMerge, and SpellStar from MicroPro International and EasyWriter 1 from IUS. Also configured with both systems is Sanyo BASIC supplied on the system diskette.

**Competition & Pricing** These Sanyo computers compete with the IBM Personal Computer, Texas Instruments Professional Computer, and NEC Advanced Personal Computer.

Model	Price \$
MBC 550	949
MBC 555	1,299

**Seequa Computer Corp**8305 Telegraph Rd  
Odenton MD 21113

(301) 672-3600

**Cobra**

**Overview** Seequa Computer, maker of the low-cost portable Chameleon, introduced a second dual-processor machine, the Cobra, in the fall of 1984. Like the Chameleon, the Cobra runs both Microsoft MS-DOS and Digital Research CP/M software. The Cobra features a Winchester disk drive for increased storage capacity.

**System Design** The Cobra is based on the full 16-bit Intel 8086 processor, with a clock speed of 8MHz. This provides increased performance over the IBM Personal Computer, which uses the 8-/16-bit Intel 8088 with a 4.77MHz clock rate. Access to 8-bit CP/M software is provided through a Zilog Z80A processor.

In addition to 16KB of ROM, the Cobra features 256KB of RAM in the basic unit, expandable to 640KB. Disk storage consists of a 10MB or 20MB Winchester disk and a double-sided, double-density diskette drive with a 630KB storage capacity. The keyboard follows the IBM Personal Computer 83-key format but is enhanced by indicator lights on the caps and numeric lock keys.

Serial and parallel ports are standard, as is a real-time clock. High-resolution graphics support is built-in. The Cobra features 6 IBM-compatible expansion slots for add-on options.

In addition to the MS-DOS operating system, Seequa's C Term and Microsoft GWBASIC, bundled software includes Seequa Exec, which enables users to access 14 applications from a menu without directly contacting the operating system, Micropro Wordstar, Sorcim Supercalc<sup>3</sup> spreadsheet package, or Condor Computer Condor I data base management system.

**Competition & Pricing** The Seequa Cobra competes with the IBM Personal Computer XT, the COMPAQ DESKPRO, the Sperry Personal Computer, and other IBM-compatible computers with Winchester disk storage.

The Cobra is priced at \$3,995 with a 10MB disk and at \$4,995 with a 20MB disk.



**Seequa Computer Corp**8305 Telegraph Rd  
Odenton MD 21113

(301) 627-3600

**Seequa/PC, Seequa/XT**

**Overview** Seequa Computer, manufacturer of the Chameleon and Chameleon Plus IBM-compatible portable computers, also manufactures the Seequa/PC and Seequa/XT desktop systems. Like the Chameleon computers, the desktop products feature dual-processor technology supporting compatibility with Microsoft MS-DOS and Digital Research CP/M operating systems.

The Seequa/PC and Seequa/XT feature up to 640KB of RAM and 320KB of diskette storage; the Seequa/XT is also configured with a 10MB disk drive.

Both systems run under the Microsoft MS-DOS operating system.

Seequa Computer offers a 90-day warranty for parts and labor. An extended warranty covering a system for an additional 12 months is optional. All Seequa dealers qualify as registered service centers and provide factory-supported maintenance.

**System Design** The Seequa/PC and Seequa/XT incorporate a 16-bit Intel 8088 processor and 8-bit Zilog Z80 processor for IBM software and hardware compatibility plus CP/M software compatibility. Both systems support an Intel 8087 math coprocessor option. Both computers have 5 internal expansion slots for IBM-compatible expansion cards, an asynchronous RS-232C serial port and a Centronics-compatible parallel port, and a video output jack. Both systems include a 5-1/4-inch diskette with 320KB of formatted storage.

The Seequa/PC offers 128KB of RAM expandable to 640KB; the Seequa/XT has 256KB of RAM, also expandable to 640KB. In addition, the Seequa/XT features a 10MB fixed disk drive. Both systems are equipped with 16KB of ROM for system initialization and diagnostic routines.

Both systems include an IBM Personal Computer-style detachable keyboard and a 12-inch-diagonal monitor that displays 80 columns by 25 lines or 40 columns by 25 lines, depending on user selection of software. Color capability is optional.

Software bundled with both systems include GWBASIC and WordStar from Microsoft, SuperCalc<sup>3</sup> from Sorcim, and Perfect Writer and Perfect Calc from Perfect Software. In addition, the Seequa/XT includes Condor I and Perfect Speller.

**Competition & Pricing** Competing with the Seequa/PC and Seequa/XT are the IBM Personal Computer and Personal Computer XT, Columbia MPC, Eagle PC, and Sperry Personal Computer.

Model	Price \$
Seequa/PC	1,895
Seequa/XT	3,495

**Siemens AG**Postfach 103  
D-8000 München 1  
West Germany

(089) 23 41

**PC 16-11**

**Overview** The 16-bit PC 16-11 is manufactured by Siemens and sold to end users either directly or through retailers, computer stores, and OEMs. Designed as a desktop business system, the PC 16-11 consists of a separate, thin-profile, ergonomic keyboard; an adjustable monitor with small footprint; and a separate unit containing the processor and diskette/disk drives. Keyboards and screen character sets are available in several languages.

**System Design** The PC 16-11 is based on the Intel 8088 processor. An Intel 8087 math coprocessor is optional. The basic system contains 128KB of memory, expandable to 1,024KB. Task and restart functions are integrated in EPROM. One 720KB 5-1/4-inch diskette drive is standard; a second diskette drive or 10MB, 20MB, or 40MB 5-1/4-inch Winchester disk or 45MB streamer tape can be added.

The 12-inch standard monitor can be tilted forward and backward; a loadable character generator enables use of various character sets. The flat keyboard includes a separate numeric pad, cursor control keys, and 16 programmable function keys.

To support data communications, the unit has an asynchronous/synchronous/HDLC interface and an optional Ethernet or ARCnet interface. A low-noise ink-jet printer is available from Siemens with 8 international character sets and a graphics capability.

The PC 16-11 supports the Digital Research CP/M-86 operating system and BASIC, COBOL, Pascal, FORTRAN-77, and assembly languages. A range of CP/M-86 applications software can be used.

**Competition & Pricing** In Germany, the Siemens PC 16 competes with the Triumph-Adler Alphatronic series, IBM Personal Computer XT and Nixdorf 8810 Workstation Computer. Competitive systems in the rest of Europe include the Bull Micral 90, ACT Sirius 1 (Victor 9000), Olivetti M20, and ICL Personal Computer.

The vendor declined to provide pricing information.

**Solaris Computer Corp**1994 Tarob Ct  
Milpitas CA 95035

(408) 943-1818

**Solaris 1000**

**Overview** The Solaris 1000, an upgraded version of the PCE 1000, consists of a keypad and a system unit that turn the Digital Equipment VT100 and compatible terminals into MS-DOS-compatible personal computing workstations. The workstations retain all terminal functions and support the concurrent operation of host computer and personal computer applications.

**System Design** The Solaris 1000 system unit contains an 8-/16-bit Intel 8088 main processor and an I/O processor card containing an Intel 8088-2 processor. The system unit also includes 256KB of RAM, expandable to 640KB, and two 5-1/4-inch 360KB diskette drives. A 10MB Winchester disk is optional. The system unit plugs into the communications line between the host computer or modem and the terminal. No software or hardware modifications are required. Users can run in full-screen host or personal computer mode or in split-screen mode viewing both functions.

A keypad with 45 keys supplements the terminal keyboard to provide the equivalent of a full personal computer key layout. Special function keys are also included for windowing, host and local mode selection, and window sizing and scrolling.

Seven IBM-compatible expansion slots are included in the system unit. One slot is used for the diskette drive controller. Two serial RS-232C ports and 2 parallel printer ports are standard; the serial ports are used for the host and terminal interfaces.

The ROM-resident Solaris Operating System kernel, Microsoft MS-DOS 2.11, and a bidirectional file transfer program are included. The kernel automatically adapts to the terminal it is used with and preserves terminal communications in the event of a personal computer fault by locking out the main processor.

**Competition & Pricing** The Solaris products provide an alternative to IBM-compatible personal computers in an asynchronous terminal environment.

Pricing for a unit with 256KB and 2 diskette drives is \$2,195.

**Sony Corp**7 Mercedes Dr  
Montvale NJ 07645

(201) 930-1000

**SMC-70**

**Overview** The Sony SMC-70 microcomputer system, based on the Zilog Z80A, is designed for personal or home computing applications. Featuring 64KB of RAM, the SMC-70 has 38KB of ROM devoted to graphics and 32KB of ROM for its BASIC interpreter. The SMC-70 can also be configured as a 16-bit system via an Intel 8086 plug-in module.

The SMC-70 runs under the Digital Research CP/M operating system and supports various CP/M-compatible applications programs.

Maintenance and support for the Sony SMC-70 is provided by the Customer Service Division of Decision Data Computer Corporation. Decision Data provides a warranty for the system and carry-in and on-site service.

Authorized Sony servicing dealers also provide maintenance.

**System Design** The SMC-70 is based on an 8-bit Zilog Z80A microprocessor with 64KB of RAM. Up to 128KB of additional RAM can be accommodated via the Sony bankswitching system. The basic system also has 38KB of ROM for graphics and 32KB of ROM for the BASIC interpreter. Other standard features include an integral clock/calendar with battery backup and a tone generator. The SMC-70 can also be configured as a 16-bit computer via a plug-in module with an Intel 8086 microprocessor. The 16-bit board provides up to 256KB of RAM.

Optional components available with the system include 3-1/2-inch diskettes with 280KB of storage per diskette and a 5-1/4-inch Winchester disk with 6MB of storage.

A high-resolution 16-color display with a 1,920-character capacity and 4 graphics modes is available, as well as a 12-inch-diagonal Trinitron video color monitor and a black-and-green monitor. A video adapter for hookup to a standard color or black-and-white TV is also available. An RS-232C serial interface and Centronics parallel port are provided with the system.

The SMC-70 runs under the CP/M operating system and offers VisiCorp Visicalc, a six-module accounting system, a family of word processing packages, and a communications/terminal emulation package. Two extended versions of BASIC with color graphics commands are also available with the system.

**Competition & Pricing** Competition for the Sony SMC-70 includes the Apple III, Tandy Radio Shack TRS-80 Model II, and NEC Information Systems Advanced Personal Computer.

The basic configuration for the Sony SMC-70 is priced at \$995.



**Sord Computer of America**645 5th Ave  
New York NY 10022

(212) 759-0140

**Sord Computer of America**645 5th Ave  
New York NY 10022

(212) 759-0140

**M23 Series**

**Overview** The Sord M23 Series consists of 2 desktop microcomputer systems, Mark 41 and Mark X, designed specifically for product planning, cost analysis, financial planning, and other applications requiring extensive computations. Based on an 8-bit microprocessor with a separate high-speed arithmetic unit, both systems feature 128KB of RAM and 1MB of diskette storage. A fixed disk drive is standard on the Mark X. IBM 3270 terminal emulation is provided at up to 19.2K bps.

Software support consists of the Sord operating system and high-level programming languages.

Sord has contracted with Xerox to provide third-party maintenance from the 82 Xerox offices nationwide.

**System Design** The M23 Series is based on an 8-bit Zilog Z80A microprocessor with a separate arithmetic processor and 128KB of RAM. The Mark 41 features 2 integral 5-1/4-inch diskette drives with 1MB of storage each; Mark X has 1 of these drives and supports an optional 7.5MB Winchester disk drive.

A 12-inch-diagonal green-phosphor monitor or 14-inch-diagonal color monitor (each with 2,000-character capacity) is available on both systems. Standard features include 8-color graphics with a resolution of 640 by 256 pixels and a full-function ASCII keyboard with 10-key numeric keypad.

Software support consists of Sord's operating system, which runs BASIC, UCSD Pascal, FORTRAN, and an assembler with a debugger. An optional Lifeboat Associates operating system, SB-80, provides complete compatibility with the Digital Research CP/M operating system.

**Competition & Pricing** The M23 Series competes with the Computhink Eagle 32, Intertec Compustar Model 30, Onyx Sundance II, and Wicat System 100.

Pricing for the M23 Series starts at \$1,995.

**M68 System**

**Overview** The Sord M68 System is a desktop microcomputer designed for commercial and scientific applications. Utilizing a dual-processor design, the M68 supports a maximum 1MB of RAM and 7.9MB of fixed disk storage. Standard features include a 12-inch-diagonal monochrome or color CRT, detachable ASCII keyboard, and various ports.

The M68 is supported by Sord's proprietary operating system, which accommodates several high-level programming languages.

Maintenance for the M68 System is provided by Xerox through its 82 offices nationwide.

**System Design** The M68 is based on the 16-/32-bit Motorola MC 68000 microprocessor and 8-bit Zilog Z80 microprocessor. Standard memory is 256KB of RAM internally expandable to 1MB or externally expandable to 4MB through the addition of 256KB dynamic RAM boards. The Z80 processor can be used as an I/O controller when the M68 is running in 16-bit mode.

Disk storage devices available with the M68 include two 5-1/4-inch diskette drives with combined storage of 1.2MB; an 8-inch, 1.2MB diskette drive; and a 5-1/4-inch 10MB or 20MB fixed disk drive.

A 12-inch-diagonal CRT available in a monochrome or color version displays 2,000 characters in 25 lines of 80 characters each. High-resolution graphics displayed in 16 colors within a 640-by-400-pixel format is also standard.

Other standard features include a detachable ASCII-style keyboard with numeric keypad, 2 serial I/O ports, a Centronics-compatible printer port, and IEEE-488 bus interface.

M68 software consists of Sord's proprietary operating system, which accommodates UCSD p-System, BASIC, FORTRAN, and Pascal programming languages.

**Competition & Pricing** Competition for the Sord M68 is provided by the Computhink Eagle 32, Data General MPT/100, Fortune 32:16, and IBM Personal Computer XT.

The M68 base system with 256KB of RAM and monochrome monitor costs \$4,490. The M68 with 1MB of RAM and color monitor costs \$5,990.

**Sperry Corp**

PO Box 500  
Blue Bell PA 19424

(215) 542-4011

**Sperry Personal Computer**

**Overview** In December 1984, Sperry introduced the Sperry Personal Computer, a 16-bit system available in 7 preconfigured models. All models are compatible with the IBM Personal Computer.

The Sperry Personal Computer supports up to 640KB of main memory, 640KB of diskette storage, and a 10MB fixed disk drive. Sperry Personal Computer models are configured with either a monochrome or color graphics display. The system runs under the Microsoft MS-DOS operating system and supports applications software available for MS-DOS.

Sperry warrants its personal computer for 90 days. Service for the Sperry Personal Computer is available with a Sperry Personal Computer Maintenance Agreement. Service options include on-call, over-the-counter, and central-office repair service.

**System Design** The Sperry Personal Computer features an Intel 8088 microprocessor with 256KB of RAM expandable to 640KB as well as 20KB of ROM for test and BIOS. All models use the same I/O bus architecture, memory organization, disk formats, and graphics organization as the IBM Personal Computer.

The 7 Sperry Personal Computer models are Models 100, 200, 250, 300, 400, 450, and 500. All models include 256KB of RAM, RS-232C and current-loop interfaces, and an 84-key keyboard.

Model 100 includes a 320KB diskette, 5 expansion slots, a 12-inch-diagonal monochrome display, and a Centronics-compatible printer interface. Model 200 has the same features as Model 100 but includes two 320KB diskettes. Models 250 and 300 include two 320KB diskettes, 4 expansion slots, and a 12-inch color graphics display. Model 400 features a 320KB diskette, one 10MB fixed disk, 4 expansion slots, and a 12-inch monochrome display. Models 450 and 500 have the same features as Model 400, except the former features a 12-inch-diagonal color graphics display.

Software for the Sperry Personal Computer includes the MS-DOS 2.11 operating system and Microsoft GWBASIC programming language. Additional software includes the Ashton-Tate dBASE II; Microsoft Multiplan; MicroPro International WordStar, SpellStar, and Mail Merge; Peachtree Software business application series; and Sperry UNISCOPE Terminal Emulation.

**Competition & Pricing** Competition includes the IBM Personal Computer and Personal Computer XT, Columbia MPC, and Eagle PC.

The Sperry Personal Computer ranges in price from \$2,417 for a Model 100 to \$5,502 for a Model 500.

**Tandy Corp**

1800 One Tandy Ctr  
Fort Worth TX 76102

(817) 390-3700

**Radio Shack TRS-80 Model 12**

**Overview** Tandy's Radio Shack Division introduced the 8-bit TRS-80 Model 12 microcomputer in January 1983. Model 12 is designed for professionals and small businesses handling inventory control, medical records, and accounting applications.

TRS-80 Model 12 supports up to 144KB of main memory, 2.5MB of diskette storage, and 60MB of Winchester disk storage and is compatible with TRS-80 Model 16.

Available software for Model 12 includes the TRSDOS operating system, programming languages, and various application programs.

Maintenance and support are provided by the Radio Shack network of 7,000 retail stores. When equipment needs repair, it is sent to the nearest service center, providing a relatively fast turnaround time.

**System Design** Model 12 is based on an 8-bit Zilog Z80A microprocessor with direct memory access and vectored interrupts and features 80KB of main memory expandable to 144KB or 512KB. A VisiCalc memory expansion board increases main memory to 144KB; a Model 16 upgrade kit supports 16-/32-bit processing capabilities on Model 12 and expands its memory to 512KB.

The TRSDOS operating system includes I/O drivers, a supervisor program, a keyahead feature that buffers commands for execution while others are entered, utilities, a communications command set, and 37 library commands. Languages supported by TRSDOS include BASIC, RBASIC (a compiled version for new program development), COBOL, and FORTRAN.

Model 12 is software compatible with and supports applications written for Model II, including an inventory management system, accounting procedures, and the SCRIPSIT WP program.

The basic Model 12 configuration includes a CPU with 80KB of main memory, a high-resolution 12-inch-diagonal display with 82-key keyboard, 1.25MB of diskette storage, 2 RS-232C serial ports, a parallel port, and an external disk bay port. The disk bay port connects printers, plotters, modems, diskette drives, and up to 48MB of Winchester disk storage.

**Competition & Pricing** Model 12 competes with the Apple IIe, Franklin Computer Ace 1000, and NEC PC-8000.

A basic Model 12 configuration is priced at \$2,799.



**Tandy Corp**1800 One Tandy Ctr  
Fort Worth TX 76102

(817) 390-3700

**Radio Shack TRS-80 Model 4**

**Overview** Tandy Corporation's Radio Shack Division introduced the TRS-80 Model 4 desktop microcomputer in April 1983. The self-contained personal computer supports from 64KB to 128KB of main memory and up to 736KB of diskette storage and 60MB of hard disk storage. The TRS-80 Model 4 is targeted for business professionals and managers, educators, small business owners, and personal computer users.

Software for Model 4 includes the TRSDOS operating system, Microsoft BASIC programming language, and various application programs.

Radio Shack's network of 7,000 retail outlets provides the basis of Tandy's customer service. Users return faulty equipment to their local store, which then forwards the equipment to the nearest service center for repair. On-site service contracts are also available through Radio Shack.

**System Design** The TRS-80 Model 4 uses an 8-bit Zilog Z80 microprocessor that features 158 instructions, 17 standard registers, and decimal arithmetic functions.

Under TRSDOS, user-selected strings can be assigned to the alphabetical keys, allowing common TRSDOS or BASIC commands to be stored and accessed with a simple keystroke. TRSDOS contains a complete job control language that handles unattended operations and controls the application. TRSDOS supports Microsoft's BASIC programming language for program development.

TRS-80 Model 4 can run existing TRS-80 Model III software with no conversions. The diskette-based systems can also run CP/M Plus-based programs and applications based on the Logical Systems LDOS operating system.

Model 4 is available in several configurations, including a cassette-based system with 16KB of RAM. The single-diskette version features 64KB of RAM and 184KB of diskette storage. The dual-diskette version is configured with 64KB of RAM and 368KB of diskette storage, an RS-232C port, and a parallel printer interface.

All TRS-80 Model 4 configurations feature a high-resolution 12-inch-diagonal green-phosphor monitor and a typewriter-style keyboard with 12-key numeric keypad.

**Competition & Pricing** Competition for the Tandy Radio Shack TRS-80 Model 4 includes the Apple IIe and low-end models of the IBM Personal Computer.

A dual diskette-based system is priced at \$1,299.

**Tandy Corp**1800 One Tandy Ctr  
Ft Worth TX 76102

(817) 390-3700

**Tandy 1000**

**Overview** Introduced in November 1984, the Tandy 1000 is an IBM-compatible desktop personal computer. The system is distinctive among the compatibles for its bundled integrated software and low price. The system imitates the design of the IBM Personal Computer but improves on it in details such as the placement of the keyboard cable socket and joystick ports on the front of the unit.

**System Design** The Tandy 1000 uses the 8-/16-bit, 4.77MHz Intel 8088 processor. Standard RAM is 128KB, expandable to 640KB. The basic system includes 1 half-height, 5-1/4-inch diskette drive with 360KB of storage. A second drive is optional. A monitor is not included in the basic unit; however, a 12-inch green monochrome monitor and a color monitor are available. The color monitor displays 8 of 16 colors simultaneously. Built-in graphics support enables either monitor to display 640-by-200-pixel graphics in addition to 80 or 40 characters by 25 lines of text. The 90-key keyboard does not follow the IBM format but includes 12 function keys across the top of the number row.

Standard I/O connections include a parallel port and connectors for monochrome, RGB, and composite video monitors; 3-voice audio; a light pen; and 2 joysticks. In addition, 3 IBM-compatible expansion slots are provided. Expansion cards available from Tandy include a 300-baud modem, an RS-232C serial port, a Winchester disk controller, and a mouse controller board with a clock and calendar.

Tandy's DeskMate integrated software package, included in the price of the basic unit, provides word processing, spreadsheet, filing, communications, calendar, and electronic mail capabilities, all on one diskette. In addition, the 1000 runs IBM Personal Computer software, such as the Lotus Development 1-2-3, Ashton-Tate dBase III, and Multimate International Multimate.

**Competition & Pricing** The Tandy 1000 competes with the IBM Personal Computer and compatible systems.

Pricing for the Tandy 1000 begins at \$1,199.



**Tandy Corp**1800 One Tandy Ctr  
Fort Worth TX 76102

(817) 390-3700

**Tandy Corp**1800 One Tandy Ctr  
Fort Worth TX 76102

(817) 390-3700

**Tandy 1200 HD**

**Overview** The Tandy 1200 HD personal computer is hardware and software compatible with the IBM Personal Computer XT and provides the same basic hardware configuration, including a single diskette drive and a Winchester disk. The Microsoft MS-DOS 2.11 operating system is provided, and Tandy states that the system runs software designed for the IBM Personal Computer XT. Monochrome and color monitors are available for the system.

**System Design** The Tandy 1200 HD is based on the 16-bit, 4.77MHz Intel 8088 microprocessor, which is also used in the IBM Personal Computer. A slot for an optional Intel 8087 mathematics coprocessor is provided. Main memory is 256KB, expandable to 640KB. Five expansion slots are included (2 are normally used for disk controllers). A parallel printer interface is standard.

Monochrome or color display adapters are available. The color display adapter supports graphics on a suitable monitor. A TECMAR Graphics Master card can be used to provide 640-by-400-pixel resolution and 16 colors. This card includes PC Paintbrush software, which provides drawing capabilities similar to those of Apple's MacPaint software.

TECMAR's optional Captain board adds 384KB RAM, an RS-232C serial port, a second parallel port, a clock/calendar, and RAM disk and RAM spooler software.

Microsoft MS-DOS 2.11 and BASIC 2.0 are available from Tandy. Applications software available from Tandy includes MicroPro International WordStar Professional, Software Publishing PFS Series, and Ashton-Tate dBase III and Framework. The system and software are available through Tandy's network of Radio Shack stores.

**Competition & Pricing** The Tandy 1200 HD competes with the IBM Personal Computer XT and with IBM-compatible, disk-based systems, including the COMPAQ DESKPRO, Seequa/XT, Corona PC, and Sperry Personal Computer.

Prices for the 1200 HD start at \$2,999. A system with 256KB RAM, a monochrome monitor, and an adapter costs \$3,437.

**Tandy 2000**

**Overview** The Tandy 2000, introduced in November 1983, is a 16-bit computer based on the Microsoft MS-DOS operating system. Designed for business and professional use, the Tandy 2000 can be a desktop system, or the CPU can be mounted on a floor stand under or beside a desk.

The Tandy 2000 supports up to 768KB of main memory and a 10MB disk drive. The system can be configured with a monochrome or color high-resolution monitor.

Tandy provides maintenance and support through its nationwide network of Radio Shack stores. On-site and carry-in service are available. Software support includes training classes, a newsletter, and a telephone hot line.

**System Design** The Tandy 2000 is built around an Intel 80186 processor with a 16-bit data path. The processor features an 8MHz clock speed and is object code compatible with Intel 8086 and 8088 processors. There are 2 DMA channels and 3 programmable timers. Model 2000 includes a standard parallel port and an RS-232C serial communications port. Standard memory is 256KB of parity-checking RAM, expandable to 768KB.

A typical configuration includes 256KB of RAM and two 5-1/4-inch diskette drives with 720KB each. An expanded system can include 256KB of RAM, a 720KB diskette drive, and a 10MB disk drive. Both configurations include the 90-key typewriter-style keyboard with numeric keypad and 12 programmable function keys. The keyboard also features a 6-foot coil cable. Options for Model 2000 include a 12-inch-diagonal monochrome or 14-inch-diagonal color monitor, and a digital mouse (Digi-Mouse). The Tandy 2000 features 4 user-accessible plug-in card slots for internal expansion.

The system runs under the MS-DOS operating system and supports BASIC, COBOL, C, FORTRAN, Pascal, and a macroassembler. Applications software includes Microsoft Multiplan; Lotus 1-2-3; Multimate International Multimate; Software Publishing PFS:File, PFS:Report, and PFS:Graph; Ashton-Tate dBase II; and MAI/Basic Four General Ledger and Accounts Payable/Receivable.

**Competition & Pricing** Competition for the Tandy 2000 includes the IBM Personal Computer, Texas Instruments Professional Computer, and COMPAQ DESKPRO.

Model	Price \$
2000	2,499
2000 (w/10MB disk)	3,950



**TeleVideo Systems Inc**

550 E Brokaw Rd  
San Jose CA 95112

(408) 971-0255

**Tele-PC PLUS, Tele-XT PLUS**

**Overview** TeleVideo Systems announced two IBM-compatible computers in late 1983—the Tele-PC PLUS and the Tele-XT PLUS, which are hardware and software compatible with the IBM Personal Computer and Personal Computer XT, respectively.

Both systems support up to 640KB of main memory. Maximum diskette storage is 720KB; the Tele-XT PLUS also supports a 10MB Winchester disk drive.

Because these systems are software compatible with the IBM Personal Computer product line, they can run IBM Personal Computer application programs.

TeleVideo computers are serviced by TRW's national network of service centers and by TeleVideo authorized distributors.

**System Design** The Tele-PC PLUS and Tele-XT PLUS are based on the 16-bit Intel 8088 microprocessor. The Tele-PC PLUS is configured with 256KB of main memory expandable to 640KB; the Tele-XT PLUS is also configured with 256KB of memory.

Each system is equipped with an RS-232C serial port and an IBM-style DB-25S parallel printer port. The Tele-PC PLUS and Tele-XT PLUS are configured with a 14-inch-diagonal CRT that includes a standard graphics resolution of 640 by 200 pixels and an IBM-compatible keyboard.

The Tele-PC PLUS is configured with two 5-1/4-inch diskette drives with 360KB of storage each. The Tele-XT PLUS features a single 5-1/4-inch 360KB diskette and a 10MB Winchester disk drive.

Software includes the Microsoft MS-DOS-compatible operating system, Tele-DOS, and the TeleSolutions-PC applications package. Users can take advantage of a large base of third-party, MS-DOS-compatible application programs.

**Competition & Pricing** Competition for the Tele-PC PLUS and Tele-XT PLUS includes the IBM Personal Computer and Personal Computer XT, Sperry Personal Computer, Columbia MPC, and Wang Professional Computer.

Model	Purchase Price \$
Tele-PC PLUS	2,595
Tele-XT PLUS	3,995

**TeleVideo Systems Inc**

550 E Brokaw Rd  
San Jose CA 95112

(408) 971-0255

**TS 1603**

**Overview** The TeleVideo Systems TS 1603 16-bit personal computer is designed to be used as a standalone system or part of a personal computer network. Main memory can be expanded to 256KB.

Software for the TS 1603 comprises 2 operating systems, high-level programming languages, and several personal and business applications.

TRW's customer service division provides maintenance and service support for customers in the U.S. Local TeleVideo distributors provide service for overseas customers.

**System Design** The TS 1603 is based on a 16-bit Intel 8088 microprocessor with 128KB of RAM expandable to 256KB. A total of 4KB of erasable PROM is available for extensive self-diagnostic functions.

TS 1603 systems run under the Digital Research CP/M-86 or Microsoft MS-DOS Version 2 operating system. Both 8- and 16-bit software applications can be processed simultaneously under CP/M-86. The TS 1603 can be programmed in BASIC and COBOL. Applications software include general business and accounting applications and the Graftalk business graphics system. Digital Research's GSX-86 graphics system is an extension to CP/M-86.

A basic TS 1603 configuration includes 128KB of RAM, 2MB of diskette storage, 2 RS-232C serial ports, and an RS-422 serial port for interfacing to TeleVideo's personal computer network.

**Competition & Pricing** The Digital Equipment Rainbow 100 and IBM Personal Computer XT compete with the TS 1603.

Model	Price \$
TS 1603	2,995



**TeleVideo Systems Inc**550 E Brokaw Rd  
San Jose CA 95112

(408) 971-0255

**TS 802 Series**

**Overview** The TS 802 Series features 2 single-user desktop microcomputer systems—the TS 802 and TS 802H/20. Both systems feature an 8-bit microprocessor, 64KB of RAM, and 4KB of EPROM. The TS 802 has 1MB of diskette storage; the TS 802H/20 has 15.4MB of Winchester disk storage and a diskette drive with 500KB of storage.

The TS 802 Series uses the Digital Research CP/M 2.2 operating system, which supports a number of high-level programming languages.

Maintenance and support are provided by TRW's customer service division in the U.S. and by local TeleVideo distributors overseas.

**System Design** Based on a Zilog 8-bit Z80A microprocessor, the TS 802 Series supports 64KB of RAM main memory with direct memory access.

The TS 802 model has dual 5-1/4-inch diskette drives with 1MB of storage, and the TS 802H/20 model has one 5-1/4-inch 500KB diskette drive and one 5-1/4-inch Winchester disk drive with 15.4MB of storage.

Both models include a 12-inch-diagonal CRT, with a 2,000-character capacity, and a detachable typewriter-style keyboard with 96 ASCII and 32 control characters.

Standard software includes the Digital Research CP/M 2.2 operating system and TeleVideo MmmOST service operating system. High-level programming languages supported on the TS 802 Series include BASIC and COBOL. MicroPro WordStar word processing software and CalcStar business planning software are available as options.

The TS 802 Series can be equipped with 2 RS-232C serial ports, or 1 RS-232C serial port and 1 RS-422 high-speed port. The systems will also support a Centronics parallel printer port. The TS 802 Series can support data transmission rates of up to 19.2K bps.

**Competition & Pricing** Competition for the TeleVideo TS 802 Series includes the Sord Computer M23 Series, Epson America QX-10, and Tandy Radio Shack TRS-80 Model 4.

Model	Price \$
TS 802	3,495
TS 802H/20	5,995

**TeleVideo Systems Inc**550 E Brokaw Rd  
San Jose CA 95112

(408) 971-0255

**TS 803 Series**

**Overview** The TS 803 Series of personal computers comprises two single-user, desktop microcomputers: the TS 803 and TS 803H. Both are 8-bit systems and support up to 128KB of RAM and 8KB of EPROM. The TS 803 has dual diskette drives, while the TS 803H includes a Winchester disk and a diskette drive. A display, detachable keyboard, serial port, and modem port are standard.

TS 803 software includes the Digital Research CP/M 2.2 operating system and programming languages.

The TRW Customer Service Division provides maintenance for the TS 803 Series in the U.S. Local TeleVideo distributors provide maintenance overseas.

**System Design** The TS 803 Series is based on an 8-bit Zilog Z80A microprocessor with 64KB of dynamic RAM (expandable to 128KB) and DMA.

Model TS 803 includes dual 5-1/4-inch diskette drives with 1MB of total storage, while the TS 803H model features a 5-1/4-inch diskette drive with 500KB of storage and a 5-1/4-inch Winchester disk drive with 10.4MB of storage.

Both models include a 14-inch-diagonal CRT with a 2,000-character capacity, 640-by-240-pixel resolution, and detachable typewriter-style keyboard with 96 ASCII and 32 control characters.

Standard software includes the CP/M 2.2 operating system and TeleVideo MmmOST service operating system. Programming languages supported included BASIC and COBOL. TeleSolutions II business software, TeleWrite WP, as well as TeleChart and TeleCalc financial planning software are also bundled with the system.

TS 803 Series systems can be equipped with 2 RS-232C serial ports (1 serial printer port and 1 modem port). Data communications at up to 19.2K bps is supported.

**Competition & Pricing** Competition for the TeleVideo TS 803 Series includes the Apple II+, IBM Personal Computer XT, NEC Advanced Personal Computer, and Toshiba T100 microcomputers.

Model TS 803 is priced at \$2,495; the TS 803H costs \$3,995.



**Texas Instruments**

Data Systems Group  
PO Box 402430  
Dallas TX 75240

(800) 527-3500

**Professional Computer**

**Overview** Texas Instruments introduced the 16-bit Professional Computer in January 1983. The Professional Computer is designed for general business, WP, and graphics applications. Texas Instruments is marketing the Professional Computer through its Authorized Dealer Program—a network of retail outlets that also supply maintenance and support. Texas Instruments is also selling the Professional Computer directly to large companies.

The Professional Computer supports up to 768KB of main memory, 640KB or 680KB of diskette storage, and 10MB of Winchester disk storage.

Software supported by the system includes various operating systems, high-level languages, and application programs.

Maintenance and support are provided by authorized dealers and Texas Instruments field service representatives or through Texas Instruments service depots.

**System Design** The Professional Computer features a 16-bit Intel 8088 microprocessor, 8KB of ROM expandable to 16KB, and 128KB of RAM expandable to 768KB in 64KB and 256KB increments. An Intel 8087 companion processor is optionally available for the system. The 8087 is designed for math-intensive applications.

Operating systems include the Microsoft MS-DOS Version 2.1, Digital Research CP/M-86 and Concurrent CP/M-86, and UCSD p-System. Languages supported by the operating systems are BASIC, COBOL, FORTRAN, and Pascal. Application programs, available from Texas Instruments and such third-party vendors as Ashton-Tate, MicroPro International, and Lotus Development Systems, include various accounting, financial modeling and planning, data base management, graphics, and WP packages.

A basic configuration for the Professional Computer includes the system unit with 128KB of RAM, a 97-key keyboard with numeric keypad, a 12-inch-diagonal high-resolution display, 320KB or 360KB diskette drive, 5 expansion slots, and a parallel printer port. Options include an asynchronous/synchronous communications board and 10MB Winchester disk drive.

**Competition & Pricing** Competition for the Professional Computer includes the COMPAQ, NCR Decision Mate V, IBM Personal Computer, and Digital Equipment Rainbow 100.

The basic configuration for a Professional Computer is priced at \$2,495.

**Torch Computers**

Abberley House  
Great Shelford  
Cambridge CB2 5LQ  
England

(0223) 841000

**C-Series**

**Overview** The Torch C-Series represents 6 micro-computer models designed for communicating and networking business applications. The models differ mainly in their memory configuration and the main processor. All models feature high-resolution graphics, a Digital Research CP/M-compatible operating system, and a comprehensive package of business and communications software.

**System Design** In C-500 models, a Zilog Z80A processor with a 64KB RAM runs the applications software while a slave Synertek 6502 processor handles the peripherals. In C-68000 models, the applications processor is upgraded to a Zilog Z80B, and an additional Motorola 68000 processor with 256KB of RAM is provided for running 16- or 32-bit software. All models include an RS-423 serial port, a Centronics parallel port, a TORCHNET/ECONET port, 4 analog-to-digital channels, UHF and RGB outputs, a cassette I/O port, and a direct telephone line connection.

Software for the system includes the TORCHNET operating system, Torchmail Plus, and Torchtel (Viewdata videotex access); the Perfect Software Perfect Writer, Perfect Speller, Perfect Calc, and Perfect Filer; Executive Aid, and BBCBASIC. Other operating systems supported include the AT&T Bell Laboratories UNIX System III, for C-68000 models only, and the Softech Microsystems Inc UCSD p-systems. The C-Series supports a wide range of programming languages, including COBOL, FORTRAN, Pascal, BASIC, FORTH, LISP, C, and Pilot.

**Competition & Pricing** The Torch C-Series competes with the North Star Horizon because of its similar networking capabilities; it also competes with the Tele-video TS 803 Series.

Model	Price £
C-500 w/dual diskette	2,950
C-500 w/20MB Winchester disk drive	5,650
C-500 w/dual diskette & sync adapter	3,150
C-500 w/20MB Winchester disk drive & sync adapter	5,850
C-68000 w/dual diskette & triple processor	3,550
C-6800 w/20MB Winchester disk drive & triple processor	5,900

**Torch Computers**

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**Torch 725**

**Overview** The Torch 725 is a triple-processor system designed to allow the user a choice of Digital Research CP/M or AT&T Bell Laboratories UNIX software; it uses a Synertek 6502 processor to control the peripheral and I/O devices and two applications processors for CP/M and UNIX programs. The Torch 725 is supplied with a tilt-adjustable, high-resolution color monitor and a 102-key keyboard with 19 function keys, cursor keys, and a numeric keypad.

**System Design** The 725 incorporates a 2MHz 6502 peripheral processor, a 6MHz Zilog Z80B application processor, an 8MHz Motorola 68000 32-bit application processor, and a TMS 5220 speech processor. The basic system includes 288KB of RAM, expandable to 1MB; an RS-423 serial port, a Centronics parallel port, a TORCHNET port, 4 analog-to-digital channels, 2 sense lines, RGB output, Mains output, 2 400KB diskette drives, and one 20MB Winchester disk drive.

Software for the system includes the Torch Computer TORCHNET and the CPN operating system; UNIX; disk utilities; a music system; miscellaneous utilities; Perfect Software Perfect Writer, Perfect Filer, Perfect Calc, and Perfect Speller; Executive Aid, and BBC-BASIC. (CPN is compatible with CP/M.) The system can also support the Softech Microsystems Inc UCSD p-system operating system. The TORCHNET software allows up to 254 computers on a network to share data and peripherals. A wide range of programming languages is available.

**Competition & Pricing** The Torch 725 competes with the IBM Personal Computer and Personal Computer AT and the Altos Computer Systems Altos 586.

Model	Price £
725	5,650
725/U (w/UNIX)	6,050

**Toshiba America Inc**

2441 Michelle Dr  
Tustin CA 92680

(714) 730-5000

**T300**

**Overview** Toshiba America introduced the T300 personal/business computer in late 1983. The T300 is configured as a complete system, including either a color or monochrome display, and is available in two models—one featuring a single diskette drive and another with dual diskette drives. Both T300 models support up to 512K bytes of main memory and 1.2M bytes of diskette storage. A 10M-byte Winchester disk drive is optional.

The T300 is designed for WP, graphics, and general business applications. Standard software includes the Microsoft MS-DOS operating system with T-BASIC 16.

Toshiba America and its nationwide network of distributors provide maintenance and support for the T300.

**System Design** The T300 CPU is built around a 16-bit Intel 8088 microprocessor with 256KB of main memory, a 6-MHz clock speed, 3 video ports, a Centronics-compatible parallel printer interface, an RS-232C serial interface, and 7 expansion slots. The T300 features a detachable, low-profile keyboard with 103 keys in a standard typewriter layout, separate numeric keypad, and set of function keys.

The T300 system is available in 2 models: System 1 and System 2. Both models are configured with 256KB of main memory (expandable to 512KB) and the CPU. A 12-inch-diagonal green-phosphor display and two 14-inch color displays are available. System 1 is equipped with one 5-1/4-inch, 640KB diskette drive; System 2 features 2 of these drives. System 1 can be field upgraded to a System 2.

Options for the T300 include an Intel 8087 numeric processor, a graphics adapter, a color-palette board, an IEEE-488 board, a multifunctional RS-232C board, a disk controller, and a 10MB Winchester disk drive. Two 14-inch-diagonal color displays are also optional.

Software bundled with the T300 includes the Microsoft MS-DOS 2.0 with T-BASIC16, Microsoft Multiplan, and Multimate International MultiMate. Additional software includes the Digital Research CP/M-86 with CBASIC-86 and a number of third-party application programs.

**Competition & Pricing** The T300 competes with the IBM Personal Computer, Eagle PC, and Mad Computer Mad-1.

Model	Purchase Price \$
T300 System 1	1,650
T300 System 2	1,725



**Vector Graphic Inc**500 N Ventu Park Rd  
Thousand Oaks CA 91320

(805) 499-5831

**Vector 3**

**Overview** The Vector 3 is designed for small businesses, departments of large corporations, and self-employed professionals. Used as a basis for several single-user systems, the Vector 3 features the 8-bit Zilog Z80A microprocessor and 56KB of RAM.

Vector Graphic products are serviced through an agreement with TRW's customer service division for nationwide on-site service.

**System Design** The Vector 3 Z80A-based CPU incorporates NMOS technology, 128 interrupt levels, a standard set of 158 instructions, and 17 standard registers. Systems using the Vector 3 computer include the 2600, 2800, 3005, 3030, and Vector Intelligent Partner (VIP).

The System 2600 features 64KB of RAM, plus dual double-sided quad-density diskette drives with a storage capacity of up to 1.2MB. Interrupts and data transfers are performed through a dual-mode controller, with 256-byte sector buffering. The S-100 bus and RS-232C port provide communications and network applications.

The System 2800 includes a dual 8-inch diskette drive with 2MB capacity, as well as 3 PROM slots, three 8-bit parallel ports, and 1 serial port. The serial port features programmable data protocol and switch-selectable asynchronous rates between 110 and 9,600 bps.

The System 3005 features a 5MB Winchester disk drive, 56KB main memory, and 630KB diskette drive for backup. An RS-232C serial port with programmable data protocol is standard, as well as three 8-bit parallel ports with switch-selectable baud rates.

The System 3030 offers from 32MB to 128MB of hard disk storage, plus 630KB of diskette storage.

The VIP is at the low end of the series, featuring a single 5-1/4-inch diskette drive with 315 characters of online storage.

Vector Graphic offers a variety of software, including the CP/M operating system from Digital Research, the Memorite III word processing package, and a number of programming languages, including BASIC, FORTRAN and Pascal.

**Competition & Pricing** Vector Graphic systems based on the Vector 3 compete with the Xerox 820-II, Apple II and III, and Cromemco computer systems.

Vector Graphic systems range in price from the VIP, which is \$3,995, to the System 3030, which is \$12,750.

**Vector Graphic Inc**500 N Ventu Rd  
Thousand Oaks CA 91320

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**Vector 4**

**Overview** The Vector 4, an advanced desktop microcomputer system, features dual-processor architecture and access to more than 1,000 CP/M-based application programs. Available in several models, the Vector 4 offers 128KB of main memory expandable to 256KB and supports up to 1.4MB of diskette storage and 36MB of Winchester disk storage.

Digital Research's CP/M-86 operating system and numerous high-level programming languages are supported.

Vector Graphic provides a nine-month service warranty that covers all parts and on-site labor for qualified systems at no charge.

**System Design** The Vector 4 incorporates an 8-bit Zilog Z80 microprocessor and 16-bit Intel 8088 processor to access all CP/M-based application programs. Main memory is time shared between the CPU and video display controller and can be expanded from 128KB to 256KB. Memory mapping logic allows the Z80 processor to access the entire memory in increments as small as 2KB.

A Vector 4 basic configuration includes 128KB of memory and 737KB of diskette storage; additional configurations include a second diskette and 5MB, 10MB, or 36MB of Winchester disk storage. A 12-inch-diagonal P-31 monitor is standard. The Vector 4 generates standard color signals to drive an optional multicolor CRT display. The standard 91-key detachable keyboard features its own dedicated microprocessor; Vector provides I/O connectors for the keyboard as well as parallel interfaces for Centronics, Qume, and NEC printers.

Software supported on the Vector 4 includes the Digital Research CP/M-86 Phase One Oasis, and Microsoft MS-DOS operating systems. Languages and utilities include Microsoft's BASIC-80, SCOPE program editor, RAID program debugger, and ZSM assembler.

**Competition & Pricing** Competition for the Vector 4 microcomputer system includes Modular Computer's Supermicro 8, the Altos ACS-8600, the Zenith Z-100, and IBM's Personal Computer.

Vector 4 systems range in price from \$3,295 to \$9,995.

**Vector Graphic Inc**500 N Ventu Park Rd  
Thousand Oaks CA 91320

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**Vector SX**

**Overview** In March 1984, Vector Graphic introduced the Vector SX, which features an 8-bit processor in addition to a 16-bit processor. The system is designed for business, professional, scientific, and engineering applications.

Vector SX provides a maximum 896KB of main memory, 1.4MB of diskette storage, and 36MB of Winchester disk storage. The Vector SX is available in 4 models: 2000, 3000, 4500, and 5000. Also supported by the Vector SX is the LINC local area network. LINC permits 2-32 Vector SX single-user computers to be linked.

Standard software available for the Vector SX includes the Digital Research CP/M-86 and CP/M-80 simulator. Several operating systems are optional, as are high-level programming languages and applications software.

Maintenance and support are provided by the Vector Graphic network of authorized dealers and distributors.

**System Design** Vector SX systems are designed around an 8-bit Zilog Z80B processor and a 16-bit Intel 8086 processor. An optional Intel 8087 math coprocessor is also available for the system. The 8086 processor gives the Vector SX an 8MHz clock speed.

A basic Vector SX configuration includes dual processors, 3 modified S-100 expansion slots, 128KB of RAM expandable to 896KB in 128KB increments, an integral 12-inch-diagonal green-phosphor display, a detached keyboard, a tone generator, 2 RS-232C serial ports, and 2 parallel ports. Software provided with the basic configuration includes the CP/M-86 operating system, GSX-86 Graphics System extensions, a CP/M-80 emulator, and the SCOPE 8-bit text editor.

Model 2000 also includes two 737KB diskette drives. Model 3000 features one 737KB diskette drive and a 10MB Winchester disk drive. Model 4500 has a 737KB diskette drive and a 28MB Winchester disk drive. Model 5000 is configured with a 737KB diskette drive and 36MB Winchester disk drive.

Optional operating systems include Digital Research's Concurrent CP/M-86 and Microsoft's MS-DOS. Programming languages supported include BASIC, COBOL, and FORTRAN.

**Competition & Pricing** Competition for the Vector SX includes the IBM Personal Computer XT, Digital Equipment Professional 300 Series, and Sperry Personal Computer.

Model	Price \$
2000	4,295
3000	6,295
5000	9,995

**VIASYN Corp**3506 Breakwater Ct  
Hayward CA 94545

(415) 786-0909

**CompuPro 816/A**

**Overview** CompuPro changed its name to VIASYN in January 1985. The CompuPro 816/A is an entry-level, single-user system for such applications as word processing, business and financial planning, data base management, and other business functions. It supports a full line of peripherals commonly used in the business environment and can accommodate future expansion.

The system is marketed to OEMs, system integrators, and such sophisticated end users as software developers and computer manufacturers. The system boards and mainframe enclosure are warranted for 12 months and the disk drive, for 6 months. On-site service is provided by the Xerox Service Group. Micro Support provides remote and on-site software support.

**System Design** The CompuPro 816/A includes the CompuPro Intel 8085/8088 CPU board running at clock rates of 6MHz and 8MHz, 128KB of high-speed RAM, 4 serial ports and 1 parallel and 1 Centronics printer port, and two 8-inch diskette drives storing a total of 2.4MB. The 8085/8088 is a dual-processor board that allows concurrent execution of 8- and 16-bit programs.

Software available for the system includes the CP/M 8-16 operating system as well as the Proteus Engineering WRITE, Sorcim SuperCalc-86, Summit Software Hyper Typer, Gensoft Field Companion, and Ashton-Tate dBase II. CP/M 8-16 is based on the Digital Research CP/M-86; it is a 16-bit system that relegates 8-bit applications as tasks to the 8-bit processor for execution.

**Competition & Pricing** The CompuPro 816/A competes with the OSM Computer Zeus PC, the Altos Computer Systems ACS 8600, and the Alpha Micro AM-680 Series ELS.

A single-user CompuPro 816/A, as described, costs \$5,495.



**VIASYN Corp**3506 Breakwater Ct  
Hayward CA 94545

(415) 786-0909

**CompuPro 816/E**

**Overview** CompuPro changed its name to VIASYN in January 1985. The CompuPro 816/E is a 32-bit single-user system designed for business, industry, and science applications. (The 816/E is a multiuser version.)

The 816/E is marketed to OEMs, system integrators, and such sophisticated end users as software developers and computer manufacturers. The system has a limited 12-month warranty on the boards and mainframe enclosure and a 6-month warranty on the disk drive. On-site service is available through the Xerox Service Group. Micro Support provides remote and on-site software support.

**System Design** The CompuPro 816/E conforms to the IEEE 696 standard and is built around the CompuPro 10MHz 68000 CPU board. Standard features of this system include 512KB of main memory, expandable to 16MB; four serial ports; 1 parallel and 1 Centronics printer port; 1.5MB of M Drive/H, expandable to 4MB; and 2.4MB of diskette storage, expandable to 4.8MB.

The 816/E runs on the Digital Research CP/M 68K operating system and mapFORTH and is packaged with a C compiler. Its operating system allows programs written in C under UNIX to run in the CP/M environment.

**Competition & Pricing** The CompuPro 816/E competes with the Callan Data Systems Unistar 100 and the Stride Micro Stride 440.

The basic CompuPro 816/E costs \$8,995.

**VIASYN Corp**3506 Breakwater Ct  
Hayward CA 94545

(415) 786-0909

**CompuPro 816/Z**

**Overview** CompuPro changed its name to VIASYN in January 1985. The CompuPro 816/Z is a single-user system designed for business applications, such as word processing, business and financial planning, data base management, and other functions.

The system is marketed to OEMs, system integrators, and such sophisticated end users as software developers and computer manufacturers. The system has a limited 12-month warranty on the boards and mainframe enclosure and a 6-month warranty on the disk drive. On-site service is available from the Xerox Service Group. Micro Support provides remote and on-site software support.

**System Design** The CompuPro 816/Z features a 6MHz Zilog Z80B CPU, 64KB of RAM, three serial ports, 1 parallel and 1 Centronics printer port, and two 8-inch diskette drives storing a total of 2.4MB. It may be expanded to include an optional diskette or fixed disk subsystem.

Available software includes the Digital Research CP/M-80 Version 2.2, Sorcim SuperCalc, Proteus Engineering WRITE, Ashton-Tate dBASE II, Summit Software Hyper Typer, and Field Companion.

**Competition & Pricing** The CompuPro 816/Z competes with the OSM Computer Zeus PC, the Altos Computer Systems Altos Series 5, and the North Star Horizon.

The basic System 816/Z costs \$4,995.



**Wang Laboratories Inc**

One Industrial Ave  
Lowell MA 01851

(617) 459-5000

**Professional Computer**

**Overview** The Professional Computer, first announced by Wang Laboratories in May 1982, is a 16-bit microcomputer system that can function as a workstation on any Wang 2200, VS, OIS, or Alliance system. The Professional Computer can run in a standalone mode, through coaxial cable to other Wang products, through phone lines to Wang and non-Wang products, and through Wang's local area network, WangNet. The Wang Professional Computer is marketed to professionals and managers for data processing, word processing, and image processing functions.

The Professional Computer supports from 256KB to 640KB of RAM and 10MB to 30MB of Winchester disk storage.

Software supported by the system includes the Microsoft MS-DOS operating system and BASIC-86 interpreter.

Wang Laboratories provides maintenance and support for the system via the Wang Professional Computer Assistance Center.

**System Design** The Wang Professional Computer is based on the Intel 8086 microprocessor with 16-bit architecture and 16-bit internal and external data paths.

The basic configuration includes 256KB of RAM, 360KB of diskette storage, a keyboard, 3-channel direct memory access, an RS-232C asynchronous interface, a Centronics-compatible parallel printer interface, 5 expansion slots, and the MS-DOS and BASIC-86 interpreter.

The system supports a 12-inch monochrome or color monitor with 800-by-300-pixel resolution and a 101-key keyboard.

Additional software available for the system includes BASIC, Pascal, FORTRAN and COBOL compilers; communications software; and a variety of third-party applications packages.

**Competition & Pricing** The competition for the Wang Professional Computer includes the Digital Equipment Professional 300 Series, IBM Personal Computer, and Burroughs B 20.

Model	Price \$
Basic system	2,445
Basic w/10MB drive	4,455

**Xerox Corp**

1341 W Mockingbird La  
Dallas TX 75247

(214) 689-6100

**Xerox 16/8**

**Overview** The Xerox 16/8, a professional computer that supports concurrent processing capabilities, was introduced by Xerox in May 1983. The dual-processor 8-/16-bit system is designed to be used as a standalone unit or a workstation in an office communications network. Each processor has its own main memory, which permits a user to perform 2 computer operations concurrently.

Xerox is marketing the 16/8 through its direct sales force, Xerox retail stores, and other Xerox marketing channels.

The Xerox 16/8 supports up to 320KB of main memory, 8.2MB of Winchester disk storage, and 2MB of diskette storage. Three industry-standard operating systems are available for the Xerox 16/8 as well as various programming languages and application programs.

Several service options are offered by Xerox, including on-site service, carry-in service centers, pickup and delivery with or without a loaner system, and centralized depot service.

**System Design** The Xerox 16/8 features 2 processors: the 16-bit Intel 8086 and the 8-bit Zilog Z80A. The Intel 8086 has 128KB of main memory expandable to 256KB. The Zilog Z80A has 64KB of main memory. The Xerox 16/8 supports simultaneous 16- and 8-bit processing.

Three operating systems are available for the system: Digital Research CP/M-80 and CP/M-86 and Microsoft MS-DOS. BASIC, COBOL, and FORTRAN programming languages are supported. Application packages include WP, financial modeling, and business graphics. Additional software packages are available through independent software firms.

Xerox 820-II personal computers can be upgraded to the 16/8 system at the user installation. Existing 8-bit software for the 820-II can also be used on the 16/8 computer.

A typical 16/8 configuration includes the 8- and 16-bit processors with 64KB and 128KB of memory, respectively; 12-inch-diagonal, 80-column-by-24-line display; low-profile keyboard with numeric keypad; and 964KB of diskette storage. Also included with the configuration are CP/M-80, CP/M-86, and MS-DOS.

**Competition & Pricing** Competition for the Xerox system includes the Tandy Radio Shack TRS-80 Model 16, Vector Graphic Vector 4, and Digital Equipment Rainbow 100.

The price for a typical 16/8 configuration is \$2,895.



# DESKTOP MICROCOMPUTERS

## Product Briefs

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### Canon USA

System Div  
One Canon Plaza  
Lake Success NY 11042

(516) 488-6700

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### TX-50

**Overview** The Canon TX-50 is a desktop turnkey system for specialized applications, such as loan, mortgage, or insurance calculations, sales credit calculations, and customer management. This compact system includes a CPU, keyboard, CRT, diskette drive, and dot matrix printer.

**System Design** The TX-50 incorporates a 16-bit Intel 8088 microprocessor with 128KB of memory, expandable to 256KB. The system features a built-in 3-inch diskette drive with a capacity of 180KB per side. Two slots for optional expansion boards are included; a slot can be either 2 serial ports or 1 parallel port.

The TX-50 keyboard is not alphanumeric but has 50 function keys with LED indicators, a separate numeric keypad, and cursor control keys. The CRT is a flat, 7-inch monochrome unit that can display 30 characters by 10 lines, 15 characters by 5 lines, or 80 characters by 25 lines; it has a resolution of 480 by 200 pixels. The dot matrix printer can print 30 characters per line at 1.2 lines per second and will print on a roll of paper similar to that used in an adding machine.

System software includes the Microsoft MS-DOS operating system and BASIC.

**Competition & Pricing** The TX-50 is a unique computer with no comparable competitors at this time.

The TX-50 sells for \$1,295.

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### Centurion Computer Corp

1111 S Sherman  
Richardson TX 75081

(800) 527-4266

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### Centurion PC

**Overview** The single-user desktop Centurion PC features built-in color capability and full IBM PC-DOS compatibility; the basic system includes 256KB of RAM. The microcomputer is available through dealers.

**System Design** The Centurion PC runs on the Intel 8088 and will support the optional Intel 8087 math coprocessor. The basic system includes 256KB of RAM, expandable to 640KB; a keyboard with numeric keypad and 10 function keys; a parallel printer and RS-232C serial ports; a speaker for synthesized voice and music applications; and support for 9 expansion slots. Two 5-1/4-inch, 360KB diskette drives are standard, and a 10MB Winchester disk is available. The Centurion PC can operate in a standalone mode or can serve as a terminal to a host computer, such as the Centurion 7000 minicomputer series, using asynchronous, synchronous, or bisynchronous IBM protocols. Two serial ports and 1 parallel port are standard. The built-in graphics feature includes 32 colors, highlighting, underlining, and reverse imaging. The Centurion PC runs the Microsoft MS-DOS operating system and most MS-DOS-compatible software.

**Competition & Pricing** The Centurion PC competes with the IBM Personal Computer and IBM-compatible systems.

The basic model costs \$3,100.

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**CompuPro**3506 Breakwater Ct  
Hayward CA 94545(415) 786-0909

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**CompuPro 816/A**

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**Overview** The CompuPro 816/A is an entry-level, single-user system for such applications as word processing, business and financial planning, data base management, and other business functions. It supports a full line of peripherals commonly used in the business environment and can accommodate future expansion.

The system is marketed to OEMs, system integrators, and such sophisticated end users as software developers and computer manufacturers. The system boards and mainframe enclosure are warranted for 12 months and the disk drive, for 6 months. On-site service is provided by the Xerox Service Group.

**System Design** The CompuPro 816/A includes the CompuPro Intel 8085/8088 CPU board running at clock rates of 6MHz and 8MHz, 128KB of high-speed RAM, 4 serial ports and 1 parallel and 1 Centronics printer port, and two 8-inch diskette drives storing a total of 2.4MB. The 8085/8088 is a dual-processor board that allows concurrent execution of 8- and 16-bit programs.

Software available for the system includes the CP/M 8-16 operating system as well as the Proteus Engineering WRITE, Sorcim SuperCalc-86, Summit Software Hyper Typer, Gensoft Field Companion, and Ashton-Tate dBase II. CP/M 8-16 is based on the Digital Research CP/M-86; it is a 16-bit system that relegates 8-bit applications as tasks to the 8-bit processor for execution.

**Competition & Pricing** The CompuPro 816/A competes with the OSM Computer Zeus PC, the Altos Computer Systems ACS 8600, and the Alpha Micro AM-680 Series ELS.

A single-user CompuPro 816/A, as described, costs \$5,495.

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**CompuPro**3506 Breakwater Ct  
Hayward CA 94545(415) 786-0909

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**CompuPro 816/E**

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**Overview** The CompuPro 816/E is a 32-bit single-user system designed for business, industry, and science applications. (The 816/E is a multiuser version.)

The 816/E is marketed to OEMs, system integrators, and such sophisticated end users as software developers and computer manufacturers. The system has a limited 12-month warranty on the boards and mainframe enclosure and a 6-month warranty on the disk drive. On-site service is available through the Xerox Service Group.

**System Design** The CompuPro 816/E conforms to the IEEE 696 standard and is built around the CompuPro 10MHz 68000 CPU board. Standard features of this system include 512KB of main memory, expandable to 16MB; four serial ports; 1 parallel and 1 Centronics printer port; 1.5MB of M Drive/H, expandable to 4MB; and 2.4MB of diskette storage, expandable to 4.8MB.

The 816/E runs on the Digital Research CP/M 68K operating system and mapFORTH and is packaged with a C compiler. Its operating system allows programs written in C under UNIX to run in the CP/M environment.

**Competition & Pricing** The CompuPro 816/E competes with the Callan Data Systems Unistar 100 and the Stride Micro Stride 440.

The basic CompuPro 816/E costs \$8,995.



**CompuPro**

3506 Breakwater Ct  
Hayward CA 94545

(415) 786-0909

**CompuPro 816/Z**

**Overview** The CompuPro 816/Z is a single-user system designed for business applications, such as word processing, business and financial planning, data base management, and other functions.

The system is marketed to OEMs, system integrators, and such sophisticated end users as software developers and computer manufacturers. The system has a limited 12-month warranty on the boards and mainframe enclosure and a 6-month warranty on the disk drive. On-site service is available from the Xerox Service Group.

**System Design** The CompuPro 816/Z features a 6MHz Zilog Z80B CPU, 64KB of RAM, three serial ports, 1 parallel and 1 Centronics printer port, and two 8-inch diskette drives storing a total of 2.4MB. It may be expanded to include an optional diskette or fixed disk subsystem.

Available software includes the Digital Research CP/M-80 Version 2.2, Sorcim SuperCalc, Proteus Engineering WRITE, Ashton-Tate dBASE II, Summit Software Hyper Typer, and Field Companion.

**Competition & Pricing** The CompuPro 816/Z competes with the OSM Computer Zeus PC, the Altos Computer Systems Altos Series 5, and the North Star Horizon.

The basic System 816/Z costs \$4,995.

**Datapoint Corp**

9725 Datapoint Dr  
San Antonio TX 78284

(800) 334-1122

**VISTA-PC**

**Overview** The VISTA-PC is a color computer designed for the automated office; it is part of the PRO-VISTA family of products. Available in a variety of configurations, the VISTA-PC runs many commonly available software packages, such as the Lotus 1-2-3. Up to 5 VISTA-PC workstations or processors can be connected to a master station. The system can also emulate Datapoint terminals in an Attached Resource Computer (ARC) network environment.

**System Design** The VISTA-PC is based on the Convergent Technology N-GEN workstation and incorporates an 8MHz Intel 80186 16-bit CPU. The system includes 16KB of ROM and 256KB of RAM, expandable to 1MB; a 15-inch color monitor with 720-x-348-pixel resolution and a detached 98-key keyboard, 2 RS-232C serial interfaces, a Centronics parallel interface, a bus interface for connecting expansion disk units, and a cluster interface for connecting up to 5 VISTA-PC model 1204 workstations to the master 1202 station. The model 1201 workstation includes two 630KB diskette drives, whereas the 1202 includes one 630KB diskette drive and a 10MB disk. The system can also accommodate a model 1258 printer, a model 9656 6-pen color plotter and a monochrome monitor.

The VISTA-PC includes the Microsoft MS-DOS operating system, GW-BASIC, Micro Focus COBOL, and diagnostics software. It can run popular software packages, such as Lotus 1-2-3, Sorcim SuperWriter/SuperCalc<sup>3</sup>, and MicroRIM Inc R:Base Series 4000. The VISTA-PC also includes an extensive communications library.

**Competition & Pricing** Competition includes other Convergent Technologies N-GEN-based systems, including the Burroughs B 25 and NCR Work saver 300.

Model	Price \$
1201	\$4,795
1202	6,695
1202 (w/monochrome monitor)	5,770
1204 Workstation	3,795

**IBM Corp**

Information Systems Group  
1133 Westchester Ave  
White Plains NY 10604

(914) 696-1900

**System 9000**

**Overview** IBM has renamed its Instruments Computer System 9000, adding a new model to the line in the process. The renamed System 9000 currently includes two models: the 9001 Bench-Top Computer (formerly the IBM Instruments Computer System 9000) and the new 9002 Desk-Top Computer. Occupying 288 square inches, the 9002 is suited to professional environments in which space is at a premium. It differs from the 9001 in size, keyboard, and printer attachment.

The system is warranted for 3 months; an optional 9-month warranty is also available. Service is provided under an IBM Instruments Maintenance Service Agreement or on a per-incident basis. A malfunctioning unit must be returned, prepaid, to IBM Instruments Customer Support Center in Danbury CT.

**System Design** The basic configuration of the 9002 Desk-Top Computer includes the Motorola 68000 8MHz processor with a hybrid keyboard, expansion feature, and general-purpose keypad overlay. The hybrid keyboard comprises an alphanumeric keyboard and pressure-sensitive keypad in 1 unit. The expansion feature provides 5 slots for additional cards. The system does not have an integral printer, as does the 9001, but will support the IBM Personal Computer Color Printer 5182 Model 1 or other user-provided system printers. The system display can be added with or without a diskette drive. The user can add, as options, a 1MB memory expansion card, a cabinet with 1 or 2 5-1/4- or 8-inch diskette drives, a hard disk controller, a cabinet with 1 or 2 10MB Winchester disks, an analog sensor board, and a printer cable.

**Competition & Pricing** The System 9000 competes with other computers designed to operate in a laboratory environment. These include the Hewlett-Packard 9800 Series and the Perkin-Elmer Model 7500.

The 9002 Desk-Top Computer with expansion feature and hybrid keyboard costs \$6,495. The Model 5182 Color Printer is available for \$1,995. The system display costs \$750.

**Leading Edge Products Inc**

225 Turnpike St  
Canton MA 02021

(800) 343-6833

**Personal Computer System**

**Overview** The Leading Edge Personal Computer, built by Mitsubishi, is an IBM PC-compatible model that has 128KB of memory, a monitor, and a keyboard. Software for the system includes Microsoft MS-DOS Version 1.25 and GW-BASIC as well as the Leading Edge Word Processing Program. The system can run a great variety of IBM PC software, including Lotus 1-2-3, Microsoft Multiplan, and Ashton-Tate dBASE II.

**System Design** The Personal Computer System incorporates an Intel 8088-2 microprocessor and an optional Intel 8087 to support 80-bit floating-point numbers. The main board includes 128KB RAM, with up to a total of 640KB on the optional card. The system also includes 2 half-height 5-1/4-inch double-density, double-sided diskette drives with a 320KB capacity each, 7 IBM-compatible I/O slots, a parallel printer port, and a Centronics-compatible serial port. The keyboard for the system includes 10 function, 16 keypad, and 57 typewriter keys. The monochrome monitor has a green phosphor screen and can display 80 columns by 25 lines.

Software for the system includes MS-DOS Version 1.25, GW-BASIC, and Leading Edge Word Processing Program. IBM PC DOS and PC software will run on the system.

**Competition & Pricing** The Leading Edge Personal Computer competes with the Sperry Personal Computer (also built by Mitsubishi), the IBM Personal Computer, and other systems compatible with the IBM Personal Computer.

The Leading Edge Personal Computer is available with a monochrome monitor for \$1,995. With the color monitor, the system sells for \$2,495.



**Morrow Inc**

600 McCormick St  
San Leandro CA 94577

(415) 430-1970

**Morrow MD5-E**

**Overview** The Morrow MD5-E is a 5MB Winchester disk microcomputer system with word processing software. The system is part of the Micro Decision E series, which offers bundled word processing software as well as the ability to select other applications software as needed. It is aimed at professional writers who need faster response times than those generally available on diskette systems. The system is distributed through retailers.

**System Design** The MD5-E is based on a Zilog Z80A CPU running at 4MHz and has 128KB of RAM, 8KB of ROM, 3 serial ports, and a standard Centronics parallel port. It also includes a detachable keyboard and full-size display terminal with 80 columns by 25 lines. A 5MB Winchester disk is standard, as is a 5-1/4-inch diskette drive with 384KB of storage; another diskette and fixed disk may be added as options.

Software for the MD5-E includes the Digital Research CP/M Plus operating system, Morrow NewWord word processing software, and Correct-It spelling checker.

**Competition & Pricing** The MD5-E competes with the North Star Horizon, Sony Corporation SMC-70, Televideo Systems TS 802, and Xerox 820-II.

At \$1,999, the MD5-E is priced somewhat lower than the Kaypro 10.

**NBI**

PO Box 9001  
Boulder CO 80301

(303) 444-5710

**U! Technical WorkStation**

**Overview** The U! Technical WorkStation is a desktop computer for technical professionals such as engineers and scientists. It runs the Berkeley 4.2 version of UNIX and supports most applications designed to run with AT&T's System V version of UNIX. The basic system includes 1MB of main memory, a diskette and fixed disk, a monochrome monitor, virtual memory, a full typewriter keyboard, a mouse, a printer interface, and 2 RS-232C interfaces.

**System Design** U! is based on a Motorola MC 68010 virtual memory microprocessor running at 8MHz. The standard configuration with 1MB of memory can be expanded to 2MB. Also included are a 640KB diskette and a 22MB disk, a high-resolution monochrome monitor for text and graphics display, virtual memory, a full typewriter keyboard, a mouse, a printer interface, and 2 RS-232C interfaces. The system can be expanded to include additional peripheral, communications, networking, and bus interface adapters as well as increased disk capacities.

The U! Technical Workstation offers more than 250 utilities, including line and screen editors, document preparation tools, data manipulation, and various office automation aids. Programming languages include C, FORTRAN-77, Pascal, LISP, 68010 Assembly language, and others. Development tools such as adb, sdb, and a Motorola 68010 disassembler are also available.

Communications utilities, such as TIP, CU, and UUCP, allow U!s to share information with one another or with micro and mainframe computers. Xerox, EtherNet, and Department of Defense TCP/IP protocols are supported.

U! includes a Desktop Manager system for new applications that allows programmers to use menus, quizzes or forms, multiple fonts, and mixed text and graphics. A window may support Digital Equipment VT100, Tektronics 4010, ANSI GKS, or Siggraph CORE commands and primitives.

**Competition & Pricing** The U! Technical Workstation competes with the IBM Personal Computer AT and the AT&T 3B2/300.

The basic U! configuration costs \$15,495 per unit.

**NCR Corp**

1700 S Patterson  
Dayton OH 45479

(513) 449-2000

**WorkSaver 300**

**Overview** The NCR WorkSaver 300 is a desktop system with a detachable keyboard and a high-resolution, nonglare screen. The product is designed for the automated office and can operate as a standalone system or in conjunction with other terminals in a local cluster network. System components include a 12-inch high-resolution screen and a 15-inch color display, a 16-bit processor with 256KB to 1MB of RAM, a detached keyboard, and optional storage and printing devices.

A comprehensive training program, including workbooks and audio cassettes, is available for operators. The WorkSaver 300 includes free support for 90 days after installation; thereafter, ongoing support is available at a nominal charge for software and application development.

**System Design** Based on the Convergent Technologies N-GEN system, the WorkSaver 300 basic configuration is based on a 16-bit Intel 80186 processor and includes 256K of RAM, expandable to 1MB. Storage options include 1 or 2 diskette drives with 630KB of storage each, 1 or more disk drives in 10MB and 20MB capacities, and an expansion feature for more disk storage. Monochrome or color screens that can display 80 characters by 29 lines are available. Two serial ports and 1 Centronics printer port are incorporated in the design. Three letter-quality printers are available in speeds ranging from 20 to 55 characters per second. The system can operate in standalone mode or can be configured as a master or cluster station; depending on the model, the master station can support from 2 to 16 additional workstations. The system is set up for communications through emulation of TTY, IBM 2780, 3780, 3270, and various NCR terminals and through SNA/SDLC.

Software for the system includes either the Microsoft MS-DOS or Digital Research CP/M-86 operating system as well as NCR WordReady, MULTIPLAN, Records Processing, WordCheck, Spelling Dictionary, WorkGraph, Color and MonoGraphics, high-level languages, and communications programs.

**Competition & Pricing** Competing systems include other Convergent Technologies N-GEN-based systems, such as the Burroughs B 25 and Datapoint VISTA-PC. The WorkSaver 300 also competes with the IBM Personal Computer AT.

Pricing for the WorkSaver 300 is available on request from the vendor.

**Panafacom Ltd**

National Bldg, 17-15, Shinbashi  
6-chome, Minato-ku, Tokyo  
105 Japan

03-438-0311

**Duet-16**

**Overview** The Duet-16 is a 16-bit business personal computer designed for office, laboratory, school, and factory applications. It features a 16-bit microprocessor, user memory that is expandable to 512KB, a high-resolution and color display, 2 5-1/4-inch diskette drives, and a disk.

The Duet-16 is sold through Sakata Shokai Ltd and its distributors. Maintenance and support is also provided by them.

**System Design** The Duet-16 is based on the Intel 8086 microprocessor running at 8MHz, with HMOS technology. It is equipped with 8KB of ROM and 128KB of RAM that can be expanded to 512KB. Three monitors are available for the Duet-16: a 12-inch monochrome monitor, a 12-inch color monitor, and a 5-1/2-inch monochrome monitor. A thermal printer is supplied with the system, but a dot-matrix or daisy wheel printer can be attached instead. Two 720KB diskette drives are incorporated as well as 3 types of disk: the expansion unit, the disk unit, and the expansion disk unit. The expansion unit houses a disk with an intelligent controller, 48KB cache memory, and 5 user slots for expansion. The disk unit is identical but has no expansion slots. The expansion disk unit allows for file expansion but is connected to an expansion or a disk unit rather than directly to the system.

The Duet-16 supports both Microsoft MS-DOS and Digital Research CP/M-86 operating systems and can use BASIC and COBOL languages. The system can run the Microsoft Multiplan, Micropro International WordStar, IBM 3270 emulation, and various business application software.

**Competition & Pricing** The Duet-16 competes with the IBM Personal Computer and compatible systems, Leading Edge Personal Computer, Wang Professional, and Sperry Personal Computer.

Pricing is available from Sakata Shokai on request.



**Ricoh Company Ltd**

15-5, Minami-Aoyama  
1-Chome, Minato-ku, Tokyo  
107, Japan

(03) 479-3111

**Ricoh SBC-16**

**Overview** The SBC-16 is a desktop computer designed for the office environment; the basic configuration includes an Intel 80186 microprocessor, a keyboard and display, a diskette drive, and an optional Winchester disk. The RTC-1 is a CCITT-compatible Teletex adapter unit that allows the SBC-16 to be connected to a variety of networks.

**System Design** The SBC-16 incorporates an Intel 80186 microprocessor running at 8MHz, single or dual 5-1/4-inch diskette drives with a 720KB capacity each, 256KB of RAM that is expandable to 896KB, a 12-inch nonglare monochrome screen that can display 80 characters by 25 lines, a detachable keyboard, 2 RS-232C ports, a Centronics printer port, and 5 expansion slots. Software for the system includes the Microsoft MS-DOS and GW-BASIC. Options for the system include a 10MB Winchester disk drive, a mouse, IBM 3270 SNA, IBM 3770 and 3780 emulation software, a CP/M-86 operating system, and a RAM expansion board.

The RTC-1 features full Teletex compatibility and does not interfere with local computer processing. The CPU is an Intel 80186 with 64KB of RAM, expandable to 256KB. Available network interfaces (X.21 and V.24) allow connection to the circuit switched data networks, public switched data networks, and public switched telephone networks. Transmission functions such as multiaddress, transmit at specified time, and automatic retry are provided for improved productivity.

**Competition & Pricing** The Ricoh SBC-16 competes with the IBM Personal Computer and compatible systems, the Burroughs B 25, the NCR WorkSaver 300, the Datapoint VISTA-PC, and the Wang Professional Computer.

Prices for both systems are available from the vendor on request.

**Solaris Computer Corp**

1994 Tarob Ct  
Milpitas CA 95035

(408) 943-1818

**Solaris PCE 1000**

**Overview** The Solaris PCE 1000 is an IBM Personal Computer emulation package that attaches to asynchronous terminals (e.g., Digital Equipment VT100 and compatible terminals) to provide local computing functions. The system operator can view IBM Personal Computer functions and host transmissions simultaneously because the integrity of corporate data processing functions is maintained. The PCE 1000 is available through a nationwide network of distributors.

**System Design** The PCE 1000 offers a functional equivalent to the IBM Personal Computer. It is based on an Intel 8088 CPU with 128KB of RAM, expandable to 256KB on the CPU, and an additional 640KB on memory expansion boards. One parallel and 4 serial ports are incorporated, as are a total of 7 expansion slots. Two 5-1/4-inch diskette drives with a total capacity of 720KB of formatted storage and a 10MB Winchester disk can be configured with the system. A 45-key keypad provides direct generation of IBM Personal Computer control codes and specific keys for such Solaris functions as split screen, host/local selection, and scrolling of host or local windows.

The PCE 1000 includes Microsoft MS-DOS Version 2.1 and can run existing application programs for the IBM Personal Computer without modification.

**Competition & Pricing** The Solaris PCE 1000 is unique in its market segment but provides computing capabilities like those of the IBM Personal Computer and its compatible systems. The system's VT100 emulation capabilities enable it to compete with the Zentec WS-1000.

The PCE 1000 is available for \$2,495.



**Torch Computers**

Abberley House  
Great Shelford  
Cambridge CB2 5LQ  
England

(0223) 841000

**C-Series**

**Overview** The Torch C-Series represents 6 micro-computer models designed for communicating and networking business applications. The models differ mainly in their memory configuration and the main processor. All models feature high-resolution graphics, a Digital Research CP/M-compatible operating system, and a comprehensive package of business and communications software.

**System Design** In C-500 models, a Zilog Z80A processor with a 64KB RAM runs the applications software while a slave Synertek 6502 processor handles the peripherals. In C-68000 models, the applications processor is upgraded to a Zilog Z80B, and an additional Motorola 68000 processor with 256KB of RAM is provided for running 16- or 32-bit software. All models include an RS-423 serial port, a Centronics parallel port, a TORCHNET/ECONET port, 4 analog-to-digital channels, UHF and RGB outputs, a cassette I/O port, and a direct telephone line connection.

Software for the system includes the TORCHNET operating system, Torchmail Plus, and Torchtel (Viewdata videotex access); the Perfect Software Perfect Writer, Perfect Speller, Perfect Calc, and Perfect Filer; Executive Aid, and BBCBASIC. Other operating systems supported include the AT&T Bell Laboratories UNIX System III, for C-68000 models only, and the Softech Microsystems Inc UCSD p-systems. The C-Series supports a wide range of programming languages, including COBOL, FORTRAN, Pascal, BASIC, FORTH, LISP, C, and Pilot.

**Competition & Pricing** The Torch C-Series competes with the North Star Horizon because of its similar networking capabilities; it also competes with the Televideo TS 803 Series.

Model	Price £
C-500 w/dual diskette	2,950
C-500 w/20MB Winchester disk drive	5,650
C-500 w/dual diskette & sync adapter	3,150
C-500 w/20MB Winchester disk drive & sync adapter	5,850
C-68000 w/dual diskette & triple processor	3,550
C-6800 w/20MB Winchester disk drive & triple processor	5,900

**Torch Computers**

Abberley House  
Great Shelford  
Cambridge CB2 5LQ  
England

(0223) 841000

**Torch 725**

**Overview** The Torch 725 is a triple-processor system designed to allow the user a choice of Digital Research CP/M or AT&T Bell Laboratories UNIX software; it uses a Synertek 6502 processor to control the peripheral and I/O devices and two applications processors for CP/M and UNIX programs. The Torch 725 is supplied with a tilt-adjustable, high-resolution color monitor and a 102-key keyboard with 19 function keys, cursor keys, and a numeric keypad.

**System Design** The 725 incorporates a 2MHz 6502 peripheral processor, a 6MHz Zilog Z80B application processor, an 8MHz Motorola 68000 32-bit application processor, and a TMS 5220 speech processor. The basic system includes 288KB of RAM, expandable to 1MB; an RS-423 serial port, a Centronics parallel port, a TORCHNET port, 4 analog-to-digital channels, 2 sense lines, RGB output, Mains output, 2 400KB diskette drives, and one 20MB Winchester disk drive.

Software for the system includes the Torch Computer TORCHNET and the CPN operating system; UNIX; disk utilities; a music system; miscellaneous utilities; Perfect Software Perfect Writer, Perfect Filer, Perfect Calc, and Perfect Speller; Executive Aid, and BBC-BASIC. (CPN is compatible with CP/M.) The system can also support the Softech Microsystems Inc UCSD p-system operating system. The TORCHNET software allows up to 254 computers on a network to share data and peripherals. A wide range of programming languages is available.

**Competition & Pricing** The Torch 725 competes with the IBM Personal Computer and Personal Computer AT and the Altos Computer Systems Altos 586.

Model	Price £
725	5,650
725/U (w/UNIX)	6,050



**Xerox Corp**

1341 W Mockingbird La  
Dallas TX 75247

(214) 689-6100

**Xerox 820-II**

**Overview** Xerox introduced the first version of the 820 Information Processor in June 1981. A second 820 version—the 820-II—was announced in June 1982. The 820-II is designed to serve as a desktop business computer, small standalone word processor, or workstation connected to other computers through the Xerox Ethernet local communications network.

Xerox 820-II supports 64KB of main memory and either two 5-1/4- or 8-inch diskette drives with from 172KB to 1MB capacity each, or 1 diskette drive and one 8.4MB Winchester disk. The Xerox 820-II runs under the CP/M operating system, which supports various high-level programming languages and application packages from Xerox and independent vendors.

The 820-II is sold only through dealers.

**System Design** The 820-II is built around a microprocessor developed by Xerox and based on a Zilog Z80 processor. The 820-II is compatible with the 860 WP system and Star 8010 professional workstation. The 820-II can function as a Teletype station within an Ethernet local network through the 872/872 Communications Server. The Xerox 871 interactive communications emulator—an IBM 3270 emulation option—handles communications with a host computer.

A standard Xerox 820-II system features a 12-inch diagonal CRT, 64KB of main memory, 2 serial and 2 parallel ports, a 96-character keyboard, and 92KB of diskette storage.

Software includes the CP/M operating system and Microsoft versions of BASIC, COBOL, and MACRO programming languages. Additional languages include CBASIC II from Compiler Systems and the A.L.D.S. Z80 assembler language. Xerox offers various application packages, including accounting and WP. Additional application packages are available from independent vendors.

**Competition & Pricing** The 820-II competes with CP/M-based systems, such as the Sony SMC-70, Toshiba T100, and Vector 3.

Prices for the 820-II begin at about \$2,195 but vary from dealer to dealer.

**Zenith Data Systems**

1000 Milwaukee Ave  
Glenview IL 60025

(321) 391-8744

**Z-150 PC Series**

**Overview** In February 1984, Zenith Data Systems replaced its Z-100 Series of personal computers with the Z-100 PC Series. The Z-100 PC Series includes 3 Z-150 desktop computers and 2 Z-160 portable systems. Zenith Z-100 PC personal computers are software and expansion board compatible with the IBM Personal Computer.

The Z-150 desktop systems support a maximum 640KB of diskette storage, a 10MB Winchester disk drive, and a color display. Software for the Zenith Z-150 PC includes the Microsoft MS-DOS operating system.

Zenith warrants the Z-150 PC for 90 days; on-site maintenance is available from more than 300 authorized service centers.

**System Design** The desktop Z-150 systems are based on a 16-bit Intel 8088 microprocessor with 320KB of RAM with internal parity checking. Further expansion to 640KB requires an additional memory card. The Z-150 features 2 RS-232C serial ports, a Centronics-compatible parallel printer port, an 80-character-by-25-line display of medium resolution, and a detached, low-profile keyboard with a 17-key numeric keypad.

The Z-150 is available in 3 configurations that differ only in the amount of storage. Two of the systems are available with diskette storage only: the ZF-151-21 features a single 5-1/4-inch diskette drive with either 320KB or 360KB of storage; the ZF-151-22 includes dual diskette drives. The ZW-151-22 is configured with a 320KB or 360KB diskette drive and a 10MB Winchester disk drive.

Z-150 systems include 4 card slots for system expansion. Options include various printers, graphics plotters, and monochrome and color displays.

Z-150 PC Series systems run under MS-DOS and can implement a number of application programs from third-party vendors, including 1-2-3 from Lotus Development Corporation.

**Competition & Pricing** Competing with the Z-150 PC Series are the IBM Personal Computer and Personal Computer XT, Texas Instruments Professional Computer, and Tandy 2000.

Model	Price \$
ZF-151-21	2,699
ZF-151-22	3,099
ZW-151-22	4,799



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**Zentec Corp**2400 Walsh Ave  
Santa Clara CA 95050(408) 727-7662

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**WS-1000**

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**Overview** The WS-1000 is a display terminal designed to emulate the Digital Equipment Corporation VT220 and can be upgraded to a workstation that is fully compatible with the IBM Personal Computer or Personal Computer XT. Expansion capabilities for the basic intelligent terminal include plug-in ROM cartridges and word processing, networking, and mouse interfaces.

The WS-1000 is marketed to OEMs and system integrators.

**System Design** The WS-1000 display station is equipped with a Zilog Z80A microprocessor with 16KB of ROM and Digital Equipment VT-220 emulation firmware; it has an IBM-compatible bus and IBM-compatible video logic. There are 2 RS-232C serial communications ports, one of which includes an RS-422A interface. The 14-inch monochrome monitor displays 80 columns by 24 lines of text and has a 108-key low-profile keyboard. Cartridge ROM with up to 32KB of additional ROM and/or RAM can override or add to the terminal's firmware. Word processing, local area networking, and mouse interfaces are available.

The upgrade package for the system that is compatible with the IBM Personal Computer and Personal Computer XT includes an Intel 8088 microprocessor, an optional Intel 8087 arithmetic coprocessor, and 128KB of RAM that can be expanded to 256KB. The backplane has 6 additional slots for IBM Personal Computer- or Personal Computer XT-compatible printed circuit boards. The PC Connection can accommodate 2 diskette drives or 1 diskette and 1 Winchester disk drive. The WS-1000 has an IBM PC Personal Computer XT-compatible ROM basic input/output system (BIOS), IBM-compatible sound, a bus extension to the terminal, and a 90-watt power supply to support options such as the disk controller and IBM-compatible printed circuit boards.

**Competition & Pricing** Because the Zentec WS-1000 can emulate the Digital Equipment VT220, it competes with the IBM Personal Computer and its compatible systems and the Solaris PCE 1000.

The basic WS-1000 terminal costs \$995. When the terminal is expanded with the PC Connection module and one diskette drive, the price becomes \$2,595; with a diskette and a Winchester disk drive, \$4,745.



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**Zentec Corp**2400 Walsh Ave  
Santa Clara CA 95050(408) 338-0572

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The basic WS-1000 terminal costs \$995. When the terminal is expanded with the PC Connection module and one diskette drive, the price becomes \$2,595; with a diskette and a Winchester disk drive, \$4,845.



# PORTABLE MICROCOMPUTERS

## Market Analysis Report

### INTRODUCTION

With the introduction of the first portable computer, the microcomputer took on a myriad of new roles. Users are now able to transmit digital files between home and office or from a meeting room across town or across the country.

The portable microcomputer market has undergone many changes since that first system was developed and manufactured by Adam Osborne in 1981. Called the Osborne 1, the system was an 8-bit machine that weighed 23 pounds and cost \$1,795. More than 8,000 of these models were sold during the first year of availability. Today, only five years later, the portable microcomputer market boasts numerous laptop systems weighing less than four pounds and priced at less than \$500.

As the portable microcomputer becomes more compact, users are discovering more application environments that are suitable for the portable system. Once thought of as primarily a sales tool, the portable system's ability to run under industry-standard operating systems provides users with a wealth of available applications. Accountants, insurance agents, journalists, consultants, and executives are now commonly found with portables in hand.

Along with the availability of a large number of applications, many portable systems are bundled with systems and applications software. This frees system memory for other uses and saves the user money on license fees.

Auerbach has surveyed portable microcomputer products currently on the market. Our analysis of 51 systems available from 26 vendors evaluates each system against more than a dozen criteria. This analysis provides an in-depth study of the major criteria that users should consider when making a purchase decision.

These criteria—weight, operating system, display size and type, storage media, and price—should be weighed in relation to the user's specific needs. Identifying and assigning priorities to these needs is the first, and possibly the most important, step in the purchase process. It may also prove to be the most difficult. But once this is accomplished, with the assistance of our market analysis, users should be well on their way to making a sound purchase decision.

### Weight

In our survey of portable microcomputers, we found a wide variation in the definition of *portable*; systems ranged in weight from less than four pounds to more than thirty-five pounds. Users need to keep in mind just how portable their

portable system should be. How often will the system be taken on the road and where is it most likely to be used—train, plane, or boardroom (i.e., how much space is available)? These are some of the key questions users need to ask themselves.

Not surprisingly, the weight of the system typically corresponds to the amount of storage it offers. The PC 8201A from NEC Home Electronics is considered a true laptop system, weighing just 3.8 pounds without its optional diskette drive, but including a 7.75-inch LCD with an 8-line-by-40-column display. The COMPAQ PLUS, which weighs 31.6 pounds, is more accurately classified as a transportable, or "luggable," system; it includes both diskette and disk drives along with a 9-inch CRT with a 25-line-by-40- or 80-column selectable display.

More than 30 percent of the systems surveyed weigh in excess of 30 pounds and therefore fall into the transportable category. Users planning to travel extensively with their systems may want to avoid transportables and consider instead a lighter-weight model. Those products weighing less than 20 pounds are typically much easier to transport and also require less space to set up. Some 50 percent of the systems surveyed fall into this category. The remaining systems, weighing between 20 and 30 pounds, may or may not be easy to transport, depending upon a user's physical prowess.

### Operating System

One of the most critical microcomputer selection criteria is the operating system. This single component monitors and controls the execution of all programs that run on the system and also defines the application environments the system can support.

Systems that support an industry-standard operating system are generally considered a step ahead of the competition because of the wealth of application packages commercially available for them. Of the products surveyed, a whopping 64 percent operate under, and include as standard, the MS-DOS operating system developed by Microsoft Corporation. Another 8 percent of the systems surveyed support MS-DOS as an optional operating system.

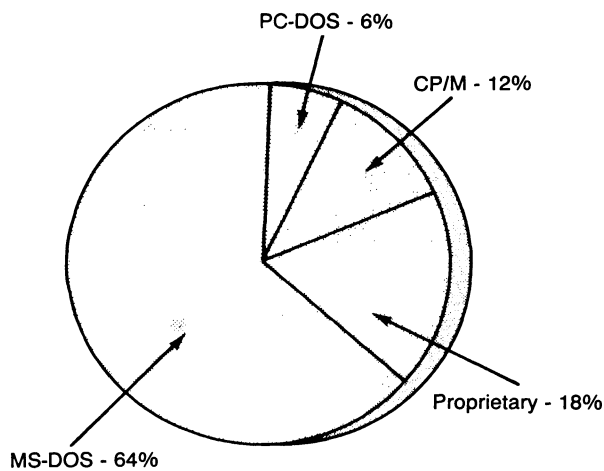
Twelve percent of the systems surveyed support the CP/M operating system from Digital Research Inc. CP/M was one of the first single-user operating systems to gain market acceptance, but its popularity has waned in recent years, primarily because of IBM's commitment to an MS-DOS-compatible operating system on the IBM PC.

Surprisingly, 18 percent of the systems support a proprietary operating system. Users need to consider the amount and type of application programs these vendors offer, the compatibility of the proprietary system with an industry-standard operating system, and the ability of the system to support any optional operating systems. Only 29 percent of the systems surveyed offer optional operating systems.

Finally, a mere 6 percent of the systems surveyed specified standard support for IBM's PC-DOS operating system. Other than IBM, the only vendor to claim PC-DOS compatibility is OEMTEK. OEMTEK also offers MS-DOS as a standard system feature.

Exhibit 1 illustrates the breakdown of operating systems supported on the 51 systems surveyed.

Exhibit 1. *Distribution of Operating Systems*



## Display Size and Type

One of the most common complaints among portable PC users, and a major flaw in portable computer design, is the limitation of the display technology. This is especially true of the flat-panel displays—typically liquid crystal displays (LCDs)—that are used in the laptop portables. LCDs, which require strong, direct light to be readable, are notorious for their poor contrast and glare problems. CRTs, another common display technology of portable computers, also have glare problems.

Some vendors now offer enhanced LCDs as well as different display technologies. Both Morrow and Zenith Data Systems market portable systems with backlit LCDs. According to Morrow, these displays—with their own internal light source—are less susceptible to glare. Sharp Electronics also offers a portable model with an illuminated crystal display.

Electroluminescent and gas-plasma displays are considered

by far the most readable as well as the most expensive display technologies available. GRiD Systems—the first vendor to use these display technologies on its Compass and GRiDCase portable lines, respectively—has been followed by Panasonic, which also offers gas-plasma displays with its Exec. Partner line of portable systems.

Of the systems surveyed, 45 percent offer LCDs and 43 percent offer CRT displays.

Display sizes, measured diagonally, range from five to twelve inches. Fifty-three percent of the systems surveyed feature nine-inch screens. But bigger is not always better. Since larger displays magnify the glare factor, display quality tends to decrease as screen size increases.

## Storage Media

Because almost 65 percent of the systems in this survey support the MS-DOS operating system as standard, users need to concern themselves with the size of the system's diskette drive. This may seem unrelated at first, but the majority of application packages available for industry-standard operating systems are formatted for use with 5.25-inch diskette drives. A system with a 3.5-inch diskette drive requires software conversion to transfer data between systems. There are, however, some positive things about 3.5-inch minidiskette drives; they use less space within the computer, weigh less than larger diskette drives, and generate less heat.

Almost three-quarters of the systems surveyed offer diskette storage as a standard feature. Eighty-four percent of the diskette drives measure 5.25 inches; the remaining 16 percent are 3.5-inch drives.

As with the operating system, users need to consider specific application requirements when evaluating a product's storage media.

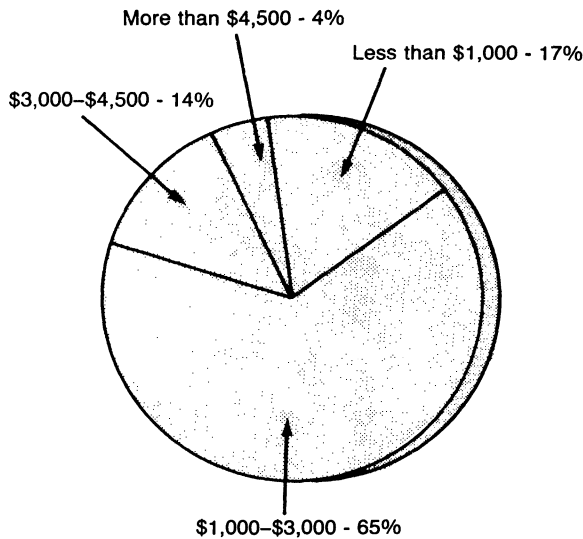
## Price

As with all purchase decisions, price is a major consideration in selecting a portable microcomputer. In some cases, price may be the deciding factor in a purchase decision.

The 51 systems surveyed range in price from \$399 to \$8,000 for entry-level configurations. The price of the system corresponds primarily to its storage capacity and display capabilities. Surprisingly, weight is not a good gauge of price. Exhibit 2 illustrates the distribution of prices for entry-level configurations.

Prices vary dramatically among laptop systems. The Tandy 100—the largest selling portable microcomputer to date—weighs just 3.9 pounds, features an 8-line-by-40-column LCD, and offers a 3.5-inch diskette drive as an option. A system with 24K bytes of RAM is priced at \$599. The Compass II models from GRiD Systems weigh 10 pounds and include 384K bytes of bubble memory and electroluminescent displays

Exhibit 2. Base System Pricing



as standard; diskette and disk storage are optional. These systems range from \$6,000 to \$8,000.

Transportable systems also range in price, though not quite as drastically as the laptop models. These systems typically resemble their desktop counterparts in terms of system capabilities and price. The Cordata (formerly Corona Data Systems) PPC-400 weighs 38 pounds and features dual 360K-byte diskette drives and a 9-inch CRT. A standard configuration is priced at \$1,495. The COMPAQ PORTABLE 286 weighs 33 pounds and features a single 1.2M-byte diskette drive and a 9-inch CRT. The system is priced at \$4,499.

Of the systems surveyed, 17 percent are priced under \$1,000. Sixty-five percent are priced from \$1,000 to \$3,000; the remaining 18 percent are priced at more than \$3,000.

## PORTABLE MICROCOMPUTER MARKET TRENDS

The portable microcomputer market is divided into laptop and transportable product segments. In both cases, most of the systems available today are either smaller versions of a general-purpose desktop microcomputer or products that complement a desktop unit but are geared toward a particular vertical market.

While the portable microcomputer market as a whole has grown steadily in recent years, the market still lacks a definitive industry standard. Many users and vendors alike are waiting for IBM to introduce a laptop model and establish a much-needed industry standard. Analysts believe that IBM's entry into the laptop portable market will stimulate the market to-

ward the growth that has been expected but that has never quite materialized.

Similarly, the personal computer market floundered for several years without an industry standard until IBM's introduction of the IBM Personal Computer (PC) in 1981. Standards for processor type, operating system, and price were then quickly established. Manufacturers then entered the microcomputer market in droves, offering systems that were compatible with the IBM PC but that featured increased performance levels and system capabilities along with lower price tags.

And so, the industry waits for IBM to announce the development of its already-infamous laptop portable computer. The announcement was initially expected to coincide with the awarding of an IRS contract for laptop computers in late 1985 or early 1986; when the announcement and contract failed to materialize, expectations shifted to a nationwide announcement during the 1985 Super Bowl game, though this too did not occur.

IBM, it seems, is caught in the middle of its own marketing game. Its new laptop system must not only be compatible with the current PC line (IBM's existing transportable is not entirely compatible) but must also tap into a new customer base so as not to detract seriously from the sales of its existing products.

This waiting game is reminiscent of mid-1985, when rumors abounded concerning IBM's "PC2." The rumors had a profound effect on the personal computer market. Sales of microcomputers, including IBM's, slowed to a crawl, while the PC2 remained just a rumor. The question now is whether the IBM laptop is just a rumor, and if not, when it is likely to materialize.

IBM is, however, not the only notable absentee from the portable microcomputer arena. AT&T Information Systems, Digital Equipment Corporation, and NCR Corporation all offer outstanding products in the desktop and multiuser markets, but have thus far chosen not to participate in the portable microcomputer market. IBM may be considered the most likely candidate to develop an industry standard but is by no means the only possibility. AT&T has thus far contributed the multiuser UNIX operating system, while Digital Equipment has developed a popular single-board microcomputer, the MicroVAX II. Either is capable of producing an industry standard for laptops.

## GETTING STARTED

In addition to the selection criteria discussed in the preceding pages, potential users should also consider several additional features:

- IBM PC compatibility is a major selection consideration for any microcomputer purchase, yet only 31 percent of the systems surveyed claim some type of IBM PC compatibility.
- An integral modem vastly aids in communications applications, but only 20 percent of the systems surveyed offer



this feature as standard, while another 8 percent offer it as an option.

- Vendor stability, an important consideration in any purchase decision, is possibly even more critical in selecting a microcomputer, considering the rather volatile state of the industry during the past year.

Following this analysis are the specifications on the 51

products included in our survey. Potential buyers should weigh their own requirements along with the guidelines suggested in this report and select a few products and vendors that could best meet their needs. These systems should then be re-evaluated through additional research and hands-on demonstrations. Product warranties, vendor reputation, and service provisions should be considered because, along with actual features and price, they also determine future satisfaction.

# PORTABLE MICROCOMPUTERS Compatibility Matrix

229.0025.001

Vendor/Package	Compatible Operating Systems												Others				
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16		TRSDOS	UCSD p-System	UNIX	XENIX
<b>ACT (UK) Ltd</b> Apricot PC Apricot F1, Apricot F1e Apricot Portable Apricot xi, Apricot xi-20s			•		••				••					•			
<b>Actrix Computer</b> Actrix			•														
<b>AMust Compak Manufacturing Pty</b> Executive 816			•														
<b>Apple Computer</b> Apple IIc Macintosh	•																Apple proprietary
<b>Columbia Data Products</b> Columbia VP					•				•								
<b>COMPAQ Computer</b> COMPAQ COMPAQ Plus									••								
<b>Computer Transceiver Systems</b> EXECUPORT XL Series			•														
<b>Convergent Technologies</b> Workslate																	Convergent proprietary
<b>Corona Data Systems</b> Corona Portable PC, Portable PC-XT									•								
<b>Data General</b> DATA GENERAL/One					•				•								
<b>DVW Microelectronics Ltd</b> Husky																	DVW proprietary
<b>Eagle Computer</b> Eagle PC Spirit 2, PC Spirit XL					•				•								
<b>Epson America</b> HX-20 PX-8 Personal Computer			•														ROM-based OS
<b>GRiD Systems</b> COMPASS Computer, COMPASS II Computer																	CCOS
<b>Hewlett-Packard</b> Integral PC The Portable HP 110									•								HP-UX

Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	UNIX	XENIX
<b>IBM</b> Portable Personal Computer							•										
<b>Jonos International</b> C2500 C2600			•														
<b>Kaypro</b> Kaypro 2, 2X Kaypro 4 Kaypro 10 Kaypro 16			•							•							
<b>MicroStandard Technologies</b> M3000			•		•					•					•		
<b>Morrow</b> Pivot										•							
<b>Olivetti</b> M21		•								•				•			
<b>Osborne Computer</b> Executive Osborne 3 Osborne Vixen			•							•				•			
<b>Panasonic</b> Sr. Partner The Link										•							BASIC interpreter
<b>Seequa Computer</b> Chameleon, Chameleon Plus			•			•				•							
<b>Semi-Tech Microelectronics</b> Pied Piper I STM Personal Computer			•							•							
<b>Sharp Electronics</b> PC-5000										•							
<b>Sord Computer of America</b> Consultant IS-11C																	TOS TOS
<b>Sperry</b> Sperry Portable Computer										•							
<b>Tandy</b> Radio Shack TRS-80 Model 4P TRS-80 Model 100, Model 200													•				Tandy proprietary
<b>Teleram Communications</b> Teleram T-3000 Teleram T-4000 Teleram T-5000			•											•			RAM-based OS

Vendor/Package	Compatible Operating Systems													Others			
	Apple DOS/SOS	Concurrent CP/M-86	CP/M	CP/M 68K	CP/M-86	FORTH	IBM PC DOS	MP/M II	MP/M-86	MS-DOS	OASIS	OASIS-16	TRSDOS		UCSD p-System	UNIX	XENIX
<b>TeleVideo Systems</b> TPC I, TPC II			•														
<b>Texas Instruments</b> Portable Professional Computer Pro-Lite					•					••							
<b>Visual Computer</b> Commuter										•							
<b>Zenith Data Systems</b> Z-160 PC Portable						•				•							





# PORTABLE MICROCOMPUTERS

## Company Directory

229.0032.001

Vendor	Address/Telephone	Model
ACT (UK)	Shenstone House Dudley Rd, Halesowen West Midlands B63 3NT England 021-501 2284 ACT (North America) Inc 3375 Scott Blvd Suite 336 Santa Clara CA 95051 (408) 727-8090	Apricot F1 Apricot F1e Apricot PC Apricot Portable Apricot xi Apricot xi-20s
Actrix Computer	2159 Bering Dr San Jose CA 95131 (408) 263-3660	Actrix
AMust Compak Manufacturing Pty	50 Keys Rd Moorabbin Victoria 3189 Australia (03) 553-3755	Executive 816
Apple Computer	20525 Mariana Ave Cupertino CA 95014 (408) 973-2042	Macintosh Apple IIC
Columbia Data Products	9150 Rumsey Rd Columbia MD 21045 (301) 992-3400	Columbia VP
COMPAQ Computer	12330 Perry Rd Houston TX 77070 (713) 370-7040	COMPAQ COMPAQ Plus
Compucorp	2211 Michigan Ave Santa Monica CA (213) 829-7453	Omegamite B Omegamite OA
Computer Transceiver Systems	PO Box 15 E 66 Midland Ave Paramus NJ 07652 (201) 261-6800	EXECUPORT XL 8000 EXECUPORT XL 8086 EXECUPORT XL + 8086
Convergent Technologies	2441 Mission College Blvd Santa Clara CA 95050 (408) 727-8830	Workslate
Corona Data Systems	275 E Hillcrest Dr Thousand Oaks CA 91360 (800) 621-6746	Corona Portable PC Corona Portable PC-XT
Data General	4400 Computer Dr Westboro MA 01580 (617) 366-8911	DATA GENERAL/One
DVW Electronics	PO Box 135 345 Foleshill Rd Coventry CV6 5RW England 020-366 8181	Husky
Eagle Computer	7100 Chapman Dr Garden Grove CA 92641 (714) 891-2665	PC Spirit 2 PC Spirit XL



Vendor	Address/Telephone	Model
Epson America	3415 Kashiwa St Torrance CA 90505 (213) 539-9140  Epson 80 Hirooka Shiojiri City Nagano Japan 399-07 (0263) 52-2552	HX-20 PX-8 Personal Computer
GRiD Systems	2535 Garcia Ave Mountain View CA 94043 (415) 961-4800	COMPASS COMPASS II
Hewlett-Packard	3000 Hanover St Palo Alto CA 94304 (415) 857-1501	HP 110 Integral PC
IBM	1133 Westchester Ave White Plains NY 10604 (914) 696-1900	Portable Personal Computer
ISM	932 Hungerford Dr Ste 6 Rockville MD 20850 (301) 279-5775	ISM Express PC ISM Express XT
Jonos International	1835 Dawns Way Fullerton CA 92631 (714) 999-6661	C2500 C2600
Kaypro	533 Stevens Ave Solana Beach CA 92075 (619) 481-4300	Kaypro 10 Kaypro 16 Kaypro 2 Kaypro 2X Kaypro 4
Magic Computer	Fairfield Business Campus 333 Route 46 West Fairfield NJ 07006 (800) 221-1565	PBC-88/1 PBC-88/2 PBC-88/H
MicroStandard Technologies	PO Box 319 New Lebanon OH (513) 687-1395	M3000
Morrow	600 McCormick San Leandro CA 94577 (415) 430-1970	Pivot
NEC Home Electronics	Personal Computer Division 1401 Estes Ave Elk Grove Village IL (312) 228-5900	PC-8201 PC-8401A
NNC Electronics	15631 Computer Lane Huntington Beach CA 92649 (714) 895-8000	Model 20 Microcomputer Model 40 Microcomputer
Olivetti	Via G. Jervis, 77 10015 Ivrea Italy (0125) 525	M21
Osborne Computer	42680 Christy St Fremont CA 94538 (415) 490-6885	Executive Osborne 3 Osborne Vixen

Vendor	Address/Telephone	Model
Panasonic	One Panasonic Way Secaucus NJ 07094 (201) 348-7000	Link Sr. Partner
Paradise Systems	150 N Hill Dr Brisbane CA 94005 (415) 468-6000	Convertible
Personal Micro Computers	275 Santa Ana Ct Sunnyvale CA 94086 (408) 737-8444	MicroMate Model PMC-101
Pronto Computers	3730 Skypark Dr Torrance CA 90505 (213) 539-6400	Transportable Solution
QDP Computer Systems	10033 Brecksville Rd Cleveland OH 44141 (216) 526-0838	500
Quadram	4355 International Blvd Norcross GA 30093 (404) 923-6666	Datavue 25
Sanyo Business Systems	51 Joseph St Moonachie NJ 07074 (201) 440-9300	MBC 775
Seequa Computer	8305 Telegraph Rd Odenton MD 21113 (301) 672-3600	Chameleon Chameleon Plus
Semi-Tech Microelectronics	390 Steelcase Rd E Unit 8 Markham Ontario L3R 1G2 Canada (416) 475-2670  STM Electronics 525 Middlefield Rd Suite 130 Menlo Park CA 94025 (415) 326-6226	Pied Piper 1 STM-1001 STM-1009
Sharp Electronics	10 Sharp Plaza Paramus NJ 07652 (201) 265-5600	PC-5000
Sord Computer of America	645 5th Ave New York NY 10022 (212) 759-0140	Consultant IS-IIC
Spectravideo	3300 Seldon Court 10 Freemont CA 94539 (415) 490-4300	Bondwell 12 Bondwell 14
Sperry	Computer Systems PO Box 500 Blue Bell PA 19424 (215) 542-4213	Sperry Portable Computer
Tandy	1800 One Tandy Center Fort Worth TX 76102 (817) 390-3700	Radio Shack TRS-80 Model 100 Radio Shack TRS-80 Model 200 Radio Shack TRS-80 Model 4P
Teleram Communications	2 Corporate Park Dr White Plains NY 10604 (914) 694-9270	Teleram T-3000 Teleram T-4000 Teleram T-5000





Vendor	Address/Telephone	Model
TeleVideo Systems	1170 Morse Ave Sunnyvale CA 94086 (408) 745-7760	TPC-I TPC-IIS & IID
Texas Instruments	PO Box 2909 Austin TX 78769 (512) 250-7111	Portable Professional Computer Pro-Lite
Visual Computer	135 Maple St Marlboro MA 01752 (617) 480-0000	Commuter
Zenith Data Systems	1000 Milwaukee Ave Glenview IL 60025 (312) 391-8860	Z-160 PC Portable

# MICROCOMPUTERS

## Specifications Chart Guide

The Microcomputer Specifications Charts summarize the significant characteristics of the major offerings in the portable, desktop, and multiuser microcomputer markets. The information is presented in chart form to facilitate the evaluation and comparison of alternative systems; microcomputers are listed in alphabetical order by manufacturer.

### VENDOR AND MODEL

This section identifies the microcomputer vendor by name and the product model number and/or name.

### CLASSIFICATION

This section identifies the category into which the microcomputer falls. Portable specifications charts include the weight of each unit. Desktop and multiuser systems are designated as desktop, floor standing, or rackmounted units.

### USERS/TASKS

Desktop system chart entries specify the number of tasks supported on each system. Multiuser system entries specify both the maximum and recommended number of users supported along with the number of tasks supported.

### MAIN UNIT

This section describes the characteristics of the central processing unit.

- **Main Processor**—This entry identifies the central processor vendor and the processor model number or name.
- **Word Size**—This entry indicates the number of bits handled as a unit; it is expressed as data bus size/internal architecture.
- **Clock Rate**—This entry, expressed in MHz, indicates the rate at which a word is transferred from one internal computer element to another.
- **Other Processors**—This entry identifies by vendor and model number any additional coprocessors (e.g., math and graphics) that are standard or optional on the system.

### MEMORY

This section describes, in bytes, the standard RAM for a typical configuration, the minimum and maximum amounts of RAM, and the available RAM increments.

### DISKETTE STORAGE

This section describes the characteristics of standard diskette drives and media.

- **No. of Drives**—This entry indicates the number of diskette drives.
- **Size and Format**—This entry indicates the diameter (in inches) of the diskettes used and the format of the diskettes: single- or double-sided (SS or DS), and single-, double-, or quad-density (SD, DD, or QD).
- **Capacity**—This entry indicates the amount of storage, in bytes, available on each diskette.

### DISK STORAGE

This section describes the characteristics of disk storage. The entries are similar to those given under Diskette Storage.

### OTHER STORAGE

This section indicates type and capacity of any other type of mass storage and whether it is a standard feature or an option (e.g., tape cartridge, bubble memory).

### DISPLAY

This section describes the characteristics of standard displays. Optional displays available from the vendor are listed in the comments section.

- **Size and Type**—This entry indicates the diagonal size of the display screen (in inches) and describes the technology (e.g., CRT, LCD, RGB).
- **Resolution**—This entry indicates the number of pixels (picture elements) available on the screen for forming images.
- **Text Display**—This entry indicates how many lines and characters the screen can display.
- **Character Matrix**—This entry indicates the number of dots available within a character block to form a character.
- **Colors**—This entry indicates the number of colors that can be displayed simultaneously and the number of colors available in the entire palette.

### KEYBOARD

This section describes the characteristics of the standard keyboard.

- **Keyboard Type**—This entry indicates whether the keyboard is detachable from or integral to (nondetachable) the system unit or display.
- **No. of Function Keys**—This entry indicates the total number of dedicated and programmable function keys.
- **Special Features**—Included in this entry are such features as cursor keys, mouse, touchscreen, and numeric keypad capabilities. Features are standard unless otherwise indicated.

## NUMBER OF AVAILABLE I/O SLOTS

This section indicates the number of I/O slots available for expansion after the installation of all major system components. The I/O slots are standard unless otherwise indicated.

## INTERFACES

This section describes the interface capabilities of the system. Interfaces are standard unless otherwise indicated.

- **Serial Ports**—This entry indicates the number and types of serial ports.
- **Parallel Ports**—This entry indicates the number and types of parallel ports.
- **Other Ports**—This entry indicates special output ports, including composite video, audio, and IEEE-488 as well as special input ports for such devices as a light pen, bar-code reader, and tablet.

## COMMUNICATIONS

This section indicates whether asynchronous and/or synchronous communications are standard, optional, or not available. When available, emulation protocols are given.

## SOFTWARE

This section indicates which operating systems are standard and optional, which software is included with the cost of the system, and which languages will run on the system.

## SALES AND SERVICE

This section indicates the initial delivery date of the system as well as sales and service channels.

## PRICING

This section gives the price of the system as specified by the manufacturer for a standard configuration or a range of prices for available system configurations.

## COMMENTS

This section lists special features or options that might influence a purchase decision (e.g., IBM Corporation Personal Computer (PC) compatibility).



# SPECIFICATIONS CHART

## Portable Microcomputers

229.0045.001

	<b>Apple Computer</b>	<b>Canon USA</b>	<b>COMPAQ Computer</b>
<b>Manufacturer</b>	Apple IIc	A-200TP	COMPAQ PLUS
<b>Model</b>	Apple IIc	19	31.6
<b>Weight (lbs)</b>	7.5		
<b>Main Processor</b>			
Model	Synertek 65C02	Intel 80C88	Intel 8088
Word Size (bits)	8/8	8/16	8/16
Clock Rate (MHz)	1.02	4.77	4.77
<b>Additional Processors</b>	NA	NA	Intel 8087 math coprocessor (opt.)
<b>RAM Memory</b>			
Standard RAM (bytes)	128K	512K	128K
Min/Max RAM (bytes)	128K/128K	512K/512K	128K/640K
RAM Increments (bytes)	NA	—	256K
<b>Std Diskette Storage</b>			
No. of Drives	1	2	1
Size (in.) & Format	5.25 SS	5.25 DSDD	5.25 DSDD
Capacity per Diskette (bytes)	140K	360K	360K
<b>Std Disk Storage</b>			
No. of Drives	NA	NA	1
Size (in.)	NA	NA	3.5
Capacity per Disk (bytes)	NA	NA	10M
<b>Other Storage (Std)</b>	NA	—	NA
<b>Other Storage (Opt.)</b>	3.5-in. 800KB diskette drive	5.25-in. 10MB disk drive	NA
<b>Display</b>			
Size and Type	9-in. CRT	12-in. LCD	9-in. CRT
Resolution (pixels)	560 x 192 (graphics mode)	200 x 640	640 x 200
Text Display (lines x col)	24 x 40/80	25 x 80	25 x 40/80
Character Matrix (dots)	5 x 7	8 x 8	—
Colors (simul/palette)	Green monochrome	Black and white monochrome	Monochrome
<b>Keyboard</b>			
Type	Integral	—	Detachable
No. of Programmable Function Keys	—	—	10
Special Features	Cursor keys (std); mouse, digital input pad (opt.)	—	Numeric keypad
<b>No. of Avail. I/O Slots</b>	NA	5 (opt.)	2
<b>Interfaces</b>			
Serial	2 RS-232C	1 (std); 2 (opt.)	1 RS-232C (opt.)
Parallel	NA	1 (std); 2 (opt.)	1 Centronics
Other	5 (incl mouse, video, printer/plotter connectors)	RGB modem	RGB, composite video, light pen
<b>Communications</b>			
Asynchronous	Std	Std (TTY)	Opt.
Synchronous	—	Opt. (2780/3780 BSC, 3270 BSC, 3270 SDLC)	NA
<b>Software</b>			
Std Operating Sys	ProDOS	MS-DOS	MS-DOS 2.0
Opt. Operating Sys	NA	—	—
Bundled Software	Applesoft BASIC	BASIC	NA
Languages	Applesoft BASIC	BASIC (std); Pascal, C, or Assembler from 3rd party	BASIC
<b>Sales &amp; Service</b>			
First Delivered	April 1984	September 1985	October 1983
Sales Channels	Direct, dealer	Dealer	Dealer
Service Channels	Dealer	Dealer	Dealer
<b>Pricing</b>	\$940	\$2,295	\$3,999
<b>Comments</b>	NA	Opt. 8/16 (simul/palette) color CRT available	IBM PC compatible

**Notes:**

- Information unavailable at press time
- NA Not applicable

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Manufacturer Model	COMPAQ Computer COMPAQ PORTABLE 31.3	COMPAQ Computer COMPAQ PORTABLE 286 33	Cordata ATP —
<b>Weight (lbs)</b>			
<b>Main Processor</b>			
Model	Intel 8088	Intel 80286	Intel 80286
Word Size (bits)	8/16	16/16	16/16
Clock Rate (MHz)	4.77	8	8
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt.)	Intel 80287 math coprocessor (opt.)	Intel 80287 math coprocessor (opt.)
<b>RAM Memory</b>			
Standard RAM (bytes)	128K (single drive), 256K (dual drive)	256K (Model 1), 640K (Model 2)	512K
Min/Max RAM (bytes)	128K (single drive), 256K (dual drive)/640K	128K/2.7M	512K/16M
RAM Increments (bytes)	64K, 256K	128K, 512K	—
<b>Std Diskette Storage</b>			
No. of Drives	1 - 2	1 - 2	1
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 QD
Capacity per Diskette (bytes)	360K	1.2M	1.2M
<b>Std Disk Storage</b>			
No. of Drives	NA	1	1
Size (in.)	NA	3.5	5.25
Capacity per Disk (bytes)	NA	20M	20M
<b>Other Storage (Std)</b>	NA	NA	—
<b>Other Storage (Opt.)</b>	3.5-in. 10MB disk drive (single diskette drive system only)	Dual 360KB diskette drives or 10MB disk/tape drive backup	5.25-in. 1.2MB diskette drive
<b>Display</b>			
Size and Type	9-in. CRT	9-in. CRT	9-in. CRT
Resolution (pixels)	640 x 200	640 x 200	400 x 640
Text Display (lines x col)	25 x 40/80	25 x 40/80	25 x 80
Character Matrix (dots)	—	—	16 x 16
Colors (simul/palette)	Monochrome	Monochrome	Green monochrome
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No. of Programmable Function Keys	10	10	10
Special Features	Numeric keypad	Numeric keypad	Cursor keys
<b>No. of Avail. I/O Slots</b>	3	3 (Model 1), 2 (Model 2)	5
<b>Interfaces</b>			
Serial	1 RS-232C (opt.)	1 RS-232C	1 RS-232C
Parallel	1 Centronics	1 Centronics	1 Centronics
Other	RGB, composite video, light pen	RGB, composite video, light pen	NA
<b>Communications</b>			
Asynchronous	Opt.	Std	Std
Synchronous	NA	NA	NA
<b>Software</b>			
Std Operating Sys	MS-DOS 2.0	MS-DOS 3.0	MS-DOS 3.XX
Opt. Operating Sys	—	—	—
Bundled Software Languages	NA BASIC	NA BASIC	— GW BASIC 3.X
<b>Sales &amp; Service</b>			
First Delivered	January 1983	April 1985	November 1985
Sales Channels	Dealer	Dealer	Distributor, VARs, OEM, private label
Service Channels	Dealer	Dealer	—
<b>Pricing</b>	\$2,495 (128KB RAM, 360KB diskette drive), \$2,699 (256KB RAM, 2 360KB diskette drives)	\$4,499 (Model 1 w/256KB RAM, 1.2MB diskette drive), \$6,299 (Model 2 w/640KB RAM, 1.2MB diskette drive, 20MB disk drive)	\$4,286
<b>Comments</b>	IBM PC compatible	IBM PC compatible	Processor features no wait states

**Notes:**

— Information unavailable at press time  
NA Not applicable



	<b>Cordata</b>	<b>Data General</b>	<b>Eagle Computer</b>
<b>Manufacturer Model</b>	PPC-400	DATA GENERAL/One	Eagle PC Spirit 2
<b>Weight (lbs)</b>	38	9.1	28
<b>Main Processor Model</b>	Intel 8088	Intel 80C88	Intel 8088
<b>Word Size (bits)</b>	8/16	8/16	8/16
<b>Clock Rate (MHz)</b>	4.77	4	4.77
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt.)	NA	Intel 8087 math coprocessor (opt.)
<b>RAM Memory Standard RAM (bytes)</b>	256K	256K	256K
<b>Min/Max RAM (bytes)</b>	256K/640K	256K/512K	256K/640K
<b>RAM Increments (bytes)</b>	128K	128K	256K
<b>Std Diskette Storage No. of Drives</b>	2	1 - 2	2
<b>Size (in.) &amp; Format</b>	5.25 DSDD	3.5 DSDD	5.25 DSDD
<b>Capacity per Diskette (bytes)</b>	360K	720K	360K
<b>Std Disk Storage No. of Drives</b>	NA	NA	NA
<b>Size (in.)</b>	NA	NA	NA
<b>Capacity per Disk (bytes)</b>	NA	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt.)</b>	3.5-in. 10MB disk drive w/5.25-in. form factor	5.25-in. diskette drive	NA
<b>Display Size and Type</b>	9-in. CRT	10.75-in. LCD	9-in. CRT
<b>Resolution (pixels)</b>	400 x 640	640 x 256	200 x 640
<b>Text Display (lines x col)</b>	25 x 80	25 x 80	24 x 80
<b>Character Matrix (dots)</b>	16 x 16	8 x 8	5 x 7
<b>Colors (simul/palette)</b>	Green monochrome	Monochrome	Green monochrome
<b>Keyboard Type</b>	Detachable	Integral	Detachable
<b>No. of Programmable Function Keys</b>	10	10	10
<b>Special Features</b>	Cursor keys, numeric keypad	4-key cursor control	Numeric keypad
<b>No. of Avail. I/O Slots</b>	4	2	2
<b>Interfaces Serial</b>	1 RS-232C	1 RS-232C, 1 RS-232C/RS-422	2
<b>Parallel</b>	1 Centronics	NA	1
<b>Other</b>	—	TTY	1 RGB, 1 composite video
<b>Communications Asynchronous</b>	Std	Opt.	Std
<b>Synchronous</b>	NA	NA	Opt.
<b>Software Std Operating Sys</b>	MS-DOS 2.11	MS-DOS	MS-DOS
<b>Opt. Operating Sys</b>	NA	CP/M-86	NA
<b>Bundled Software</b>	NA	NA	NA
<b>Languages</b>	GW BASIC 2.X	BASIC, Pascal, C	GW BASIC
<b>Sales &amp; Service First Delivered</b>	March 1985	September 1984	November 1983
<b>Sales Channels</b>	Distributor, VARs, OEM, private label	Distributor, dealer	Distributor, dealer
<b>Service Channels</b>	NA	Direct, dealer	Bell & Howell
<b>Pricing</b>	\$1,495	\$2,195 (incl 256KB RAM, 3.5-in. diskette drive), \$3,495 (incl 512KB RAM, two 3.5-in. diskette drives, internal 300-baud modem)	\$1,495
<b>Comments</b>	NA	IBM PC compatible, expansion chassis available	Opt. 13-in. 4/16 (simul/palette) color monitor available

**Notes:**

- Information unavailable at press time
- NA Not applicable



	<b>Eagle Computer</b>	<b>Epson America</b>	<b>Epson America</b>
<b>Manufacturer</b>	Eagle PC Spirit XL	Geneva PX-8	HX-20 Notebook Computer
<b>Model</b>	32.5	4	4
<b>Weight (lbs)</b>			
<b>Main Processor</b>	Intel 8088	Zilog Z80	Hitachi 6301
Model	8/16	8/8	8/8
Word Size (bits)	4.77	2.45	1.6 MHz
Clock Rate (MHz)		NA	NA
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt.)		
<b>RAM Memory</b>	256K	64K	16K
Standard RAM (bytes)	256K/640K	64K	16K/32K
Min/Max RAM (bytes)	256K	NA	8K
RAM Increments (bytes)			
<b>Std Diskette Storage</b>	1	NA	NA
No. of Drives	5.25 DSDD	NA	NA
Size (in.) & Format	360K	NA	NA
Capacity per Diskette (bytes)			
<b>Std Disk Storage</b>	1	NA	NA
No. of Drives	—	NA	NA
Size (in.)	10M	NA	NA
Capacity per Disk (bytes)			
<b>Other Storage (Std)</b>	NA	Microcassette tape drive	Microcassette drive
<b>Other Storage (Opt.)</b>	NA	3.5-in. 320KB diskette drive; 60KB or 120KB RAM disk	NA
<b>Display</b>	9-in. CRT	9-in. LCD	LCD
Size and Type	200 x 640	480 x 64	120 x 32
Resolution (pixels)	24 x 80	8 x 80	4 x 20
Text Display (lines x col)	5 x 7	6 x 8	6 x 8
Character Matrix (dots)	Green monochrome	Black and white monochrome	Black and white monochrome
Colors (simul/palette)			
<b>Keyboard</b>	Detachable	Integral	Integral
Type	10	9	8
No. of Programmable Function Keys			
Special Features	Numeric keypad	Cursor keys, 10-key numeric keypad	Numeric keypad function, cursor keys
<b>No. of Avail. I/O Slots</b>	2	NA	NA
<b>Interfaces</b>	2	2 RS-232C	2 RS-232C
Serial	1	NA	NA
Parallel	1 RGB, 1 composite video	External speaker, bar code reader, A/D converter, systems bus interface	External cassette, barcode reader, systems bus
Other			
<b>Communications</b>	Std	Std	Std
Asynchronous	Opt.	Std	NA
Synchronous			
<b>Software</b>	MS-DOS	CP/M 2.2	Proprietary
Std Operating Sys	PICK	NA	NA
Opt. Operating Sys	NA	GW BASIC, Portable	SkiWriter, BASIC
Bundled Software		Wordstar, Portable	
		Scheduler, Portable Calc	
		GW BASIC	
Languages	GW BASIC	GW BASIC	BASIC
<b>Sales &amp; Service</b>	November 1983	June 1984	May 1983
First Delivered	Distributor, dealer	Epson dealers	Dealer, VARs
Sales Channels	Bell & Howell	Epson dealers	Direct, VARs
Service Channels	\$2,295	\$995	\$795
<b>Pricing</b>	13-in. 4/16 (simul/palette)	Opt. Multi Unit w/64KB RAM	Clock/calendar and 24
<b>Comments</b>	color monitor available	disk, ROM sock, modem	column microprinter std

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<b>Manufacturer Model</b>	<b>Epson America</b> HX-40	<b>GRiD Systems</b> Compass I (1100, 1101, 1109) 10	<b>GRiD Systems</b> Compass II (1121, 1129, 1131, 1139) 10
<b>Weight (lbs)</b>	3.5		
<b>Main Processor Model</b>	Zilog Z80	Intel 8086	Intel 8086
<b>Word Size (bits)</b>	8/8	16/16	16/16
<b>Clock Rate (MHz)</b>	3.68	5	5
<b>Additional Processors</b>	NA	Intel 8087 math coprocessor	Intel 8087 math coprocessor
<b>RAM Memory Standard RAM (bytes)</b>	64K	256K (1100, 1101), 512K (1109)	256K (1121, 1131), 512K (1129, 1139)
<b>Min/Max RAM (bytes)</b>	64K/64K	256K/512K	256K/256K (1121, 1131), 512K/512K (1129, 1139)
<b>RAM Increments (bytes)</b>	NA	256K	NA
<b>Std Diskette Storage No. of Drives</b>	NA	NA	NA
<b>Size (in.) &amp; Format</b>	NA	NA	NA
<b>Capacity per Diskette (bytes)</b>	NA	NA	NA
<b>Std Disk Storage No. of Drives</b>	NA	NA	NA
<b>Size (in.)</b>	NA	NA	NA
<b>Capacity per Disk (bytes)</b>	NA	NA	NA
<b>Other Storage (Std)</b>	NA	384KB bubble memory	384KB bubble memory
<b>Other Storage (Opt.)</b>	Microcassette; 5.25-in. 320KB or 3.5-in. 320KB diskette drive; 128KB RAM disk	5.25-in. 360KB diskette drive, 10MB disk drive	5.25-in. 360KB diskette drive, 10MB disk drive
<b>Display Size and Type</b>	5.75-in. LCD	6-in. electrolum	6-in. electrolum (1121, 1129), 8-in. electrolum (1131, 1139)
<b>Resolution (pixels)</b>	64 x 240	320 x 240	320 x 240 (1121, 1129), 512 x 256 (1131, 1139)
<b>Text Display (lines x col)</b>	8 x 40	25 x 80	25 x 80
<b>Character Matrix (dots)</b>	6 x 8	—	—
<b>Colors (simul/palette)</b>	Black and white monochrome	Amber monochrome	Amber monochrome
<b>Keyboard Type</b>	Integral	Integral	Integral
<b>No. of Programmable Function Keys</b>	9	10	10
<b>Special Features</b>	Cursor keys (std); numeric keypad (opt.)	Cursor keys	Cursor keys
<b>No. of Avail. I/O Slots</b>	NA	NA	NA
<b>Interfaces Serial</b>	2 RS-232C	1 RS-232C/RS-422	1 RS-232C/RS-422
<b>Parallel</b>	1 Centronics	NA	NA
<b>Other</b>	Audio cassette, bar code reader	IEEE-488 GPIB expansion bus	IEEE-488 GPIB expansion bus
<b>Communications Asynchronous</b>	Std	Std	Std
<b>Synchronous</b>	NA	Std	Std
<b>Software Std Operating Sys</b>	CP/M 2.2	NA	NA
<b>Opt. Operating Sys</b>	NA	GRiD-OS, MS-DOS	GRiD-OS, MS-DOS
<b>Bundled Software Languages</b>	Microsoft BASIC Microsoft BASIC	NA C, FORTRAN 77, Pascal, PLM, ASM	NA C, FORTRAN 77, Pascal, PLM, ASM
<b>Sales &amp; Service First Delivered</b>	November 1984	April 1982	June 1984
<b>Sales Channels</b>	VARs	Direct, VAR	Direct, VAR
<b>Service Channels</b>	VARs	Direct	Direct
<b>Pricing</b>	Vendor declined to provide	\$4,250-\$6,200	\$6,000-\$8,000
<b>Comments</b>	One cartridge module supported for connecting printer, microcassette, modem, 16KB RAM or 64KB ROM	Std integral modem (1101, 1109); opt. integral modem (1100)	Four ROM slots, integral modem

**Notes:**

- Information unavailable at press time
- NA Not applicable





Manufacturer Model	GRiD Systems GRiDCase (Models 1, 2 and 3)	Hewlett-Packard HP-71 Handheld Computer	Hewlett-Packard HP-75D Handheld Computer
<b>Weight (lbs)</b>	12	—	—
<b>Main Processor Model</b>	Intel 80C86	Proprietary	Proprietary
Word Size (bits)	16/16	—/4	8/8
Clock Rate (MHz)	4.77	—	—
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt.)	NA	NA
<b>RAM Memory</b>			
Standard RAM (bytes)	128K	17.5K	16K
Min/Max RAM (bytes)	128K/512K	17.5K/33.5K	16K/24K
RAM Increments (bytes)	128K	4K	8K
<b>Std Diskette Storage</b>			
No. of Drives	1	NA	NA
Size (in.) & Format	3.5	NA	NA
Capacity per Diskette (bytes)	720K	NA	NA
<b>Std Disk Storage</b>			
No. of Drives	NA	NA	NA
Size (in.)	NA	NA	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt.)</b>	3.5-in. 720KB diskette drive, 5.25-in. 360KB diskette drive, 10MB disk drive	NA	NA
<b>Display</b>			
Size and Type	9.5-in. LCD (Model 1), enhanced LCD (Model 2), plasma (Model 3)	LCD	LCD
Resolution (pixels)	640 x 200	—	—
Text Display (lines x col)	25 x 80	Single line	Single line
Character Matrix (dots)	—	—	—
Colors (simul/palette)	Amber monochrome	Monochrome	Monochrome
<b>Keyboard</b>			
Type	Integral	Integral	Integral
No. of Programmable Function Keys	10	—	—
Special Features	Cursor keys	10 digit numeric keypad	Redefinable
<b>No. of Avail. I/O Slots</b>	NA	4	3
<b>Interfaces</b>			
Serial	1 RS-232C	1 RS-232C	1 RS-232C (opt.)
Parallel	1 Centronics	—	—
Other	RJ-11, IBM PC-compatible external bus, IBM PC keyboard (std); color monitor (opt.)	HP-IL (opt.)	HP-IL (opt.)
<b>Communications</b>			
Asynchronous	Std	—	—
Synchronous	Std	—	—
<b>Software</b>			
Std Operating Sys	NA	HP BASIC	HP BASIC
Opt. Operating Sys	GRiD-OS, MS-DOS	NA	NA
Bundled Software Languages	NA C, FORTRAN 77, Pascal, PLM, ASM	NA BASIC, Forth, Assembler	NA BASIC, Forth, Assembler
<b>Sales &amp; Service</b>			
First Delivered	April 1985	—	—
Sales Channels	Direct, VAR	Direct, dealer	Direct, dealer
Service Channels	Direct	Direct, dealer	Direct, dealer
<b>Pricing</b>	\$2,975 (Model 1), \$3,150 (Model 2), \$4,350 (Model 3)	\$525	\$1,145
<b>Comments</b>	IBM PC compatible, opt. integral modem	129KB RAM max. using 3rd party modules	Opt. expansion unit incl 64KB RAM and internal modem

**Notes:**

- Information unavailable at press time  
 NA Not applicable



	<b>Hewlett-Packard</b>	<b>IBM</b>	<b>Kaypro</b>
<b>Manufacturer Model</b>	HP Portable PLUS 9	Portable Personal Computer 30	Kaypro 10 31
<b>Weight (lbs)</b>			
<b>Main Processor Model</b>	Intel 80C86	Intel 8088	Zilog Z80A
<b>Word Size (bits)</b>	16/16	8/16	8/8
<b>Clock Rate (MHz)</b>	5.33	4.77	4
<b>Additional Processors</b>	NA	Intel 8087 math coprocessor (opt.)	NA
<b>RAM Memory Standard RAM (bytes)</b>	128K	256K	64K
<b>Min/Max RAM (bytes)</b>	128K/896K	256K/512K	64K/64K
<b>RAM Increments (bytes)</b>	128K	64K, 256K	NA
<b>Std Diskette Storage No. of Drives</b>	NA	1 - 2	1
<b>Size (in.) &amp; Format</b>	NA	5.25 DSDD	5.25 DSDD
<b>Capacity per Diskette (bytes)</b>	NA	360K	400K
<b>Std Disk Storage No. of Drives</b>	NA	NA	1
<b>Size (in.)</b>	NA	NA	—
<b>Capacity per Disk (bytes)</b>	NA	NA	10M
<b>Other Storage (Std)</b>	Integral HP Electronic Disc	NA	NA
<b>Other Storage (Opt.)</b>	3.5-in. 710KB diskette drive	360KB diskette drive, 10MB or 20MB disk drive	NA
<b>Display Size and Type</b>	LCD	9-in. CRT	9-in. CRT
<b>Resolution (pixels)</b>	200 x 480	640 x 368	100 x 160
<b>Text Display (lines x col)</b>	25 x 80	—	25 x 80
<b>Character Matrix (dots)</b>	—	—	—
<b>Colors (simul/palette)</b>	Monochrome	Amber monochrome	Green monochrome
<b>Keyboard Type</b>	Integral	Separate	Detachable
<b>No. of Programmable Function Keys</b>	8	10	18
<b>Special Features</b>	Shifted numeric keypad	4-key cursor control in numeric pad	Cursor keys, numeric keypad
<b>No. of Avail. I/O Slots</b>	2	5	NA
<b>Interfaces Serial</b>	1 RS-232C	Opt.	2 RS-232
<b>Parallel</b>	NA	Opt.	1 Centronics
<b>Other</b>	HP-IL	Color/graphics monitor adapter	NA
<b>Communications Asynchronous</b>	Opt.	Opt.	Std (TTY)
<b>Synchronous</b>	—	Opt. (BSC, SDLC, IBM 3278/3279)	NA
<b>Software Std Operating Sys</b>	MS-DOS 2.11	PC-DOS 2.1 (or later)	CP/M
<b>Opt. Operating Sys</b>	NA	MS-DOS, UCSD p-System, CP/M-86	NA
<b>Bundled Software</b>	Personal Applications Manager (PAM), communications, text editor	NA	WordStar, CalcStar, InfoStar, MicroPlan, Mite
<b>Languages</b>	GW BASIC, C, Pascal	APL, BASIC, COBOL, FORTRAN, Pascal	CBASIC, SBASIC, MBASIC-80
<b>Sales &amp; Service First Delivered</b>	—	February 1984	—
<b>Sales Channels</b>	Direct, dealer	Direct, dealer	Kaypro dealers
<b>Service Channels</b>	Direct, dealer	IBM Customer Service	Kaypro dealers
<b>Pricing</b>	\$2,295 (incl 128KB RAM)	\$2,595 (incl 256KB RAM; 1 diskette drive), \$3,020 (includes 2 diskette drives)	\$2,295
<b>Comments</b>	Opt. integral modem	Opt. color/graphics monitor available	NA

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable



	<b>Kaypro</b>	<b>Kaypro</b>	<b>Kaypro</b>
<b>Manufacturer</b>	Kaypro	Kaypro	Kaypro
<b>Model</b>	Kaypro 16	Kaypro 16/2	Kaypro 2000
<b>Weight (lbs)</b>	35	30	11.5
<b>Main Processor</b>			
Model	Intel 8088	Intel 8088	Intel 8088
Word Size (bits)	8/16	8/16	8/16
Clock Rate (MHz)	4.77	4.77	4.77
<b>Additional Processors</b>	NA	NA	Intel 8087 math coprocessor (opt.)
<b>RAM Memory</b>			
Standard RAM (bytes)	256K	256K	256K
Min/Max RAM (bytes)	256K/640K	256K/640K	256K/768K
RAM Increments (bytes)	64K	64K	—
<b>Std Diskette Storage</b>			
No. of Drives	1	2	1
Size (in.) & Format	5.25 DSDD	5.25 DSDD	3.5 DSQD
Capacity per Diskette (bytes)	360K	360K	720K
<b>Std Disk Storage</b>			
No. of Drives	1	NA	NA
Size (in.)	—	NA	NA
Capacity per Disk (bytes)	10M	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt.)</b>	NA	NA	5.25 360KB DSDD or 1.35-in. DSQD diskette drive; 5.25-in. 10MB or 20MB disk drive
<b>Display</b>			
Size and Type	9-in. CRT	9-in. CRT	11-in. LCD
Resolution (pixels)	200 x 320/640	200 x 320/640	200 x 640
Text Display (lines x col)	25 x 40/80	25 x 40/80	25 x 80
Character Matrix (dots)	—	—	—
Colors (simul/palette)	Green monochrome	Green monochrome	Monochrome
<b>Keyboard</b>			
Type	Detachable	Detachable	Detachable
No. of Programmable Function Keys	10	10	10
Special Features	Cursor keys, numeric keypad	Cursor keys, numeric keypad	Cursor keys, numeric keypad
<b>No. of Avail. I/O Slots</b>	1	1	1 (std); 3 (opt.)
<b>Interfaces</b>			
Serial	1 RS-232	1 RS-232	1 RS-232 (std); 1 RS-232 (opt.)
Parallel	1 Centronics	1 Centronics	1 Centronics (opt.)
Other	1 RGB, 1 composite	1 RGB, 1 composite	1 RGB, 1 monochrome, 1 composite (opt.)
<b>Communications</b>			
Asynchronous	NA	—	—
Synchronous	NA	—	—
<b>Software</b>			
Std Operating Sys	MS-DOS	MS-DOS	MS-DOS
Opt. Operating Sys	NA	NA	NA
Bundled Software	WordStar, PolyWindows, KDesk, Mite	WordStar, PolyWindows, KDesk, Mite	WordStar, Traveling Expense Manager, Mite, PolyWindows
Languages	GW BASIC	GW BASIC	GW BASIC
<b>Sales &amp; Service</b>			
First Delivered	December 1984	February 1985	May 1985
Sales Channels	Kaypro dealers	Kaypro dealers	Kaypro dealers
Service Channels	Kaypro dealers	Kaypro dealers	Kaypro dealers
<b>Pricing</b>	\$2,695	\$1,995	\$1,995
<b>Comments</b>	Opt. 14-in. 16/16 (simul/palette) color monitor available	Opt. 14-in. 16/16 (simul/palette) color monitor available	Opt. 14-in. 16/16 (simul/palette) color monitor available

**Notes:**

— Information unavailable at press time  
 NA Not applicable



	<b>Kaypro</b>	<b>Morrow</b>	<b>NEC Home Electronics</b>
<b>Manufacturer Model</b>	Kaypro 2X 26	Pivot 2 14.5	PC 8201A 3.8
<b>Weight (lbs)</b>			
<b>Main Processor Model</b>	Zilog Z80A	Intel 80C88	Intel 80C85
Word Size (bits)	8/8	8/16	8/8
Clock Rate (MHz)	4	4.77	2.4
<b>Additional Processors</b>	NA	NA	NA
<b>RAM Memory</b>			
Standard RAM (bytes)	64K	320K	16K
Min/Max RAM (bytes)	64K/64K	320K/640K	16K/96K
RAM Increments (bytes)	NA	320K	8K
<b>Std Diskette Storage</b>			
No. of Drives	2	2	NA
Size (in.) & Format	5.25 DSDD	5.25 DSDD	NA
Capacity per Diskette (bytes)	400K	320K	NA
<b>Std Disk Storage</b>			
No. of Drives	NA	NA	NA
Size (in.)	NA	NA	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt.)</b>	NA	Expansion chassis w/hard disk	3.5-in. 320KB SSDD diskette drive
<b>Display</b>			
Size and Type	9-in. CRT	LCD (nonglare, backlit)	7.75-in. LCD
Resolution (pixels)	100 x 160	200 x 640	240 x 64
Text Display (lines x col)	25 x 80	25 x 80	8 x 40
Character Matrix (dots)	—	—	—
Colors (simul/palette)	Green monochrome	Black and white monochrome	Black and white monochrome
<b>Keyboard</b>			
Type	Detachable	Integral	Integral
No. of Programmable Function Keys	18	10	10
Special Features	Cursor keys, numeric keypad	Cursor keys	Cursor keys
<b>No. of Avail. I/O Slots</b>	NA	NA	1
<b>Interfaces</b>			
Serial	2 RS-232	1	3
Parallel	1 Centronics	1	1 Centronics
Other	NA	RJ 11 phone jack outlet	Bar code reader, audio cassette, system slot for 32KB RAM memory cartridge
<b>Communications</b>			
Asynchronous	Std (TTY)	Yes (VT-100)	Std
Synchronous	NA	NA	NA
<b>Software</b>			
Std Operating Sys	CP/M	MS-DOS 3.1	Proprietary
Opt. Operating Sys	NA	PC DOS (3rd party)	NA
Bundled Software	WordStar, CalcStar, InfoStar, MicroPlan, Mite	NewWord	Microsoft BASIC, text editing, telecommunications
Languages	CBASIC, SBASIC, MBASIC-80	GW BASIC, Turbo Pascal	Microsoft BASIC
<b>Sales &amp; Service</b>			
First Delivered	June 1984	July 1985	September 1983
Sales Channels	Kaypro dealers	Dealers	Direct, distributor, dealer
Service Channels	Kaypro dealers	Morrow service centers	NEC HE regional service centers
<b>Pricing</b>	\$1,295	\$1,995	\$399
<b>Comments</b>	NA	IBM PC compatible; opt. modem & video card for attachment to color monitor	Opt. CRT adapter

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer Model</b>	<b>NEC Home Electronics</b> PC 8401A-LS	<b>OEMTEK</b> 8200 Series	<b>OEMTEK</b> 9200 Series
<b>Weight (lbs)</b>	5.9	36	37
<b>Main Processor</b>	Zilog Z80	Intel 8088	Intel 80286
Model	8/8	8/16	16/16
Word Size (bits)	4	4.77	6 or 8
Clock Rate (MHz)	NA	Intel 8087 math coprocessor (opt.)	NA
<b>Additional Processors</b>			
<b>RAM Memory</b>	64K	256K	640K
Standard RAM (bytes)	64K/64K	256K/640K	512K/1MB
Min/Max RAM (bytes)	NA	64K	64K
RAM Increments (bytes)			
<b>Std Diskette Storage</b>	NA	1	1
No. of Drives	NA	5.25	5.25
Size (in.) & Format	NA	360K	1.2MB
Capacity per Diskette (bytes)			
<b>Std Disk Storage</b>	NA	NA	1
No. of Drives	NA	NA	5.25
Size (in.)	NA	NA	10M, 20M
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt.)</b>	1-2 3.5-in. 320KB SSDS diskette drive; 32KB external RAM disk cartridge	5.25-in. 360KB diskette drive or 5.25-in. 10MB disk drive	
<b>Display</b>	10-in. LCD	9-in. CRT	9-in. CRT
Size and Type	480 x 128	—	—
Resolution (pixels)	16 x 80	25 x 80	25 x 80
Text Display (lines x col)	—	9 x 14	9 x 14
Character Matrix (dots)	Black and white monochrome	Amber monochrome	Amber monochrome
Colors (simul/palette)			
<b>Keyboard</b>	Integral	Detachable	Detachable
Type	10	18	18
No. of Programmable Function Keys	Cursor keys	Cursor keys	Cursor keys
Special Features	NA	5	5
<b>No. of Avail. I/O Slots</b>			
<b>Interfaces</b>	1 RS-232C	Opt.	Opt.
Serial	1 Centronics	2 Centronics compatible (opt.)	2 (opt.)
Parallel		Composite video port (opt.)	Composite video (opt.)
Other	Cassette recorder, systems slot (for 32KB RAM disk cartridge), 2 RJ11C phone jack outlets		
<b>Communications</b>	Std	Std (TTY)	Std (TTY)
Asynchronous	NA	Std	Std
Synchronous			
<b>Software</b>	CP/M	PC-DOS, MS-DOS	PC DOS, MS-DOS
Std Operating Sys	NA	CP/M-86	CP/M-86
Opt. Operating Sys	Wordstar To Go, Calc To Go, Filer, telecommunications (in ROM)	NA	NA
Bundled Software			
Languages	—	GW BASIC, FORTRAN, COBOL, Assembler	GW BASIC, FORTRAN, COBOL, Assembler
<b>Sales &amp; Service</b>	April 1985	November 1985	November 1985
First Delivered	Direct, distributor, dealer	VARs, OEM	VARs, OEM
Sales Channels	NEC HE regional service centers	Vendor, 3rd party	Vendor, 3rd party
Service Channels			
<b>Pricing</b>	\$999	\$1,895-\$2,800	\$4,900
<b>Comments</b>	Integral modem, opt. CRT adapter	IBM PC, PC XT compatible	IBM PC AT compatible

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<b>Manufacturer Model</b>	<b>Osborne Computer</b> Vixen	<b>Panasonic</b> Exec. Partner FT-70F1 & FT-70	<b>Panasonic</b> Exec. Partner FT-80
<b>Weight (lbs)</b>	20	28	28
<b>Main Processor Model</b>	Zilog Z80A	Intel 8086-2	Intel 8086-2
<b>Word Size (bits)</b>	8/8	16/16	16/16
<b>Clock Rate (MHz)</b>	—	7.16	7.16
<b>Additional Processors</b>	NA	Intel 8087 math coprocessor (opt.)	Intel 8087 math coprocessor
<b>RAM Memory</b>			
Standard RAM (bytes)	64K	256K	256K
Min/Max RAM (bytes)	64K/64K	256K/640K	256K/640K
RAM Increments (bytes)	NA	256K	256K
<b>Std Diskette Storage</b>			
No. of Drives	2	1 (FT-70F1), 2 (FT-70)	1
Size (in.) & Format	5.25 DSDD	5.25 DSDD	5.25 DSDD
Capacity per Diskette (bytes)	390K	360K	360K
<b>Std Disk Storage</b>			
No. of Drives	NA	NA	1
Size (in.)	NA	NA	5.25
Capacity per Disk (bytes)	NA	NA	10M
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt.)</b>	5.25-in. 10MB disk drive	10MB or 20MB disk drive (FT-70F1)	NA
<b>Display</b>			
Size and Type	7-in. CRT	11-in. gas plasma	11-in. gas plasma
Resolution (pixels)	—	640 x 400	640 x 400
Text Display (lines x col)	24 x 80	25 x 80	25 x 80
Character Matrix (dots)	—	8 x 16	8 x 16
Colors (simul/palette)	Amber monochrome	Neon orange	Neon orange
<b>Keyboard</b>			
Type	Integral	Integral	Integral
No. of Programmable Function Keys	10	10	10
Special Features	Cursor keys; numeric keypad (opt.)	Cursor keys, numeric keypad	Cursor keys, numeric keypad
<b>No. of Avail. I/O Slots</b>	NA	2	2
<b>Interfaces</b>			
Serial	1 RS-232	1 RS-232C	1 RS-232C
Parallel	1 Centronics	1 Centronics	1 Centronics
Other	NA	60-pin bus port	60-pin bus port
<b>Communications</b>			
Asynchronous	—	Std	Std
Synchronous	NA	—	—
<b>Software</b>			
Std Operating Sys	CP/M 2.2	MS-DOS 2.11	MS-DOS 2.11
Opt. Operating Sys	NA	UCSD p-System, CP/M-86, XENIX	—
<b>Bundled Software</b>	WordStar, Supercalc, MediaMaster, Desolation	NA	NA
<b>Languages</b>	—	—	—
<b>Sales &amp; Service</b>			
First Delivered	October 1984	January 1986 (FT-70F1), July 1985 (FT-70)	January 1986
<b>Sales Channels</b>	Dealer, distributor	Dealers, VARs	Dealers, VARs
<b>Service Channels</b>	Dealer	3rd party	3rd party
<b>Pricing</b>	\$1,298	\$2,445 (FT-70F1); \$2,595 (FT-70)	\$3,795
<b>Comments</b>	NA	Integral printer	Integral printer

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable

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Manufacturer Model	Panasonic Sr. Partner RL-H7000 & RL-H7000W	Panasonic Sr. Partner RL-H7100	Quadram Datavue
<b>Weight (lbs)</b>	31 (RL-H7000), 33 (RL-H7000W)	35	12
<b>Main Processor</b>	Intel 8088	Intel 8088	Intel 80C88
Model	8/16	8/16	8/16
Word Size (bits)	4.77	4.77	4.77
Clock Rate (MHz)			
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt.)	Intel 8087 math coprocessor (opt.)	Intel 8087 math coprocessor (opt.)
<b>RAM Memory</b>	256K	256K	256K
Standard RAM (bytes)	256K/512K	256K/640K	256K/1.3M
Min/Max RAM (bytes)	256K	256K	256K
RAM Increments (bytes)			
<b>Std Diskette Storage</b>	1 (RL-H7000), 2 (RL-H7000W)	1	1
No. of Drives	5.25 DSDD	5.25 DSDD	5.25 DSDD
Size (in.) & Format	360K	360K	360K
Capacity per Diskette (bytes)			
<b>Std Disk Storage</b>	NA	1	NA
No. of Drives	NA	5.25	NA
Size (in.)	NA	10M	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt.)</b>	NA	NA	5.25-in. 360KB diskette drive, 10MB disk drive
<b>Display</b>	9-in. CRT	9-in. CRT	10-in. LCD
Size and Type	640 x 200	640 x 200	640/320 x 200
Resolution (pixels)	25 x 80	25 x 80	25 x 80
Text Display (lines x col)	—	—	8 x 8
Character Matrix (dots)	Monochrome	Monochrome	Gray monochrome
Colors (simul/palette)			
<b>Keyboard</b>	Detachable	Detachable	Detachable
Type	10	10	10
No. of Programmable Function Keys	Cursor keys, numeric keypad	Cursor keys, numeric pad	Cursor keys, numeric keypad
Special Features	2	2	NA
<b>No. of Avail. I/O Slots</b>			
<b>Interfaces</b>	1 RS-232C	1 RS-232C	1 RS-232C
Serial	1 Centronics	1 Centronics	1 Centronics
Parallel	NA	NA	RGB
Other			
<b>Communications</b>	Std	Std	Std (TTY, VT 100)
Asynchronous	—	—	Std (3270 BSC)
Synchronous			
<b>Software</b>	MS-DOS 2.11	MS-DOS 2.11	MS-DOS
Std Operating Sys	NA	NA	PC-DOS
Opt. Operating Sys	pfs:file, pfs:write, pfs:plan, pfs:report, pfs:graph	NA	NA
Bundled Software			
Languages	—	—	Avail. thru 3rd party
<b>Sales &amp; Service</b>	September 1984	December 1984	February 1985
First Delivered	Dealer, VARs	Dealer, VARs	Direct, distributor, dealer
Sales Channels	3rd party	3rd party	Manufacturer
Service Channels	\$1,845 (RL-H7000); \$2,195 (RL-H7000W)	\$3,495	\$1,695 (w/256KB RAM); \$2,195 (w/1.3MB RAM)
<b>Pricing</b>	Integral printer	Integral printer	IBM PC-compatible; opt. color monitors available
<b>Comments</b>			

**Notes:**

— Information unavailable at press time  
NA Not applicable



<b>Manufacturer</b>	Sanyo	Sanyo	Sharp Electronics
<b>Model</b>	MBC-675	MBC-775e	PC-5000
<b>Weight (lbs)</b>	31	36	11.2
<b>Main Processor</b>			
Model	Intel 8088	Intel 8088-2	Intel 8088
Word Size (bits)	8/16	8/16	8/16
Clock Rate (MHz)	4.77	4.77/8	—
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt.)	Intel 8087 math coprocessor (opt.)	NA
<b>RAM Memory</b>			
Standard RAM (bytes)	256K	256K	128K
Min/Max RAM (bytes)	256K/640K	256K/640K	128K/320K
RAM Increments (bytes)	256K, then 64K	64K	64K, 128K
<b>Std Diskette Storage</b>			
No. of Drives	2	2	NA
Size (in.) & Format	5.25 DSDD	5.25 DSDD	NA
Capacity per Diskette (bytes)	360K	360K	NA
<b>Std Disk Storage</b>			
No. of Drives	NA	NA	NA
Size (in.)	NA	NA	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt.)</b>	NA	NA	128KB nonvolatile bubble memory, dual 5.25-in. 320KB drives
<b>Display</b>			
Size and Type	7-in. CRT	9-in. CRT	12-in. LCD
Resolution (pixels)	640 x 200	640 x 200	640 x 80
Text Display (lines x col)	25 x 80	25 x 80	8 x 80
Character Matrix (dots)	8 x 8	8 x 8	—
Colors (simul/palette)	Monochrome	16/16 color	Monochrome
<b>Keyboard</b>			
Type	Detachable	Detachable	Integral
No. of Programmable Function Keys	10	10	8
Special Features	Cursor keys, numeric keypad, LED on num lock, caps lock	Cursor keys, numeric keypad, LED on caps lock, num lock	4-key row cursor control (std); numeric keypad (opt.)
<b>No. of Avail. I/O Slots</b>	2	2	2
<b>Interfaces</b>			
Serial	1 RS-232 (std); 3 RS-232 (opt.)	1 to 4 RS-232 (opt.)	1 RS-232C
Parallel	1 Centronics (std); 3 Centronics (opt.)	1 Centronics (std); 1-2 addl. Centronics (opt.)	1 Centronics
Other	NA	RGB composite	1 audio cassette
<b>Communications</b>			
Asynchronous	Std (VT 100)	Opt. (VT 100)	Std (AT&T 103)
Synchronous	Opt. (2780/3780 BSC, 3270 BSC, 3270 SDLC, X.25)	Opt. (2780/3780 BSC, 3270 BSC, 3270 SDLC, X.25)	NA
<b>Software</b>			
Std Operating Sys	MS-DOS 2.11	MS-DOS 2.11	MS-DOS
Opt. Operating Sys	CP/M-86, XENIX, MS-DOS 3.0, 3.1	CP/M-86, XENIX, MS-DOS 3.0, 3.1	NA
Bundled Software	WordStar 3.3, CalcStar	EasyWriter II, EasyPlanner, EasyFiler, EasyMailer	SuperWriter, SuperComm
Languages	—	—	BASIC, FORTRAN, COBOL
<b>Sales &amp; Service</b>			
First Delivered	May 1985	November 1984	Fall 1984
Sales Channels	Direct, distributor	Distributor, direct	Retailer, VARs
Service Channels	Dealer, in-house	Dealer, in-house	Direct, dealers
<b>Pricing</b>	\$1,599	\$2,299-\$2,449	\$795 (includes 128KB RAM)
<b>Comments</b>	Opt. color monitor available	Opt. monochrome monitor available	Opt. integral thermal printer

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable

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	Sharp Electronics	Sord Computer of America	Tandy
<b>Manufacturer Model</b>	PC-7000	IS-11C	Model 100
<b>Weight (lbs)</b>	18.8	6.5	3.9
<b>Main Processor Model</b>	Intel 8086	Zilog Z80A	Intel 80C85
Word Size (bits)	16/16	8/8	8/8
Clock Rate (MHz)	7.37	3.6	2.4
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt.)	NA	NA
<b>RAM Memory</b>			
Standard RAM (bytes)	320K	80K	24K
Min/Max RAM (bytes)	320K/704K	80K/144K	24K/32K
RAM Increments (bytes)	128K	64K	8K
<b>Std Diskette Storage</b>			
No. of Drives	2 integral	NA	NA
Size (in.) & Format	5.25	NA	NA
Capacity per Diskette (bytes)	320K (8 sector), 360K (9 sector)	NA	NA
<b>Std Disk Storage</b>			
No. of Drives	NA	NA	NA
Size (in.)	NA	NA	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	128KB microcassette	NA
<b>Other Storage (Opt.)</b>	3.5-in. 10MB disk drive	3.5-in. 640KB diskette drives	3.5-in. 100KB portable diskette drive
<b>Display</b>			
Size and Type	10.5-in. Sharp illuminated crystal display	LCD	LCD
Resolution (pixels)	640 x 200	640 x 200	240 x 64
Text Display (lines x col)	25 x 80	25 x 80	8 x 40
Character Matrix (dots)	—	—	—
Colors (simul/palette)	Monochrome	Monochrome	Monochrome
<b>Keyboard</b>			
Type	Detachable	Integral	Integral
No. of Programmable Function Keys	10	6	8
Special Features	Numeric keypad	Numeric keypad (std); 10-keypad with 12 function keys (opt.)	4 command keys, 4 cursor control keys
<b>No. of Avail. I/O Slots</b>	3	1	—
<b>Interfaces</b>			
Serial	1 RS-232C	1 RS-232C	1 RS-232C
Parallel	1 Centronics	1 Centronics	1
Other	NA	Modem port, bar code reader port	Cassette tape, bar-code reader
<b>Communications</b>			
Asynchronous	Opt.	Std	Std
Synchronous	NA	NA	NA
<b>Software</b>			
Std Operating Sys	MS-DOS 2.11	Proprietary	Proprietary (dev. by Microsoft)
Opt. Operating Sys	NA	NA	NA
Bundled Software	NA	WP, notebook, calendar, calculator	5 mgmt. programs
Languages	GW BASIC	I-BASIC	BASIC
<b>Sales &amp; Service</b>			
First Delivered	1985	February 1985	March 1983
Sales Channels	Retailers, VARs	Direct, distributor, OEM, VARs	Direct, dealer
Service Channels	Direct, dealers	Direct	Direct, dealer
<b>Pricing</b>	\$1,795 (includes 320KB RAM)	\$1,395	\$599 (incl 24KB RAM)
<b>Comments</b>	Opt. color monitor available	Integral modem	Integral modem, opt. bar code reader available

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<b>Manufacturer</b>	<b>Tandy</b>	<b>Tandy</b>	<b>TeleVideo Systems</b>
<b>Model</b>	Tandy 200	Tandy 600	TPC IIS & TPC IID
<b>Weight (lbs)</b>	4.5	11	28
<b>Main Processor</b>			
Model	Intel 80C85	Intel 80C88	Intel 8088
Word Size (bits)	8/8	8/16	8/16
Clock Rate (MHz)	2.4	3.07	5
<b>Additional Processors</b>	NA	NA	NA
<b>RAM Memory</b>			
Standard RAM (bytes)	24K	32K	256K
Min/Max RAM (bytes)	24K/72K	32K/32K	256K/640K
RAM Increments (bytes)	24K	NA	64K, 256K
<b>Std Diskette Storage</b>			
No. of Drives	NA	1	1 (TPC IIS), 2 (TPC IID)
Size (in.) & Format	NA	3.5	5.25 DSDD
Capacity per Diskette (bytes)	NA	360K	360K
<b>Std Disk Storage</b>			
No. of Drives	NA	NA	NA
Size (in.)	NA	NA	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt.)</b>	3.5-in. 100KB portable diskette drive	3.5-in. 100KB portable diskette drive	NA
<b>Display</b>			
Size and Type	LCD	9-in. LCD	9-in. CRT
Resolution (pixels)	240 x 128	—	640 x 200
Text Display (lines x col)	16 x 40	16 x 80	24 x 80
Character Matrix (dots)	—	—	7 x 7
Colors (simul/palette)	Monochrome	Monochrome	Monochrome
<b>Keyboard</b>			
Type	Integral	Integral	Detachable
No. of Programmable Function Keys	8	16	10
Special Features	4 command keys, 4 cursor control keys	Numeric keypad function	Numeric keypad
<b>No. of Avail. I/O Slots</b>	—	—	1
<b>Interfaces</b>			
Serial	1 RS-232C	1 RS-232C	1 RS-232C
Parallel	1	1	1 Centronics
Other	Cassette tape, bar-code reader	NA	1 RGB, 1 composite video
<b>Communications</b>			
Asynchronous	Std	Std	Std
Synchronous	NA	NA	NA
<b>Software</b>			
Std Operating Sys	Proprietary (dev. by Microsoft)	Microsoft Works	MS-DOS 2.11
Opt. Operating Sys	NA	NA	NA
Bundled Software	Multiplan, WP, calendar, address/phone directory, auto-dialer, communications	Word processor, spreadsheet, database, telecommunications, calendar	TeleWrite, TeleCalc, TeleDBMS
Languages	BASIC	—	GW BASIC
<b>Sales &amp; Service</b>			
First Delivered	—	October 1985	April 1984
Sales Channels	Direct, dealer	Dealer	Distributors, dealers
Service Channels	Direct, dealer	Dealer	TRW, distributors, dealers
<b>Pricing</b>	\$999 (incl 24KB RAM)	\$1,599	\$2,095 (TPC IIS), \$2,395 (TPC IID)
<b>Comments</b>	Integral modem, opt. bar code reader available	Integral modem; opt. dual 96KB RAM upgrades	IBM PC compatible; incl. 16KB RAM video graphics

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable

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	<b>Texas Instruments</b> Portable Professional 34	<b>Texas Instruments</b> Pro-Lite 10.5	<b>Toshiba</b> T1100 9
<b>Manufacturer</b>			
<b>Model</b>			
<b>Weight (lbs)</b>			
<b>Main Processor</b>			
Model	Intel 8088	Intel 80C88	Intel 80C88
Word Size (bits)	8/16	8/16	8/16
Clock Rate (MHz)	5	5	4.77
<b>Additional Processors</b>	Intel 8087 math coprocessor (opt.)	Intel 80C87 math coprocessor (opt.)	NA
<b>RAM Memory</b>			
Standard RAM (bytes)	128K	256K	512K
Min/Max RAM (bytes)	128K/768K	256K/768K	512K/512K
RAM Increments (bytes)	64K, 256K	64K, 256K	NA
<b>Std Diskette Storage</b>			
No. of Drives	1	1	1
Size (in.) & Format	5.25	3.5	3.5 DSDD
Capacity per Diskette (bytes)	320K	720K	720K
<b>Std Disk Storage</b>			
No. of Drives	NA	NA	NA
Size (in.)	NA	NA	NA
Capacity per Disk (bytes)	NA	NA	NA
<b>Other Storage (Std)</b>	NA	NA	NA
<b>Other Storage (Opt.)</b>	5.25-in. 320KB diskette drive	3.5-in. 720KB diskette drive	External 3.5-in. or 5.25-in. diskette drive
<b>Display</b>			
Size and Type	8-in. color CRT	12-in. LCD	10-in. LCD
Resolution (pixels)	720 x 300	640 x 200	640 x 200
Text Display (lines x col)	25 x 80	25 x 80	25 x 80
Character Matrix (dots)	—	—	8 x 8
Colors (simul/palette)	8/8 color	Monochrome	Monochrome
<b>Keyboard</b>			
Type	Detachable	Integral	Integral
No. of Programmable Function Keys	12	12	10
Special Features	Numeric keypad	Numeric keypad	Cursor keys, digital input pad, numeric keypad (std); mouse (opt.)
<b>No. of Avail. I/O Slots</b>	5	2	NA
<b>Interfaces</b>			
Serial	1 RS-232C (opt.)	1 RS-232C (opt.)	RS-232C (opt.)
Parallel	1	1	1 Centronics
Other	NA	Diskette port	External diskette
<b>Communications</b>			
Asynchronous	Opt.	Opt.	Std (TTY)
Synchronous	Opt.	Opt.	NA
<b>Software</b>			
Std Operating Sys	MS-DOS 2.1	MS-DOS 2.13	MS-DOS
Opt. Operating Sys	CP/M-86, Concurrent CP/M-86, UCSD p-System	NA	NA
Bundled Software Languages	NA BASIC, COBOL, FORTRAN, Pascal, C, Assembler	NA BASIC, COBOL, Pascal	— —
<b>Sales &amp; Service</b>			
First Delivered	November 1983	1985	January 1986
Sales Channels	Direct, dealer, VARs	Direct, dealer, VAR	—
Service Channels	Dealer	Dealer	—
<b>Pricing</b>	\$2,795	\$2,995 - \$4,980	\$1,999
<b>Comments</b>	IBM PC compatible	IBM PC compatible	IBM PC compatible

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer</b>  <b>Model</b>  <b>Weight (lbs)</b>  <b>Main Processor</b>  Model  Word Size (bits)  Clock Rate (MHz)  <b>Additional Processors</b>  <b>RAM Memory</b>  Standard RAM (bytes)  Min/Max RAM (bytes)  RAM Increments (bytes)  <b>Std Diskette Storage</b>  No. of Drives  Size (in.) &amp; Format  Capacity per Diskette (bytes)  <b>Std Disk Storage</b>  No. of Drives  Size (in.)  Capacity per Disk (bytes)  <b>Other Storage (Std)</b>  <b>Other Storage (Opt.)</b>  <b>Display</b>  Size and Type  Resolution (pixels)  Text Display (lines x col)  Character Matrix (dots)  Colors (simul/palette)  <b>Keyboard</b>  Type  No. of Programmable Function Keys  Special Features    <b>No. of Avail. I/O Slots</b>  <b>Interfaces</b>  Serial  Parallel  Other    <b>Communications</b>  Asynchronous    Synchronous  <b>Software</b>  Std Operating Sys  Opt. Operating Sys  Bundled Software    Languages    <b>Sales &amp; Service</b>  First Delivered  Sales Channels  Service Channels  <b>Pricing</b>      <b>Comments</b></p>	<p><b>Visual Technology</b>  Commuter  16    Intel 8088  8/16  4.77  Intel 8087 math coprocessor (opt.)    256K  256K/512K  256K    1 - 2  5.25 DSDD  360K    NA  NA  NA  NA  NA  NA    LCD  640 x 200  16/25 x 80  8 x 8  Monochrome    Integral  10    —    NA    1 RS-232C  1 Centronics  RGB, RF modulator, composite video    Opt.    Opt.    MS-DOS  PC DOS, CP/M-86  GW BASIC      GW BASIC (std); C Compiler, APL, Pascal, Fortran, COBOL (opt.)    Fall 1983  Dealer, distributor  Dealer, distributor, Sorbus  \$1,895 (incl 256KB RAM and 2 diskette drives), \$2,100 (256KB RAM, 16-line LCD), \$2,495 (256KB RAM, 25-line LCD)  NA</p>	<p><b>Zenith Data Systems</b>  Z-138  24.2    Intel 8088  8/16  4.77 or 8  Intel 8087 math coprocessor (opt.)    256K  256K/640K  64K, 256K    2  5.25 DSDD  360K    NA  NA  NA  NA  NA  NA    7-in. CRT  640 x 200  25 x 80  —  Amber monochrome    Detachable  10    Cursor keys, numeric keypad; mouse (opt.)    1 (opt.)    1 RS-232C  1 Centronics  RGB composite    Std (TTY, VT100)    NA    MS-DOS 2.11  NA  NA    Avail. thru 3rd party    September 1985  Direct, distributor, dealer  Direct, dealer  \$1,799 (dual diskette drives)</p>	<p><b>Zenith Data Systems</b>  Z-171  14.3    Intel 80C88  8/16  4.77  NA    256K  256K/640K  64K, 256K    2  5.25 DSDD  360K    NA  NA  NA  NA  NA  NA    10-in. backlit LCD  640 x 200  25 x 80  8 x 8  Blue    Integral  10    Cursor keys, numeric keypad, 4 special func. keys for int. software  2 (opt.)    1 RS-232C  1 Centronics  RJ11 phone jack outlet, IBM expansion bus port; RGB composite (opt.)    Std (TTY, IBM 3101); opt. (VT100)  NA    MS-DOS 2.11  NA  64K ROM w/calendar, clock, map, comm. scheduler, calculator  Avail. from third party    September 1985  Direct, distributor, dealer  Direct, dealer  \$2,399    IBM PC compatible; opt. color and monochrome dispays available</p>
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**Notes:**  
— Information unavailable at press time  
NA Not applicable





# PORTABLE MICROCOMPUTERS

## Product Briefs

229.0050.001

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### ACT (UK) Ltd

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Dudley Rd, Halesowen  
West Midlands B63 3NT  
England

021-501 2284

ACT (North America) Inc  
3375 Scott Blvd  
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### Apricot PC

**Overview** The Apricot PC is manufactured and marketed by the UK company that markets the Sirius 1 (sold in the U.S. as the Victor 9000). The system features three operating systems, bundled business software, mouse cursor control, and the MicroScreen, which can be used to label programmable function keys or serve as a screen window for customers using the unit without a monitor. The Apricot PC unit weighs 17.5 pounds without the monitor and has a handle for easy carrying.

**System Design** The 16-bit Apricot PC incorporates an Intel 8086 main processor, 8089 I/O processor, and optional 8087 mathematics processor; these processors provide extensive processing power. Memory size is expandable from 256KB to 768KB. Storage options include 2 Sony 3.5-inch diskette drives (either single or double density) for a maximum of 1.44MB. Communications and I/O facilities include an optional internal modem with autodialer, 1 synchronous or asynchronous RS-232C port, and an 8-bit parallel port. A 9-inch green-phosphor display provides 25 lines of 80 characters and 800-by-400-pixel graphics resolution. Eight fixed function keys, 6 programmable keys labeled by the MicroScreen, and cursor control and numeric keys complement the standard typewriter keyboard.

Included with the system are the Microsoft MS-DOS and Digital Research CP/M-86 and Concurrent CP/M-86 operating systems; also available are the UCSD p-System and BOS (from MPSTL). Interpretive BASIC and Personal BASIC are included; Pascal, FORTRAN, COBOL, and C are optional. Also bundled with the system are the proprietary programs ACT-ACTIVITY, ACT-SKETCH, ACT-DIARY, and ACT-TUTOR; SuperCalc and SuperPlanner from Sorcim/IUS; and asynchronous communications software.

**Competition & Pricing** Offering some of the advantages of a portable and bundled software, Apricot PC competes with the IBM Personal Computer and such compatible systems as the COMPAQ and Corona Portable Computer. The base U.K. price for Apricot PC with 256KB, one 315KB diskette, and software is £1,495. The monitor is £195. Prices in the U.S. begin at \$2,195 for a system configured with 256KB of memory and 2 diskettes.

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### Apricot F1, Apricot F1e

**Overview** The Apricot F1 is an entry-level business microcomputer. The F1e is a lower-cost version of the F1 designed for the education market and is marketed only in Europe. Both were introduced by ACT in July 1984.

The F1 supports up to 768KB of RAM, 720KB of diskette storage, an infrared keyboard, color electronics, and several application packages. The F1e supports a maximum 256KB of RAM, 315KB of diskette storage, an infrared keyboard, and color electronics. The F1 and F1e weigh less than 13 pounds.

The Apricot F1 can be used with other Apricot computers, such as the Portable and F1e, in ACT's Omninet-based Point 32 network of up to 32 workstations, or it can be used as an intelligent workstation in the Apricot Point 7 seven-user system.

**System Design** Both systems are built around 16-bit Intel 8086 microprocessors. The F1 is configured with 256KB of RAM; 720KB, double-sided, 3-1/2-inch diskette drive; and a 92-key infrared keyboard. An optional 10-inch-diagonal color monitor provides 640-by-256-pixel graphics resolution. The F1 can be expanded to include 768KB of main memory and a 10MB Winchester disk drive.

The F1e is configured with 128KB of RAM; a 315KB, single-sided, 3-1/2-inch diskette drive; and a 92-key keyboard. A 9-inch- or 12-inch-diagonal monochrome monitor or a 10-inch-diagonal color monitor is available. Options include an infrared mouse with a tracker ball (also available for the F1) and a 5-slot expansion box.

Both systems feature RS-232C and Centronics parallel interfaces and 1 expansion slot.

The Apricot F1 supports Microsoft MS-DOS, Digital Research CP/M-86 and Concurrent CP/M-86, UCSD p-System, and Business Operating System (BOS) from Micro Products Software Ltd (MPSTL). Bundled software includes ACTIVITY, DIARY, SKETCH, and TUTOR. The languages supported are BASIC, Pascal, FORTRAN, COBOL, and C.

**Competition & Pricing** Competing with the systems are the Apple IIe, Apple IIc, and Macintosh from Apple Computers and the Jonos C2500 and 2500i. The price for the F1 with 256K is \$1,495. The vendor did not provide prices for the F1e.

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**Apricot Portable**

**Overview** ACT, manufacturer of the Apricot PC executive microcomputer, introduced the Apricot Portable in July 1984. The Apricot Portable weighs 13 pounds and is 18 inches long, 8 inches high, and 6 inches wide. The system is completely software compatible with the Apricot.

The Apricot Portable features voice recognition, a liquid crystal display (LCD) screen, up to 1MB of main memory, diskette storage, an infrared keyboard, an infrared mouse and tracker ball, color electronics, and graphics and system software.

The Apricot Portable can be used with other Apricot systems, including the xi, F1, and F1e, in ACT's Omninet-based Apricot Point 32 network system, or it can be used as an intelligent workstation in the Apricot Point 7 system.

**System Design** The Apricot Portable is based on a 16-bit Intel 8086 microprocessor configured with 256KB of RAM. The system includes an expansion slot, RS-232C interface, and a Centronics-compatible parallel interface. The system is also configured with a 720KB diskette drive and an LCD screen for text or graphics display. The LCD is supported by 16KB of memory. In text mode, the screen features an 80-column-by-25-line display; graphics mode supports 640 by 250 pixels. A 92-key, low-profile infrared keyboard transmits characters as 32-bit data blocks; 10 function keys are included on the keyboard.

The Apricot Portable RAM can be expanded to 1MB; a 10MB Winchester disk drive is optional. A vocabulary of 4,096 words is available for voice recognition; 64 words can be used at a time.

Several software packages are bundled with the Apricot Portable, including the Microsoft MS-DOS operating system. Application packages include ACT-DIARY and ACT-SKETCH from ACT and SuperCalc, SuperPlanner, and SuperWriter from Sorcim/IUS. Also included is the Digital Research GSX graphics extension system. Digital Research's Concurrent DOS is optional.

**Competition & Pricing** Competition for the system includes the IBM Portable Personal Computer, Texas Instruments Portable Professional Computer, and Anderson Jacobson AJ Passport.

The basic Apricot Portable system is priced at \$2,495.

**Apricot xi, Apricot xi-20s**

**Overview** ACT has introduced the Apricot xi and xi-20s with a Winchester disk drive for more storage and faster access.

Like the Apricot PC, Apricot xi and Apricot xi-20s feature 3 operating systems, bundled business software, mouse cursor control, and the Microscreen, which can be used to label programmable function keys or serve as a screen window for use without a monitor.

Both models include a slim (16.5-by-4-by-12.5-inch) chassis and keyboard, which combine to form an 18.5-pound portable package the size of a briefcase.

Service and support in the U.S. are provided by Micro D, the U.S. distributors for ACT.

**System Design** The 16-bit Intel 8086-based Apricot xi includes 256KB of main memory expandable to 768KB. The Apricot xi-20s comes with 512KB of RAM, expandable to 1MB. Storage options for the Apricot xi include a 720KB diskette drive and a 5MB or 10MB 3-1/2-inch Winchester disk drive. Communications and I/O facilities include an optional internal modem with autodialer, a synchronous or asynchronous RS-232C port, and an 8-bit parallel port.

A separate 9-inch-diagonal green-phosphor display provides 25 lines of 80 characters and an 800-by-400-pixel graphics resolution. The standard typewriter-style keyboard includes 8 fixed-function keys, 6 touch-sensitive programmable keys labeled by the Microscreen, cursor control, and a numeric keypad.

Along with the Microsoft MS-DOS and Digital Research Concurrent CP/M-86 operating systems, the UCSD p-System and MP/SL BOS are available. Interpretive BASIC and Personal BASIC are included; Pascal, FORTRAN, COBOL, and C programming languages are optional. Also bundled with the system are SuperCalc, SuperWriter, and SuperPlanner from Sorcim as well as ACT DIARY, ACT SKETCH, and asynchronous communications software. Apricot xi houses a built-in emulator for IBM Personal Computer-compatible software access.

**Competition & Pricing** Competition for the Apricot xi includes the IBM Personal Computer XT, Seequa Computer Seequa/XT, and Wang Professional Computer.

The base price for the Apricot xi is \$2,995. The price is \$3,995 for the Apricot xi-20s.



**Actrix Computer Corp**

2159 Bering Dr  
San Jose CA 95131

(408) 263-3660

**Actrix**

**Overview** The Actrix, an 8-bit portable microcomputer from Actrix Computer (formerly Access Matrix), weighs 33 pounds and measures 16-1/8 by 10 by 10-13/16 inches. Actrix includes 64KB of RAM, an integral display, a detachable keyboard, a dot matrix printer, and dual diskette drives. The Actrix is compatible with RS-232C and IEEE-488 interfaces.

The system is equipped with the Digital Research CP/M 2.2 operating system and supports several programming languages.

**System Design** The Actrix portable computer is based on an 8-bit Zilog Z80A microprocessor with 64KB of RAM and two 5-1/4-inch diskette drives with 180KB of storage each. The 7-inch-diagonal monochrome amber CRT with a 2,000-character capacity, 80-cps dot matrix printer, and 75-key detachable keyboard are also controlled by the microprocessor. Two RS-232C serial ports and a Centronics-compatible parallel port are standard. Two Actrix models are offered: a single-sided disk version and a dual-sided disk version.

Standard software includes the CP/M 2.2 operating system; Perfect Writer, Perfect Speller, Perfect Filer, and Perfect Calc from Perfect Software; and Fancy Font from Software Inc. System utilities are also included.

An uninterruptible power supply and battery powered backup unit as well as a 1.2K-bps modem are optional.

**Competition & Pricing** Competition for the Actrix includes the Anderson Jacobson AT Passport, Compal Electric Briefcase, Eagle PC Spirit XL, and Otrona Attache.

Model	Price \$
Actrix	1,895
Actrix DS	2,195

**AMust Compak Manufacturing Pty**

50 Keys Rd  
Moorabbin Victoria 3189  
Australia

(03) 553-3755

**Executive 816**

**Overview** The Executive 816, from AMust Compak Manufacturing of Australia, is a briefcase computer measuring 19 by 14-1/4 by 5-1/2 inches and weighing 17-1/2 pounds. The Executive 816 supports 64KB of memory, up to 2.4MB of diskette storage, and an integral 5-inch-diagonal display. AMust Compak bundles numerous software programs with the Executive 816.

Maintenance and support for the Executive 816 is provided by AMust Compak distributors product support facilities in Australia, New Zealand, Canada, the U.S., Japan, Israel, South Africa, South America, Europe, and Hong Kong.

**System Design** The Executive 816 is based on a Zilog Z80A microprocessor with a 64KB main memory. Main memory cannot be expanded beyond 64KB. Configured with the Executive 816 are 1.6MB of diskette storage, an RS-232C communications port, a Centronics-compatible printer port, connection for an 8-inch dual diskette drive, connection for a 10MB disk, an integral 5-inch display with an 80-by-24-character format, connection for an external 12-inch CRT, and a serial keyboard with 5 function keys and a numeric keypad.

Executive 816 can be expanded to include dual diskettes with up to 2.4MB of diskette storage and a 10MB disk drive. The system runs under various power supplies, including a 12-volt option for a car cigarette lighter. The external modem supports data communications at speeds of 300 to 9.6K bps.

Ten software packages are bundled with the Executive 816. The system runs under the Digital Research CP/M operating system and can run software written under CP/M. Software packages bundled with the system include the Sorcim SuperWriter and SuperCalc; IMS Accounting; Software Solution Office Costing Analysis, Membership System, Disk Editor and Diagnostics, and Communications package; and Advanced Robotics Manufacturing Project Costing and ARM Database.

**Competition & Pricing** Competition for the Executive 816 includes the Pied Piper from STM Electronics, Grundy Business Systems NewBrain, and Teleram T-3000.

The Executive 816 is priced at \$2,995 (Australian dollars).





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**Apple Computer**20525 Mariani Ave  
Cupertino CA

(408) 996-1010

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**Apple Computer**20525 Mariani Ave  
Cupertino CA 95014

(408) 973-2042

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**Apple IIc**

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**Overview** The Apple IIc, the newest addition to the Apple Computer family, is an 8-bit portable computer designed primarily for home or school use. Apple Computer, which introduced the IIc in April 1984, is marketing the Apple IIc to compete with the IBM PCjr home computer. The IIc weighs 7-1/2 pounds and is the size of a notebook.

Software packages provide such personal use applications as WP, tax planning and home budgeting, home education, and entertainment. More than 90 percent of Apple IIe programs run on the IIc. In addition, software has been specifically designed for the IIc.

Apple Computer warrants the IIc for 90 days; AppleCare service extends the warranty by 1 year. Service for the IIc is provided by Apple Computer dealers and the more than 300 RCA service centers nationwide.

**System Design** The Apple IIc is based on a Synertek 65C02 microprocessor with 128KB of RAM and 16KB of ROM and features a typewriter-style keyboard, 140KB of diskette storage, a 40- or 80-column display switch, 2 integral expansion ports, a radio frequency (RF) modulator, and a power pack. Each expansion port is marked with a symbol indicating where to connect the various peripheral devices. There is also a built-in speaker with an audio range of 5 octaves.

Three graphics modes are available: low resolution (40 by 48 pixels) in 16 colors, high resolution (280 by 192 pixels) in 6 colors, and monochromatic ultrahigh resolution (560 by 192 pixels) in 16 colors.

Text consists of a full set of ASCII characters. The keyboard can be propped to the desired typing position. A keyboard switch allows the user to alternate between Dvorak and the standard keyboard layout.

Software programs for the Apple IIc include Apple Access II and AppleWorks from Apple Computer, Bank Street Writer from Broderbund, Multiplan from Microsoft, and PFS:File and PFS:Report from Software Publishing Corporation.

The Imagewriter printer and plotter, modems, joysticks, and controllers for other Apple systems are supported by the IIc.

**Competition & Pricing** Competing with the Apple IIc are the IBM PCjr, Commodore 64, Compaq Electric Briefcase, and Jonos C2100.

The Apple IIc is priced at \$1,295.

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**Macintosh**

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**Overview** Introduced in January 1984, Macintosh is marketed by Apple Computer as an alternative to the IBM Personal Computer. Like the Apple Computer Lisa, Macintosh uses a Motorola MC 68000 32-bit processor, bit-mapped display, sophisticated windowing environment, and mouse for cursor control. The footprint of the main Macintosh unit is 9.7 by 10.9 inches, and the combined weight of the main unit and keyboard is less than 20 pounds. Two software packages are available from Apple for WP and graphics drawing.

Service for the Macintosh is provided through Apple's network of retail stores and dealers and through more than 300 RCA service centers nationwide.

**System Design** Based on a Motorola MC 68000 microprocessor, the Macintosh is configured with 64KB of ROM containing the operating system and 128KB of RAM, expandable to 512KB through the replacement of the 64KB RAM chips with 256KB RAM chips. An integral 3-1/2-inch diskette drive provides 400KB of storage. An external diskette drive can be added to double the capacity. Macintosh features 2 RS-232C or RS-422 serial ports; a single-button mouse; and a 9-inch, black-on-white, bit-mapped display with a resolution of 512 by 342 pixels. The separate keyboard unit features 58 software-mapped typewriter-style keys. No function or cursor control keys are provided, but a separate numeric keypad can be added.

Peripheral devices available from Apple include the Imagewriter dot matrix printer, which can reproduce the contents of any Macintosh screen; a telephone modem; and AppleLine, which provides IBM 3277 and 3278 emulation.

Software introduced with the Macintosh includes the MacWrite WP package, which offers multiple typefaces and sizes and the ability to integrate text and graphics on the screen or in hard copy. Also offered is the MacPaint graphics drawing package, which provides a set of on-screen tools, including brushes, pencils, and erasers, for creating illustration graphics. Additional software, including Microsoft BASIC and Multiplan, is available from third-party vendors.

**Competition & Pricing** Apple's advertising campaign clearly pits Macintosh against the IBM Personal Computer and IBM-compatible systems. Macintosh provides more processing power, a user interface that greatly reduces keyboard use, and superior graphics capability on the basic system.

The basic Macintosh with 128KB of RAM, integral 400KB diskette drive, and keyboard is priced at \$2,195. With 512KB RAM, the system costs \$3,195. The dealer-installable memory upgrade from 128KB to 512KB is priced at \$995.



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**Columbia Data Products**8990 Route 108  
Columbia MD 21045(301) 992-3400

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**Columbia VP**

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**Overview** The Columbia VP is a 16-bit portable computer measuring 18 by 16 by 8 inches and weighing 32 pounds. The VP is an IBM Personal Computer-compatible system that features 128KB of RAM, 320KB of diskette storage, and an integral CRT.

The VP operates under operating systems from Microsoft and Digital Research and supports several programming languages. Various applications software packages are also available.

Bell and Howell, a third-party service organization, provides maintenance for the Columbia VP. Bell and Howell has service offices nationwide. Software is provided by Perfect Software.

**System Design** The Columbia VP is designed around a 16-bit Intel 8088 microprocessor with 128KB of RAM and 12KB of EPROM. RAM can be expanded to 256KB. A socket is provided for an Intel 8087 companion numeric processor. Dual half-height 5-1/4-inch diskette drives with 360KB of storage each are standard.

The VP also includes an integral 9-inch-diagonal CRT with a display capacity of 25 lines by 40 or 80 characters per line, as well as a CRT controller board with RGB color and composite monochrome output. Graphics capabilities of 640 by 200 or 320 by 200 pixels are provided. A detachable IBM Personal Computer-compatible keyboard with numeric keypad is standard.

System interfaces include an RS-232C serial port and a Centronics-compatible printer port. An optional dual serial board controller converts serial ports to parallel ports and parallel ports to serial ports. The controller also supports asynchronous, synchronous, HDLC, and SDLC data communications at up to 19.2K bps.

Software includes the Digital Research CP/M-86 and Microsoft MS-DOS operating systems. Programming languages include GW-BASIC and macro assembler. Application programs include the Perfect Software Perfect Writer and Perfect Speller WP programs and Perfect Calc electronic spreadsheet. A full complement of third-party professional, educational, and entertainment software programs are also available.

**Competition & Pricing** Competition for the VP includes the Compal Electric Briefcase, Eagle PC Spirit XL, and TeleVideo (TPCI) portable computer.

The Columbia VP is priced at \$2,495 with a single diskette drive and \$2,695 with 2 diskette drives.

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**COMPAQ Computer**12330 Perry Rd  
Houston TX 77070(713) 370-7040

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**COMPAQ**

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**Overview** The portable, 16-bit COMPAQ is compatible with and runs all software written for the IBM Personal Computer. The self-contained unit features 2 integral disk drives and a 9-inch diagonal display screen. COMPAQ Computer Corporation markets the system through computer retail outlets and its own direct sales force.

Software for the system includes the Microsoft MS DOS operating system and various application programs.

Retailers provide support, training, consulting, and maintenance for COMPAQ.

**System Design** The COMPAQ system weighs 28 pounds and is 20 inches wide by 8.5 inches high by 16 inches deep. Its detachable keyboard is a replica of the IBM Personal Computer keyboard. COMPAQ features a 16-bit Intel 8088 microprocessor with 128KB of RAM, which can be expanded to 256KB. A socket for an optional Intel 8087 floating-point coprocessor is available. Other options include 3 IBM-compatible printed circuit board expansion slots as well as ports for an RGB color video monitor, composite video, and connection to a standard TV set through a radio frequency modulator.

The COMPAQ system runs under the Microsoft MS DOS operating system and supports Microsoft BASIC. Applications software includes the VisiCorp VisiCalc and Information Unlimited Software EasyWriter in addition to all applications available for the IBM Personal Computer.

An optional asynchronous communications interface is also available.

A basic configuration for COMPAQ includes a 9-inch diagonal CRT with a 25-line-by-80-character display, 128KB of main memory, a detachable keyboard with a 6-foot cord, and a 5-1/4-inch diskette drive with 320KB of storage. A second 320KB drive is optional.

**Competition & Pricing** Competition for the COMPAQ Computer includes the Columbia Data Product Multi-Personal Computer, Computer Devices DOT family of portable personal computers, and the Osborne 1.

The portable COMPAQ is priced at around \$1,895 for a model with 128KB of RAM and 1 diskette drive. The system costs about \$2,295 with 256KB of RAM and 2 diskette drives. Prices are determined by the individual dealer.



**COMPAQ Computer Corp**12330 Perry Rd  
Houston TX 77070

(713) 890-7390

**COMPAQ Plus**

**Overview** The COMPAQ Plus is a 16-bit portable personal computer with a shock isolation fixed-disk system designed specifically for environments where portable computers are used. Measuring 20 by 8-1/2 by 16 inches, the COMPAQ Plus features a fixed-disk drive, diskette, 128KB RAM, and integral CRT.

Software for COMPAQ Plus includes the Microsoft MS-DOS operating system and BASIC.

Retailers provide support, training, consultation, and maintenance for COMPAQ Computer products.

**System Design** Based on the 16-bit Intel 8088 microprocessor, the COMPAQ Plus features 128KB of RAM expandable to 640KB, a 10MB Winchester disk drive, and a 360KB diskette drive. The system also includes 2 IBM Personal Computer expansion board slots. An Intel 8087 companion numeric processor is optional.

An integral 9-inch-diagonal CRT displays 25 lines by 80 characters with high-resolution graphics. An 83-key detachable keyboard has 10 special function keys and 10-key numeric keypad. A parallel printer interface is standard, and an asynchronous communications interface is optional.

COMPAQ Plus supports the MS-DOS 2.0 operating system and BASIC programming language. All major business and professional software written for the IBM Personal Computer XT can run on COMPAQ Plus.

**Competition & Pricing** Competition for the COMPAQ Plus includes the GRiD Systems COMPASS Computer, Otrona Attache, and Olympia Portable microcomputer.

COMPAQ Plus is priced at \$4,995.

**Computer Transceiver Systems**PO Box 15  
East 66 Midland Ave  
Paramus NJ 07652

(201) 261-6800

**EXECUPORT XL Series**

**Overview** The Computer Transceiver Systems EXECUPORT XL Series is offered in 2 portable microcomputer models: the EXECUPORT XL and EXECUPORT XL+. The EXECUPORT XL Series systems are 8-/16-bit microcomputers designed for applications in which portability is a major requirement—the systems are self-contained in a leather case that fits under an airplane seat.

Software for the EXECUPORT XL Series includes both 8- and 16-bit operating systems, programming languages, and bundled application programs.

Computer Transceiver Systems provides maintenance and support for the EXECUPORT XL Series. Nationwide on-site service programs are available; carry-in and mail-in programs are also available. Monthly leasing costs include on-site service.

**System Design** The EXECUPORT XL model is based on an 8-bit Zilog Z80 microprocessor; the EXECUPORT XL+ adds a 16-bit coprocessor to the 8-bit processor. The EXECUPORT XL model includes 80KB of main memory, while the EXECUPORT XL+ features 128KB of additional memory for a total of 208KB. The EXECUPORT XL is field upgradable to the EXECUPORT XL+. Both models include a 9-by-5-inch green-phosphor screen that displays 132 columns by 24 lines, a typewriter-style keyboard with numeric keypad and 22 programmable function keys, and dual 5-1/4-inch diskette drives with 400KB of formatted storage each.

The EXECUPORT XL runs under the Digital Research CP/M operating system; the EXECUPORT XL+ runs under CP/M and CP/M-86 as well as Microsoft MS-DOS. EXECUPORT XL Series users can choose a range of programming languages and application programs. Software bundled with the EXECUPORT XL Series includes Perfect Software's Perfect Calc, Perfect Speller, Perfect Writer, and Perfect Filer. Optional software includes the Phase One Systems OASIS and Digital Research MP/M operating systems.

**Competition & Pricing** Competition for the EXECUPORT XL Series includes the Digital Equipment Rainbow 100, COMPAQ Computer COMPAQ, Kaypro Computers Kaypro 4, and Seequa Computer Chameleon and Chameleon Plus.

Model	1-Yr Lease \$/Mo	Purchase Price \$
Execuport XL	117	1,995
Execuport XL+	144	2,995



**Convergent Technologies**

2441 Mission College Blvd  
Santa Clara CA 95050

(408) 727-8830

**Workslate**

**Overview** The Workslate is an 8-bit portable micro-computer with 64KB of ROM and 16KB of RAM. Workslate weighs about 3 pounds, measures 8-1/2 by 11 by 1 inches, and is powered by 4AA alkaline batteries or an AC adapter/recharger.

The basic system features a liquid crystal display (LCD) typewriter-style keyboard, microcassette, and integral modem.

Integrated software includes a worksheet capability and terminal emulation under a proprietary operating system.

Maintenance for the Workslate is available from Convergent Technologies.

**System Design** Workslate, based on an 8-bit processor featuring 64KB of ROM and 16KB of RAM, has sufficient memory to store twelve 8-1/2-by-11-inch pages of data. The standard button-cell battery provides 1-month backup memory protection during a power loss.

Workslate is equipped with an LCD display with 16 lines of 46 characters; a 60-key, typewriter-style keyboard with 5 function keys and numeric keypad; a microcassette recorder with storage capacity for up to 10 worksheets; a built-in 300-bps modem with autoanswer/autodial capability; and an integral appointment calendar, address list, and memo pad.

Software consists of an electronic worksheet and terminal emulation under control of a proprietary operating system.

Workslate can be optionally configured with a nickel cadmium rechargeable battery; a roll-fed, battery-powered microprinter; and 9.6K-bps serial interface port.

**Competition & Pricing** Competition for the Workslate includes the Compal Electric Briefcase, Otrona Attache, and Teleram T-3000 portable computer.

Workslate is priced at \$400.

**Corona Data Systems**

31324 Via Colinas  
Westlake Village CA 91361

(213) 706-1505

**Corona Portable PC, Portable PC-XT**

**Overview** The Corona Portable PC is a 16-bit portable personal computer measuring 20 by 8 by 20 inches and weighing 30 pounds. Corona PC features up to 512KB of main memory, two diskette drives, and an integral display with detachable keyboard. The Portable PC-XT comes with 1 diskette and one 10MB Winchester disk drive.

Both Corona Portable PC models operate under the Microsoft MS-DOS operating system and support high-level programming languages.

Maintenance is provided by authorized Corona Data Systems distributors.

**System Design** The Corona Portable PC and Portable PC-XT are based on a 16-bit Intel 8088 microprocessor with 128KB of RAM expandable to 512KB and are thus designed for single-user applications. The Portable PC features two 5-1/4-inch, half-height diskette drives with 360KB of storage each. The Portable PC-XT features 1 diskette drive and one 10MB Winchester disk drive. An integral 9-inch-diagonal monochrome CRT features a full-page display of 2,000 characters; bit graphics with 640 by 325 pixels can also be displayed. A detachable ASCII-style keyboard with programmable function keys and numeric keypad is standard.

An integral RS-232C serial interface supports data communications at up to 19.2K bps. A Centronics-compatible printer interface is also provided.

Software consists of the MS-DOS operating system and GW-BASIC programming language. The system also supports programs developed with Digital Research CP/M-86 and MP/M-86. The Softword Systems Multi-Mate WP and PC Tutor programs are standard with the Corona Portable PC.

**Competition & Pricing** Competition for the Corona Portable PC includes the Kaypro 4, Otrona Attache, and TeleVideo Portable Computer (TPCI).

The Corona Portable PC is priced as follows:

Configuration	Price \$
1 diskette/128KB RAM	2,195
2 diskettes/256KB RAM	2,595
1 diskette/10MB Winchester/ 256KB RAM	4,095



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**Data General Corp**4400 Computer Dr  
Westboro MA 01580

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**DATA GENERAL/One**

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**Overview** The DATA GENERAL/One (DG/One) is a 10-pound portable computer with all the capabilities of the IBM Personal Computer. The DG/One functions as a standalone system or as a terminal in a distributed network or multiuser system. Despite its small size, the system offers a full-sized 79-key keyboard and a 10-3/4-inch-diagonal LCD display that closes over the keyboard to form a compact unit. The DG/One can run on a rechargeable battery pack for up to 10 hours, or it can be plugged into a standard electrical outlet. The basic system fits inside a briefcase, or it can be carried in its soft or hard carrying case.

**System Design** The 16-bit DG/One is built on the Intel 80C88 microprocessor, which incorporates CMOS technology to use less energy and produce less heat. The basic system has 128KB of RAM (expandable to 512KB) and a built-in 3-1/2-inch diskette drive. The bit-mapped LCD screen displays 25 lines of 80 characters each and supports 640-by-256-pixel resolution for graphics applications. The 79-key keyboard includes 47 alphanumeric, 18 control, 10 function, and 4 cursor keys. The DG/One also includes 2 serial ports for a printer, an external high-speed modem, or other RS-232C devices.

Options for the DG/One include a second drive, which provides additional storage on double-density diskettes, each with a formatted capacity of 720KB. Additional 128KB-RAM boards can be added to the basic system or mounted on the expansion chassis. The chassis also support adapter cards for communications, LAN connections, and color graphics. An internal 300-baud modem enables communications over phone lines; an external 1,200-baud modem provides faster transmission speeds. A 5-1/4-inch diskette drive for IBM-format diskettes can be mounted on the expansion chassis or function as a standalone unit. The 4-pound thermal printer types from 20-40 cps and is battery or AC powered.

Included with the basic system is internal ROM software for remote terminal emulation, text editing, and automatic self-testing diagnostics. The DG/One runs under the Microsoft MS-DOS and Digital Research CP/M-86 operating systems and is therefore compatible with most software written for the IBM Personal Computer. Numerous IBM-compatible software packages on 3-1/2-inch diskettes are available from Data General or other software vendors. Programming can be done in BASIC, Pascal, C, and other languages.

**Competition & Pricing** The DG/One competes with the Apple IIc, Hewlett-Packard HP 110, Sharp PC-5000, ACT Apricot Portable, GRiD 1101, and Epson Geneva.

The basic system with 128KB of RAM, 3-1/2-inch drive, an AC adapter, and MS-DOS is priced at \$2,895.

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**DVW Microelectronics Ltd**PO Box 135  
345 Foleshill Rd  
Coventry CV6 5RW  
EnglandCoventry (0203) 668181

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**Husky Portable Computer**

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**Overview** The Husky Portable Computer is a lightweight system (less than 5 pounds) suited for applications such as data collection in the field. The modified keyboard allows users to enter numerics as well as English messages. It can be reprogrammed through user software.

**System Design** The Husky is based on the NSC800 microprocessor and includes from 32KB to 144KB of memory; 32KB of ROM is allocated for the BASIC interpreter and housekeeping functions. The built-in screen features 4 lines of 32 characters. The entire unit, including the pressure-sensitive, 40-key keyboard, is enclosed in a waterproof case. The Husky includes 1 serial and 1 parallel port and can accommodate an acoustic coupler for data communications at rates from 50 to 1,200 baud. The Husky supports a variety of communications protocols. Four C cell batteries are required.

The Husky executes the Zilog Z80 instruction set (8080 superset) and can run software developed for Z80, Intel 8080, and Intel 8085 microprocessors. An extended BASIC interpreter is incorporated for user programming. Programs may be written directly on the Husky or downloaded from other computer systems. DVW Microelectronics Ltd also provides application packages and programming assistance as required by the user.

**Competition & Pricing** The Husky competes with the Tandy TRS-80 Model 100, the Hewlett-Packard HP 110, and other handheld computers. The price ranges from £997 to £3,120, depending on the amount of memory included.



**Eagle Computer**

7100 Chapman Dr  
Garden Grove CA 92641

(714) 891-2665

**Eagle PC Spirit 2, PC Spirit XL**

**Overview** Designed for both business and personal use, the Eagle PC Spirit 2 and PC Spirit XL are portable microcomputers weighing 28 and 32-1/2 pounds respectively and measuring 19-3/8 by 8-3/8 by 15-1/2 inches. Both models feature up to 640KB of RAM and offer diskette and Winchester disk storage.

The Eagle PC Spirit 2 and PC Spirit XL feature a display and typewriter-style keyboard.

Microsoft and Digital Research operating systems are supported.

Both Eagle PC Spirit models are covered by a 90-day limited warranty for labor and one year for parts. Maintenance service is available either directly from Eagle Computer or on a third-party basis from Bell and Howell.

**System Design** Both models are based on the 16-bit Intel 8088 microprocessor with 256KB of RAM expandable to 640KB. The PC Spirit 2 comes with two 5-1/4-inch diskette drives with a capacity of 360KB each. The PC Spirit XL comes with a single diskette drive and a 10MB Winchester disk drive.

A 9-inch-diagonal green-phosphor CRT with a 2,000-character capacity and detachable 84-key IBM Selectric-style keyboard, 10 function keys, and numeric keypad are standard. A color monitor with 16 foreground and background colors can also be added to the system. Graphics, line graphs, and pie charts are supported. LED indicators display the status of all lock keys. A deluxe keyboard with 105 keys is optional.

Two RS-232C serial ports and a parallel port support asynchronous communications and a printer interface. Four IBM Personal Computer-compatible option slots support peripheral devices.

The Eagle PC Spirit models are hardware and software compatible with the IBM Personal Computer and Personal Computer XT. The Microsoft MS-DOS and Digital Research CP/M-86 operating systems as well as GW-BASIC (an IBM Personal Computer BASICA-compatible language) are included with the system. GW-BASIC enables the system to run off-the-shelf IBM BASICA programs prepared for the IBM Personal Computer.

**Competition & Pricing** Competition includes the Compal Electric Briefcase, Otrona Attache, and Kaypro 10.

The Eagle PC Spirit 2 is priced at \$2,095, and the Eagle PC Spirit XL is priced at \$3,295.

**Epson America**

3415 Kashiwa St  
Torrance CA 90505

(213) 539-9140

**HX-20**

**Overview** The Epson HX-20 is a portable computer weighing 4 pounds, measuring 11-1/4 inches by 8-1/2 inches by 1-3/4 inches (about the size of a standard notebook), and featuring an integral microprinter. The HX-20 supports up to 32KB of RAM and 40KB of internal ROM. An expansion unit contains 64KB of ROM.

HX-20 systems feature an integral word processor and microcassette drive and run on an internal power supply for more than 50 hours. When the unit is shut down, a low-voltage system maintains information in main memory.

Maintenance and support for the HX-20 is provided by Epson America and its authorized dealers.

**System Design** The HX-20 is based on the 8-bit CMOS Hitachi 6301 microprocessor, which is compatible with the Motorola MC 6801 processor. An additional 6301 processor acts as a slave CPU. Both processors feature a 64kHz clock rate.

The HX-20 display is a liquid crystal screen that features a 120-by-32-dot matrix in a 20-by-4-character format. Also integral to the system is a 24-column dot matrix impact microprinter with a 42-lpm graphic print rate. The microprinter features bit-addressable graphics with a full ASCII upper- and lowercase character set.

The HX-20 can be programmed in Microsoft BASIC and includes an integral WP program. Additional software provides business applications as well as educational, entertainment, home management, and personal productivity programs.

The basic HX-20 system includes main and slave processors, 16KB of RAM, 32KB of ROM, a liquid crystal display, a microprinter, a microcassette drive, and the WP system. Additional features include peripheral interfaces for a bar-code reader, cassette, and system bus as well as a ROM cartridge/microcassette interface.

The power supply for the HX-20 comprises 4 internal Sub C-type nickel cadmium batteries. The power supply provides a 50-hour capacity when the system is running BASIC and less if the system is supporting an RS-232C port, printer, or microcassette drive. The power supply can be fully charged within 8 hours.

An expansion unit adds 8KB of RAM plus a 24KB ROM or 16KB of RAM plus a 16KB ROM.

**Competition & Pricing** Competition for the HX-20 includes the TeleVideo TeleTote I.

The HX-20 is priced at \$795.

**Epson America**

3415 Kashiwa St  
Torrance CA 90505 (213) 539-9140

Epson  
80 Hirooka  
Shiojiri City, Nagano  
Japan 399-07 (0263) 52-2552

**PX-8 Personal Computer**

**Overview** The Epson PX-8 Personal Computer is a compact, battery-powered, rechargeable portable system that fits inside a briefcase. The PX-8 features 64KB of RAM, a liquid-crystal display, and microcassette data storage. Designed for traveling executives, sales and service professionals, and journalists, the PX-8 can be used as a general-purpose personal computer, complement another system, or serve as a portable terminal.

Interfaces provide support for several peripheral devices available from Epson.

Maintenance and support are provided by Epson.

**System Design** The PX-8 is based on an 8-bit Zilog Z80 CMOS main processor and a 6301 slave processor. The 64KB RAM is complemented by 6KB of video RAM and 32KB of ROM. The PX-8 comes with business software for WP, spreadsheet analysis, and communications. Additional custom programs are available on plug-in ROM chips.

The PX-8 is powered by rechargeable nickel-cadmium removable batteries. An AC adapter also provides a continuous controlled charge to replenish the battery supply. The batteries support from 10 to 20 hours of use.

The PX-8 is available with a full-sized 72-key keyboard with 5 programmable function keys and supports a flip-up display panel with an 80-column-by-8-line liquid-crystal display.

Devices integral to the system include a clock, microcassette with software control and sequential storage, speaker with volume control and sound-source software, and 2-channel analog input. Interfaces include an RS-232C serial port. Optional peripherals include a battery-operated 3-1/2-inch diskette drive (360KB) and a 5-1/4-inch diskette drive. In addition, 60KB and 120KB RAM packs are available for additional memory. The PX-8 plugs into the Epson QX-10 and compatible computers.

Software for the PX-8 includes the Digital Research CP/M operating system; PX-8 can also run CP/M-compatible application programs with some modifications. In addition, the PX-8 is configured with an extended version of Microsoft BASIC.

**Competition & Pricing** Competing with the PX-8 are the Teleram T-4000, Otrona Attache, and Convergent Technologies Workslate.

The PX-8 is available for \$995.

**GRiD Systems Corp**

2535 Garcia Ave  
Mountain View CA 94043 (415) 961-4800

**COMPASS Computer, COMPASS II Computer**

**Overview** The COMPASS and COMPASS II Computers are 16-bit portable microprocessor-based systems weighing 10 pounds and featuring 256KB or 512KB of RAM and 384KB of fixed bubble memory.

A complete set of peripherals, including printers, 5-1/4-inch Winchester disk drives, and diskette drives, can be supported on the COMPASS system.

GRiD Systems Corporation has a nationwide field service and support organization that provides maintenance for its COMPASS system.

**System Design** The COMPASS and COMPASS II are based on Intel's 16-bit 8086 and 8-bit 8087 processors. The 8087 handles floating-point arithmetic.

COMPASS is available in 3 models: the 1100, with 256KB RAM and 384KB bubble memory; the 1101, which is the same as the 1100 but with a 1,200-baud modem; and the 1109, which is the same as the 1101 except with 512KB of RAM. The COMPASS II consists of four models, each with 128KB of ROM, expandable to 512KB; 384KB of bubble memory; and an internal modem. Model 1121 comes with 256KB of RAM; the 1129 has 512KB of RAM; the 1131 has 256KB of RAM; and the 1139 has 512KB of RAM. The system opens to a 57-key keyboard and a bit-mapped flatpanel display. All models except the 1131 and 1139 come with a 6-inch diagonal electroluminescent display featuring a resolution of 320 by 240 pixels and a format of 80 by 24 characters. The 1131 and 1139 come with a similar 8-inch display with a resolution of 512 by 256 pixels and a format of 128 characters by 24 lines.

COMPASS also supports a 360KB portable diskette drive and a 10MB disk/360KB diskette storage system.

The system uses GRiD/OS, a single-user operating system with multitasking capability and dynamic task management. Available application programs include GRiDFILE, GRiDPLAN, GRiDPLOT, GRiDWRITE, and GRiDPATH. Programming languages include Pascal, C, PL/M, FORTRAN-77, and BASIC.

**Competition & Pricing** Competition for the COMPASS Computer includes the Osborne 1, Otrona Attache, and Hewlett-Packard HP 87.

Model	Price \$
1100	4,250
1101	4,990
1109	6,195
1121	5,995
1129	7,195
1131	6,795
1139	7,995



**Hewlett-Packard**

3000 Hanover St  
Palo Alto CA 94304

(415) 857-1501

**Integral PC**

**Overview** Hewlett-Packard redefined the limits of portable computer design in January 1985 with the introduction of the Integral PC, a 16- or 32-bit machine based on Bell Laboratories' UNIX with a windowing electroluminescent (EL) screen and built-in ThinkJet printer, all in a 25-pound package. The system is targeted at engineers, software developers, university students, technical and commercial value-added resellers, and professionals with high-performance application requirements. The HP-UX operating system (an implementation of UNIX) provides compatibility with the HP Series 80 and HP 9000 computers.

**System Design** The Integral PC is based on the 8MHz Motorola MC 68000 processor. Built into 256KB of ROM is the HP-UX operating system software. Standard user RAM is 512KB. Up to 1.5MB can be supported in the system unit on 256KB or 512KB expansion cards; up to 5.5MB can be supported through two I/O bus expanders.

Standard disk storage consists of a single 710KB 3-1/2-inch diskette drive. External diskette or Winchester disk drives can be added. A portion of RAM can be used as a RAM disk for copying diskettes or for applications requiring 2 diskette drives.

The display is a 9-inch EL panel with a graphics resolution of 512 by 255 pixels and a text display of 80 characters by 31 lines. Multiple windows can be overlapped on the screen.

The detachable keyboard features a numeric pad, cursor control keys, and a row of function keys. Two interface ports on the front panel of the system unit support such optional input devices as a mouse, a graphics pad, or a bar-code reader. Two HP-IB (IEEE 488) interfaces are standard. A bus expander can be used to turn each of these 2 I/O slots into 5. I/O cards available for the system include RS-232C, general-purpose I/O, HP-IL, binary-coded decimal, and current-loop interfaces and a 300- or 1,200-bit-per-second modem.

The integral ThinkJet printer provides quiet text and graphics at 150 characters per second. Other HP printers and plotters can also be attached.

In addition to HP-UX, the system's ROM includes a window manager and the Personal Application Manager, a menu-based shell that insulates the novice user from UNIX commands. Applications software is available in several technical, scientific, and professional areas.

**Competition & Pricing** The Integral PC provides unmatched capabilities in a portable computer. Its closest competition is scientific desktop machines, such as the IBM CS 9000.

Pricing for the Integral PC begins at \$4,995.

**Hewlett-Packard**

1507 Page Mill Rd  
Palo Alto CA 94303

(415) 856-1501

**The Portable HP 110**

**Overview** In May 1984, Hewlett-Packard introduced The Portable HP 110, a 9-pound personal computer measuring 13 by 10 by 3 inches. The HP 110 is powered by rechargeable batteries and features a flip-up display screen; full-sized keyboard; and integral software packages for data management, spreadsheet analysis, graphics, and WP.

The Portable HP 110, available with an optional leather carrying case, is designed for use by traveling managers, financial analysts, and sales persons. The system can be used as a standalone computer, as a remote terminal with a built-in direct-connect modem; or as a data-sharing companion to the HP 150 and IBM Personal Computer.

Hewlett-Packard offers several maintenance plans for the HP 110, including dealer repair and user maintenance.

**System Design** The Portable is based on a 16-bit Intel 8086 microprocessor with 272KB of RAM. The system features a typewriter-style keyboard with 8 special-function keys and HP 150 compatibility. The Portable supports an adjustable, flip-up, 16-line-by-80-column display with a resolution of 128 by 480 pixels. The system also includes bit-mapped graphics, and contrast control from the keyboard.

The 384KB of ROM contains several software programs, including the Personal Applications Manager, MemoMaker WP, Lotus 1-2-3, and terminal emulation for communicating with such systems as the HP 150.

The Portable includes an HP-IL serial interface card for connecting such peripheral options as a 5-pound battery-powered 9114A disk drive and the battery-powered ThinkJet printer. Additional options include a dot matrix printer, a 2-pen plotter, and a daisy wheel printer.

The Hewlett-Packard Portable Desktop Link (PDL) provides communications between an HP 110 and HP 150 and includes an HP-IL interface card and a Centronics-compatible printer interface. A PDL for communications between an HP 110 and IBM Personal Computer also includes an HP-IL interface card.

The Portable HP 110 runs under Microsoft MS-DOS. Optional software includes the Ashton-Tate dBASE II and MicroPro International SpellStar and WordStar. Programming languages include BASIC, FORTRAN, and Pascal.

**Competition & Pricing** Competition for the system includes the IBM Portable Personal Computer, Columbia VP, and COMPAQ portable computer.

The HP 110 is priced at \$2,995.





**IBM**

1133 Westchester Ave  
White Plains NY 10604

(914) 696-1900

**Portable Personal Computer**

**Overview** IBM announced its first portable system in February 1984 with the introduction of the 16-bit Portable Personal Computer. IBM has silenced industry speculation and lent credibility to the portable computer marketplace as it did with the microcomputer market when it introduced the Personal Computer. This system weighs approximately 30 pounds, measures 20 by 17 by 8 inches, and is enclosed in a lightweight case with a carrying handle.

The Portable Personal Computer can run all software created on any member of the IBM Personal Computer family.

IBM provides maintenance and support for the Portable Personal Computer through its nationwide network of sales and service offices. Several maintenance agreements are available from IBM.

**System Design** The CPU in the Portable Personal Computer 5155 system unit is based on a 16-bit Intel 8088 microprocessor with 256KB of main memory. The system board is the same as that used for the IBM Personal Computer XT. The 5155 system unit is expandable to 512KB with a 64KB/256KB memory expansion option. Standard features of the Portable Personal Computer include a 9-inch-diagonal amber display, an 83-key keyboard, 5 expansion slots, a diskette drive adapter, a slimline 5-1/4-inch 360KB diskette drive, and a color/graphics monitor adapter. A second model with 2 integral 360KB diskette drives is also available.

Options include an additional 360KB diskette drive, a 5161 expansion unit with a 10MB Winchester disk drive, a color display, a printer adapter, several types of printers, and a math coprocessor. Optional data communications features include SDLC, asynchronous, and bi-synchronous communications adapters.

The Portable Personal Computer runs under the IBM PC DOS Version 2.1, Microsoft MS-DOS, UCSD p-System, and Digital Research CP/M-86 operating systems. Programming languages include APL, BASIC, COBOL, FORTRAN, and Pascal. Application programs are available from VisiCorp, Lotus Development, Microsoft, Peachtree Software, and Software Publishing. The Portable Personal Computer supports all diskette-based software; fixed-disk-based software is supported by the system when the 5161 expansion unit is added.

**Competition & Pricing** Competition for the system includes the Apple Macintosh, the Eagle PC Spirit XL, and COMPAQ Computer COMPAQ.

Model	No. of Diskettes	Price \$
Portable PC	1	2,595
Portable PC	2	3,020

**Jonos International Corp**

1835 Dawns Way  
Fullerton CA 92631

(714) 999-6661

**C2500**

**Overview** The C2500 is a portable computer that weighs 33 pounds and measures 17-1/4 by 7-1/4 by 13-1/4 inches. The C2500 is based on an 8-bit CPU and supports a maximum of 128KB of RAM.

The system features an integral 9-inch-diagonal display and a detachable 92-key keyboard. Auxiliary storage includes a 5MB fixed disk drive and a 5MB Winchester disk drive with removable cartridge.

Because the C2500 runs on industry-standard operating systems, several thousand application packages are available.

Jonos Corporation and its authorized dealers provide maintenance and support for the C2500.

**System Design** The C2500 system is designed around an 8-slot card cage; the basic configuration occupies 5 slots. The C2500 features an 8-bit Zilog Z80B processor, 2 banks of 64KB of RAM, an internal timer, and 2 RS-232C ports.

The system features a 3.9-inch fixed disk drive with 5MB of storage and a 3.9-inch 5MB Winchester disk drive with removable cartridge. The system supports up to 4 disk drives and up to 4 external diskette drives.

Standard communications capabilities operate at 16 selectable rates ranging from 75 to 19.2K bps. Optional communications capabilities include synchronous, bi-synchronous, HDLC, and SDLC protocols.

The C2500 runs under the Digital Research CP/M operating system.

**Competition & Pricing** Competing with the C2500 is the Kaypro Computers Kaypro 10, IBM Portable Personal Computer, and Eagle PC Spirit XL.

The 2500 sells for \$5,595.



**Jonos International Corp**1835 Dawns Way  
Fullerton CA 92631

(714) 999-6661

**C2600**

**Overview** The C2600 is a portable computer that weighs 31 pounds and measures 17-1/4 by 7-1/4 by 13-1/4 inches. The C2600 is based on an 8-bit CPU and supports up to 128KB of RAM.

The system features an integral 9-inch-diagonal display and a detachable 92-key keyboard. Auxiliary storage includes a 10MB Winchester disk drive and diskette drive.

The C2600 system runs on industry-standard operating systems that support several thousand application packages.

Maintenance and support are provided by Jonos International Corporation and its authorized dealers.

**System Design** The C2600 is designed around an 8-slot card cage; the basic configuration of both systems occupies 5 slots. The C2600 includes an 8-bit Zilog Z80B processor, 2 banks of 64KB of RAM, an internal timer, and 2 RS-232C ports.

The system features a 3-1/2-inch 10MB Winchester disk drive and 3-1/2-inch 640KB diskette drive. The system supports up to 4 disk drives and up to 4 diskette drives.

Asynchronous communications capabilities operate at 16 selectable rates ranging from 75 to 19.2K bps. Optional communications capabilities include synchronous, bisynchronous, HDLC, and SDLC protocols.

The C2600 runs under the Digital Research CP/M operating system.

**Competition & Pricing** The C2600 competes with the IBM Portable Personal Computer, Eagle PC Spirit XL, Kaypro 10, and Columbia Data Products Columbia VP.

The 2600 sells for \$5,595.

**Kaypro Corp**533 Stevens Ave  
Solana Beach CA 92075

(619) 481-4300

**Kaypro 2, 2X**

**Overview** Kaypro Computers introduced the Kaypro 2 in 1982 and the enhanced Kaypro 2X in June 1984. Kaypro 2 and 2X are 8-bit portable, self-contained computers that weigh 26 pounds, have a detachable keyboard, and are equipped with a metal carrying case. The Kaypro 2 and 2X are available directly from Kaypro Computers. The systems are designed for various computer applications but are especially suited for military as well as portable WP applications.

Both systems support 64KB of main memory and are configured with two 5-1/4-inch diskette drives. Systems and applications software are bundled with the basic configuration. Additional software is available at extra cost.

Maintenance and support is provided by MAI/Sorbus at an annual rate of \$240 and a monthly rate of \$30.

**System Design** Kaypro 2 and 2X are based on an 8-bit single-chip Zilog Z80 processor with a cycle time of 250 nsec and standard decimal arithmetic functions. The CPU features 64KB of RAM, which is not expandable. The system is also configured with 2KB of ROM.

Like most portable computers, Kaypro 2 and 2X run under the Digital Research CP/M 2.2 operating system. Programming languages include BASIC, COBOL, FORTRAN, Macroassembler, and Pascal. Applications software includes an electronic spreadsheet, a WP program, and a file management system.

Communications are implemented through an RS-232C interface. Asynchronous communications is available at selectable rates of 300 to 19.2K bps. A parallel Centronics printer interface is also configured with the system.

Kaypro 2 features 64KB of RAM and 2KB of ROM; an 80-column-by-24-line, 9-inch-diagonal high-resolution display; a detachable typewriter-style keyboard with numeric keypad; 390KB of diskette storage; and a modem connection. Also included with the system is CP/M 2.2, BASIC-80 from Microsoft, and The Word Plus, ProfitPlan, Wordstar, MailMerge, DataStar, SuperSort, and CalcStar from MicroPro International. A 5MB hard disk drive expansion is optional.

The 2X has the same features as the 2, but with double-sided, double-density diskettes for 780KB of storage.

**Competition & Pricing** Kaypro 2 competes with the Osborne 1, Otrona Attache, and GRiD Compass Computer.

The Kaypro 2 is priced at \$1,295; the 2X is priced at \$1,595.



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**Kaypro Corp**533 Stevens Ave  
Solana Beach CA 92075(619) 481-4300

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**Kaypro 4**

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**Overview** The Kaypro Computers Kaypro 4 is a portable personal computer measuring 18 by 8 by 15.5 inches and weighing 26 pounds. Based on the Zilog Z80 microprocessor, the Kaypro 4 features 64KB of RAM, 2KB of ROM, two 5-1/4-inch diskette drives, and an integral CRT display with full-function keyboard.

The Kaypro 4 operates under the Digital Research CP/M 2.2 operating system. Additional software includes high-level programming languages and a variety of applications software.

Maintenance and support for hardware and software is provided by Kaypro Computers authorized distributors and MAI/Sorbus.

**System Design** Based on an 8-bit Zilog Z80 microprocessor with 64KB of RAM, the Kaypro 4 has dual 5-1/4-inch diskette drives with 394KB of storage each. An integral, 9-inch, green phosphor CRT displays 1,920 characters; bit graphics with 160 by 100 pixels can also be displayed. A 72-key detachable keyboard with 20 programmable function keys and a 14-key numeric keypad is standard.

Data communications at up to 19.2K bps is supported by an integral modem and RS-232C serial interface; a Centronics-compatible printer interface is also provided.

The CP/M 2.2 operating system supports BASIC-80, CBASIC, and SBASIC programming languages. Kaypro software reads and writes files created on computers from Osborne, Tandy Radio Shack, and Xerox.

Applications software bundled with the Kaypro 4 includes The Word Plus, MicroPlan, SUPRTERM, WordStar, MailMerge, InfoStar, and CalcStar from MicroPro International and dBASE II from Ashton-Tate.

**Competition & Pricing** Competition for the Kaypro 4 includes the Otrona Attache, Osborne Executive, Sharp PC-5000, and Teleram T-3000 portable computer systems.

The Kaypro 4 purchase price is \$1,995, including software.

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**Kaypro Corp**533 Stevens Ave  
Solana Beach CA 92075(619) 481-4300

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**Kaypro 10**

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**Overview** A portable personal computer, the Kaypro 10 measures 18 by 8 by 13.5 inches and weighs 31 pounds. The system features 64KB of RAM and 10MB of Winchester disk storage.

A full complement of applications software is provided with the Kaypro 10, which runs under the Digital Research CP/M operating system.

Maintenance is provided by MAI/Sorbus and authorized distributors of Kaypro systems.

**System Design** Based on an 8-bit Zilog Z80 microprocessor with 64KB of RAM, the Kaypro 10 features a 10MB Winchester disk drive and a 5-1/4-inch diskette drive with 400KB of storage. An integral, 9-inch, green-phosphor CRT displays 1,920 characters as well as graphics with 160 by 100 pixels. A 72-key detachable keyboard with 20 programmable function keys and a 14-key numeric keypad is standard.

Data communications is supported by an integral modem with an RS-232C serial interface; maximum communications speed is 19.2K bps. A Centronics-compatible printer interface and a light-pen connection are also provided.

Software supported includes the CP/M 2.2 operating system and CBASIC, SBASIC, and BASIC-80 programming languages. Kaypro software reads and writes files created on Osborne, Tandy Radio Shack, and Xerox computers. Applications software provided with the system includes The Word Plus, MicroPlan, SUPRTERM, WordStar, MailMerge, InfoStar, and CalcStar from MicroPro International and dBASE II from Ashton-Tate.

**Competition & Pricing** Kaypro 10 competitors include the Osborne Executive, IBM Personal Computer XT, and Teleram T-3000 portable computer systems.

The Kaypro 10 comes with all software and costs \$2,795.



**Kaypro Corp**

533 Stevens Ave  
Solana Beach CA 92057

(619) 481-4300

**Kaypro 16**

**Overview** The Kaypro 16 is the first 16-bit system from the most successful maker of 8-bit CP/M-based portable computers. Announced in 1985, the Kaypro 16 is designed to compete in the IBM-compatible portable computer market. The 35-pound portable machine, with Kaypro's typical metal casing, includes a Winchester disk drive and 1 diskette and features 8 bundled software packages.

**System Design** Driven by the 4.77MHz Intel 8088 processor, the Kaypro 16 features 256KB of RAM, expandable to 512KB through the addition of 64K-bit dynamic RAM chips. Expansion to 640KB requires the return of the computer to the factory for an upgrade.

Disk storage includes 1 double-sided, double-density diskette drive with 360KB capacity and one 10MB Winchester disk. Both drives are integrated into the main system unit and are covered by the keyboard unit when the system is carried.

An internal 9-inch green monochrome CRT displays 80 or 40 characters by 25 lines, with 640 or 320 by 200 pixel graphics resolution. Composite video and RGB output ports are included to support an external color monitor; however, the composite video output is in color only in 40-character mode.

The Kaypro 16 keyboard layout is based on the layout of the IBM Personal Computer keyboard, with 10 function keys and a combined numeric pad/cursor control cluster. The keyboard cord is connected to the back of the system unit.

The system has four I/O slots; however, three of these are used for standard components, leaving only one for user-supplied add-on boards. One serial and one parallel printer port (both IBM-compatible) are standard.

The Microsoft MS-DOS operating system and GW-BASIC are bundled with the system. Also bundled are the MITE asynchronous communications program from Mycroft Labs, and Micropro's WordStar, MailMerge, InfoStar, and CalcStar packages. Software tutorials for the Micropro packages are included.

**Competition & Pricing** The Kaypro 16 competes with the IBM Personal Computer XT and with lower priced compatible systems with Winchester disks, such as the Tandy 1000. It also competes with the COMPAQ Plus and the Columbia VP.

The Kaypro 16 costs \$3,295.

**MicroStandard Technologies**

PO Box 319  
New Lebanon OH 45345

(513) 687-1395

**M3000**

**Overview** The M3000 is a portable personal computer that occupies 1 cubic foot of space, measures 7.25 by 16.3 by 14.8 inches, and is enclosed in a water-resistant and dust-proof aluminum carrying case. The case includes lockable latches and a built-in storage compartment for the power cord and data cable. The M3000 is designed for engineering and industrial applications, military applications, and the traveling professional.

M3000 systems support a maximum of 512KB of main memory, 376KB of diskette storage, and 10MB Winchester disk drive.

The system runs under the Digital Research CP/M Plus operating system; additional operating systems are optional.

MicroStandard Technologies warrants the M3000 against defects in workmanship and materials for 3 months. MicroStandard Technologies provides factory service for the system.

**System Design** The M3000 standard configuration is based on an 8-bit Zilog Z80A processor. Optional configurations include STD-88A and STD-68000A micro-processor cards. The standard configuration includes the processor; 64KB of RAM; 8KB of ROM; an RS-232C port, a Centronics-compatible printer port, and RGB video ports; and a single diskette drive with 376KB of storage.

Also configured with the system is a 93-key detachable keyboard with programmable function keys and integral calculator.

Options for the M3000 include up to 512KB of main memory, a 12-inch-diagonal video display, an external 8-inch disk drive with 1.2MB of storage, an AT&T 103/212A high-speed modem, 3 user-configurable expansion ports, two 376KB diskette drives, and a 10MB Winchester disk drive with a 376KB diskette drive.

Optional operating systems for the M3000 include the Microsoft MS-DOS, Digital Research CP/M-86, and Bell Laboratories UNIX.

**Competition & Pricing** Competition for the M3000 includes the Bytec-Comterm Hyperion, Kaypro 4 and 10, and IBM Personal Computer.

Model	Price \$
Basic M3000	1,995
M3000 w/Winchester disk	2,895



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**Morrow**600 McCormick  
San Leandro CA 94577(415) 430-1970

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**Pivot**

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**Overview** The Morrow Pivot, a 10-pound portable microcomputer with dimensions of 13 by 5.6 by 9.5 inches, runs on battery power for up to five hours. The system uses the Microsoft MS-DOS operating system and the 5-1/4-inch disk format used on the IBM Personal Computer.

**System Design** The Pivot is based on the Intel 80C86 processor, the CMOS version of the 8086. CMOS technology reduces power consumption and enables the Pivot to run on battery power. The display screen is an 80-column-by-16-line LCD with 480-by-128-pixel graphics resolution. The fold-down keyboard has 63 programmable keys, 10 membrane function keys, and a 22-key calculator overlay.

The basic configuration includes 128KB of RAM, expandable to 640KB, and a single 5-1/4-inch, 360KB diskette drive in the 9-sector IBM format, enabling use of standard software diskettes. A second diskette drive can be added. A built-in 300-bps modem is standard. Standard interfaces include an RS-232C serial port, an IBM-compatible parallel port, and an RJ-11C port for connecting the modem to standard phone connectors.

Options include the rechargeable battery unit, 128KB or 512KB of additional memory, and a vinyl or leather carrying case.

The MS-DOS operating system and the New Star NewWord WP program are standard, as are calendar, calculator, and appointment scheduler ROM functions. Standard IBM-compatible software packages can be used.

**Competition & Pricing** The Pivot competes with the Data General Corporation DATA GENERAL/One, Hewlett-Packard Portable HP 110, and Texas Instruments Pro-Lite.

The Pivot costs \$1,995 with 1 diskette and 128KB of RAM, \$2,895 with 2 diskettes and 256KB of RAM, and \$3,695 with 2 diskettes and 640KB of RAM.

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**Olivetti**Via G. Jervis, 77  
10015 Ivrea Italy(0125)-525

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**M21**

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**Overview** The Olivetti M21 was introduced in 1984 as a portable companion to the M24 (sold in the U.S. by AT&T Information Systems as the PC 6300). This 31-pound 16-bit portable system has 2 diskette drives and is IBM compatible. The system unit has a built-in monitor and drives, and the separate keyboard unit serves as a cover.

**System Design** The M21 is based on the 16-bit Intel 8086 processor running at 8MHz (nearly twice the speed of the IBM Personal Computer's Intel 8088). A socket in the mother board enables the user to add an optional Intel 8087 mathematics coprocessor. Memory includes 16KB of ROM for storing bootstrap routines, initialization diagnostics, and BIOS (Basic input-output system), and 128KB of RAM, expandable to 256KB through the addition of memory chips to the mother board. A memory expansion board can add an additional 128KB, 256KB, or 384KB of RAM. Storage options include 1 or 2 half-height, double-sided diskette drives, each with a 360KB or 720KB capacity. The integral 9-inch green monochrome display supports text of 80 or 40 characters by 25 lines and 3 graphics modes with resolutions of 640 by 400, 640 by 200, and 320 by 200 pixels, with 16 shades of gray representing colors. The display controller also supports an optional external color display. The detached 83-key keyboard features a row of 10 function keys above the numeric keys and a combined numeric pad/cursor control cluster.

One expansion slot for add-on boards is standard. An optional bus converter provides 3 IBM-compatible expansion slots. An RS-232C serial port and a Centronics-compatible parallel port are standard. A communications adapter chip can be used to provide communications capability without requiring the use of an add-on board. A battery-powered clock/calendar is also included. Optional add-on boards are available to provide graphics, a second communications port, a twin serial interface, OMNINET/ETHERNET capability, or a Zilog Z8000 coprocessor.

The M21 uses several operating systems: Microsoft MS-DOS, Digital Research CP/M-86, UCSD p-System, and the proprietary PCOS (used with the Zilog processor).

**Competition & Pricing** The M21 competes with the IBM Portable Personal Computer and such compatible and near-compatible MS-DOS-based systems as the COMPAQ, Kaypro 16, Columbia VP, and Texas Instruments Portable Professional Computer.

The vendor did not provide pricing on the M21.

**Osborne Computer Corp**42680 Christy St  
Fremont CA 94538

(415) 490-6885

**Osborne 3**

**Overview** Introduced in August 1984, the portable Osborne 3 is manufactured by Morrow Designs (and sold by them as the Pivot) and marketed in Europe as the Osborne Encore. This 16-bit system weighs 9 pounds and measures 9.5 by 13 x 5.5 inches. The system features an LCD screen, a built-in modem, and 2 diskette drives. Battery power is optional. The system's design features an attached, fold-down keyboard that covers the LCD screen during transport. Unlike many portable systems, the Osborne 3 can be carried on a shoulder strap. The system uses CMOS circuitry to reduce power requirements. The system can run most software developed for the IBM Personal Computer.

**System Design** The Osborne 3 is based on the Intel 8086 microprocessor, a 6-bit CMOS processor running at 3.5MHz, somewhat slower than the 4.77MHz Intel 8088 used by the IBM Personal Computer. Standard memory includes 16KB of ROM and 128KB of RAM, expandable to 256KB through the addition of 64K-bit dynamic RAM chips or to 512KB with 256K-bit chips. Disk storage consists of 1 or 2 integral 360KB double-sided, double-density diskettes. A 16-line, 80-character LCD display provides 480 x 128 pixel graphics resolution. The attached keyboard has 63 alphanumeric keys and 10 function keys. A keyboard overlay provides a 22-key calculator through 4-function calculator software provided with the system.

An RS-232C serial port supporting synchronous and asynchronous communications at 300 to 19.2K bits per second is standard. An integral 300-bit-per-second modem (AT&T 103 or CCITT compatible) provides autoanswer and autodial capability.

Power is supplied by a 100/220 volt AC-to-DC adapter. Built-in battery circuitry includes a backup feature to ensure against data loss due to power interruption during AC operation. The unit uses a nickel-cadmium video camera battery.

The Microsoft MS-DOS operating system (Version 2.11) is bundled with the system. Also included are integrated software tools providing an appointment scheduler (including a real-time clock/calendar), a terminal emulation program, and the calculator. These functions all use window-based displays and can be called up on the screen at any time by the user.

**Competition & Pricing** The Osborne 3 competes with the Morrow Pivot and with other lightweight portables with 16-line LCD screens, including the Hewlett-Packard HP 110 and the Texas Instruments ProLite.

Pricing for the Osborne 3 is \$1,995 for a system with 1 diskette drive and 128K-bytes of RAM.

**Osborne Computer Corp**42680 Christy St  
Fremont CA 94538

(415) 490-6885

**Executive**

**Overview** The Osborne Executive is the successor to the Osborne 1, the pioneer portable computer. This 8-bit system features the Digital Research CP/M operating system, bundled applications software, and an integral modem for communications over telephone lines.

**System Design** The Osborne Executive is based on the 4MHz Zilog Z80A processor. Standard memory is 128KB of bank-switched RAM, meaning that the operating system occupies 64KB RAM and the remaining 64KB are available for running applications. Two 200KB diskette drives provide the ability to read and write IBM Personal Computer, Digital Equipment VT180, Xerox 821, Cromemco, and UCSD p-System disk formats.

An integral 7-inch amber monochrome CRT display provides an 80-character-by-24-line text display. Video attributes include reverse video, underscoring, blinking, and half intensity. Brightness and contrast controls are located on the front panel of the system. The typewriter-style keyboard has a numeric pad and cursor control keys.

Two RS-232C serial ports plus a serial printer port are standard. An S10 serial communications controller is also included. The power supply is switchable for American and European voltages.

Software bundled with the system includes the Digital Research CP/M and Softek UCSD p-System operating systems, Digital Research CBASIC and Microsoft MBASIC programming languages, Micropro WordStar and MailMerge, Sorcim/IUS Micro Software SuperCalc, and Relational Systems Personal Pearl data base system.

**Competition & Pricing** The Osborne Executive competes with other 8-bit CP/M-based portables, including the Kaypro 1 and 2, and the 8- or 16-bit Seequa Chameleon portable.

Pricing for the Executive starts at about \$1,100. The price will differ among value-added resellers.



**Osborne Computer Corp**42680 Christy St  
Fremont CA 94538

(415) 490-6885

**Osborne Vixen**

**Overview** A reorganized Osborne Computer Corporation introduced the Osborne Vixen in October 1984. The 8-bit machine features compatibility with the Osborne 1 while providing a larger screen, more disk capacity, and a smaller, lighter system unit. The 22-pound portable machine uses the Digital Research CP/M operating system.

**System Design** Based on the 4MHz Zilog Z80A processor, the Vixen includes 64KB of RAM (including 4KB of display memory) and 2 double-sided, double-density diskette drives with 390KB formatted capacity per drive. The Vixen can read disk formats of IBM, Xerox, Kaypro, and Digital Equipment microcomputers.

A 7-inch amber CRT provides 80-character-by-24-line text display. Only character-oriented graphics are supported. The 60-key keyboard is attached to the main unit by a hinge and acts as a cover for the screen and diskette drives.

An RS-232C serial interface and a Centronics-compatible parallel interface are standard. The serial interface is programmable for transmission rates from 50 to 19.2K bits per second. Built-in hardware supports bi-synchronous communications at up to 34K bits per second using HASP station emulation software. The power supply is switchable between 120 and 240 volts.

Bundled software includes the Digital Research CP/M operating system (version 2.2), Micropro's WordStar and Mailmerge, Sorcim/IUS Micro Software SuperCalc2, Microsoft MBASIC, MDG & Associates MediaMaster disk exchange software, and an autostart package. Buyers also receive a free 1-year membership in the Osborne user group.

**Competition & Pricing** The Osborne Vixen competes most directly with 8-bit, CP/M-based portables, including the Kaypro 1 and 2, as well as with the 8- or 16-bit Seequa Chameleon portable.

Pricing for the Vixen begins at \$1,298.

**Panasonic**One Panasonic Way  
Secaucus NJ 07094

(201) 348-7000

**Sr. Partner**

**Overview** The Panasonic Sr. Partner is a 16-bit portable computer that can run IBM Personal Computer-compatible software. The Sr. Partner is available in 3 models: RL-H7000, RL-H7000W, and RL-700W. Each measures 18-1/2 by 13-3/16 by 8-1/4 inches.

The RL-H7000 and RL-H7000W support a maximum of 512KB of RAM and up to 2 diskette drives. The RL-700W supports up to 640KB of RAM, 1 diskette drive, and a 10MB-fixed disk. Each system features a 9-inch-diagonal monitor and a thermal printer.

Service and support for the Sr. Partner are provided by the nationwide Panasonic service network.

**System Design** A 16-bit, 4.77MHz Intel 8088 microprocessor provides the CPU for the Sr. Partner. A socket is available for an Intel 8087 numeric coprocessor option. Standard main memory on each system is 256KB, expandable to 512KB on the diskette models and 640KB on the fixed disk model. Each model is configured with 16KB of ROM.

Integral to each model is a 9-inch-diagonal, high-resolution, 80-column-by-25-line display. The monochrome display supports a graphics resolution of 640 by 200 pixels, and the color display supports a graphics resolution of 320 by 200 pixels.

Sr. Partner includes a built-in thermal printer that is switch selectable from 80 to 132 columns. The printer uses 8-1/2-inch thermal paper. A Centronics-compatible parallel printer port and RS-232C serial port can be used for connection to other manufacturers' printers. There are 2 optional ports available: 1 for an option board and another for a RAM board.

The RL-H7000 model is configured with a 5-1/4-inch diskette drive with 360KB of storage. There are 2 diskette drives configured with the RL-H7000W. The RL-700W has 1 diskette and a 10MB fixed disk. Included with each system are an 83-key detachable keyboard with 10 function keys and a 10-key numeric keypad.

In addition to MS-DOS, Panasonic bundles several software packages with the Sr. Partner, including the VisiCorp VisiCalc; MicroPro International WordStar; Software Publishing pfs:File, pfs:Report, and pfs:Graph; and Microsoft GW BASIC.

**Competition & Pricing** Competition includes the Kaypro 2, Visual Computer Commuter, and IBM Portable Personal Computer.

Model	Price \$
RL-H7000	2,145
RL-H7000W	2,595
RL-700W	3,995



**Panasonic Co**

One Panasonic Way  
Secaucus NJ 07094

(201) 348-7000

**The Link**

**Overview** The Link handheld computer was originally developed by Matsushita Corporation (parent company of Panasonic) and Friends Amis Inc. Measuring 8-15/16 inches by 1-3/16 inches by 3-3/4 inches and weighing 1 pound, The Link systems are based on a Synertek 6502 microprocessor with a 16KB ROM. Two models are available: a 4KB RAM and an 8KB RAM.

Available software includes a variety of commercial, scientific, and word processing packages.

Maintenance is available through Panasonic's nationwide network of distributors.

**System Design** The Link systems are based on an 8-bit Synertek 6502 microprocessor with an internal 16KB ROM and real-time clock. The Model RL-H1400 features a 4KB RAM, and the Model RL-H1800 features an 8KB RAM. Optional modules expand RAM up to 16KB.

A single-line liquid crystal display, featuring 26 characters formed by an 8-by-15-dot matrix, is standard. The full-function keyboard consists of 65 keys, including 4 programmable function keys and 3 user-definable function keys. The Link systems can be configured with a variety of peripherals, including a 40- and 80-column printer, 4-color plotters, an RS-232C serial port, and a video adapter with color graphics. Only 1 peripheral can be connected directly to The Link; additional peripherals can be connected to the system via an I/O adapter.

Software available from Panasonic for the handheld systems includes the Scientific Calculator, for mathematical problems; Portabudget, for financial budgeting; Portacalc, for numerical analysis; Portawriter, a portable information editor and formatter; Portalog, a portable time-keeping and billing system; and Timecomputing, a data communications program.

Programming languages include Microsoft BASIC; an extended BASIC compiler and interpreter; and Snap-FORTH, a portable EPROM burner and FORTH-like language.

**Competition & Pricing** Competition for The Link includes the Convergent Technologies Workslate, Compal Electric Briefcase, and Hewlett-Packard HP 75C.

Model	Price \$
RL-H1400	380
RL-H1800	480

**Seequa Computer**

8305 Telegraph Rd  
Odenton MD 21113

(301) 672-3600

**Chameleon and Chameleon Plus**

**Overview** The Seequa Chameleon and Chameleon Plus are portable dual-processor microcomputer systems. Based on a 16-bit microprocessor, the Chameleon and Chameleon Plus feature a maximum 640KB of internal RAM. The Chameleon is configured with 320KB of diskette storage, a 9-inch CRT display, and serial and parallel ports. The Chameleon Plus comes with two 320KB diskette drives.

Software support for the Chameleon includes the Microsoft MS-DOS operating system, WP and electronic spreadsheet packages, and a programming language. The Chameleon Plus operates under the Digital Research CP/M-80 or IBM PC DOS 1.1 or 2.0 operating systems.

Maintenance for the Chameleon and Chameleon Plus is provided through Seequa Computer Corporation's network of authorized dealers.

**System Design** The Chameleon is compatible with the IBM Personal Computer and has 128KB of RAM expandable to 640KB. A 16KB ROM expandable to 40KB is also provided. One 5-1/4-inch diskette drive with a capacity of 320KB, a 9-inch-diagonal green-phosphor CRT with 24 lines of 80 characters and color capability, and RS-232C serial and Centronics-compatible parallel ports are provided. The single-sided diskette drive is field upgradable to a dual-density model. Operating under MS-DOS, the Chameleon features the Perfect Software PerfectWriter WP package and PerfectCalc electronic spreadsheet. Programs can be written using MBASIC.

The Chameleon Plus has twice the standard memory (256KB) and diskette capacity (640KB) of the Chameleon and operates under CP/M-80, PC DOS 1.1, or 2.0. The Chameleon Plus supports all system components and software available for the Chameleon.

**Competition & Pricing** The Chameleon and Chameleon Plus compete with the Altos ACS-8600, IBM Personal Computer, OSM Zeus 2, and Zenith Z-100 microcomputers.

The Chameleon costs \$1,695 with bundled application software and \$1,495 without it. The Chameleon Plus costs \$2,195 with software and \$1,995 without software.





**Semi-Tech Microelectronics Corp**

390 Steelcase Rd. East  
Unit 8  
Markham, Ontario L3R 1G2  
Canada (416) 475-2670

STM Electronics Corp  
535 Middlefield Rd  
Menlo Park CA 94025 (415) 326-6226

**Semi-Tech Microelectronics Corp**

390 Steelcase Rd. East  
Unit 8  
Markham, Ontario L3R 1G2  
Canada (416) 475-2670

STM Electronics Corp  
525 Middlefield Rd Suite 130  
Menlo Park CA 94025 (415) 326-6226

**STM Personal Computer**

**Overview** Introduced in 1984, the STM Personal Computer is an 18-pound portable computer that features a full-sized LCD screen, two 5-1/4-inch diskette drives, and IBM compatibility. Its distinctive design includes a system unit measuring 20.3 by 10.8 by 4 inches with a back-lighted LCD screen fixed at the optimum viewing angle for a seated user. The screen is protected by a cover that also stores the keyboard when the system is transported. The disk drives remain uncovered, but the unit is carried in a padded case with the disk drives facing up for protection. The STM Personal Computer can also support text and graphics on optional monochrome and color displays.

**System Design** Based on the 16-bit Intel 80186 processor with a 8MHz clock rate, the STM includes 256KB of dynamic RAM expandable to 512KB. The standard disk drives provide 720KB of storage each; optional 360KB drives can be substituted.

The 80-character-by-25-line LCD provides 640-by-200-pixel monochrome graphics resolution and supports IBM medium- and high-resolution graphics, running programs such as Microsoft's Flight Simulator. An electroluminescent back-lighted panel provides background illumination for the LCD screen in order to increase readability. A color monitor supports 16 colors with 320 by 200 pixels in a medium-resolution graphics mode and 4 colors with 640 by 200 pixels in a high-resolution graphics mode. A monochrome video output supports 720 by 384 pixels in a high-resolution graphics mode. (External monitors are not offered by STM.)

I/O ports include a Centronics-compatible parallel printer port and 2 synchronous or asynchronous RS-232C serial ports with programmable baud rates. An IBM-compatible bus expansion connector provides for connection of an expansion box for IBM-compatible add-on boards. A hard-disk interface (SCSI compatible) and an autodial, autoanswer modem are also standard.

The STM Personal Computer runs the Microsoft MS-DOS 2.11 operating system and runs many IBM Personal Computer application packages.

**Competition & Pricing** Primary competition for the STM Personal Computer is the Data General/One, which also features a 25-line LCD display. Other competition includes the Hewlett-Packard HP 110 and the Texas Instruments ProLite.

Pricing for the STM Personal Computer begins at \$3,449.

**Pied Piper I**

**Overview** The Pied Piper I is a CP/M-based portable personal computer weighing less than 13 pounds. Built around an 8-bit microprocessor, the Pied Piper I has 64KB of RAM, an integral diskette drive with 800KB of storage, and a full-function ASCII keyboard.

The Pied Piper I has a variety of software programs, including a WP package, electronic spreadsheet, and a 50,000-word dictionary.

STM has contracted with Xerox to provide third-party maintenance service to Pied Piper I users from 82 Xerox offices nationwide.

**System Design** The Pied Piper I is based on an 8-bit Zilog Z80A microprocessor with 64KB of RAM and 4KB of ROM. The system supports 800KB of formatted slim-line diskette storage and a 5MB or 10MB fixed disk subsystem.

For video display, the system interfaces either to a standard CRT monitor, providing a 24-line-by-80-character screen format, or to a television set through a radio frequency modulator. The Pied Piper I can also include a liquid crystal display (LCD) with a 2-line-by-80-character format and a thermal printer, both contained in the system's cabinet. For hard-copy printouts, the Pied Piper I parallel port accepts a Centronics/Epson-type printer; an optional serial port permits the use of additional printers or a standalone modem.

Two card slots accommodate expansion boards, such as a disk controller or serial I/O port. The optional programmable serial port allows data rates up to 19.2K bps for connection to other peripheral devices and local area network systems.

Software support includes the Digital Research CP/M operating system and the complete line of Perfect Software programs: Perfect Writer, a user-teaching WP system; Perfect Speller, a 50,000-word spelling checker; Perfect Filer, a data base manager; and Perfect Calc, an electronic spreadsheet program. Optional software available from STM includes MicroPro WordStar and MailMerge, Microsoft Multiplan, Sorcim SuperCalc, Ashton-Tate dBASE II, and Microsoft MBASIC. Programming languages that run under CP/M include CBASIC, APL, COBOL, FORTRAN, PL/1, and Pascal.

**Competition & Pricing** Competition for the Pied Piper I includes the Kaypro 10, Osborne Executive, Sharp PC-5000, and Teleram T-3000 portable computer systems.

The purchase price of the Pied Piper I is \$1,299.



**Sharp Electronics Corp**10 Sharp Plaza  
Paramus NJ 07652

(201) 265-5600

**PC-5000**

**Overview** The PC-5000 is a portable computer that weighs less than 12 pounds and is battery operated with an AC adapter. The system is targeted for professionals in any size company—Fortune 1000, medium, and small. The unit has a built-in 8-line display terminal, a keyboard, a modem, and an optional printer.

The product is sold by Sharp's direct sales force to independent retailers.

**System Design** The PC-5000 is based on a 16-bit Intel 8088 processor with 128KB of RAM, expandable to 320KB, and an additional 128KB of bubble memory. The unit also accepts 192KB of ROM in cartridge applications using the Microsoft MS-DOS operating system and GW-BASIC resident in ROM.

The unit is equipped with an LCD panel that folds flat over the keyboard when not in use; the panel shows 8 lines of 80 characters each and supports a full personal computer character set of 256 characters and symbols. An optional printer that can print on thermal or plain bond paper can be attached to the back of the unit. The printer speed is approximately 37 cps; 10- and 12-pitch printing is available. Also optional is a 10-key modem and autodialer that operates on Touch-Tone or pulse phones, stores up to 10 phone numbers, and incorporates a loudspeaker for 2-way conference calling. Disk drives with 320KB of storage and a cassette interface are available for the PC-5000.

Software for the system includes the MS-DOS operating system, word processing communications, spreadsheets, an executive planner, and a data base manager. The system can also use MS-DOS software packages.

**Competition & Pricing** The PC-5000 competes with the Data General Corporation DATA GENERAL/One, the Hewlett-Packard HP 110, and the Texas Instruments Pro-Lite.

The PC-5000 sells for \$1,695. With the thermal printer, it sells for \$1,995. The modem costs \$349.

**Sord Computer of America**645 5th Ave  
New York NY 10022

(212) 759-0140

**Consultant**

**Overview** Sord Computer of America introduced the IS-11, its first briefcase-sized computer, in 1984. Called the Consultant, the IS-11 is designed for business and home applications. The system weighs 4-1/2 pounds and measures 11-3/16 by 8-7/16 by 1-7/16 inches. The Consultant operates on internal, rechargeable nickel cadmium batteries; the unit operates for up to 8 hours on 1 charge. Each system includes an AC adapter/battery charger.

Main memory on the system can be expanded to 64KB. Mass storage is provided by a high-speed cassette tape; each tape stores 128KB of data.

The Consultant includes several integrated software packages that take advantage of its multiwindowing capabilities.

Maintenance for the Consultant is provided on a third-party basis through the nationwide network of Xerox service offices.

**System Design** The Consultant features an 8-bit Zilog Z80 processor and is configured with 32KB of non-volatile RAM, expandable to 64KB. The system also includes 64KB of ROM. Data storage is provided by a high-speed cassette tape that stores 128KB of data; the tape cassette is supported by the tape operating system (TOS).

Each system includes a bit-mapped liquid crystal display that has an 8-line-by-40-character format.

Options for the system include a 3-1/2-inch diskette drive, thermal printer, numeric keypad with 16 additional function keys, bar-code reader, and BASIC programming module.

Software integrated with the system includes the I-PIPS data handling facility, I-Calc electronic spreadsheet, I-EDIT for basic editing capabilities, I-WP, and I-COMM data communications facility. Optional software includes programs for sales, finance, business security, time sharing, and data entry.

**Competition & Pricing** Competing with the Consultant is the Teleram T3000, Convergent Technologies Workslate, and Epson America HX-20.

The Consultant is priced at \$795. It is also available with a built-in modem for \$895.



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**Sord Computer of America**645 5th Ave  
New York NY 10022(212) 759-0140

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**IS-11C**

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**Overview** The Sord IS-11C, a briefcase-sized portable weighing 6.4 pounds, is an enhanced version of the IS-11 Consultant and was introduced in 1984. Improvements include a 25-line LCD display, expanded memory, and additional built-in software functions. The IS-11C is powered by AC or a battery and includes a microcassette tape for data storage.

**System Design** Based on a CMOS implementation of the Zilog Z80A processor running at 3.4MHz, the IS-11C includes 72KB of ROM and 80KB of RAM, expandable to 144KB. The integral 128KB microcassette provides the only other storage. The bit-mapped LCD display, which is located in the lid covering the system and keyboard unit, can be adjusted to the optimum viewing angle. The display provides a full 80-character-by-25-line text display with 640 by 200 pixel graphics resolution. The screen can be divided into multiple windows. The integral keyboard has 64 alphanumeric keys and 6 function keys.

An RS-232C serial port, a Centronics-compatible parallel port, and a 300-bit-per-second modem are standard. A real-time clock is also provided.

The nickel-cadmium batteries are recharged by an AC adapter. An indicator light signals when battery charge becomes low.

Standard software built into the ROM includes a word processor, a communications package, and management utilities. Optional ROM packs provide the DB-PIPS data base program, BASIC, the I-Trans file transfer program (for data transfer to MS-DOS or CP/M systems), and I-TSS, a module used to access public bulletin boards.

**Competition & Pricing** The Sord IS-11C competes with the Tandy TRS 80 Model 100, the Teleram T-100, and other lightweight computers.

Pricing for the IS-11C begins at \$1,495.

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**Sperry Corporation**Computer Systems  
PO Box 500  
Blue Bell PA 19424(215) 542-4213

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**Sperry Portable Computer**

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**Overview** The Sperry Portable Computer is a 1-piece, compact computer system with built-in interfaces and a high-resolution monochrome screen. The system, which is manufactured for Sperry by Corona Data Systems, is available in 3 models and complies with IBM's open architecture design to be compatible with a large base of business and personal applications software.

**System Design** The Portable Computer is based on an Intel 8088 microprocessor that runs at 4.77MHz and has 256KB of RAM in the standard configuration. Up to 512KB of RAM can be supported by the main board, and an additional 640KB of RAM can be added through an expansion board. The system is equipped with a graphics controller, memory, and diskette controllers on the main board. Up to 4 expansion slots are available to accommodate both Sperry and IBM option cards. Each model includes 1 parallel and 1 serial port; depending on the model, mass storage consists of one 360KB, 5-1/4-inch diskette drive, two 360KB, 5-1/4-inch diskette drives, or one 360KB diskette drive and one 10MB fixed disk drive. The standard 9-inch green phosphor screen can create high-resolution monochrome graphics using a built-in graphics board; an optional color board allows the user to display graphics on a Sperry, IBM, or compatible monitor.

Software for the system includes Microsoft MS-DOS and GW-BASIC. The Portable Computer runs a range of personal and business applications software. In addition to communicating with Sperry's desktop personal computer models and other MS-DOS machines, the Portable Computer communicates with both Sperry and IBM central processors through standard and optional communications interfaces, such as IBM's BSC and SNA/SDLC protocols.

**Competition & Pricing** The Sperry Portable Computer competes with the Columbia Data Products Columbia VP, the COMPAQ Computer Corporation COMPAQ and COMPAQ Plus, the IBM Portable Personal Computer, the Corona Data Systems Corona Portable PC, and the Seequa Computer Chameleon.

Prices for the Portable Computer range from \$2,685 to \$4,985, depending on the model selected.

**Tandy**

1800 One Tandy Ctr  
Fort Worth TX 76102

(817) 390-3700

**Radio Shack TRS-80 Model 4P**

**Overview** Tandy Corporation's Radio Shack Division introduced the TRS-80 Model 4P transportable desktop microcomputer in September 1983. Model 4P weighs 26 pounds and measures 16-1/2 inches by 13-1/2 inches by 9-3/4 inches. The self-contained system supports from 64KB to 128KB of main memory and up to 368KB of diskette storage. Model 4P is targeted for business managers and professionals, educators, small business owners, and personal computer users.

Model 4P systems are completely compatible with all Model 4 programs. The Model 4P can run all Model III TRSDOS and LDOS disk programs in Model III mode.

Radio Shack's 7,000 retail outlets provide the basis for Tandy's customer service. Users return faulty equipment to their local store, which then forwards the equipment to the nearest service center for repair. Onsite service contracts are also available through Radio Shack.

**System Design** Model 4P is based on an 8-bit Zilog Z80 microprocessor that features 158 instructions, 17 standard registers, and decimal arithmetic functions.

TRSDOS features a complete job control language that handles unattended operations and controls applications. TRSDOS supports the Microsoft BASIC programming language for program development. Model 4P can run existing TRS-80 Model III software with no conversions. The 4P can also run CP/M Plus-based programs and applications based on the Logical Systems LDOS operating system.

Model 4P is configured with 64KB of main memory, 368KB of diskette storage, an RS-232C port, a parallel printer interface, a 9-inch-diagonal monitor, a typewriter-style keyboard, and Microsoft Disk BASIC. An optional internal direct-connect modem board supports communications with other computers and access to information services. The modem board features a direct-connect, autodial/autoanswer, 300-bps modem with full- and half-duplex as well as originate/answer modes.

Model 4P systems feature a 9-inch-diagonal high-resolution monitor with an 80-column-by-24-line display that can be upgraded to an optional 640-dot-by-240-dot high-resolution graphics display.

**Competition & Pricing** Competition for the TRS-80 Model 4P includes the Kaypro Computers Kaypro 2, Osborne Executive, and Otrona Attache.

Model 4P is priced at \$1,299.

**Tandy Corp**

1800 One Tandy Ctr  
Fort Worth TX 76102

(817) 390-3700

**TRS-80 Model 100 and Model 200**

**Overview** One of the most popular notebook-sized computers, the Model 100 was introduced in 1983. It measures 2 by 11.8 by 8.5 inches and weighs approximately 4 pounds. The unit features a full-size typewriter keyboard, an 8-line LCD display, a built-in modem, and built-in ROM-based software for several business-related functions. The slightly larger Model 200 offers the same features but comes with a 16-line flip-up LCD display. Each unit is powered by nickel cadmium batteries that maintain memory contents for up to 3 days. These batteries are charged by an optional AC adapter. A low battery indicator light warns when only 15 minutes of power remain.

**System Design** The Model 100 is based on the 8-bit Intel 80C85 processor running at 2.4MHz. Model 100 has 32KB of ROM; Model 200 has 72KB of ROM, expandable to 104KB. RAM capacity is 8KB, expandable in 8KB increments to 32KB on Model 100. Model 200 comes with 24KB of RAM, expandable in 24KB increments to 72KB. No diskette storage is provided. An optional audio cassette player can be used for program and data storage. The LCD on Model 100 displays 8 lines of 40 characters. The viewing angle can be adjusted electronically for optimum readability. The LCD on the Model 200 displays 16 lines of 40 characters.

On both models, the full-sized keyboard includes a tenkey numeric pad imbedded in the alphanumeric keyboard, 8 programmable function keys, 4 pre-labeled keys for paste, label, print, and break/pause functions, and a row of 4 cursor control keys. An RS-232C serial interface, a Centronics-compatible parallel port, and a built-in autodial modem are standard equipment.

The proprietary built-in software includes TEXT for creating and editing short text files, SCHEDL for keeping track of appointments, ADDRSS for storing addresses and phone numbers, TELCOM for communication and file transfer, and BASIC. Model 200 also comes with Microsoft Multiplan. When the system is turned on, the user sees a menu of these built-in software features.

**Competition & Pricing** The TRS-80 Model 100 and Model 200 compete with the Teleram T-3000, Sord IS-11C, and NEC Home Electronics PC-8201A.

Pricing for the Model 100 begins at \$399 for the 8KB RAM version. The 24KB version costs \$599. Optional 8KB RAM add-ons cost \$120 plus installation. Model 200 with 24KB RAM costs \$999. The 24KB RAM add-ons cost \$250 each.



**Teleram Communications Corp**2 Corporate Park Dr  
White Plains NY 10604

(914) 694-9270

**Teleram T-3000**

**Overview** The T-3000 is a battery-powered portable personal computer weighing 8-3/4 pounds and measuring 13 inches by 9-3/4 inches by 3-1/2 inches. Consisting of a Z80L microprocessor with 64KB of RAM, the T-3000 is available in 2 versions, with 128KB or 256KB of nonvolatile bubble memory.

The T-3000 features a 4-line liquid crystal display with 80 characters per line, vertical scrolling with 400 lines by 80 characters, a standard typewriter-style keyboard, an RS-232C serial interface, and an AC power adapter.

Software support includes the Digital Research CP/M operating system and Teleram diagnostics and debugging programs.

Teleram Communications Corporation maintains its own computer equipment.

**System Design** The T-3000 is based on a special low-powered version of the Zilog Z80 microprocessor, with 64KB of RAM and 4KB of ROM. Two models are available: one has 128KB of nonvolatile bubble memory, and the other has 256KB of nonvolatile bubble memory. Automatic battery recharging is provided with both.

A 4-line liquid crystal display features 80 characters per line. Vertical scrolling with 400 lines by 80 characters is standard. The keyboard is programmable and arranged in the standard typewriter format. Programs and data can be entered into or removed from the T-3000 via its built-in RS-232C serial interface or optional T-3500 office station.

The T-3000 is supported by the Digital Research CP/M operating system and BASIC programming language.

Options available with the T-3000 include from 1 to 4 diskette drives, an acoustic coupler, a serial printer, word processing, and spreadsheet programs.

**Competition & Pricing** Competition for the Teleram T-3000 includes the GRiD Systems COMPASS computer, Otrona Attache, and Kaypro 2.

Model	Price \$
T-3000-1	1,795
T-3000-2	2,295

**Teleram Communications Corp**2 Corporate Park Dr  
White Plains NY 10604

(914) 694-9270

**Teleram T-4000**

**Overview** In late 1983, Teleram Communications Corporation expanded its portable computer line with the addition of the T-4000, a system that features an integral 8-line-by-80-character display, 64KB of RAM, and 4KB of ROM. The T-4000 is battery powered, weighs 9 pounds, and measures 13 by 9-3/4 by 3-1/2 inches. The system is slightly larger than the T-3000 but weighs three-quarters of a pound less.

The T-4000 runs under the Digital Research CP/M Version 2.2 operating system and supports several programming languages and application programs.

Teleram Communications maintains its own systems.

**System Design** The T-4000 is based on the Zilog Z80L microprocessor, a special low-powered version of the Zilog Z80 microprocessor with a clock speed of 2.5MHz. The optional teleCONNECT interface is a proprietary 2.5MHz CPU bus that attaches peripherals to the T-4000. The 4KB ROM contains power-on diagnostics, teleCONNECT initialization, and a bootstrap loader. In addition to the 64KB RAM, T-4000 offers 16KB of overlay memory through teleCONNECT. T-4000 also supports 128KB or 256KB of internal bubble memory and includes 1 programmable RS-232C serial interface.

The system's 83-key keyboard features 16 programmable function keys and 12-key numeric keypad. The display for the T-4000 is an 8-line-by-80-character liquid crystal display. The T-4000 also supports an external 24-line-by-80-character CRT through teleCONNECT.

Hardware options include a CRT interface that attaches the T-4000 to any standard 24-line-by-80-character Teleram RS-170 CRT monitor, a diskette drive, and the Teleram Model 3500 office station, which is an expansion chassis with 6 card slots.

Software for the T-4000 includes the Digital Research CP/M Version 2.2 operating system, which supports BASIC, COBOL, FORTRAN, Z80 assembler, and Pascal programming languages. The UCSD p-System is optional. A number of system utilities are available, such as the teleTALK telecommunications utility and KEYDEF, DEFAULT, ASSIGN, FORMAT, and RECOVER functions. Applications software includes packages for WP, spreadsheets, and data base management.

**Competition & Pricing** Competition includes the Otrona Attache and GRiD COMPASS.

The T-4000 is priced at \$1,995 for 128KB of bubble memory and \$2,495 for 256KB of bubble memory.



**Teleram Communications Corp**

2 Corporate Park Dr  
White Plains NY 10604

(914) 694-9270

**Teleram T-5000**

**Overview** The T-5000 is a battery-powered system that weighs 10 pounds and measures 13 by 9-3/4 by 4-1/3 inches. The system features a 16-line-by-80-character display, 64KB of RAM, 4KB of ROM, and up to 256KB of bubble memory.

T-5000 runs under the Digital Research CP/M Version 2.2 operating system and supports several programming languages and application programs.

Maintenance and support for the T-5000 are provided by Teleram Communications. The mean time between failure (MTBF) is 2,800 hours and the mean time to repair is 30 minutes for the T-5000.

**System Design** Like the other Teleram systems, the T-5000 is built around a Zilog Z80L microprocessor, a low-powered version of the Z80 with a clock speed of 2.5MHz. The T-5000 supports 64KB of RAM and 4KB of ROM. ROM includes power-on diagnostics, teleCONNECT initialization, and a bootstrap loader. teleCONNECT is an optional interface that provides a 2.5MHz CPU bus used to attach peripherals to the T-5000. teleCONNECT also provides 16KB of overlay memory.

The T-5000 is available in two models: the T-5000-1 and T-5000-2, which differ only in the size of bubble memory. The T-5000-1 features 128KB of bubble memory, and the T-5000-2 includes 256KB. Both models are equipped with an RS-232C serial interface.

Integral to the system is a 16-line-by-80-character liquid crystal display and an 83-key typewriter-style keyboard with 16 programmable function keys and 12-key numeric keypad. Both T-5000 models also support an external 24-line-by-80-character CRT through teleCONNECT.

T-5000 systems run under the Digital Research CP/M Version 2.2; the UCSD p-System is optional. CP/M 2.2 supports BASIC, COBOL, FORTRAN, Pascal, and Z80 assembler programming languages. System utilities include telecommunications, function-key definition, I/O redirection, and disk formatting. Applications for the T-5000 include WP, spreadsheet, and data base management packages.

**Competition & Pricing** Competition for the T-5000 includes the Otrona Attache, TeleVideo TPCI, Convergent Technologies Workslate, and Compal Electric Briefcase.

Model	Purchase Price \$
T-5000-1	2,495
T-5000-2	2,995

**TeleVideo Systems**

1170 Morse Ave  
Sunnyvale CA 94086

(408) 745-7760

**TPC I, TPC II**

**Overview** The TeleVideo Portable Computer (TPC I) is an 8-bit microcomputer measuring 8 by 18 by 15 inches and featuring an integral display screen, detachable keyboard, modem port, and parallel printer port. In November 1983, TeleVideo Systems introduced its second portable system, the TPC II. The TPC II is a 16-bit portable system that is compatible with the IBM Personal Computer.

TPC I runs under the Digital Research CP/M operating system; TPC II runs under Microsoft's MS-DOS operating system. Both systems support several programming languages as well as application programs from TeleVideo and from third-party vendors. TPC II runs applications developed for the IBM Personal Computer.

Maintenance is provided by the TRW Customer Service Division in the U.S. and through local TeleVideo distributors in other countries.

**System Design** TPC I is based on an 8-bit Zilog Z80A microprocessor with 64KB of RAM expandable to 128KB. An 8KB EPROM and 32KB alphanumeric and graphics display memory are standard. TPC II is built around the 16-bit Intel 8088 microprocessor with 128KB of RAM expandable to 256KB.

TPC I standard features include dual 5-1/4-inch diskette drives with 720KB of storage, a 9-inch-diagonal display, and a detachable typewriter-style keyboard. Standard features of the TPC II include a 9-inch-diagonal display with graphics resolution of 640 by 200 pixels, an RS-232C serial port, an IBM-style DB-25S parallel printer port, dual 5-1/4-inch diskette drives for 720KB of storage, and rear panel connectors for a color monitor and composite video.

Software for the TPC I includes the CP/M operating system with GSX-80 graphics extension, TeleWriter WP, TeleCalc spreadsheet, and TeleChart business graphics. BASIC and COBOL are supported. TPC II runs under MS-DOS, and it supports most third-party application packages available for the IBM Personal Computer.

**Competition & Pricing** Competition for the TPC I and TPC II includes Kaypro 2, COMPAQ Computers COMPAQ, Otrona Attache, IBM Portable Personal Computer, Apple Macintosh, and Eagle PC Spirit XL.

Pricing is as follows:

Configuration	Price \$
TPC I with one diskette drive	1,595
TPC I with two diskette drives	1,999
TPC II with one diskette drive	2,095
TPC II with two diskette drives	2,395



**Texas Instruments**

PO Box 2909  
Austin TX 78769

(512) 250-7111

**Texas Instruments**

PO Box 809063  
Dallas TX 75380

(800) 527-3500

**Portable Professional Computer**

**Overview** Texas Instrument's introduction of the Portable Professional Computer in November 1983 marked the company's entry into the portable computer market. The Portable Professional Computer is compatible with the desktop Texas Instruments Professional Computer and is designed for professionals and executives.

The Portable Professional Computer features high-resolution graphics, color capability, up to 768KB memory expansion, and internal modems. The system weighs 32 pounds and features a detachable keyboard.

Texas Instruments provides maintenance and support for the Portable Professional Computer. Maintenance is available through Texas Instruments authorized dealers. On-site service is available on a contractual basis through the Texas Instruments nationwide service organization.

**System Design** The Portable Professional Computer includes a 16-bit Intel 8088 microprocessor with 64KB of RAM, 5 expansion slots, and an integral 5-1/4-inch diskette with either 320KB or 360KB of storage. The Portable Professional Computer supports high-resolution graphics on a 9-inch-diagonal monochrome or color display. Both displays feature a 25-line-by-80-column format and a resolution of 720 by 300 pixels. The system also supports an external 12-inch monochrome or 13-inch color monitor. The keyboard configured with the system is the same as the one on the desktop Professional Computer. A second half-height 5-1/4-inch diskette drive is available to expand diskette storage to a maximum of 640KB or 720KB.

Software includes the Microsoft MS-DOS 1.1 and 2.1 operating systems. The Portable Professional Computer supports programming languages and application packages available for MS-DOS. Application packages supported include the Lotus Development Lotus 1-2-3 and Texas Instruments NaturalLink and Command systems. The system also supports the EtherSeries and other communications products, including IBM 3270 and TTY emulation.

**Competition & Pricing** Competition for the Portable Professional Computer includes the Kaypro 2, Otrona Attache, and COMPAQ Computer.

Model	Price \$
Portable Professional Computer w/monochrome display	2,295
Portable Professional Computer w/color display	3,465

**Pro-Lite**

**Overview** The Texas Instruments Pro-Lite is a 10.5-pound portable microcomputer with dimensions of 2.75 by 11.5 by 18.5 inches. An external battery pack enables use of the system without AC power. The system supports the Microsoft MS-DOS operating system. Like the Texas Instruments Professional Computer, the Pro-Lite is not IBM compatible, but users can transfer files between IBM and Texas Instruments personal computers.

**System Design** The briefcase-sized Pro-Lite features a full 12-inch, 80-column-by-25-line LCD screen with graphics capability. An external color or monochrome monitor is optional. The system is based on the 16-bit Intel 80C88, the CMOS version of the 8088 used in the IBM Personal Computer. The 80C87 mathematics coprocessor is optional. CMOS technology reduces power consumption and enables the Pro-Lite to run on battery power for up to 8 hours.

The system has 256KB of RAM, expandable to 768KB. A single 3-1/2-inch diskette drive with 720KB capacity is standard. An expansion board enables connection of a second diskette drive, a battery pack, or both. Two internal expansion slots can be used for a 300-bps modem, an RS-232C synchronous or asynchronous interface, an external monitor interface, or programmable ROM software modules. A parallel port is standard.

The keyboard has 79 full-travel keys, including 12 programmable function keys and an embedded numeric pad. A 45-cps thermal printer is optional. A soft-sided carrying case is also available.

The Pro-Lite uses the MS-DOS operating system and can exchange files with other MS-DOS-based computers or with IBM Personal Computers through an optional interface cable.

**Competition & Pricing** The Pro-Lite competes with the Data General Corporation DATA GENERAL/One, Hewlett-Packard Portable HP 110, and Morrow Pivot.

The basic system, with 256KB of RAM and 1 diskette drive, costs \$2,995.



**Visual Computer**

135 Maple St  
Marlboro MA 01752

(617) 480-0000

**Commuter**

**Overview** Visual Computer introduced the Commuter portable personal computer in late 1983. The Commuter is a 16-pound, IBM-compatible system measuring 15 by 18 by 3 inches. The system is packaged in an attache case with a keyboard that is identical to that of the IBM Personal Computer.

The Commuter supports a maximum of 512KB of main memory and up to 720KB of diskette storage. The system supports either a character or a flat-panel display.

Commuter is compatible with IBM software and can take advantage of a large base of IBM-compatible applications software.

Visual Computer markets the Commuter through major retail outlets and distributors.

Maintenance and support services for the Commuter are provided through authorized Visual Computer dealers and distributors.

**System Design** The Commuter is based on the 16-bit Intel 8088 microprocessor. Standard features available with the system include 256KB of main memory, two 5-1/4-inch diskette drives with 360KB of storage each, a parallel printer port, an RS-232C serial port, support logic for a display, a diskette drive controller, a connector to an IBM expansion unit, ROM-based terminal emulation, ROM-based extended diagnostics, and the attached keyboard.

Hardware options for the Commuter includes memory expansion to 512KB, an 80-character-by-16-line or 80-character-by-25-line flat-panel liquid-crystal display, and an RS-232C programmable serial port.

Communications is provided through the optional RS-232C port and supported through asynchronous, bi-synchronous, SDLC, and HDLC capabilities.

Visual Computer bundles the Microsoft MS-DOS operating system and GW-BASIC with the Commuter system. Thus, Commuter users can access a variety of MS-DOS-compatible application packages. The Commuter can also run most software written for the IBM Personal Computer.

**Competition & Pricing** The Commuter portable computer competes with the IBM Portable Personal Computer, Corona Portable Computer, Columbia VP, and COMPAQ Computer COMPAQ.

The base price for the Commuter is \$1,895. With the 16-line LCD, the system costs \$2,195; with the 25-line LCD, it costs \$2,495.

**Zenith Data Systems**

1000 Milwaukee Ave  
Glenview IL 60025

(312) 391-8744

**Z-160 PC Portable**

**Overview** Zenith Data Systems revamped its Z-100 Series of personal computers in February 1984; the series currently includes 3 desktop computers and 2 portable configurations. The Z-160, 1 of the portable configurations, is software and expansion-board compatible with the IBM Personal Computer.

Z-160 supports up to 640KB of main memory and single or dual diskette drives. The system is completely hardware and software compatible with the Zenith Z-150 desktop systems.

Available software for the Z-160 includes the Microsoft MS-DOS operating system, which is identical to the IBM PC DOS.

Zenith sells the Z-160 through a nationwide network of authorized distributors and dealers. The Z-160 includes a 90-day warranty; on-site maintenance is available from more than 300 authorized service centers.

**System Design** A 16-bit Intel 8088 microprocessor provides the basis for the Z-160 CPU. The system is initially configured with 128KB of RAM with internal parity checking. The basic memory card supports up to 320KB in increments of 64KB; further expansion to 640KB requires an additional memory card. The Z-160 includes 2 RS-232C serial ports, a Centronics-compatible parallel printer port, an 80-character-by-25-line display of medium resolution, and a detached low-profile keyboard with 17-key numeric keypad.

The Z-160 is available in 2 configurations: ZFA-161-21 and ZFA-161-22. The ZFA-161-21 features 128KB of main memory and a single 5-1/4-inch diskette drive with 360KB of storage. The ZFA-161-22 includes 320KB of main memory plus dual 5-1/4-inch diskette drives for 720KB of storage.

Z-160 systems include 4 card slots for system expansion. Options include various printers, graphics plotters, and monochrome and color displays.

Z-160 systems run under the Microsoft MS-DOS and therefore support various software packages, such as Lotus 1-2-3 from Lotus Development, dBASE II from Ashton-Tate, and PerfectCalc and PerfectWriter from Perfect Software. Z-160 also supports other operating systems, including the Digital Research CP/M-86.

**Competition & Pricing** Competition includes the IBM Portable Personal Computer, Apple Macintosh, Columbia VP, and Eagle PC Spirit XL.

Model	Purchase Price \$
ZFA-161-21	2,399
ZFA-161-22	2,999







# DISK DRIVES

## Company Directory

232.0032.001

Vendor	Address/Telephone	Model
Advanced Storage Technology (CAST)	6580 Via Del Oro San Jose CA 95119 (408) 224-8010	10203 10304 10305 96202 96203
Alloy Computer Products	100 Pennsylvania Ave Framingham MA 01701 (617) 875-6100	PC-DISC/140 PC-DISC/36 PC-DISC/52 PC-DISC/85 PC-QICSTOR/140; PC-QICSTOR/280 PC-QICSTOR/36; PC-QICSTOR/72 PC-QICSTOR/52; PC-QICSTOR/104 PC-QICSTOR/85; PC-QICSTOR/170 PC-STOR/36; PC-STOR/72 PC-STOR/52; PC-STOR/104 PC-STOR/85; PC-STOR/170
Alpha Data	20750 Marilla St Chatsworth CA 91311-4488 (818) 882-6500	ATLAS-5
Alps Electric	3553 N First St San Jose CA 95134 (408) 946-6000	DRA010 DRA020 DRB040 DRL010 DRM020
Apple Computer	20525 Mariani Ave Cupertino CA 95014 (408) 996-1010	Macintosh Hard Disk 20
AST Research	2121 Alton Ave Irvine CA 92714 (714) 863-1333	Colossus MicroStor-10D MicroStor-20D
Bull Peripherals	766 San Aleso Sunnyvale CA 94086 (408) 745-0855	D530 D550 D570 D585
Comark	PO Box 474 93 West St Medfield MA 02052 (617) 359-8161	MW 26 MW 52
Computer Memories	PO Box 2740 9216 Eton Ave Chatsworth CA 91311 (818) 709-6445	CM3026 SCSI CM3426 CM6426 CM6640 CM7053 CM7085
Control Data	Box 0 Minneapolis MN 55440 (612) 853-8100	9415-21/-36 Wren I 9415-48/-67/-86 Wren II 94166 Wren III 94205-51 Wren II Half-Height 9720X EMD 8-Inch Module Drive
Corvus Systems	2100 Corvus Dr San Jose CA 95124 (408) 559-5068	OmniDrive Model 11 OmniDrive Model 16 OmniDrive Model 20 OmniDrive Model 45 OmniDrive Model 5

Vendor	Address/Telephone	Model
Data Technology	2775 Northwestern Pkwy Santa Clara CA 95051 (408) 986-9545	TeamMate 1110 TeamMate 1120/1120AT TeamMate 1123/1223 TeamMate 1132/1132AT TeamMate 1160AT TeamMate 1213 TeamMate 1300/R10; 1400/R10 TeamMate 1320/R10; 1420/R10 TeamMate 1420/T20; 1420/T60 TeamMate 1432/T60 TeamMate 1460/T60 TeamMate 2213 TeamMate Double Play
Digital Equipment	146 Main St Maynard MA 01754-2571 (617) 897-5111 (800) DIGITAL ext 990	RCD50 RD31 RD51 RD52 RD53 RL02
Emerald Systems	4757 Morena Blvd San Diego CA 92117 (619) 270-1994	118/Maxtor 30/CDC 40/CDC 55/CDC 72/CDC
Epson	23600 Telo St Torrance CA 90505 (213) 534-4500	HD-830 HD-860
Fujitsu America	3055 Orchard Dr San Jose CA 95134 (408) 946-8777	M222X Series M223X Series M2246E M224X Series
Hewlett-Packard	PO Box 10301 Palo Alto CA 94303 (415) 857-1501	HP 7906M HP 7907A HP 7911P/7912P/7914P HP 7920M/7925M HP 7933H HP 7935H HP 7941A/7945A HP 9134H/9133H HP 9134L/9133L HP 9154A/9153A
Hitachi	950 Elm Ave Suite 100 San Bruno CA 94066 (415) 872-1902	DK301-1/-2 DK502-1/-2/-3 DK503-1/-2 DK511-3/-5/-8 DK512-8/-12/-17 DK812S-5/-8/-12/-17 DK814S-17/-24/-34
Lobo Systems	7334 Hollister Ave #J Goleta CA 93117 (805) 968-6929	RAM 10A/-10-I RAM 5A Winchester 10 Winchester 5
Maxtor	150 River Oaks Pkwy San Jose CA 95134 (408) 942-1700	EXT-4175 EXT-4280 EXT-4380 XT-1085 XT-1105 XT-1140 XT-2085 XT-2140

Vendor	Address/Telephone	Model
		XT-2190 XT-3170 XT-3280
Micro Storage	2986 Oakmead Village Ct Santa Clara CA 95051 (408) 986-0770	MS212
Micropolis	21123 Nordhoff St Chatsworth CA 91311 (818) 709-3300	1302 1303 1304 1323 1323A 1324 1324A 1325 1353 1353A 1354 1354A 1355 1373 1373A 1374 1374A 1375
Mitope	1770 Walt Whitman Rd Melville NY 11747 (516) 420-0200	RD15 RD160 RD40 RD45 RDS86
MiniScribe	1861 Lefthand Circle Longmont CO 80501 (303) 651-6000	3212 3425 6032 6053 6085 8212 8425
Mitsubishi Electronics America	991 Knox St Torrance CA 90502 (213) 515-3993	M4870 MR322 MR5310 MR533 MR535
NEC Information Systems	1414 Massachusetts Ave Boxborough MA 01719 (617) 264-8000	D3126 D5124 D5126 D5146 D5146H D5652
Nippon Electric Industry	4984 El Camino Real Suite 111 Los Altos CA 94022 (415) 964-9543	RD-3127 RD-3255 RD-4064 RD-4127 RD-4191 RD-4255
Paradise Systems	217 E Grand Ave South San Francisco CA 94080 (415) 588-6000	MAC-10 MAC-20
Pertec Peripherals	9600 Irondale Ave Chatsworth CA 91311 (818) 882-0030	DX199 DX265 DX332 DX368

Vendor	Address/Telephone	Model
Plus Development	1778 McCarthy Blvd Milpitas CA 95035 (408) 946-3700	DX548  Hardcard
Priam	20 W Montague Expressway San Jose CA 95134 (408) 946-4600	15450 3450 514 519 617 623 6650 7050 725 803 806 807 808 Vertex 130 Vertex 150 Vertex 170 Vertex 185
Quadram	One Quad Way Norcross GA 30093-2919 (404) 923-6666	QuadDrive 10MB QuadDrive 20MB QuadDrive 40MB QuadDrive 72MB
Quantum	1804 McCarthy Blvd Milpitas CA 95035 (408) 262-1100	Q2010 Q2020 Q2030 Q2040 Q250 Q280 Q520 Q530 Q540
RACET Computes	1855 W Katella Suite 255 Orange CA 92667 (714) 997-4950	PCMS-150 PCMS-250 PCMS-300 PCMS-411 PCMS-500 PCMS-822
Rodime	901 Broken Sound Pkwy NW Boca Raton FL 33431 (305) 994-6200	RO202 RO202E RO203 RO203E RO204 RO204E RO251 RO251F RO252 RO252F RO351 RO352 RO412 RO413 RO414 RO432 RO433 RO434 RO651 RO652 RO655 RO657

Vendor	Address/Telephone	Model
Seagate	920 Disc Dr PO Box 66360 Scotts Valley CA 95066-4544 (408) 438-6550	ST212 ST213 ST225 ST225N ST238 ST4026 ST4038 ST4051 ST4096
Siemens	186 Wood Ave S Iselin NJ 08830 (201) 321-8953	Megafire/1100 Megafire/1200 Megafire/1300
SyQuest Technology	47923 Warm Springs Blvd Fremont CA 94539 (415) 490-7511	SQ306RD SQ312RD SQ325F SQ338F
Tallgrass Technologies	11100 W 82nd St Overland Park KS 66214 (913) 492-6002	TG-2025i TG-5025 Hardfile TG-5525i TG-5535i TG-5550i CDC TG-5550i MS TG-5580i MS TG-6135 Hardfile TG-6150 TG-6180 Hardfile
Tandon	20320 Prairie St Chatsworth CA 91311 (818) 993-6644	DISKARD 21 TM250 Series TM500 Series TM700 Series
Tandy/Radio Shack	1700 One Tandy Center Fort Worth TX 76102 (817) 390-3921	25-10-25 10MB Drive 26-41-55/56 15MB Drive 26-41-71/72 35MB Drive 26-41-73/74 70MB System
TEAC	7733 Telegraph Rd PO Box 750 Montebello CA 90640 (213) 726-0303	SD-510 SD-520
Tecmar	6225 Cochran Rd Solon OH 44139-3377 (216) 349-1009	40010 Removable 40011 Internal Removable 40020 Removable 40200 Hard Disk 10 40210 Removable and 10 40300 Hard Disk 15 40310 Removable and 15 40414 Expansion Hard Disk 43010 Removable 43200 Hard Disk 10 43300 Hard Disk 15 43400 Hard Disk 33 43404 Mini Hard Disk 73010 MacDrive 73020 MacDrive 73200 MacDrive 73210 MacDrive 812205 T-Disk AT HD 811606 MassFile Q60W20/Q60W20 AT

Vendor	Address/Telephone	Model
Toshiba	3910 Freedom Circle Suite 103 Santa Clara CA 95054 (408) 727-3939	MK-153FA MK-154FA MK-156FA MK-53F MK-54F MK-56F
Wang	1 Industrial Ave Lowell MA 01851 (617) 967-3765	APC-PM023 APC-PM025 APC-PM026
Xebec	2055 Gateway Pl Suite 600 San Jose CA 95110 (408) 287-2700	9710H/9720H 9730 Universal Subsystem Insider Owl

# DISK DRIVES

## Specifications Chart Guide

The Disk Drive Specifications Charts include 438 models of hard disk storage units from 62 manufacturers. The disk drives, which are compatible with a wide range of computer systems from numerous manufacturers, include both Winchester and non-Winchester technologies. Systems using optical disk storage, a technology that is beginning to offer a feasible alternative to traditional disk storage, will be covered separately in a future survey.

Although there is little obvious difference in the performance of Winchester and non-Winchester disk drives, Winchester-type disk drives are popular because they generally offer larger storage capacities and greater reliability than conventional rigid (hard) disk drives. A Winchester-type disk drive can be defined as any disk drive whose magnetic media and read/write heads are sealed in a head disk assembly (HDA). The HDA can be fixed in place at the time of manufacture, or it can be a removable cartridge. By preventing contamination that can hinder head movement, the Winchester design permits increased bit and track density.

Disk drive systems are available in various physical sizes, ranging from 14 inches in diameter to 3.5 inches in diameter, with wide variations in the disk storage capacity. The 14-inch units, originally developed for use with mainframes in the early 1970s, are facing extinction as capacities of the 8- and 5.25-inch disk drives continue to expand dramatically and prices decrease. Storage capacities of 300M bytes are not uncommon in today's 8-inch disk drive models, and transfer rates and access times typically rival (or surpass) those of earlier 14-inch disk drive models.

The following sections explain the entries in the Disk Drive Specifications Charts.

### MANUFACTURER AND MODEL

These entries list the manufacturer's name and the model number or name of the disk drive.

### AVAILABILITY

This entry indicates whether the drive is available directly to end users or is sold on an OEM basis to systems integrators who package the drives with additional hardware and/or software and then sell the entire package to end users. If a drive is available on an OEM basis, it may be privately labeled and sold (without alteration) by numerous computer companies and systems integrators.

### CHARACTERISTICS

This section provides technical and performance information regarding the disk drive.

- **Style**—Indicates whether the drive features fixed media, removable media, or both.
- **Maximum Capacity**—Lists the maximum total storage capacity, in bytes, available on the disk drive. This capacity is usually designated as either formatted or unformatted. Unformatted capacity refers to the gross capacity of the disk, whereas the formatted capacity indicates the subset of the gross capacity actually available for data storage. The difference between unformatted and formatted capacity equals the remaining bytes of storage used for disk management, including track and sector addresses, interrecord gaps, and spare sectors.
- **Platter Diameter**—Specifies the diameter, in inches, of the platter (recording surface) within the disk drive unit. Popular sizes are 14, 8, 5.25, and 3.5 inches.
- **Recording Surfaces per Drive**—Indicates the total number of platter recording surfaces (e.g., disk sides) per drive. Most surfaces have one read/write head; the more read/write heads, the better the drive performs.
- **Number of Cylinders**—Indicates the number of cylinders (tracks) available on each disk recording surface. In general, the fewer cylinders, the higher the performance of the drive because the read/write head requires less repositioning.
- **Rotational Speed**—Specifies the actual rotational speed, in revolutions per minute, of the disk drive.
- **Latency**—Indicates the average amount of time, in milliseconds, required for the head to reach a specific record on a specific track. Latency, also referred to as average rotational delay, is usually equal to the time required to read half the data stored on one track.
- **Average Access Time**—Specifies the average amount of time, in milliseconds, required to access and read a specific record. Latency plus the time required to properly position the head to the track (seek time) equals the average access time.
- **Data Transfer Rate**—Specifies the rate, in bits or bytes per second, at which data can be transferred between the disk storage device and host system memory. This rate is necessarily lower than the maximum transfer rate of the I/O bus or channel to which the drive is attached. A high data transfer rate is particularly significant when transferring large blocks (1K bytes or more) of data.
- **Drives per Controller**—Lists the maximum number of drives that can be attached to each disk controller. This figure is particularly important in determining the total cost of a multidrive disk subsystem and in ensuring that the host computer system can support enough controllers to connect the required number of drives.



- **Size**—Indicates the physical length, width, and height, in inches, of the disk drive unit.

that are similar to the listed model or that the listed model is designed to replace or emulate.

## INTERFACE

This entry specifies the de facto or industry-standard interfaces with which the disk drive is compatible. Many manufacturers of larger (8- and 14-inch) drives comply with the storage module drive (SMD) interface standard established by Control Data Corporation. Other popular interfaces are the enhanced storage module drive (ESMD) and Shugart SA1000 standards for 8-inch drives and the enhanced small device interface (ESDI) and Seagate Technology (ST506) standards for 5.25-inch (and smaller) drives.

## COMPARABLE EQUIPMENT

This section lists any disk drives from other manufacturers

## PURCHASE PRICE

This section indicates the disk drive purchase price as specified by the manufacturer. Prices reflect single-unit costs (unless otherwise specified). Drives sold on an OEM basis are typically subject to varying quantity discounts. These prices must be obtained directly from the manufacturer.

## COMMENTS

This section lists any special features or limitations of the disk drive that might be relevant to a purchase decision. If the disk drive is designed to support a specific type of computer system or model, that is specified in this section, as is the monthly or annual cost of a standard maintenance agreement if one is offered by the manufacturer or a third-party service company.



# SPECIFICATIONS CHART

## Disk Drives (A-M)

232.0045.001

<b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Advanced Storage Technology (CAST)</b> 10203 OEM Fixed 65MB unformatted 5.25 3 1,050 3,600 8.33 30 10M bits — 1.63 x 5.75 x 8 ESDI, SCSI — Vendor declined to provide NA	<b>Advanced Storage Technology (CAST)</b> 10304 OEM Fixed 87MB unformatted 5.25 4 1,050 3,600 8.33 30 10M bits — 1.63 x 5.75 x 8 ESDI, SCSI — Vendor declined to provide NA	<b>Advanced Storage Technology (CAST)</b> 10305 OEM Fixed 110MB unformatted 5.25 5 1,050 3,600 8.33 30 10M bits — 1.950 x 5.75 x 8 ESDI, SCSI — Vendor declined to provide NA
<b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Advanced Storage Technology (CAST)</b> 96202 OEM — 60MB unformatted 5.25 — 922-987 3,600 8.33 30 10M bits — 1.63 x 5.75 x 8 ESDI — Vendor declined to provide NA	<b>Advanced Storage Technology (CAST)</b> 96203 OEM — 100MB unformatted 5.25 — 922-987 3,600 8.33 30 10M bits — 1.95 x 5.75 x 8 ESDI — Vendor declined to provide NA	<b>Alloy Computer Products</b> PC-DISC/140 End-user — 110MB formatted 5.25 — 918 3,600 8.3 30 5M bits — 5 x 8.5 x 16 — \$6,995 For use w/IBM PC Series and compat

**Notes:**

— Information unavailable at press time  
 NA Not applicable

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<b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Alloy Computer Products</b> PC-DISC/36 End-user — 30MB formatted 5.25 — 695 3,600 8.3 45 5M bits — 5 x 8.5 x 16 — — \$2,595 For use w/IBM PC Series and compat	<b>Alloy Computer Products</b> PC-DISC/52 End-user — 41MB formatted 5.25 — 830 3,600 8.3 30 5M bits — 5 x 8.5 x 16 — — \$3,995 For use w/IBM PC Series and compat	<b>Alloy Computer Products</b> PC-DISC/85 End-user — 67MB formatted 5.25 — 1,024 3,600 8.3 28 5M bits — 5 x 8.5 x 16 — — \$4,995 For use w/IBM PC Series and compat
<b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Alloy Computer Products</b> PC-QICSTOR/140; PC-QICSTOR/280 End-user — 110MB formatted (PC-QICSTOR/140); 220MB formatted (PC-QICSTOR/280) 5.25 — 918 3,600 8.3 30 5M bits — 19.6 x 18 x 5.4 — — \$9,995 (PC-QICSTOR/140); \$15,995 (PC-QICSTOR/280) For use w/IBM PC Series and compat; w/.25-in. cartridge file-oriented streaming tape drive	<b>Alloy Computer Products</b> PC-QICSTOR/36; PC-QICSTOR/72 End-user — 30MB formatted (PC-QICSTOR/36); 60MB formatted (PC-QICSTOR/72) 5.25 — 695 3,600 8.3 45 5M bits — 5.4 x 19.6 x 18 — — \$4,595 (PC-QICSTOR/36); \$6,795 (PC-QICSTOR/72) For use w/IBM PC Series and compat; w/.25-in. cartridge file-oriented streaming tape drive	<b>Alloy Computer Products</b> PC-QICSTOR/52; PC-QICSTOR/104 End-user — 41MB formatted (PC-QICSTOR/52); 82MB formatted (PC-QICSTOR/104) 5.25 — 830 3,600 8.3 30 5M bits — 5.4 x 19.6 x 18 — — — For use w/IBM PC Series and compat; w/.25 cartridge file-oriented streaming tape drive

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity  Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment Purchase Price</b> <b>Comments</b></p>	<p><b>Alloy Computer Products</b> PC-QICSTOR/85; PC-QICSTOR/170 End-user  — 67MB formatted (PC-QICSTOR/85); 134MB formatted (PC-QICSTOR/170) 5.25 — 1,024 3,600 8.3 28 5M bits — 5.4 x 19.6 x 18 — — \$7,295 (PC-QICSTOR/85); \$10,295 (PC-QICSTOR/170) For use w/IBM PC Series and compat; w/.25-in. cartridge file-oriented streaming tape drive</p>	<p><b>Alloy Computer Products</b> PC-STOR/36; PC-STOR/72 End-user  — 30MB formatted (PC-STOR/36); 60MB formatted (PC-STOR/72) 5.25 — 695 3,600 8.3 45 5M bits — 5.4 x 19.6 x 18 — — \$4,295 (PC-STOR/36); \$6,495 (PC-STOR/72) For use w/IBM PC Series and compat; w/.25-in. cartridge tape start-stop drive</p>	<p><b>Alloy Computer Products</b> PC-STOR/52; PC-STOR/104 End-user  — 41MB formatted (PC-STOR/52); 82MB formatted (PC-STOR/104) 5.25 — 830 3,600 8.3 30 5M bits — 5.4 x 19.6 x 18 — — \$5,995 (PC-STOR/52); \$8,995 (PC-STOR/104) For use w/IBM PC Series and compat; w/.25-in. cartridge tape start-stop drive</p>
<p><b>Manufacturer Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity  Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment Purchase Price</b> <b>Comments</b></p>	<p><b>Alloy Computer Products</b> PC-STOR/85; PC-STOR/170 End-user  — 67MB formatted (PC-STOR/85), 134MB (PC-STOR/170) 5.25 — 1,024 3,600 8.3 28 5M bits — 5.4 x 19.6 x 18 — — \$6,995 (PC-STOR/85); \$9,995 (PC-STOR/170) For use w/IBM PC Series and compat; w/.25-in. cartridge tape start-stop drive</p>	<p><b>Alpha Data</b> ATLAS-5 OEM, end-user  Fixed 517MB unformatted  14 8  2,250 3,600 8 18 1.8MB  8 23 x 19 x 7 SMD NA Vendor declined to provide Power supply incl; flexible sector format; sealed chamber</p>	<p><b>Alps Electric</b> DRA010 OEM  Fixed 10MB formatted  5.25 4  306 3,600 — 80 5M bits  — 1.64 x 8.54 x 8.13 ST506/412 — Vendor declined to provide NA</p>

Notes:  
— Information unavailable at press time  
NA Not applicable



<b>Manufacturer Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Alps Electric</b> <b>DRA020</b> OEM  Fixed 20MB formatted 5.25 4  612 3,600 — 80 5M bits  — 1.64 x 8.54 x 8.13 ST506/412  — Vendor declined to provide NA	<b>Alps Electric</b> <b>DRB040</b> OEM  Fixed 40MB formatted 5.25 4  — 3,600 — 40 5M bits  — 1.64 x 8.54 x 8.13 ST506/412  — Vendor declined to provide NA	<b>Alps Electric</b> <b>DRL010</b> OEM  Fixed 10MB formatted 3.5 4  306 3,600 — 80 5M bits  — 1.64 x 8.54 x 8.13 ST506/412  — Vendor declined to provide NA
<b>Manufacturer Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Alps Electric</b> <b>DRM020</b> OEM  Fixed 20MB formatted 3.5 4  612 3,600 — 80 5M bits  — 1.64 x 8.54 x 8.13 ST506/412  — Vendor declined to provide NA	<b>Apple Computer</b> <b>Macintosh Hard Disk 20</b> End-user  Fixed 20.77MB formatted 5.25 4  305 2,744 — — 500K bits  — — — \$1,499  Supports Apple Macintosh 512K	<b>AST Research</b> <b>Colossus</b> End-users, VAD, VAR, OEM  Fixed 74MB formatted 5.25 11  754 3,600 — 30 5M bits  5 5.5 x 14.5 x 17 SCSI BUS  — \$7,499 (IBM), \$6,995 (Macintosh) Expandable to 370MB; supports IBM PC Series & Apple Macintosh 512K

**Notes:**

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 NA Not applicable



<p><b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b></p>	<p><b>AST Research</b> MicroStor-10D OEM, end-users — 10MB formatted 3.5 — — — — 85 5M bits — 9.5 x 3.75 x 13 — — \$1,295 3M DC-1000 tape cartridges included; supports Apple IIe</p>	<p><b>AST Research</b> MicroStor-20D OEM, end-users — 20MB formatted 3.5 — — — — 85 5M bits — 9.5 x 3.75 x 13 — — \$1,595 3M DC-1000 tape cartridges included; supports Apple IIe</p>	<p><b>Bull Peripherals</b> D530 OEM Fixed 25.8MB (formatted) 5.25 3 987 3,600 8.3 30 5M bits — 8 x 5.75 x 3.25 ST406/512 — \$1,825 (w/out controller) NA</p>
<p><b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b></p>	<p><b>Bull Peripherals</b> D550 OEM Fixed 43MB (formatted) 5.25 5 987 3,600 8.3 30 5M bits — 8 x 5.75 x 3.25 ST406/512 — \$2,050 (w/out controller) NA</p>	<p><b>Bull Peripherals</b> D570 OEM Fixed 60MB (formatted) 5.25 7 987 3,600 8.3 30 5M bits — 8 x 5.75 x 3.25 ST406/512 — \$2,375 (w/out controller) NA</p>	<p><b>Bull Peripherals</b> D585 OEM Fixed 74MB (formatted) 5.25 7 1,166 3,600 8.3 30 5M bits — 8 x 5.75 x 3.25 ST406/512 — \$2,450 (w/out controller) NA</p>

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<b>Manufacturer Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Comark</b> MW 26 OEM, end user Fixed 26MB unformatted 5.25 8 320 — 8.3 70 5MB 1-4 14.25 x 8.55 x 4.62 SASI-in, ST506-out (Xebec controller w/Rodime drive) — \$3,995 For use w/Multibus systems	<b>Comark</b> MW 52 OEM, end user Fixed 52MB unformatted 5.25 8 320 — 8.3 70 5MB 1-4 14.25 x 8.55 x 4.62 SASI-in, ST506-out (Xebec controller w/Rodime drive) — \$5,995 For use w/Multibus systems	<b>Computer Memories</b> CM3026 SCSI OEM Fixed 22.67MB formatted 5.25 4 615 — 8.3 65 5MB — 1.61 x 5.75 x 8 SCSI — \$450 (Q 1,000) Half-height drive
<b>Manufacturer Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Computer Memories</b> CM3426 OEM Fixed 20.2MB formatted 5.25 4 615 3,600 8.3 85 5M bits — 1.61 x 5.75 x 8 ST506/412 — \$905 Half-height drive	<b>Computer Memories</b> CM6426 OEM Fixed 21MB formatted 5.25 — 640 3,573 8.3 39 5M bits — 3.25 x 5.75 x 8 ST506/412 — \$1,120 NA	<b>Computer Memories</b> CM6640 OEM Fixed 31.5MB formatted 5.25 — 640 3,573 8.3 39 5M bits — 3.25 x 5.75 x 8 ST506/412 — \$1,185 NA

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 NA Not applicable



<p><b>Manufacturer Model</b>  <b>Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                    Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment</b>  <b>Purchase Price</b>  <b>Comments</b></p>	<p><b>Computer Memories</b>                  CM7053                  OEM                    Fixed                  42MB formatted                    5.25                  7                    733                  3,600                  8.3                  39                  5M bits                    —                  3.25 x 5.75 x 8                  ST506                  —                  \$1,355                  NA</p>	<p><b>Computer Memories</b>                  CM7085                  OEM                    Fixed                  67.1MB formatted                    5.25                  8                    1,024                  3,600                  8.3                  39                  5M bits                    —                  3.25 x 5.75 x 8                  ST506                  —                  \$1,845                  NA</p>	<p><b>Control Data</b>                  9415-21/-36 Wren I                  OEM                    Fixed                  21MB (-21), 35MB (-36) unformatted                  5.25                  3 (-21), 5 (-36)                    697                  3,600                  8.33                  40                  5M bits (ST506 interface), 4.84M bits (FDI interface)                    —                  3.25 x 5.75 x 8                  FDI, ST506                  —                  \$1,105 (-21), \$1,225 (136)                  NA</p>
<p><b>Manufacturer Model</b>  <b>Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                    Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment</b>  <b>Purchase Price</b>  <b>Comments</b></p>	<p><b>Control Data</b>                  9415-48/-67/-86 Wren II                  OEM                    Fixed                  48MB (-48), 67MB (-67), 87MB (-86) unformatted                  5.25                  5 (-48), 7 (-67), 9 (-86)                    925                  3,600                  8.33                  30                  4.84M bits (FDI interface), 5M bits (ESDI interface)                    —                  3.25 x 5.75 x 8                  ESDI, FDI                  —                  \$1,270 (-48), \$1,455 (-67), \$1,640 (-86)                  NA</p>	<p><b>Control Data</b>                  94166 Wren III                  OEM                    Fixed                  101, 141, 182MB unformatted                  5.25                  5, 7, 9                    969                  3,600                  8.33                  24.73                  10M bits                    —                  3.25 x 5.75 x 8                  ESDI, SCSI                  —                  \$1,500 (Q 2,500)                  NA</p>	<p><b>Control Data</b>                  94205-51 Wren II Half-Height                  OEM                    Fixed                  40MB formatted                  5.25                  5                    989                  3,600                  8.33                  36.33                  5M bits                    —                  1.6 x 5.75 x 8                  ST506 compat                  —                  \$820 (Q 2,500)                  NA</p>

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 NA Not applicable





<b>Manufacturer Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Control Data</b> 9720X EMD 8-inch Module Drive OEM Fixed 368MB unformatted 8 10 1,217 3,600 8.33 26.33 — — 4.75 x 8.5 x 14.7 SMD-O, SMD-O w/extended addressing, SMD-E; IPI-2 and SCSI (future) — \$5,135 (Q 50), \$4,305 (Q 500) NA	<b>Corvus Systems</b> OmniDrive Model 11 OEM, distributors — 12.75MB unformatted 5.25 4 306 — 8.33 55-68 625KB 1 14.25 x 10 x 5 — — \$2,995 For use w/Apple II, Ile, Corvus Concept, Digital Equipment Rainbow 100, IBM PC and PC XT, Texas Instruments Professional, Zenith Z-100, Omninet LAN	<b>Corvus Systems</b> OmniDrive Model 16 OEM, distributors — 19.13MB unformatted 5.25 6 306 — 8.33 55-68 625KB 1 14.25 x 10 x 5 — — \$3,695 For use w/Apple II, Ile, Corvus Concept, Digital Equipment Rainbow 100, IBM PC and PC XT, Texas Instruments Professional, Zenith Z-100, Omninet LAN
<b>Manufacturer Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Corvus Systems</b> OmniDrive Model 20 OEM, distributors — 21.0MB unformatted 5.25 6 306 — 8.33 55-68 687.5KB 1 15 x 12 x 6 — — \$3,995 For use w/Apple II, Ile, Corvus Concept, Digital Equipment Rainbow 100, IBM PC and PC XT, Texas Instruments Professional, Zenith Z-100, Omninet LAN	<b>Corvus Systems</b> OmniDrive Model 45 OEM, distributors — 53.3MB unformatted 5.25 8 640 — 8.33 55-68 625KB 1 13 x 9.5 x 6 — — \$5,495 For use w/Apple II, Ile, Corvus Concept, Digital Equipment Rainbow 100, IBM PC and PC XT, Texas Instruments Professional, Zenith Z-100, Omninet LAN	<b>Corvus Systems</b> OmniDrive Model 5 OEM, distributors — 6.38MB unformatted 5.25 2 306 — 8.33 55-68 625KB 1 14.25 x 10 x 5 — — \$2,095 For use w/Apple II, Ile, Corvus Concept, Digital Equipment Rainbow 100, IBM PC and PC XT, Texas Instruments Professional, Zenith Z-100, Omninet LAN

**Notes:**

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<p><b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b></p>	<p><b>Data Technology</b> TeamMate 1110 — — 10MB formatted — — 306 — 8.3 85 5M bits — — — — — — — \$995 For use w/IBM PC, PC XT</p>	<p><b>Data Technology</b> TeamMate 1120/1120AT — — 20MB formatted — — 612 — 8.3 85 5M bits — — — — — — — \$1,095 (1120); \$895 (1120AT) For use w/IBM PC, PC XT (Model 1120) and PC AT (Model 1120AT)</p>	<p><b>Data Technology</b> TeamMate 1123/1223 — — 20MB formatted — — 612 — 8.3 85 5M bits — — — — — — — \$2,295 (1223) Includes 2.78MB (formatted) Kodak diskette drive; 1123 is internally mounted subsystem; 1223 is externally mounted subsystem</p>
<p><b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b></p>	<p><b>Data Technology</b> TeamMate 1132/1132AT — — 32MB formatted — — 640 — 8.3 40 5M bits — — — — — — — \$1,595 For use w/IBM PC, PC XT (1132) and PC AT (1132 AT)</p>	<p><b>Data Technology</b> TeamMate 1160AT — — 60MB formatted — — 987 — 8.3 30 5M bits — — — — — — — \$2,495 For use w/IBM PC AT</p>	<p><b>Data Technology</b> TeamMate 1213 — — 10.65MB formatted — — 306 — 8.3 85 5M bits — — — — — — — \$2,095 Includes 2.78MB (formatted) Kodak diskette drive</p>

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NA Not applicable



<p><b>Manufacturer Model</b></p> <p><b>Availability</b></p> <p><b>Characteristics</b></p> <p>Style</p> <p>Max Capacity</p> <p>Platter Diameter (in.)</p> <p>Recording Surfaces per Drive</p> <p>No. of Cylinders</p> <p>Rotational Speed (rpm)</p> <p>Latency (msec)</p> <p>Avg Access Time (msec)</p> <p>Data Transfer Rate (per sec)</p> <p>Drives per Controller</p> <p>Size (H x W x D, in.)</p> <p><b>Interface</b></p> <p><b>Comparable Equipment</b></p> <p><b>Purchase Price</b></p> <p><b>Comments</b></p>	<p><b>Data Technology</b> TeamMate 1300/R10; 1400/R10</p> <p>—</p> <p>Removable cartridge</p> <p>10MB formatted</p> <p>—</p> <p>612</p> <p>—</p> <p>8.3</p> <p>135</p> <p>5M bits</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>\$1,695 (1300/R10); \$1,995 (1400/R10)</p> <p>For use w/IBM PC, PC XT; 1300/R10 is internally mounted; 1400/R10 is externally mounted</p>	<p><b>Data Technology</b> TeamMate 1320/R10; 1420/R10</p> <p>—</p> <p>Fixed/removable</p> <p>20MB/10MB formatted</p> <p>—</p> <p>612</p> <p>—</p> <p>8.3</p> <p>85/135</p> <p>5M bits</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>\$2,495 (1320/R10); \$2,795 (1420/R10)</p> <p>For use w/IBM PC, PC XT; 1320/R10 is internally mounted; 1420/R10 is externally mounted</p>	<p><b>Data Technology</b> TeamMate 1420/T20; 1420/T60</p> <p>—</p> <p>—</p> <p>20MB formatted</p> <p>—</p> <p>612</p> <p>—</p> <p>8.3</p> <p>85</p> <p>5M bits</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>\$2,195 (T20); \$2,695 (T60)</p> <p>For use w/IBM PC, PC XT; 1420/T20 incl. 20MB (formatted) tape drive; 1420/T60 incl. 60MB (formatted) tape drive</p>
<p><b>Manufacturer Model</b></p> <p><b>Availability</b></p> <p><b>Characteristics</b></p> <p>Style</p> <p>Max Capacity</p> <p>Platter Diameter (in.)</p> <p>Recording Surfaces per Drive</p> <p>No. of Cylinders</p> <p>Rotational Speed (rpm)</p> <p>Latency (msec)</p> <p>Avg Access Time (msec)</p> <p>Data Transfer Rate (per sec)</p> <p>Drives per Controller</p> <p>Size (H x W x D, in.)</p> <p><b>Interface</b></p> <p><b>Comparable Equipment</b></p> <p><b>Purchase Price</b></p> <p><b>Comments</b></p>	<p><b>Data Technology</b> TeamMate 1432/T60</p> <p>—</p> <p>—</p> <p>32MB formatted</p> <p>—</p> <p>640</p> <p>—</p> <p>8.3</p> <p>85</p> <p>5M bits</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>\$3,195</p> <p>For use w/IBM PC, PC XT; incl. 60MB (formatted) tape drive</p>	<p><b>Data Technology</b> TeamMate 1460/T60</p> <p>—</p> <p>—</p> <p>60MB formatted</p> <p>—</p> <p>987</p> <p>—</p> <p>8.3</p> <p>30</p> <p>5M bits</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>\$4,495</p> <p>For use w/IBM PC, PC XT; incl. 60MB (formatted) tape drive</p>	<p><b>Data Technology</b> TeamMate 2213</p> <p>—</p> <p>Removable</p> <p>10.65MB formatted</p> <p>—</p> <p>306</p> <p>—</p> <p>8.3</p> <p>85</p> <p>5M bits</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>\$1,495</p> <p>Incl. 2.78MB Kodak diskette drive; for use w/Apple microcomputers</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable





<p><b>Manufacturer Model</b>  <b>Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                  Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment</b>  <b>Purchase Price</b>  <b>Comments</b></p>	<p><b>Digital Equipment</b>                  RL02                  End-user                    Removable                  10.4MB formatted                  14                  2                  512                  2,400                  12.5                  67.5                  512K bits                  4                  10.5 x 19 x 25                  —                  \$3,600 (w/out controller)                  For use w/Q-bus systems, UNIBUS systems; \$72 monthly maintenance fee; cartridge disk drive</p>	<p><b>Emerald Systems</b>                  118/Maxtor                  OEM, end-users                    Removable                  118MB formatted                  5.25                  —                  918                  3,600                  8.33                  —                  5M bits                  —                  —                  ST506                  —                  Vendor declined to provide                  For use w/IBM PC Series and compat; 1 yr warranty</p>	<p><b>Emerald Systems</b>                  30/CDC                  OEM, end-users                    Removable                  30MB formatted                  5.25                  —                  697                  3,600                  8.33                  —                  5M bits                  —                  —                  ST506                  —                  Vendor declined to provide                  For use w/IBM PC Series and compat; 1 yr warranty</p>
<p><b>Manufacturer Model</b>  <b>Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                  Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment</b>  <b>Purchase Price</b>  <b>Comments</b></p>	<p><b>Emerald Systems</b>                  40/CDC                  OEM, end-users                    Removable                  40MB formatted                  5.25                  —                  925                  3,600                  8.33                  —                  5M bits                  —                  —                  ST506                  —                  Vendor declined to provide                  For use w/IBM PC Series and compat; 1 yr warranty</p>	<p><b>Emerald Systems</b>                  55/CDC                  OEM, end-users                    Removable                  55MB formatted                  5.25                  —                  925                  3,600                  8.33                  —                  5M bits                  —                  —                  ST506                  —                  Vendor declined to provide                  For use w/IBM PC Series and compat; 1 yr warranty</p>	<p><b>Emerald Systems</b>                  72/CDC                  OEM, end-users                    Removable                  72MB formatted                  5.25                  —                  925                  3,600                  8.33                  —                  5M bits                  —                  —                  ST506                  —                  Vendor declined to provide                  For use w/IBM PC Series and compat; 1 yr warranty</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer Model</b>  <b>Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                  Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment</b>  <b>Purchase Price</b>  <b>Comments</b></p>	<p><b>Epson</b>                  HD-830                  OEM                  Fixed                  10MB formatted                  5.25                  2                  612                  3,600                  8.33                  85                  5M bits                  4                  1.63 x 5.76 x 8.0                  ST412/506                  Seagate                  \$350                  Plated media, carbon sputtered overcoat</p>	<p><b>Epson</b>                  HD-860                  OEM                  Fixed                  20MB formatted                  5.25                  4                  612                  3,600                  8.33                  85                  5M bits                  4                  1.63 x 5.76 x 8.0                  ST412/506                  Seagate                  \$350                  Plated media, carbon sputtered overcoat</p>	<p><b>Fujitsu America</b>                  M222X Series                  OEM                  Fixed                  5MB, 10MB, 15MB formatted                  3.5                  2, 4, 6                  306                  3,600                  8.3                  88                  625KB                  4                  1.625 x 4 x 5.75                  ST506/412                  —                  Vendor declined to provide                  NA</p>
<p><b>Manufacturer Model</b>  <b>Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                  Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment</b>  <b>Purchase Price</b>  <b>Comments</b></p>	<p><b>Fujitsu America</b>                  M223X Series                  OEM                  Fixed                  5MB, 10MB, 15MB, 20MB formatted                  5.25                  2, 4, 6, 8                  320                  3,600                  8.3                  83                  625KB                  4                  8 x 5.7 x 3.3                  —                  —                  Vendor declined to provide                  Opt. 6.7MB, 13MB storage avail. in half height models</p>	<p><b>Fujitsu America</b>                  M2246E                  OEM                  Fixed                  135MB formatted                  5.25                  10                  823                  3,600                  8.3                  25                  1.25MB                  4                  3.3 x 5.7 x 8                  ESDI                  —                  Vendor declined to provide                  NA</p>	<p><b>Fujitsu America</b>                  M224X Series                  OEM                  Fixed                  27MB, 43MB, 68MB formatted                  5.25                  4, 7, 11                  754                  3,600                  8.3                  33                  625KB                  4                  8 x 5.7 x 3.3                  —                  —                  Vendor declined to provide                  NA</p>

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 NA Not applicable



<b>Manufacturer Model Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Hewlett-Packard</b> HP 7906M OEM, end-users Fixed/removable 9.8MB/9.8MB — — — — 8.3 33.3 940KB — 28.25 x 21.78 x 31.13 HP-IB — \$21,000 For use w/HP 1000, 9000; includes controller	<b>Hewlett-Packard</b> HP 7907A OEM, end-users Fixed/removable 20.5/20.5MB 8 — — — 8.5 38.5 555.6KB/sec — 7.1 x 12.8 x 18.4 CS/80/HP-IB — \$12,500 For use w/HP 1000, 9000	<b>Hewlett-Packard</b> HP 7911P/7912P/7914P OEM, end-user Fixed 28MB (HP 7911P); 65MB (HP 7912P); 132MB (HP 7914P) — — — — 8.3 35 (HP 7911P, HP 7912P); 36 (HP 7914P) 983KB — 28.3 x 14 x 28 (standalone model; rackmount also avail.) HP-IB — \$13,750 (HP 7911P); \$14,800 (HP 7912P); \$17,350 (HP 7914P) For use w/HP 1000, 3000, 9000; integral microprocessor controller; 1/4-in. cartridge tape drive avail.
<b>Manufacturer Model Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Hewlett-Packard</b> HP 7920M/7925M OEM, end-user Removable 50MB (HP 7920M); 120MB (HP 7925M) — — 823 — 8.3 (HP 7920M); 11.1 (HP 7925M) 33.3 (HP 7920M); 26.1 (HP 7925M) 940KB — 32.5 x 21.66 x 32 HP-IB — \$24,525 For use w/HP 1000, 3000, 9000	<b>Hewlett-Packard</b> HP 7933H OEM, end-users Fixed 404MB — 13 1,321 — 11.1 35.1 1MB — 32.5 x 21.7 x 32.8 HP-IB — \$25,700 For use w/HP 1000, 3000, 9000	<b>Hewlett-Packard</b> HP 7935H OEM, end-users Removable 404MB — 13 1,321 — 11.1 35.1 1MB — 32.5 x 21.7 x 32.8 HP-IB — \$28,300 For use w/HP 1000, 3000, 9000

**Notes:**

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 NA Not applicable



<p><b>Manufacturer Model Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                  Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment Purchase Price</b>  <b>Comments</b></p>	<p><b>Hewlett-Packard</b>                  HP 7941A/7945A                  OEM, end-users                  Fixed                  24MB (HP 7941A); 55MB (HP 7945A)                  5.25                  3                  987                  —                  8.3                  38.3                  625KB                  1                  5.1 x 12.8 x 11.2                  HP-IB                  —                  \$4,500 (HP 7941A); \$6,000 (HP 7945A)                  For use w/HP 250, 1000, 3000, 9000</p>	<p><b>Hewlett-Packard</b>                  HP 9134H/9133H                  OEM, end-user                  —                  20MB formatted                  3.5                  4                  612                  3,600                  —                  8.5                  145KB                  —                  5.2 x 12.8 x 11.2                  HP-IB; HP 88500A (for IBM PC and compat)                  —                  \$2,390 (HP 9134H); \$2,740 (HP 9133H)                  For use w/HP Touchscreen II, Touchscreen PC and Max; IBM PC, PC XT and PC AT; COMPAQ Portable; HP 9133H is HP 9134H plus a 3.5-in. diskette drive</p>	<p><b>Hewlett-Packard</b>                  HP 9134L/9133L                  OEM, end user                  —                  40MB formatted                  —                  5                  977                  3,700                  —                  40                  5M bits                  —                  —                  HP-IB; HP 88500A (for IBM PC and compat)                  —                  \$4,050 (HP 9134L), \$4,450 (9133L - incl. add'l 3.5-in. diskette drive)                  For use w/HP Touchscreen II, Touchscreen PC and Max; IBM PC, PC XT and AT; COMPAQ Portable</p>
<p><b>Manufacturer Model Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                  Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment Purchase Price</b>  <b>Comments</b></p>	<p><b>Hewlett-Packard</b>                  HP 9154A/9153A                  —                  —                  10MB formatted                  3.5                  2                  698 + 5 spares                  3,000                  —                  75                  145KB                  —                  4.2 x 12.8 x 11.2                  HP 88500A (for IBM PC and compat)                  —                  \$1,690 (9154A); \$1,940 (9153A)                  For use w/HP Touchscreen II, Touchscreen PC and Max; IBM PC, PC XT, and PC AT; COMPAQ Portable; HP 9153A is HP 9154A plus a 3.5-in. diskette drive</p>	<p><b>Hitachi</b>                  DK301-1/-2                  OEM                  —                  10MB (-1), 15MB (-2) unformatted                  3.5                  —                  306                  3,600                  8.3                  85                  625KB                  —                  1.625 x 4 x 5.75                  ST506/412                  —                  Vendor declined to provide                  NA</p>	<p><b>Hitachi</b>                  DK502-1/-2/-3                  OEM                  —                  10.4MB (-1), 15.6MB (-2), 20.8MB (-3) formatted                  5.25                  —                  320                  3,600                  8.3                  85                  625KB                  —                  3.25 x 5.75 x 8                  ST506/412                  —                  Vendor declined to provide                  Full-height drive</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable





<b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity  Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Hitachi</b> DK503-1/-2 OEM  — 5.2MB (-1), 10.4MB (-2) formatted 5.25 — 320 3,600 8.3 85 625KB — 3.25 x 5.75 x 8 ST506/412 — Vendor declined to provide Half-height drive	<b>Hitachi</b> DK511-3/-5/-8 OEM  — 28.6MB (-3), 40MB (-5), 67.4MB (-8) formatted 5.25 — 699 3,600 8.3 30 625KB — 3.25 x 5.75 x 8 ST506/412 — Vendor declined to provide Direct-drive DC spindle motor, microproc. controlled rotary voice-coil actuator, dedicated LSIs; SCSI controller (opt.)	<b>Hitachi</b> DK512-8/-12/-17 OEM  — 67.4MB (-8), 94.4MB (-12), 134.8MB (-17) formatted 5.25 — 823 3,482 8.6 23 1,215KB — 3.25 x 5.75 x 8 ESDI — Vendor declined to provide SCSI controller (opt.)
<b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity  Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Hitachi</b> DK812S-5/-8/-12/-17 OEM  — 40.5MB (-5), 67.4MB (-8), 94.4MB (-12), 134.8MB (-17) formatted 8 — 823 3,510 8.5 25 1,209KB — 4.61 x 8.55 x 14.96 SMD — Vendor declined to provide Winchester-type low-load head, direct-drive DC spindle, dedicated LSIs	<b>Hitachi</b> DK814S-17/-24/-34 OEM  — 134.8MB (-17), 188.7MB (-24), 269.6MB (-34) formatted 8 — 823 2,632 11.4 20 1,815KB — 5.12 x 8.55 x 14.96 High-performance SMD — Vendor declined to provide	<b>Hitachi</b> DK815-5 OEM  — 525MB unformatted 8.8 — 1,241 3,600 8.3 18 1.815MB — 10.2 x 8.5 x 20 Enhanced SMD — Vendor declined to provide Dual port, DC power supply (opt.)

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 NA Not applicable



<p><b>Manufacturer Model</b>  <b>Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                  Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment</b>  <b>Purchase Price</b>  <b>Comments</b></p>	<p><b>Lobo Systems</b>                  RAM 10A/-10-I                  OEM, VAR, end-user</p> <p>Fixed                  10MB formatted                  5.25                  —</p> <p>306                  3,600                  8.3                  92                  —</p> <p>—                  4.39 x 6.75 x 12.50                  SASI/SCSI</p> <p>—                  \$1,295 (10A); \$1,095 (-10-I)                  For use with Apple II, II+, IIe, IBM PC and compatibles; 1 yr limited warranty</p>	<p><b>Lobo Systems</b>                  RAM 5A                  OEM, VAR, end-user</p> <p>Fixed                  5MB formatted                  5.25                  —</p> <p>153                  3,600                  8.3                  99                  —</p> <p>—                  4.39 x 6.75 x 12.50                  SASI/SCSI</p> <p>—                  \$895                  For use with Apple II, II+, IIe, IBM PC and compatibles; 1 yr limited warranty</p>	<p><b>Lobo Systems</b>                  Winchester 10                  OEM, VAR, end-user</p> <p>Fixed                  10MB formatted                  5.25                  —</p> <p>306                  3,600                  8.3                  92                  —</p> <p>—                  4.5 x 6 x 16                  SASI/SCSI</p> <p>—                  \$1,395                  1 yr limited warranty</p>
<p><b>Manufacturer Model</b>  <b>Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                  Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment</b>  <b>Purchase Price</b>  <b>Comments</b></p>	<p><b>Lobo Systems</b>                  Winchester 5                  OEM, VAR, end-user</p> <p>Fixed                  5MB formatted                  5.25                  —</p> <p>153                  3,600                  8.3                  99                  —</p> <p>—                  4.5 x 6 x 16                  SASI/SCSI</p> <p>—                  \$995                  1 yr limited warranty</p>	<p><b>Maxtor</b>                  EXT-4175                  OEM</p> <p>Fixed                  149.2MB formatted                  5.25                  7</p> <p>1,224                  3,600                  8.33                  29                  10M bits</p> <p>NA                  3.25 x 5.75 x 8.20                  ESDI</p> <p>—                  Vendor declined to provide                  NA</p>	<p><b>Maxtor</b>                  EXT-4280                  OEM</p> <p>Fixed                  234.4MB formatted                  5.25                  11</p> <p>1,224                  3,600                  8.33                  29                  10M bits</p> <p>NA                  3.25 x 5.75 x 8.20                  ESDI</p> <p>—                  Vendor declined to provide                  NA</p>

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 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Maxtor</b> EXT-4380 OEM Fixed 319.6MB formatted 5.25 15 1,224 3,600 8.33 29 10M bits NA 3.25 x 5.75 x 8.20 ESDI — Vendor declined to provide NA	<b>Maxtor</b> XT-1085 OEM Fixed 69.2MB formatted 5.25 8 1,024 3,600 8.33 28 5M bits NA 3.25 x 5.75 x 8.20 ST506/412 — Vendor declined to provide Uses spindle motor, thin-film metallic media, voice coil actuator	<b>Maxtor</b> XT-1105 OEM Fixed 85.3MB formatted 5.25 11 918 3,600 8.33 27 5M bits NA 3.25 x 5.75 x 8.20 ST506/412 — Vendor declined to provide Uses spindle motor, thin-film metallic media, voice coil actuator
<b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Maxtor</b> XT-1140 OEM Fixed 116.3MB formatted 5.25 15 918 3,600 8.33 27 5M bits NA 3.25 x 5.75 x 8.20 ST506/412 — Vendor declined to provide Uses spindle motor, thin-film metallic media, voice coil actuator	<b>Maxtor</b> XT-2085 OEM Fixed 72.4MB formatted 5.25 7 1,224 3,600 8.33 30 5M bits NA 3.25 x 5.75 x 8.20 ST506/412 — Vendor declined to provide Uses spindle motor, thin-film metallic media, voice coil actuator	<b>Maxtor</b> XT-2140 OEM Fixed 113.7MB formatted 5.25 11 1,224 3,600 8.33 30 5M bits NA 3.25 x 5.75 x 8.20 ST506/412 — Vendor declined to provide Uses spindle motor, thin-film metallic media, voice coil actuator

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 NA Not applicable



<p><b>Manufacturer Model</b>  <b>Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                  Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment</b>  <b>Purchase Price</b>  <b>Comments</b></p>	<p><b>Maxtor</b>                  XT-2190                  OEM                  Fixed                  155.1MB formatted                  5.25                  15                  1,224                  3,600                  8.33                  30                  5M bits                  NA                  3.25 x 5.75 x 8.20                  ST506/412                  —                  Vendor declined to provide                  Uses spindle motor, thin-film metallic media, voice coil actuator</p>	<p><b>Maxtor</b>                  XT-3170                  OEM                  Fixed                  157MB formatted                  5.25                  9                  1,224                  3,600                  8.33                  30                  7.5MB                  NA                  3.25 x 5.75 x 8.20                  SCSI                  —                  Vendor declined to provide                  Uses spindle motor, thin-film metallic media, voice coil actuator, full SCSI support; for use with any SCSI system</p>	<p><b>Maxtor</b>                  XT-3280                  OEM                  Fixed                  256MB formatted                  5.25                  15                  1,224                  3,600                  8.33                  30                  7.5MB                  NA                  3.25 x 5.75 x 8.20                  SCSI                  —                  Vendor declined to provide                  Uses spindle motor, thin-film metallic media, voice coil actuator, full SCSI support; for use with any SCSI system</p>
<p><b>Manufacturer Model</b>  <b>Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                  Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment</b>  <b>Purchase Price</b>  <b>Comments</b></p>	<p><b>Micro Storage</b>                  MS212                  OEM                  Removable                  10.1MB formatted                  5.25                  2                  620                  3,520                  8.53                  95                  5M bits                  NA                  1.63 x 5.75 x 8.00                  ST506                  —                  \$1,075                  Cartridges \$100 ea; uses sputtered thin film</p>	<p><b>Micropolis</b>                  1302                  OEM                  Fixed                  20.4MB formatted                  5.25                  3                  830                  3,600                  8.33                  30                  5M bits                  4                  3.25 x 5.75 x 8                  ST506/412                  —                  \$1,030 (Q 1,000)                  NA</p>	<p><b>Micropolis</b>                  1303                  OEM                  Fixed                  34MB formatted                  5.25                  5                  830                  3,600                  8.33                  30                  5M bits                  4                  3.25 x 5.75 x 8                  ST506/412                  —                  \$1,160 (Q 1,000)                  NA</p>

Notes:  
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 NA Not applicable



<b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Micropolis</b> 1304 OEM Fixed 40.8MB formatted 5.25 6 830 3,600 8.33 30 5M bits 4 3.25 x 5.75 x 8 ST506/412 — \$1,260 (Q 1,000) NA	<b>Micropolis</b> 1323 OEM Fixed 33.6MB formatted 5.25 4 1,024 3,600 8.33 28 5M bits 4 3.25 x 5.75 x 8 ST506/412 — \$895 (Q 2,500) NA	<b>Micropolis</b> 1323A OEM Fixed 41.9MB formatted 5.25 5 1,024 3,600 8.33 28 5M bits 4 3.25 x 5.75 x 8 ST506/412 — \$925 (Q 2,500) NA
<b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Micropolis</b> 1324 OEM Fixed 50.3MB formatted 5.25 6 1,024 3,600 8.33 28 5M bits 4 3.25 x 5.75 x 8 ST506/412 — \$995 (Q 2,500) NA	<b>Micropolis</b> 1324A OEM Fixed 58.7MB formatted 5.25 7 1,024 3,600 8.33 28 5M bits 4 3.25 x 5.75 x 8 ST506/412 — \$1,025 (Q 2,500) NA	<b>Micropolis</b> 1325 OEM Fixed 67.1MB formatted 5.25 8 1,024 3,600 8.33 28 5M bits 4 3.25 x 5.75 x 8 ST506/412 — \$1,050 (Q 2,500) NA

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<b>Manufacturer Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Micropolis</b> 1353 OEM  Fixed 73.4MB formatted 5.25 4  1,024 3,600 8.33 28 10M bits  7 3.25 x 5.75 x 8 ESDI — \$1,095 (Q 2,500) NA	<b>Micropolis</b> 1353A OEM  Fixed 91.8MB formatted 5.25 5  1,024 3,600 8.33 28 10M bits  7 3.25 x 5.75 x 8 ESDI — \$1,275 (Q 2,500) NA	<b>Micropolis</b> 1354 OEM  Fixed 110.1MB formatted 5.25 6  1,024 3,600 8.33 28 10M bits  7 3.25 x 5.75 x 8 ESDI — \$1,340 (Q 2,500) NA
<b>Manufacturer Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Micropolis</b> 1354A OEM  Fixed 128.5MB formatted 5.25 7  1,024 3,600 8.33 28 10M bits  7 3.25 x 5.75 x 8 ESDI — \$1,365 (Q 2,500) NA	<b>Micropolis</b> 1355 OEM  Fixed 146.8MB formatted 5.25 8  1,024 3,600 8.33 28 10M bits  7 3.25 x 5.75 x 8 ESDI — \$1,395 (Q 2,500) NA	<b>Micropolis</b> 1373 OEM  Fixed 77MB formatted 5.25 4  1,016 3,600 8.33 28 1.5MB  7 3.25 x 5.75 x 8 SCSI — \$1,320 (Q 2,500) Balanced rotary voice coil positioner, supports common command set, full disconnect/arbitrate/reconnect, 16KB dual-ported FIFO buffer w/parity

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Micropolis</b> 1373A OEM Fixed 96.3MB formatted 5.25 5 1,016 3,600 8.33 28 1.5MB 7 3.25 x 5.75 x 8 SCSI — \$1,495 (Q 2,500) Balanced rotary voice coil positioner, supports common command set, full disconnect/arbitrate/reconnect, 16KB dual-ported FIFO buffer w/parity	<b>Micropolis</b> 1374 OEM Fixed 115.5MB formatted 5.25 6 1,016 3,600 8.33 28 1.5MB 7 3.25 x 5.75 x 8 SCSI — \$1,560 (Q 2,500) Balanced rotary voice coil positioner, supports common command set, full disconnect/arbitrate/reconnect, 16KB dual-ported FIFO buffer w/parity	<b>Micropolis</b> 1374A OEM Fixed 134.8MB formatted 5.25 7 1,016 3,600 8.33 28 1.5MB 7 3.25 x 5.75 x 8 SCSI — \$1,585 (Q 2,500) Balanced rotary voice coil positioner, supports common command set, full disconnect/arbitrate/reconnect, 16KB dual-ported FIFO buffer w/parity
<b>Manufacturer</b> <b>Model</b> <b>Availability</b> <b>Characteristics</b> Style Max Capacity Platter Diameter (in.) Recording Surfaces per Drive No. of Cylinders Rotational Speed (rpm) Latency (msec) Avg Access Time (msec) Data Transfer Rate (per sec) Drives per Controller Size (H x W x D, in.) <b>Interface</b> <b>Comparable Equipment</b> <b>Purchase Price</b> <b>Comments</b>	<b>Micropolis</b> 1375 OEM Fixed 154MB formatted 5.25 8 1,016 3,600 8.33 28 1.5MB 7 3.25 x 5.75 x 8 SCSI — \$1,625 (Q 2,500) Balanced rotary voice coil positioner, supports common command set, full disconnect/arbitrate/reconnect, 16KB dual-ported FIFO buffer w/parity	<b>Miltope Business Products</b> RD10 OEM Removable 18.50MB formatted 5.25 — 669 3,600 8.3 40 5M bits — 2.31 x 5.75 x 8 SCSI — \$22,000 Compliance to MIL-E-16400/MIL-E-5400/MIL-E-4158	<b>Miltope Business Products</b> RD160 OEM Removable 134.8MB formatted 8 10 823 3,600 8.3 26 1.2MB 4 12.19 x 6.69 x 21 SMD — \$50,000 Compliance to MIL-E-16400/MIL-E-5400/MIL-E-4158

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer Model</b>  <b>Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                  Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment</b>  <b>Purchase Price</b>  <b>Comments</b></p>	<p><b>Miltope Business Products</b>                  RD40                  OEM                    Removable                  33MB formatted                  3.5                  —                  829                  3,600                  8.3                  35                  5M bits                  —                  4 x 2 x 6                  ST506; SCSI opt.                  —                  \$24,000                  Compliance to MIL-E-16400/                  MIL-E-5400/MIL-E-4158</p>	<p><b>Miltope Business Products</b>                  RD45                  OEM                    Removable                  28.5MB formatted                  8                  5                  580                  3,600                  8.3                  42                  922KB                  4                  12 x 6.19 x 21                  8 bit bus + control and data                  —                  \$45,000                  Compliance to MIL-E-16400/                  MIL-E-5400/MIL-E-4158</p>	<p><b>Miltope Business Products</b>                  RDS86                  OEM                    Removable                  86MB unformatted                  —                  8                  1,031                  3,600                  —                  40                  5M bits                  —                  7.62 x 10.13 x 19.56                  SCSI                  —                  \$30,000                  Compliance to MIL-E-16400/                  MIL-E-5400/MIL-E-4158</p>
<p><b>Manufacturer Model</b>  <b>Availability</b>  <b>Characteristics</b>                  Style                  Max Capacity                  Platter Diameter (in.)                  Recording Surfaces per Drive                  No. of Cylinders                  Rotational Speed (rpm)                  Latency (msec)                  Avg Access Time (msec)                  Data Transfer Rate (per sec)                  Drives per Controller                  Size (H x W x D, in.)  <b>Interface</b>  <b>Comparable Equipment</b>  <b>Purchase Price</b>  <b>Comments</b></p>			

Notes:  
 — Information unavailable at press time  
 NA Not applicable







# DISKETTE DEVICES Company Directory

233.0032.001

Vendor	Address/Telephone	Model
Allied Storage Devices	2809 Boardwalk Ann Arbor MI 48104 (313) 996-1282	351M 516M 548D 596D
Analog & Digital Peripherals	815 Diana Dr Troy OH 45373 (513) 339-2241	Easi-Disk RS-232 (3.5 in.) Easi-Disk RS-232 (5.25 in.) IBM PC-Compatible RS-232 Easi-Disk
Anderson Jacobsen	521 Charcot Ave San Jose CA 95131 (408) 263-8520	AJ460
Apple Computer	20525 Mariani Ave Cupertino CA 95014 (408) 996-1010	Apple Disk III DuoDisk UniDisk
BGL Technology	438 Constitution Ave Camarillo CA 93010 (805) 987-7305	FSS-102A FSS-102B FSS-102D FSS-103A FSS-103A.5 FSS-103B
Canon USA	Disk Drive Div One Canon Plaza Lake Success NY 11042 (516) 488-6700	MD 350 MD 351 MD 352 MD 353
Chrislin Industries	Computer Products Div 31352 Via Colinas No. 101 Westlake Village CA 91362 (818) 991-2254	CI-1220-TF CI-550
Comark	PO Box 474 93 West St Medfield MA 02052 (617) 359-8161	MF85-DDS MF85-DSS
Data Technology	2775 Northwestern Pkwy Santa Clara CA 95051 (408) 496-0434	IBM Design Kit SSA003 SSM003 TM1103 TM1203 TM1206 TM2203 TM2206
Digital Equipment	146 Main St Maynard MA 01754-2571 (800) DIGITAL ext 990 (617) 897-5111	RX02 RX50
Dual Systems	2530 San Pablo Ave Berkeley CA 94702 (415) 549-3854	FD 1165
Epson America	OEM Products Div 23530 Hawthorne Blvd Torrance CA 90505 (213) 533-8277	SD-320 SD-321 SD-521 SD-540 SD-560 SD-580 SMD-110 SMD-120





Vendor	Address/Telephone	Model
Portable Computer Support Group (PCSG)	11035 Harry Hines Blvd No. 207 Dallas TX 75229 (214) 351-0564	Chipmunk
Shugart	475 Oakmead Pkwy Sunnyvale CA 94086 (408) 737-7900	SA801
Sony Corporation of America	15 Essex Rd Paramus NJ 07652 (201) 368-5000	OA-D32V OA-D32W OA-D33V
Tandon	20450 Plummer St Chatsworth CA 91311 (818) 933-6644	TM100-1 TM100-2 TM65-1L TM65-2L TM65-4 TM65-8 TM848E-1 TM848E-2
Teac	7733 Telegraph Rd Montebello CA 90640 (213) 726-0303	FD-35 Series FD-55 Series



# DISKETTE DEVICES

## Specifications Chart Guide

For the purposes of this guide, a diskette device is anything that magnetically records on flexible platter-style media. Diskette devices offer low-cost, low-performance online storage with greater reliability than low-cost cassette tape. Although originally intended for use as software distribution and program loading devices for mainframes and minicomputers, the primary use of diskettes at present is as primary storage for microcomputer systems.

### VENDOR/MODEL

This section identifies the diskette device vendor and the product model number or name.

### CHARACTERISTICS

This section provides the following details:

- **Maximum Capacity**—The maximum total storage, in bytes, available on the diskette device is listed. This capacity is sometimes designated as unformatted or formatted. The unformatted capacity is the gross capacity of the diskette device, whereas the formatted capacity indicates the subset of the gross capacity that is available for storage of user data. The mathematical difference between formatted and unformatted capacity represents the bytes of storage remaining for disk management and includes track and sector addresses and interrecord gaps.
- **Platter Diameter**—The diameter of the diskette is given in inches. Popular sizes are 8, 5.25, and 3.5 inches.
- **Density**—Devices are described as having one of three recording densities: single, dual, or quad. Dual density is achieved by recording twice as much data on each track. Quad density is achieved by recording twice as many tracks (at double density) on each side of the diskette.
- **Number of Recording Surfaces**—The number of recording surfaces (i.e., disk sides) available for data storage and retrieval is listed.
- **Tracks per Surface**—This entry lists the number of tracks recorded on each surface of the diskette device.
- **Average Rotational Delay**—Average rotational delay times are given in milliseconds. The rotational delay time equals the time required to read one-half of the records stored on one track. (Based on probability theory, once the heads are positioned to the right track, half the records on the track will be read before the desired record is encountered.)
- **Average Access Time**—The sum of a seek spanning one-

third of the track plus the rotational delay time. Seek time defines the time it takes to move the read/write head one track. With diskette drives, seek time is linear (that is, it takes 10 times as long to seek across 10 tracks as it does to seek across one track).

- **Rotational Speed**—This entry lists the rotational speed of the diskette in revolutions per minute.
- **Data Transfer Rate**—The number of bytes or bits per second that can be transferred to or from the diskette is listed. This value is a function of rotational speed.
- **Drives per Controller**—This entry gives the maximum number of disk drives each controller will support.

### POWER SOURCE

Indicates whether the power to operate the disk device is internal (supplied by the computer) or requires a separate, external power source.

### AVAILABILITY

This section indicates the time span between the receipt of the order and the delivery of the diskette subsystem.

### PRICE

This section provides the quantity-one list price of the diskette subsystem.

### COMPARABLE EQUIPMENT

This section indicates any equipment that is functionally similar to the listed device.

### COMPATIBLE COMPUTER SYSTEMS

This category lists computer systems or industry-standard interfaces with which the diskette device is designed to operate.

### COMMENTS

This entry lists any special features provided by the vendor concerning the diskette device.



# SPECIFICATIONS CHART

## Diskette Devices

233.0045.001

<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Allied Storage Devices</b> 351M 1M 3.5 — 2 80 500 94 300 250KB/sec 4 Separate 90 days Contact vendor — — NA	<b>Allied Storage Devices</b> 516M 1.2M 5.25 — 2 80 400 91 360 500KB/sec 4 Separate Immediate Contact vendor — Uses Shugart interface NA	<b>Allied Storage Devices</b> 548D 360K 5.25 — 2 40 400 93 300 250KB/sec 4 Separate Immediate Contact vendor — IBM PC, PC XT, and PC AT; ITT, Zenith, AT&T; uses Shugart interface NA
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Allied Storage Devices</b> 596D 800K 5.25 — 2 80 400 94 300 250KB/sec 4 Separate Immediate Contact vendor Uses Shugart interface — NA	<b>Analog &amp; Digital Peripherals</b> Easi-Disk RS-232 3.5 in. 1M 3.5 Single/dual 1, 2 40, 80 15 158 300 110 to 19.2K bits/sec 1, 2 Internal, separate 1 month \$995 — Systems w/RS-232C port Available with/without case and power supply, and w/parallel interface	<b>Analog &amp; Digital Peripherals</b> Easi-Disk RS-232 5.25 in. 1M 5.25 Single/dual 1, 2 40, 80 15 158 300 110 to 19.2K bits/sec 1, 2 Internal, separate 1 month \$995 — Systems w/RS-232C port Available with/without case and power supply, and w/parallel interface
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Analog &amp; Digital Peripherals</b> IBM PC-Compatible RS-232 Easi-Disk 360K 5.25 Single/dual 2 80 15 158 300 110 to 19.2K bits/sec 1, 2 Internal, separate 1 month \$995 — IBM microcomputers and compatibles, any device w/RS-232C port Formats RS-232C input into PC DOS. Ideal for data transfer between dissimilar systems.	<b>Anderson Jacobson</b> AJ460 200K 5.25 Dual 1 40 100 200 300 110-9600 bits/sec 1 Internal 2 weeks \$1,595 — Any RS-232C device Includes 2 RS-232C ports (term. FDX modem)	<b>Apple Computer</b> Apple Disk III 140K/drive 5.25 Single 1 35 100 463 — 125K bits/sec 3 — Immediate \$435 — Apple II, II + , and IIe NA

**Notes:**

NA Not applicable  
 — Information unavailable at press time





<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Apple Computer</b> DuoDisk 140K/drive 5.25 Single 1 35 200 — 299 250K bits/sec 1 — Immediate \$729 — Apple II NA	<b>Apple Computer</b> UniDisk 143K 5.25 Single 1 35 200 — 299 250K bits/sec 2 — Immediate \$429 (w/controller card); \$329 (w/out controller card) — Apple II, II + , or IIe Functionally identical to Apple's Disk II drive. 90 day warranty included.	<b>BGL Technology</b> FSS-102A 505K/drive 8 Single/dual 1 76 83 265 360 62.5KB/sec 2 Computer (controller); separate (drives) 4 weeks \$3,100 — Interdata, Perkin-Elmer Includes 1-yr. warranty; factory serviced
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>BGL Technology</b> FSS-102B 1M/drive 8 Single/dual 2 76 83 91 360 62.5KB/sec 2 Computer (controller); separate (drives) 4 weeks \$3,900 — Interdata, Perkin-Elmer Includes 1-yr warranty; factory serviced	<b>BGL Technology</b> FSS-102D 1M/drive 8 Single/dual 2 76 83 91 360 62.5KB/sec 2 Computer (controller); separate (drives) 8 weeks \$5,130 — Interdata, Perkin-Elmer NA	<b>BGL Technology</b> FSS-103A 149K/drive 5.25 Single/dual 1 39 100 335 300 31.25KB/sec 2 Computer (controller); separate (drives) 4 weeks \$1,800 — Interdata, Perkin-Elmer Includes 1-yr warranty; factory serviced
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>BGL Technology</b> FSS-103A.5 149K/drive 5.25 Single/dual 1 39 100 335 300 31.25KB/sec 1 Computer (controller); separate (drives) 4 weeks \$1,300 — Interdata, Perkin-Elmer Includes 1-yr warranty; factory serviced	<b>BGL Technology</b> FSS-103B 250K/drive 5.25 Single/dual 2 39 100 335 300 31.25KB/sec 2 Computer (controller); separate (drives) 4 weeks \$2,100 — Interdata, Perkin-Elmer Includes 1-yr warranty; factory serviced	<b>Canon USA</b> MD 350 1M 3.5 Quad 2 80 100 3 300 250KB/sec 4 Internal (from computer) 30-60 days — — Any system using a standard 5.25-in. controller 32 or 42 mm available

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Canon USA</b> MD 351 500K 3.5 Quad 1 80 100 3 300 250KB/sec 4 Internal (from computer) 30-60 days — — Any system using a standard 5.25-in. controller 32 or 42 mm available	<b>Canon USA</b> MD 352 500K 3.5 — 2 40 100 6 300 250KB/sec 4 Internal (from computer) 30-60 days — — Any system using a standard 5.25-in. controller 32 or 42 mm available	<b>Canon USA</b> MD 353 250K 3.5 — 1 40 100 6 300 250KB/sec 4 Internal (from computer) 30-60 days — — Any system using a standard 5.25-in. controller 32 or 42 mm available
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Chrislin Industries</b> CI-1220-TF 2M 8 Dual 2 77 83 91 360 18KB/sec 2 Internal 14 days \$2,445 Digital Equipment RX01, RX02, RX03 Digital Q-bus Dual diskette thin-line sys w/DMA Q-bus	<b>Chrislin Industries</b> CI-550 2M 5.25 Dual 2 77 83 91 360 18KB/sec 2 Internal 14 days Contact vendor Digital RX50 Digital Q-bus Dual minidiskette sys w/DMA Q-bus	<b>Comark</b> MF85-DDS 2M 8 Single/dual 4 77 — — 360 62.5KB/sec 3 (5.25-in.), 4 (8-in.) Internal 30 days \$3,495 — IEEE 796 (multibus); IBM 3740/3741 NA
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Comark</b> MF85-DSS 1M 8 Single/dual 2 77 — — 360 62.5KB/sec 3 (5.25-in.), 4 (8-in.) Internal 30 days \$2,995 — IEEE 796 (multibus); IBM 3740/3741 NA	<b>Data Technology</b> IBM Design Kit 2.78M 5.25 Quad 2 160 83 225 360, 600 62.5KB/sec 2 Internal 30 days Contact vendor — IBM PC NA	<b>Data Technology</b> SSA003 2.78M 5.25 Quad 2 160 83 225 360, 600 62.5KB/sec 2 Separate 30 days Contact vendor — Apple II, II +, IIe, III NA

**Notes:**

NA Not applicable

— Information unavailable at press time

<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Data Technology</b> SSM003 2.78M 5.25 Quad 2 160 83 225 360, 600 62.5KB/sec 2 Separate 30 days Contact vendor — IBM PC NA	<b>Data Technology</b> TM1103 2.78M 5.25 Quad 2 160 83 225 360, 600 62.5KB/sec 2 Internal 30 days Contact vendor — IBM PC Includes backup utility	<b>Data Technology</b> TM1203 2.78M 5.25 Quad 2 160 83 225 360, 600 62.5KB/sec 2 Separate 30 days Contact vendor — IBM PC Includes backup utility
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Data Technology</b> TM1206 5.56M 5.25 Quad 4 160 83 225 360, 600 62.5KB/sec 2 Separate 30 days Contact vendor — IBM PC Includes backup utility	<b>Data Technology</b> TM2203 2.78M 5.25 Quad 2 160 83 225 360, 600 62.5KB/sec 2 Separate 30 days Contact vendor — Apple II, II + , IIe, III NA	<b>Data Technology</b> TM2206 5.56M 5.25 Quad 4 160 83 225 360, 600 62.5KB/sec 2 Separate 30 days Contact vendor — Apple II, II + , IIe, III NA
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Digital Equipment</b> RX02 1M 8 Dual — 77 83 262 360 61KB/sec 2 — — \$3,000 (for DECmate), \$4,430 (for Q-bus), \$4,150 (for Unibus) — VAX, PDP-11, or LSI-11-based systems NA	<b>Digital Equipment</b> RX50 409KB/diskette (818KB/drive) 5.25 — 2 80 100 290 — 250KB/sec — — \$995 (for Rainbow and DECmate), \$1,300 (Q-bus) — Digital personal computers or Q-bus systems NA	<b>Dual Systems</b> FD 1165 1.6M 8 Dual 2 77 83.3 — 360 500KB/sec 4 Separate 30-60 days \$600 — Shugart-type interface Slim-line and half-height available; drive manufactured by NEC Information Systems

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Epson SD-320</b> 164K, 328K (formatted) 5.25 — 2 40 100 220 300 125Kbits/sec, 250Kbits/sec — — — — — NA	<b>Epson SD-321</b> 164K, 328K 5.25 — 2 40 100 220 300 125Kbits/sec, 250Kbits/sec — — — — — NA	<b>Epson SD-521</b> 250K, 500K (unformatted) 5.25 — 2 40 100 97 300 125Kbits/sec, 250Kbits/sec — — — — — NA
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Epson SD-540</b> 500K, 1M (unformatted) 5.25 — 2 80 100 96 300 125Kbits/sec, 250Kbits/sec — — — — — NA	<b>Epson SD-560</b> 800K, 1.6M (unformatted) 5.25 — 2 77 100 93 360 250Kbits/sec, 500Kbits/sec — — — — — NA	<b>Epson SD-580</b> 1025K, 656K (formatted) — — — — — 93 300, 360 — — — — PC AT NA
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Epson SMD-110</b> 82K, 164K (formatted) 3.5 — 1 40 100 97 300 125Kbits/sec, 250Kbits/sec — — — — — For AC operation	<b>Epson SMD-120</b> 164K, 328K (formatted) 3.5 — 2 40 100 97 300 125Kbits/sec, 250Kbits/sec — — — — — For AC operation	<b>Epson SMD-130</b> 164K, 328K (formatted) 3.5 — 1 80 100 96 300 125Kbits/sec, 250Kbits/sec — — — — — For AC operation

**Notes:**

NA Not applicable  
 — Information unavailable at press time

<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Epson</b> SMD-140 328K, 656K (formatted) 3.5 — 2 80 100 96 300 125Kbits/sec, 250Kbits/sec — — — — — For AC operation	<b>Epson</b> SMD-150 82K, 164K (formatted) 3.5 — 1 40 100 97 300 128Kbits/sec, 250Kbits/sec — — — — — For AC and battery operation	<b>Epson</b> SMD-160 164K, 328K 3.5 — 2 40 100 97 300 125Kbits/sec, 250Kbits/sec — — — — — For AC and battery operation
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Epson</b> SMD-170 164K, 328K 3.5 — 1 80 100 96 300 125Kbits/sec, 250Kbits/sec — — — — — For AC and battery operation	<b>Epson</b> SMD-180 328K, 656K (formatted) 3.5 — 2 80 100 96 300 125Kbits/sec, 250Kbits/sec — — — — — For AC and battery operation	<b>Epson</b> SMD-200 Series Up to 1M (unformatted) 3.5 — 2 80 100 — 300, 600 250Kbits/sec — — — — — NA
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Greco Systems</b> DU-58/8 800K (formatted) 5.25 Dual 4 40 100 93 300 250KB/sec 2 Separate 30 days \$1,995 — DEC PDP and VAX systems Microprocessor-based controller, power supply and RSP/MRSP serial protocol and formatting software included	<b>Greco Systems</b> DU-58/16 1600K (formatted) 5.25 Quad 4 80 100 94 300 250KB/sec 2 Separate (included) 30 days \$2,395 — DEC PDP and VAX computer systems Microprocessor-based controller, power supply and RSP/MRSP serial protocol and formatting software included	<b>Greco Systems</b> DU-58/55 5.56M (formatted) 5.25 — 4 160 83 160 360 500KB/sec 2 Separate (included) 30 days \$3,895 — DEC PDP and VAX computer systems Microprocessor-based controller, power supply and RSP/MRSP serial protocol and formatting software included

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Greco Systems</b> PS2/400 400K 5.25 Dual 2 40 100 93 300 250KB/sec 1-2 Separate (included) 30 days \$1,690 — All systems supporting serial RS-232C and parallel RS-408 interfaces Portable or rack mount. Microprocessor-based controller, power supply, all file management, serial and parallel communications protocols included.	<b>Greco Systems</b> PS2/800 800K (formatted) 5.25 Quad 2 80 100 94 300 250KB/sec 1-2 Separate (included) 30 days \$2,090 — All systems supporting serial RS-232C and parallel RS-408 interfaces Portable or rack mount. Microprocessor-based controller, power supply, all file management, serial and parallel communications protocols included.	<b>Greco Systems</b> PS2/2700 2.78M (formatted) 5.25 — 2 160 38 160 360 500KB/sec 1-2 Separate (included) 30 days \$3,190 — All systems supporting serial RS-232C and parallel RS-408 interfaces Portable or rack mount. Microprocessor-based controller, power supply, all file management, serial and parallel communications protocols included.
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Honeywell</b> DIU 9607 650K 5.25 — 2 80 100 160 300 20.48KB/sec 2 Internal — \$1,400 — Honeywell DPS 6, Level 6 NA	<b>IBM</b> 4964 Diskette Unit 303K (w/diskette 1); 606K (w/diskette 2) 8 Single 1-2 74 83.3 — 360 31KB/sec 1 Separate 2-6 months \$3,005 — Series/1 Uses IBM diskette 1 or 2	<b>IBM</b> 4965 Storage and I/O Expansion Unit, Models 001 & 30D 1.2M 8 Single/Dual 1-2 74 83.3 — 360 62.5KB/sec Model 001: 2; Model 30D: 1 External 2-6 months \$6,635-\$13,500 — IBM Series/1 Uses IBM 1, 2, or 2D diskettes. Drives are part of larger storage and I/O expansion system.

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Instor</b> Instor/85-2D 2,500K 8 Single/dual 2 — — 91 360 75–19.2KB/sec (selectable) — 3 weeks \$4,500 — RS-232C interface Uses IBM Basic or Type H Data Exchange	<b>Legacy Technologies</b> Legacy II-Panasonic 360K 5.25 — — — — — Immediate \$595 in expansion chassis NA IBM PCjr Includes 4-slot Legacy expansion chassis	<b>Micro Technology</b> MD3100 512K 8 Single/dual 1 77 83 260 360 64KB/sec — Internal 2–4 weeks \$1,995 Digital RX02 — NA
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Micro Technology</b> MD3200 1M 8 Single/dual 2 77 83 91 360 64KB/sec — Internal 2–4 weeks \$3,995 Digital RX03 — NA	<b>Miltope</b> Alpha 10 10M 8 — 1 306 20 35 1,500 1,130KB/sec 4 Internal 6 months \$12,000 Iomega Alpha 10 All small computer systems using SCSI interface Designed for compliance to MIL-E-16400/MIL-E-4158/MIL-E-5400	<b>Miltope</b> DD 400 Master 1M 8 Dual 2 77 83 6 360 500KB/sec 4 Internal 6 months \$8,950 — Rolm, Norden, Honeywell Complies w/all military-std interfaces req
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Miltope</b> DD 400 Slave 1M 8 Dual 2 77 83 6 360 500KB/sec 4 Internal 6 months \$4,900 — Rolm, Norden, Honeywell Complies w/all military-std interface req	<b>Miltope</b> DD 400 W 1M 8 Dual 2 77 83 6 360 500KB/sec 4 Internal 6 months \$15,000 — Rolm, Norden, Honeywell Complies w/all military-std interface req	<b>Mitsubishi Electronics America</b> M2894-63 1.6M 8 — 2 77 83.5 91 360 62.5KB/sec — — Immediate — — 4.63-in. high

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Vendor</b> <b>Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Mitsubishi Electronics America</b> M2896-63 1.6M 8 — 2 77 83.5 91 360 62.5KB/sec — Immediate — — — 2.25-in. high	<b>Mitsubishi Electronics America</b> M4851 .5M 5.25 — 2 40 100 103 300 31.25KB/sec — Immediate — — IBM PC 1.61-in. high	<b>Mitsubishi Electronics America</b> M4852/3 1M 5.25 — 2 80 100 94 300 31.25KB/sec — Immediate — — — M4852: 3.25-in. high, M4853: 1.61-in. high
<b>Vendor</b> <b>Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Mitsubishi Electronics America</b> M4854 1.6M, 1M 5.25 — 2 80 83.5, 100 91 360, 300 62.5, 37.5, or 31.5KB/sec — Immediate — — IBM PC AT 96 tpi, 1.61-in. high, user selectable and switchable configurations	<b>Mitsubishi Electronics America</b> M4855 2M 5.25 — 2 80 100 94 300 62.5KB/sec — Immediate — — — 96 tpi, 1.61-in. high	<b>Mitsubishi Electronics America</b> MF 351 .5M 3.5 — 1 80 100 94 300 31.25KB/sec — Immediate — — — 135 tpi, 1.63-in. high
<b>Vendor</b> <b>Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Mitsubishi Electronics America</b> MF 353 1M 3.5 — 2 80 100 94 300 31.25KB/sec — Immediate — — — 135 tpi, 1.63-in. high, stand-by power .05 watts	<b>Mitsubishi Electronics America</b> MF 353A 1M 3.5 — 2 80 100 173 300 31.25KB/sec — Immediate — — — 135 tpi, 1.63-in. high	<b>Okidata</b> GM 3305H 500K 5.25 — 2 40 100 95 including settling 300 31.25KB/sec 4 — Immediate Contact vendor — Uses Shugart-type interface Half height drive

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Okidata</b> GM 3315B 500K 5.25 — 2 40 100 95 including settling 300 31.25KB/sec 4 — Immediate Contact vendor — Uses Shugart-type interface 1/3 height drive	<b>Panasonic Industrial</b> JU-313 250K (unformatted) 3.5 Single 1 40 — 165 300 250Kbits/sec 4 — 30 days \$138 — — NA	<b>Panasonic Industrial</b> JU-323 500K (unformatted) 3.5 Dual 1 80 — 323 300 250Kbits/sec 4 — 30 days \$144 — — NA
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Panasonic Industrial</b> JU-363 1M (unformatted) 3.5 Dual 2 80 — 94 300 250Kbits/sec 4 — 30 days \$154 — — NA	<b>Panasonic Industrial</b> JU-455 250K, 500K (unformatted) 5.25 Single/dual 2 40 100 93 300 125Kbits/sec, 250Kbits/sec 4 — 30 days (from distributors) \$150 — — Half-height drive	<b>Panasonic Industrial</b> JU-475 .8/1.6M (unformatted) 5.25 Single/dual 2 80 83 91 (including settling) 360 250Kbits/sec, 500Kbits/sec 4 — 30 days (from distributors) \$187 — — Half-height drive. Reads 48 or 96 tpi.
<b>Vendor Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Personal Micro Computers</b> FDD-420 500K 5.25 Single/dual 2 40 93 6 300 250KB/sec 4 Internal 30 days Contact vendor — Most microcomputers Half-height drive	<b>Personal Micro Computers</b> FDD-421 500K 5.25 Single/dual 2 40 93 6 300 250KB/sec 4 Separate 30 days Contact vendor — Most microcomputers Includes case and power supply	<b>Personal Micro Computers</b> FDD-422 1M 5.25 Single/dual 4 40 93 6 300 250KB/sec 4 Separate 30 days Contact vendor — Most microcomputers 2 drives in one case w/power supply

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<b>Vendor</b> <b>Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Personal Micro Computers</b> SFD-51A 250K 5.25 — 1 40 100 5 300 250KB/sec 4 Internal — \$355 — Tandy TRS-80 I, III; IBM PC Includes case	<b>Portable Computer Support Group</b> Chipmunk 360K/diskette 3.5 Dual 1 80 100 96 300 10KB/sec 1 — 1 day \$599 — Radio Shack TRS 80 Model 100 or Tandy 200 NA	<b>Shugart Group</b> SA801 800K 8 Single/dual 1 77 83 210 360 250Kbits/sec (single), 500Kbits/sec (dual) — Separate Contact vendor — NA
<b>Vendor</b> <b>Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Sony</b> OA-D32V 184.3K, 368.6K 3.5 Single/dual 1 80 50 350 600 250Kbits/sec, 500Kbits/sec — 30 days \$250 — — NA	<b>Sony</b> OA-D32W 368.6K, 737.2K 3.5 Single/dual 2 80 50 350 600 250Kbits/sec, 500Kbits/sec — 30 days \$300 — — NA	<b>Sony</b> OA-D33V 184.3K, 368.6K 3.5 Single/dual 1 80 100 350 300 125Kbits/sec — 30 days \$250 — — Plug-compatibility with 5.25-in. drives
<b>Vendor</b> <b>Model</b> <b>Characteristics</b> Max Capacity (bytes) Platter Diameter (in.) Density No. of Recording Surfaces Tracks per Surface Avg Rotational Delay (msec) Avg Access Time (msec) Rotational Speed (rpm) Data Transfer Rate Drives per Controller <b>Power Source</b> <b>Availability</b> <b>Price</b> <b>Comparable Equipment</b> <b>Compatible Computer Systems</b> <b>Comments</b>	<b>Tandon</b> TM100-1 250K 5.25 Dual 1 40 100 75 300 250Kbits/sec 4 Internal Immediate \$230 — — Full height drive, industry standard interface	<b>Tandon</b> TM100-2 500K 5.25 Dual 2 40 100 75 300 250Kbits/sec 4 Internal Immediate \$290 — — Full height drive, industry standard interface	<b>Tandon</b> TM65-1L 250K 5.25 Dual 1 40 100 90 300 250Kbits/sec 4 Internal Immediate \$160 — — LSI circuitry, half height drive

**Notes:**

- NA Not applicable  
— Information unavailable at press time



<p><b>Vendor Model</b>  <b>Characteristics</b>                  Max Capacity (bytes)                  Platter Diameter (in.)                  Density                  No. of Recording Surfaces                  Tracks per Surface                  Avg Rotational Delay (msec)                  Avg Access Time (msec)                  Rotational Speed (rpm)                  Data Transfer Rate                  Drives per Controller  <b>Power Source</b>  <b>Availability</b>  <b>Price</b>  <b>Comparable Equipment</b>  <b>Compatible Computer Systems</b>  <b>Comments</b></p>	<p><b>Tandon</b>                  TM65-2L                  500K                  5.25                  Dual                  2                  40                  100                  90                  300                  250Kbits/sec                  4                  Internal                  Immediate                  \$180                  —                  —                  LSI circuitry, half height drive</p>	<p><b>Tandon</b>                  TM65-4                  1M                  5.25                  Dual                  2                  80                  100                  90                  300                  250Kbits/sec                  4                  Internal                  Immediate                  \$220                  —                  —                  Half height drive, microprocessor controlled, brushless, direct drive motor operation</p>	<p><b>Tandon</b>                  TM65-8                  1.6M                  5.25                  Dual                  2                  80                  100                  90                  360                  500Kbits/sec                  4                  Internal                  Immediate                  \$260                  —                  —                  Half height drive, microprocessor controlled, brushless, direct drive motor operation</p>
<p><b>Vendor Model</b>  <b>Characteristics</b>                  Max Capacity (bytes)                  Platter Diameter (in.)                  Density                  No. of Recording Surfaces                  Tracks per Surface                  Avg Rotational Delay (msec)                  Avg Access Time (msec)                  Rotational Speed (rpm)                  Data Transfer Rate                  Drives per Controller  <b>Power Source</b>  <b>Availability</b>  <b>Price</b>  <b>Comparable Equipment</b>  <b>Compatible Computer Systems</b>  <b>Comments</b></p>	<p><b>Tandon</b>                  TM848E-1                  800K                  8                  Dual                  1                  77                  83                  91                  360                  500Kbits/sec                  4                  Internal                  Immediate                  \$460                  —                  —                  Half height drive, microprocessor controlled, LSI circuitry, buffered seek</p>	<p><b>Tandon</b>                  TM848E-2                  1.6M                  8                  Dual                  2                  77                  83                  91                  360                  500Kbits/sec                  4                  Internal                  Immediate                  \$560                  —                  —                  Half height drive, microprocessor controlled, LSI circuitry, buffered seek</p>	<p><b>Teac</b>                  FD-35 Series                  125K, 250K, 500K, 1M (unformatted)                  3.5                  —                  1-2                  40, 80                  100                  93, 94                  300                  128Kbits/sec, 250Kbits/sec                  —                  —                  Contact vendor (Quantity 1000) A-\$86, B-\$96, E-\$82, F-\$100                  —                  —                  Models A, B, E and F available</p>

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 NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor Model</b>  <b>Characteristics</b>                  Max Capacity (bytes)                  Platter Diameter (in.)                  Density                  No. of Recording Surfaces                  Tracks per Surface                  Avg Rotational Delay (msec)                  Avg Access Time (msec)                  Rotational Speed (rpm)                  Data Transfer Rate                  Drives per Controller  <b>Power Source</b>  <b>Availability</b>  <b>Price</b>    <b>Comparable Equipment</b>  <b>Compatible Computer Systems</b>  <b>Comments</b></p>	<p><b>Teac</b>                  FD-55 Series                    250K, 500K, 1M, 1.6M (unformatted)                  5.25                  Dual                  1-2                  40, 80                  —                  93, 94, 91                  300, 360                  125, 250, or 500Kbits/sec                  —                  Contact vendor                  (Quantity 1000) A-\$74, B-\$84, E-\$85, F-\$93, G-\$101, GF-\$103                  —                  —                  Half-height drive</p>		
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**Notes:**

- NA Not applicable
- Information unavailable at press time



# ADD-ON MEMORIES

## Company Directory

234.0032.001

Vendor	Address/Telephone	Model
Alpha Micro Systems	3501 Sunflower Ave Santa Ana CA 92704 (714) 957-8500	AM-170 AM-171
Amdek	2201 Lively Blvd Elk Grove Village IL 60007 (312) 595-6890	Amdek DVM-III
Apricorn	10670 Treena St Suite 10 San Diego CA 92131 (619) 569-9483	1300-10 16K RAM Expansion 1300-35 Graphics Printer Interface 1300-45 Super Serial Imager 1300-70 UPPER/lower Case Adapter 1400-10 80 Column Card 1400-15 Extend-It
AST Research	2121 Alton Ave Irvine CA 92714 (714) 863-1333	Advantage! AST-3270/Coax AST-3770 AST-3780 AST-5250 Display AST-5251-11 AST-5251/12 AST-BSC AST-BSC Cluster AST-FourPort/XN AST-PCnet AST-PCnet II AST-PCOX AST-SNA AST-SNA/BSC Gateway AST-SNA/Cluster CC-232 Advanced Communications Card ColorGraph Plus ComboPlus Expansion Memory MP II GraphPak I/O Mini I/O Plus II Mega Plus II MonographPlus MP Mini Multi I/O Preview RAMpage! RAMstak RAMvantage! Reach! SixPakPlus
Avatar Technologies Inc	99 South St Hopkinton MA 01748 (617) 435-6872 (800) 828-2004	PA 100 PA 100 Turbo
Barr Systems	2830 NW 41st St Suite M Gainesville FL 32606 (904) 371-3050	BARR/HASP
Bit 3 Computer	8120 Penn Ave S Suite 548 Minneapolis MN 55431 (612) 881-6955	401 IBM PC to Multibus Adapter 402 PC AT to Multibus Adapter 520 Memory Plus 32K RAM Card 610 Full-view 80 701 Dual-Comm Plus
Bizcomp	532 Mercury Dr Sunnyvale CA 94086 (408) 733-7800	IntelliModem/ST/XT/XL



Vendor	Address/Telephone	Model
Bronson Electronics	12700 Nicolet Burnsville MN 55337 (612) 894-6466	Innovation 1007 CGP Innovation 1008 RAM Board
Caere Corp	100 Cooper Ct Los Gatos CA 95030 (408) 395-7000	Model 240 PC Scanner PC SCAN-NET Model 941
Chrislin Industries	Computer Products Div 31352 Via Colinas No. 101 Westlake Village CA 91362 (818) 991-2254	CI-1173 CI-1173-EDC CI-796-EDC CI-8086 + CI-PCM +
Cleveland Codonics	18001 Englewood Dr Cleveland OH 44130 (216) 243-1198	I-200 I-300
Colex America	737 Lincoln Centre Dr Foster City CA 94404 (415) 345-7999	Colex VME Board-level Computer VME/186
Comark	PO Box 474 93 West St Medfield MA 02052 (617) 359-8161	CBX-DI240 CBX-SASI CBX-SI-200
Conographic	17841 Fitch Irvine CA 92714 (714) 474-1180	Cono-Color
Control Systems	2855 Anthony La Minneapolis MN 55418 (612) 789-2421	Artist 1 Artist 2 Artist Transformer Artist Video Hostess 4/8
DataCube	4 Dearborn Rd Peabody MA 01960 (617) 535-6644	128 Family QVG-123 VG-123 VG-150
Datapoint	9725 Datapoint Dr San Antonio TX 78284 (800) 334-1122	0740 Intelligent Network Executive-PC
Datatron	Enhancement Products Div 2922 Dow Ave Tustin CA 92680 (714) 832-0691	2 megaboard
Datec	200 Eastowne Dr Suite 116 Chapel Hill NC 27514 (800) 334-7722	PAL Plus
Digigraphic Systems	7277 Flying Cloud Dr Eden Prairie MN 55344 (612) 944-6383	COM 4 COM 8 COM PLUS EXTEND 384M EXTEND 512M EXTEND 512X
Digital Communications Associates	1000 Alderman Dr Alpharetta GA 30201 (404) 442-4000	IRMA IRMAcom/3270 IRMAcom/3270B IRMAcom/3770

Vendor	Address/Telephone	Model
Digital Equipment	146 Main St Maynard MA 01754-2571 (800) DIGITAL ext 990 (617) 897-5111	IRMcom/RJE IRMAlette  256KB Memory Option 512KB Memory Option 8087 Option DECNA-K Ethernet to PRO-350/380 Controller Extended Bit-Map Graphics Module Extended Communications Option Graphics Option MicroVAX and PDP-11/73 Memory Add-On Rainbow 100 Memory Adapter Option
Dual Systems	2530 San Pablo Ave Berkeley CA 94702 (415) 549-3854	AIM-12 AOM-12 CLK-240 CMEM CPU-6800M LIO DMEM EMEM EPROM SI04-DMA VIC4-20 VMEM-2M VMPU-32
Electro-Design	690 Rancheros Dr San Marcos CA 92069 (619) 471-0680	COMBI-4 MEMCARD
Electronic Modular Systems	4546 Beltway Dr Dallas TX 75244 (214) 392-3473	CPU-1 CPU-2RT ICC-1 MEM-2 VME-488
EMC	12 Mercer Rd Natick MA 01760 (617) 655-6600	MAXEM 1 MAXEM 2
Emulex Persyst	3545 Harbor Blvd PO Box 6725 Costa Mesa CA 92626 (714) 662-5600	BoB Display Adapter Coax/3270 Color Combo Card DCP-88/VM Communications Processor Mega Memory Mini-Mono Card Mono Combo Card Multiple Protocol Communications Controller PC/Memory Plus Clock PC/Short Memory SB384 Time-Spectrum Short-Port Color Card TI Time Spectrum
Enterprise Systems	PO Box 698 Dover NH 03820 (603) 742-7363	10301 Versatile Video Display Card 10303 STD Bus Color Terminal Card 10611 Parallel I/O Board 10764 Universal Non-volatile Memory Card
Eventide	One Alsan Way Little Ferry NJ 07643 (201) 641-1200	WKBP-16 WKBP-4 WMAZ-4 Series





Vendor	Address/Telephone	Model
Fast Feedback Technologies	1505 Aviation Blvd Redondo Beach CA 90278 (213) 379-6100	1553-Net Flashcard M-500
Frontier Technologies	3510 N Oakland Ave PO Box 11238 Milwaukee WI 53211 (414) 964-8689	AdCom 2 Advanced Communications Controller AdCom 2-I Intelligent Advanced Communications Controller AdCom 2-M Advanced Communications Controller CADgraph 2 IHR 2gc-001 Intelligent High Resolution Graphics Controller MEMBD-001
Gamma Link	2452 Embarcadero Way Palo Alto CA 94303 (415) 856-7421	GammaCom
Gateway Communications	16782 Red Hill Ave Irvine CA 92714 (714) 261-0762	G/Net LAN I/F Card WNIM
Helix Systems and Development	Helix Technology Div 8435 Canoga Ave Canoga Park CA 91304 (818) 407-1131 (800) 468-0004	Helix ABM Helix PC Bubble Disk II Helix VME Bubble Module
Hercules Computer Technology	2550 Ninth St Suite 210 Berkeley CA 94710 (415) 540-6000	Hercules Color Card Hercules Graphics Card
IBM	1133 Westchester Ave White Plains NY 10604 (914) 696-1900	128KB Memory Expansion Option (0209) 256KB Memory Expansion (1209) 3278/79 Emulation Adapter (2507) 512KB Memory Expansion Option (0203) 64K/256K Memory Expansion Option (1013) 64KB Memory and Display Expansion Asynchronous Communications Adapter (2074) Binary Synchronous Communications Adapter (1204 or 2075) Color/Graphics Monitor Adapter (4910) Combination Adapter (6000) Display Station Emulator Adapter (2887) Enhanced Display Station Emulation Adapter (2879) Game Control Adapter (1300) General Purpose Interface Bus Adapter (1503) Graphics Memory Expansion Card (1201) IBM PC AT/370 Option Kit (6115) IBM PC Data Acquisition and Control Adapter (1502) IBM PC Enhanced Graphics Adapter (1200) Monochrome Display and Printer Adapter (4900) Professional Graphics Controller (150)

Vendor	Address/Telephone	Model
IDEAssociates	35 Dunham Rd Billerica MA 01821 (617) 275-4430 (800) 257-5027	Prototype Adapter (0220) Prototype Card (1400) SDLC Communications Adapter (1205 & 2090) Serial/Parallel Adapter (0215) XT/370 Option Kit (3891)  IDEA Minicom (CPR) IDEA Minimax (MPR) IDEAcomm 1200 (CPR) IDEAcomm 3278 (CPR) IDEAcomm 5251 (CPR) IDEAgraph (GPR) IDEAmax 384 (ZPR) IDEAmini (YPR) IDEAnet (NPR) Supermax (SMX)
Information Technologies	7850 E Evans Rd Scottsdale AZ 85260 (602) 998-1033	Linkup 1 Linkup Coax Linkup XT Linkup XT +
Intel	Personal Computer Enhancement Operations TO C-03 5200 NE Elam Young Pkwy Hillsboro OR 97124 (503) 629-7354	Above Board/AT Above Board/PC
Intercontinental Micro Systems	4015 Leaverton Ct Anaheim CA 92807 (714) 630-0964	256KMB CPS-16X CPS-68 CPS-B6A CPZ-186 CPZ-4800X LAN-PC LANS100
Interstate Voice Products	1849 W Sequoia Ave Orange CA 92668 (714) 937-9010	CSRB (Connected Speech Recognition Board) VRT 300
Lanier Business Products	1700 Chantilly Dr NE Atlanta GA 30371 (404) 329-8000	PC-Touch
Macrotech International	9551 Irondale Ave Chatsworth CA 91311 (818) 700-1501	ADIT MI-286 80286/Z80H Dual Processor S-100 CPU MSR Series ST Series S-100 Static CMOS Memory
Matrox	1055 St Regis Blvd Dorval, Quebec Canada H9P 1H6 (514) 685-2630	GBX-1000A MIP-512 SX-900
Multi-Tech Systems	82 Second Ave SE New Brighton MN 55112 (612) 631-3550	MultiModem (MT-224 PC) MultiModem IIe (MT-103E) MultiModem PC (MT-212 PC)
Natural MicroSystems	6 Mercer Rd Natick MA 01760 (617) 655-0700	Watson
NCR Microelectronics Div	1635 Aeroplaza Dr Colorado Springs CO 80916 (303) 596-5612	NCR/32-796A-16



Vendor	Address/Telephone	Model
Orange Micro	1400 N Lakeview Ave Anaheim CA 92807 (714) 779-2772	Buffered Grappler + Bufferpak Grappler C Grappler CD Grappler + HotLink Orange Interface Serial Grappler
Orchid Technology	47790 Westinghouse Dr Fremont CA 94539 (415) 490-8586	Blossom Conquest CramRAM ECCELL PCnet PCnet Blossom PCTurbo186 Processor Card Turbo Graphics Controller
Paradise Systems	217 E Grand Ave San Francisco CA 94080 (415) 588-6000	5-Pack Modular Graphics Card Multi-Display Card
PC Technologies	704 Airport Blvd Suite 6 PO Box 2090 Ann Arbor MI 48106 (800) 821-3086 (313) 996-9690	XTender
PHAZE Information Machines	7650 E Redfield Rd Scottsdale AZ 85260 (602) 991-6855 (800) 423-2994	Brigitte
Profit Systems	30150 Telegraph Rd Birmingham MI 48010 (313) 647-5010	Addram Elite AT Power Multigraph II
Qua Tech	478 Exchange St Akron OH 44304 (216) 434-3154	ADM12-10 Module ADM12-11 Module ADM8-10 Module CTM-10 Module DM12-10 Module DM8-10 Module DS-201 DSDP-401 MXI-241 PMD-10 Module PXB-721 RTM-10 Module UIO-10 WSB-10
Quadram	4355 International Blvd Norcross GA 30093 (404) 923-6666	Asher C1200 Buffered Serial Printer Adapter eRAM 80 Expanded Quadboard Extended Multi-function Card Gold Quadboard Liberty Multicore Palette Master Quad 3278 Quad 512 + Quad 5251 Quacolor I Quacolor II Quadgraph Quadjr Memory Board

Vendor	Address/Telephone	Model
		Quadlink QuadMEG ATX QuadMEMjr Quadmodem II Quadnet IX Quadnet VI Quadport AT Quadsprint Quadvue Serial Interface Adapter ShortRAM Silver Quadboard
Qubie Distributing	4809 Calle Alto Camarillo CA 93010 (805) 987-9741	Basic Time BT6Plus
Racal-Vadic	1525 McCarthy Blvd Milpitas CA 95035 (408) 946-2227 (800) 543-3000	Maxwell 1200 PC Maxwell 2400 PC
Scientific Solutions	6225 Cochran Rd Solon OH 44139-3377 (216) 349-0600	Base Board DADIO Board IEEE-488 (GPIB) Interface Board Lab Master Lab Tender
Sigma Designs	2023 O'Toole Ave San Jose CA 95131 (408) 943-9480	Color 400 Graphics Dazzler Graphics Dazzler II Maximizer SDI-384 SDI-SSC
STB Systems	601 N Glenville Suite 125 Richardson TX 75081 (214) 234-8750	Atta Byte Big Byte Chaufeur Colorific Grande Byte Graphix Plus II Memory Companion/PC Mono Plus II Quarter Byte Rio Grande Rio Plus IIA Super I/O II Super Res 400
Tall Tree Systems	1120 San Antonio Rd Palo Alto CA 94303 (415) 964-1980	JRAM 2 JRAM-AT
Techland Systems	25 Waterside Plaza New York NY 10010 (212) 684-7788	BlueLynx 2780/3780 RJE BlueLynx 3270 Gateway BlueLynx 3270 Local (coax) BlueLynx 3270 Remote BlueLynx 3270/BSC BlueLynx 5251 Model 11 BlueLynx 5251 Model 12
Tecmar	6225 Cochran Rd Solon OH 44139-3377 (216) 349-0600	1stMATE Multifunction Board 2ndMATE Multifunction Board 3rdMATE Multifunction Board Bosun XT Multifunction Board Captain Multifunction Board Device Master Board Dynamic Memory Board



Vendor	Address/Telephone	Model
		Graphics Master Board Maestro AT Multifunction Phonegate 2400 PowerLink Scribe Master Board Scribe Tender Board Speech Master Board Time Master Board Video Van Gogh Board Voice Recognition Board Wave 'XT' Memory Board
Teletek	4600 Pell Dr Sacramento CA 95838 (916) 920-4600	SBC 86/87 SBC-I SBC-II Systemaster Systemaster II Z-150MB
Titan Technologies	310 W Ann St Ann Arbor MI 48104 (313) 662-8542	Accelerator 2e Accelerator PC Neptune 64K card Titan 32K Titan 64K Titan Multifunction Titan P-1 Titan S-1
Univation	1037 N Fair Oaks Ave Sunnyvale CA 94089 (408) 745-0180	CT 640 CT-640-87 DMB 192-192 DMB 768-768 DMB-384 Uni-Net 1 Uni-Net 2
Vectrix	2606 Branchwood Dr Greensboro NC 27408 (919) 288-0520 (800) 334-8181	Video Encoder VX/PC Graphics Card VX128A Graphics Processor VX384A Graphics Processor
Ven-Tel	2342 Walsh Ave Santa Clara CA 95051 (408) 727-5721	PC Modem 1200 PC Modem Half Card
Vertex Systems	6022 W Pico Blvd Suite 4 Los Angeles CA 90035 (213) 938-0857	Apple Turnover
Viasyn	3506 Breakwater Ct Hayward CA 94545 (800) VIASYN-1	CPU 286 CPU 32016 CPU 68K CPU 8086 CPU 85/88 CPU-Z MDRIVE/H Networking Boards (Net 10/Net 11/Net 100/Net 101) PC Video Board RAM 22 RAM 23 SPUZ System Support 1
Videx	1105 NE Circle Blvd Corvallis OR 97330 (503) 785-0521	PS-000 (PSIO Dual Function Interface) ULP-001 (Ultraterm) UNP-000 (Uniprint Parallel Printer Card)

Vendor	Address/Telephone	Model
Votan	4487 Technology Dr Fremont CA 94538 (415) 490-7600	VT-602 (Videoterm) VPC 2000 Voice Card
Vynet	2607 S Winchester Blvd Campbell CA 95008 (408) 370-0555 (800) 538-7002	V101A/VS Telephone Voice Synthesizer Unit V101I, V102I Speech Digitizer & Playback Unit V101I/VS, V102I/VS Telephone Voice Synthesizer Unit
Winterhalter	3853 Research Park Dr PO Box 2180 Ann Arbor MI 48106 (313) 662-2002 ext 17 (800) 321-7785	Datatalker Secure
Wolfdata	187 Billerica Rd Chelmsford MA 01824 (617) 250-1500	WD 212 WD 212-LAPB WD 212/X.25
Zenith Data Systems	1000 Milwaukee Ave Glenview IL 60025 (312) 391-8869	Z-305 128K Memory Expansion Board





# ADD-ON BOARDS

## Specifications Chart Guide

In the ten years since their introduction to the market, microcomputers have taken the world by storm, with millions of personal computers in use in government, academic, and business organizations. Because of microcomputers' low cost and slim profit margins, vendors cannot cost-effectively send in systems analysts to study each prospective buyer's needs as minicomputer and mainframe vendors can. This circumstance, in conjunction with the desire of many microcomputer buyers to increase their configuration and investment only as they add applications, has led to the growth of the add-on board segment of the microcomputer industry. This segment consists of vendors who manufacture and sell board-level products intended to be inserted in the motherboards or buses of a computer made by the same or a different vendor.

A personal computer can be purchased from any number of vendors and expanded with, if desired, only boards and peripherals made by other companies than the computer manufacturer. In addition, the boards and peripherals can be bought from a variety of vendors and, in most cases, still work together harmoniously.

Why does a user buy from someone other than the original computer vendor? Often, the add-on boards offer more capacity or functionality than the boards offered by the computer vendor. In addition, they are often cheaper and better engineered, sometimes because of a more recent design that takes advantage of newer, lower-cost technology.

The specifications chart lists four categories of add-on microcomputer boards: Memory and Processing Boards, Communications Boards, Multifunction Boards, and Graphics Boards. Add-on boards that are dedicated device controllers are not included. However, device controller boards able to support more than one type of peripheral or that provide functionality beyond the control of one type of device are sometimes included.

The following items are common to all four types of add-on microcomputer boards:

- **Vendor**—This entry identifies the manufacturer or distributor of the board. Since some vendors are known for excellent quality and others for excellent value (i.e., good quality at relatively low prices), buyers should consider which is more important when choosing a vendor.
- **Model**—The name or number by which the vendor identifies the add-on board product is identified here.
- **Compatibility**—This section describes the computer or bus, the microprocessors, and the operating systems with which the board is designed to work. A buyer interested in a specific add-on board whose compatibility listing does not match the buyer's computer environment should contact the vendor to determine under what conditions, if any, the add-on board will work in his or her environment.
- **Computer/Bus**—The particular computer or bus that the add-on board is designed to plug in to is listed here. Three physical factors affect this compatibility. First, each pin on the connectors peculiar to a motherboard or bus design has specific voltage and signal requirements unique to that motherboard or bus. Second, the two connectors must have the same number of pins. Third, the spacing between adjacent pins must be the same for both the add-on board and the motherboard or bus.
- **Microprocessors**—Because of differences in either microprocessor hardware or software, restrictions beyond bus and motherboard compatibility often must be considered. For example, most microprocessors are available in several performance levels. Unless designed to accommodate them, the high-performance microprocessors will not work with add-on memory boards populated with low-performance RAM chips. Another situation in which an add-on board may not function properly is when the computer, even though it uses the same bus the add-on board was designed to work with, uses a different microprocessor. For example, the vast majority of S-100 bus (IEEE-696 bus) systems use the Intel 8080 or Zilog Z80 microprocessor, but some S-100 bus machines use the Motorola MC 6809 or 6800 or the Intel 8086. Add-on boards designed to be installed on an S-100 bus with a Zilog Z80 may not work with an S-100 bus machine built around a Motorola MC 6800.
- **Operating Systems**—A software device driver, such as a mouse driver, is commonly provided with an add-on board. These drivers are generally written for use only with a specific operating system. If a buyer purchases an add-on board whose software device driver is not compatible to his or her own operating system and one is not available for his operating system, the user will have to write the software driver or contract to have it written. In general, unless boards are purchased in quantity, the high cost of software development makes it more cost-effective to find a board compatible with the buyer's operating system. In many cases, the driver will work only with a specific version or release of the operating system. Many add-on boards designed to work with MS-DOS 2.11, for example, will not work with any earlier release of MS-DOS and may not work with any subsequent release of MS-DOS. The purchaser should check operating system compatibility before purchasing a product.
- **Word Size**—For graduates from singleuser to multiuser systems, word size may be a consideration. Intel's Multibus II and the VMEbus, both common to multiuser systems, can be specified with 8-, 16-, or 32-bit data path word sizes. An add-on board with a 16-bit data path word size usually won't work with a bus with either an 8- or 32-bit data path word size. (Some multiuser systems using Multibus II and VMEbus will support multiple data path word sizes.)



- **Physical Size**—Some microcomputers accept different size boards in different slots. For example, the IBM Portable Personal Computer has one full-size and four half-size slots, and the IBM Personal Computers XT and AT have six full- and two half-size slots (the IBM Personal Computer, in contrast, has five full-size slots only). Apple computers have seven 50-pin slots and one auxiliary 60-pin slot; vendors sometimes specify which slots their boards should go into in an Apple. For this entry, the physical size of the board is defined either in specific dimensions (L × W × H, in inches) or as a relationship to the slots into which it fits in the computer (i.e., full- or half-size slots or, for Apple boards, sometimes which specific slot).
- **First Delivered**—This data indicates how long the product has been available. First-time buyers often gain such advantages as superior service and technical support from the vendor, no-charge upgrades as the product is enhanced and stabilized, or a more favorable price. However, an older product may prove more dependable. Buyers should thus consider the relative advantages of a newer and an older product in making product decisions.
- **Price**—Unless otherwise specified, this provides the list price for a single unit. Since manufacturers do not control prices set by distributors and dealers, it is often possible to purchase add-on boards at lower than list price. In addition, manufacturers, distributors and dealers often have price discounts for larger quantities. When choosing a vendor, buyers should consider their needs and the availability of local service and support as well as price.
- **Warranty**—Add-on microcomputer boards that work when received from the vendor and continue working for three or four weeks will probably continue to work for the next five years. This is because of the nature of the solid state electronic components and assembly processes used in manufacturing add-on boards. Long warranties provide a measure of insurance against unusual failure conditions and against sloppy installation and operating practices. On the other hand, a 30-day warranty is sufficient to identify the vast majority of add-on boards that will fail within five years.
- **Additional Features**—This section lists a more descriptive definition of the board, clarifying the vendor's design or marketing objectives and any special features of the board.

The following sections list the four categories of boards and the listings particular to each board.

## MEMORY & PROCESSOR BOARDS

This category includes boards that add more memory or more processing power to the microcomputer system.

- **Maximum Memory Capacity**—This entry lists how many bytes the add-on memory board will hold when populated with a full complement of RAM chips.

## COMMUNICATIONS BOARDS

This category encompasses micro-to-mainframe links, voice I/O boards, modem boards, networking boards, and other types

of boards performing data communications functions. It provides the following information:

- **Ports**—This entry lists the number and type of ports provided with the add-on multifunction board. These may include such items as game ports and SASI or SCSI disk ports as well as communications ports.
- **Communications Protocols**—This entry supplies the particular communications protocols supported by the add-on boards. At least one of these must be a protocol supported by whatever the microcomputer is to communicate with. For example, an IBM mainframe using IBM 3270 protocol will be able to communicate with a personal computer containing an add-on board supporting IBM 3270 protocol.

## MULTIFUNCTION BOARDS

This category encompasses boards that provide on just one board a variety of functions that might otherwise be distributed among two or three boards within the microcomputer. This frees the other slots in a microcomputer to accept boards providing other functions, thereby increasing the potential capabilities of the microcomputer. Information in this section includes the following:

- **Maximum Memory Capacity**—This entry lists how many bytes the add-on multifunction board will hold when populated with a full complement of RAM chips.
- **Ports**—This entry lists the number and type of ports provided with the add-on multifunction board. These may include such items as game ports and SASI or SCSI disk ports as well as communications ports.
- **Clock/Calendar**—This listing notes whether or not the multifunction board has a clock/calendar feature. This is a popular feature on add-on multifunction boards intended for use in the IBM Personal Computer, which does not have a clock/calendar feature.
- **Printer Buffer**—This listing notes whether or not the multifunction board features a printer buffer. This popular feature enables the computer to transfer a buffer full of data to the add-on multifunction board; then, while the computer performs other tasks, the add-on multifunction board manages the printer. This process is sometimes effected with software included in the price of the multifunction card.
- **Disk Emulation**—A major consideration in personal computer performance is the access time of the diskette or disk drives. Disk emulation, also called disk spooling or virtual disk, sets aside a block of RAM memory and uses it as though it were a disk. By moving frequently referenced files to the RAM disk, users can realize significant performance gains, both real and perceived.
- **Controller Capabilities**—Many add-on boards provide controller functionality for one or more classes of peripheral device. One common combination is the support of both Winchester disks and the cartridge tape units used to backup the data on the Winchesters.

## GRAPHICS BOARDS

This category encompasses boards that control graphics display on monitors and, in some cases, printers. It includes the following information:



- **Ports**—This listing provides the number and type of ports provided on the graphics add-on board.
- **Colors**—Aside from resolution, the key measure of image quality, the primary measure of interest in relation to a graphics display is the number of colors it can display simultaneously. For most commercial applications, four colors is sufficient. (The use of more than eight colors on screen can cause viewer eyestrain or visual distraction if not used judiciously.)
- **Resolution**—This entry provides the number of pixels (dots) the screen will be able to display when using the add-on board. Although theoretically, higher resolution is preferable to lower resolution, in graphics color boards designed for the IBM Personal Computer, higher resolution may not be the best choice in an add-on board. Other personal computer vendors and add-on board vendors offer graphics boards with much better resolution than IBM's graphics boards, but they may not be compatible with many popular IBM graphics programs because many popular programs bypass the PC DOS and MS-DOS operating systems and effect their own screen management in order to improve speed or image quality. An owner of an IBM Personal Computer (or compatible machine) might need to choose between the standard IBM color board, compatible with IBM software but with a reputation for poor resolution, or an alternate vendor's high-resolution board, which may not run popular software. (Some add-on board vendors provide their own software.) A buyer who does not have a completely standard IBM Personal Computer running PC DOS with IBM color boards but wishes to run IBM-compatible software should check with the software vendor to be sure it will provide a refund if the software is not fully compatible.
- **Lines × Columns**—Add-on boards often operate in two modes, a graphics mode and an alphanumeric mode. The alphanumeric mode shows text arranged in lines by columns (one character per column). Since CRT monitors currently in use do not have adequate resolution to display more than 80 legible characters per line and 24 or 25 lines, the graphics board should support 24 or 25 lines by 80 columns among its alphanumeric display capabilities.



# SPECIFICATIONS CHART

## Add-on Boards-Memory & Processing

234.0045.001

<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b></p>	<p><b>Alpha Micro</b> AM-171</p> <p>IBM PC XT, AT&amp;T PC 6300 Motorola MC 68000 PC DOS, MS-DOS, AMOS (Alpha Micro Operating System)</p> <p>16 bit Full 1985 \$1,095-\$1,720 90 day 256KB, 512KB, or 768KB For use with Alpha Micro AM-170 board in IBM PC XT or AT&amp;T PC 6300</p>	<p><b>Apricorn</b> 1300-10 16K RAM Expansion</p> <p>Apple II, II + Synertek 6502 Apple DOS, CP/M-80</p> <p>8 bit — 1982 \$119.95 Lifetime 16KB NA</p>	<p><b>Apricorn</b> 1400-15 Extend-It</p> <p>Apple IIe Synertek 6502A AppleDOS, ProDOS, CP/M-80</p> <p>8 bit — 1983 \$99.95 Lifetime 64KB Piggybacks onto Apple's 80 col text card w/removal of 3 socketed chips from card. 64K bits/chip.</p>
<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b></p>	<p><b>AST Research</b> Expansion Memory MP11</p> <p>IBM PC, PC XT Intel 8088 —</p> <p>8 bit Full 1981 \$345-\$795 (64KB-384KB) One year; two year opt. 384KB</p> <p>Opt. clock/calendar. Includes SuperDrive and SuperSpool software, providing disk emulation and print spooling. Parity checked memory.</p>	<p><b>AST Research</b> MP Mini</p> <p>IBM PC, PC XT Intel 8088 —</p> <p>Half 1984 \$295-\$890 (64KB-384KB) One year; two year opt. 256KB, 128KB add'l w/ MiniPak daughterboard AST SuperPak included. Parity checked memory.</p>	<p><b>AST Research</b> RAMpage!</p> <p>IBM PC Intel 8088 —</p> <p>8 bit Full 1985 \$445-\$1,895 One year; two year opt. 256KB-2MB</p> <p>Includes SuperDrive &amp; SuperSpool software.</p>

**Notes:**

NA Not applicable  
— Information unavailable at press time



<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b>	<b>AST Research</b> <b>RamStack</b>  Apple Macintosh XL — — Full 1984 \$2,095-\$2,695 One year; two year opt. 512KB-2MB NA	<b>AST Research</b> <b>RAMvantage!</b>  IBM PC AT Intel 80286 — 16 bit Full 1985 \$495-\$2,695 One year; two year opt. 128KB-3MB Split memory addressing. Include SuperDrive & SuperSpool software.	<b>Bit 3 Computer</b> <b>520 Memory Plus 32K RAM</b> <b>Card</b>  Atari 800 Synertek 6502 DOS 8 bit Full 1982 \$40 One year 32KB —
<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b>	<b>Bronson Electronics</b> <b>Innovation 1008 RAM Board</b>  IBM PC, PC XT, & compatibles Intel 8088 PC DOS, MS-DOS — Full January 1985 \$219 Two year Up to 512KB 64K bits/chip.	<b>Chrislin Industries</b> <b>CI-1173</b>  DEC LSI-11, J-11, MicroVAX LSI-11, J-11, MicroVAX UNIX, RT-11, RSX, VMS 16 bit 8.44 x — x 10.46 1983 \$1,895 (4MB) One year 4MB Block mode DMA, parity checking. Can function as a disk emulator. 160 nsec access time (write).	<b>Chrislin Industries</b> <b>CI-1173-EDC</b>  DEC LSI-11, J-11, MicroVAX — UNIX, RT-11, RSX, VMS 16 bit 8.44 x — x 10.46 (full) 1984 \$1,500 (2MB) One year Up to 2MB Error detection and correction, block mode DMA. 256K bits/chip. Can function as a disk emulator.

**Notes:**

NA Not applicable

— Information unavailable at press time



<p><b>Vendor Model</b>  <b>Compatibility</b>          Computer/Bus          Microprocessors          Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Max Memory Capacity</b>  <b>Additional Features</b></p>	<p><b>Chrislin Industries</b>          CI-796-EDC</p> <p>Multibus          Any Multibus          UNIX          16 bit          6.75 x — x 12 (full)          1983          \$1,385 (2MB)          One year          512KB-2MB          Error detection and correction, parity checking. Can function as a disk emulator. 256K bits/chip.</p>	<p><b>Chrislin Industries</b>          CI-8086 +</p> <p>Any Multibus          Any Multibus          UNIX          16 bit          6.75 x — x 12 (full)          1982          \$1,460 (2MB)          One year          Up to 2MB          Parity checking. 256K bits/chip. Can function as a disk emulator.</p>	<p><b>Chrislin Industries</b>          CI-PCM +</p> <p>IBM PC &amp; compatibles          Intel 80186          PC DOS, CP/M-86          8 bit          4.2 x — x 13.1          1982          \$375 (512KB), \$300 (256KB)          One year          512KB          1 serial port. Can function as a disk emulator. 64K bits/chip.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>          Computer/Bus          Microprocessors          Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Max Memory Capacity</b>  <b>Additional Features</b></p>	<p><b>Colex America</b>          Colex VME Board-level Computer</p> <p>Any VME bus based system          —          Concurrent CP/M-86, UNIX, P-DOS          16 bit, 32 bit          9.2 x 0.3 x 6.3          February 1985          \$4,300          90 day          2MB          On-board Intel 80186 I/O processor and Motorola 68000 on-board processor. 1 parallel, 1 SASI/SCSI, 2 serial ports. TTY communications compatibility. Clock/calendar std. 64K bits/chip. Modem, printer, terminal, disk, diskette, and tape controller.</p>	<p><b>Colex America</b>          VME/186</p> <p>Any VMEbus based system          —          PC DOS, Concurrent CP/M-86          16 bit          9.2 x 0.3 x 6.3          February 1985          \$1,565          90 day          256KB          On-board Intel 80186 I/O processor. 1 parallel, 1 SASI/SCSI, 2 serial ports. TTY communications compatibility. Modem, printer, terminal, disk, diskette and tape controller. Clock/calendar std. 64K bits/chip.</p>	<p><b>Datatron</b>          2megaboard</p> <p>IBM PC, PC XT, &amp; compatibles          Intel 8086, 8088          PC DOS          8 bit          —          March 1985          \$295 and up          One year          64KB-2MB          Provides automatic disk caching and print spooling; transparent to all software. Can be operated in 64K bank switching mode.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<b>Vendor</b> <b>Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b>	<b>Digigraphic Systems</b> EXTEND 384M IBM PC, PC XT, & compatibles Intel 8088 PC DOS — 4.2 x — x 13.1 (full) March 1983 \$199 (64KB) One year 384KB 1 serial port, 1 parallel port, 1 game port. Diagnostic software and clock calendar included.	<b>Digigraphic Systems</b> EXTEND 512M IBM PC, PC XT, & compatibles Intel 8088 PC DOS — 4.2 x — x 13.1 (full) December 1982 \$359 (64KB) One year 512KB 1 serial port, 1 parallel port. Diagnostic software included. Max 250 nsec access time.	<b>Digigraphic Systems</b> EXTEND 512X IBM PC, PC XT, & compatibles Intel 8088 PC DOS — 4.2 x — x 13.1 (full) August 1982 \$199 (64KB) One year 512KB Includes memory and I/O diagnostics software. Max 250 nsec access time.
<b>Vendor</b> <b>Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b>	<b>Digital Equipment</b> 256KB Memory Option Professional 325, 350 or 380 — — — — — \$595 — 256KB RAM parity memory.	<b>Digital Equipment</b> 512KB Memory Option Professional 380 — — — — — \$1,595 — 512KB Dynamic MOS memory.	<b>Digital Equipment</b> 8087 Option Digital Equipment Rainbow 100, 100B, 100 + — — — — — \$395 — — Provides Intel 8087 numeric coprocessor.

**Notes:**

- NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Additional Features</b></p>	<p><b>Digital Equipment</b> MicroVAX and PDP-11/73 1MB Memory Add-On</p> <p>MicroVAX, Micro PDP-11</p> <p>—</p> <p>—</p> <p>—</p> <p>\$2,800</p> <p>—</p> <p>1MB</p> <p>DRAM MOS parity memory. Uses 64K bits/chip.</p>	<p><b>Digital Equipment</b> Rainbow 100 Memory Adapter Option</p> <p>Digital Equipment Rainbow 100</p> <p>—</p> <p>—</p> <p>—</p> <p>\$99-\$794 (including chip sets or memory modules)</p> <p>—</p> <p>Up to 768KB w/addition of chip sets &amp; memory modules</p> <p>NA</p>	<p><b>Dual Systems</b> CMEM</p> <p>All S-100, IEEE-696-based systems Zilog Z80, Intel 8080, 8085, 8086, 80186, 80286, Motorola MC 68000, Z-8000, 16000 CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System 8 bit, 16 bit 10 x 0.6 x 5 (full) 1981 \$725</p> <p>One year 32K</p> <p>Non-volatile memory. Dynamically movable write-protect window. 3-10 yr battery life.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Additional Features</b></p>	<p><b>Dual Systems</b> CPU-68000M LIO</p> <p>Dual 83/20, Dual 83/80, any true S-100 IEEE-696 system Motorola MC 68000</p> <p>UNIX, proprietary</p> <p>16 bit 10 x 0.6 x 5 1981 \$1,195 One year 16M</p> <p>Functions as CPU card for S-100 bus. Operates at 10 MHz. Multi-user/multi-tasking. Segmented memory management. Selectable mapped and unmapped address space.</p>	<p><b>Dual Systems</b> DMEM</p> <p>All S-100, IEEE-696 based computers Zilog Z80, Intel 8080, 8085, 8086, 8088, 80186, 80286, Motorola MC 68000 CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX</p> <p>16 bit 10 x 0.6 x 5 1982 \$1,395 One year 256KB</p> <p>8 or 16 bit data paths. 24 bit addressing. Parity checking on each byte. No S-100 wait states. 2 independently addressable 128KB banks.</p>	<p><b>Dual Systems</b> EMEM</p> <p>S-100, IEEE-696 based systems Intel 8086, 8088, 80186, 80286, Motorola MC 68000</p> <p>CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System 16 bit 10 x 0.6 x 5 1984 \$4,995 One year 1MB</p> <p>8 or 16 bit data transfers. 24-bit extended addressing. 6 MHz clock rate. 220 nsec access time, 330 nsec cycle time. No S-100 wait states except during refresh.</p>

**Notes:**  
 NA Not applicable  
 — Information unavailable at press time





<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b></p>	<p><b>Dual Systems</b> EPROM</p> <p>Dual 83/20, 83/80, 83/500, and all true S-100, IEEE-696-based computers</p> <p>Zilog Z80, Intel 8080, 8085, 8086, 8088, 80186, 80286, Motorola MC 68000, Z-8000, 16000</p> <p>CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System, proprietary</p> <p>16 bit 10 x 0.6 x 5 1982 \$345 One year 64KB Provides permanent non-volatile storage for up to 64KB of data.</p>	<p><b>Dual Systems</b> VMEM-2M</p> <p>All VMEbus-based systems</p> <p>Intel 80286, MC 68000, MC 68020</p> <p>—</p> <p>8, 16, 32 bit 9.1 x 0.7 x 6.2 3Q 1985 \$7,500 One year 2MB Dynamic RAM. Has prefetch cache w/75 nsec typ. access time on sequential reads, 250 nsec typ on random access, 200 nsec typ on writes. 32 and 16 bit data transfers, 30 or 24 bit addressing.</p>	<p><b>Dual Systems</b> VMPU-32</p> <p>All VMEbus-based systems</p> <p>Motorola MC 68000, MC 68020</p> <p>UNIX, proprietary</p> <p>8, 16, 32 bit 9.1 x 0.7 x 6.2 3Q 1985 \$6,550 One year 1MB 32 bit CPU for VMEbus. Paged MMU, on-board floating point unit, 1MB dual-ported RAM on board, 32-bit data paths throughout.</p>
<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b></p>	<p><b>Electro Design</b> MEMCARD</p> <p>IBM PC &amp; compatibles Intel 8088 PC DOS, CP/M-86, UNIX, UCSD p-System</p> <p>8 bit 5 x 0.5 x 3.75 (half) June 1983 \$190 (256KB) 90 day 256KB 64K bits/chip. Capable of memory starting addresses from 0 to 586K.</p>	<p><b>Electronic Modular Systems</b> MEM-2</p> <p>All VMEbus systems Motorola MC 68000 UNIX: any other systems</p> <p>16 bit Full — \$1,500-\$1,600 90 days 2M Parity or error correction available. Functionally equivalent to boards made by Motorola, Force, &amp; Signetics, Uses 256KB chips.</p>	<p><b>EMC</b> MAXEM 1</p> <p>Wang PC Intel 8086 —</p> <p>16 bit 8 x 0.5 x 12 March 1984 \$375-\$1,245 Lifetime 128KB-640KB RAM Can be combined w/EMC's MAXEM 2 multifunction board in one expansion slot. Full parity checking.</p>

**Notes:**

- NA Not applicable  
— Information unavailable at press time



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Max Memory Capacity</b>  <b>Additional Features</b></p>	<p><b>Emulex Persyst</b>                  Mega Memory                  IBM PC AT                  Intel 80286                  —                  Full                  —                  \$395-\$2,795 (0-3MB)                  Two year                  3MB                  64K or 256K bits/chip. INSTA-DRIVE RAM and WAIT-LESS PRINTING software incl, providing disk emulation and printer buffer features.</p>	<p><b>Emulex Persyst</b>                  PC/Memory Plus Clock                  IBM PC, PC XT                  Intel 8088                  —                  Full                  —                  \$245-\$695 (0-576KB)                  Two year                  0-576KB                  64K bits/chip. Clock/calendar included. Includes INSTA-DRIVE RAM and WAIT-LESS PRINTING software, providing disk emulation and printer buffer features.</p>	<p><b>Emulex Persyst</b>                  PC/Short Memory                  IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  Half                  —                  \$159-\$459 (0-384KB)                  Two year                  0-384KB                  Parity checking and error reporting. INSTA-DRIVE RAM and WAIT-LESS PRINTING software included, providing disk emulation and printer buffer feature. 64K or 256K bits/ chip.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                    Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Max Memory Capacity</b>  <b>Additional Features</b></p>	<p><b>Enterprise Systems</b>                  10764 Universal Non-volatile Memory Card                  Any STD bus system                  —                  8 bit                  —                  \$275 (8KB)                  Limited one year                  128KB EPROM, 64KB static RAM                  Universal non-volatile memory board. Available w/CMOS RAM, EPROM, or EEPROM, in various configurations.</p>	<p><b>Eventide</b>                  WKBP-16                  Hewlett-Packard Series 200 (9819, 9826, 9836, 9920, 217, 237)                  MC 68000                  16 bit                  —                  January 1984                  \$1,750 (w/quantity discount)                  One year                  1MB                  Also avail in .5MB version (part no. WKBP-8). NMOS RAM memory.</p>	<p><b>Eventide</b>                  WKBP-4                  Hewlett-Packard Series 200 (9819, 9826, 9836, 9920, 217, 237)                  —                  16 bit                  Full                  1982                  \$599 (w/quantity discount)                  One year                  256KB                  Operationally similar to HP 98256A. 64K bits/chip. NMOS RAM memory.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b></p>	<p><b>Eventide</b> WMAZ-4 Series Hewlett-Packard 9845 Computers — — 16 bit — 1982 \$1,000 (256KB), \$1,500 (512KB), \$2,000 (1MB), \$4,000 (2MB); w/quantity discount One year 2MB NMOS RAM memory.</p>	<p><b>Fast Feedback Technologies</b> Flashcard IBM PC XT, PC AT, VMEbus Zilog Z80, Intel 8080, 8085, 8086, 8088, 80186, 80286, Synertek 6502, Motorola MC 68000 PC DOS, CP/M-86, FORTH 8 bit, 16 bit Full (IBM PC), Dual (VMEbus) October 1985 Contact vendor One year — On-board proprietary high-speed engine designed to be 500 times faster than PC XT. 10 MOPS at high level.</p>	<p><b>Frontier Technologies</b> MEMBD-001 IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286 PC DOS 8 bit Full (13.1 x — x 4.2) December 1983 \$595 One year 64KB-256KB 1 serial, 1 parallel port, clock/calendar, 225 nsec access time, 64K bits/chip.</p>
<p><b>Vendor</b> <b>Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b></p>	<p><b>Helix Systems &amp; Development</b> Helix ABM Apple II, Ile Synertek 6502, 6502A CP/M-86, Apple Pascal 1.1, ProDOS 8 bit 8.5 x 0.5 x 3 July 1983 \$475 Two year 128KB Functions as diskette emulator for Apple II &amp; Ile, using bubble memory.</p>	<p><b>Helix Systems &amp; Development</b> Helix PC Bubble Disk II IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286 PC DOS, MS-DOS 8 bit 13.3 x 0.5 x 4.05 (full) September 1983 \$1,495 Two year 512KB 128K bits/chip. Harsh environment disk emulator bubble memory device. Opt. RS-232 or RS-422 serial port (\$25 add'l), plus Security Password Feature.</p>	<p><b>Helix Systems &amp; Development</b> Helix VME Bubble Module Any VME 16 bit system Motorola MC 68000 UNIX 16 bit 6.2 x — x 9 June 1985 — Two year 8.5MB Harsh environment bubble memory. 128K bits/chip. Helix Q-bus bubble module in development, expected late 1985.</p>

**Notes:**

NA Not applicable

— Information unavailable at press time



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Additional Features</b></p>	<p><b>IBM</b> 128KB Memory Expansion Option (#0209)</p> <p>IBM PC AT Intel 80286 — — — — \$350 — 128KB Requires 16-bit expansion slot.</p>	<p><b>IBM</b> 256KB Memory Expansion (#1209)</p> <p>IBM PC, PC XT Intel 8088 — Half — \$489 One year 256KB NA</p>	<p><b>IBM</b> 512KB Memory Expansion Option (#0203)</p> <p>IBM PC AT Intel 80286 — Full — \$1,125 — 512KB Requires 16 bit expansion slot.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Additional Features</b></p>	<p><b>IBM</b> 64KB Memory and Display Expansion (#0007)</p> <p>IBM PC, PC XT Intel 8088 — — — — \$140 — 64KB</p> <p>Permits use of higher density video modes and 80-col text support while increasing system memory by 64KB.</p>	<p><b>IBM</b> 64K/256K Memory Expansion Option (#1013)</p> <p>IBM PC, PC XT, 5531 Industrial Computer Intel 8088 — Full — \$265 — 64KB-256KB parity-checked RAM Memory is increased to 256K w/64KB Memory Module Kits.</p>	<p><b>IBM</b> Graphics Memory Expansion Card (#1201)</p> <p>IBM PC, PC XT, PC AT Intel 8088, 80286 — — — — \$199 — 64KB RAM</p> <p>Used w/IBM PC Enhanced Graphics Adapter card to expand memory.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor</b></p> <p><b>Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Additional Features</b></p>	<p><b>IDEAssociates</b></p> <p>IDEA Minimax (MPR)</p> <p>IBM PC, PC AT, PC XT; primarily designed for PC Portable</p> <p>Intel 8088, 80286</p> <p>PC DOS</p> <p>16 bit</p> <p>Half</p> <p>—</p> <p>\$325 (128KB RAM)</p> <p>One year</p> <p>384KB</p> <p>Double decker memory card. 128KB RAM on motherboard, 256KB on daughterboard; boards may be purchased separately. Incl software prgrm that features disk emulation, print spooler, and diagnostics. 64K bits/chip.</p>	<p><b>Intel Personal Computer Enhancement Operation Above Board/AT</b></p> <p>IBM PC AT</p> <p>Intel 80286</p> <p>—</p> <p>Full 1985</p> <p>\$595 (128KB); \$995 (512KB)</p> <p>Five year</p> <p>2MB</p> <p>Integrated RAMdisk and printer buffer program. 64K or 256K bits/chip. Meets Lotus/Intel Expanded Memory Specification. Piggyback memory module opt: \$295 w/128KB, \$795 w/512KB.</p>	<p><b>Intel Personal Computer Enhancement Operation Above Board/PC</b></p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>—</p> <p>Full 1985</p> <p>\$395 (64KB), \$595 (256KB)</p> <p>Five year</p> <p>2MB</p> <p>Integrated RAMdisk &amp; printer buffer program. 64K or 256K bits/chip. Meets Lotus/Intel Expanded Memory Specification.</p>
<p><b>Vendor</b></p> <p><b>Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Additional Features</b></p>	<p><b>Intercontinental Micro Systems</b></p> <p>256KMB</p> <p>Any IEEE 696.1/D2 S-100 bus system</p> <p>Any compatible w/IEEE 696.1/ D2 S-100 specs</p> <p>MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, CP/M</p> <p>8 bit</p> <p>10 x 0.56 x 5.5</p> <p>June 1982</p> <p>\$595</p> <p>One year</p> <p>256KB</p> <p>Can operate as either bank selectable or linear addressable memory. Bank selectable in 16KB increments. Any combination of 16K banks is possible. Up to 2MB linear address memory may be configured. Parity error detection and disk emulation capabilities provided.</p>	<p><b>Macrotech International</b></p> <p>MI-286 80286/Z80H Dual Processor S-100 CPU board</p> <p>S-100 bus (exceeds all IEEE-696 standards)</p> <p>—</p> <p>MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UCSD p-System, UNIX, MC-DOS</p> <p>8 bit, 16 bit</p> <p>5 x — x 10 (half)</p> <p>August 1984</p> <p>\$1,095</p> <p>One year</p> <p>—</p> <p>Supports 8 and 16 bit environments for single or multi-user systems. On-board Zilog Z80H and Intel 80286 processors.</p>	<p><b>Macrotech International</b></p> <p>MSR Series</p> <p>S-100 bus systems (designed to IEEE-696 specs)</p> <p>Zilog Z80, Intel 8080, 8085, 8088, 80186, 80286, Motorola MC 68000</p> <p>PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, AMOS</p> <p>8 bit, 16 bit</p> <p>5 x — x 10 (half)</p> <p>November 1985</p> <p>\$2,100</p> <p>One year</p> <p>256KB, 512KB, 1MB, 2MB</p> <p>Dynamic RAM; can use 120 nsec RAM chips to support high speed CPU's (80286, 8086, Z80H) up to 12 MHz. 64K and 256K bits/chip.</p>

**Notes:**

NA Not applicable

— Information unavailable at press time



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Additional Features</b></p>	<p><b>Macrotech International</b> ST Series S-100 Static CMOS Memory</p> <p>S-100 systems (exceeds all IEEE-696 specs) Zilog Z80, Intel 8080, 8085, 8086, 8088, 80186, 80286, Motorola MC 68000</p> <p>PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX</p> <p>512KB 5 x — x 10 (half) 1984 \$2,300 (512KB); \$1,200 (256KB)</p> <p>One year 512KB High speed static RAM. On-board battery backup. Special logic design for high speed environments. 64K bits/chip.</p>	<p><b>NCR Microelectronics</b> NCR/32-796A-16</p> <p>Multibus systems</p> <p>Zilog Z80, Intel 8080, 8085, 8086, 8088, 80186, 80286, Synertek 6502, Motorola MC 68000</p> <p>PC DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System</p> <p>16 bit, 32 bit Full — \$4,995 (quantity 1-9)</p> <p>90 day 4GB 32-bit NCR/32-796A (on-board) microprogrammable microprocessor w/virtual memory &amp; floating point capability. Allows host functions to be off-loaded and microprogrammed.</p>	<p><b>Orchid Technology</b> PCTurbo186 Processor Card</p> <p>IBM PC, PC XT, PC AT</p> <p>—</p> <p>—</p> <p>16 bit Full — \$895 (128K)</p> <p>One year 640KB On-board Intel 80186 8 MHz processor. Designed to increase performance of PC 200 to 400%. Includes disk caching and RAM disk. Designed to take on a variety of enhancement daughtercards and companion boards.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Additional Features</b></p>	<p><b>PC Technologies</b> XTender</p> <p>IBM PC, PC XT, PC AT, &amp; some compatibles Intel 8088, 80186, 80286 PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86</p> <p>16 bit 2 full-sized boards March 1984 \$4,995</p> <p>— 4,096KB Provides multi-user (shared processor) capabilities to up to 9 users. On-board Intel 80287 math co-processor. Can execute PC DOS and concurrent DOS applications on the same system. 256K bits/chip.</p>	<p><b>Quadram</b> Liberty</p> <p>IBM PC, PC XT</p> <p>Intel 8088 —</p> <p>8 bit Full 1985 \$345 (64K), \$595 (512K), \$1,295 (2M) Five year 2MB Meets Lotus 1-2-3 and Symphony 1.1 Expanded Memory Specifications. Also uses split memory mapping and extended memory capacity features.</p>	<p><b>Quadram</b> Quad 512 +</p> <p>IBM PC</p> <p>Intel 8088 —</p> <p>8 bit Full 1984 \$325 (64KB), \$550 (256KB), \$895 (512KB) One year 512KB Comes w/QuadMaster III software.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b>	<b>Quadram</b> Quadjr Memory Board IBM PCjr Intel 8088 — Full (for Quadram Quadjr. Expansion Chassis) 1984 \$275 One year 128KB-384KB Comes w/Quadmasterjr. software.	<b>Quadram</b> QuadMEG ATX IBM PC AT Intel 80286 — 16 bit Full 1985 \$445 (128KB), \$1,295 (2MB) One year 0MB-2MB; 4MB w/ daughterboards Meets Lotus 1-2-3 and Symphony 1.1 Expanded Memory Specification. Also features split memory mapping.	<b>Quadram</b> QuadMEMjr. IBM PCjr Intel 8088 — 8 bit Snaps onto side of PCjr 1985 \$275 (218KB), \$675 (256KB), \$995 (512KB) One year 512KB Comes w/QuadMaster software.
<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b>	<b>Quadram</b> Quadsprint IBM PC, PC XT Intel 8088 — Full 1985 \$645 One year 4KB cache memory On-board Intel 8086 processor, 10 MHz, to increase processing speed of PC.	<b>Quadram</b> Short RAM IBM PC, PC XT, PC AT Intel 8088 — 8 bit Half 1985 \$205 (64KB); \$425 (256KB); \$595 (384KB) One year 384KB Comes w/Quadmaster III software.	<b>STB Systems</b> Atta Byte AT&T PC 6300 Intel 8086-2 — 16 bit Full 1985 \$295 (128KB) One year 128KB, 256KB, 384KB PC Accelerator software included. All memory fully parity checked for data errors. 64K bits/chip.

**Notes:**

NA Not applicable

— Information unavailable at press time



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Max Memory Capacity</b>  <b>Additional Features</b></p>	<p><b>STB Systems</b>                  Big Byte                  IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  8 bit                  Full                  —                  \$249                  One year                  64KB, 256KB or 384KB                  64K bits/chip. Memory is parity checked for data errors. Includes PC Accelerator software.</p>	<p><b>STB Systems</b>                  Grande Byte                  IBM PC AT                  Intel 80286                  —                  16 bit                  Full                  —                  \$395-\$3,795 (0-2.5MB)                  One year                  Up to 2.5MB                  Uses 64K or 256K bits/chip. All memory fully parity checked for data errors.</p>	<p><b>STB Systems</b>                  Memory Companion/PC                  IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  8 bit                  Full                  May 1985                  \$349 (64KB)                  One year                  64KB-2MB                  Meets Lotus/Intel expanded memory specification. Uses 64K or 256K bits/chip. All memory fully parity checked for data errors.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Max Memory Capacity</b>  <b>Additional Features</b></p>	<p><b>STB Systems</b>                  Quarter Byte                  IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  8 bit                  —                  —                  \$179 (64KB)                  One year                  64KB, 256KB                  Parity checked for data errors. Includes STB PC Accelerator software.</p>	<p><b>Tecmar</b>                  Dynamic Memory Board                  IBM PC, PC XT                  Intel 8088                  —                  Full                  —                  \$249-\$489                  One year                  0-256KB                  Dynamic RAM memory. Disk emulation and printer buffer included.</p>	<p><b>Tecmar</b>                  Wave 'XT' Memory Board                  IBM PC XT                  Intel 8088                  —                  Half                  —                  \$299-\$499                  One year                  0-256KB                  Dynamic RAM. Std IBM PC parity checking.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time





<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b>	<b>Teletek Enterprises SBC 86/87</b> S-100 bus systems — TurboDOS 1.41, PC DOS 16 bit 5 x .63 x 10 (full) February 1985 \$837 (128KB, 5 MHz) Three year 512KB Slave board w/on-board Intel 8086 processor for use in multi-user, multi-processing TurboDOS-based systems. 2 serial, 1 parallel ports. Can control printers, terminals, disks and diskettes.	<b>Teletek Enterprises SBC-I</b> S-100 bus systems — TurboDOS 1.41 8 bit 5 x .63 x 10 (full) August 1982 \$449 (4 MHz, 64KB) Three year 128KB Slave board w/on-board Zilog Z80 processor for use in multi-user multi-processing TurboDOS based systems. 2 serial ports; can control printers, terminals.	<b>Teletek Enterprises SBC-II</b> S-100 bus systems — TurboDOS 8 bit 5 x .63 x 10 (full) January 1984 \$809 (64KB, 4 MHz) Three year Dual on-board Zilog Z80 processors; serves as slave board that can support two independent users in a multi-user, multi-processing TurboDOS based system. 2 serial ports per user (4 total on board).
<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b>	<b>Teletek Enterprises Systemaster</b> S-100 bus systems — CP/M-80, TurboDOS 8 bit 5 x .63 x 10 (full) August 1982 \$499 (4 MHz, 64KB) Three year 64KB Single board computer in CP/M-based system or file server in a multi-user, multi-processing TurboDOS based system. On-board Zilog Z80 processor. 2 serial, 1 parallel port. Can control printers, terminals, or diskettes.	<b>Teletek Enterprises Systemaster II</b> S-100 bus systems — PC DOS, CP/M-86, TurboDOS 1.41 8 bit 5 x .63 x 10 (full) December 1984 \$679.50 (6 MHz, 128KB) Three year 128KB Single board computer in CP/M-based system or file server in a multi-user, multi-processing TurboDOS based system. On-board Zilog Z80 processor. 2 serial and 2 parallel ports, opt. IEEE-488 port, opt. SASI/SCSI port. 64K bits/chip. Can control printers, terminals, and diskette drives.	<b>Titan Technologies Accelerator 2e</b> Apple II, II + , IIe Synertek 6502, 6502A — 8 bit Fits any Apple slot — \$319 One year — Synertek 65C02 on-board processor increases speed of Apple PCs. 3.6 MHz clock rate. 80KB RAM on-board: 64KB RAM and 16KB emulating ROM.

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b></p>	<p><b>Titan Technologies</b> Accelerator PC</p> <p>IBM PC, PC XT, COMPAQ Portable Intel 8086 PC DOS, MS-DOS; can accept software based on CP/M-86 and UCSD p-System 16 bit Full</p> <p>—</p> <p>\$795 (128KB) One year 128KB-640KB Replaces PC's Intel 8088 microprocessor with Intel's true 16 bit 10 MHz 8086. 512KB printer buffer. Can function as a disk emulator.</p>	<p><b>Titan Technologies</b> Titan 32K</p> <p>Apple II, II + , IIe</p> <p>Synertek 6502, 6502A</p> <p>—</p> <p>8 bit Fits in any Apple slot</p> <p>—</p> <p>\$179 One year 32KB Uses bank switching mode originally developed by Titan Technologies. VC-Expand and Plan-Expand software opt.</p>	<p><b>Titan Technologies</b> Titan 64K</p> <p>Apple II, II + , IIe</p> <p>Synertek 6502, 6502A</p> <p>—</p> <p>8 bit Fits in any Apple slot</p> <p>—</p> <p>\$199 (64KB), \$269 (128KB) One year 64KB-128KB Uses bank switching mode originally developed by Titan Technologies. VC-Expand and Plan-Expand software opt.</p>
<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b></p>	<p><b>Univation</b> CT 640</p> <p>IBM PC, PC XT, &amp; 100% compatibles Intel 8088 PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System, proprietary 16 bit Half May 1984 \$1,295 1 year std, 2 opt. 640KB Includes 1 serial port. Functions as turbo board w/on-board 10 MHz Intel 8086 processor to increase system performance. 256K bits/chip. Includes cache and print spooler software.</p>	<p><b>Univation</b> CT-640-87</p> <p>IBM PC, PC XT, &amp; 100% compatibles Intel 8088 PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System, proprietary 16 bit Full January 1985 \$1,695 One year 640KB On-board Intel 8087 math coprocessor to increase of PC. Speed switch allows PC to switch back to normal PC speeds.</p>	<p><b>Univation</b> DMB 192-192</p> <p>Digital Equipment Rainbow 100, A &amp; B</p> <p>—</p> <p>PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System, proprietary 8 bit</p> <p>—</p> <p>January 1984 \$295 One year 192KB 64K bits/chip.</p>

Notes:  
NA Not applicable  
— Information unavailable at press time



<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems  <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b>	<b>Univation</b> DMB 768-768  DEC Rainbow 100, A & B — PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System, proprietary — August 1985 \$695 One year 768KB NA	<b>Univation</b> DMB-384  DEC Rainbow 100, A & B Intel 8088, 8086, Zilog Z80 PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System, proprietary 8 bit — January 1984 \$395 One year 384KB 64K bits/chip.	<b>Viasyn</b> CPU 286  IEEE 696 S-100 bus systems Intel 8086, 8088, 80286, 80287 —  16 bit — — \$995 One year 16KB On-board 80286 processor, opt. 80287 math processor. 24 address lines allow access to 16MB memory. Clock rate 6 MHz and above.
<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems  <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Additional Features</b>	<b>Viasyn</b> CPU 32016  IEEE-696 S-100 bus — CP/M-86, MP/M-86, Concurrent CP/M-86  32 bit — — \$895 One year 32KB (opt.) On-board Intel 32016 processor. 24-bit addressing accesses 16MB. 16MB unsegmented address space. Power-on jump capability, flexible wait state circuitry and interrupt control. 16-bit I/O address capable of accessing 64 I/O devices.	<b>Viasyn</b> CPU 68K  IEEE 696-S-100 bus — CP/M-86, MP/M-86, Concurrent CP/M-86, proprietary 16 bit — — \$425 One year Up to 16KB On-board Motorola MC 68000 10 MHz processor. Includes provision for 68451 Memory Management Unit and sockets for up to 16KB opt. EPROM.	<b>Viasyn</b> CPU 8086  IEEE-696 S-100 bus — CP/M-86, MP/M-86, Concurrent CP/M-86, proprietary 16 bit — — \$395 One year 1MB Intel 8086-based board w/socket for Intel 8087 math processor chip.

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems</p> <p><b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Max Memory Capacity</b>  <b>Additional Features</b></p>	<p><b>Viasyn</b>                  CPU 85/88</p> <p>All IEEE-696 S-100 bus systems</p> <p>—                  —</p> <p>8 bit, 16 bit                  —                  —</p> <p>\$275 (8 MHz Intel 8088); \$350 (10 MHz Intel 8088)</p> <p>One year                  —</p> <p>Features two on-board processors; 1 Intel 8088 to run 16-bit software; 1 Intel 8085 to run 8-bit software.</p>	<p><b>Viasyn</b>                  CPU-Z</p> <p>S-100 bus systems</p> <p>—                  MS-DOS, CP/M-86, MP/M-86, proprietary</p> <p>8 bit                  —                  —</p> <p>\$275</p> <p>One year                  8KB                  Slave processor w/on-board Zilog Z80 processor.</p>	<p><b>Viasyn</b>                  MDRIVE/H</p> <p>IEEE-696 S-100 bus</p> <p>—                  CP/M-86, MP/M-86, Concurrent CP/M-86, proprietary</p> <p>—                  —                  —</p> <p>\$695-\$2,450</p> <p>One year                  2MB                  Solid-state memory board w/diskette emulation capabilities. Provides between 512KB and 2MB of storage.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems</p> <p><b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Max Memory Capacity</b>  <b>Additional Features</b></p>	<p><b>Viasyn</b>                  RAM 22</p> <p>IEEE-696 S-100 bus systems</p> <p>—                  CP/M-86, MP/M-86, Concurrent CP/M-86, proprietary</p> <p>8 bit, 16 bit                  —                  —</p> <p>\$1,250</p> <p>One year                  256KB</p> <p>Low power static RAM.</p>	<p><b>Viasyn</b>                  RAM 23</p> <p>IEEE-696 S-100 bus systems</p> <p>—                  CP/M-86, MP/M-86, Concurrent CP/M-86, proprietary</p> <p>8 bit, 16 bit                  —                  —</p> <p>\$395 (64KB), \$695 (128KB)</p> <p>One year                  64KB or 128KB</p> <p>Low power static RAM.</p>	<p><b>Viasyn</b>                  SPUZ</p> <p>IEEE-696 S-100 bus systems</p> <p>—                  CP/M-86, MP/M-86, Concurrent CP/M-86, proprietary</p> <p>8 bit                  —                  —</p> <p>\$795 (256KB), \$395 (64KB)</p> <p>One year                  64KB-256KB</p> <p>8 bit slave processor w/on-board Zilog Z80. 2 RS-232C ports.</p>

**Notes:**  
 NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Additional Features</b></p>	<p><b>Zenith Data Systems</b> Z-305 128K Memory Expansion Board</p> <p>Z-100 PC's Intel 8088 PC DOS 16 bit — 1984 \$325 (128KB) 90 day 128KB-320KB NA</p>		
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**Notes:**

- NA Not applicable
- Information unavailable at press time



# SPECIFICATIONS CHART

## Add-On Boards—Communications

234.0045.101

<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Alpha Micro</b> AM-170</p> <p>IBM PC XT, AT&amp;T PC 6300 Intel 8088, 8086-2 PC DOS, MS-DOS, AMOS (Alpha Micro Operating System)</p> <p>16 bit Full 1984 \$2,800 90 day — —</p> <p>On-board Motorola MC 68000. Converts IBM PC XT into a multi-user system running AMOS operating system. Includes clock/calendar. 64K bits/chip.</p>	<p><b>AST Research</b> AST-3270/Coax</p> <p>IBM PC, PC XT, PC AT Intel 8086, 80286 DOS</p> <p>— Half 1985 \$1,145 One year; two year opt. — 3270 coax type A</p> <p>AST-3270/FTS-C is included w/card. Provides data transfer system for MVS/TSO and DM/CMS systems. Multiple windowing, hot key support. Multiple display format profiles supported.</p>	<p><b>AST Research</b> AST-3770</p> <p>IBM PC, PC XT, PC AT Intel 8088, 80286 DOS</p> <p>— Full 1985 \$595; upgrade \$300 One year; two year opt. — SNA/SDLC LU.T1 half duplex mode</p> <p>Allows connection to IBM mainframes for SNA/SDLC RJE support. Automatic translation to/from EBCDIC and ASCII. 9600 baud. On-line help facility.</p>
<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>AST Research</b> AST-3780</p> <p>IBM PC, PC XT, PC AT Intel 8088, 80286</p> <p>— Full 1983 \$895 One year; two year opt. — Bisync</p> <p>Emulates common bisync RJE workstations (2780, 3780, 3741, 2770). Includes software.</p>	<p><b>AST Research</b> AST-5251-11</p> <p>IBM PC, PC XT, PC AT Intel 8088, 80286</p> <p>— Full 1985 \$1,095 One year, two year opt. — 5215 Model 11 emulation</p> <p>Emulates IBM 5251 Model 11 display terminal and printer to connect to IBM System 34, 36, or 38. Includes software.</p>	<p><b>AST Research</b> AST-5251/12</p> <p>IBM PC, PC XT, PC AT Intel 8088, 80286</p> <p>— Full 1983 \$790 One year; two year opt. — IBM 5251 Model 12 emulation</p> <p>Emulates IBM 5251 Model 12 display station and printer to connect IBM PC to System 34, 36 or 38. Includes software.</p>

**Notes:**  
— Information unavailable at press time  
NA Not applicable



<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b>	<b>AST Research</b> <b>AST-BSC</b> IBM PC, PC XT, PC AT Intel 8088 — Full 1983 \$695 One year; two year opt. — 3270 BSC Emulates 3274/76 control unit w/3278/79 display and 3287 type printer. Includes software.	<b>AST Research</b> <b>AST-BSC Cluster</b> IBM PC, PC XT, PC AT Intel 8088, 80286 — 2 cards 1985 \$1,990 One year; two year opt. — 3270 BSC Allows PC and up to 4 add'l PCs or ASCII terminals to communicate w/IBM hosts. Operates as 3270 control unit w/3278/3279 Display Station and 3287-type printer; attached PCs or terminals appear as 3278/3279 Display stations. Software included.	<b>AST Research</b> <b>AST-FourPort/XN</b> IBM PC AT — Xenix — Mid-size July 1985 \$495 One year; two year opt. Up to 4 RS-232C — Std DB25 connectors. On-board Xenix 8286 processor. Xenix software driver supplied, includes Xenix diagnostics. Operates in compatible or enhanced mode.
<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b>	<b>AST Research</b> <b>AST-PCnet</b> IBM PC, PC XT, PC AT Intel 8088, 80286 — Full 1983 \$495 (One card and accessories) One year; two year opt. — — Connects PCs into LAN, allowing sharing of disk drives, printers, & software files. Print spooling software also included.	<b>AST Research</b> <b>AST-PCnet II</b> IBM PC, PC XT, PC AT Intel 8088, 80286 — Full 1984 \$495 (One card and accessories) One year; two year opt. — — Connects PCs into LAN, allowing sharing of disk drives, printers, and software files. Print spooling software also included.	<b>AST Research</b> <b>AST-PCOX</b> IBM PC, PC XT, PC AT Intel 8088, 80286 — Full 1983 \$1,145 — — IBM 3270 Allows IBM PC to emulate a coaxial IBM 3278/79 Display Station, to be connected to IBM 3274/76 terminal controller. Includes software.

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Communications Protocols</b>  <b>Additional Features</b></p>	<p><b>AST Research</b>                  AST-SNA                  IBM PC, PC XT, PC AT                  Intel 8088                  —                  Full                  1983                  \$895                  One year; two year opt.                  —                  3270 SNA/SDLC                  Designed to communicate w/IBM host computers. Operates as 3274/3276 control unit w/attached 3278/79 Display Station and 3287 type printer. Includes software.</p>	<p><b>AST Research</b>                  AST-SNA/BSC Gateway                  IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  Full                  1985                  \$1,995-\$2,695                  One year; two year opt.                  —                  IBM 3270 BSC or SNA/SDLC                  Provides IBM 3270 communications capability from an AST coaxial cable or two-wire "twisted pair" LAN to an IBM 4300, 303x, 380x, or System/370 mainframe computer.</p>	<p><b>AST Research</b>                  AST-SNA/Cluster                  IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  2 cards (full)                  1985                  \$2,190                  One year, two year opt.                  —                  3270 SNA/SDLC                  Complete hardware/software product designed to allow master PC and up to four add'l PCs or ASCII terminals to communicate w/IBM host computers. Operates as 3270 control unit w/attached 3278/3279 Display Station and 3287-type printer; attached PCs or ASCII display station appear as 3278/3279 Display stations. Includes software.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Communications Protocols</b>  <b>Additional Features</b></p>	<p><b>AST Research</b>                  CC-232 Advanced Communications Card                  IBM PC                  Intel 8088                  —                  —                  —                  —                  \$315                  One year; two year opt.                  —                  —                  Designed for user who will be writing his own communications software.</p>	<p><b>AST Research</b>                  Multi I/O                  Apple IIe                  —                  —                  —                  Fits into any slot typically designated for one of its three functions                  1984                  \$235                  One year; two year opt.                  2 serial ports                  —                  Clock/calendar included.</p>	<p><b>AST Research</b>                  Reach!                  IBM PC, PC XT, PC AT                  Intel 8088                  —                  —                  Half                  1984                  \$549                  One year; two year opt.                  —                  —                  300/1200 baud modem. Includes Crosstalk XVI software. Offers on-board speaker, call progress monitoring, remote digital loopback diagnostics, &amp; Hayes compatibility.</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable





<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b>  <b>Additional Features</b>	<b>Avatar Technologies</b> PA100 IBM PC, PC XT, PC AT Intel 8088, 80286 PC DOS — 13.1 x 4.2 (full) 1984 \$895 — Coax type A IBM 3270, BSC and SDLC  Provides IBM 3278/3279 terminal emulation. Functionally similar to DCA's IRMA.	<b>Avatar Technologies</b> PA100 Turbo IBM PC, PC XT, PC AT Intel 8088, 80286 PC DOS — 13.1 x 4.2 (full) 1984 \$1,195 — Coax type A IBM 3270, SDLC and BSC  Provides IBM 3278/3279 terminal emulation w/local processing for IBM PCs.	<b>Barr Systems</b> BARR/HASP IBM PC, PC XT, PC AT, & compatibles Intel 8080, 8086, 8088, 80186, 80286 PC DOS 8 bit, 16 bit Half August 1983 \$890 One year — HASP multileaving workstation terminal emulation (bisync) Transmits data and receives output to multiple printers, plotters and disks. 1MB memory. 2,400 lpm (lines per minute) on PC, 7,000 lpm on PC AT; 19,200 baud on PC, 56,000 baud on PC AT.
<b>Vendor Model</b>  <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b>  <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b>  <b>Additional Features</b>	<b>Bit 3 Computer</b> 401 IBM PC to Multibus Adaptor IBM PC or PC XT Intel 8088, 8086 OS independent 8 bit; 16 bit opt. Two boards: half (IBM PC), full (Multibus) May 1983 \$995 One year NA —  Permits PC to function as a single processor or coprocessor: and as master or slave, on IEEE-796 Multibus. Opt. 32KB dual port RAM.	<b>Bit 3 Computer</b> 402 PC AT to Multibus Adaptor IBM PC AT, Multibus Intel 80286 OS independent 16 bit 2 cards: full (IBM PC AT), full (Multibus) 1985 \$1,175 One year NA —  Permits PC AT to function as a single processor or coprocessor, and as master or slave on IEEE-796 Multibus.	<b>Bit 3 Computer</b> 701 Dual-Comm Plus  Apple II, II + Synertek 6502 AppleDOS 8 bit Full  1980 \$239 — 2 serial TTY, IBM 2780/3780, IBM 3270 (BSC and SNA) Can control any RS-232C-interfaced modem, printer, or terminal. With appropriate software, can function as terminal emulator. Uses on-board Zilog Z80 chip.

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Bizcomp</b> IntelliModem, Models ST, XT, and XL</p> <p>IBM PC, PC XT, &amp; compatibles Intel 8086, 8088 PC DOS</p> <p>—</p> <p>Half (XT), full (ST, XL) Mid 1984 ST-\$499, XT-\$549, XL-\$549 2 year</p> <p>—</p> <p>Bell 103/212A-compatible modem. 110, 300, or 1200 bps; full or half duplex communications.</p>	<p><b>Caere</b> Model 240 PC Scanner</p> <p>IBM PC, PC XT, PX AT, &amp; compatibles Intel 8088, 80286 Transparent to OS 8 bit 5 x 0.5 x 4.25 October 1982 \$745 One year</p> <p>—</p> <p>On-board Intel 8085 processor. Automatic data entry using hand-held bar code pen. Keyboard and program transparency. Menu selection of codes and other controls.</p>	<p><b>Caere</b> PC SCAN-NET Model 941</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286 PC DOS</p> <p>—</p> <p>13.3 x 0.85 x 4.2 (half) January 1985 \$1,789 One year 2 serial 485 scanners On-board Intel 8085 processor. Bar code scanner network for up to 64 scanners. Two-way communications thru async com line. Converts RS-422 networking line to RS-232 data communications. Stand-alone board unit w/own power.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Comark</b> CBX-DI240</p> <p>Any system with SBX ports Any Any</p> <p>—</p> <p>3.75 x 0.8 x 3.75 October 1984 \$150 One year 24 parallel</p> <p>—</p> <p>Provides 24 lines of bi-directional parallel I/O. Can control parallel port printers.</p>	<p><b>Comark</b> CBX-SASI</p> <p>Any system with SBX ports Any Any</p> <p>—</p> <p>October 1984 \$175 One year (parts) 1 SASI/SCSI</p> <p>—</p> <p>Provides an SASI bus out of host system. Can control disks, diskettes, and magnetic tape.</p>	<p><b>Comark</b> CBX-SI-200</p> <p>Any system w/SBX ports Any Any 8 bit</p> <p>—</p> <p>October 1984 \$250 One year parts 2 serial SNA/SDLC, HDLC Dual channel, multiprotocol serial controller. Baud rate up to 1M baud. Can control modems, printers, terminals.</p>

**Notes:**  
— Information unavailable at press time  
NA Not applicable



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Control Systems</b> Hostess 4/8</p> <p>IBM PC, PC XT, PC AT Intel 8086, 8088, 80186, 80286</p> <p>PC-DOS 2.0, 3.0, XENIX 8 bit Half</p> <p>—</p> <p>\$495 (4 ports), \$750 (8 ports)</p> <p>90 day 4 or 8 (2nd 4 in daughter board)</p> <p>—</p> <p>Multi-user host adapter; serial adapter for communications. HOSTBIOS software for COM3-COM18. Support for QNX, IRMX-86, Coherent and MultiLink.</p>	<p><b>Datapoint</b> 0740 Intelligent Network Executive-PC (INX-PC)</p> <p>IBM PC, PC XT, PC AT Intel 80286, 8088</p> <p>PC DOS — — —</p> <p>\$695; \$75 for software</p> <p>— —</p> <p>Datapoint 8220 terminal emulation</p> <p>Integrates at IBM PC, PC XT, or PC AT into a Datapoint ARC LAN. W/Datapoint PC 8220 software, can emulate a Datapoint 8220 terminal.</p>	<p><b>Datec</b> PAL Plus</p> <p>IBM PC, &amp; compatibles —</p> <p>PC DOS — —</p> <p>December 1983 Quantity-one, \$499, quantity-100, \$349 One year 1 serial</p> <p>—</p> <p>0-300/1200 bps modem card. Shipped w/Crosstalk XVI software.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Digigraphic Systems</b> COM 4</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286 PC DOS, CDOS, UNIX</p> <p>—</p> <p>Full August 1983 \$349 One year 4 serial ports</p> <p>—</p> <p>For use in multi-user and/or multiple I/O environment. Opt. software to access ports under DOS.</p>	<p><b>Digigraphic Systems</b> COM 8</p> <p>IBM PC, PC XT, PC AT &amp; compatibles Intel 8088, 80286 PC DOS, CDOS, UNIX</p> <p>—</p> <p>Full May 1984 \$649 One year 8 serial</p> <p>—</p> <p>For use in multi-user and/or multiple I/O environment. Opt. software to access ports under DOS.</p>	<p><b>Digigraphic Systems</b> COM PLUS</p> <p>IBM PC, PC XT, PC AT &amp; compatibles Intel 8088, 80286 PC DOS</p> <p>—</p> <p>Half October 1984 \$109 One year 1 serial, 1 parallel, 1 game</p> <p>—</p> <p>Diagnostic software opt.</p>

**Notes:**

- Information unavailable at press time  
NA Not applicable



<p><b>Vendor</b></p> <p><b>Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Digital Communications Associates</b> IRMA</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8085, 8086, 8088, 80186, and 80286</p> <p>PC DOS, MS-DOS</p> <p>16 bit</p> <p>Full</p> <p>December 1982</p> <p>\$1,195</p> <p>One year</p> <p>1 coax</p> <p>IBM 3270, IBM coax protocol.</p> <p>Micro-to-mainframe link w/IBM 3278/79 terminal emulation. Provides file transfer capabilities for VM/CMS and MVS/TSO environments. Light pen interface, APL programming support opt.</p>	<p><b>Digital Communications Associates</b> IRMAcom/3270</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286</p> <p>PC DOS, MS-DOS</p> <p>16 bit</p> <p>—</p> <p>January 1985</p> <p>\$895</p> <p>One year</p> <p>1 serial</p> <p>3270/SNA</p> <p>Enables PC's to access networks using synchronous protocols over leased or switched lines in an SNA/SDLC environment by emulating 3270 controllers. Consists of IRMAcom board and software.</p>	<p><b>Digital Communications Associates</b> IRMAcom/3270B</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286</p> <p>PC DOS, MS-DOS</p> <p>16 bit</p> <p>—</p> <p>December 1984</p> <p>\$895</p> <p>One year</p> <p>1 serial</p> <p>2780/3780, 3270 BSC</p> <p>Enables PC to communicate w/host system in bisync environment by emulating 3270 controllers. Consists of IRMAcom board and software.</p>
<p><b>Vendor</b></p> <p><b>Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Digital Communications Associates</b> IRMAcom/3770</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286</p> <p>PC DOS, MS-DOS</p> <p>16 bit</p> <p>—</p> <p>\$895</p> <p>One year</p> <p>1 serial</p> <p>3770/SNA</p> <p>Provides 3770 RJE workstation emulation in SNA environments. Consists of IRMAcom board and software.</p>	<p><b>Digital Communications Associates</b> IRMAcom/RJE</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286</p> <p>PC DOS, MS-DOS</p> <p>16 bit</p> <p>—</p> <p>\$895</p> <p>One year</p> <p>1 serial</p> <p>2780/3780</p> <p>Provides 2780/3780 RJE workstation emulation in BSC environments. Consists of IRMAcom board and software.</p>	<p><b>Digital Communications Associates</b> IRMAlette</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8085, 8086, 8088, 80186, 80286</p> <p>PC DOS, MS-DOS</p> <p>16 bit</p> <p>Full</p> <p>—</p> <p>\$395</p> <p>One year</p> <p>1 serial</p> <p>TTY</p> <p>Used in conjunction w/DCA's IRMAline, provides remote PCs w/IBM 3278/79 terminal emulation, and file transfers under VM/CMS and MVS/TSO.</p>

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 NA Not applicable



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Digital Equipment</b> DECNA-K Ethernet to PRO-350/380 Controller &amp; PRO/DECnet License</p> <p>Digital Equipment Professional 350 and 380</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>\$895</p> <p>—</p> <p>—</p> <p>DECnet</p> <p>128KB memory. Allows Professional 350 and 380 systems to tie into high speed DECnet LANs.</p>	<p><b>Digital Equipment</b> Extended Communications Option</p> <p>Digital Equipment Rainbow</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>\$500</p> <p>—</p> <p>—</p> <p>DDCMP, bisync, SDLC, HDLC, ADCCP</p> <p>For floppy-based system. Can communicate w/IBM mainframes as 3270 terminal w/software.</p>	<p><b>Dual Systems</b> AIM-12</p> <p>S-100, IEEE 696-based systems</p> <p>Zilog Z80, Intel 8080, 8085, 8086, 8088, 80186, 80286, Motorola MC 68000</p> <p>CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System</p> <p>—</p> <p>10 x 0.6 x 5</p> <p>1980</p> <p>\$725</p> <p>One year</p> <p>—</p> <p>—</p> <p>Analog to digital converter. 35 nsec conversion time. Instrumentation amplifier, 12-bit resolution and accuracy, 32 channels single-ended or 16 channels differential.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Dual Systems</b> AOM-12</p> <p>All S-100, IEEE-696-based systems</p> <p>Zilog Z80, Intel 8080, 8085, 8086, 8088, 80186, 80286, Motorola MC 68000</p> <p>CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System</p> <p>—</p> <p>10 x 0.5 x 5</p> <p>1980</p> <p>\$675</p> <p>One year</p> <p>—</p> <p>—</p> <p>Digital to analog converter. 12 bit <math>\pm 1/2</math> LSB accuracy. Voltage outputs of 0 to 10V, <math>\pm 5V</math>, and <math>\pm 10V</math>. Four separate channels.</p>	<p><b>Dual Systems</b> SI04-DMA</p> <p>Dual 83/20, 83/80, 83/500, &amp; all S-100, IEEE-696-based computers</p> <p>Zilog Z80, Intel 8080, 8085, 8086, 8088, 80186, 80286, Motorola MC 68000</p> <p>CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System</p> <p>—</p> <p>10 x 0.5 x 5 (full)</p> <p>1982</p> <p>\$695</p> <p>One year</p> <p>4 serial</p> <p>TTY</p> <p>Intelligent serial I/O board w/direct memory access. Built-in 8085A processor.</p>	<p><b>Dual Systems</b> VIC4-20</p> <p>S-100, IEEE-696-based systems</p> <p>Zilog Z80, Intel 8080, 8085, 8086, 8088, 80186, 80286, Motorola MC 68000</p> <p>—</p> <p>—</p> <p>10 x 0.6 x 5 (full)</p> <p>1980</p> <p>\$600</p> <p>One year</p> <p>—</p> <p>—</p> <p>Serves as voltage-to-current converter module. 4-20 mA current outputs for industry-standard controls. Overvoltage protection on all current output. Full 12-bit performance. 12-bit <math>\pm 1/2</math> LSB accuracy. Low drift, .01%/°C.</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                    Operating Systems    <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Communications Protocols</b>  <b>Additional Features</b></p>	<p><b>Electronic Modular Systems</b>                  ICC-1                    All VMEbus systems                  Intel 8086, 80186, Motorola                  MC 68000                  CP/M-86, MP/M-86, UNIX,                  pSOS, CP/M-68K                  16 bit                  Full                  —                  \$935                  90 day                  4 serial, 1 parallel                  —                  Intelligent communications                  controller w/on-board Zilog                  Z80 processor. UNIX                  interface.</p>	<p><b>Electronic Modular Systems</b>                  VME-488                    VMEbus systems                  Motorola MC 68000                    UNIX, CP/M-68K, pSOS                    16 bit                  Full                  —                  \$1,295                  90 day                  IEEE-488 ports                  —                  Enables transfers of data                  between VMEbus and GPIB                  bus. Can make a VMEbus                  computer a controller/group                  manager for remotely                  programmable test and                  measurement devices w/in                  a GPIB instrumentation                  system.</p>	<p><b>Emulex Persyst</b>                  Coax/3270                    IBM PC, PC XT, PC AT                  Intel 8088, 80286                    —                  —                  \$1,095                  Two year                  —                  3270 SNA or BSC                  Hardware and software                  micro-to-mainframe link.                  Connects PC to IBM 3274                  or 3276 Control Unit; uses                  3278-2 or 3279-S2A/S2B                  terminal emulation.</p>
<p><b>Vendor Model</b>    <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems    <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Communications Protocols</b>    <b>Additional Features</b></p>	<p><b>Emulex Persyst</b>                  DCP-88/VM Communications                  Processor                    IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  —                  Full                  —                  \$1,000-\$2,150 (64KB-512KB)                  Two year                  1 parallel                  Async, BSC, SNA/SDLC,                  HDLC                  On-board Intel 8088                  processor. 64KB-512KB                  memory. Designed for                  Persyst communications                  software including PC/3270                  SNA Emulation Software,                  PC/3270 BSC Emulation                  Software, PC/HASP RJE                  Software, and PCP/EXEC                  Software.</p>	<p><b>Emulex Persyst</b>                  Multiple Protocol                  Communications Controller                    IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  —                  Half                  —                  \$245                  Two year                  1 serial                  Async, HDLS, SNA/SDLC,                  BSC                  On-board Zilog 8530-SCC                  serial communications                  processor; designed for                  Persyst communications                  software including PC3270                  SNA Emulation Software,                  PC/3270 BSC Emulation                  Software, and PC/3780 RJE                  Software.</p>	<p><b>Enterprise Systems</b>                  10611 Parallel I/O Board                    Any STD bus system                  —                  8 bit                  —                  —                  \$195                  Limited one year                  8 parallel                  —                  Universal TTL I/O board</p>

Notes:  
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 NA Not applicable



<p><b>Vendor</b> <b>Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Fast Feedback Technologies</b> 1553-Net</p> <p>IBM PC XT, PC AT, Apple II, S-100 VME bus Zilog Z80, Intel 8086, 8088, 80186, 80286, Synertek 6502, Motorola MC 68000</p> <p>PC DOS, CP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System 8 bit, 16 bit 8 x 0.5 x 5 (half) January 1983 \$350 One year 1 Serial Ethernet subset</p> <p>Background server w/opt. software for Fast Feedback Technologies LAN. 256KB memory. 256K bits/chip.</p>	<p><b>Fast Feedback Technologies</b> M-500</p> <p>IBM PC XT, PC AT, Apple II Zilog Z80, Intel 8080, 8085, 8086, 8088, 80186, 80286, Synertek 6502, Motorola MC 68000 PC DOS, CP/M-86</p> <p>8 bit, 16 bit 12 x 2 x 8 January 1984 \$1,495 One year 1 serial, 2 parallel —</p> <p>Designed for use in LAN. Contains proprietary high speed engine (designed to be 500 times faster than PC XT). PC-based instrumentation useful for test measurement and control. 16 color graphics. 640KB memory, 256K bits/chip.</p>	<p><b>Frontier Technologies</b> AdCom 2 Advanced Communications Controller</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286</p> <p>—</p> <p>8 bit Full March 1984 \$275 One year 1 parallel (opt.) Async protocols; 3270 BSC, 3780 BSC, 3270 SNA/SDLC, X.25, HDLC, VIP Multiple protocol micro-to-mainframe controller. Can use 19.2K baud rates. 128KB max memory capacity. On-board Zilog Z80-SIO communications controller. Opt. clock/calendar.</p>
<p><b>Vendor</b> <b>Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Frontier Technologies</b> AdCom 2-I Intelligent Advanced Communications Controller</p> <p>IBM PC, PC XT, PC AT, and compatibles Intel 8088, 80286 PC DOS 8 bit Full February 1985 \$1,295 One year —</p> <p>Async protocols; 3270 BSC, 3780 BSC, 3270 SNA/SDLC, X.25, HDLC, VIP</p> <p>Multiple protocol, multiple interface micro to mainframe controller, ideal for PC X.25 software. 76K baud rates. 512KB max memory capacity. On-board Intel 80188 chip.</p>	<p><b>Frontier Technologies</b> AdCom 2-M Advanced Communications Controller</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286 PC DOS 8 bit Full February 1985 \$850 One year —</p> <p>Async protocols; 3270 BSC, 3780 BSC, 3270 SNA/SDLC, X.25, HDLC, VIP</p> <p>Multiple protocol and multiple interface micro-to-mainframe controller. On-board Zilog Z80-SIO controller chip. 128KB max memory capacity. Automatic error checking (parity, overflow, framing, CRC). Interfaces include RS-232, RS-422, RS-H23, MIL 188-114 bal, MIL 188-114 unbal, MIL 188C)</p>	<p><b>Gamma Link</b> GammaCom</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286 PC DOS</p> <p>—</p> <p>Full July 1984 \$1,995 One year —</p> <p>3270 BSC and SNA, 3780 BSC, 3790 SNA, 5251/12 SNA, HASP, SPERRY, X.25 LAPB, and all synchronous protocols. 9,600 bps modem card. Works over dial-up lines.</p>

**Notes:**

— Information unavailable at press time  
NA Not applicable



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Gateway Communications</b> G/Net LAN I/F Card</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80186, 80286 PC DOS 8 bit Full September 1983 \$525 One year — CSMA/CD/CA 64KB RAM. Transmission rate 1.43 Mbps. On-board Zilog Z80B processor.</p>	<p><b>Gateway Communications</b> WNIM</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286 PC DOS 8 bit Full March 1985 \$595 One year 2-4 serial X.25 Connects single section PC or a LAN to an X.25 packet data network or a mainframe supporting X.25. Runs Gateway Communications G/X25 software pkg. On-board Zilog Z80B processor.</p>	<p><b>IBM</b> 3278/79 Emulation Adapter (#2507)</p> <p>IBM PC, 5531 Industrial Computer Intel 8088 — Full — \$905 — — IBM 3270 Provides micro-to-mainframe link. W/PC 3278/79 Emulation Control Program, the PC can emulate a 3278 Display Station mdl 2 or a 3279 Color Display Station mdl 2A or 52A, and support file transfer with the host.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>IBM</b> Aynchronous Communications Adapter (#2074)</p> <p>IBM PC, PC XT, 5531 Industrial Computer Intel 8088 — Half — \$100 — 1 Serial (RS-232C) — Connects data processing or I/O devices to PC.</p>	<p><b>IBM</b> Binary Synchronous Communications Adapter (#1204 or 2075)</p> <p>IBM PC, PC XT, PC AT, 5531 Industrial Computer Intel 8088, 80286 — — — \$240 — 1 serial (RS-232C) — W/BSC 3270 Emulation Program, can be used to emulate 3270 interactive BSC operation and perform file transfer operation. Operates at up to 9600 bps. Max of two, only one if SDLC Adapter is installed on same system.</p>	<p><b>IBM</b> Display Station Emulator Adapter (#2887)</p> <p>IBM PC, PC XT, 5531 Industrial Computer Intel 8088 — Full — \$600 — — W/5520/Personal Computer Attachment Program, version 1 or 2, PC can access local 5520 Administrative System's word processing, records processing, storage distribution, and 3270 emulation facilities. W/PC 5250 Emulation Program, PC can be connected to System/34, 36 or 38 as a workstation.</p>

**Notes:**  
— Information unavailable at press time  
NA Not applicable





<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b>	<b>IBM</b> Enhanced Display Station Emulation Adapter (#2879) IBM PC, PC XT, PC AT Intel 8088, 80286 — Full — \$595 — — — — Links PC to System/34, /36, or /38. Emulates a 5291 or 5292 display and 5256 or 5219 printer.	<b>IBM</b> Game Control Adapter (#1300) IBM PC, PC XT, PC AT Intel 8088, 80286 — — — \$45 — — — — Permits up to two joysticks or up to four game paddles to be attached to PC. Can also serve as general purpose I/O card w/4 analog inputs plus four digital input points.	<b>IBM</b> General Purpose Interface Bus Adapter (#1503) IBM PC, PC XT, PC AT Intel 8088, 80286 — Half \$395 One year — — — Enables PC to access and control IEEE-488 compatible instruments and devices. Designed to ANSI/IEEE-488 Standard 1978.
<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b>	<b>IBM</b> IBM PC AT/370 Option Kit (#6115) IBM PC AT Intel 80286 — 2 full size cards — \$3,095 One year — — — Upgrades IBM Personal Computer AT to IBM Personal Computer AT/370.	<b>IBM</b> IBM PC Data Acquisition and Control Adapter (#1502) IBM PC, PC XT, PC AT Intel 8088, 80286 — — — \$1,275 — — — — 4 analog input channels, 2 analog output channels (both 12-bit resolution), 16 channel digital input port, 16 channel digital output port. Used for data acquisition control, analysis, & quality control functions.	<b>IBM</b> Prototype Adapter (#0220) IBM PC AT Intel 80286 — 13.12 x — x 4.8 — \$35 — — — Serves as base for building and testing custom attachments to PC. No components shipped w/card. Recommended system interface logic diagram avail along w/list of recommended components.

**Notes:**

- Information unavailable at press time  
 NA Not applicable



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<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>IDEAssociates</b> IDEA Minicomm (CPR)</p> <p>IBM PC, PC XT, and PC AT</p> <p>Intel 8088, 80286</p> <p>PC DOS</p> <p>16 bit</p> <p>Half</p> <p>—</p> <p>\$295 (w/out software)</p> <p>One year</p> <p>—</p> <p>IBM 3780/BSC, 3270 SNA or BSC, 3770/SNA</p> <p>Micro-to-mainframe link. Supports 2 channels of asynchronous, byte synchronous, or bit synchronous RS-232 communications. Built-in baud rate generator, internal loopback flexible clocking. 64K bits/chip.</p>	<p><b>IDEAssociates</b> IDEAcomm 1200 (CPR)</p> <p>IBM PC, PC XT, PC AT</p> <p>Intel 8088, 80286</p> <p>PC DOS</p> <p>16 bit</p> <p>13.13 x 0.5 x 4.25 (full)</p> <p>—</p> <p>\$495</p> <p>One year</p> <p>—</p> <p>—</p> <p>Contains on-board Hayes compatible modem. W/software, features auto log-on, autodial, 2 sftwr select. baud rates (300 or 1200), spool to printer or disk, transmit &amp; receive files, automatically answer or imitate phone calls. Asynch, full duplex. Runs Smartcom, Crosstalk, and PC talk. 64K bits/chip.</p>	<p><b>IDEAssociates</b> IDEAcomm 3278 (CPR)</p> <p>IBM PC, PC XT, PC AT</p> <p>Intel 8088, 80286</p> <p>PC DOS</p> <p>16 bit</p> <p>Full</p> <p>—</p> <p>\$995</p> <p>One year</p> <p>—</p> <p>3270 SNA/SDLC or BSC</p> <p>Allows IBM PCs to interface via coax cable w/IBM 3274 and 3276 cluster controllers. Emulates IBM 3278/3279 terminal. 2.35Mbits/sec. 64K bits/chip.</p>

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 NA Not applicable



<p><b>Vendor</b> <b>Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b></p>	<p><b>IDEAssociates</b> IDEAcomm 5251 (CPR)</p> <p>IBM PC, PC XT, PC AT Intel 8088, 80286 PC DOS 16 bit Full</p> <p>— \$895 One year —</p> <p>5251 terminal emulation Provides PC-to-minicomputer (IBM S/3x) local communications. Software provides print support, disk access, "hot-key" function, and color mapping. 64K bits/chip.</p>	<p><b>IDEAssociates</b> IDEAmini (YPR)</p> <p>IBM PC, PC AT, PC XT Intel 8088, 80286 PC DOS 16 bit 4.25 x 0.5 x 5.75 (half)</p> <p>— \$175 (w/one option) 2 year Opt.: 1 parallel, 1-2 serial —</p> <p>Clock calendar opt. Software included, provides print spooler, diagnostics, and clock software. 64K bits/chip.</p>	<p><b>IDEAssociates</b> IDEAnet (NPR)</p> <p>IBM PC, PC AT, PC XT Intel 8088, 80286 PC DOS 16 bit Full</p> <p>— \$1,195 (IDEAnet starter kit) One year —</p> <p>CSMA/CD Combined hardware/software product. Coax cable operates w/in 2,000 ft; links up to 20 PC's. 800,000 bps. Master station capability, no dedicated file server, security features. Integrated with IDEAdisk. 64K bits/chip.</p>
<p><b>Vendor</b> <b>Model</b> <b>Compatibility</b> Computer/Bus  Microprocessors  Operating Systems  <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b>  <b>Additional Features</b></p>	<p><b>Information Technologies</b> Linkup 1</p> <p>IBM PC, PC XT, &amp; compatibles Intel 8086, 8088, 80186, 80286 PC DOS, MS-DOS</p> <p>8 bit 13 x — x 4.2 (full) August 1983 \$995 —</p> <p>ATERM, ABLOCK, VT52/100, TTY, 3270 SNA and BSC, 3770 SNA, 3780 BSC. 36KB memory. Supports multiple unattended modes, dial-up, log-on, file transfer, job and program execution, high speed coprocessor up to 56KB. Price includes software.</p>	<p><b>Information Technologies (ITI)</b> Linkup Coax</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8086, 8088, 80186, 80286 PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UCSD p-System, UNIX, proprietary</p> <p>8 bit 13 x — x 4.2 (Full) January 1985 \$995 —</p> <p>3278 coax</p> <p>SNA 3278 terminal emulator. 8KB memory. Effects file transfer to and from host; user can define keyboard layout; price includes software. Functionally similar to PHAZE Brigitte, or DCA's IRMA.</p>	<p><b>Information Technologies (ITI)</b> Linkup XT</p> <p>IBM PC, PC XT, PC AT &amp; compatibles Intel 8086, 8088, 80186, 80286 PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UCSD p-System, UNIX, proprietary</p> <p>8 bit 13.6 x — 4.2 (Full) June 1984 \$785 —</p> <p>3270 SNA or BSC, 3770 SNA, 2780/3780 BSC</p> <p>Micro-to-mainframe link for remote communications. Multiple 3270 sessions. Price includes software.</p>

**Notes:**

- Information unavailable at press time  
NA Not applicable



<p><b>Vendor</b> <b>Model</b> <b>Compatibility</b> Computer/Bus  Microprocessors  Operating Systems  <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b>  <b>Additional Features</b></p>	<p><b>Information Technologies (IT)</b> Linkup XT +  IBM PC, PC XT, PC AT, &amp; compatibles Intel 8086, 8088, 80186, 80286 PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UCSD p-System, UNIX, proprietary. 8 bit Half June 1985 \$785 — — 3270 SNA or BSC, 3770 SNA, 2780/3780 BSC For remote communications. Multiple 3270 sessions. Price includes software.</p>	<p><b>Intercontinental Micro Systems</b> LAN-PC  IBM PC, PC XT, PC AT, &amp; compatibles Zilog Z80, Intel 8086, 8088, 80186, 80286 PC DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, TurboDOS, XENIX 8 bit 10.5 x .63 x 4 November 1984 \$495 One year — ARCnet  Links PC's and ARCnet LANs. Can convert PC's into intelligent workstations, diskless workstations and file processors. Opt. 64K-256K dynamic RAM.</p>	<p><b>Intercontinental Micro Systems</b> LAN5100  Any IEEE 696.1/D2 S-100 bus system Any compatible w/IEEE 696.1/D2 specs TurboDOS 8 bit 10 x .56 x 5.5 June 1984 \$495 One year — —  Acts as interface between S-100 bus and LAN; can link S-100 bus systems to other ARCnet compatible 8 and 16 bit computers such as IBM PC's and compatibles.</p>
<p><b>Vendor</b> <b>Model</b> <b>Compatibility</b> Computer/Bus  Microprocessors Operating Systems  <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b>  <b>Additional Features</b></p>	<p><b>Interstate Voice Products</b> CSR (Connected Speech Recognition Board)  IBM PC, PC XT, &amp; compatibles — OS independent 8 bit Full September 1984 \$1,250 w/out microphone; \$1,410 w/microphone — — —  128KB RAM, 32KB EPROM. Using Texas Instruments TMS 5220 speech processor, supports continuous or discrete recognition. 240 word vocabulary. Provides keyboard emulation. Voice synthesis module opt. (\$350 extra).</p>	<p><b>Interstate Voice Products</b> VRT 300  DEC VT-100 terminal, C-Itch CIT 101, Plessey PT 100-B — OS independent — 9.3 x — x 10.44 1982 \$850 (w/out microphone); \$1,110 (w/microphone) — — —  Adds speech recognition capabilities to PC. 200 word vocabulary.</p>	<p><b>Lanier Business Products</b> PC-Touch  Lanier 1200 workstation; Lanier Business processor 1000 Zilog Z80 PC DOS; CP/M-86, MS-DOS, HDOS 8 bit, 16 bit Full September 1984 \$595 — 1 parallel TTY, VT-100, 2780/3780, 3270 Adds IBM PC functionality to Lanier line of microprocessors.</p>

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<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b></p> <p><b>Communications Protocols</b> <b>Additional Features</b></p>	<p><b>Macrotech International</b> ADIT</p> <p>Alpha Micro (meets S-100 IEEE-696 specifications) Intel 8080, 8085, 8086, 8088, 80186, 80286, Motorola MC 68000</p> <p>PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX; drivers must be supplied for AMOS</p> <p>8 bit, 16 bit 5 x — x 10 (half) 1983</p> <p>\$1,795 (16 port) One year 4, 8, 12 or 16 serial ports, 1 IEEE-488 port</p> <p>—</p> <p>16 channel intelligent I/O running w/Zilog Z80B. 32KB CMOS static RAM. Employs 8530 dual channel Serial Communications Controller. On-board Zilog Z80B processor.</p>	<p><b>Multi-Tech Systems</b> Multi Modem (MT-224 PC)</p> <p>IBM PC, PC XT, PC AT, 3270 PC &amp; compatibles Intel 8088, 80286</p> <p>—</p> <p>—</p> <p>February 1985 \$795 2 year 1 serial</p> <p>TTY, ANSI 300/1200/2400 bps modem card. Includes MultiCom PC communications software. Controls disk and diskette drives, and serial or parallel printer. Functionally similar to Hayes Smartmodem 2400.</p>	<p><b>Multi-Tech Systems</b> MultiModem IIe (MT-103E)</p> <p>Apple II, II+, IIe</p> <p>Synertek 6502, 6502A</p> <p>—</p> <p>—</p> <p>Full January 1983 \$199 2 year 1 serial</p> <p>TTY Functions as 300/110 bps modem card. Includes MultiCom II communications software. Controls serial or parallel printer. 15KB printer buffer. Functionally similar to Hayes Micromodem II.</p>
<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b></p>	<p><b>Multi-Tech Systems</b> MultiModem PC (MT-212 PC)</p> <p>IBM PC, PC XT, PC AT, 3270 PC &amp; compatibles Intel 8088, 80286</p> <p>—</p> <p>Full December 1983 \$479 2 year 1 serial TTY, ANSI</p> <p>Functions as 300/1200 bps modem card. Includes MultiCom PC communications software. Can control disks, diskette drives, and serial or parallel printer. Functionally similar to Hayes Smartmodem 1200B.</p>	<p><b>Natural Microsystems</b> Watson</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8086, 8088, 80186, 80286 PC DOS, MS-DOS</p> <p>—</p> <p>13.25 x .63 x 3.88 (full) May 1984 \$698 including software One year parts &amp; labor</p> <p>—</p> <p>Digital voice processing telephone message system. On-board Hayes-compatible 300/1200 modem, electronic phone book, automatic daily calendar automatic time recording/billing system. Add'l VIS chip option adds touchtone question and answer capabilities.</p>	<p><b>Orchid Technology</b> PCnet</p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>—</p> <p>8 bit Full 1982 \$495 One year</p> <p>—</p> <p>CSMA/CD Links up to 255 PCs in a shared network. Includes printer sharing, interactive electronic message system, disk caching, and public/private disk volume utilities.</p>

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NA Not applicable



<p><b>Vendor</b></p> <p><b>Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Orchid Technology</b></p> <p>PCnet Blossom</p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>PC DOS 2.0, 2.1, 3.0</p> <p>8 bit</p> <p>Full</p> <p>1984</p> <p>\$795 (includes daughter card, 64KB RAM)</p> <p>One year</p> <p>1 serial, 1 parallel</p> <p>CSMA/CD</p> <p>64KB-384KB memory. Allows sharing of resources among PC users. Clock included.</p>	<p><b>PHAZE Information Machines</b></p> <p>Brigitte</p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>PC DOS, MS-DOS, CP/M-86, MP/M-86</p> <p>16 bit</p> <p>13.1 x 0.8 x 4.2</p> <p>August 1984</p> <p>\$995</p> <p>—</p> <p>1 coax</p> <p>3278 coax</p> <p>Zilog 2901 processor on-board. Provides 3278/79 terminal emulation. 1920 char display buffer, 16-color graphics. Functionally similar to Digital Communications Associates IRMA board. Light pen support.</p>	<p><b>Qua Tech</b></p> <p>ADM12-10 Module</p> <p>IBM PC, PC XT, PC AT &amp; compatibles</p> <p>Intel 8086, 8088, 80186, 80286</p> <p>PC DOS</p> <p>—</p> <p>Module for Qua Tech MXI-241 or PXB-721 motherboard</p> <p>May 1984</p> <p>\$495</p> <p>90 day</p> <p>—</p> <p>—</p> <p>12-bit, 16 channel A/D converter module. 16 single-ended or 8 differential channels. Gain selection of 1, 10, or 100 24 KHz thru-put rate. Software drivers provided std.</p>
<p><b>Vendor</b></p> <p><b>Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Qua Tech</b></p> <p>ADM12-11 Module</p> <p>IBM PC, PC XT, PC AT &amp; compatibles</p> <p>Intel 8086, 8088, 80186, 80286</p> <p>PC DOS</p> <p>—</p> <p>Module for Qua Tech MXI-241 or PXB-721 motherboard</p> <p>—</p> <p>\$595</p> <p>90 day</p> <p>—</p> <p>—</p> <p>12-bit, 16 channel A/D converter module. 16 single-ended or 8 differential channels. Gain selection of 1, 10, or 100 30 KHz thru-put rate. Software drivers provided free of charge.</p>	<p><b>Qua Tech</b></p> <p>ADM8-10 Module</p> <p>IBM PC, PC XT, PC AT &amp; compatibles</p> <p>Intel 8086, 8088, 80186, 80286</p> <p>PC DOS</p> <p>—</p> <p>Module for Qua Tech MXI-241 or PXB-721 motherboard</p> <p>May 1984</p> <p>\$295</p> <p>90 day</p> <p>—</p> <p>—</p> <p>8-bit, 16 channel A/D converter module. 16 single-ended or 8 differential channels. Gain selection of 1, 10, or 100 30 KHz thru-put rate. Software drivers provided free of charge.</p>	<p><b>Qua Tech</b></p> <p>CTM-10 Module</p> <p>IBM PC, PC XT, PC AT and compatibles</p> <p>Intel 8086, 8088, 80186, 80286</p> <p>PC DOS</p> <p>—</p> <p>Module for Qua Tech MXI-241 or PXB-721 motherboard</p> <p>April 1985</p> <p>\$195</p> <p>90 day</p> <p>—</p> <p>—</p> <p>Combination pulse counter/timer. 3 counters w/jumper selectable contact debounce or signal conditioning. 2MHz std, opt. 5MHz.</p>

Notes:  
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 NA Not applicable



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<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b>  <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b>	<b>Qua Tech</b> DSDP-401 IBM PC & compatibles Intel 8086, 8088, 80186 PC DOS — Full August 1984 \$245 90 day 2 serial, 2 parallel — Clock calendar opt., one serial and one parallel cable provided.	<b>Qua Tech</b> MXI-241 IBM PC, PC XT, PC AT & compatibles Intel 8086, 8088, 80186, 80286 PC DOS — — May 1984 \$495 (including software) 90 day 1 IEEE-488 — Allows PC to be fully IEEE-488 compatible, able to control up to 14 GPIB-compatible devices. Has Intel 8255 chip w/24 digital I/O lines. Can accept Qua Tech data acquisition and control modules.	<b>Qua Tech</b> PMD-10 Module IBM PC, PC XT, PC AT & compatibles Intel 8086, 8088, 80186, 80286 PC DOS — Module for Qua Tech MSI-214 or PXB-721 motherboard May 1984 \$30 90 day — — Allows user to wire-wrap custom circuits. Allows user access to 24 digital I/O lines, as well as $\pm 5V$ and $\pm 12V$ supplies.

**Notes:**

- Information unavailable at press time  
 NA Not applicable



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Communications Protocols</b>  <b>Additional Features</b></p>	<p><b>Qua Tech</b>                  PXB-721                  IBM PC, PC XT, PC AT &amp; compatibles                  Intel 8086, 8088, 80186, 80286                  PC DOS                  —                  Full                  May 1984                  \$195                  90 day                  9 parallel                  —                  Motherboard for other Qua Tech module boards; consists of three Intel 8255 chips, each capable of accepting a Qua Tech module. Can be used on its own, providing user w/up to 72 digital I/O lines.</p>	<p><b>Qua Tech</b>                  RTM-10 Module                  IBM PC, PC XT, PC AT &amp; compatibles                  Intel 8086, 8088, 80186, 80286                  PC DOS                  —                  Module for Qua Tech MXI-241 or PXB-721 motherboard                  December 1984                  \$135                  90 day                  —                  —                  Real-time clock/calendar for use w/Qua Tech modular data acquisition system; used primarily for time dating data.</p>	<p><b>Qua Tech</b>                  UIO-10                  IBM PC, PC XT, PC AT &amp; compatibles                  Intel 8086, 8088, 80186, 80286                  PC DOS                  —                  —                  May 1984                  \$125                  90 day                  3 parallel                  —                  Provides screw terminal connection to A/D I/O lines of any two modules of the Qua Tech Modular Data Acquisition system, as well as providing buffers for 24 digital I/O lines.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Communications Protocols</b>  <b>Additional Features</b></p>	<p><b>Qua Tech</b>                  WSB-10                  IBM PC, PC XT, PC AT &amp; compatibles                  Intel 8086, 8088, 80186, 80286                  PC DOS                  —                  Full                  November 1984                  \$795                  90 day                  —                  —                  Arbitrary waveform generator for use in scientific and engineering applications. Can generate user-definable signals up to 2048 points in length. All software provided free with board. Analog output range ± 5V w/12-bit resolution.</p>	<p><b>Quadram</b>                  Asher C1200                  IBM PC, PC XT, PC AT                  —                  —                  Full                  April 1985                  \$695 (C1200)                  One year                  —                  —                  Converts PC into integrated voice/data communications management system. Simultaneous voice &amp; data calls. Concurrent windowing program included. Asher desk management software, Asherlink communications software, &amp; AsherDOS concurrent windowing program software included.</p>	<p><b>Quadram</b>                  Quad 3278                  IBM PC, PC XT, PC AT                  Intel 8088, 80286                  MS DOS 1.1 or 2.0, PCIX (UNIX) or QNX                  —                  Full                  1985                  \$1,195                  One year                  —                  IBM 3270                  Emulates IBM 3278 terminal. Allows PC to pull data from host and analyze it w/software running under DOS.</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable





<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b>	<b>Quadram</b> Quad 5251 IBM PC, PC XT, PC AT Intel 8088, 80286 DOS 1.1 or 2.0 Full 1985 \$995 One year — Micro-to-minicomputer link. Links PC's to IBM S/34, S/36, & S/38 through IBM 5251 model 11, IBM 5291 and IBM 5292 workstation emulation. "Hot key" switching between PC & IBM S/3x.	<b>Quadram</b> Quadlink IBM PC, COMPAQ, or Columbia — Full 1984 — One year — Allows Apple II & II+ software programs to run on IBM PC, COMPAQ, or Columbia. 64KB memory.	<b>Quadram</b> Quadmodem II IBM PC, PC XT, PC AT Intel 8088, 80286 PC DOS 1.1 or higher Half April 1985 \$495 (300/1200); \$795 (300/1200/2400) One year — 300/1200 or 300/1200/2400 bps. Three call/answer modes. Supports both pulse (rotary) and touch-tone dialing. Autodial also avail. Supports Bell 103/212A protocols. Avail as standalone modem also.
<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b>	<b>Quadram</b> Quadnet IX IBM PC Intel 8088 DOS 1.1, DOS 2.x Full 1984 \$1,595, \$795 (Master Kit or User Kit) One year — Links 256 PC's and compatibles into shared resource network. 10Mbits/sec. Print spooling, disk caching and hatching.	<b>Quadram</b> Quadnet VI IBM PC Intel 8088 DOS 1.1, DOS 2.x Full 1984 \$1,395, \$595 (Master Kit and User Kit) One year — CSMA/CD/CA Links up to 64 PCs and compatibles into shared resource network. 2Mbits/sec. Print spooling, disk caching and hatching.	<b>Quadram</b> Quadport AT IBM PC AT Intel 80286 Full 1985 \$145; add'l 195 w/4 add'l serial ports One year 1 serial, 1 parallel std; 4 add'l serial opt. NA

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Communications Protocols</b>  <b>Additional Features</b></p>	<p><b>Racal-Vadic</b>                  Maxwell 1200 PC</p> <p>IBM PC, PC XT, PC AT                  Intel 8088, 80286                  PC DOS</p> <p>—                  —                  August 1984                  \$295                  2 year                  —                  —                  Provides modem capabilities to PCs. Hayes compatible; Bell 212/303 compatible. Autodial tone or pulses, call progress detection, "George" communications software included. On-board Intel 8031 processor.</p>	<p><b>Racal-Vadic</b>                  Maxwell 2400 PC</p> <p>IBM PC, PC XT, PC AT                  Intel 8088, 80286                  PC DOS</p> <p>—                  —                  September 1985                  \$595                  Two year                  —                  —                  Provides modem capabilities for PCs. Hayes-compatible; V.22 bis, 212, 103 compatible. Autodial tone or pulse, call progress detection, "George" communications software included. On-board Intel 8031 processor.</p>	<p><b>Scientific Solutions</b>                  DADIO Board</p> <p>IBM PC, PC XT                  Intel 8088</p> <p>—                  Full                  \$395                  One year                  3 parallel                  —                  Digital to Analog and Digital Input and Digital Output board. 4 channels of 12 bit digital-to-analog conversion. Double buffering. On-board Intel 8255 IC chip. 5 microsecond settling time. 200,000 Hz conversion time.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Communications Protocols</b>  <b>Additional Features</b></p>	<p><b>Scientific Solutions</b>                  IEEE-488 (GPIB) Interface Board</p> <p>IBM PC, PC XT                  Intel 8088</p> <p>—                  Full                  \$395                  One year                  —                  —                  Functions as talker, listener, or controller of GPIB IEEE-488 bus. On-board Intel GPIB chip set (8291A, 8292, 8293). DMA and interrupt capabilities.</p>	<p><b>Scientific Solutions</b>                  Lab Master</p> <p>IBM PC, PC XT                  Intel 8088</p> <p>—                  Full                  \$995                  One year                  3 parallel                  —                  Converts PC to laboratory analysis tool. 8 to 256 channels for analog to digital conversion. 12, 14 or 16 bit resolution. 30, 40, or 80 KHz conversion rate.</p>	<p><b>Scientific Solutions</b>                  Lab Tender</p> <p>IBM PC, PC XT                  Intel 8088</p> <p>—                  Full                  \$495                  One year                  3 parallel                  —                  Data processing subsystem for industrial, scientific, and other laboratory &amp; control environments. 8 bit accuracy and Timer/Counters for A to D or D to A.</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b>  <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b>	<b>Techland Systems</b> BlueLynx 2780/3780 RJE  IBM PC, PC XT, PC AT Intel 8088, 80286 — Half August 1985 \$690  90 day w/2 yr option — 2780/3780 Transfers data from PC to mainframe and PC to PC.	<b>Techland</b> BlueLynx 3270/BSC  IBM PC, PC XT, PC AT Intel 8088, 80286 PC DOS — Half 1983 \$795  90 day w/2 year option — 3270/BSC Provides PC to IBM mainframe communications w/printer support. Keyboard opt.	<b>Techland Systems</b> BlueLynx 3270 Gateway  IBM PC Intel 8088 — Half January 1985 \$1,195 (5 PC network), \$3,995 (32 PC network); other configurations avail. 90 day w/2 year option — IBM 3270/SNA Allows one PC in LAN to act as 3274 gateway enabling other LAN PCs to communicate w/mainframe. 3270 PC keyboard and data reader utility std.
<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b>	<b>Techland Systems</b> BlueLynx 3270 Local (coax)  IBM PC, PC XT, PC AT Intel 8088, 80286 PC DOS — Full July 1985  \$1,295 (add'l \$450 for file transfer software) 90 day w/2 year option — IBM 3270 Enables PC to access an IBM 3270 mainframe by emulating 3278/3279 terminal. Attaches to 3274 cluster controller. 3270 keyboard and data reader utility included.	<b>Techland Systems</b> BlueLynx 3270 Remote  IBM PC, PC XT, PC AT Intel 8088, 80286 PC DOS — Half June 1983, Nov 1984 (2 models) \$945  90 day w/2 year option — IBM 3270/SNA Micro-to-mainframe communications board. 3270 PC keyboard and data reader utility std.	<b>Techland Systems</b> BlueLynx 5251, Model 11  IBM PC, PC XT, PC AT Intel 8088, 80286 PC DOS — Full July 1985  \$745 (ver. 1), 945 (ver. 2), \$1195 (ver. 3) 90 day w/2 year option — IBM 5251/12 Allow IBM PCs to communicate locally via twinax cable to IBM S/34, S/36, or S/38 appearing as IBM 5251/12 workstations. 3 versions: Version 1 supplies hot key & IBM virtual disk, Version 2 adds 5224 print support, and Version 3 adds 4 LU's and 3180 keyboard, to Version 1 features.

**Notes:**

- Information unavailable at press time  
 NA Not applicable



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Communications Protocols</b>  <b>Additional Features</b></p>	<p><b>Techland Systems</b>                  BlueLynx 5251, Model 12                    IBM PC, PC XT, PC AT                  Intel 8088, 80286                  PC DOS                  —                  Full                  1982                  \$745                  90 day w/2 year option                  —                  IBM 5251/12                  Allows PCs to communicate remotely through a modem with IBM S/34, S/36, or S/38, appearing as an IBM 5251/12 workstation.                  Emulator transfer utility opt.</p>	<p><b>Tecmar</b>                  Device Master Board                    IBM PC, PC XT                  Intel 8088                  —                  Full                  —                  \$245                  One year                  —                  —                  Interfaces PC to BSRX10 remote device controller to control up to 16 devices in home or office on a regular schedule.</p>	<p><b>Tecmar</b>                  Phonegate 2400                    IBM PC, PC XT                  Intel 8088                  —                  Full                  1985                  \$789                  One year                  No                  —                  Bell 103, Bell 212A compatible. CCITT V.22 bis, 2400 baud; 1200, 600, 300 and 110 baud also avail.                  Auto answer, auto dial.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Communications Protocols</b>  <b>Additional Features</b></p>	<p><b>Tecmar</b>                  PowerLink                    IBM PC, PC XT                  Intel 8088                  —                  Half                  1984                  \$1,099                  One year                  NA                  3278/3279 emulation (SNA)                  Micro-to-mainframe link.                  Windowing capabilities, file transfer, keyboard mapping, batch file generator utility.</p>	<p><b>Tecmar</b>                  Scribe Master Board                    IBM PC, PC XT                  Intel 8088                  —                  Full                  —                  \$495                  One year                  3 serial                  —                  High speed serial ports well-suited for computer-to-computer communications. Prgrmble bit rates from 100 to 115,000 bits/sec. Independently selectable word length, parity, and no. of stop bits.</p>	<p><b>Tecmar</b>                  Scribe Tender Board                    IBM PC, PC XT                  Intel 8088                  —                  Full                  —                  \$195                  One year                  2 serial, 1 parallel                  —                  Serial ports can be accessed w/normal PC DOS and BASIC commands such as COM1 (AUX) and COM2. Printer port can be accessed w/PC DOS or BASIC commands such as LPT1 (or LPT2).</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b></p>	<p><b>Tecmar</b> Speech Master Board</p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>—</p> <p>—</p> <p>Full</p> <p>—</p> <p>\$395</p> <p>One year</p> <p>—</p> <p>—</p> <p>Gives voice output capability to IBM PC. Uses both digitized, stored vocabulary or synthesis of phonemes. 143 wd vocabulary std, can be increased.</p>	<p><b>Tecmar</b> Voice Recognition Board</p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>—</p> <p>—</p> <p>Full</p> <p>—</p> <p>\$995</p> <p>One year</p> <p>—</p> <p>—</p> <p>Recognition of up to 200 words. Programmable gain setting, reject threshold, and noise reject levels.</p>	<p><b>Univation</b> Uni-Net 1</p> <p>Digital Equipment Rainbow 100; A, B, and + Intel 8086, 8088, Zilog Z80 PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System, proprietary</p> <p>—</p> <p>—</p> <p>June 1984</p> <p>\$750</p> <p>One year</p> <p>—</p> <p>Ethernet</p> <p>For networking, file transfers, electronic mail, device sharing, and communications w/diverse micros &amp; mainframes.</p>
<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b></p>	<p><b>Univation</b> Uni-Net 2</p> <p>IBM PC, PC XT, PC AT</p> <p>Intel 8088, 80286 PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System, proprietary</p> <p>8 bit, 16 bit</p> <p>—</p> <p>January 1985</p> <p>\$555</p> <p>One year</p> <p>—</p> <p>Ethernet</p> <p>For networking, file transfers, electronic mail, device sharing, and communication w/diverse micros and mainframes.</p>	<p><b>Ven-Tel</b> PC Modem 1200</p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>—</p> <p>8 bit</p> <p>Full</p> <p>Early 1984</p> <p>\$499</p> <p>Two year</p> <p>NA</p> <p>—</p> <p>1200/300 baud, auto dial, auto answer. Full or half duplex operation. Crosstalk XVI communications software included. Complete compatibility w/AT command set. On-board speaker, extra phone jack.</p>	<p><b>Ven-Tel</b> PC Modem Half Card</p> <p>IBM PC, PC XT &amp; compatibles Intel 8088</p> <p>—</p> <p>8 bit</p> <p>Half</p> <p>Early 1984</p> <p>\$549</p> <p>Two year</p> <p>NA</p> <p>—</p> <p>1200/300 baud, auto dial, auto answer. Full or half duplex operation. Crosstalk XVI communications software included. Complete compatibility w/AT command set. On-board speaker, extra phone jack.</p>

**Notes:**

— Information unavailable at press time  
NA Not applicable



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Vertex Systems</b> Apple Turnover</p> <p>IBM PC, PC XT</p> <p>Intel 8088 PC DOS, MS-DOS</p> <p>NA Half</p> <p>October 1984</p> <p>\$279</p> <p>—</p> <p>—</p> <p>Allows IBM PCs to read, format, and write to AppleDOS 3.3 and Apple CP/M diskettes.</p>	<p><b>Viasyn</b> Networking boards (Net 10, Net 11, Net 100, Net 101)</p> <p>IEEE-696 S-100 bus</p> <p>—</p> <p>CP/M-86, MP/M-86, Concurrent CP/M-86, proprietary</p> <p>—</p> <p>—</p> <p>\$395-\$595</p> <p>One year</p> <p>—</p> <p>ARCnet; opt. async, SDLC/HDLC, 2780/3780 2.5 Mbit/sec transfer rate.</p>	<p><b>Votan</b> VPC 2000 Voice Card</p> <p>IBM PC, PC XT, PC AT &amp; compatibles</p> <p>Intel 8088, 80286</p> <p>—</p> <p>—</p> <p>Full plus piggyback</p> <p>May 1984</p> <p>\$2,450</p> <p>90 day, extended opt.</p> <p>—</p> <p>I/O and telephone management capabilities. Continuous speech recognition. Works over standard telephone lines.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Communications Protocols</b></p> <p><b>Additional Features</b></p>	<p><b>Vynet</b> V101A/VS Telephone Voice Synthesizer Unit</p> <p>Apple II</p> <p>Synertek 6502</p> <p>—</p> <p>—</p> <p>May 1982</p> <p>\$495</p> <p>One year</p> <p>—</p> <p>—</p> <p>Multi-line telephone interface w/std quality voice response. Allows users from remote telephone to access a database. Can answer on ring, dial, and detect Touch Tone signals and respond w/voice. 1300 wd vocab provided.</p>	<p><b>Vynet</b> V101I/VS, V102I/VS Telephone Voice Synthesizer Unit</p> <p>IBM PC, PC XT, &amp; compatibles</p> <p>Intel 8086, 8088</p> <p>PC DOS, MS-DOS</p> <p>—</p> <p>—</p> <p>January 1983</p> <p>\$695-\$895</p> <p>One year</p> <p>—</p> <p>—</p> <p>Single or dual line telephone interface w/std quality voice response. Allows users from a remote telephone to access a database. Can answer on ring, dial and detect Touch Tone signals and respond w/voice. Applications included order entry, stock quotes, etc.</p>	<p><b>Vynet</b> V101I &amp; V102I Speech Digitizer &amp; Playback Unit</p> <p>IBM PC, PC XT, PC AT &amp; compatibles</p> <p>Intel 8086, 8088, 80186, 80286</p> <p>PC DOS, MS-DOS</p> <p>8 bit, 16 bit</p> <p>Full</p> <p>January 1984</p> <p>\$1,495-\$1,995</p> <p>One year</p> <p>—</p> <p>—</p> <p>Multi-line telephone interface w/high quality voice response. Allows users from remote telephone to access a database. Answers on ring, dials &amp; detects Touch-Tone signals. Responds w/voice. Unlimited vocabulary. Applications include banking by phone, airline arrival and departure info, lab results, etc.</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Vendor</b> <b>Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b></p>	<p><b>Winterhalter</b> Datatalker IBM PC, PC XT, PC AT Intel 8088, 80286 — 8 bit, 16 bit — June 1983 Datatalker PC, \$695, Datatalker PC +, \$1,095 One year 1 serial TTY, X.25, 2780/3780, 3270 SNA or BSC Micro-to-mainframe link. Board can be purchased w/various software communications pkgs. 64KB memory. Spooler buffer. Monochrome or 4-color graphics capability. 2 or 3-user versions of X.25 communications avail at \$1,295 and \$1,495.</p>	<p><b>Winterhalter</b> Secure IBM PC, PC XT, PC AT Intel 8088, 80286 — Half June 1985 \$495 — One year NA — Data encryption product using DES encryption chip. Enables encryption of files, directories, or complete disks onto new (or the same) disks.</p>	<p><b>Wolfdata</b> WD 212 IBM PC, PC XT, PC AT Intel 8088, 80286 — Full 1983 \$299 — One year 1 serial — Intelligent 212A/103 modem</p>
<p><b>Vendor</b> <b>Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Communications Protocols</b> <b>Additional Features</b></p>	<p><b>Wolfdata</b> WD 212-LAPB IBM PC, PC XT, PC AT Intel 8088, 80286 — Full 1984 \$550 One year — — Sync and async modem which is CCITT LAPB-compatible, designed for error-free transmission over dial network.</p>	<p><b>Wolfdata</b> WD 212/X.25 IBM PC, PC XT, PC AT Intel 8088, 80286 — Full 1984 \$650 One year — X.25 Combined X.25 level 3 PAD and intelligent 212A modem, designed for error-free transmission to private and public packet networks (Telenet, Uninet).</p>	

**Notes:**

— Information unavailable at press time  
NA Not applicable



# SPECIFICATIONS CHART

## Add-On Boards—Multifunction

234.0045.201

<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Ports</b> <b>Clock Calendar</b> <b>Printer Buffer</b> <b>Disk Emulation</b> <b>Controller Capabilities</b> <b>Additional Features</b>	<b>AST Research Advantage!</b> IBM PC AT Intel 80286 — 16 bit Full 1984 \$595-\$4,145 One year; 2 year opt. 3MB (on main board and daughterboard) 2 serial (1 opt., 1 std), 1 parallel, 1 game — Yes, w/software Yes, w/software — Parity checked memory. Uses split memory addressing. Includes SuperDrive and SuperSpool software.	<b>AST Research ComboPlus</b> IBM PC, PC XT Intel 8088 — 8 bit Full 1982 \$395-\$695 (64K-256K) One year, 2 year opt. 64KB-256KB 1 serial, 1 parallel Yes Yes, w/software Yes, w/software — SuperDrive, SuperSpool, & Clock/Utility software incl. Parity checked memory.	<b>AST Research GraphPak</b> IBM PC, PC XT Intel 8088 — 2 (full size) 1984 \$790-\$1,290 (64KB-384KB) One year, 2 year opt. 64KB-384KB 1 serial, 1 parallel Yes Yes, w/software Yes, w/software — SuperDrive and SuperSpool software included. Provides bit-mapped monochrome graphics.
<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Ports</b> <b>Clock Calendar</b> <b>Printer Buffer</b> <b>Disk Emulation</b> <b>Controller Capabilities</b> <b>Additional Features</b>	<b>AST Research I/O Mini</b> IBM PC, PC XT Intel 8088 — Half 1984 \$185-\$285 One year; two year opt. NA 1-2 serial, 1 parallel opt. Yes Yes, w/software Yes, w/software — Includes SuperDrive, SuperSpool, and Clock Utility software.	<b>AST Research I/O Plus II</b> IBM PC, PC XT Intel 8088 — Full 1983 \$185-\$285 One year; two year opt. — 2 serial (1 std, 1 opt.), 1 parallel, 1 opt. game Yes Yes, w/software Yes, w/software — SuperDrive, SuperSpool, and Clock Utility software included.	<b>AST Research MegaPlus II</b> IBM PC, PC XT Intel 8088 — 8 bit Full 1982 \$395-\$695 (0-256KB) One year, 2 year opt. 64KB-512KB 1 parallel opt., 2 serial (1 opt., 1 std) Yes Yes, w/software Yes, w/software — Includes AST SuperDrive, SuperSpool, and Clock Utility software. Parity checking provided.

**Notes:**

NA Not applicable  
 — Information unavailable at press time





<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Ports</b> <b>Clock Calendar</b> <b>Printer Buffer</b> <b>Disk Emulation</b> <b>Controller Capabilities</b> <b>Additional Features</b>	<b>AST Research</b> SixPakPlus IBM PC, PC XT Intel 8088 — 8 bit Full 1983 \$395-\$895 (0-384KB) One year 384KB 1 serial, 1 parallel, 1 opt. game Yes Yes, w/software Yes, w/software — Includes SuperDrive, SuperSpool, and Clock Utility software. Parity checking provided.	<b>Dual Systems</b> CLK-240 All S-100, IEEE-696-based systems Zilog Z80, Intel 8080, 8085, 8086, 8088, 80186, Motorola MC 68000 CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System — 10 x 0.6 x 5 (full) 1981 \$325 One year — — Yes — — — Uses LSI CMOS chip. 3 yr minimum operation w/out battery replacement.	<b>Electro Design</b> COMBI-4 IBM PC & compatibles Intel 8088 PC DOS, CP/M-86, UNIX, UCSD p-System — 5 x 0.5 x 3.75 (half) June 1983 \$187 90 day — 1 serial, 1 parallel, 1 game Yes — — — IBM-compatible printers, RS-232C terminals NA
<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Ports</b> <b>Clock Calendar</b> <b>Printer Buffer</b> <b>Disk Emulation</b> <b>Controller Capabilities</b> <b>Additional Features</b>	<b>Electronic Modular Systems</b> CPU-1 All VMEbus systems — UNIX, CP/M-68K 16 bit Full — \$1,600 90 day 256KB 1 serial, 1 parallel — — — — Centronics printer, RS-232C terminals, diskettes, (WD 2791 controller) On-board Motorola MC 68000 processor. Motorola MC 68451 Memory Management Unit. 8 MHz CPU, full VMEbus control.	<b>Electronic Modular Systems</b> CPU-2RT All VMEbus systems — UNIX, pSOS, CP/M-68K 16 bit Full — \$2,200-\$2,385 90 day 512KB RAM, 128KB PROM, 16K bits EEPROM 2 serial, 1 parallel — — — — On-board Motorola MC 68000 processor. No wait state memory management; 12.5 MHz CPU.	<b>EMC</b> MAXEM 2 Wang PC Intel 8086 MS DOS — 8 x 0.5 x 12 March 1984 \$595 Lifetime — 1 RS-232C serial, 1 Centronics compatible parallel Yes Up to 640KB — — Provides alarm clock feature. Can be combined w/EMC's MAXEM 1 memory board in one expansion slot.

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Max Memory Capacity</b>  <b>Ports</b>    <b>Clock Calendar</b>  <b>Printer Buffer</b>  <b>Disk Emulation</b>  <b>Controller Capabilities</b>  <b>Additional Features</b></p>	<p><b>Emulex Persyst</b>                  Color Combo Card                    IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  Full                  —                  \$520–\$820 (0–384KB)                  Two year                  0–384KB                  1 serial, 1 parallel                    Yes                  Yes, w/software                  Yes, w/software                  —                  INSTA-DRIVE RAM and WAIT-LESS PRINTING software included. Parity checking and error reporting. Full modem support. Uses 64K or 256K bit chips. Acts as color graphics display adapter (via custom chip).</p>	<p><b>Emulex Persyst</b>                  Mono Combo Card                    IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  Full                  —                  \$520–\$820 (0–384KB)                  Two year                  384KB                  1 serial, 1 parallel                    Opt.                  Yes, w/software                  Yes, w/software                  —                  INSTA-DRIVE RAM and WAIT-LESS PRINTING software included. Contains monochrome display adapter via a custom chip, designed to enable user to run IBM monochrome compatible software. Parity checking and error reporting, modem support. 64K or 256K bits/chip.</p>	<p><b>Emulex Persyst</b>                  SB384 Time-Spectrum                    IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  Full                  —                  \$295–\$595 (0–384K)                  Two year                  0–384KB                  1 serial, 1 parallel, 1 opt. game                  Yes                  Yes, w/software                  Yes, w/software                  —                  Parity checking and error reporting. INSTA-DRIVE RAM and WAIT-LESS PRINTING software included.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>    <b>Price</b>  <b>Warranty</b>  <b>Max Memory Capacity</b>    <b>Ports</b>    <b>Clock Calendar</b>  <b>Printer Buffer</b>  <b>Disk Emulation</b>  <b>Controller Capabilities</b>  <b>Additional Features</b></p>	<p><b>Emulex Persyst</b>                  TI Time Spectrum                    TI Professional Computer                  —                  —                  Full                  \$405–\$1,120 (0–448K) w/1 serial port                  —                  Two year                  0–192K (main board); up to 448K w/opt. TI RAMPAK                  1 serial, 1 2nd serial opt., 1 light pen                  Yes                  Yes, w/software                  Yes, w/software                  —                  Parity checking and error reporting. INSTA-DRIVE RAM and WAIT-LESS PRINTING software included.</p>	<p><b>IBM</b>                  Combination Adapter (#6000)                    IBM 5531 Industrial Computer                  Intel 8088                  —                  —                  Half                  —                  \$445                  —                  —                  1 serial, 1 parallel                    Yes                  —                  —                  —                  Thermal sensor interface included.</p>	<p><b>IDEAssociates</b>                  IDEAmax 384 (ZPR)                    IBM PC, PC XT, PC AT                  Intel 8088, 80286                  PC DOS                  16 bit                  13.81 x 1.13 x 5                  —                  \$275 (64K) w/one option)                  One year                  384KB                    Opt.: 1 serial, 1 parallel, 1 game                  Yes (opt.)                  Yes                  —                  —                  Features software that provides RAM floppy print, sprint spooler, diagnostics. 64K bits/chip.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor</b></p> <p><b>Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Ports</b></p> <p><b>Clock Calendar</b></p> <p><b>Printer Buffer</b></p> <p><b>Disk Emulation</b></p> <p><b>Controller Capabilities</b></p> <p><b>Additional Features</b></p>	<p><b>IDEAssociates</b></p> <p>Supermax (SMX)</p> <p>IBM PC AT</p> <p>Intel 80286 PC DOS</p> <p>—</p> <p>Full</p> <p>—</p> <p>\$495-\$3,795</p> <p>One year</p> <p>0K-4M (w/daughterboard)</p> <p>2 serial, 1 parallel</p> <p>—</p> <p>Yes, w/software</p> <p>—</p> <p>—</p> <p>64K or 256K bits/chip. Software includes diagnostics, print spooler, &amp; split-memory addressing.</p>	<p><b>Intercontinental Micro Systems</b></p> <p>CPS-16X</p> <p>Any IEEE 696.1/D2 S-100 bus system</p> <p>—</p> <p>TurboDOS, CP/M-86, MP/M-86, Concurrent CP/M-86, MS-DOS, CP/M</p> <p>16 bit</p> <p>10 x 0.56 x 5.5</p> <p>June 1984</p> <p>\$995 (256K), \$1,295 (512K), \$1,595 (1MB)</p> <p>One year</p> <p>1MB</p> <p>2 serial, 1 parallel, 1 SASI/SCSI</p> <p>Yes</p> <p>Yes</p> <p>No</p> <p>Most modems, serial and parallel printers, most terminals</p> <p>Acts as slave processor in a multi-user system functioning independently of master, resulting in a dedicated processor for each user. On-board Intel 8086 8 MHz processor. 2780/ 3780 communications compatibility. 256K bits/ chip.</p>	<p><b>Intercontinental Micro Systems</b></p> <p>CPS-68</p> <p>IEEE 696.1/D2 S-100 bus system</p> <p>—</p> <p>TurboDOS, CP/M, MP/M</p> <p>8 bit</p> <p>10 x 0.56 x 5.5</p> <p>January 1983</p> <p>\$550</p> <p>One year</p> <p>64KB</p> <p>2 serial, 2 parallel, 1 SASI/SCSI</p> <p>Yes</p> <p>Yes</p> <p>—</p> <p>Modems, serial &amp; parallel printers, terminals</p> <p>Acts as slave processor. On-board Zilog Z80 processor. IBM 2780/3780 communications compatibility.</p>
<p><b>Vendor</b></p> <p><b>Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Ports</b></p> <p><b>Clock Calendar</b></p> <p><b>Printer Buffer</b></p> <p><b>Disk Emulation</b></p> <p><b>Controller Capabilities</b></p> <p><b>Additional Features</b></p>	<p><b>Intercontinental Micro Systems</b></p> <p>CPS-B6A</p> <p>IEEE 696.1/D2 S-100 bus systems</p> <p>—</p> <p>TurboDOS, CP/M, MP/M</p> <p>8 bit</p> <p>10 x 0.56 x 5.5</p> <p>January 1984</p> <p>\$750</p> <p>One year</p> <p>128KB</p> <p>2 serial, 2 parallel, 1 SASI/SCSI</p> <p>Yes</p> <p>Yes</p> <p>No</p> <p>Modem, serial and parallel printers, most terminals</p> <p>Slave processor. Operates independently of master, resulting in a dedicated processor for each user in a multi-user system. On-board Zilog Z80 6 MHz processor. IBM 2780/3780 protocol compatibility.</p>	<p><b>Intercontinental Micro Systems</b></p> <p>CPZ-186</p> <p>Any IEEE 696.1/D2 S-100 bus system</p> <p>—</p> <p>TurboDOS, PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, CP/M</p> <p>16 bit</p> <p>10 x 0.56 x 5.5</p> <p>February 1985</p> <p>\$1,495</p> <p>One year</p> <p>256KB-1MB</p> <p>2 serial, 2 parallel, 1 SASI/SCSI</p> <p>Yes</p> <p>Yes</p> <p>No</p> <p>Most modems, printers, terminals, disks, diskettes, and tape drives</p> <p>Master processor w/on-board memory management which addresses up to 4MB of system memory. On-board Intel 80186 8 MHz processor. 64K or 256K bits/ chip.</p>	<p><b>Intercontinental Micro Systems</b></p> <p>CPZ-4800X</p> <p>Any IEEE 696.1/D2 S-100 bus system</p> <p>—</p> <p>TurboDOS, CP/M, MP/M, MS-DOS</p> <p>8 bit</p> <p>Full</p> <p>1982</p> <p>\$995 (4 MHz), \$1,045 (6 MHz)</p> <p>One year</p> <p>64KB</p> <p>2 serial, 2 parallel, 1 SASI/SCSI</p> <p>Yes</p> <p>Yes</p> <p>No</p> <p>Most modems, printers, terminals, disks, diskettes, and tape drives</p> <p>Master processor w/4-channel direct memory access. On-board memory management unit controls up to 16MB extended memory. On-board Zilog Z80 4 or 6 MHz processor.</p>

**Notes:**

NA Not applicable  
— Information unavailable at press time



<p><b>Vendor</b> <b>Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b></p> <p><b>Ports</b> <b>Clock Calendar</b> <b>Printer Buffer</b> <b>Disk Emulation</b> <b>Controller Capabilities</b> <b>Additional Features</b></p>	<p><b>Orchid Technology</b> Blossom</p> <p>IBM PC, PC XT Intel 8088</p> <p>—</p> <p>8 bit Full</p> <p>1984</p> <p>\$295 (0 RAM)</p> <p>One year</p> <p>0-384KB</p> <p>1 serial, 1 parallel Yes Yes, w/software Yes, w/software</p> <p>—</p> <p>Upgradeable to PCnet LAN. Includes Orchid Productivity software.</p>	<p><b>Orchid Technology</b> Conquest</p> <p>IBM PC, PC XT Intel 8088 PC DOS</p> <p>8 bit Full</p> <p>September 1985</p> <p>\$395</p> <p>Two year</p> <p>1MB plus 1MB daughtercard (std)</p> <p>1 serial, 1 parallel Yes Yes Yes</p> <p>—</p> <p>Includes productivity, RAMdisk, printer buffer and disk cache software. Meets Lotus/Intel Expanded Memory specifications. Can accept PCnet LAN daughtercard in addition to std memory daughtercard provided. 256K bits/chip.</p>	<p><b>Orchid Technology</b> CramRAM</p> <p>IBM PC, PC XT Intel 8088 PC DOS</p> <p>8 bit Half</p> <p>September 1985</p> <p>\$395</p> <p>Two year</p> <p>2MB</p> <p>NA No Yes Yes</p> <p>—</p> <p>Includes productivity, RAMdisk, printer buffer and disk cache software. Meets Lotus/Intel Expanded Memory specifications. Designed w/switchless installation. 256K bits/chip.</p>
<p><b>Vendor</b> <b>Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b></p> <p><b>Ports</b></p> <p><b>Clock Calendar</b> <b>Printer Buffer</b> <b>Disk Emulation</b> <b>Controller Capabilities</b> <b>Additional Features</b></p>	<p><b>Orchid Technology</b> ECELL</p> <p>IBM PC AT &amp; compatibles Intel 80286 XENIX</p> <p>16 bit Full</p> <p>September 1985</p> <p>\$595</p> <p>Two year</p> <p>1MB, opt. add'l 1MB w/daughtercard</p> <p>Opt. w/daughtercards: 1 serial, 1 parallel or 2 serial</p> <p>No Yes Yes</p> <p>—</p> <p>Can accept two daughtercards. Includes productivity, RAMdisk, printer buffer and disk cache software. Meets Lotus/Intel Expanded Memory Specifications. Incorporates ECC std error detection and correction. 256K bits/chip.</p>	<p><b>Paradise Systems</b> 5-Pack</p> <p>IBM PC, PC XT &amp; compatibles Intel 8088</p> <p>—</p> <p>Full</p> <p>January 1985</p> <p>\$229</p> <p>One year</p> <p>Up to 384KB</p> <p>1 serial</p> <p>Yes Yes, w/software (std) Yes, w/software (std)</p> <p>—</p> <p>Uses 64K bits/chip.</p>	<p><b>Profit Systems</b> Addram Elite</p> <p>IBM PC, PC XT Intel 8086 PC DOS</p> <p>8 bit —</p> <p>January 1983</p> <p>\$475 base config</p> <p>5 year</p> <p>512KB</p> <p>1 serial, 1 parallel (Elite)</p> <p>Yes Yes Yes</p> <p>—</p> <p>64K bits/chip. Includes multitasking Profit Systems Teammaster software. Allows up to 9 applications to run concurrently.</p>

**Notes:**  
NA Not applicable  
— Information unavailable at press time



<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b>	<b>Profit Systems</b> AT Power IBM PC AT Intel 80286 PC DOS 16 bit — December 1984 \$495 base configuration	<b>Quadram</b> Expanded Quadboard IBM PC, PC XT Intel 8088 — 8 bit Full 1984 \$325 (0KB), \$395 (64KB), \$595 (384KB)	<b>Quadram</b> Extended Multi-function Card Apple IIe Synertek 6502A — — June 1985 \$229; \$275 w/RGB interface for Apple-style, Quadchrome or IBM monitors One year 64KB — Yes — — — Extends Apple IIe's on-screen display mode to 80 col.
<b>Warranty</b> <b>Max Memory Capacity</b> <b>Ports</b> <b>Clock Calendar</b> <b>Printer Buffer</b> <b>Disk Emulation</b> <b>Controller Capabilities</b> <b>Additional Features</b>	Five year 128KB-4MB 2 serial (1 opt., 1 std), 1 parallel; 1 game (opt.) Yes — — — 64K or 256K bits/chip.	One year 384KB 1 parallel, 1 serial, 1 game Yes Yes, w/software Yes, w/software — Includes QuadMaster III software	One year 64KB — Yes — — — Extends Apple IIe's on-screen display mode to 80 col.
<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b>	<b>Quadram</b> Gold Quadboard IBM PC, PC XT, & PC AT compatibles Intel 8088, 80286 — 8 bit Full 1985 \$595 (0K), \$795 (384K)	<b>Quadram</b> Multicore Apple II, II +, IIe Synertek 6502, 6502A — — Full July 1985 \$219 (0K), \$279 (64K), \$329 (128K), \$399 (256K) One year	<b>Quadram</b> Silver Quadboard IBM PC, PC XT, PC AT & compatibles Intel 8088, 80286 — 8 bit Full 1985 \$595
<b>Warranty</b> <b>Max Memory Capacity</b> <b>Ports</b> <b>Clock Calendar</b> <b>Printer Buffer</b> <b>Disk Emulation</b> <b>Controller Capabilities</b> <b>Additional Features</b>	Lifetime (fully loaded 384KB or 640KB only) 0K-640K 1 parallel, 1 serial std; 1 parallel, 1 serial opt. Yes Yes, w/software Yes, w/software — IBM color graphics capabilities. 8K battery backup. Comes w/Quadmaster III software.	— 1 parallel, 1 serial Yes, w/battery backup — — — NA	Five yr (w/fully loaded 384KB & 640KB board) 64KB, 384KB, 640KB 1 parallel, 1 serial std; 1 serial opt. Yes Yes, w/software Yes, w/software — QuadMaster III software included.

**Notes:**

NA Not applicable

— Information unavailable at press time



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems</p> <p><b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Max Memory Capacity</b>  <b>Ports</b></p> <p><b>Clock Calendar</b>  <b>Printer Buffer</b>  <b>Disk Emulation</b>  <b>Controller Capabilities</b></p> <p><b>Additional Features</b></p>	<p><b>Qubie</b>                  Basic Time BT6Plus</p> <p>IBM PC, PC XT, most compatibles                  Any                  Any</p> <p>—                  Full                  November 1984                  \$179 (64KB), \$279 (384KB)                  One year                  384KB                  1 serial, 1 parallel, 1 opt. game</p> <p>Yes                  Yes                  Yes                  Modem, printer, terminal</p> <p>RAMdrive, print spooler, and utilities software included.</p>	<p><b>Scientific Solutions</b>                  Base Board</p> <p>IBM PC, PC XT</p> <p>Intel 8088                  —</p> <p>—                  Full                  —                  \$345                  One year                  —                  —                  —                  —                  —</p> <p>A digital input and digital output board with four sections of 24 DI/DO lines each. Allows customization to create a multifunction board by the addition of modules.</p>	<p><b>Sigma Designs</b>                  Maximizer</p> <p>IBM PC, PC XT, PC AT</p> <p>Intel 8086, 8088, 80186, 80286                  PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD, p-System                  8 bit                  Full                  January 1983                  \$265 (0KB)                  One year                  512K (w/opt. stack card)                  2 serial (1 opt., 1 std), 1 parallel, 1 game                  Yes                  Yes, w/software                  Yes, w/software                  RS-232C modem;                  Centronics-compat printer, terminal                  Includes SoftDisk and Spool software. 64K bits/chip.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems</p> <p><b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Max Memory Capacity</b>  <b>Ports</b></p> <p><b>Clock Calendar</b>  <b>Printer Buffer</b>  <b>Disk Emulation</b>  <b>Controller Capabilities</b></p> <p><b>Additional Features</b></p>	<p><b>Sigma Designs</b>                  SDI-384</p> <p>IBM PC, PC XT, PC AT                  Intel 8086, 8088, 80186, 80286                  PC DOS, MS-DOS, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System</p> <p>8 bit                  Full or half avail                  June 1984                  \$225 (0KB)                  One year                  512KB (w/128KB opt. Maxistack card)</p> <p>—                  Opt.                  Yes                  Yes                  —                  NA</p>	<p><b>Sigma Designs</b>                  SDI-SSC</p> <p>IBM PC, PC XT, PC AT                  Intel 8086, 8088, 80186, 80286                  PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System</p> <p>8 bit                  Half                  1983                  \$210                  One year                  NA</p> <p>1 serial, 1 parallel, 1 game</p> <p>Yes                  Yes                  Yes                  RS-232C modem; Centronics-compat printer, terminals                  TTY communications compatibility.</p>	<p><b>STB Systems</b>                  Rio Grande</p> <p>IBM PC AT                  Intel 80286                  —</p> <p>16 bit                  Full                  —                  \$549 (128KB memory)                  One year                  128KB-1.5MB</p> <p>1 parallel, 1 serial (std); 1 serial, 1 game (opt.)                  —                  —                  —                  —</p> <p>64K or 256K bits/chip. All memory fully parity checked for data errors.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems  <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Ports</b>  <b>Clock Calendar</b> <b>Printer Buffer</b> <b>Disk Emulation</b> <b>Controller Capabilities</b> <b>Additional Features</b>	<b>STB Systems</b> Rio Plus IIA  IBM PC, PC XT, PC AT Intel 8088, 80286 — — Full — \$349 (64KB memory) One year 64KB, 256KB, 384KB 1 parallel, 1 serial, 1 game (std); 1 serial (opt.) Yes — — — All memory fully parity checked for data errors.	<b>STB Systems</b> Super I/O II  IBM PC, PC XT, PC AT Intel 8088, 80286 — — Half — \$195 One year — 1 serial, 1 parallel, 1 game Yes Yes, w/software Yes, w/software — Includes PC Accelerator software.	<b>Tall Tree Systems</b> JRAM 2  IBM PC, PC XT & compatibles Intel 8088 PC DOS, MS-DOS, UCSD p-System — 13.25 x .75 x 4.25 (full) March 1984 \$219 (w/out RAM or ports) — Up to 2MB 1-2 serial, 0-1 parallel Yes Yes Yes Printers Incl software for RAMdisk and print spooler. Functionally similar to AST 6-pack. 64K or 256K bits/ chip.
<b>Vendor Model</b>  <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Ports</b> <b>Clock Calendar</b> <b>Printer Buffer</b> <b>Disk Emulation</b> <b>Controller Capabilities</b> <b>Additional Features</b>	<b>Tall Tree Systems</b> JRAM-AT  IBM PC AT Intel 80286 PC DOS, MS-DOS — 16 bit 13.5 x .75 x 4.75 — \$269 (w/out RAM or ports) — 2MB 0-2 serial, 0-1 parallel — Yes (2MB max) — Printer 64K or 256K bits/chip.	<b>Tecmar</b> 1stMATE Multifunction Board  IBM PC, PC XT, & compatibles Intel 8088 — — Full — \$319-\$589 One year 0-256KB 1 parallel, 1 serial Yes, w/battery backup Yes — — Includes Tecmar Treasure Chest of Software.	<b>Tecmar</b> 2ndMATE Multifunction Board  IBM PC, PC XT Intel 8088 — — Full — \$295 One year — 2 serial, 2 parallel Yes, w/battery backup — — — Autotime software, vectored interrupt, PAL lockout option. 1 serial and 1 parallel cable included.

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Ports</b></p> <p><b>Clock Calendar</b></p> <p><b>Printer Buffer</b></p> <p><b>Disk Emulation</b></p> <p><b>Controller Capabilities</b></p> <p><b>Additional Features</b></p>	<p><b>Tecmar</b> 3rdMATE Multifunction Board</p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>—</p> <p>Full</p> <p>—</p> <p>\$445</p> <p>One year</p> <p>—</p> <p>1 serial, 2 parallel</p> <p>Yes, w/battery backup</p> <p>—</p> <p>—</p> <p>—</p> <p>Includes 50-300 baud, Bell 103-compatible modem. Autotime software, vectored interrupt, PAL lock-out option.</p>	<p><b>Tecmar</b> Bosun XT Multifunction Board</p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>—</p> <p>Half</p> <p>—</p> <p>\$195</p> <p>One year</p> <p>—</p> <p>1 serial, 1 parallel</p> <p>Yes, w/battery backup</p> <p>Yes</p> <p>—</p> <p>—</p> <p>Autotime and RAMSpooler software, PAL (Programmable Array Logic) chip.</p>	<p><b>Tecmar</b> Captain Multifunction Board</p> <p>IBM PC, PC XT and compatibles</p> <p>Intel 8088</p> <p>—</p> <p>8 bit</p> <p>Full</p> <p>—</p> <p>\$259-\$589</p> <p>One year</p> <p>0-384KB</p> <p>1 parallel, 1 serial</p> <p>Yes, w/battery backup</p> <p>Yes</p> <p>—</p> <p>—</p> <p>Includes Tecmar Treasure Chest of Software.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Max Memory Capacity</b></p> <p><b>Ports</b></p> <p><b>Clock Calendar</b></p> <p><b>Printer Buffer</b></p> <p><b>Disk Emulation</b></p> <p><b>Controller Capabilities</b></p> <p><b>Additional Features</b></p>	<p><b>Tecmar</b> Maestro AT Multifunction</p> <p>IBM PC AT</p> <p>Intel 80286</p> <p>—</p> <p>8 bit, 16 bit</p> <p>Full</p> <p>1984</p> <p>\$529-\$4,589 (0-2,560K)</p> <p>One year</p> <p>2,560KB</p> <p>1 serial, 1 parallel</p> <p>No</p> <p>Yes</p> <p>Yes, w/software (std)</p> <p>—</p> <p>PAL (Programmable Array Logic) chip. Extra software security. Tecmar Treasure Chest of Software included.</p>	<p><b>Tecmar</b> Time Master Board</p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>—</p> <p>Full</p> <p>—</p> <p>\$135</p> <p>One year</p> <p>—</p> <p>—</p> <p>Yes</p> <p>—</p> <p>—</p> <p>Automatically sets time and date; 5-yr battery backup.</p>	<p><b>Teletek</b> Z-150MB</p> <p>Zenith Z-150/Z-160, other IBM PC compatibles</p> <p>—</p> <p>—</p> <p>Full</p> <p>—</p> <p>—</p> <p>—</p> <p>0-384KB</p> <p>1 game</p> <p>Opt.</p> <p>Yes, w/software</p> <p>Yes, w/software</p> <p>—</p> <p>64K bits/chip. Parity checked RAM. RAMdrive and print spooler software included.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time





<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems  <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b>  <b>Warranty</b> <b>Max Memory Capacity</b> <b>Ports</b>  <b>Clock Calendar</b> <b>Printer Buffer</b> <b>Disk Emulation</b> <b>Controller Capabilities</b> <b>Additional Features</b>	<b>Titan Technologies</b> Neptune 64K card  Apple II, II + , IIe Synertek 6502, 6502A —  8 bit Fits in any Apple slot — \$249 (64KB), \$399 (128KB), \$499 (192KB) One year 64K/192K NA  No No No — Adds 80 col. capabilities to Apple PCs. VC-Expand and Plan-Expand software opt.	<b>Titan Technologies</b> Titan Multifunction  IBM PC, PC XT Intel 8086, 8088 PC DOS, MS-DOS, CP/M-86, UCSD p-System  8 bit Full — \$556 (64KB)  One year 64KB-576KB 2 serial, 1 parallel, 1 SASI/SCSI Yes 512KB Yes Modem, printer, SASI disk NA	<b>Titan Technologies</b> Titan P-1  IBM PC, PC XT Intel 8086, 8088 PC DOS, MS-DOS  8 bit Half — \$199  One year NA 1 parallel, 1 game  Yes, w/battery backup — No — NA
<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems  <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Max Memory Capacity</b> <b>Ports</b> <b>Clock Calendar</b> <b>Printer Buffer</b> <b>Disk Emulation</b> <b>Controller Capabilities</b> <b>Additional Features</b>	<b>Titan Technologies</b> Titan S-1  IBM PC, PC XT Intel 8086, 8088 PC DOS, MS-DOS  8 bit Full — \$229 One year NA 1 serial, 1 game Yes, w/battery backup — NA External PC-compatible modem, serial printer TTY communications compatibility.	<b>Viasyn</b> System Support 1  IEEE-696 S-100 bus — CP/M-86, MP/M-86, Concurrent CP/M-86, proprietary — — — \$350 One year 4KB 1 serial Yes — — — 15 level interrupt control. Includes three 16-bit interval timers, socket for opt. math processor.	

**Notes:**

NA Not applicable

— Information unavailable at press time



# SPECIFICATIONS CHART

## Add-On Boards—Graphics

234.0045.301

<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Colors: Simul/Palette</b></p> <p><b>Resolution</b></p> <p><b>Lines x Columns</b></p> <p><b>Additional Features</b></p>	<p><b>Amdek</b> Amdek DVM-III</p> <p>Apple IIe</p> <p>Synertek 6502</p> <p>—</p> <p>—</p> <p>Fits in slot 7 of Apple IIe</p> <p>March 1984</p> <p>\$179</p> <p>One year</p> <p>NA</p> <p>—/16</p> <p>—</p> <p>— x 40/80</p> <p>Reproduces on RGB monitors video modes that Apple IIe can display on NTSC or composite monitors.</p>	<p><b>Apricorn</b> 1300-35 Graphics Printer Interface</p> <p>Apple II, II+, IIe, and compatibles</p> <p>Synertek 6502</p> <p>Apple DOS, ProDOS, CP/M-80</p> <p>8 bit</p> <p>—</p> <p>1982</p> <p>\$99.95</p> <p>Lifetime</p> <p>—</p> <p>—</p> <p>—</p> <p>Outputs graphics from hi-res screen to various printers. Inverse and emphasized graphics, expansion and rotations, 40 and 80 col text screen dumps, enhanced text formatting commands, full 8th bit control.</p>	<p><b>Apricorn</b> 1300-45 Super Serial Imager</p> <p>Apple II, II+, IIe, and compatibles</p> <p>Synertek 6502</p> <p>AppleDOS, ProDOS, CP/M-80</p> <p>8 bit</p> <p>—</p> <p>1984</p> <p>\$129.95</p> <p>Yes</p> <p>1 serial</p> <p>—</p> <p>—</p> <p>Enables high res graphics transfer from screen to serial printers. Controls modems, printers and terminals. Features include invert image, rotate image, page overlay, horizontal and vertical aspect control, side by side dump, and zoom size. Utilizes TTY communications protocol.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Colors: Simul/Palette</b></p> <p><b>Resolution</b></p> <p><b>Lines x Columns</b></p> <p><b>Additional Features</b></p>	<p><b>Apricorn</b> 1300-70 UPPER/lower Case Adapter</p> <p>Apple II, II+</p> <p>Synertek 6502</p> <p>Apple DOS, CP/M-80</p> <p>—</p> <p>—</p> <p>1982</p> <p>\$19.95</p> <p>Lifetime</p> <p>—</p> <p>—</p> <p>—</p> <p>Expands 64 character set of Apple II &amp; II+ to 96 characters, upper and lower case.</p>	<p><b>Apricorn</b> 1400-10-80 Column Card</p> <p>Apple IIe</p> <p>Synertek 6502</p> <p>AppleDOS, ProDOS, CP/M-80</p> <p>8 bit</p> <p>—</p> <p>1983</p> <p>\$89.95 (1KB memory)</p> <p>Yes</p> <p>—</p> <p>Monochrome</p> <p>— x 80</p> <p>Adds 80 col display to Apple IIe. 64KB memory opt. Can function as disk emulator.</p>	<p><b>AST Research</b> AST-5250 Display</p> <p>IBM PC, PC XT, PC AT</p> <p>—</p> <p>DOS</p> <p>—</p> <p>Full</p> <p>August 1985</p> <p>\$495</p> <p>One year, 2 year opt.</p> <p>1 parallel</p> <p>—</p> <p>720 x 348</p> <p>25 x 80</p> <p>IBM monochrome monitor connector; CRT controller. Full IBM 5251-11 character and field display attribute support. Bit-mapped graphics and text; compatible w/popular bitmapped graphics text and windowing applications software.</p>

**Notes:**

NA Not applicable  
— Information unavailable at press time

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MW-11/85

<p><b>Vendor Model</b> <b>Compatibility</b> Computers/Bus Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Colors: Simul/Palette</b> <b>Resolution</b> <b>Lines x Columns</b> <b>Additional Features</b></p>	<p><b>AST Research</b> ColorGraphPlus IBM PC AT Intel 8086, 8088, 80286 PC DOS, MS-DOS — Full August 1985 \$295; \$370 for enhanced version One year; two year opt. 1 parallel —/16 320 x 200 x 16; 640 x 200 x 4 (8 opt.) 25 x 40/80 32KB memory. Designed to be compatible w/software for IBM Color Graphics Adapter. Can coexist w/AST Preview! card. Light pen and RF modulator interface std.</p>	<p><b>AST Research</b> MonoGraphPlus IBM PC, PC XT, PC AT Intel 8088, 80286 — Full 1984 \$499 One year, 2 year opt. 1 parallel, 1 serial Monochrome 720 x 348 — Clock/calendar included. Provides graphics and text capabilities on IBM monochrome display.</p>	<p><b>AST Research</b> Preview! IBM PC, PC XT, PC AT Intel 8088, 80286 — — 1984 \$399 One year, two year opt. 1 printer Monochrome 720 x 348 — Compatible w/major applications software that uses monochrome bit-mapped graphics, such as Lotus 1-2-3, Symphony, &amp; Framework. SuperDrive and SuperSpool software included to provide disk emulation and print spooler features.</p>
<p><b>Vendor Model</b> <b>Compatibility</b> Computers/Bus  Microprocessors Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Colors: Simul/Palette</b> <b>Resolution</b> <b>Lines x Columns</b> <b>Additional Features</b></p>	<p><b>Bit 3 Computer</b> 610 Full-view 80 Atari 800 Synertek 6502 DOS 8 bit Full 1982 \$139 One year — — — 24 x 80 Adds 80 col graphics to Atari 800; features line drawing graphics.</p>	<p><b>Bronson Electronics</b> Innovation 1007 CGP IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286 PC DOS, MS-DOS — Full May 1984 \$244 2 year 1 parallel 4 or 16/16 640 x 200 x 1; 320 x 200 x 4, 160 x 100 x 16 25 x 40/80 Provides color/graphics video signals for display on monitor and printer port. 1 light pen connector, 1 RF modulator connector, 8K char ROM, 16K display ROM. Designed to be compatible w/software for IBM PC.</p>	<p><b>Cleveland Codonics</b> I-200 Zenith Z-29 terminal — Any — April 1984 \$1075 90 day — —/16; monochrome also 1024 x 1024 physical, 672 x 500 display — On-board Intel 8051 &amp; NEC 7220 processors. Gives Zenith Z-29 terminal graphics capabilities w/Tektronix 4010/4014 emulation. 6 pgs of graphics std; pan, zoom; 300, 000 pixel per second drawing rate.</p>

**Notes:**

NA Not applicable

— Information unavailable at press time



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Colors: Simul/Palette</b>  <b>Resolution</b>  <b>Lines x Columns</b>  <b>Additional Features</b></p>	<p><b>Cleveland Codonics</b>                  I-300                  WYSE-50 or 75 alphanumeric terminal                  —                  Any                  —                  April 1985                  \$1,595                  90 day                  —                  —                  1,024 x 800                  —                  On-board Intel 8051 and NEC 7220 processors. Gives WYSE-50 or 75 terminal Tektronix 4010/4014 graphics capabilities. Has pan and zoom capabilities, fast 1,000,000 pixel per second drawing rate, opt. hardcopy capabilities.</p>	<p><b>Conographic</b>                  Cono-Color 40                  IBM PC, PC XT, PC AT                  Intel 8080, 8088, 8086, 80186, 80286                  PC DOS                  —                  November 1983                  \$995                  One year                  —                  16/256                  To 640 x 400 or 512 x 512                  25 x 40/80, 36 x 40/80                  Functionally equivalent to IBM Color/Graphics Adapter. Features high speed fill, digital and analog RGB, 1 pixel resolution, light pen, CGI compatible drive.</p>	<p><b>Control Systems</b>                  Artist 1                  IBM PC, PC AT, PC XT                  Intel 8086, 8088, 80186, 80286                  PC DOS, CP/M-86                  8 bit                  Full                  December 1982                  \$2,295                  90 day                  —                  —/4096                  1024 x 1024                  —                  Color graphic display controller w/512KB memory, graphic library, autocad software, artbrush software, VDI device drivers.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Colors: Simul/Palette</b>  <b>Resolution</b>  <b>Lines x Columns</b>  <b>Additional Features</b></p>	<p><b>Control Systems</b>                  Artist 2                  IBM PC, PC XT, PC AT                  Intel 8086, 8088, 80186, 80286                  —                  8 bit                  Full                  August 1983                  \$1,195 (TTL), \$1,395 (analog)                  90 day                  —                  —/4096                  512 x 512                  —                  Color graphic display controller w/graphic library, autocad software, artbrush software, and VDI.</p>	<p><b>Control Systems</b>                  Artist Transformer                  IBM PC, PC XT, PC AT                  Intel 8086, 8088, 80186, 80286                  —                  8                  Full                  July 1984                  \$1,795 (TTL), \$1,995 (analog)                  90 day                  —                  —/4096                  720 x 540                  —                  Color graphic display controller w/text overlay plane. 128KB memory. 64K bits/chip. 190KB display buffer.</p>	<p><b>Control Systems</b>                  Artist Video                  IBM PC, PC XT, PC AT                  Intel 8086, 8088, 80186, 80286                  —                  —                  Full                  October 1984                  \$1,495                  90 day                  —                  —                  —                  —                  Digital video processing for video frame sync, color keying, graphic overlay, NTSC encode/decode for video disk, camera, and broadcast.</p>

**Notes:**  
 NA Not applicable  
 — Information unavailable at press time



<b>Vendor Model</b> <b>Compatibility</b> Computer/Bus  Microprocessors  Operating Systems <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b>  <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Colors: Simul/Palette</b> <b>Resolution</b>  <b>Lines x Columns</b> <b>Additional Features</b>	<b>DataCube</b> 128 Family  Model IVG-128: IBM PC, PC XT, PC AT; Model VVG-128: VME bus; Model VG-128: Multibus; Model QVG-128: Q-bus  —  —  Full IVG-128, 1984; other models, 1985 \$2,995 90 day  —  —  384 x 512 x 8  —  Real-time video acquisition process and display board. Accepts RS-170 video input. Analog to digital conversion 7.16 MHz, 24 bit addressing, 196KB image memory.	<b>DataCube</b> QVG-123  Digital Equipment Q-bus, LSI-11 bus  Digital Equipment 11/23, 11/03, MicroVAX Micro VMS, RT-11, UNIX  —  June 1983  \$7,500 30 day  —  —/256 768 x 512 x 4/8 (8 w/addition of piggyback expansion module AF-123A)  —  Video digitizer and re-display board targeted at inspection and robotics marketplace. Reverse video, highlighting, underlining, character overlay generation, zoom w/2X factor, and full compatibility w/broadcast equipment.	<b>DataCube</b> VG-123  Multibus systems (IEEE-796 bus)  Any  Any  —  June 1983  \$7,500 30 day  —  —/256 768 x 512 x 4/8 (8 w/addition of piggyback module AF-123A)  —  Real-time video digitizer and redisplay board for the inspection and robotics marketplace.
<b>Vendor Model</b>  <b>Compatibility</b> Computer/Bus  Microprocessors Operating Systems  <b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Colors: Simul/Palette</b>  <b>Resolution</b> <b>Lines x Columns</b> <b>Additional Features</b>	<b>DataCube</b> VG-150  Any 16-bit Multibus-based system (IEEE-796 bus)  —  UNIX, CP/M-86, MP/M-86, Concurrent CP/M-86  —  12 x 0.5 x 6.75 June 1984 \$4,000 30 day  —  Monochrome  1408 x 1100  —  Bitmap graphics controller board. Driven by a bipolar AMD 291116 bit slice processor. 8 nsec pixel period. Microcode development package available to users who wish to write their own microcode. Features BIT-BLT function.	<b>Digital Equipment</b> Extended Bit-Map Graphics Module  Professional 325 or 350  —  —  —  —  \$895  —  —  8/256 color, 8/16 monochrome shades 960 x 240 (each plane)  —  Adds two bit-map planes to std video generator for a total of three planes.	<b>Digital Equipment</b> Extended Bit-Map Graphics Module  Professional 380  —  —  —  —  \$1,295  —  —  8/4,096  960 x 240/480 (each plane)  —  Adds two bit-map planes to std video generator for a total of three planes.

**Notes:**

NA Not applicable

— Information unavailable at press time



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Colors: Simul/Palette</b>  <b>Resolution</b>  <b>Lines x Columns</b>  <b>Additional Features</b></p>	<p><b>Digital Equipment Graphics Option</b>                  Digital Equipment Rainbow, PRO, DECmate                  —                  —                  —                  —                  \$40                  —                  —                  4 or 16/4096                  384 x 240 x 4 or 800 x 240 x 2                  —                  Gives computer high-resolution, bitmapped graphics.</p>	<p><b>Emulex Persyst BoB Display Adapter</b>                  IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  Full                  —                  \$525 base config                  Two year                  1 light pen                  —/16                  800 x 400 alphanumeric; 320 x 200/400 x 4 or 640 x 200/400 x 1 graphics                  25 x 40/80                  BoB stands for "Best of Both"; card provides high res text of IBM monochrome adapter and full color &amp; graphics of display adapter. 8 x 11 char in 10 x 16 cell. Designed to be compatible w/complete library of IBM Color Graphics software.</p>	<p><b>Emulex Persyst Mini-Mono Card</b>                  IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  Half                  —                  \$225, \$250 w/parallel port                  Two year                  1 opt. parallel                  Monochrome                  —                  25 x 80                  Monochrome display adapter, designed to be fully compatible w/IBM software and monitors. Uses custom VLSI. 18.432 KHz horizontal rate. Screen memory supports DMA operations. 7 x 9 char in 9 x 14 field.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Colors: Simul/Palette</b>  <b>Resolution</b>  <b>Lines x Columns</b>  <b>Additional Features</b></p>	<p><b>Emulex Persyst Short-Port Color Card</b>                  IBM PC, PC XT, PC AT                  Intel 8088, 80286                  —                  —                  Half                  —                  \$210, \$245 w/printer port &amp; composite output                  Two year                  1 parallel opt, 1 light pen                  —/16                  320 x 200 x 4, 640 x 200 x 1                  24 x 40/80                  Designed to be compat w/IBM color graphics software and color monitors. VLSI custom chip technology. 16KB video memory. Direct drive, (IRGB) and composite video color outputs. 7 x 7 char in 8 x 8 field.</p>	<p><b>Enterprise Systems 10301 Versatile Video Display Card</b>                  Any STD bus system                  —                  —                  8 bit                  —                  March 1985                  \$495 (4 page version)                  Limited one year                  —                  —/64                  640 x 240                  24 x 80 or 132 x 48 text; 640 x 240 graphics                  Provides RGB color or monochrome and alphanumerics or graphics data display on raster scan monitor. 32KB memory.</p>	<p><b>Enterprise Systems 10303 STD Bus Color Terminal Card</b>                  Any STD bus system                  —                  —                  —                  July 1985                  \$475                  One year                  2 serial (1 RS-232C, 1 RS-485)                  —/16                  256 x 192                  40 x 24 (to 8 pgs)                  On-board Zilog Z80 processor. NTSC or PAL video.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor</b></p> <p><b>Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Colors: Simul/Palette</b></p> <p><b>Resolution</b></p> <p><b>Lines x Columns</b></p> <p><b>Additional Features</b></p>	<p><b>Frontier Technologies</b></p> <p>CADgraph 2</p> <p>IBM PC, PC XT, PC AT, &amp; compatibles Intel 8088, 80286 PC DOS</p> <p>—</p> <p>Full</p> <p>March 1984</p> <p>\$995</p> <p>One year</p> <p>—</p> <p>4 or 16/16 640 x 480 x 16, 1024 x 1024 x 4 (programmable)</p> <p>—</p> <p>Graphics output board w/NEC 7220 graphics controller. Light pen interface std. Runs AutoCAD, CADplan and SMART software. Graphics kernel system set available.</p>	<p><b>Frontier Technologies</b></p> <p>IHR 2gc-001 Intelligent High Resolution Graphics Controller</p> <p>IBM PC, PC XT, PC AT &amp; compatibles Intel 8088, 80286 PC DOS</p> <p>—</p> <p>Full</p> <p>January 1985</p> <p>\$1,295</p> <p>One year</p> <p>—</p> <p>16/4096 1024 x 1024 x 16</p> <p>—</p> <p>On-board Intel 80188 processor and Hitachi HD63484 graphics controller. 512KB memory, light pen interface, built-in graphics kernel system.</p>	<p><b>Hercules Computer Technology</b></p> <p>Hercules Color Card</p> <p>IBM PC, PC XT, PC AT</p> <p>Intel 8086, 8088 PC DOS, MS-DOS</p> <p>—</p> <p>Half (PC XT), full (PC) November 1984</p> <p>\$245</p> <p>Two year extended</p> <p>1 parallel 4/16 320 x 200 RGB, 640 x 200 monochrome 25 x 40/80</p> <p>Functionally similar to IBM Color Monitor Adapter card. Fully compatible w/software written for IBM color card.</p>
<p><b>Vendor</b></p> <p><b>Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Colors: Simul/Palette</b></p> <p><b>Resolution</b></p> <p><b>Lines x Columns</b></p> <p><b>Additional Features</b></p>	<p><b>Hercules Computer Technology</b></p> <p>Hercules Graphics Card</p> <p>IBM PC, PC XT, PC AT</p> <p>Intel 8086, 8088 PC DOS, MS-DOS</p> <p>—</p> <p>Full</p> <p>August 1982</p> <p>\$499</p> <p>Two year extended</p> <p>1 parallel</p> <p>Monochrome 720 x 348</p> <p>—</p> <p>Functionally similar to IBM Monochrome Display/Printer Adapter, w/additional graphics capability. 64KB display buffer.</p>	<p><b>IBM</b></p> <p>Color/Graphics Monitor Adapter (4910)</p> <p>IBM PC, PC XT, 5531 Industrial Computer Intel 8088</p> <p>—</p> <p>Full</p> <p>\$550</p> <p>—</p> <p>1, 4 or 16/16 320 x 200 x 4 color, 640 x 200 x 1 color</p> <p>—</p> <p>Supports IBM 5153 Color Display when attached to IBM PC and PC XT. Also supports light pen. 16KB RAM, 8KB ROM.</p>	<p><b>IBM</b></p> <p>IBM PC Enhanced Graphics Adapter (#1200)</p> <p>IBM PC, PC XT, PC AT</p> <p>Intel 8088, 80286</p> <p>—</p> <p>Full</p> <p>\$524</p> <p>—</p> <p>16/16 or 64 640 x 350, 320/640 x 200</p> <p>25 x 40/80</p> <p>Used for attachment of direct-drive RGB signal displays. 64KB max memory capacity on card; 128KB w/Graphics Memory Expansion Card (#1201), 256KB w/Graphics Memory Module Kit (#1203).</p>

**Notes:**

NA Not applicable

— Information unavailable at press time



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Colors: Simul/Palette</b></p> <p><b>Resolution</b></p> <p><b>Lines x Columns</b></p> <p><b>Additional Features</b></p>	<p><b>IBM</b> Monochrome Display and Printer Adapter (#4900)</p> <p>IBM PC, PC XT, 5531 Industrial Computer Intel 8088</p> <p>—</p> <p>Full</p> <p>—</p> <p>\$250</p> <p>—</p> <p>1 parallel</p> <p>—</p> <p>720 x 350 25 x 40/80</p> <p>Supports IBM 5151 Monochrome Display mdl 1 and IBM 5152 Graphics Printer mdl 2. 7 x 9 in 9 x 14 box char matrix. 8KB ROM memory.</p>	<p><b>IBM</b> Professional Graphics Controller (#1501)</p> <p>IBM PC, PC XT, PC AT</p> <p>Intel 8088, 80286</p> <p>—</p> <p>Requires two full-size slots</p> <p>—</p> <p>—</p> <p>—</p> <p>256/4,096 640 x 480/400</p> <p>—</p> <p>Attaches IBM 5175 Professional Graphics Display to PC. 320KB display storage. On-board Intel 8088 processor. Provides capability to run IBM PC software. 2D &amp; 3D drawing functions.</p>	<p><b>IBM</b> Prototype Card (#1400)</p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>—</p> <p>Full</p> <p>—</p> <p>\$35</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>Can be used as a base for building and testing custom attachments to system. Instructions and component identifications included for I/O decode attachment logic.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Colors: Simul/Palette</b></p> <p><b>Resolution</b></p> <p><b>Lines x Columns</b></p> <p><b>Additional Features</b></p>	<p><b>IDEAssociates</b> IDEAgraph (GPR)</p> <p>IBM PC, PC XT, PC AT Intel 8088, 80286</p> <p>PC DOS</p> <p>16 bit Full</p> <p>—</p> <p>\$995 (128KB)</p> <p>One year</p> <p>—</p> <p>256/4096 1024 x 1024, 512 x 512</p> <p>—</p> <p>128KB or 256KB memory. Transforms PC into graphics workstation. 80 ns per pixel drawing speed. Hardware-controlled zoom factor (1-16), software-controlled blink feature. Automatic line, circle, vector and space filling function. 64K bits/chip.</p>	<p><b>Matrox</b> GXB-1000A</p> <p>Any Multibus-based system Independent of system processor Independent of OS</p> <p>8 bit 12 x 0.5 x 6.25</p> <p>—</p> <p>\$4,735 6 month</p> <p>—</p> <p>11/16; monochrome 1024 x 1024</p> <p>—</p> <p>Max display buffer: 1280 x 1024 x 4, light pen, reverse video, blinking char, highlighting, underlining. 64K bits/chip.</p>	<p><b>Matrox</b> MIP-512</p> <p>IEEE-796 Multibus Independent of system processor Independent of OS</p> <p>8 bit, 16 bit 12 x 0.5 x 6.25</p> <p>—</p> <p>\$2,995 6 month</p> <p>—</p> <p>—</p> <p>512 x 512</p> <p>—</p> <p>Single board imaging processor. RS-170 video input. 256KB max memory capacity.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time





<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Colors: Simul/Palette</b> <b>Resolution</b> <b>Lines x Columns</b> <b>Additional Features</b></p>	<p><b>Matrox Electronic Systems</b> SX-900</p> <p>IEEE-796 Multibus Independent of system processor Independent of OS</p> <p>8 bit, 16 bit 12 x 0.5 x 6.25 — \$3,805 6 month — 16/64 640 x 480 — Intelligent color graphics processor. 512KB max memory.</p>	<p><b>Orange Micro</b> Buffered Grappler +</p> <p>Apple II + , IIe Synertek 6502, 6502A</p> <p>AppleDOS 3.3, ProDOS, UCSD p-System, Apple CP/M</p> <p>8 bit Full — \$209 One year 1 parallel — — 64K bits/chip. On-board Intel 8048 processor. 64KB ROM, 4K RAM. Parallel printer interface w/features including dual hi-res graphics, mixed mode screen dumps, 16KB buffering.</p>	<p><b>Orange Micro</b> Bufferpak</p> <p>Apple II + , IIe Synertek 6502, 6502A</p> <p>AppleDOS 3.3, ProDOS, UCSD p-System, Apple CP/M</p> <p>8 bit — — \$135 One year 1 serial — — 64K bits/chip. On-board Zilog 8681 processor. Printer buffer in 16K, 32K, and 64K capacities.</p>
<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b> <b>Colors: Simul/Palette</b> <b>Resolution</b> <b>Lines x Columns</b> <b>Additional Features</b></p>	<p><b>Orange Micro</b> Grappler +</p> <p>Apple II + , IIe Synertek 6502, 6502A AppleDOS 3.3, ProDOS, UCSD p-System, Apple CP/M</p> <p>8 bit — — \$119 One year 1 parallel — — Parallel printer interface w/features including dual hi-res graphics, mixed mode screen dumps. Compat. w/variety of parallel printers. On-board Intel 8048 processor.</p>	<p><b>Orange Micro</b> Grappler C</p> <p>Apple IIc Synertek 65C02 —</p> <p>7 or 8 — 1985 \$119 One year 1 parallel — — Printer interface, serial to parallel converter. Includes Imagewriter emulation for most popular printers. Graphics print software included.</p>	<p><b>Orange Micro</b> Grappler CD</p> <p>Commodore 64 — Commodore OS</p> <p>8 bit — — \$119 One year 1 parallel — — On-board Rockwell 6501Q processor. Interfaces various parallel printers w/Commodore 64. Graphics and text capabilities including text, block graphics, &amp; hi-res screen dumps; print graphics rotated, inverted, or double-sized.</p>

**Notes:**

- NA Not applicable  
— Information unavailable at press time



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems</p> <p><b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Colors: Simul/Palette</b>  <b>Resolution</b>  <b>Lines x Columns</b>  <b>Additional Features</b></p>	<p><b>Orange Micro</b>                  HotLink</p> <p>Apple IIc                  Synertek 65C02</p> <p>—</p> <p>7 or 8</p> <p>—</p> <p>1985</p> <p>\$69</p> <p>One year</p> <p>1 parallel</p> <p>—</p> <p>—</p> <p>—</p> <p>Serial to parallel converter.                  No power supply required.                  Switch for text/graphics.</p>	<p><b>Orange Micro</b>                  Orange Interface</p> <p>Apple II + , Apple IIe                  Synertek 6502, 6502A                  Apple DOS 3.3, ProDOS,                  UCSD p-System, Apple                  CP/M</p> <p>8 bit                  Full</p> <p>—</p> <p>\$69</p> <p>One year</p> <p>1 parallel</p> <p>—</p> <p>—</p> <p>—</p> <p>2KB ROM. Parallel printer                  interface. 15 text formatting                  features.</p>	<p><b>Orange Micro</b>                  Serial Grappler</p> <p>Apple II + , IIe                  Synertek 6502, 6502 +                  AppleDOS 3.3, ProDOS,                  UCSD p-System, Apple                  CP/M</p> <p>8 bit                  Full</p> <p>—</p> <p>\$119</p> <p>One year</p> <p>1 serial</p> <p>—</p> <p>—</p> <p>—</p> <p>4KB ROM. Printer interface                  for Apple Imagewriter and                  Scribe printers, with full text                  and graphic functions                  including dual hi-res                  graphics and mixed mode                  screen dumps.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus</p> <p>Microprocessors</p> <p>Operating Systems</p> <p><b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Colors: Simul/Palette</b>  <b>Resolution</b></p> <p><b>Lines x Columns</b>  <b>Additional Features</b></p>	<p><b>Orchid Technology</b>                  Turbo Graphics Controller</p> <p>IBM PC, PC XT, PC AT &amp;                  compatibles                  Intel 8088, 80286</p> <p>—</p> <p>8 bit                  Full (2 card set)</p> <p>September 1985</p> <p>\$1,995</p> <p>Two year</p> <p>1 opt. serial w/daughtercard</p> <p>256/4096</p> <p>640 x 480</p> <p>—</p> <p>Emulates IBM Professional                  Graphics Controller. One of                  two cards is modified                  Orchid PCTurbo 186 card                  w/80186 on-board                  processor. Hardware CAD                  features: pan, zoom,                  programmable command                  set.</p>	<p><b>Paradise Systems</b>                  Modular Graphics Card</p> <p>IBM PC, PC XT &amp;                  compatibles                  Intel 8086, 8088, 80186,                  80286</p> <p>PC DOS, MS-DOS, CP/M-86</p> <p>8 bit                  Full</p> <p>August 1984</p> <p>\$395</p> <p>One year</p> <p>0</p> <p>—/16</p> <p>640 x 200 monochrome, 320                  x 200 color</p> <p>—</p> <p>64KB/chip. Can run graphics                  on either color or                  monochrome monitor. Can                  run programs like                  PFS-GRAPH, SuperCalc,                  Symphony, Flight Simulator,                  or Lotus 1-2-3, all w/out                  modification. Opt. add-on                  module provides 1 serial, 1                  parallel port, clock calendar,                  and 64KB-384KB memory.</p>	<p><b>Paradise Systems</b>                  Multi-Display Card</p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>—</p> <p>Full                  December 1983</p> <p>\$279</p> <p>One year</p> <p>1 parallel</p> <p>4/4</p> <p>640 x 200 monochrome, 320                  x 200 x 4 color</p> <p>25 x 80</p> <p>Color or monochrome display                  controller. Full IBM software                  compatibility. Light pen and                  RF modulator ports.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Colors: Simul/Palette</b></p> <p><b>Resolution</b></p> <p><b>Lines x Columns</b></p> <p><b>Additional Features</b></p>	<p><b>Profit Systems</b> Multigraph II</p> <p>IBM PC, PC XT Intel 8086, 8088</p> <p>—</p> <p>Full June 1984 \$595</p> <p>5 year</p> <p>—/16</p> <p>640 x 200/400 (color), 720 x 350/700 monochrome 80/90/132 x 40</p> <p>Can run software written for IBM color card on the monochrome monitor. Functionally similar to IBM Color/Monochrome Adapter Card. EGA compatible.</p>	<p><b>Quadram</b> Buffered Serial Printer Adaptor</p> <p>Apple II, II+, IIe Synertek 6502, 6502A</p> <p>—</p> <p>Full June 1985 \$139 (64K), \$199 (128K), \$259 (256K)</p> <p>One year</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>Provides ROM-based graphics support for Apple's Imagewriter and Scribe for DOUBLE HIRES and color printing. 64K-256K print spooler.</p>	<p><b>Quadram</b> eRAM 80</p> <p>Apple IIe Synertek 6502A</p> <p>—</p> <p>8 bit 5.5 x 0.5 x 2.75 1983 \$135</p> <p>One year</p> <p>—</p> <p>—</p> <p>—</p> <p>—</p> <p>Doubles the amount of text displayed on the Apple IIe. Adds 64K of RAM.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Colors: Simul/Palette</b></p> <p><b>Resolution</b></p> <p><b>Lines x Columns</b></p> <p><b>Additional Features</b></p>	<p><b>Quadram</b> Palette Master</p> <p>IBM PC Intel 8088</p> <p>—</p> <p>Full April 1985 \$695</p> <p>One year</p> <p>256/256,000 (used w/analog monitor) 320 x 200</p> <p>—</p> <p>Color resolution graphics adapter. 64KB memory.</p>	<p><b>Quadram</b> Quadcolor I</p> <p>IBM PC Intel 8088</p> <p>—</p> <p>Full 1984 \$275</p> <p>One year</p> <p>—</p> <p>1/16 foreground, 1/16 background</p> <p>—</p> <p>—</p> <p>Will drive any RGB monitor or composite video monitor.</p>	<p><b>Quadram</b> Quadcolor II</p> <p>IBM PC Intel 8088</p> <p>—</p> <p>Full 1984 \$569</p> <p>One year 1 game</p> <p>—</p> <p>320 x 200 x 136, 640 x 200 x 16</p> <p>—</p> <p>NA</p>

**Notes:**

NA Not applicable

— Information unavailable at press time



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Colors: Simul/Palette</b>  <b>Resolution</b>  <b>Lines x Columns</b>  <b>Additional Features</b></p>	<p><b>Quadram</b>                  Quadgraph                  IBM PC, PC XT                  Intel 8088                  PC DOS 2.0 and above                  —                  Full                  1984                  \$499                  One year                  1 parallel                  —                  720 x 384                  25 x 80                  64KB RAM screen memory. Functionally similar to IBM monochrome display/printer adapter card; will run Lotus 1-2-3, Autocad, and Microsoft's Windows.</p>	<p><b>Quadram</b>                  Quadvue                  IBM PC                  Intel 8088                  —                  Full                  1984                  \$345                  One year                  1 serial, 1 parallel std; 1 serial opt.                  Monochrome                  —                  —                  Clock/calendar. Character display generation; allows word processing in four fonts; allows users to create their own character fonts.</p>	<p><b>Quadram</b>                  Serial Interface Adapter                  Apple II, II+, IIe                  Synertek 6502, 6502A                  —                  Full                  1985                  \$99                  One year                  —                  —                  —                  Replaces Apple's Super Serial Card or Quadram Serial APIC C/G Card. Provides graphics support for Apple's Imagewriter &amp; Scribe printers.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Colors: Simul/Palette</b>  <b>Resolution</b>  <b>Lines x Columns</b>  <b>Additional Features</b></p>	<p><b>Sigma Designs</b>                  Color 400                  IBM PC, PC XT, PC AT &amp; compatibles                  Intel 8086, 8088, 80186, 80286                  PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System                  8 bit                  Full                  November 1984                  \$795                  One year                  —                  16/16                  640 x 400                  25 x 40/80; also 50 x 40/80                  Displays 640 x 400 in non-interlaced mode when used w/640 x 200 IBM software. Compatible to IBM color card in all graphics or alphanumerics modes.</p>	<p><b>Sigma Designs</b>                  Graphics Dazzler                  IBM PC, PC XT, PC AT &amp; compatibles                  Intel 8086, 8088, 80186, 80286                  PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System                  8 bit                  Full                  January 1984                  \$895                  One year                  —                  16/16                  640 x 200/400 display, 1024 x 1024 memory                  —                  Can use any IBM compatible monitor. Uses NEC 7220 graphics processor. Zoom capability from 1 to 16 in integral steps.</p>	<p><b>Sigma Designs</b>                  Graphics Dazzler II                  IBM PC, PC XT, PC AT &amp; compatibles                  Intel 8086, 8088, 80186, 80286                  PC DOS, MS-DOS, CP/M-86, MP/M-86, Concurrent CP/M-86, UNIX, UCSD p-System                  8 bit                  Full                  January 1984                  \$995                  One year                  —                  16/16                  640 x 400 x 4 color                  —                  For non-interlaced operation, requires high-res monitor; for interlaced mode can use standard color monitor. Uses on-board NEC 7220 display controller chip. Light pen interface. 1 to 16 step zoom capability. Hardware line and arc drawing; area filling.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus</p> <p>Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b></p> <p><b>Colors: Simul/Palette</b> <b>Resolution</b></p> <p><b>Lines x Columns</b> <b>Additional Features</b></p>	<p><b>STB Systems</b> Chauffeur</p> <p>IBM PC, PC XT, PC AT, IT&amp;T PC</p> <p>Intel 8088, 80286</p> <p>—</p> <p>Full 1985</p> <p>\$395</p> <p>One year 1 parallel</p> <p>16 level gray scale 640 x 352; 640 x 200 x 2 color (shades), 320 x 200 x 4 color (shades)</p> <p>25 x 80</p> <p>Converts any graphic display into format compatible w/IBM monochrome monitor. No software modification, preboot software, or drivers necessary. STB PC Accelerator software included; 32KB memory. Opt. clock/calendar.</p>	<p><b>STB Systems</b> Colorific</p> <p>IBM PC, PC XT, PC AT</p> <p>Intel 8088, 80286</p> <p>—</p> <p>Full 1985</p> <p>\$275</p> <p>One year 1 parallel (compatible w/IBM Parallel Printer Adapter)</p> <p>—</p> <p>640 x 200 x 4 color; 320 x 200 x 16 color</p> <p>—</p> <p>Emulates IBM Color/Graphics Display Adapter. Provides extended graphics capabilities and opt. clock/calendar. Includes PC Accelerator software.</p>	<p><b>STB Systems</b> Graphix Plus II</p> <p>IBM PC, PC XT, PC AT</p> <p>Intel 8088, 80286</p> <p>—</p> <p>Full —</p> <p>\$395</p> <p>One year 1 parallel</p> <p>4 or 16/16; monochrome 320 x 200 (16 color), 640 x 200 (4 color), 640 x 352 (monochrome)</p> <p>—</p> <p>Hardware and software compatible w/IBM display adapters. Connects PC to variety of color and/or monochrome monitors. STB PC Accelerator software std (provides printer buffer and disk emulation); clock/calendar opt.</p>
<p><b>Vendor Model</b> <b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b> <b>Physical Size (in.)</b> <b>First Delivered</b> <b>Price</b> <b>Warranty</b> <b>Ports</b></p> <p><b>Colors: Simul/Palette</b> <b>Resolution</b></p> <p><b>Lines x Columns</b> <b>Additional Features</b></p>	<p><b>STB Systems</b> Mono Plus II</p> <p>IBM PC, PC XT, PC AT</p> <p>Intel 8088, 80286</p> <p>—</p> <p>Full —</p> <p>\$249</p> <p>One year 1 parallel</p> <p>Monochrome</p> <p>—</p> <p>25 x 80</p> <p>Hardware &amp; software compatible w/IBM Monochrome/Printer Display Adapter. 4K display memory. Clock/calendar opt.</p>	<p><b>STB Systems</b> Super Res 400</p> <p>IBM PC, PC XT, PC AT</p> <p>Intel 8088, 80286</p> <p>—</p> <p>Full 1985</p> <p>\$595</p> <p>One year</p> <p>—</p> <p>2, 4, or 16/16 640/320 x 400/200</p> <p>25 x 40/80</p> <p>Emulates IBM Color Graphics Adapter. Connects PC to color monitors w/horizontal scan rate of 25 KHz and 640 x 400 resolution. Works w/Taxan 440, Mitsubishi AT-1341A, Dyneer 14CHI monitors. 32KB video display memory.</p>	<p><b>Tecmar</b> Graphics Master Board</p> <p>IBM PC, PC XT</p> <p>Intel 8088</p> <p>—</p> <p>Full —</p> <p>\$695</p> <p>One year</p> <p>—/16 640 x 400 color, 720 x 700 monochrome</p> <p>—</p> <p>Can replace or be used with IBM video boards. Displays alphanumerics and graphics on RGB, NTSC Composite or IBM Monochrome monitors. 128KB on-board memory.</p>

**Notes:**

NA Not applicable  
— Information unavailable at press time



<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  —                  Microprocessors                  Operating Systems  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>                  —  <b>Warranty</b>  <b>Ports</b>  <b>Colors: Simul/Palette</b>  <b>Resolution</b>  <b>Lines x Columns</b>  <b>Additional Features</b></p>	<p><b>Tecmar</b>                  Video Van Gogh Board                  IBM PC, PC XT                  Intel 8088                  —                  Full                  —                  \$345                  One year                  —                  —/256 gray levels                  255 x 255                  —                  Video digitizer. Converts TV camera images to information usable by PC. Can be used to digitize information from microscopes and telescopes, and to aid in signature recognition, assembly line inspection, or other applications.</p>	<p><b>Vectrix</b>                  Video Encoder                  IBM PC, PC XT, PC AT, &amp; compatibles                  Intel 8088, 80286                  PC DOS                  —                  November 1984                  \$500                  90 day                  —                  512/16.8M                  512 x 512                  —                  Encodes digital data from monitor to NTSC standards for output to video tape.</p>	<p><b>Vectrix</b>                  VX/PC Graphics Card                  IBM PC, PC XT, PC AT, most compatibles                  Intel 8088, 80286                  PC DOS                  16 bit                  Full                  June 1984                  \$2,495, \$2,995 (depends on color palette chosen)                  90 day                  —                  512/16.8M                  672 x 480                  —                  Adds graphics capabilities to IBM PCs. On-board Intel 80188 and NEC 7220. 384KB memory, 64K bits/chip. Data transfer via DMA feature.</p>
<p><b>Vendor Model</b>  <b>Compatibility</b>                  Computer/Bus                  Microprocessors                  Operating Systems                  —  <b>Word Size</b>  <b>Physical Size (in.)</b>  <b>First Delivered</b>  <b>Price</b>  <b>Warranty</b>  <b>Ports</b>  <b>Colors: Simul/Palette</b>  <b>Resolution</b>  <b>Lines x Columns</b>  <b>Additional Features</b></p>	<p><b>Vectrix</b>                  VX128A Graphics Processor                  Any                  Any                  Any                  16 bit                  Full                  November 1982                  \$2,295                  90 day                  —                  —/8                  672 x 480                  —                  On-board Intel 8088, NEC 7220 processors. 64K bits/chip. Attaches to host computer, providing graphics output capability to any computer, interfacing via printer port. Can function as Tektronix 4010, or DEC VT-100 terminal emulator.</p>	<p><b>Vectrix</b>                  VX384A Graphics Processor                  Any                  Any                  Any                  16 bit                  Full                  November 1982                  \$3,695                  90 day                  —                  512/16.8M                  672 x 480                  —                  On-board Intel 8088, NEC 7220 processors. 384KB memory. 64K bits/chip. Attaches to host computer, providing graphics output capability to any computer, interfacing via printer port. Controls Prism, Quadjet, ACT, and Radio Shack printers.</p>	<p><b>Viasyn</b>                  PC Video Board                  IEEE-696 S-100 bus                  —                  CP/M-86, MP/M-86, Concurrent CP/M-86, proprietary                  —                  1985                  \$495                  One year                  —                  —/16                  640 x 200                  25 x 40/80                  Support IBM PC software formats. On-board 6485 video display controller.</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Colors: Simul/Palette</b></p> <p><b>Resolution</b></p> <p><b>Lines x Columns</b></p> <p><b>Additional Features</b></p>	<p><b>Videx</b> PS-000 (PSIO Dual Function Interface)</p> <p>Apple II + , IIe Synertek 6502, Zilog Z80 CP/M-86, UCSD p-System</p> <p>—</p> <p>April 1983</p> <p>\$229</p> <p>90 day</p> <p>1 serial, 1 parallel</p> <p>—</p> <p>—</p> <p>—</p> <p>Communications protocol: TTY. Capabilities include phantoming to allow simultaneous use of the parallel and serial ports for modem and printer.</p>	<p><b>Videx</b> ULP-001 (Ultraterm)</p> <p>Apple II, Apple IIe Synertek 6502, Zilog Z80 CP/M-86, UCSD p-System</p> <p>—</p> <p>June 1983</p> <p>\$299</p> <p>90 day</p> <p>—</p> <p>—</p> <p>Up to 48 x 160</p> <p>Enhances text display quality of Apple II. Allows up to 32 lines x 128 col w/Multiplan and Flashcalc.</p>	<p><b>Videx</b> UNP-000 (Uniprint Parallel Printer Card)</p> <p>Apple II + , Apple IIe Synertek 6502, Zilog Z80 CP/M-86, UCSD p-System, AppleDOS 3.3</p> <p>—</p> <p>April 1984</p> <p>\$89</p> <p>90 day</p> <p>1 parallel</p> <p>—</p> <p>—</p> <p>Works with Dataproducts (IDS) color printer. Rotations, enlargements and color graphics are available.</p>
<p><b>Vendor Model</b></p> <p><b>Compatibility</b> Computer/Bus Microprocessors Operating Systems</p> <p><b>Word Size</b></p> <p><b>Physical Size (in.)</b></p> <p><b>First Delivered</b></p> <p><b>Price</b></p> <p><b>Warranty</b></p> <p><b>Ports</b></p> <p><b>Colors: Simul/Palette</b></p> <p><b>Resolution</b></p> <p><b>Lines x Columns</b></p> <p><b>Additional Features</b></p>	<p><b>Videx</b> VT-602 (Videoterm)</p> <p>Apple II + Synertek 6502, Zilog Z80 CP/M-86, UCSD p-System</p> <p>—</p> <p>April 1980</p> <p>\$319</p> <p>90 day</p> <p>—</p> <p>—</p> <p>80 columns</p> <p>80 col card; widely compatible w/business and home software in Apple DOS, Pascal, and CP/M.</p>		

**Notes:**

- NA Not applicable
- Information unavailable at press time



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# PRINTERS: TECHNOLOGIES AND TRENDS

by: Janice C. Wright

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## INTRODUCTION

Nothing stands still for long in the printer market. Although basic printer technologies have not changed significantly in recent years, the implementation of those technologies is constantly evolving—providing continually improved price/performance ratios for printers of all types. The most dramatic improvements in price and performance, however, are achieved in the dot matrix and laser printer arenas. Prices for both of these printer types have decreased significantly within the past two years—making them practical for general-purpose business applications.

Market research by Datec Information Services indicates that more than 5.5 million printers, with a total combined value of almost \$8 billion, were shipped in 1985. By far the most of these (approximately 65 percent) were dot matrix units. Less than 2 percent (approximately 50,000) of the units shipped were page printers—incorporating laser printers from several major printer manufacturers. These numbers may seem low when compared with the massive shipments of dot matrix printers, but they represent a significant increase over the 1984 shipments, when laser printers accounted for less than 1 percent of total shipments. Daisy wheel printers, once the standby of the office, have slipped to a distant second behind dot matrix printers, in both the number of units shipped (just more than 1.1 million) and the dollar value of those units (approximately \$1.5 billion).

Changes in printer shipments are directly attributable to several factors:

- Technological improvements such as the 24-wire dot matrix printhead that can produce

near-letter-quality (NLQ) output at reasonably high speed and the LBP-CX laser printing mechanism that serves as the print engine for many of the currently available desktop laser printers

- Decreasing component costs, caused partially by increasing competition from the Far East (primarily Japan) and the recent slowdown in the microcomputer industry
- Proliferation of personal computers in offices and traditional DP environments, with each personal computer or workstation cluster using a relatively low-cost, dedicated “convenience” printer
- Increasing need for hard-copy graphics output to support the increased availability and use of such business graphics software packages as Microsoft Corporation’s Chart, PFS:Graph by PFS Publishing Corporation, and ChartMaster and SignMaster by Design Resources Corporation.

The current proliferation of printers from major manufacturers, improving technology, and decreasing prices all indicate that now is an ideal time to purchase a printer. The same factors also combine, however, to make printer selection extremely difficult. Who among the current crop of manufacturers will survive and prosper in the next five years (the average life span of an office printer)? Which of the current technologies will continue to improve? Which have already peaked? Will prices continue to decrease? Would it be practical to wait a year instead of purchasing now?

All of these questions are valid, along with the traditional questions of printer application and reliability, and should be considered before a practi-



cal selection decision is reached. This article is designed to guide the reader along the way—providing some background and explanation to complement the accompanying specification charts. Unfortunately, there are no easy answers to the printer selection questions; the printer market is constantly changing, as are user applications and requirements. To make an informed selection, the prospective buyer must be aware of the intended application and environment (future as well as current) and fully understand the various technologies and their respective advantages and disadvantages.

Auerbach surveyed 65 printer manufacturers to gather the specification data for 476 products included in the printer specification charts. The specification chart guide provides a detailed explanation of the technologies and features surveyed, and the company directory indicates which types of printers are offered by the various manufacturers. This information should be used as an integrated package to assist in the selection of several manufacturers and/or specific printer models that meet all user-defined requirements and warrant additional hands-on research at a sales office or authorized dealer for the product. Final decisions should be based on the results of a satisfactory product demonstration and successful negotiation regarding product price and maintenance and support policies.

### PRINTER CLASSIFICATIONS

Printers are most often classified by their technology rather than their use. For example, many salespersons would not recognize the term *convenience printer*; however, any equipment vendor understands what is needed if a customer asks for a dot matrix printer to be attached to a personal computer. Many end users, however, think first of applications. The four basic types of printers, classified by application, are:

- Convenience—Intended for occasional use by one person or one work group; these are typically peripheral devices for terminals or personal computers.
- Satellite—Intended for use as the only printer for a distributed processing node or as the primary printer on a small system.
- High volume—Designed for use as the primary printer for one or more mainframe computers.
- Special purpose—Designed for a single application (e.g., automatic teller machine receipts, price tags, airline baggage tickets). Because they are sold as parts of systems rather than

as independent units, they are not discussed in this article.

### PRINTER TYPES

Printers can be loosely defined as impact or non-impact. Although both categories include several specific types of mechanisms, impact printers generally involve some device striking the ribbon and/or paper to form an impression. Nonimpact printers create images on paper through a photographic or chemical process. Impact printers, which are generally noisier and less expensive than nonimpact printers, are by far the more commonly used in offices and DP environments.

#### Impact Printers

Impact printers fall into two categories: solid character and dot matrix. A solid character printer uses a hammer to strike the back of a lead slug containing the fully formed image of the desired character. This forces the slug into the ink ribbon and transfers the image to the paper. Dot matrix printers form characters by extending pins mounted in the head. The entire head is then slammed into the ribbon, and the pin pattern is transferred onto the paper as a group of dots that forms the desired character.

Solid character technology types include daisy wheel, ball, thimble, band, chain, and train. Daisy wheel ball, and thimble printers are most suitable for use as office or personal convenience printers because both produce letter-quality printing. Band, drum, chain, and train printers are better suited for use as satellite printers.

Daisy wheel, ball, and thimble printers have traditionally been used in conjunction with word processors to produce letter-quality output. Print speeds for these printers vary greatly—ranging from 10 to 600 characters per second. The majority, however, fall into the 30 to 40 characters-per-second range. Ball printers, so called because the striking element is round and solid, are the slowest of the group. They also offer some of the highest print quality. Daisy wheel printers, which use metal or plastic print wheels with one or two characters on each spoke, approach the print quality of ball printers and offer the advantage of higher print speeds—up to 55 characters per second in some of the newer, bidirectional models. Thimble printers, which are much less common than either ball or daisy wheel printers, are generally comparable with daisy wheel printers in speed and print quality. Because thimble printers are less com-

mon, however, there are fewer choices of thimble print elements. Daisy wheel and ball print elements are available in many varied type sizes and styles from numerous manufacturers.

Daisy wheel, ball, and thimble printers are all classified as serial printers because they produce individual characters, one at a time, in sequence as data is received from the sending unit (typically a word processor or personal computer). The recent Auerbach survey, which includes 353 serial character printers from 58 manufacturers, indicates that purchase prices for these units generally range from \$170 for a relatively slow (10 to 15 characters per second) ball printer to \$9,500 for a bidirectional daisy wheel unit.

Band, drum, chain and train printers, traditionally used in DP environments for high-speed draft-quality printing, are all classified as line printers because each print line is produced after a line of data is received from the host computer. Print speeds are expressed in lines per minute and range from approximately 200 to 5,000 lines per minute. These printers, unlike serial printers, are equipped with a standard character set that is impossible (or, at best, impractical) to change. Thus, users have no choice of type size or style and are limited to printing the characters provided in the standard set.

Line printers typically are much more expensive than serial character printers. Our survey includes 88 line printers from 17 manufacturers. Prices range from \$495 to \$94,500 for a very high speed chain printer.

Dot matrix printers, which may use either serial or line printing techniques, are gradually replacing serial character printers in the office and line printers in the DP center. This is because improved printheads are providing a much improved print quality and output speeds have been stretched to approximately 400 characters per second—which compares favorably with the high-speed line printers.

Because dot matrix printers vary significantly in speed and output quality, they are difficult to classify according to price. Generally however, they fall into three broad ranges:

- Low-speed, relatively low-cost units used as light-duty convenience printers—These printers typically produce draft-quality output at speeds of up to 120 characters per second.

Prices, according to our survey, range from \$170 to \$2,850.

- Medium-speed units that produce good draft or NLQ output at speeds of approximately 120 to 250 characters per second—These devices are generally somewhat more durable than the low-speed convenience printers and may include a few additional capabilities, such as a wide carriage (for lines of 132 characters) and the ability to produce multiple copies in a single pass. These printers typically fall into the \$350 to \$4,995 price range.
- High-speed printers that produce NLQ output at speeds of 150 to 400 characters per second—These printers, increasingly common in the office, can be connected to a word processor, personal computer, or the company mini-computer. They are generally considered heavy-duty devices and include numerous features to enhance reliability. They may also include automatic paper feed devices and graphics output capabilities. Prices for these printers range from \$650 to \$21,750.

Increasing numbers of dot matrix printers offer user-selectable print speeds and qualities. These printers provide high-speed draft output (accomplished by a single pass of the printhead) and various levels of letter-quality or NLQ output at slower speeds (with multiple passes of the printhead). These variable speed/quality dot matrix printers are suitable for many business and DP applications, and, with variable output quality, one printer can frequently be used in place of two or more specialized units. The survey indicates that variable-speed printers are becoming very common. Almost 58 percent of the dot matrix printers studied offer user-selectable print speeds and qualities.

### Nonimpact Printers

Nonimpact printers can use thermal, ink-jet, or laser technology to produce images on paper. Most are classified as page printers because information is printed on a page-by-page basis as it is received from the sending unit through the printer buffer. Print speed typically is expressed in pages per minute, although some ink-jet and thermal printers designate speed according to lines per minute in order to compete directly with the impact line printers.

Thermal printers, the oldest of the nonimpact technologies, use a dot matrix printhead to burn character patterns onto chemically treated paper. They, like other nonimpact printers, operate very

quietly and are suitable for an office environment. Thermal printers are relatively inexpensive to purchase; prices range from approximately \$149 to \$9,800 but are not used widely because of the high cost of thermal paper and the declining prices of dot matrix printers. Because of their inherent durability, light weight, and low cost, thermal printers typically are used in portable terminals and for such special applications as ticket or receipt printing.

The ink-jet printers currently marketed by several major manufacturers differ significantly from the early models introduced to office automation (OA) applications in the early 1970s. Today's ink-jet printers have overcome most of the technical difficulties that hampered their predecessors but still offer many of the advantages, including relatively high print speeds and flexible (generally programmable) character sets. In addition, ink-jet printers offer nearly silent operation and the ability to mix ink colors on a single page.

Because ink-jet printers actually spray ink onto paper in a dot matrix pattern, print quality can vary greatly depending on the density of the matrix provided by the printhead. Print quality can also be dramatically affected by the maintenance of the printhead. If it is not cleaned (referred to as purging) at regular intervals, the ink clogs in the head and the spray is blocked—resulting in uneven, often illegible characters. Some of the early ink-jet printers required purging after each print run; current models are generally less sensitive to clogging but the maintenance schedule depends on the type of ink used and the porosity of the paper.

Print speeds of ink-jet printers typically fall into the 60-to-100-characters-per-second range (approximately three to five pages per minute), although some of the low-cost models designed for use with office personal computers fall below that average. For example, the Quadjet from Quadram Corporation prints at 40 characters per second and is priced at \$895. It also provides full graphics and color capabilities and includes an interface to the IBM Corporation Personal Computer Series.

Laser printers, arguably the hottest technology in the printer industry, offer various advantages for either business or DP applications. They are fast, typically producing from eight to sixteen pages per minute, and their print quality, generally a 300-dot-by-300-dot resolution, is acceptable for most all applications. In addition, laser print-

ers, like their ink-jet counterparts, offer silent operation and the ability to easily combine text and graphics on a single page. Although a few of the laser models produce color text and graphics, it is not as common a capability as on the ink-jet models.

Prices for laser printers generally reflect their numerous capabilities; even with the recent price decreases, they are considerably more expensive than dot matrix printers and slightly more costly than ink-jet printers. Prices typically range from \$7,000 to \$20,000 for a fully featured laser printer. Several major vendors, notably Hewlett-Packard Corporation and Digital Equipment Corporation, offer models for less than \$5,000. These printers fall into the lower levels of the speed range, with eight pages per minute as their upper limit, but produce NLQ text in a variety of user-selectable type styles.

Laser printers, which use an amplified light beam to form character images and xerographic technology to transfer them to paper, are not without problems. In addition to their high purchase prices, laser printers also involve high maintenance costs and are incompatible with much of the operating system software used in business and DP applications. As a result of the software limitations, many laser printers cannot function in a network environment. Thus, a very high priced piece of hardware must be dedicated to a specific terminal or personal computer—significantly reducing its cost-effectiveness.

Despite the growing popularity of laser printers, several major manufacturers are delaying their entry into the laser market until the existing difficulties are resolved. IBM, for example, does not currently offer a laser printer and has indicated that it has no plans to announce one in the near future. Of the manufacturers currently active in this market niche, several—including Hewlett-Packard, Apple Computer, and Corona Data Systems—all use a print engine developed and manufactured by Canon U.S.A. This print engine—the LBP-CX—serves as the primary component for most of the "under \$7,000" desktop laser printers on the market. Thus, most are nearly identical in terms of speed, features, and price.

The recent Auerbach survey includes 43 laser printers from 19 manufacturers.

## PRINTER APPLICATIONS

Of course, the primary factor in selecting a



printer should be how well it fits the intended application and corresponds to the existing hardware/software environment. Some printers have dominated specific applications because they meet the requirements for that application and are compatible with the equipment used to enter and/or receive text. Daisy wheel printers are an excellent example of such application dominance. Since the early 1970s, they have been used almost exclusively with word processors to produce letter-quality output. They continued to prosper, even after daisy wheel technology fully matured in the early 1980s, despite the fact that they are relatively slow (compared with nonimpact printers), noisy, and expensive. However, the reason for their continued popularity is easy to understand; until the recent innovations in dot matrix technology and price breakthroughs in laser printing, they were essentially the only game in town.

The application distinction, in the office or DP center, is no longer as clear as it once was. The print quality of serial dot matrix printers now rivals that of the daisy wheels, and the speeds of impact line printers are matched (or exceeded) by nonimpact page printers. Still, it is important for a prospective buyer to define the print speeds and quality required from an additional or replacement printer and to understand the types of output and print load expected. These factors, along with a ballpark budget, can be used to narrow the field to specific printer manufacturers or models. It is no longer practical (if it ever really was) to define the need for a specific technology (e.g., "We need a new daisy wheel printer for the word processing (WP) center" or "We need a new chain printer for the DP center").

Market studies of the installed printer base indicate that daisy wheel printers are used primarily with word processing applications, while dot matrix printers are used with office personal computers for a variety of business applications. Page printers, specifically laser and ink-jet units, are used in a range of applications, including word processing, but are typically driven by a departmental minicomputer or mainframe and shared by multiple work groups. However, these applications areas are sure to widen, given the technological and price changes in dot matrix and page printer technologies.

### Printer Characteristics and Capabilities

A survey of prospective printer buyers conducted by Datec Information Services revealed that

several characteristics are particularly influential in printer purchase decisions. In order of importance, the characteristics cited were:

- Print resolution
- Print speed
- Overall throughput rates
- Ability to print in color

More than half the respondents in the Datec survey indicated that a specific application dictated a corresponding print resolution. Thus, daisy wheel, variable-quality dot matrix, or nonimpact page printers are favored for WP applications requiring letter-quality output, and impact line printers are generally selected for DP or general-purpose business applications for which print quality need not be as high. Printer speed and overall throughput capabilities (generally dependent on paper handling mechanisms provided) also influence printer selection but to a much smaller degree than resolution; less than half of the respondents indicated that speed or throughput was the primary consideration in printer selection decision.

Printer speed, which is usually specified in a range (e.g., 30 to 40 characters per second) or for a particular character set (e.g., 40 characters per second at 10 pitch), can be a very misleading indicator of overall capability or suitability. The print speeds quoted by printer manufacturers and vendors are frequently maximum speeds (or ranges) achieved under ideal conditions in a laboratory environment. This is especially true of the page printers that quote speeds on a page-per-minute basis. Although a logical page is generally understood to contain about 2,000 characters, some manufacturers quote speeds based on abbreviated (usually undefined) page lengths. Also, print speed is highly dependent on the line length and spacing specified and the character set in use; it may also be dramatically affected by the page format and type style on page printers.

Paper feed devices, which may feed single sheets, paper rolls, or envelopes, can greatly increase printer throughput. More important, such mechanisms can significantly reduce operator time since no individual is needed to monitor the paper supply and feed it manually through the printer. Paper feed units are commonly used in WP applications in which single-sheet memos and correspondence predominate. They are also very popular in DP applications in which long reports can be output in draft format on roll paper. Paper feed devices can add significantly to the cost of a

printer but may easily be cost-justified in applications in which they preclude the need for a dedicated printer attendant.

### Printer Compatibilities

A major factor in determining printer suitability for a specific application is its potential compatibility with existing hardware and software. Hardware compatibility generally depends on the interfaces provided on the printer, while software compatibility is a factor of the operating system installed on the device driving the printer. Most printer manufacturers offer a variety of physical interfaces for connecting their products to other equipment. In some cases, these interfaces are standard on specific models, and in others they are user selectable. Printers must be configured (typically at installation) for the specific interface, and, in almost all cases, operation is limited to that configuration. Thus, a printer with an RS-232 serial interface, a common link for word processors and personal computers, is limited to operating with devices equipped with a physical RS-232 interface that transmits information in serial mode. The two most common hardware interfaces are RS-232 serial and Centronics-compatible parallel; numerous other interfaces are available, however, with some especially designed for specific applications or to link specific equipment. The printers in our survey offer 50 different types of interfaces, although the RS-232C serial interface was the most common, with 44 percent of the printers providing it as standard.

Software compatibility determines a printer's ability to operate in a multiuser or network environment. Some printers, especially laser and ink-jet models, are limited by their internal software and electronics to operation with a dedicated driver (whether a word processor, minicomputer, or microcomputer). Others can accept input from multiple drivers if it is processed through an external controller or is received in a specific format with software codes that determine queueing. If multiple printers and associated drivers operate in a network environment, imbedded software codes can be used to specify print format and document queueing, as well as monitor paper supplies. If these codes are not provided by the software, they must be entered by the operator. The Dattec printer survey indicates that almost half the printers purchased in 1985 were intended for use in multiuser and/or network environments.

### PRINTER MANUFACTURERS: SHIFTING ROLES

As printer technologies improve and applications shift and expand, so do the roles of the various printer manufacturers. Companies that previously led the industry in printer development and market share are being displaced by new companies with untraditional products or by computer manufacturers that recognized the shifting market demands (and potentially lucrative revenues from the printer market) and began their own printer development efforts to meet those demands. Such traditional printer manufacturing companies as Okidata, Epson, Dataproducts Corporation, and Printronix Inc are experiencing a significant erosion of their market share as computer manufacturers like Hewlett-Packard and Texas Instruments actively market popular new printer models. Hewlett-Packard's market share is expected to increase more than 600 percent, growing from just over 4 percent in early 1985 to about 27 percent by the close of 1986. Texas Instruments' market share is expected to increase by a relatively modest 50 percent during the same interval. At the same time, various other established printer manufacturers, including Centronix Corporation and Mannesman-Tally Inc, are shifting their product lines to respond to the demand for better cost/performance and more flexible output.

Although it is probably a good idea to purchase a printer from an established manufacturer likely to survive the printer market shakeup, identifying those companies is not a simple task. To compound the problem, it should be remembered that many printers are sold by, and labeled by, companies other than the manufacturer. Most minicomputer and mainframe manufacturers purchase some (or all) of their printers from other manufacturers, then package and label them under their own name. This is also true of many microcomputer companies. Indeed, computer companies are the major purchasers of printers from U.S. manufacturers, far surpassing the printers labeled and sold by the actual manufacturing companies to individual buyers. Thus, the printer selected from a major printer manufacturer such as Okidata may be available (often at a different price) from one or more microcomputer companies. Although this situation is confusing, it is not necessarily undesirable; the printers may be nearly identical, but different vendors may offer slightly different configurations or service policies. Purchase prices and product warranties may also vary widely, so it is beneficial to determine which company actually

manufactures the printer and what, if any, changes have been made to the basic product.

### PURCHASING THE PRINTER

After the selection process is complete and the field of candidates has been narrowed to those specific models suitable for the environment and applications identified, the second phase of acquisition can be started. The actual printer purchase can be a relatively time-consuming process in itself if the prospective buyer investigates several sources to find the most advantageous arrangement in terms of price and maintenance policy.

In most cases, specific printers are available from numerous sources, generally (but not always) including the actual printer manufacturer, the manufacturers of related equipment (e.g., word processor and computer companies), authorized distributors of either manufacturer, and retail dealers that purchase the printer in quantity from any of the other sources. These sources typically differ widely in their ability to provide maintenance support for the printer, with the printer manufacturer usually able to offer the highest level of technical support and parts availability and the retail dealers least able to directly support the unit. The availability of service technicians, on-site support, and spare parts should be major considerations in the purchase decision, as should the initial installation support offered by the vendor. Most printers do not require a great deal of technical expertise to install or use. Consequently, installation services are generally not included in the purchase price, and training is limited to user manuals. If, however, the printer is being configured with new or unusual equipment or by personnel generally unfamiliar with computer installations, the availability of installation support—even for a fee—can be a major benefit. Similarly, some vendors include basic maintenance for a specified period (e.g., six or twelve months) with the printer purchase. This type of arrangement can be extremely cost-effective if the printer requires regular maintenance at scheduled intervals (typical of laser and ink-jet models) or is likely to require frequent repair because of heavy use.

Ongoing costs for service and printer supplies should be considered along with the initial cost to purchase. Some printers require specialized supplies (e.g., paper and ink) and scheduled maintenance visits based on time or use. These costs, along with costs involved in adding options or extending features (e.g., adding type style cartridges or paper feed devices), should be included in de-

termining the total life cost of the printer. The total life cost, based on the calculated life span of the printer and type and frequency of use, can vary dramatically with different purchase plans from different vendors. If cost is a major factor in the selection and purchase decision, the total life cost of the printer—rather than purchase price—should be used for comparison among the various candidates.

### CONCLUSION

There is both good news and bad news regarding the printer market; current trends, including technological improvements and price decreases, are likely to continue—at least for the next three to five years. Nevertheless, the printer selection process is likely to remain at least as time-consuming and potentially confusing as it is now.

Laser printers are expected to continue their downward price spiral. Industry analysts project that models currently selling for around \$3,000 will be available for approximately half that amount by the end of 1986. In that price range, the laser printers will have an even more dramatic impact on the general-purpose business market. Although the current leaders in laser technology—namely, Hewlett-Packard, Canon U.S.A., and Apple—are likely to continue their leadership roles, new companies will probably enter this lucrative market with competitive new products. IBM, for example, despite its current protestations of non-involvement, has never been a company to ignore a rapidly expanding market.

Price decreases in the laser segment of the market will have a ripple effect throughout the entire printer industry. Dot matrix printers will need to offer improved print quality and flexibility, in addition to price reductions, in order to compete with the laser units in the office environment. Character printers, including impact line printers and daisy wheel units, that are currently considered mature technologies will be forced to compete on price (and proven reliability) alone. Thus, drastic price decreases can be expected in these areas as well, as printer manufacturers fight to retain their installed bases. Finally, development of those existing technologies, such as thermal and ink-jet printing, that have not yet fully matured, will continue and presumably intensify. Thermal printers that can print on standard paper stock—called thermal transfer printers—have already been introduced to the market and, with some additional development, may rival ink-jet and laser printers in speed, print quality, and cost-

effectiveness. Thus, as the respective technologies continue to improve and expand, almost any type of printer may be a feasible candidate for any particular application.

# PRINTERS

## Company Directory

235.0032.001

Vendor	Address and Telephone	Model	Dot Matrix	Daisy Wheel	Laser	Other
3M Teleterminals Products	311 Turquoise St Milpitas CA 95035 (408) 943-1970	1902/1912 1904/1914	• •			
Accon Computer	3534 Atlantic Ave Long Beach CA 90807-4516 (213) 424-2986	IJ 150 LX 528 LX 528AF			• •	•
Advanced Matrix Technology	1157 Tourmaline Dr Newbury Park CA 91320 (805) 499-8741	AMT Office Printer	•			
ALPS America	3553 N First St San Jose CA 95134 (408) 946-6000	P2000	•			
Amdek	2201 Lively Blvd Elk Grove Village IL 60007 (312) 364-1180	5025 5040 5055		• • •		
Apple Computer	20525 Mariani Ave Cupertino CA 95014 (408) 996-1010	Apple Daisy Wheel Imagewriter Imagewriter II LaserWriter	• •	•	•	
AT&T Information Systems	1 Speedwell Ave Morristown NJ 07960 (201) 898-2129	Model 455 Model 457 Model 458 Model 470/471 Model 473/474 Model 475/476 Model 478/479	• • • • • •	• • •		
Axiom	1014 Griswold Ave San Fernando CA 91340 (818) 365-9521	DX 1500 DX 2000 DX 2500 DX 3500 EX-1620 EX-420	• •	• • • •		
Canon USA	One Canon Plaza Lake Success NY 11042 (516) 488-6700	A-40 A-50/55 BJ-80 LBP-8 A1 PJ-1080A	• •		•	• •
Centronics	1 Wall St Hudson NH 03051 (603) 883-0111	351 353 354 358 359 GLP H-136 H-80 LW 400 LW 800 Printstation 240 TIP 300/301 Colorplot II	• • • • • • • • • • • •			• •









Vendor	Address and Telephone	Model	Dot Matrix	Daisy Wheel	Laser	Other
General Optronics	2 Olsen Ave Edison NJ 08820 (201) 549-9000	Holoscan 28 Holoscan 40			••	
GENICOM	Waynesboro VA 22980 (703) 949-1188	1020/1025 2030 2120 3014 3024 3310 3310 Color 3320 Quiet 3410 4410 4440 5010	• • • • • • • • •		•	••
Hecon	PO Box 247 15 Meridian Rd Eatontown NJ 07724 (201) 542-9200	A0543 A0556 G0687	• • •			
Hewlett-Packard	3000 Hanover St Palo Alto CA 94304 (415) 857-1501	HP 2225 Family ThinkJet Printers HP 2563A HP 2565A HP 2566A HP 2601A HP 2602A HP 2671A HP 2671G HP 2673A HP 2686A LaserJet HP 2686A LaserJet PLUS (opt. 200/210) HP 2687A HP 2932A General Purpose Printer HP 2934A Office Printer	• • • • • • • • • • • • • • • •	• •	• • •	•
Honeywell Information Systems	200 Smith St Waltham Ma 02154 (617) 895-6000	PRU7070/7071/7072 PRU7075/7076/7077 PRU7170/7171/7172 PRU7175/7176/7177 PRU7200/7210, Models 24 and 25 PRU7270/7271/7272	• • • • •	• •		
IBM	1133 Westchester Ave White Plains NY 10604 (914) 696-1900	3852 Color Jetprinter 4201 Proprinter 4715 5181 Compact Printer 5182 Color Printer 5201 QUIETWRITER Printer 5216 Wheelprinter 5218-A2/-A3/-A4	• • • • • •	• •		•



Vendor	Address and Telephone	Model	Dot Matrix	Daisy Wheel	Laser	Other
C. Itoh Digital Products	19750 S Vermont Ave Suite 220 Torrance CA 90502 (800) 423-0300 (213) 327-2110	PROWRITER 8510 + NLQ/1550 + NLQ PROWRITER C 310 PROWRITER Jr. STARWRITER D10-40 STARWRITER F10-55 STARWRITER Y10-20	• • •	• • •		
Juki Office Machines	23844 Hawthorne Blvd Suite 101 Torrance CA 90505 (800) 932-0590	5510 6000 6100 6200 6300	•	• • • •		
Mannesmann Tally	8301 S 180th St Kent WA 98032 (206) 251-5524	MT 180 MT 290 MT 420/440 MT 460 MT 490 MT 660 MT 85/86	• • • • • • •			
Micro Peripherals	4415 S 500 West Salt Lake City UT 84123 (801) 263-3081	Printmate 350 SXPrinter	• •			
Miltope	1770 Walt Whitman Rd Melville NY 11747 (516) 420-0200	HSP-3609-212A LP 3036 TP-2000 TP-3000	• • •			• •
NEC Information Systems	1414 Massachusetts Ave Boxborough MA 01719 (617) 264-8000	Pinwriter CP2, CP3 Pinwriter P2, P3 Pinwriter P5 Series Spinwriter 300 Series Spinwriter 3500 Series Spinwriter 8800 Series	• • •	• • •		
Norcom Electronics	675 Third Ave New York NY 10017 (212) 599-0085	DP-80	•			
North Atlantic Industries	Quantex Div 60 Plant Ave Hauppauge NY 11788-3890 (516) 582-6060 (800) 645-5292	7035 Tempest 7075 7085	• • •			
Okidata	532 Fellowship Rd Mt Laurel NJ 08054 (609) 235-2600	Microline 182/182 TTY/183 Microline 192 Microline 193 Okidata 120 Okimate 10 Okimate 20 Pacemark 2410	• • • • • • • •			
Olivetti Peripherals	505 White Plains Rd Tarrytown NY 10591 (914) 631-3000	DM580 DY250/DY450	•	•		



Vendor	Address and Telephone	Model	Dot Matrix	Daisy Wheel	Laser	Other
Olympia USA	Box 22 Somerville NJ 08876-0022 (201) 722-7000	Compact NP Compact R0 ESW 3000	•	• •		
Panasonic Industrial Company	One Panasonic Way Secaucus NJ 07094 (201) 348-7183	KX-P1080 KX-P1090 KX-P1091 KX-P1092 KX-P1093 KX-P1592 KX-P1595 KX-P3131 KX-P3151	• • • • • • • •	• • • •		
Primages	620 Johnson Ave Bohemia NY 11716 (516) 567-8200	Primage 100 Primage 90		• •		
Prime Computer	Prime Park Natick MA 01760 (617) 655-8000	3126 3173/3174 3185 3226 3273/3274	• • • •	•		
Printek	1517 Townline Rd Benton Harbor MI 49022 (616) 925-3200	Model 910 Model 920 Model 930 Model 930 dlx Model 930/dd Model 935	• • • • • •			
Printer Products	25 Denby Rd Boston MA 02134 (617) 254-1200	S-400 S-400 G	• •			
QMS	PO Box 81250 Mobile AL 36689 (205) 633-4300	QMS Lasergrafix 1200 QMS Lasergrafix 2400 QMS Lasergrafix 800 QMS SmartWriter QMS-PS 800			• • • •	
Quadram	1 Quad Way Norcross GA 30093 (404) 923-6666	Quadjet QuadLaser			•	•
Qume	2350 Qume Dr San Jose CA 95131 (800) 223-2479	LaserTEN LetterPro 20 LetterPro Plus SPRINT 11/40 PLUS SPRINT 11/55 PLUS SPRINT 11/90 PLUS		• • • •	•	
Ricoh of America	5 Dedrick Pl West Caldwell NJ 07006 (201) 575-9550	LP4080R RP3400Q		•	•	
Sanyo Business Systems	51 Joseph St Moonachie NJ 07074 (201) 440-9300	PR 3000 PR 5200 PR 5500		• •		





Vendor	Address and Telephone	Model	Dot Matrix	Daisy Wheel	Laser	Other
Xerox/Diablo	Diablo Systems Inc A Xerox Company Xerox Sq Rochester NY 14644	2700 34LQ 3700 4045 Advantage D25 Advantage D80 Advantage D80IF Diablo 635 P101 P12CQ1 P32CQ1 P38	•     • • •	   • • • • •	• • •	



# PRINTERS

## Specifications Chart Guide

Peripheral devices that can transfer computer output to paper are classified as either printers or plotters. Printers produce both text and graphics in various formats and levels of quality; plotters are designed solely to produce graphic information, including charts and graphs. General-purpose business printers vary widely in cost—from less than \$200 to more than \$100,000. Although there are some correlations between printer price and performance, printer features, speed, and output quality do not necessarily mirror the purchase price. Design engineers frequently make trade-offs between printer performance and durability and between the cost to build and cost to service. As a result, printers with comparable specifications often differ significantly in price and in ongoing support costs.

These specifications charts should be used to identify printers whose characteristics meet user requirements and to assist in making accurate price and features comparisons among those printers identified. Potential buyers should investigate printers from several manufacturers and compare purchase prices and service costs involved with competing models and various technologies.

Because several printer technologies are suited for general-purpose business and DP applications and because these technologies typically enable a printer to produce varying levels of print quality in a range of speeds, these charts present the information alphabetically by vendor—abandoning all attempts to logically segment the diverse printer market by technology, speed, or application.

### MANUFACTURER AND MODEL

This section identifies the manufacturer and name or model number of the printer. The manufacturer is the company responsible for labeling or packaging the printer and selling the unit to end users, although the actual printer mechanism (i.e., the printer driver) may be manufactured by a separate, unspecified company. The manufacturer may sell the printer through dedicated sales outlets, distributors, or retail dealers.

### TYPE

This section provides the standard industry classification for the printer, based on the type of printing technology used. Common types of printers are serial (i.e., producing one character at a time), line, or page.

- **Print Mechanism**—This entry identifies the specific printer mechanism used. For example, serial printers use ball or daisy wheel mechanisms; line printers use drum, band, chain, or train mechanisms; both serial and line printers can use dot matrix printheads.
- **Character Set**—This entry specifies the number of characters

included in the standard set and also indicates what languages and special sets (e.g., international, graphics) are available.

- **Print Column**—The maximum number of characters that can be printed across a horizontal line is indicated here. The number is typically dependent on the print pitch in use.
- **Print Speed**—This entry indicates the maximum speed that can be obtained under ideal conditions in a laboratory; actual print speed is affected by such factors as line spacing, page advancement, and character set in use. If multiple print speeds are listed, this indicates that different print qualities are achieved with different print speeds (e.g., a high-speed draft mode and a low-speed letter-quality mode).
- **Print Pitch**—This entry presents the number of characters per inch (cpi) that can be produced. The usual responses, 10 and 12 cpi, are the standard typewriter pitches; smaller and larger numbers indicate expanded or compressed type. Variable or proportional pitch indicates the ability of the printer to automatically adjust character spacing to fit within the specified line space.
- **Vertical Spacing**—The number of vertical lines per inch (lpi) is indicated in this entry. Vertical spacing of 8 lpi is the practical maximum for most printers, although some offer programmable line spacing that enables vertical spacing to be divided into increments as small as 1/48 of an inch.
- **Bidirectional Printing**—This entry indicates whether the printer operates bidirectionally, thus eliminating carriage-return time and significantly increasing print speed.
- **Number of Copies**—This entry lists the maximum number of legible copies (including the original) that can be produced in a single pass when the printer uses either high-quality carbon paper or no-carbon-required (NCR) paper.
- **Feed Mechanism**—This entry indicates the mechanism used to advance paper through the printer. The most common entries include friction, pinfeed, tractor, cutsheet, and roll. Friction feed (which may include cutsheet and roll) is suitable for hand feeding cut sheets of paper; pinfeed is useful if only one size of paper with sprocket holes is acceptable; tractor feed is the most flexible feed mechanism for continuous forms with sprocket holes because the distance between the tractors can be adjusted to accommodate various paper widths. Cutsheet feeders are preferred for office applications because they can handle stationery and standard business forms. Roll feed, recommended for some special applications, is typically not suited for general-purpose business use.
- **Buffer Size**—Because printers cannot print characters as quickly as computers can transmit them, many printers use a buffer memory to store characters sequentially until the printer can accept them. This entry indicates if the printer is equipped with a buffer memory and specifies



the buffer capacity in words, bytes, or characters.

- **Interface**—The industry-standard interface that can be used to attach the printer to a computer is specified in this entry. If an interface is proprietary to a specific vendor, the vendor name and protocol are indicated. If more than one interface is listed, it does not necessarily mean that the printer can be switched between interfaces but only that several versions of the printer are available.

## MAINTENANCE

- **Maintenance Provided By**—This entry specifies the service organization generally responsible for providing printer maintenance. The organization may be the manufacturer, the manufacturer's distributor, or a local or national independent service organization.
- **Monthly Maintenance Fee**—This entry indicates the monthly maintenance cost of a standard service contract from the maintenance organization specified in the preceding entry. If alternative service plans are available, the entry specifies multiple fees or a range of monthly costs.

## PURCHASE PRICE

This entry indicates the suggested retail price, as supplied by the manufacturer, of each printer. If the printer is sold through retail dealers or distributors, the actual purchase price may vary as much as 30 percent among retail outlets. If the manufacturer refused to provide pricing, the entry so states.

## FIRST DELIVERY

This entry indicates the month and year that the unit was first delivered to a customer site.

## COMMENTS

This section contains any special information or performance factors that may be significant in evaluating the printer applicability.



# SPECIFICATIONS CHART

## Printers

235.0045.001

<p><b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi)</p> <p>Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface</p> <p><b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee</p> <p><b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>3M Teleterminals Products</b> 1902/1912 Serial</p> <p>Thermal dot matrix 96 40, 80 (1902); 80, 132 (1912) 40 cps 10.9, 21.7 (1902); 10.9, 18.8 (1912) 3, 4, 6 Yes 1 Friction 2K char. RS-232C</p> <p>3M \$70/yr. \$299 January 1984 Depot service only</p>	<p><b>3M Teleterminals Products</b> 1904/1914 Serial</p> <p>Thermal dot matrix 96 40, 80 (1904), 80, 132 (1914) 40 10.9, 21.7 (1904); 10.9, 18.8 (1914) 3, 4, 6 Yes 1 Friction 2KB Centronics</p> <p>3M \$70/yr. \$289 January 1984 Depot service only</p>	<p><b>Accon Computer</b> IJ 150 Serial</p> <p>Ink jet 254 132 150 cps 5, 8.25, 10, 16.5</p> <p>6, 8 Std 1 Tractor — RS-232C</p> <p>Vendor \$43.75 \$1,995 — For IBM System S/3x users.</p>
<p><b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi)</p> <p>Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface</p> <p><b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee</p> <p><b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>Accon Computer</b> LX 528 Page</p> <p>Laser 254 To 226 8 ppm 10, 16.7, 17</p> <p>6, 8 NA 1 Friction 59K char. —</p> <p>Hewlett-Packard &amp; vendor \$57.75 \$4,795 — Up to 8 fonts/page; for IBM System/3x users; 300 x 300 dpi.</p>	<p><b>Accon Computer</b> LX 528AF Page</p> <p>Laser 254 226 8 ppm 10, 12, 16.7</p> <p>6, 8 No Single Friction 59K char. RS-232C; IBM S/3x Twinax</p> <p>Hewlett-Packard, vendor \$57.75 \$6,590 — Up to 8 fonts/page.</p>	<p><b>Advanced Matrix Technology</b> AMT Office Printer Serial</p> <p>Dot matrix — 232 max 45, 100, 250 cps 10, 12, 13.2, 15, 17.1, proportional 1-9 Yes 6 Friction; tractor opt. 512KB; 40KB opt. RS-232C; Centronics</p> <p>Sperry — \$2,195 — Color printer w/dot matrix of 16 x 72, 32 x 72, or 8 x 8; up to 480 x 240 dpi.</p>

**Notes:**

— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism</p> <p>Buffer Size Interface</p> <p><b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b> <b>Comments</b></p>	<p><b>ALPS America</b> P2000 Serial</p> <p>9-pin dot matrix Several sets avail. 136 at 10 cpi 50, 125, 250 cps 5, 6, 8.5, 10, 12, 17 6, 8 text; graphics progrmble Std 6 Tractor</p> <p>4-260K char. Centronics; RS-232C</p> <p>Vendor, distributors —</p> <p>\$995 w/IBM or Apple interface module</p> <p>— NA</p>	<p><b>Amdek</b> 5025 Serial</p> <p>Daisywheel 100 132 25 cps 10, 12, 15 — 6 Friction; bidirectional tractor opt. 500 wd; 4K wd opt. Centronics; RS-232C</p> <p>Vendor —</p> <p>\$799</p> <p>July 1984 Incl 1-yr warranty</p>	<p><b>Amdek</b> 5040 Serial</p> <p>Daisywheel 125 extended 132 40 cps 10, 12, 15 — 6 Friction; bidirectional tractor opt. 500 wd; 4K wd opt. Centronics; RS-232C</p> <p>Vendor —</p> <p>\$1,495</p> <p>March 1984 Incl 1-yr warranty</p>
<p><b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.)</p> <p>Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism</p> <p>Buffer Size Interface</p> <p><b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee</p> <p><b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>Amdek</b> 5055 Serial</p> <p>Daisywheel 125 extended</p> <p>132 55 cps 10, 12, 15 — 6 Friction; bidirectional tractor opt. 500 wd; 4K wd opt. Centronics; RS-232C</p> <p>Vendor —</p> <p>\$1,995 June 1984 Incl 1-yr warranty</p>	<p><b>Apple Computer</b> Apple Daisy Wheel Serial</p> <p>Daisywheel ASCII</p> <p>132, 158, 198 40 cps 10, 12, 15, proportional 6, 8 — 6 Friction, tractor</p> <p>256 char. RS-232C</p> <p>Auth. Apple dealers —</p> <p>\$1,145 November 1982 NA</p>	<p><b>Apple Computer</b> Imagewriter Serial</p> <p>Dot matrix (impact) 96 USASCII; 25 addl intl char. 12 print col widths 120 cps at 10 cpi 12 print pitches avail. 6, 8, 144 — 4 Friction, pinfeed</p> <p>1K char. RS-232C</p> <p>Auth. Apple dealers —</p> <p>\$595 February 1984 For Apple computers; 15-in. carriage opt.</p>

Notes:  
— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Apple Computer</b>  <b>Imagewriter II</b>                  Serial                  Dot matrix (impact)                  8 sets                  36-136                  45, 180, 250 cps                  Various pitches (4.5-17)                  6, 8, 144                  —                  4                  Friction, pinfeed                  2K char.; 82K char. opt.                  RS-232C                  Auth. Apple dealers                  —                  \$545                  September 1985                  For Apple computers; color opt. w/software</p>	<p><b>Apple Computer</b>  <b>LaserWriter</b>                  Page                  Laser                  Variable                  Variable                  8 ppm                  Variable                  Variable                  NA                  1                  —                  —                  RS-232C                  Authorized Apple dealers                  —                  \$6,995                  March 1985                  300 dpi; contains 12 MHz Motorola 68000 microproc.</p>	<p><b>AT&amp;T Information Systems</b>  <b>Model 455</b>                  Serial                  Daisywheel                  96 char. wheels                  To 197                  55 cps                  —                  Std                  5                  Friction (cutsheet), tractor                  —                  RS-232C; Centronics; IBM Centronics                  Vendor                  —                  \$1,870                  June 1984                  Used w/AT&amp;T PC &amp; 3B computers; 55 dBA noise level; for med. to heavy volume; accepts 15-in. width paper</p>
<p><b>Manufacturer Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>AT&amp;T Information Systems</b>  <b>Model 457</b>                  Serial                  Daisywheel                  96 char. wheels (AT&amp;T &amp; IBM char. sets)                  To 197                  45 cps                  —                  Std                  5                  Friction (cutsheet), tractor                  —                  Centronics                  Vendor                  —                  \$1,495                  June 1984                  For light to moderate volume; supports AT&amp;T PC product line</p>	<p><b>AT&amp;T Information Systems</b>  <b>Model 458</b>                  Serial                  Daisywheel                  96 char. (AT&amp;T char. set)                  To 197                  45 cps                  —                  Std                  5                  Friction (cutsheet), tractor feed                  —                  25-pin RS-232C                  Vendor                  —                  \$1,495                  June 1984                  For light to moderate volume; for use w/AT&amp;T 3B computers &amp; all async workstations</p>	<p><b>AT&amp;T Information Systems</b>  <b>Model 470/471</b>                  Serial                  9-pin dot matrix                  96 char. (AT&amp;T char. set)                  To 132 (470), to 230 (471)                  120 cps max                  5, 6, 8.5, 10, 12, 17, proportional                  —                  Std                  4                  Friction (cutsheet), tractor                  2KB                  36-pin Centronics                  Vendor                  —                  \$545 (470), \$795 (471)                  June 1984                  471 is wide carriage version of 470</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.)  Print Column Speed Print Pitch (cpi)  Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>AT&amp;T Information Systems</b> Model 473/474 Serial  9-pin dot matrix 96 char. (AT&T & IBM char. sets)  To 132 (473), to 224 (471) 120 cps max 5, 8.4, 10, 16.5  — Std 4 Friction (cutsheet), tractor 2KB 8-bit parallel; IBM PC compat  Vendor — \$545 (473), \$795 (474) June 1984 474 is wide-carriage version of 473	<b>AT&amp;T Information Systems</b> Model 475/476 Serial  9-pin dot matrix 96 char. (AT&T char. set)  To 132 (475), to 230 (476) 120 cps max 5, 6, 8.5, 10, 12, 17, proportional  — Std 4 Friction (cutsheet), tractor 2KB RS-232C  Vendor — \$595 (475), \$845 (476) June 1984 476 is wide-carriage version of 475.	<b>AT&amp;T Information Systems</b> Model 478/479 Serial  Dot matrix (impact) IBM Graphic 1 & 2; 2 NLQ fonts  — 50, 80, 100, 200 cps 5–18.2 (10 pitches)  2, 3, 4, 6, 8, 12 Std 6 Friction; pinfeed, tractor opt. 16K char. Centronics  Vendor — \$1,095 (478); \$1,295 (479) October 1985 479 is wide-carriage version of 478.
<b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Axiom</b> DX 1500 Serial  Daisywheel 96 ASCII 80, 96 14 cps 10, 12, 15, proportional 3, 4, 6 Std 4 Friction; tractor opt. 2KB Centronics  — — \$349 1985 NA	<b>Axiom</b> DX 2000 Serial  Daisywheel 96 ASCII 110, 132, 165 20 cps 10, 12, 15, proportional 3, 4, 6 Std 4 Friction; tractor opt. 2KB Centronics  — — \$499 1985 Accepts up to 13.7-in. paper.	<b>Axiom</b> DX 2500 Serial  Daisywheel 96 ASCII 135, 163, 204 20 cps 10, 12, 15, proportional 3, 4, 6 Std 4 Friction, tractor opt. 2KB Centronics  — — \$499 1985 Accepts up to 15-in. width paper.

**Notes:**

- Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Axiom</b>                  DX 3500                  Serial                  Daisywheel                  96 ASCII                  135, 163, 204                  35 cps                  10, 12, 15, proportional                  3, 4, 6                  Std                  4                  Friction; tractor, cutsheet opt.                  2KB                  Centronics, RS-232C                  —                  —                  \$699                  1985                  Accepts up to 15-in. width paper.</p>	<p><b>Axiom</b>                  EX-1620                  Serial                  24-wire high-speed electrosensitive stylus                  96 ASCII                  80, 160                  960 cps                  10, 20                  6, 12                  —                  1                  Friction                  8K char.                  Parallel, RS-232C; 20 mA current loop (opt.)                  Vendor                  —                  \$795                  April 1983                  NA</p>	<p><b>Axiom</b>                  EX-420                  Serial                  24-wire high-speed electrosensitive stylus                  96 ASCII                  46, 92                  550 cps                  10, 20                  6, 12                  —                  1                  Friction                  8KB                  Parallel, RS-232C                  Vendor                  —                  \$745                  April 1983                  NA</p>
<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Canon USA</b>                  A-40                  Serial                  Dot matrix                  IBM graphics 2                  80 at 10 cpi                  27, 140 cps                  5, 8.6, 10, 17.2                  6, 8, progrmble                  Std (text mode)                  3                  Tractor                  1.4KB                  8-bit parallel                  Vendor, auth serv centers                  —                  \$349                  June 1985                  NA</p>	<p><b>Canon USA</b>                  A-50/55                  Serial                  Dot matrix                  IBM graphics 2; 96 ASCII; 32 intl                  80 (A-50); 136 (A-55)                  34, 180 cps                  Variable                  6, 8, progrmble                  Std                  3                  Tractor, friction                  4KB                  8-bit parallel; RS-232C opt.                  —                  \$499                  \$499 (A-50); \$699 (A-55)                  October 1985                  A-55 is wide-carriage version of A-50</p>	<p><b>Canon USA</b>                  BJ-80                  Serial                  Bubble-jet                  IBM graphics 2                  80                  110, 220 cps                  5, 8.1, 10, 16.3                  6, 8, progrmble                  Std (text mode)                  1                  Tractor                  4.3KB                  Parallel                  Vendor, auth serv centers                  —                  \$599                  August 1985                  NA</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>Canon USA</b> LBP-8 A1 Page  Laser Various fonts avail. Variable 8 ppm Variable Variable NA 1 Friction (cutsheet) — 8-bit parallel; serial  Vendor, auth serv centers — \$3,000 Spring 1985 NA</p>	<p><b>Canon USA</b> PJ-1080A Serial  Inkjet 96 ASCII; 64 special char. 80 at 10 cpi 37 cps 6, 12 6, 8 Std 1 Friction 1 line, 40–80 char. Centronics-type  Vendor, auth serv centers — \$699 1984 7-color printer</p>	<p><b>Centronics</b> 351 Serial  Dot matrix 96 ASCII; 8 intl sets 132 at 10 cpi 200 cps 5, 6, 8, 10, 12 6, 8 Std 6 Tractor, friction 2K char. Centronics; RS-232C  Vendor — \$1,995 — IBM PC compatible</p>
<p><b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size  Interface  <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>Centronics</b> 353 Serial  Dot matrix 96 ASCII; 8 intl sets 132 at 10 cpi 200 cps 10, 12, 13.2, 15, 16.5 3, 4, 6, 8, 12 Std 6 Tractor, friction 4K char.  Centronics; RS-232C  Vendor — \$2,495 — NA</p>	<p><b>Centronics</b> 354 Serial  Dot matrix 96 ASCII; 8 intl sets 132 at 10 cpi 50, 220 cps 10, 12, 16.5 3, 4, 6, 8, 12 Std 6 Tractor, friction 2K char. expandable to 8K char. Centronics; RS-232C; RS-422; RS-423  Vendor — \$2,195 — NA</p>	<p><b>Centronics</b> 358 Serial  Dot matrix 96 ASCII; 8 intl sets 132 at 10 cpi 400 cps 10, 12, 13.2, 15, 16.5 3, 4, 6, 8, 12 Std 6 Tractor, friction 4K char.  Centronics; RS-232C  Vendor — \$2,895 — NA</p>

Notes:  
— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Centronics</b>                  359                  Serial                    Dot matrix                  96 ASCII; 8 intl sets                  132 at 10 cpi                  400 cps                  10, 12, 13.2, 15, 16.5                  3, 4, 6, 8, 12                  Std                  6                  Tractor, friction                  4K char.                  Centronics; RS-232C                    Vendor                  —                  \$2,895                  NA</p>	<p><b>Centronics</b>                  GLP                  Serial                    Dot matrix                  96 ASCII; 8 intl sets                  80 at 10 cpi                  12, 50 cps                  5, 8.5, 10, 17                  6, 8                  Std                  3                  Friction, tractor opt.                  —                  Centronics; RS-232C                    Vendor                  —                  \$299                  NA</p>	<p><b>Centronics</b>                  H-136                  Serial                    Dot matrix                  96 ASCII; 8 intl sets                  156 at 10 cpi                  27, 160 cps                  5, 6, 8.6, 10, 12, 17.2                  6, 8                  Std                  3                  Tractor, friction                  2K char.                  Centronics; RS-232C                    Vendor                  —                  \$899                  NA</p>
<p><b>Manufacturer Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Centronics</b>                  H-80                  Serial                    Dot matrix                  96 ASCII; 8 intl sets                  80 at 10 cpi                  27, 160 cps                  5, 6, 8.6, 10, 12, 17.2                  6, 8                  Std                  3                  Tractor, friction                  2K char.                  Centronics; RS-232C                    Vendor                  —                  \$699                  NA</p>	<p><b>Centronics</b>                  LW 400                  Line                    Band                  96 ASCII                  132                  400 lpm                  10, 15                  6, 8, 12                  —                  6                  Tractor                  —                  Centronics; RS-232C;                  RS-422; RS-423; RS-449                    Vendor                  —                  \$3,595                  Quietized cabinet</p>	<p><b>Centronics</b>                  LW 800                  Line                    Band                  96 ASCII                  132                  800 lpm                  10                  6, 8, 12                  —                  6                  Tractor                  —                  Centronics; RS-232C,                  RS-422; RS-423; RS-449                    Vendor                  —                  \$4,375                  Quietized cabinet</p>

**Notes:**

- Information unavailable at press time
- NA Not applicable





<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>  Print Mechanism  Character Set (char.)  Print Column  Speed  Print Pitch (cpi)  Vertical Spacing (lpi)  Bidirectional Printing  No. of Copies  Feed Mechanism  Buffer Size  Interface  <b>Maintenance</b>  Maintenance Provided By  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Centronics</b>  Printstation 240  Serial  24-pin dot matrix  96 ASCII; 8 intl sets  136 at 10 cpi  80, 160 cps  5, 6, 8.6, 10, 12, 17, 20  6, 8  Std  5  Tractor, friction  —  Centronics; RS-232C  Vendor  —  \$1,495  —  NA</p>	<p><b>Centronics</b>  TIP 300/301 Colorplot II  Line  Dot matrix impact  96 ASCII  132  300 lpm  10, 13.3, 16.6  6, 8  No  6  Tractor  —  Centronics; RS-232C  Vendor  —  —  —  Color and graphics, bar codes, wp features, nonstop printing</p>	<p><b>CIE Terminals</b>  CI-300  Line  Dot matrix hammerbank shuttle  96 ASCII; block; intl; eng.; line drawing  To 220  To 300 lpm  10, 11.67, 13.33, 16.67  3, 4, 6, 8  Std  6  Tractor  2K char.  RS-232C; Centronics; Dataproducts parallel  Vendor  \$1,080/year  \$4,495  —  Underlining, boldface, slanting; character expansion x 2, 4, 8; opt. bar codes and forms generation</p>
<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>  Print Mechanism  Character Set (char.)  Print Column  Speed  Print Pitch (cpi)  Vertical Spacing (lpi)  Bidirectional Printing  No. of Copies  Feed Mechanism  Buffer Size  Interface  <b>Maintenance</b>  Maintenance Provided By  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>CIE Terminals</b>  CI-3500 Model 10  Serial  9-wire dot matrix  96 ASCII; 37 intl sets; courier; line drawing; multinatl  To 217  87, 350 cps  10, 12, 13.2, 16.5  3, 4, 6, 8  Std  6  Tractor  2K char.  RS-232C  Vendor  Contact vendor  \$1,895  —  Boldface, slanting, super/subscripts; character expansion x 2 horiz., vert.</p>	<p><b>CIE Terminals</b>  CI-3500 Model 20  Serial  9-wire dot matrix  96 ASCII; 8 intl, 2 graphic sets  To 224  87, 350 cps  10, 12, 16.5 (or 17.1)  3, 4, 6, 8, 9, 12  Std  6  Tractor  2K char.  Centronics; RS-232C  Vendor  —  \$1,895  —  Boldface, slanting, super/subscripts; character expansion x 2, 4, 8</p>	<p><b>CIE Terminals</b>  CI-3500 Model 30  Serial  9-wire dot matrix  96 ASCII; 12 intl sets; ruled line generator; block; Eng  To 233  87, 350 cps  10, 12, 15, 17.1  3, 4, 6, 8, 9, 12  Std  6  Tractor  1.5K char.  Centronics; RS-232C  Vendor  Contact vendor  \$1,895  —  Boldface, slanting, super/subscripts; character expansion x 2, 4, 8</p>

**Notes:**

— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>CIE Terminals</b>                  CI-3500, Model 40                  Serial                  9-wire dot matrix                  96 ASCII; 9 intl sets                  To 233                  87, 350 cps                  10, 12, 13.2, 15, 17.1                  6, 8                  Std                  6                  Tractor                  2K char.                  RS-232C                  Vendor                  Contact vendor                  \$1,895                  —                  Boldface, slanting, super/subscripts; character expansion x 2, 4, 8</p>	<p><b>CIE Terminals</b>                  CI-600                  Line                  Dot matrix hammerbank shuttle                  96 ASCII; block; intl; eng; line drawing                  To 220                  To 600 lpm                  10, 11.67, 13.33, 16.67                  3, 4, 6, 8                  Std                  6                  Tractor                  2K char.                  RS-232C; Centronics; Dataproducts parallel                  Vendor                  \$1,320/year                  \$6,795                  —                  Underlining, boldface, slanting; character expansion x 2, 4, 8; opt. bar codes and forms generation</p>	<p><b>Citizen America</b>                  120D Dot Matrix Printer                  Serial                  Dot matrix                  96 ASCII; intl, ital, &amp; graphic sets                  40, 48, 80, 96, 136, 160                  25, 120 cps                  5, 6, 10, 12, 17, 20                  6, 8, progrmble                  Std                  2                  Tractor                  4K char.                  Parallel; RS-232C opt.                  Honeywell Information Systems                  —                  \$249                  —                  18 mo warranty</p>
<p><b>Manufacturer Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Citizen America</b>                  MSP-10/MSP-15                  Serial                  Dot matrix                  96 ASCII; intl, ital, &amp; graphic sets                  40-136 (MSP-10), 68-231 (MSP-15)                  40, 160 cps                  5, 6, 8.5, 10, 12, 17                  6, 8, progrmble                  Std                  3                  Tractor                  1K char., 8K char. opt.                  Parallel; RS-232C opt.                  Honeywell Information Systems                  —                  \$549 (MSP-10), \$399 (MSP-15)                  —                  18 mo warranty</p>	<p><b>Citizen America</b>                  MSP-20/MSP-25                  Serial                  Dot matrix                  96 ASCII; intl, ital, &amp; graphic sets                  40-160 cps (MSP-20); 68-272 (MSP-25)                  50, 200 cps                  5, 6, 8.5, 10, 12, 17, 20                  6, 8, progrmble                  Std                  3                  Tractor; cutsheet feeder opt.                  8K char.                  Parallel; RS-232C opt.                  Honeywell Information Systems                  —                  \$499 (MSP-20); \$749 (MSP-25)                  —                  18 mo warranty</p>	<p><b>Citizen America</b>                  Premiere 35                  Serial                  Daisywheel                  96, various sets avail.                  136, 163, 204                  35 cps                  10, 12, 15, proportional                  Progrmble                  Std                  7                  Tractor; cutsheet feeder opt.                  8KB                  Centronics; RS-232C opt.                  Honeywell Information Systems                  —                  \$599                  —                  18 mo warranty</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer</b></p> <p><b>Model</b></p> <p><b>Type</b></p> <p><b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface</p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Computer Devices</b></p> <p>Miniterm 2100 Receive Only                  Serial</p> <p>Thermal dot matrix                  ASCII                  80, 132                  120, 160 cps                  10, 10.7, 18.4                  —                  Std                  1                  —                  2K char.; 4K char. opt.                  Serial</p> <p>Vendor                  —                  \$1,195 plus options                  —                  NA</p>	<p><b>Computer Devices</b></p> <p>Miniterm 2200 Series                  Serial</p> <p>Thermal dot matrix                  ASCII, APL, foreign                  80, 132                  To 160 cps                  10, 18.4                  3, 6                  Std                  1                  Friction (roll)                  2K char.; 4K char. opt.                  RS-232C; 20 mA current loop</p> <p>Vendor                  —                  \$1,395 plus options                  March 1982                  Communications terminal and                  printer; various                  communications pkgs avail.</p>	<p><b>Computer Printers                  International</b></p> <p>912                  Serial</p> <p>Dot matrix                  96 ASCII                  80                  170 lpm, 225 cps                  11                  5, 8                  —                  1                  Roll                  2K char.                  Centronics; IEEE-488;                  RS-232C</p> <p>Vendor                  —                  \$660                  1978                  NA</p>
<p><b>Manufacturer</b></p> <p><b>Model</b></p> <p><b>Type</b></p> <p><b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size</p> <p><b>Interface</b></p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Computer Transceiver                  Systems</b></p> <p>1205                  Serial</p> <p>Thermal dot matrix                  ASCII                  136                  140 cps at 10 cpi                  —                  Std                  1                  Friction                  1K char.; 8K char., 15K char.                  opt.                  Centronics parallel</p> <p>Vendor                  \$18                  \$995                  —                  96 x 120/240 dpi</p>	<p><b>Computer Transceiver                  Systems</b></p> <p>1210                  Serial</p> <p>Thermal dot matrix                  ASCII                  136                  140 cps at 10 cpi                  —                  Std                  1                  Friction                  1K char.; 8K char., 15K char.                  opt.                  RS-232C</p> <p>Vendor                  \$19                  \$1,045                  —                  96 x 120/240 dpi.</p>	<p><b>Computer Transceiver                  Systems</b></p> <p>1220                  Serial</p> <p>Thermal dot matrix                  ASCII                  136                  140 cps at 10 cpi                  —                  Std                  1                  Friction                  1K char.; 8K char., 15K char.                  opt.                  Serial RJ11C; RS-232C</p> <p>Vendor                  \$21                  \$1,395                  —                  96 x 120/240 dpi.</p>

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 — Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer</b></p> <p><b>Model</b></p> <p><b>Type</b></p> <p><b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size</p> <p><b>Interface</b></p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Computer Transceiver Systems</b></p> <p>1230 Serial</p> <p>Thermal dot matrix ASCII 136 140 at 10 cpi — — Std 1 Friction 1K char.; 8K char., 15K char. opt. RJ11C; RS-232C</p> <p>Vendor \$20 \$1,330</p> <p>96 x 120/240 dpi.</p>	<p><b>Computer Transceiver Systems</b></p> <p>1240 Serial</p> <p>Thermal dot matrix ASCII 136 140 at 10 cpi — — Std 1 Friction 1K char.; 8K char., 15K char. opt. RJ11C; RS-232C</p> <p>Vendor \$21 \$1,395</p> <p>96 x 120/240 dpi.</p>	<p><b>Computer Transceiver Systems</b></p> <p>1250 Serial</p> <p>Thermal dot matrix ASCII 136 140 at 10 cpi — — Std 1 Friction 1K char.; 8K char., 15K char. opt. Serial; RS-232C</p> <p>Vendor \$22 \$1,695</p> <p>96 x 120/240 dpi.</p>
<p><b>Manufacturer</b></p> <p><b>Model</b></p> <p><b>Type</b></p> <p><b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size</p> <p><b>Interface</b></p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Computer Transceiver Systems</b></p> <p>1260 Serial</p> <p>Thermal dot matrix ASCII 136 140 at 10 cpi — — Std 1 Friction 1K char.; 8K char., 15K char. opt. RJ11C (internal 212/103-compat intell modem)</p> <p>Vendor \$24 \$1,895</p> <p>96 x 120/240 dpi.</p>	<p><b>Computer Transceiver Systems</b></p> <p>420 Serial</p> <p>Dot matrix (impact) ASCII 140 30, 55, 80 cps 5-20 cpi — No 3 Friction 2K char.</p> <p>RS-232C; 20 Ma current loop</p> <p>Vendor \$19 \$795</p> <p>14 char. fonts avail.</p>	<p><b>Computer Transceiver Systems</b></p> <p>430 Serial</p> <p>Dot matrix (impact) ASCII 140 30, 55, 80 cps 5-20 cpi — No 3 Friction 256 char.</p> <p>RS-232C; 20 Ma current loop</p> <p>Vendor \$19 \$995</p> <p>14 char. fonts avail.</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer</b></p> <p><b>Model</b></p> <p><b>Type</b></p> <p><b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism</p> <p>Buffer Size                  Interface</p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Computer Transceiver Systems</b></p> <p>440                  Serial</p> <p>Dot matrix (impact)                  ASCII                  140                  30, 55, 80 cps                  5-20 cpi                  —                  No                  3                  Friction</p> <p>256 char.                  RS-232C; acoustic modular telephone jack; 20 Ma current loop; internal modem</p> <p>Vendor                  \$19                  \$1,195</p> <p>—                  14 char. fonts avail.; 60 x 120 dpi.</p>	<p><b>Computer Transceiver Systems</b></p> <p>443                  Serial</p> <p>Dot matrix (impact)                  ASCII                  140                  30, 55, 80 cps                  —                  No                  3                  Friction</p> <p>16K char.                  RS-232C; 20 Ma current loop; acoustic modular telephone jack; internal modem</p> <p>Vendor                  \$21                  \$1,795-\$1,995</p> <p>—                  Telex, TWX compat; text editing fea's std; intl units avail.; 120 x 60 dpi.</p>	<p><b>Daisy Systems</b></p> <p>M45Q/INT 2                  Serial</p> <p>Daisywheel                  96                  132 at 10 cpi                  40 cps (avg)                  10, 12, 15                  6, 8, 12                  Std (selectable)                  6                  Friction (cutsheet), tractor; single, dual, dual/envelope cutsheet feeders                  500 char.                  Serial (RS-232C); Qume (INT 2)</p> <p>Bell &amp; Howell                  Depot \$14; on-site \$20                  \$1,845</p> <p>—                  54 dBA std</p>
<p><b>Manufacturer</b></p> <p><b>Model</b></p> <p><b>Type</b></p> <p><b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism</p> <p>Buffer Size                  Interface</p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Daisy Systems</b></p> <p>M45Q/INT 3                  Serial</p> <p>Daisywheel                  96                  132 at 10 cpi                  40 cps (avg)                  10, 12, 15                  6, 8, 12                  Std (selectable)                  6                  Friction (cutsheet), tractor; single, dual, dual/envelope cutsheet feeders                  500 char.                  Parallel (50 edgepin); Qume (INT 3)</p> <p>Bell &amp; Howell                  Depot \$14; on-site \$20                  \$1,845</p> <p>—                  54 dBA std</p>	<p><b>Daisy Systems</b></p> <p>M45Q/INT 4                  Serial</p> <p>Daisywheel                  96                  132 at 10 cpi                  40 cps (avg)                  10, 12, 15                  6, 8, 12                  Std (selectable)                  6                  Friction (cutsheet), tractor; single, dual, dual/envelope cutsheet feeders                  500 char.                  HP IB-IEEE 480 (INT 4)</p> <p>Bell &amp; Howell                  Depot \$14; on-site \$20                  \$1,845</p> <p>—                  54 dBA std</p>	<p><b>Daisy Systems</b></p> <p>M45Q/INT 7                  Serial</p> <p>Daisywheel                  96 char.                  132 at 10 cpi                  40 cps (avg)                  10, 12, 15                  6, 8, 12                  Std (selectable)                  6                  Friction (cutsheet), tractor; single, dual, dual/envelope cutsheet feeders                  500-2K char.                  Serial; parallel; C/loop; Diablo/Qume compat (INT 7)</p> <p>Bell &amp; Howell                  Depot \$14; on-site \$20                  \$1,995</p> <p>—                  54 dBA std</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                      Print Mechanism                      Character Set (char.)                        Print Column                      Speed                      Print Pitch (cpi)                      Vertical Spacing (lpi)                      Bidirectional Printing                      No. of Copies                      Feed Mechanism                      Buffer Size                      Interface    <b>Maintenance</b>                      Maintenance Provided By                      Monthly Maintenance Fee  <b>Purchase Price</b>    <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Dataproducts</b>                      8010, 8012                      Serial                        Dot matrix (impact)                      7 intl (8010); 256 char. set (8012)                        —                      30, 90, 180 cps                      10, 12, 13.3, 17.1                      6, 8, progrmble                      Std                      3                      Friction, tractor                      2KB                      Serial, parallel (8010); parallel (8012)                        Third party field maint                      —                      \$499                        —                      65 dBA</p>	<p><b>Dataproducts</b>                      8020, 8022                      Serial                        Dot matrix (impact)                      7 intl (8020); 256 char. set (8022)                        —                      30, 90, 180                      10, 12, 13.3, 17.1                      6, 8, progrmble                      Std                      3                      Friction, tractor                      2KB                      Centronics-compatible (8022) parallel; Serial (RS-232C) opt.                        Third party field maintenance                      —                      \$749                        —                      65 dBA</p>	<p><b>Dataproducts</b>                      8052                      Serial                        Dot matrix (impact)                      256 char.                        —                      40, 110, 200 cps                      10, 12, 13.3, 17.1                      6, 8, progrmble                      Std                      6                      Friction, tractor                      4KB                      Centronics                        Third party field maintenance                      —                      \$1,499 monochrome, \$1,599 color                        —                      NA</p>
<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                      Print Mechanism                      Character Set (char.)                      Print Column                      Speed                      Print Pitch (cpi)                      Vertical Spacing (lpi)                      Bidirectional Printing                      No. of Copies                      Feed Mechanism                      Buffer Size                      Interface    <b>Maintenance</b>                      Maintenance Provided By                      Monthly Maintenance Fee  <b>Purchase Price</b>    <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Dataproducts</b>                      8070                      Serial                        Dot matrix (impact)                      7 intl sets                        —                      100, 300, 400 cps                      10, 12, 13.3, 17.1                      6, 8, progrmble                      Std                      6                      Friction, tractor                      5KB                      Combination serial/parallel card                        Third party field maintenance                      —                      \$1,999 monochrome, \$2,099 color                        —                      High duty cycle color printer; graphics and text capabilities</p>	<p><b>Dataproducts</b>                      8072                      Serial                        Dot matrix (impact)                      256 char.                        —                      100, 300, 400                      10, 12, 13.3, 17.1                      6, 8, progrmble                      Std                      6                      Friction, tractor                      4KB                      Centronics                        Third party field maintenance                      —                      \$1,999 monochrome, \$2,099 color                        —                      High duty cycle color printer; graphics and text capabilities.</p>	<p><b>Dataproducts</b>                      B-1000                      Line                        Band                      48, 64, 96                      136 max                      820, 1100, 1025 lpm                      10                      6, 8                      No                      6                      Tractor                      1K, 2K, 4K                      Dataproducts parallel; RS-232C, long line, Centronics opt.                        Third party field maintenance                      —                      \$12,800 to \$13,200                        —                      Self-test; automotor on/off; diagnostic display.</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>  Print Mechanism  Character Set (char.)  Print Column  Speed  Print Pitch (cpi)  Vertical Spacing (lpi)  Bidirectional Printing  No. of Copies  Feed Mechanism  Buffer Size  Interface</p> <p><b>Maintenance</b>  Maintenance Provided By  Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Dataproducts</b>  B-300  Line</p> <p>Band  48, 64, 96  136  230, 300, 320 lpm  10  6, 8  No  6  Tractor  1K, 2K, 4K  Dataproducts parallel;  RS-232C, longline,  Centronics opt.</p> <p>Third party field maintenance  —  \$6,800–\$7,400  —  Self-test; automotor on/off;  diagnostic display</p>	<p><b>Dataproducts</b>  B-600  Line</p> <p>Band  48, 64, 96  136 max  550, 650 lpm  10  6, 8  No  6  Tractor  1K, 2K, 4K  Dataproducts parallel;  RS-232C, long line,  Centronics opt.</p> <p>Third party field maintenance  —  \$8,700 to \$9,200  —  Self-test; automotor on/off;  diagnostic display.</p>	<p><b>Dataproducts</b>  BP-1500  Line</p> <p>Band  48, 64, 96  80, 132  900, 1,200, 1,500 lpm  10  6, 8  No  6  Tractor  One line  Dataproducts parallel; long  line opt.</p> <p>Third party field maintenance  —  \$22,500  —  Direct access VFU; automatic  phasing; diagnostic display</p>
<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>  Print Mechanism  Character Set (char.)  Print Column  Speed  Print Pitch (cpi)  Vertical Spacing (lpi)  Bidirectional Printing  No. of Copies  Feed Mechanism  Buffer Size  Interface</p> <p><b>Maintenance</b>  Maintenance Provided By  Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Dataproducts</b>  BP-2000  Line</p> <p>Band  48, 64, 96  80, 132  1,100, 1,650, 2,000 lpm  10  6, 8  No  6  Tractor  One line  Dataproducts parallel; long  line opt.</p> <p>Third party field maintenance  —  \$30,000  —  Direct access VFU; automatic  phasing; diagnostic display</p>	<p><b>Dataproducts</b>  DP-20  Serial</p> <p>Daisywheel  —  136, 163, 204  20, 22 cps  10, 12, 15  6, 8  Opt.  4  Friction  2KB  RS-232C; Centronics</p> <p>Third party field maintenance  —  \$799  —  Control panel</p>	<p><b>Dataproducts</b>  DP-55  Serial</p> <p>Daisywheel  96, 88, or 92  132, 158, 196  50, 55 cps  10, 12, 15  6, 8 lpi  Opt.  6  Friction  1.7 KB  RS-232C; Centronics</p> <p>Third party field maintenance  —  \$2,195; DP-55SQ (super  quiet) \$2,495  —  6,000 hour MTBF; heavy-duty  business appl.</p>

**Notes:**

— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface</p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Dataproducts</b>                  LB-300                  Line</p> <p>Band                  56, 64, 112                  136                  250, 300, 330 lpm                  10                  6, 8, 12 lpi                  NA                  6                  Pinfeed                  1 line (parallel); 2KB (serial)                  DPC parallel; triple interface                  opt. (DPC, Centronics and                  RS-232C)</p> <p>Third party field maintenance</p> <p>\$4,995</p> <p>Power stacker; solid state                  VFU programmer; meter                  package</p>	<p><b>Dataproducts</b>                  LB-600                  Line</p> <p>Band                  56, 64, 112                  136                  400, 600, 660 lpm                  10                  6, 8, 12                  NA                  6                  Pinfeed                  1 line (parallel); 2KB (serial)                  DPC parallel; triple interface                  opt. (DPC, Centronics and                  RS-232C)</p> <p>Third party field maintenance</p> <p>\$6,795</p> <p>Power stacker; solid state                  VFU programmer; meter                  package</p>	<p><b>Dataproducts</b>                  LZR-2610                  Page</p> <p>Laser</p> <p>—</p> <p>26 ppm (1,700 lpm)                  Variable                  Variable                  NA                  1                  Friction                  18KB                  DPC parallel; Centronics,                  RS-232C, or CPC long line                  opt.</p> <p>Third party field maintenance</p> <p>\$12,900</p> <p>Accepts paper sizes up to 11                  x 17-in.; 300 x 300 dpi.</p>
<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface</p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Dataproducts</b>                  LZR-2650/55                  Page</p> <p>Laser</p> <p>—</p> <p>26 ppm (1,700 lpm)                  Variable                  Variable                  NA                  Variable                  Variable                  1.5MB, 3.0MB                  Dataproducts parallel;                  RS-232C</p> <p>Third party field maintenance</p> <p>\$17,900–\$19,900</p> <p>Accepts paper sizes up to 11                  x 17-in.; 300 x 300 dpi.</p>	<p><b>Dataproducts</b>                  LZR-2660/65                  Page</p> <p>Laser</p> <p>—</p> <p>26 ppm (1,700 lpm)                  Variable                  Variable                  NA                  Variable                  Variable                  NA                  Dataproducts parallel;                  RS-232C; RS-422</p> <p>Third party field maintenance</p> <p>\$20,900–\$22,900</p> <p>Accepts paper sizes up to 11                  x 17-in.; supports Post                  Script Page Description                  programming lang.</p>	<p><b>Dataproducts</b>                  M-100L                  Serial</p> <p>Dot matrix (impact)                  96 ASCII; 36 intl sets                  132, 216 condensed                  140 cps                  5, 8.4, 10, 16.7                  6, 8                  Std                  6                  Tractor                  1KB                  8-bit parallel, Centronics                  compat; RS-232C, current                  loop opt.</p> <p>Third party field maintenance</p> <p>\$4,150</p> <p>Prints labels, graphics, bar                  codes, or text.</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable





<p><b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface</p> <p><b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee</p> <p><b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>Dataproducts</b> M-120 Serial</p> <p>7-wire dot matrix 96 ASCII; 32 intl sets 132 180 cps 5, 10, and 16.7 6, 8 Std 6 Tractor 1KB 8-bit parallel, Centronics-compat; RS-232C, current loop opt.</p> <p>Third party field maintenance — \$2,650 — Includes std digital status display; self-test feature</p>	<p><b>Dataproducts</b> M-200 Serial</p> <p>14-wire dot matrix 96 ASCII; 32 intl sets 132 340 cps 5, 10, 16.7 6, 8 lpi Std 6 Tractor 1KB 8-bit parallel, Centronics-compat; RS-232C, current loop opt.</p> <p>Third party field maintenance — \$2,950 — Includes std digital status display; self-test feature</p>	<p><b>Datasouth Computer</b> CX 3180 Serial</p> <p>Dot matrix (impact) 96 ASCII, 7 intl 132 at 10 cpi 180 cps 5, 6, 8.25, 10, 12, 16.5 6, 8 Std 6 Tractor 4K char. RS-232C, Centronics</p> <p>Third party, vendor — \$3,195 — NA</p>
<p><b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface</p> <p><b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee</p> <p><b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>Datasouth Computer</b> CX 3220 Serial</p> <p>Dot matrix (impact) 96 ASCII, 7 intl sets, APL 132 at 10 cpi 40, 90, 220 5, 6, 8, 10, 12, 16 6, 8, progrmble Std 6 Friction, tractor 4K char. IBM type "A" coaxial, Centronics</p> <p>Third party, vendor — \$3,695 — NA</p>	<p><b>Datasouth Computer</b> DS 180 Plus Serial</p> <p>Dot matrix (impact) 96 ASCII, 7 intl 132 at 10 cpi 180 cps 5, 6, 8.25, 10, 12, 16.5 6, 8 Std 6 Tractor 4K char. RS-232C, Centronics</p> <p>Third party, vendor — \$1,395 — NA</p>	<p><b>Datasouth Computer</b> DS 220 Serial</p> <p>Dot matrix 96 ASCII, 7 intl sets 132 at 10 cpi 40, 90, 220 5, 6, 8, 10, 12, 16 6, 8, progrmble Std 6 Friction, tractor 2K char. RS-232C, Centronics</p> <p>Third party, vendor — \$1,695 — NA</p>

**Notes:**  
— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model</b></p> <p><b>Type</b></p> <p><b>Characteristics</b> Print Mechanism Character Set (char.)</p> <p>Print Column Speed Print Pitch (cpi)</p> <p>Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface</p> <p><b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Datasouth Computer</b> TX 5180</p> <p>Serial</p> <p>Dot matrix 128 ASCII, 7 intl sets</p> <p>132 at 10 cpi 180 cps 5, 6, 8, 25, 10, 12, 16.5</p> <p>6, 8 Std 6 Tractor 4K char. Twin axial connectors, Centronics</p> <p>Third party, vendor — \$2,995 — NA</p>	<p><b>Datasouth Computer</b> TX 5220</p> <p>Serial</p> <p>Dot matrix (impact) 256 ASCII, 7 intl sets, APL</p> <p>132 at 10 cpi 40, 90, 220 5, 6, 8, 10, 12, 16</p> <p>6, 8 Std 6 Friction, tractor 2K char. Twin axial connectors, Centronics</p> <p>Third party, vendor — \$3,495 — NA</p>	<p><b>Digital Equipment</b> LA100 Letterprinter and Letterwriter Serial</p> <p>Dot matrix (impact) 94 ASCII for 11 countries, 8-bit nat char. set, VT100 line drawing set 40–217 30, 80, 240 cps 5, 6, 6.6, 8.25, 10, 12, 13.2, 16.5 2, 3, 4, 6, 8, 12 — 4 Friction, tractor — RS-232C; 20mA current loop opt. Vendor \$27 \$2,195–\$2,295 — Graphics, text, and line-drawing capability; microprocessor controlled</p>
<p><b>Manufacturer Model</b></p> <p><b>Type</b></p> <p><b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi)</p> <p>Vertical Spacing (lpi) Bidirectional Printing No. of Copies</p> <p>Feed Mechanism Buffer Size Interface</p> <p><b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Digital Equipment</b> LA12 DECwriter CORRESPONDENT Serial</p> <p>Dot matrix 94 ASCII, 9 intl sets 40–132 150 cps 5–16.5</p> <p>2, 3, 4, 6, 8, 12, user-def. Std 2</p> <p>Friction, pinfeed; tractor opt. — RS-232C</p> <p>Vendor \$21 \$1,495–\$2,195 — 9 x 9 or 18 x 9 char. matrix; integrated auto-dial</p>	<p><b>Digital Equipment</b> LA120-RA/RB DECprinter III Serial</p> <p>Dot matrix 94 ASCII To 216 180 cps 5, 6, 6.6, 8.25, 10, 12, 13.2, 16.5 2, 3, 4, 6, 8, 12 Std 6 (LA 120-RA); 4–9 (LA 120-RB)</p> <p>Tractor 1K char. RS-232C; 20 mA current loop opt.</p> <p>Vendor \$39 \$2,420 (LA 120-RA); \$2,600 (LA 120-RB) — 7 x 7 dot matrix char. cell; receive only</p>	<p><b>Digital Equipment</b> LA210 Letterprinter Serial</p> <p>Dot matrix (impact) 132, 217 — 40, 80, 240 cps 8 print pitches — — 4 Friction, tractor 2K char. RS-232C; IBM parallel opt. Vendor \$28 \$1,595 — NA</p>

Notes:  
— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Digital Equipment</b>                  LCP01 Inkjet Printer                  —                  Inkjet                  NA                  NA                  2 min/page                  NA                  NA                  —                  1                  Friction                  RS-422, RS-232C; 20 mA current loop                  Vendor                  \$125                  \$14,595                  —                  216-color printer; 154 dpi graphics</p>	<p><b>Digital Equipment</b>                  LN01 Laser Printer                  Page                  Laser                  —                  132                  12 ppm                  13.6 (US); 12.5 (Europe)                  8.57                  NA                  —                  2-tray cutsheet feeder                  —                  Parallel, longline, RS-232C                  Vendor                  \$310                  \$19,995                  —                  300 x 300 dpi; various software avail</p>	<p><b>Digital Equipment</b>                  LN03 Laser Printer                  Page                  Laser                  Variable                  150                  8 ppm                  —                  NA                  1                  Friction (cutsheet)                  1K char.                  RS-232C                  Vendor                  \$49                  \$4,195                  —                  300 x 300 dpi</p>
<p><b>Manufacturer Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Digital Equipment</b>                  LP25                  Line                  Band                  64, 96                  132                  215, 300                  10, 15                  6, 8                  —                  6                  Tractor                  132 char.                  Short line, parallel, RS-232C                  Vendor                  —                  —                  —                  NA</p>	<p><b>Digital Equipment</b>                  LP26                  Line                  Band                  64, 96                  132                  445, 600                  10                  6, 8                  —                  6                  Tractor                  132 char. (single line)                  Short line, parallel, RS-232C                  Vendor                  —                  —                  —                  NA</p>	<p><b>Digital Equipment</b>                  LQP02                  Serial                  Daisywheel                  94 ASCII                  132, 158                  32 cps                  10, 12                  6, 8                  Std                  4                  Pinfeed, tractor (opt.)                  —                  RS-232C                  Vendor                  \$29                  \$2,800                  —                  NA</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer</b>  <b>Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface</p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Digital Equipment</b>                  LQP03                  Serial</p> <p>Daisywheel                  130                  110, 132                  25 cps                  10, 12                  Variable                  —                  6                  Friction; tractor opt.                  256 char.                  RS-232C</p> <p>Vendor                  \$23                  \$1,395                  —                  Accepts paper to 12-in. wide</p>	<p><b>Eaton Printer Products</b>                  4000/4002                  Serial</p> <p>Dot matrix (impact)                  96 ASCII                  40                  180 lpm                  12                  5, 6, 7, 8 (4000); 6 (4002)                  Std                  5                  Friction                  1K char.                  RS-232C, 20mA current loop,                  Centronics</p> <p>Factory                  —                  \$985                  —                  Document printer (4000);                  ticket printer (4002)</p>	<p><b>Eaton Printer Products</b>                  4110                  Serial</p> <p>Dot matrix (impact)                  96 ASCII                  40                  180 lpm                  12                  5, 6, 7, 8                  Std                  4                  Friction (roll)                  1K char.                  RS-232C</p> <p>Factory                  None established                  \$1,085                  —                  Journal validate printer</p>
<p><b>Manufacturer</b>  <b>Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism</p> <p>Buffer Size                  Interface</p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Epson</b>                  AP-80                  Serial</p> <p>Dot matrix (impact)                  —                  80                  15, 75 cps                  —                  —                  Std                  —                  Friction, tractor</p> <p>256K char.                  Serial</p> <p>Epson auth dealers                  —                  \$379                  1985                  For Apple IIc, IIe, and                  Macintosh (emulates Apple                  ImageWriter)</p>	<p><b>Epson</b>                  DX-35                  Serial</p> <p>Daisywheel (Diablo-compat)                  96                  136                  35 cps                  10, 12, 15                  —                  —                  3                  Friction; tractor, cutsheet                  feeder opt.                  3K char.                  Diablo all-purpose</p> <p>Epson auth dealers                  —                  \$899                  October 1985                  Opt. keyboard avail</p>	<p><b>Epson</b>                  HomeWriter 10                  Serial</p> <p>Dot matrix                  —                  80, 96, 132, 160                  16, 100 cps                  —                  —                  Std                  —                  Friction; tractor opt.</p> <p>1K char.                  Epson printer interface                  cartridge (PIC)</p> <p>Epson auth dealers                  —                  \$249                  January 1985                  50–240 dpi graphics; PIC                  interface purchased                  separately</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.)  Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism  Buffer Size Interface  <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Epson</b> <b>HS-80</b> Letterjet Portable Serial  Inkjet 96 ASCII; 11 intl sets, 36 graphic char.  80, 96, 136, 160 32, 160 cps 7 pitches avail. — No 1 Friction  1K char. Centronics, RS-232C  Epson auth dealers — \$449 July 1985 Weighs 4 lbs.	<b>Epson</b> <b>RX-100</b> Serial  Dot matrix (impact) 96 char. ASCII; 11 intl sets, 96 ital char., 32 graphic char. 68, 81, 116, 136, 163, 233 100 cps 6 pitches avail. 6, progrmble Std (text mode only) 3 Friction, tractor  1 line; 2KB opt. 8-bit parallel; RS-232C, IEEE-488 opt.  Epson auth dealers — \$499 1985 240 dpi H, 216 dpi V; 9 x 9 char.	<b>Epson</b> <b>SQ 2000</b> Serial  Inkjet 96 ASCII; 11 intl. 96 ital  136, 163, 220, 272 106, 176 cps 10 pitches avail. — — — Friction std; tractor, cutsheet feeder opt. 32K char.; 128K char. opt. Centronics, RS-232C  Epson auth dealers — \$2,295 May 1985 NA
<b>Manufacturer Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column  Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism  Buffer Size Interface  <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Epson</b> <b>DX-10</b> Serial  Daisywheel 96 ASCII (Diablo wheel) 82, 98  10 cps 10, 12, progrmble — Std 3 Friction; tractor, cutsheet feeder opt.  NA Centronics  Epson auth dealers — \$299 June 1985 Accepts paper up to 11-in. wide	<b>Epson</b> <b>DX-20</b> Serial  Daisywheel 96 ASCII (Diablo wheel) 110, 132  20 cps 10, 12, 15, progrmble — Std 3 Friction; tractor, cutsheet opt.  1K char.; 7K char. opt. All purpose interface (serial or parallel input)  Epson auth dealers — \$459 June 1985 Accept paper up to 13-in. wide	<b>Epson</b> <b>FX-85, FX-185</b> Serial  Dot matrix (impact) 96 ASCII; ital, 11 intl sets 80, 96, 132 (FX-85); 116, 136, 233 (FX-185) 32, 160 cps 6 pitches avail. — Std 3 FX-85: friction and pinfeed std; tractor, cutsheet feed opt.; FX-185: friction, tractor std; cutsheet feeder opt. 8KB Centronics; RS-232C current loop, IEEE-488 opt.  Epson auth dealers — \$499 (FX-85); \$699 (FX-185) July 1985 NA

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                    Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                    Buffer Size                  Interface    <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Epson</b>                  JX-80                  Serial                    Dot matrix (impact)                  96 ASCII; ital, 11 intl sets,                  256 user def.                  80, 96, 132, 160                  160 cps                  10 pitches avail.                  —                  Std                  3                  Friction, tractor                    32KB                  Centronics; RS-232C, current                  loop, IEEE-488 opt.                    Epson authorized dealers                  —                  \$399                  1984                  60–240 dpi, seven-color                  printer</p>	<p><b>Epson</b>                  LQ-1500                  Serial                    24-pin dot matrix                  96 ASCII; ital, 11 intl sets,                  128 user def                  136, 163, 233, 272                  67, 200                  6 pitches avail.                  —                  Std                  —                  Friction; tractor, cutsheet opt.                    2K char.; 32K char. opt.                  Opt.; Centronics, RS-232C,                  IEEE-488                    Epson auth dealers                  —                  \$1,295                  1984                  NA</p>	<p><b>Epson</b>                  Spectrum LX-80                  Serial                    Dot matrix (impact)                  —                  80, 96, 132, 160                  100 cps                  Four pitches avail.                  —                  Std                  —                  Friction; tractor, cutsheet                  feeder opt.                  1K char.; 32K char. opt.                  Centronics; RS-232C                    Epson auth dealers                  —                  \$299                  January 1985                  NA</p>
<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface    <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Epson</b>                  Spectrum LX-90                  Serial                    Dot matrix                  96 ASCII; ital                  40, 80, 132                  16, 100 cps                  —                  6, 8, 216                  Std                  —                  Friction, tractor; cutsheet opt.                  1K char.                  Epson printer interface                  cartridge (PIC)                    Epson authorized dealers                  —                  \$389                  June 1985                  NA</p>	<p><b>FACIT</b>                  4509                  Serial                    Dot matrix (impact)                  96 ASCII                  80 at 10 cpi                  120 cps                  10, 12, 17, proportional                  6, 8, prgrmble                  Std                  4                  Tractor                  248 bytes; 2KB opt.                  Parallel                    Vendor, 3rd party, dealers                  —                  \$425                  —                  NA</p>	<p><b>FACIT</b>                  4510                  Serial                    Dot matrix (impact)                  96 ASCII                  80 at 10 cpi                  120 cps at 10 cpi                  10, 12, 17, proportional                  6, 8, progrmble                  Std                  4                  Friction, tractor                  2K char.                  Serial, parallel                    Vendor, 3rd party, dealers                  —                  \$495                  —                  NA</p>

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 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>FACIT</b> 4511 Serial  Dot matrix (impact) 96 ASCII 80 at 10 cpi 160 cps at 10 cpi 10, 12, 17, proportional 6, 8 Std 4 Friction, tractor 2K char. Serial, parallel  Vendor, 3rd party, dealers — \$595 — NA	<b>FACIT</b> 4512 Serial  Dot matrix (impact) 96 ASCII 132 at 10 cpi 140 cps at 10 cpi 10, 12, 17, proportional 6, 8, progrmble Std 4 Friction, tractor 2K char. Serial, parallel  Vendor, 3rd party, dealers — \$795 — NA	<b>FACIT</b> 4513 Serial  Dot matrix (impact) 96 ASCII 80 at 10 cpi 160 cps at 10 cpi 10, 12, 17, proportional 6, 8, progrmble Std 4 Friction, tractor 2K char. Serial, parallel  Vendor, 3rd party, dealers — \$695 — Two modes: IBM graphics & Epson FX
<b>Manufacturer Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi)  Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b>  <b>First Delivery</b> <b>Comments</b>	<b>FACIT</b> 4514 Serial  Dot matrix (impact) 96 ASCII 132 160 cps 10, 12, 17, proportional  6, 8, progrmble Std 4 Friction, tractor 2K char. Serial, parallel  Vendor, 3rd party, dealers — \$845 — Two modes: IBM graphics & Epson FX	<b>FACIT</b> 4528D Serial  Dot matrix (impact) 96 ASCII 80, 136 (at 10 cpi) 140, 165, 285 cps 10, 17.3, 2 pass NLQ, OCR-A like font 6, 8 Std 6 Tractor 6KB; 12KB opt. Parallel, serial  Vendor Basic \$470, depot \$360 \$1,695 (80 col); \$1,775 (136 col) — 9 x 9 char. cell; bar codes, variable size char.	<b>FACIT</b> 4528T Serial  Dot matrix (impact) 96 ASCII 80, 136 (at 10 cpi) 140, 165, 200, 285 cps 10, 12, 17.3  6, 8 Std 5 Tractor 2KB; 6KB opt. Serial, parallel  Vendor Basic \$470, depot \$360 \$975 (80 col), \$1,165 (136 col) — Pin addressable graphics; 9 x 9 char cell

**Notes:**

- Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>FACIT</b>                  4528V                  Serial                    Dot matrix (impact)                  96 ASCII                  80, 136 (at 10 cpi)                  140, 165, 200, 285 cps                  10, 17.3                  6, 8                  Std                  5                  Tractor                  6KB; 12KB opt.                  Parallel, serial                    Vendor                  Basic \$470, depot \$360                  \$1,545 (80 col); \$1,595 (136 col)                  —                  9 x 9 char cell; variable size char (up to 9.5 in), bar codes</p>	<p><b>FACIT</b>                  4542                  Serial                    Dot matrix (impact)                  128–512 ASCII                  150 max (normal char.)                  250 cps                  10, 12.7, 15.5                  6, 8                  Std                  6                  Tractor                  766 bytes; 8KB opt.                  Serial, parallel, IEEE-488                    Vendor                  \$850 basic, \$634 depot                  \$2,725                  —                  9 x 14 char cell, 2 color; opt. bar code &amp; variable size chars.</p>	<p><b>FACIT</b>                  4544                  Serial                    Dot matrix (impact)                  128–512 ASCII                  150                  225 cps                  10, 12.7, 15.5                  6, 8                  Std                  6                  Tractor                  4KB, 8KB opt.                  Parallel, serial, IEEE-488                    Vendor                  Basic \$894, depot \$672                  \$3,275                  —                  9 x 14 char matrix; 4 color; opt. bar codes &amp; variable size chars.</p>
<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                    Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>FACIT</b>                  4560                  Serial                    Daisywheel                  105–112                  130 (at 10 cpi)                  22 cps                  10, 12, 15, proportional                    6, 8, progrmble                  No                  6                  Friction                  2K char. (serial only)                  Serial, parallel                    Vendor, 3rd party, dealers                  —                  \$795                  —                  NA</p>	<p><b>FACIT</b>                  4565                  Serial                    Daisywheel                  96                  136 (at 10 cpi)                  40 cps                  10, 12, proportional                    6, 8, progrmble                  Std                  4                  Friction                  2KB (serial only)                  Serial, parallel                    Vendor, 3rd party, dealers                  —                  \$1,195–\$1,395                  —                  NA</p>	<p><b>FACIT</b>                  4580                  Page                    Laser                  ASCII                  —                  12 ppm                  10, 12, proportional, user definable                  6, 8, user definable                  NA                  1                  Friction                  4                  Serial, parallel                    Vendor                  \$125                  \$9,500                  —                  Workload 20,000 pages/mo; storage of 4 layouts &amp; overlay</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable





<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>  Print Mechanism  Character Set (char.)  Print Column  Speed  Print Pitch (cpi)  Vertical Spacing (lpi)  Bidirectional Printing  No. of Copies  Feed Mechanism  Buffer Size  Interface  <b>Maintenance</b>  Maintenance Provided By  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>FACIT</b>  C5500  Serial</p> <p>Dot matrix (impact)  ASCII  136 at 10 cpi  60, 250 cps  10, 12, 17.1, proportional  6, 8, microlinedfeed  Std  4  Tractor, friction  2KB; 8KB opt.  RS-232C, parallel</p> <p>Vendor  \$40  \$1,595</p> <p>7-color; handles fanfold and cutsheet simultaneously</p>	<p><b>FACIT</b>  C7500  Serial</p> <p>Dot matrix (impact)  ASCII  136 at 10 cpi  100, 400 cps  10, 12, 17.1, proportional  6, 8, progrmble  Std  4  Tractor, friction std  4K char.  RS-232C, parallel</p> <p>Vendor  \$50  \$2,495</p> <p>15 colors; handles fanfold and cutsheet simultaneously; microcharacters, low noise level</p>	<p><b>Florida Data</b>  Models 3000, OSP-130  Serial</p> <p>Dot matrix (impact)  —  237 (at 18 cpi)  120, 675 cps  3, 4, 6, 8, others  —  Std  —  Tractor, friction  To 22KB  RS-232C; S/3x opt.</p> <p>NCR, 3rd party  \$59  \$3,995</p> <p>Various fonts avail. on various models</p>
<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>  Print Mechanism  Character Set (char.)  —  Print Column  Speed  Print Pitch (cpi)  Vertical Spacing (lpi)  Bidirectional Printing  No. of Copies  Feed Mechanism  Buffer Size  Interface  <b>Maintenance</b>  Maintenance Provided By  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Fujitsu America</b>  DL2400  Serial</p> <p>24-wire dot matrix  96 ASCII; 16 intl sets, 48 graphic, 31 Greek, math, &amp; extra  136, 163, 244  60, 72, 180, 216 cps  10, 12, 15, 17.1, 18, 20  3, 4, 6, 8  Std  4  Friction, tractor  8K char.  Centronics, RS-232C</p> <p>Fujitsu cust serv, Fujitsu auth serv rep, TRW</p> <p>—  \$1,145</p> <p>Options: operator changeable font cartridges; single, double and triple bin sheet feeders; Apple Macintosh driver</p>	<p><b>Fujitsu America</b>  DX2100/DX2200  Serial</p> <p>9-wire dot matrix  96 ASCII; 32 intl sets, 96 + 32 ital, up to 255 downloadable char.  80, 136  44, 176, 188, 220 cps  10, 12, 17.1  6, 8  No  3  Friction, tractor  8K, 10K char.  Centronics, RS-232C</p> <p>Fujitsu cust serv, Fujitsu auth serv rep, TRW</p> <p>—  \$495 (DX2100), \$645 (DX2200)</p> <p>Options: 7-color printing; single and double bin sheet feeders; model DX2200-16K input buffer</p>	<p><b>Fujitsu America</b>  M304x  Line</p> <p>Band  48, 64, 96, 128 &amp; special  —  80, 132, 136 selectable  300, 600, 900, 1,200  10  6, 8  NA  6  Tractor  2KB  Centronics, Dataproducts, RS-232C, BUSS</p> <p>—  —  \$3,600-\$8,100 (Q 100)</p> <p>Options: power stacker, custom-designed interface, long line interface</p>

**Notes:**

- Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Fujitsu America</b>                  SP320                  Serial                    Daisywheel                  96, 127 char. wheel                  136, 163                  38, 48 cps                  10, 12, 15                  3, 6, 8, progrmble                  Std                  6                  Friction                  1K char.; 2K opt.                  RS-232C, Centronics                    Fujitsu cust serv, Fujitsu auth serv rep, TRW                  —                  \$1,499                  —                  Unidirectional or bidirectional forms tractor, or single or double-bin cut sheet feeder opt.</p>	<p><b>Fujitsu America</b>                  SP830                  Serial                    Daisywheel                  96, 127 char. wheel                  136, 163                  64, 80 cps                  10, 12, 15                  3, 6, 8, progrmble                  Std                  6                  Friction                  4K char.                  Centronics, RS-232C                    Fujitsu cust serv, auth serv rep, TRW                  —                  \$2,295                  —                  Unidirectional or bidirectional forms tractor, or single or double-bin sheet feeder opt.</p>	<p><b>General Optronics</b>                  Holoscan 28                  Page                    Laser                  128 ASCII, custom sets                  80, 132, 198 +                  28 ppm                  Variable                  Variable                  Std                  One                  Friction (cutsheet)                  1 page                  Parallel, RS-232C                    Third party                  \$195 + options                  \$14,500                  October 1982                  300 dpi resolution. Prints multiple fonts, graphics, forms, logos, etc.</p>
<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                    Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                    Interface    <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee    <b>Purchase Price</b>    <b>First Delivery</b>  <b>Comments</b></p>	<p><b>General Optronics</b>                  Holoscan 40                  Page                    Laser                  128 ASCII, custom sets                  80, 132, 198 +                  40 ppm                  Variable                    Variable                  Std                  Progrmble                  Friction (cutsheet)                  1 page                    Parallel, RS-232C                    Third party                  \$195 + options                    \$24,500                    First Q 1986                  300 dpi resolution. Prints multiple fonts, graphics, forms, logos, etc.</p>	<p><b>GENICOM</b>                  1020/1025                  Serial                    Dot matrix (impact)                  256 char set + 7 intl sets                  80 (1025), 136 (1020)                  100, 200 cps                  10, 12, compressed, expanded, proportional                  3, 4, 6, 8, progrmble                  Std                  4                  Friction, tractor                  2K char.; 8K, 64K char opt.                    Various via GENICOM personality cartridge                    Vendor                  —                  \$899 (1020); \$699 (1025); \$100 personality kit                  —                  O' tear-off; integral printer stand; top, bottom, rear paper paths; single sheet feeder; color opt.</p>	<p><b>GENICOM</b>                  2030                  Serial                    Dot matrix (impact)                  96 ASCII; APL, intl sets opt.                  132                  60 cps                  10, 13.2, 16.5                    2, 3, 4, 6, 8, 12                  Std                  6                  Friction; tractor opt.                  640 char.; 2K, 4K, 16K char. opt.                  RS-232C                    Vendor                  \$12 factory, \$16 field (depot), on-site \$27                  \$1,250 (KSR); \$1,175 (RO)                  —                  32KB text editor; answerback; numeric cluster; graphics</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.)  Print Column Speed Print Pitch (cpi)  Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size  <b>Interface</b> <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee  <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>GENICOM</b> 2120 Serial  Dot matrix (impact) 96 ASCII; APL, intl sets opt.  132 150 10, 13.2, 16.5  2, 3, 4, 6, 8, 12 Std 6 Friction; tractor opt. 640 char.; 2K, 4K, 16K char. opt. RS-232C  Vendor \$16 factory, \$22.50 field (depot), \$35 on-site \$2,195 (KSR); \$2,120 (RO)  32KB text editor; answerback; numeric cluster; graphics	<b>GENICOM</b> 3014 Serial  Dot matrix (impact) ASCII; 14 intl sets, IBM, 64 graphics char.  132 32, 160 10, 12, 13.1, 15, 17, expanded, proportional 6, 8, progrmble Std (draft mode) 4 Tractor 2K char.; 8K char. opt.  Serial 9,600, parallel  Vendor \$10 factory, \$19 field (depot), \$23 on-site \$1,199  IBM & Okidata emulation; opt. single doc inserter & auto sheet feeder; 96 char. downline load.	<b>GENICOM</b> 3024 Serial  Dot matrix (impact) ASCII; 14 intl sets, IBM, 64 graphics char., 96 char. downline load 132 40, 200 10, 12, 13.1, 15, 17, expanded, proportional 6, 8, 144 Std (draft mode) 4 Tractor 2K char.; 8K char. opt.  Serial 9,600, parallel  Vendor \$12 factory, \$21 field (depot), \$27 on-site \$1,499  IBM and Okidata emulation; opt. single doc inserter & auto sheet feeder
<b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.)  Print Column Speed Print Pitch (cpi)  Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size <b>Interface</b> <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee  <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>GENICOM</b> 3310 Serial  Dot matrix (impact) ASCII; 16 intl sets, IBM sets 1, 2 136 75, 300 10, 12, 13.1, 16.7, expanded, proportional 3, 4, 6, 8, 12, 144 Std 6 Tractor 512 char; 6K char. opt. Serial 9,600, parallel 100K  Vendor \$13 factory; \$23 field (depot); \$29 on-site \$1,995  IBM, Diablo 630 emulation; up to 288 x 144 dpi; 192 char. downline load; opt. single doc inserter & auto sheet feeder	<b>GENICOM</b> 3310 Color Serial  Dot matrix (impact) ASCII; 16 intl sets, IBM sets 1, 2 136 75, 300 10, 12, 13.1, 16.7, expanded, proportional 3, 4, 6, 8, 12, 144 Std 6 Tractor 512 char; 6K char. opt. Serial 9,600, parallel 100K  Vendor \$15 factory; \$25 field (depot); \$33 on-site \$2,295  IBM, Diablo 630 emulation; up to 288 x 144 dpi; 4 color; 192 char downline load; opt. single doc inserter & auto sheet feeder	<b>GENICOM</b> 3320 Quiet Serial  Dot matrix (impact) ASCII; 16 intl sets, IBM sets 1, 2 136 150, 300 10, 12, 13.1, 17, expanded, proportional 3, 4, 6, 8, 12, 144 Std 6 Tractor 512 char; 6K char. opt. Serial 9,600, parallel 100K  Vendor \$17 factory, \$27 field (depot), \$34 on-site \$2,395  55 dBA std; IBM & Diablo 630 emulations; up to 288 x 144 dpi; 192 char downline load; opt. single doc inserter & auto sheet feeder

**Notes:**

— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                    Print Column                  Speed                  Print Pitch (cpi)                    Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface    <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee    <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>GENICOM</b>                  3410                  Serial                    Dot matrix (impact)                  ASCII; 16 intl sets, IBM sets                  1, 2                  136                  100, 400                  10, 12, 13.1, 15, 17,                  expanded, proportional                  3, 4, 6, 8, 12, 144                  Std                  6                  Tractor                  512 char.; 6K char. opt.                  Serial 9,600, parallel 100K                    Vendor                  \$18 factory, \$28 field (depot),                  \$37 on-site.                  \$2,450                    IBM emulation; bold, shadow;                  super/subscripts; opt. single                  doc inserter &amp; auto sheet                  feeder</p>	<p><b>GENICOM</b>                  4410                  Line                    Shuttle matrix (impact)                  96 ASCII; 16 intl sets, IBM                  graphics, Greek, math                  132                  82, 240, 300                  10, 12, 13.3, 16.7, expanded                    3, 4, 6, 8, 12, 144                  Std                  6                  Tractor                  2K char.                  RS-232C, parallel (Printronix,                  Dataproducts, Centronics)                    Vendor                  \$69-\$110, on-site only                  \$6,195                    Pedestal/paper rack std; bold,                  super/subscripts std; bar                  codes opt.</p>	<p><b>GENICOM</b>                  4440                  Line                    Shuttle matrix (impact)                  96 ASCII; 16 intl sets, IBM                  graphics, Greek, math                  132                  165, 480, 600                  10, 12, 13.3, 16.7, expanded                    3, 4, 6, 8, 12, 144                  Std                  6                  Tractor                  2K char.                  RS-232C, parallel (Printronix,                  Dataproducts, Centronics)                    Vendor                  \$89-\$139, on-site only                  \$7,795                    Pedestal/paper rack; bold,                  super/subscripts std; bar                  codes opt.</p>
<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface    <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>GENICOM</b>                  5010                  Page                    Laser                  256 char. set; intl sets                  80, 106                  10 ppm                  Variable                  Variable                  NA                  NA                  Friction (cutsheet) only                  NA                  GENICOM personality                  cartridges                    GENICOM                  \$2,895                    Handles 8.5 x 11-in, A4,                  legal, &amp; letter size paper; 32                  char. LCD status display;                  up to 16 fonts/page</p>	<p><b>Hecon</b>                  A0543                  Serial                    Dot matrix                  96 ASCII                  40                  1.2 lps                  9                  6                  2                  Friction, pinfeed                  40 char.                  20 mA current loop,                  RS-232C, Centronics                    Vendor, dealer                  NA                  \$420                  NA                  NA</p>	<p><b>Hecon</b>                  A0556                  Line                    Thermal dot matrix                  96 ASCII w/semigraphics                  80, 132                  400 cps                  12.5                  6.4                  1                  Friction                  2K char.                  RS-232C                    Manufacturer                  NA                  \$995                  1983                  DEC UT-100 compatible</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer Model</b></p> <p><b>Type</b></p> <p><b>Characteristics</b>                  Print Mechanism                  Character Set (char.)</p> <p>Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface</p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Hecon</b> G0687</p> <p>Serial</p> <p>Electrosensitive dot matrix 64 ASCII</p> <p>40 300 lpm 10 6 — 1 Friction 40 char. 20 mA current loop, parallel, RS-232C</p> <p>Vendor NA \$975 — NA</p>	<p><b>Hewlett-Packard</b> HP 2225 Family ThinkJet Printers Serial</p> <p>Disposable ink-jet cartridge HP Roman 8, 128 USASCII, various lang 40, 71, 80, 142 150 cps 6, 10.7, 12, 21.3 6, 8 — 1 Friction, pinfeed 1KB HP-IB, HP-IL; Centronics, RS-232C</p> <p>Vendor — \$495 — 50 dBA printing; 96 x 96 dpi, 11 x 12 char.</p>	<p><b>Hewlett-Packard</b> HP 2563A</p> <p>Line</p> <p>Dot matrix HP Roman-8; others opt. 66, 132, 220 117, 150, 233, 300 lpm 5, 10, 16.7 6, 8 — Tractor — HP-IB, RS-232C, RS-422; Centronics opt.</p> <p>Vendor — \$5,800 — 70 x 72 dpi; prints graphics &amp; bar codes; 16-channel vertical format control</p>
<p><b>Manufacturer Model</b></p> <p><b>Type</b></p> <p><b>Characteristics</b>                  Print Mechanism                  Character Set (char.)</p> <p>Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface</p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Hewlett-Packard</b> HP 2565A Line</p> <p>Dot matrix 8-bit Roman 8; supports ASCII &amp; 11 European langs</p> <p>— To 600 lpm 5, 10, 16.7 — NA — Tractor — HP-IB; RS-232C, RS-422A, Centronics opt.</p> <p>Vendor — \$18,766 — Raster graphics, bar code printing; 70 x 72 dpi; 55 dBA avg.</p>	<p><b>Hewlett-Packard</b> HP 2566A Line</p> <p>Dot matrix 8-bit Roman 8; supports ASCII + 11 European langs</p> <p>— To 900 lpm 5, 10, 16.7 — NA — Tractor — HP-IB; RS-232C, RS-422A, Centronics opt.</p> <p>Vendor — \$21,766 — Raster graphics, bar code printing; 70 x 72 dpi; 55 dBA avg.</p>	<p><b>Hewlett-Packard</b> HP 2601A Serial</p> <p>Daisywheel 96 char. ASCII</p> <p>80, 132, 158, 198 32-40 cps 10, 12, 15, proportional Variable — 6 Friction, tractor 3K char. RS-232C</p> <p>Vendor — \$3,520 1981 Incl WP features</p>

Notes:

- Information unavailable at press time
- NA Not applicable



<p><b>Manufacturer Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                    Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                    Buffer Size                  Interface    <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Hewlett-Packard</b>                  HP 2602A                  Serial                    Daisywheel                  98-char. wheel                    132, 158                  25 cps                  10, 12                  —                  —                  Multipart forms                  Friction, bidirectional tractor                  accessory                    —                  RS-232C; HP-IB opt.</p>	<p><b>Hewlett-Packard</b>                  HP 2671A                  Serial                    Thermal dot matrix                  128 ASCII; line-drawing,                  extension                  80, 132                  120 cps                  10, 16.2                  6                  —                  1                  Friction                    215 char.                  8-bit parallel, IEEE-488,                  RS-232C                    Vendor                    \$1,240                  —                  7 x 11 dot matrix</p>	<p><b>Hewlett-Packard</b>                  HP 2671G                  Serial                    Thermal dot matrix                  128 ASCII; line-drawing,                  extension                  80, 132                  120 cps                  10, 16.5                  6                  —                  1                  Friction                    2K char.                  8-bit parallel, IEEE-488,                  RS-232C, Centronics                    Vendor                    \$1,640                  1981                  Incl 90 dpi sq. raster                  graphics, 7 x 11 dot matrix</p>
<p><b>Manufacturer Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                    Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface    <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Hewlett-Packard</b>                  HP 2673A                  Serial                    Thermal dot matrix                  128 ASCII; line-drawing,                  extension                  80, 132                  120 cps                  5, 10, 16.2                  6                  —                  1                  Friction                  2K char.                  8-bit parallel, IEEE-488,                  RS-232C                    Vendor                    \$2,240                  1981                  Incl 90 dpi sq. raster                  graphics, 7 x 11 dot matrix</p>	<p><b>Hewlett-Packard</b>                  HP 2686A LaserJet                  Page                    Laser                  —                    Variable                  8 ppm                  10, 12, 16.6                  6, 8                  NA                  1                  Friction (cutsheet)                  —                  Opt.: RS-232C, parallel                    Vendor                    \$2,995                  1984                  55 dBA; 300 x 300 dpi;                  multiple char. fonts; 128KB                  memory</p>	<p><b>Hewlett-Packard</b>                  HP 2686A LaserJet PLUS                  (opt. 200/210)                  Page                    Laser                  —                    Variable                  8 ppm                  10, 12, 16.6                  6, 8                  NA                  1                  Friction (cutsheet)                  —                  Opt.: RS-232C, parallel                    Vendor                    \$3,995                  1985                  300 x 300 dpi; differs from                  HP LaserJet in electric                  forms capabilities, more                  graphics per page, more                  memory, font downloading                  and macro abilities</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer Model</b></p> <p><b>Type</b></p> <p><b>Characteristics</b>                  Print Mechanism                  Character Set (char.)</p> <p>Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface</p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Hewlett-Packard</b>                  HP 2687A</p> <p>Page</p> <p>Laser</p> <p>—</p> <p>80, 107                  12 ppm                  10, 12, 15                  6, 8                  NA                  1                  Auto. single sheet                  —                  RS-232C; add'l RS-232C opt.</p> <p>Vendor                  —                  \$9,300                  —</p> <p>Prints in landscape/portrait mode; desktop printer</p>	<p><b>Hewlett-Packard</b>                  HP 2932A General Purpose Printer</p> <p>Serial</p> <p>12-wire dot matrix                  HP Roman-8 (128 USASCII, 96 Rom. exten)                  68, 136, 223                  200 cps                  5, 10, 16.36                  1, 2, 3, 4, 6, 8, 12                  Std                  6                  Tractor                  —                  RS-232C; various opt.</p> <p>Vendor                  —                  \$2,595                  —</p> <p>90 x 90 dpi.</p>	<p><b>Hewlett-Packard</b>                  HP 2934A Office Printer</p> <p>Serial</p> <p>Dot matrix                  Various plug-in fonts</p> <p>68, 136, 223                  40, 67, 200 cps                  5, 20, 12, 16.36                  1, 2, 3, 4, 6, 8, 12                  Std                  6                  Tractor, cutsheet                  —                  RS-232C; various opt.</p> <p>Vendor                  —                  \$2,995                  —</p> <p>90 x 90 dpi; includes bar code capabilities</p>
<p><b>Manufacturer Model</b></p> <p><b>Type</b></p> <p><b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface</p> <p><b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee</p> <p><b>Purchase Price</b></p> <p><b>First Delivery</b></p> <p><b>Comments</b></p>	<p><b>Honeywell Information Systems</b>                  PRU7070/7071/7072</p> <p>Serial</p> <p>Dot matrix                  96 ASCII; line graphics                  40, 66, 80, 132                  100 cps                  5, 8.3, 10, 16.7                  6, 8                  Std                  3                  Pinfeed                  —                  RS-422A direct (PRU7070); RS-232C remote (PRU7071), RS-232C direct (PRU7072)</p> <p>Vendor                  \$19                  \$1,195                  —</p> <p>9 x 7 dot matrix</p>	<p><b>Honeywell Information Systems</b>                  PRU7075/7076/7077</p> <p>Serial</p> <p>Dot matrix                  96 ASCII                  66, 110, 132, 220                  100 cps                  5, 8.3, 10, 16.7                  6, 8                  Std                  —                  Tractor                  —                  RS-232C remote (PRU7076); RS-232C direct (PRU7077); RS-422A (PRU7075)</p> <p>Vendor                  \$23                  \$1,495                  —</p> <p>NA</p>	<p><b>Honeywell Information Systems</b>                  PRU7170/7171/7172</p> <p>Serial</p> <p>Dot matrix                  96 ASCII; 7 nat char. sets                  132, 158, 220                  150 cps                  5, 6.8, 8.3, 10, 12, 16.7                  6, 8, 12                  Std (except graphics)                  5                  Tractor                  —                  RS-422A direct (PRU7170); RS-232C remote (PRU7171); RS-232C direct (PRU7172)</p> <p>Vendor                  \$28                  \$1,795                  —</p> <p>9 x 11 dot matrix; macro, line, and dot graphics</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.)  Print Column Speed  Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface  <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>Honeywell Information Systems</b> PRU7175/7176/7177  Serial  Dot Matrix 96 ASCII, 7 natl sets, 76 char. extension set  — 45, 200 cps  5, 6, 7.5, 8.3, 10, 12, 15, 16.7 6, 8 progrmble Std 5 Tractor  RS-422 A (PRU7175); RS-232C modem connect (PRU7176); RS-232C direct connect (PRU7177)</p>	<p><b>Honeywell Information Systems</b> PRU7200/7210, Models 24 and 25 Serial  Print wheel 130 ASCII (mdl 24); 96 ASCII (mdl 25)  — 50 cps (mdl 24), 55 cps (mdl 25) 10, 12, 15, proportional 6, 8 progrmble Std 6 Tractor  RS-422A direct (PRU7200/7210)</p>	<p><b>Honeywell Information Systems</b> PRU7270/7271/7272  Serial  Dot matrix 96 ASCII intl; 7 natl char. sets 66, 132 400 cps  5, 10 6, 8 Std 5 Pinfeed  RS-422A direct (PRU7270); RS-232C remote (PRU7271); RS-232C direct (PRU7272)</p>
<p><b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface  <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>IBM</b> 3852 Color Jetprinter Serial  Inkjet (drop on demand)  — 132 50 cps max 5, 8.3, 10, 16.7  — — Friction, pinfeed  — — Vendor — \$745 1985 Prints up to 7 colors; up to 9,600 dpi; attaches to IBM PC's</p>	<p><b>IBM</b> 4201 Proprinter Serial  Dot matrix (impact)  — 40, 100, 200 cps  — 144 — 4 Friction, tractor 5KB (opt.) Parallel; serial (opt.)  Vendor — \$549 1985 Up to 17,280 dpi; attaches to IBM PC's</p>	<p><b>IBM</b> 4715 Serial  Dot matrix (impact)  — 136 max 90-216 cps 10, 12, 17 5, 6 Std Multiple Tractor, friction  — — \$11-\$13 \$3,600 — NA</p>

Notes:  
— Information unavailable at press time  
NA Not applicable





<b>Manufacturer Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed  Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism  Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>IBM</b> 5181 Compact Printer Serial  Thermal dot matrix — 40, 68, 80, 136 50 cps; 2,400 dots/sec (image print) 5, 8.75, 10, 17.5 6, 9 — — Friction  256 char. Modified RS-232C  Vendor — \$175 — 5 x 8 dot matrix; connects to IBM PCs	<b>IBM</b> 5182 Color Printer Serial  Dot matrix 191, or 96 ASCII 132 35, 110, 120, 200 cps  10, 12, 17.1 6, 8 Std 4 Tractor or manual single-sheet 6KB Parallel  Vendor — \$1,995 — 8 x 9 draft mode; 24 x 9 text mode; 36 x 18 NLQ; 24 x 14 graphics; prints color; connects to 5150 PC and 5160 PC-XT	<b>IBM</b> 5201 QUIETWRITER Printer Serial  Thermal transfer ribbon 252 char/font — 40, 60  Four pitches avail. 96 — One Friction; cutsheet feeder or pinfeed opt. — Centronics-type parallel  Vendor — \$1,395 1984 For use w/IBM PC's; 15-in. max paper width
<b>Manufacturer Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed  Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size  Interface  <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>IBM</b> 5216 Wheelprinter Serial  Daisywheel 96 char. ASCII — 25 cps  10, 12, 15, proportional 48 Std Multipart forms Friction, pinfeed —  Centronics-type parallel  Vendor — \$1,795 1984 For use w/IBM PC's	<b>IBM</b> 5218-A2/-A3/-A4 Serial  Print wheel 96 — 40 cps (Model A3); 60 cps (Models A2, A4) 10, 12, 15, proportional 4-24 Std 6 Tractor (opt.) —  Vendor \$35 (Model A3); \$40 (Models A2, A4) \$3,280 (Model A3); \$3,680 (Models A2, A4) — Connects to 5150 PC and 5160 PC-XT	<b>C. Itoh Digital Products</b> PROWRITER 8510 + NLQ/1550 + NLQ Serial  Dot matrix ASCII, ital, intl — 180 cps  10, 12, 17 — Std 4 Friction, tractor 2K char. (8510), 4K char. (1550) Parallel, serial (IBM 5152, Apple Imagewriter, or C. Itoh code emulation)  Vendor — \$549 (8510), \$799 (1550) — 1550 is wide-carriage version of 8510

**Notes:**

— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                    Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>C. Itoh Digital Products</b>                  PROWRITER C 310                  Serial                    Dot matrix                  —                  80 at 10 cpi, 96 at 12 cpi,                  107–144 condensed type                  28, 62, 250, 300                  —                  Std                  4                  Friction, tractor                  2K char.                  Parallel                    Vendor                  —                  \$599                  —                  3 models avail. w/IBM                  Proprinter, Epson FX80 +,                  or C. Itoh PROWRITER                  emulation</p>	<p><b>C. Itoh Digital Products</b>                  PROWRITER Jr.                  Serial                    Dot matrix                  ASCII, ital, intl                  —                  105 cps                  10, 17                  —                  Std                  2                  Friction, tractor                  One line                  Parallel, serial opt.                    Vendor                  —                  \$299                  —                  NA</p>	<p><b>C. Itoh Digital Products</b>                  STARWRITER D10-40                  Serial                    Daisywheel                  —                  40 cps                  10, 12, 15                  —                  —                  3–4                  Friction                  8K char.                  Parallel, serial                    Vendor                  —                  \$949                  —                  Diablo 630 compat.; less than                  60 dBA; 15-in. carriage</p>
<p><b>Manufacturer Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                    Print Column                  Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>C. Itoh Digital Products</b>                  STARWRITER F10-55                  Serial                    Daisywheel                  —                  To 163                  58 cps                  10, 12, 15                  —                  Std                  3                  Friction                  256B                  —                  Vendor                  —                  \$1,449                  —                  15-in. carriage</p>	<p><b>C. Itoh Digital Products</b>                  STARWRITER Y10-20                  Serial                    Daisywheel                  —                  22 cps                  10, 12, 15                  —                  Std                  4                  Friction                  2K char.; 8K char. opt.                  Parallel, serial                    Vendor                  —                  \$549                  —                  13-in. carriage</p>	<p><b>Juki Office Machine</b>                  5510                  Serial                    9-in dot matrix (impact)                  96 ASCII; 96 italic char., 11                  intl sets                  Variable                  30, 180 cps                  Variable                  Variable                  Std                  3                  Friction; tractor                  3K char.; 15K char. opt.                  Centronics; RS-232C opt.                    Auth. serv centers                  \$499                  —                  Color conversion kit opt.</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism  Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Juki Office Machine</b> 6000 Serial  Daisywheel 100 ASCII 90, 108, 135 10 cps 10, 12, 15 Variable Std 4 Friction  — Centronics; RS-232C  Auth. service centers — \$295 — NA	<b>Juki Office Machine</b> 6100 Serial  Daisywheel 100 ASCII 110, 132, 165, proportional 18 cps 10, 12, 15, proportional Variable Std 4 Friction; tractor, cutsheet feeder opt. 2K char.; 8K char. opt. Parallel; RS-232C opt.  Auth. service centers — \$599 — NA	<b>Juki Office Machine</b> 6200 Serial  Daisywheel 96 ASCII 132, 158, 197, proportional 30 cps 10, 12, 15, proportional Variable Std 4 Friction; tractor, cutsheet feeder opt. 3K char.; 15K char. opt. Centronics; RS-232C opt.  Auth. service centers — \$745 — NA
<b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.) Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism  Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Juki Office Machine</b> 6300 Serial  Daisywheel 96 ASCII 132, 158, 197, proportional 40 cps 10, 12, 15, proportional Variable Std 4 Friction; tractor, cutsheet feeder opt. 3K char.; 15K char. opt. Centronics, RS-232C  Auth. service centers — \$995 — NA	<b>Mannesman Tally</b> MT 180 Serial  Dot matrix — To 264 40, 160 Variable — — Tractor, friction  — Serial, parallel  Vendor; auth service centers — \$998-\$1,098 — NA	<b>Mannesman Tally</b> MT 290 Serial  Dot matrix (impact) 96 USASCII, 27 intl 132, 154, 218, 264 50, 200 cps 10, 12, 17.1, proportional — Std (DP mode) 5 Friction, tractor  — 8-bit parallel, RS-232C, current loop  Vendor, auth service center — \$895 — Compat. w/software for IBM PC; auto. sheet feed

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                    Print Column Speed                    Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Mannesman Tally</b>                  MT 420/440                  Serial                    Dot matrix                  96 USASCII + intl; 128 char., OCR &amp; barcode opt.                    132                  200, 400; 50, 100, 140, 270 opt.                    10, 12.5; 16.7 opt.                  3, 4, 6, 8, 12                  Std (DP mode)                  5                  Friction, tractor                  2K char. or 1 line                  8-bit parallel, RS-232C                    Vendor, auth service center                  —                  \$1,545–\$2,295                  —                  6 models w/various options</p>	<p><b>Mannesman Tally</b>                  MT 460                  Serial                    Dot matrix (impact)                  128 USASCII, 8 intl, IBM PC; OCR &amp; barcode opt.                    132, 158, 198, 225                  50, 200                    10, 12, 15, 17.1                  3, 4, 6, 8, 12                  Std                  6                  Friction, tractor                  256 char or 2K char                  8-bit parallel; RS-232C                    Vendor, auth service center                  —                  \$1,699                  —                  NA</p>	<p><b>Mannesman Tally</b>                  MT 490                  Serial                    Dot matrix                  128 USASCII; 8 intl, IBM PC                    132, 158, 198, 225                  150, 400                    10, 12, 15, 17.1                  3, 4, 6, 8, 12                  Std                  4                  Friction, tractor                  256 char. or 2K char.                  8-bit parallel, RS-232C                    Vendor, auth service centers                  —                  \$1,999                  —                  NA</p>
<p><b>Manufacturer Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set (char.)                  Print Column                    Speed                  Print Pitch (cpi)                  Vertical Spacing (lpi)                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Mannesman Tally</b>                  MT 660                  Line                    Dot matrix (impact)                  96 USASCII; intl                  80–198                    To 600 lpm                  5, 10, 15                  6, 8                  NA                  6                  Tractor                  —                  Parallel, serial opt.                    Vendor, auth service centers                  —                  \$8,490                  —                  Bar code and OCR printing</p>	<p><b>Mannesman Tally</b>                  MT 85/86                  Serial                    Dot matrix (impact)                  128 IBM PC; EPSON w/ital                  40–137 (MT85), 68–233 (MT86)                  45, 180                  5, 6, 8.5, 10, 12, 17                  6, 8 progrmble                  Std                  3                  Tractor                  3K char.                  RS-232C, Centronics, Apple serial                    Vendor, auth service center                  —                  \$499 (MT85); \$599 (MT86)                  —                  MT85 accepts paper up to 10-in. wide; MT86 accepts paper up to 16-in. wide</p>	<p><b>Micro Peripherals</b>                  Printmate 350                  Serial                    Dot matrix (impact)                  96 ASCII; 3 foreign                  136, 163, 195, 204, 231                    300 cps                  10, 12, 14.4, 15, 17                  —                  —                  Friction, tractor                  16K; 80K char. opt.                  Centronics; RS-232C opt.                    RCA                  —                  \$1,495                  1984                  NA</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism  Character Set (char.) Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface  <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Micro Peripherals</b> SXPrinter Serial  Dot matrix (impact)  96 ASCII; 4 intl sets 80, 96, 115, 120, 136 300 cps 10, 12, 14.4, 15, 17 — — — Friction, tractor 4K; 68K char. opt. Centronics; RS-232C opt.  RCA — \$895 1984 NA	<b>Miltope</b> HSP-3609-212A Line  Helix/voice coil (impact)  64, 96, 128 ASCII 80, 132 400 lpm 10, 17 6 — 4 Friction, pinfeed 1 line T2L parallel, RS-232C, MIL-STD-1397  — NA \$20,000 1975 Fully militarized	<b>Miltope</b> LP 3036 Line  Helix/voice coil dot matrix (impact) 64, 96, 128 ASCII 36 300 lpm 10 6 — 2 Friction 1 line T2L parallel, RS-232C  — NA \$9,000 1976 Fully militarized
<b>Manufacturer</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set (char.)  Print Column Speed Print Pitch (cpi) Vertical Spacing (lpi) Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface  <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Miltope</b> TP-2000 Line  Thermal dot matrix 64, 96 ASCII, addressable dot plotting 40, 66, 80 160 lpm 10, 17 6 — 1 Friction 1 line T2L parallel, RS-232C  Vendor, customer — \$9,000 1978 Fully militarized	<b>Miltope</b> TP-3000 Line  Thermal dot matrix 64, 96 ASCII  80, 132 1000 lpm 10, 17 6 — 1 Friction, pinfeed 1 line T2L parallel, RS-232C, MIL-STD-1397  — NA \$19,800 1983 Printer/plotter; fully militarized; 153 dpi	

**Notes:**

— Information unavailable at press time  
NA Not applicable



# SPECIFICATIONS CHART

## Printers

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<p><b>Vendor Model</b> Type <b>Characteristics</b> Print Mechanism Character Set Print Column (char.)  Speed Print Pitch (cpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism  Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b>  <b>First Delivery</b> <b>Comments</b></p>	<p><b>NEC Information Systems</b> Pinwriter CP2, CP3 Serial  18-wire dot matrix US &amp; intl avail. 80, 90, 136 (CP2); 136, 163, 233 (CP3) 30, 90, 180 10, 12, 17 6, 8, progrmble — 4 Friction; tractor, cutsheet feeder opt. 3.5K char. Parallel, RS-232C — — CP2: \$1,085 serial interface, \$999 parallel interface; CP3: \$1,485 serial interface, \$1,399 parallel interface — 7 colors plus black; 240 x 240 dpi</p>	<p><b>NEC Information Systems</b> Pinwriter P2, P3 Serial  18-pin dot matrix US &amp; various intl avail. 80, 136 (P2), 136, 233 (P3) 30, 90, 180 cps 10, 12, 17 6, 8, progrmble Std 4 Friction; tractor; cutsheet feeder opt. 3.5K char. IBM PC, parallel, RS-232C — — P2: \$785 (serial interface); \$699 (parallel interface); P3: \$1,085 (serial interface); \$949 (parallel interface) — 240 x 240 dpi</p>	<p><b>NEC Information Systems</b> Pinwriter P5 Series Serial  24-pin dot matrix ASCII; IBM graphic, ital. — 100, 240, 290 10, 12, 15 3, 4, 6, 8 — 6 Friction; tractor, cutsheet feeder opt. 8K, 24K, 40K char. opt. Parallel, serial — — \$1,560 (parallel and serial interface); \$1,445 (parallel interface) — 1985 53 or 48 dBA; 16 std fonts; 360 x 360 dpi</p>
<p><b>Vendor Model</b> Type <b>Characteristics</b> Print Mechanism Character Set Print Column (char.) Speed Print Pitch (cpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>NEC Information Systems</b> Spinwriter 300 Series Serial  Thimble 128 110 19 cps 10, 12, 15, proportional 6, 8, variable w/softwr Std 4 Friction 1K, 2K, 3K char. RS-232C, Centronics, or IBM PC or PC jr-compat. NECIS — \$545 — NA</p>	<p><b>NEC Information Systems</b> Spinwriter 3500 Series Serial  Thimble 128 136 35 cps 10, 12, 15 6, 8 Std 4 Friction 2K char. RS-232C, Centronics, IBM PC-compat. NECIS — \$1,440 — Wide range of paper handling options</p>	<p><b>NEC Information Systems</b> Spinwriter 8800 Series Serial  Thimble 128 136 55 cps 10, 12, 15, proportional 6, 8, variable w/softwr Std 4 Friction 2K char. RS-232C, Centronics, IBM compat. NECIS — \$1,990 — Modular interface; wide range of paper handling options</p>

**Notes:**

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NA Not applicable



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<b>Vendor</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set Print Column (char.) Speed Print Pitch (cpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>North Atlantic Industries/Quantex Div</b> 7085 Serial Dot matrix 128 136-231 65, 125, 250, 300 cps 10, 12, 13.3, 15, 17.1 2, 3, 4, 6, 8, 12 Std 6 Tractor, friction 4.7-12.7K char RS-232C, Centronics Vendor (factory), Sorbus \$18 \$2,395 — NA	<b>Okidata</b> Microline 182/182 TTY/183 Serial Dot matrix (impact) — 40, 68, 80, 96, 137 60, 120 cps 5, 8.5, 10, 12, 17.1 6, 8 Std 4 Friction; tractor, pinfeed; roll (TTY model) 2K char. opt. Centronics compat.; RS-232C, RS-422 opt. — — \$299 (182) \$349 (182 TTY); \$549 (183) — Up to 144 x 144 dpi; TTY model features selectable operating modes for use as a telecom. or std printer; 183 is wide-carriage version of 182	<b>Okidata</b> Microline 192 Serial Dot matrix (impact) — 40, 48, 68, 80, 96, 137 160 cps 5, 6, 8.5, 10, 12, 17.1 6, 8 Std 4 Friction; pinfeed or cutsheet feeder opt. 2K char. Centronics compat.; RS-232C, RS-422 opt. — — \$499 — IBM or Apple-compat. models avail.

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<p><b>Vendor</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set Print Column (char.) Speed Print Pitch (cpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface</p> <p><b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b></p> <p><b>First Delivery</b> <b>Comments</b></p>	<p><b>Okidata</b> Okimate 20 Serial</p> <p>24-pin dot matrix (ribbon transfer)</p> <p>—</p> <p>40, 48, 66, 80, 96, 132</p> <p>40, 80 cps</p> <p>4, 6, 8.5, 10, 12, 17</p> <p>6, 8</p> <p>No</p> <p>—</p> <p>Friction, pinfeed</p> <p>8K char.</p> <p>Okidata PLUG 'n PRINT pkgs for IBM or Apple PC's, or Commodore Amiga</p> <p>—</p> <p>NA</p> <p>\$169; \$89-\$99 for PLUG 'n PRINT kit</p> <p>November 1984</p> <p>For use w/IBM PC, PCjr, &amp; compats; 144 x 144 dpi; accepts paper up to 10-in. wide; more than 100 shades; 90-day warranty std</p>	<p><b>Okidata</b> Pacemark 2410 Serial</p> <p>9-pin dot matrix</p> <p>96 ASCII</p> <p>68, 81, 116, 136, 163, 233</p> <p>87.5, 175, 350 cps</p> <p>5, 6, 8.5, 10, 12, 17</p> <p>6, 8</p> <p>Std</p> <p>4</p> <p>Friction; cutsheet feeder opt.</p> <p>4K char.</p> <p>Centronics compat., RS-232C</p> <p>—</p> <p>—</p> <p>\$2,395</p> <p>—</p> <p>NA</p>	<p><b>Olivetti</b> DM580 Serial</p> <p>Dot matrix</p> <p>IBM, Epson</p> <p>132 at 10 cpi</p> <p>45, 120, 192 cps</p> <p>10, 12, 15, 16.7, proportional</p> <p>6, 8, progrmble</p> <p>Std</p> <p>4</p> <p>Friction; tractor, double and single sheet feeders opt.</p> <p>1K char.</p> <p>Parallel, serial</p> <p>—</p> <p>NA</p> <p>\$1,495</p> <p>1985</p> <p>NA</p>

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<b>Vendor</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set Print Column (char.) Speed Print Pitch (cpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface <b>Maintenance</b> Maintenance Provided By  Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Olympia</b> ESW 3000 Serial  Daisywheel 100 150 40 cps 10, 12, 15, proportional 3, 4, 6, 96 Std 5 Friction 4K char. RS-232C, Centronics  Olympia dealers  \$17.90 \$1,599 Optional tractor, sheetfeeders	<b>Panasonic</b> KX-P1080 Serial  Dot matrix — — 20, 100 cps — — — — Friction, tractor — —  Vendor, auth. serv. ctrs (MESCO provides actual service) — \$319 December 1985 Features justification, left & right alignment, centering; 10-in. carriage; 2-yr warranty std	<b>Panasonic</b> KX-P1090 Serial  Dot matrix ASCII, ital. 80 80 cps 10, 12, 17, 20 6, 8 — 3 Friction, tractor 1 line; 4K char. opt. Parallel, serial opt.  Vendor, auth. serv. ctrs (MESCO provides actual service) — \$299 — 2-yr warranty std

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<p><b>Vendor Model Type</b>  <b>Characteristics</b>                      Print Mechanism                      Character Set                      Print Column (char.)                      Speed                      Print Pitch (cpi)                      Vertical Spacing                      Bidirectional Printing                      No. of Copies                      Feed Mechanism                      Buffer Size                      Interface  <b>Maintenance</b>                      Maintenance Provided By                      Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Panasonic</b>                      KX-P1592                      Serial                      Dot matrix                      —                      38, 180 cps                      —                      —                      —                      —                      Tractor; opt. cutsheet feeder                      32K char. opt.                      —                      Vendor, auth. serv. ctrs (MESCO provides actual service)                      —                      \$699                      December 1985                      16.5-in. carriage; 2-yr warranty std</p>	<p><b>Panasonic</b>                      KX-P1595                      Serial                      Dot matrix                      IBM Diablo 630 print modes                      —                      51, 240 cps                      Selectable                      —                      —                      —                      —                      Parallel, RS-232C                      Vendor, auth. serv. ctrs (MESCO provides actual service)                      —                      \$949                      1986                      16.5-in carriage; 2-yr warranty std</p>	<p><b>Panasonic</b>                      KX-P3131                      Serial                      Daisywheel                      96 char. wheel                      —                      17 cps                      10, 12, 15, proportional                      —                      Std                      Friction; tractor opt.                      —                      —                      Vendor, auth. serv. ctrs (MESCO provides actual service)                      —                      \$419                      October 1985                      2-yr warranty std</p>

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<p><b>Vendor Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set Print Column (char.) Speed Print Pitch (dpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface</p> <p><b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee</p> <p><b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>Prime Computer</b> 3126 Serial</p> <p>Dot matrix 96 ASCII 132 300 lpm 10 6, 8 — — 132 char. (1 line) RS-232C</p> <p>Vendor \$121 \$6,500 August 1979 NA</p>	<p><b>Prime Computer</b> 3173/3174 Line</p> <p>Dot matrix 96 ASCII 132 300 lpm 10 6, 8 — 6 — 132 char. (1 line) Parallel</p> <p>Vendor \$111-\$141 \$6,000-\$8,500 August 1979 NA</p>	<p><b>Prime Computer</b> 3185 Serial</p> <p>Daisywheel 96 ASCII 132 at 10 cpi 55 cps 10, 12, 15 6 Std 6 Tractor 500 char. RS-232C</p> <p>Vendor \$60 \$3,750 September 1983 NA</p>

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<p><b>Vendor Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (dpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Printek</b>                  Model 920                  Serial                    18-wire dot matrix                  96 ASCII + 7 intl sets                  To 227                  80, 340 cps                  10, 12, 13.3, 16.7                  6, 8, 12, 16                  Std                  6                  Tractor                  1,792 char.                  Serial, parallel                    Third party, factory                  —                  \$2,395                  April 1982                  72 or 144 dpi</p>	<p><b>Printek</b>                  Model 930                  Serial                    18-wire dot matrix                  96 ASCII + 7 intl sets                  To 220                  80, 200 cps                  10, 12, 13.3, 16.7                  6, 8, 48                  Std                  6                  Tractor, friction                  768 char.                  Serial, parallel                    Third party, factory                  —                  \$1,995                  November 1983                  NA</p>	<p><b>Printek</b>                  Model 930 dlx                  Serial                    Dot matrix                  —                  276 max                  80, 200 cps                  10, 12, 13.3, 16.7, 20                  6, 8                  Std                  5                  Tractor, friction                  792K char. (expandable)                  Serial, parallel                    Third party, factory                  —                  \$1,995                  August 1985                  NA</p>

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<b>Vendor</b> <b>Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set Print Column (char.) Speed Print Pitch (cpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface  <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Printer Products</b> S-400 G Serial  Dot matrix 96 ASCII 40 150 cps Variable — 6 Friction 6 lines RS-232C, serial, parallel, 20 mA current loop  Diebold, factory — \$1,045 — Graphics automatic "in-out" form release; 5 x 7 dot matrix	<b>QMS</b> QMS Lasergrafix 1200 Page  Laser 12 res. fonts 132 12 ppm Variable Variable NA 1 Dual sheet (250 sheets ea.) 300K char. 20 mA current loop, RS-232C, Burroughs poll/select, Centronics, Dataproducts parallel  Vendor, third party — Vendor declined to provide January 1983 Intl maintenance provided thru Xerox; compat. w/IBM 3271, 3272, 3274A & B, 3276, System 3x, sync 2780/3780, Sperry DCT-1000	<b>QMS</b> QMS Lasergrafix 2400 Page  Laser 128, 256 132 24 ppm Variable Variable NA 1 Cutsheet 2MB RS-232C, Dataproducts & Centronics parallel, IBM 3270/3276, IBM S/34, IBM 8100, DATA COMM  Vendor, third party — \$29,995 November 1984 Vector to raster conversion for mapping pages up to 11 x 17-in.

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NA Not applicable



<p><b>Vendor Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                    Print Column (char.)                  Speed                  Print Pitch (dpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface    <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>QMS</b>                  QMS Lasergrafix 800                  Page                    Laser                  128, 256                    132                  8 ppm                  Variable                  Variable                  NA                  1                  Friction (cutsheet)                  1.4MB                  RS-232C, Dataproducts &amp;                  Centronics parallel, IBM                  3270/3276, IBM S/34, 8100                    Vendor, third party                  —                  \$7,995                  May 1984                  Vector to raster conversion                  for mapping 8.5 x 14-in.                  pages</p>	<p><b>QMS</b>                  QMS SmartWriter                  Page                    Laser                  256 (res fonts); 128, 256 (opt.                  fonts)                  132                  8 ppm                  Variable                  Variable                  NA                  1                  Friction (cutsheet)                  128KB                  Centronics, RS-232C                    Vendor, third party                  —                  \$3,850                  July 1985                  Built-in emulations of QUME,                  Diablo &amp; Epson</p>	<p><b>QMS</b>                  QMS-PS 800                  Page                    Laser                  149                    132                  8 ppm                  Variable                  Variable                  NA                  1                  Friction (cutsheet)                  2MB                  RS-232C, RS-422, AppleTalk                    Vendor, third party                  —                  \$7,995                  November 1985                  PostScript-based controller</p>
<p><b>Vendor Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (dpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                    Interface    <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>    <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Quadram</b>                  Quadjet                  Line                    Inkjet                  Full ASCII                  640 dots/line                  40 cps                  —                  6                  —                  1                  Friction                  —                    8-bit parallel                    Vendor                  NA                  \$495                    —                  Up to seven colors avail.;                  uses disposable ink                  cartridges</p>	<p><b>Quadram</b>                  QuadLaser                  Page                    Laser                  Variable                  Variable                  8 ppm                  Variable                  Variable                  NA                  1                  Friction                  256K char.; 2M char. opt.                    Centronics; RS-232C opt.                    Quadram                  —                  \$3,795                    1985                  300 dpi resolution; seven font                  styles; under 55 dBA</p>	<p><b>Qume</b>                  LaserTEN/Laser TEN PLUS                  Page                    Laser                  Variable                  Variable                  10 ppm                  Variable                  Variable                  NA                  1                  Friction                  128K char. (Laser TEN);                  512K char. (LaserTEN                  PLUS)                  RS-232C, Centronics, others                  avail.                    ITT SERVCOM                  —                  \$2,799 (LaserTEN); \$3,395                  (LaserTEN PLUS)                  March 1986                  NA</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Vendor Model Type</b>  <b>Characteristics</b>  Print Mechanism  Character Set  Print Column (char.)  Speed  Print Pitch (dpi)  Vertical Spacing  Bidirectional Printing  No. of Copies  Feed Mechanism</p> <p>Buffer Size  Interface</p> <p><b>Maintenance</b>  Maintenance Provided By  Monthly Maintenance Fee</p> <p><b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Qume</b>  LetterPro 20  Serial</p> <p>Daisywheel  96 ASCII  132  20 cps  10, 12, 15, proportional  6, 8, progrmble  —  6  Friction; tractor opt.</p> <p>256 char.  Parallel, serial</p> <p>ITT SERVCOM  —  \$599  November 1983  Various printwheels avail.</p>	<p><b>Qume</b>  LetterPro Plus  Serial</p> <p>Daisywheel  96 ASCII  132 at 12 cpi  45 cps  10, 12, 15  Progrmble  Std  3  Friction; tractor opt.</p> <p>8K char.  RS-232C, Centronics</p> <p>ITT SERVCOM  —  \$899  February 1986  Various printwheels avail.</p>	<p><b>Qume</b>  SPRINT 11/40 PLUS  Serial</p> <p>Daisywheel  96 ASCII  132  40 cps  10, 12, 15, proportional  6, 8, progrmble  —  6  Friction; tractor, cutsheet feeder opt.  500 char.  Parallel, serial</p> <p>ITT SERVCOM  —  \$1,295  November 1982  Various printwheels avail.</p>
<p><b>Vendor Model Type</b>  <b>Characteristics</b>  Print Mechanism  Character Set  Print Column (char.)  Speed  Print Pitch (dpi)</p> <p>Vertical Spacing  Bidirectional Printing  No. of Copies  Feed Mechanism</p> <p>Buffer Size  Interface</p> <p><b>Maintenance</b>  Maintenance Provided By  Monthly Maintenance Fee</p> <p><b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Qume</b>  SPRINT 11/55 PLUS  Serial</p> <p>Daisywheel  96 ASCII  132  55 cps  10, 12, 15, proportional</p> <p>6, 8, progrmble  —  6  Friction; tractor, cutsheet feeder opt.  500 char.</p> <p>Parallel, serial</p> <p>ITT SERVCOM  —  \$1,595  May 1983  Various printwheels avail.</p>	<p><b>Qume</b>  SPRINT 11/90 PLUS  Serial</p> <p>Daisywheel  96 ASCII  132, 158, 198  90 cps  10, 12, 15, proportional,  progrmble  Progrmble  Std  6  Friction</p> <p>500 char; 14K char. opt.</p> <p>Centronics, IBM PC,  RS-232C, Diablo 630, IBM  Wheelprinter, and SPRINT  3</p> <p>ITT SERVCOM  —  \$1,995  December 1984  Various printwheels avail.</p>	<p><b>Ricoh</b>  LP4080R  Page</p> <p>Laser  Several fonts avail.  —  8 ppm  10, 12, 15, progrmble</p> <p>6, 8, progrmble  NA  1  Friction</p> <p>1 page (using Ricoh controller)  RS-232C, Centronics</p> <p>Vendor; third party opt.  —  Vendor declined to provide  1986  Prints across 11-in. width  (landscape mode)</p>

**Notes:**

— Information unavailable at press time  
NA Not applicable



<p><b>Vendor Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (dpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Ricoh</b>                  RP3400Q                  Serial                  Daisywheel                  96 ASCII                  132                  52 cps                  196                  Progrmble                  Std                  5                  Tractor, cutsheet                  7K char.                  RS-232, Centronics                  Vendor                  —                  \$1,095                  October 1985                  NA</p>	<p><b>Sanyo Business Systems</b>                  PR 3000                  Serial                  Daisywheel                  91 ASCII                  80                  10 cps                  12                  6                  Std                  3                  Tractor                  —                  Centronics; RS-232C opt.                  Sanyo auth dealers                  —                  \$299                  1985                  NA</p>	<p><b>Sanyo Business Systems</b>                  PR 5200                  Serial                  Daisywheel                  96 ASCII                  132                  18 cps                  10, 12, 15                  —                  Std                  4                  Tractor                  —                  RS-232C, Centronics                  Sanyo auth. dealers                  —                  \$399                  —                  NA</p>
<p><b>Vendor Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (dpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Sanyo Business Systems</b>                  PR 5500                  Serial                  Daisywheel                  96 char. wheel                  132                  16 cps                  10, 12, 15                  Progrmble                  Std                  5                  Tractor                  —                  Centronics                  Sanyo auth dealers                  —                  \$599                  1984                  NA</p>	<p><b>SCI Systems</b>                  1080/1180 Ticket Printer                  Serial                  Electrosensitive (non-impact)                  96 ASCII                  80                  1,100 cps                  10.2                  7                  —                  Friction                  1K char.                  Parallel, RS-232C                  Vendor                  NA                  \$250-\$1,160                  1981                  Opt. rotary cutter avail.; prints on 2-in. electrosensitive paper</p>	<p><b>SCI Systems</b>                  1110/1100                  Serial                  Electrosensitive (non-impact)                  96 ASCII                  136                  2,200 cps                  10.2                  7                  —                  Friction                  2K char.                  Parallel, RS-232C                  Vendor                  NA                  \$250-\$1,160                  1977                  Avail. as mechanism-only and standalone; uses 4-in. electrosensitive roll paper; rotary cutter opt.</p>

**Notes:**  
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 NA Not applicable





<p><b>Vendor Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (cpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Siemens</b>                  2712 M203                  Serial                    Inkjet                  96 (7 sets avail.)                  132                  270 cps                  —                  —                  —                  —                  Adjustable pinfeed                  2K char.                  Parallel, serial, TTY                    Vendor                  —                  \$2,250                  1981                  NA</p>	<p><b>Siemens</b>                  PT88                  Serial                    Inkjet                  96 (7 sets avail.)                  80                  150 cps                  5, 6, 8.5, 10, 12, 17                  —                  Std                  1                  Adjustable pinfeed                  4K char. (opt.)                  Parallel, serial                    Vendor                  —                  \$699                  1983                  NA</p>	<p><b>Siemens</b>                  PT89                  Serial                    Inkjet                  96 (7 sets avail.)                  132                  150 cps                  5, 6, 8.5, 10, 12, 17                  —                  Std                  1                  Adjustable pinfeed                  4K char. (opt.)                  Parallel, serial                    Vendor                  —                  \$845                  1984                  NA</p>
<p><b>Vendor Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (cpi)                    Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>    <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Siemens</b>                  PT90                  Serial                    Inkjet                  —                  136                  200, 400 cps                  10, 12, 17                    6, 8                  Std                  1                  Tractor, friction                  4K-10K char.                  Parallel, serial                    Vendor                  —                  \$2,099 w/out cutsheet feeder;                  2,399 w/cutsheet feeder                  November 1984                  NA</p>	<p><b>Smith-Corona</b>                  D-100                  Serial                    Dot matrix                  96 ASCII, 7 intl                  80                  120 cps                  5, 6, 8.3, 10, 12, 16.7,                  proportional                  6, 8, 9, 12                  Std                  2                  Friction, tractor                  1 line                  Centronics; RS-232C opt.                    Vendor                  —                  \$395                    March 1984                  NA</p>	<p><b>Smith-Corona</b>                  D-200                  Serial                    Dot matrix                  96 ASCII, 7 intl                  80                  120 cps                  5, 6, 8.3, 10, 12, 16.7,                  proportional                  6, 8, 9, 12                  Std                  3                  Friction, tractor                  2KB                  Centronics, RS-232C                    Vendor                  —                  \$595                    January 1984                  NA</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Vendor Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (cpi)                    Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Smith-Corona</b>                  D-300                  Serial                    Dot matrix                  96 ASCII, 7 intl                  132                  140 cps                  5, 6, 8.3, 10, 12, 16.7,                  proportional                  6, 8, 9, 12                  Std                  3                  Friction, tractor                  2KB                  Centronics, RS-232C                    Vendor                  —                  \$795                  March 1984                  NA</p>	<p><b>Smith-Corona</b>                  L-1000                  Serial                    Daisywheel                  93 ASCII, 7 intl                  105                  12 cps                  10, 12, 15                    6, 4, 3                  Std                  4                  Friction                  256 char.                  Centronics, RS-232C                    Vendor                  —                  \$545                  March 1984                  NA</p>	<p><b>Star Micronics</b>                  Powertype                  Serial                    Daisywheel                  96                  110, 132, 165                  18 cps                  10, 12, 15, proportional                    3, 4, 6, 8                  —                  3                  Friction                  1 line                  Parallel, serial                    Dealer, distributor                  NA                  \$499                  January 1984                  NA</p>
<p><b>Vendor Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                    Print Column (char.)                  Speed                  Print Pitch (cpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Star Micronics</b>                  STX 80                  Serial                    Thermal dot matrix                  96 ASCII, blk graphics, 51 intl                    80                  60 cps                  11                  6                  —                  —                  Friction                  1 line                  Parallel                    Dealer, distributor                  NA                  \$199                  June 1983                  NA</p>	<p><b>Tandy/Radio Shack</b>                  CGP 220                  Serial                    Inkjet                  —                  80                  37 cps                  12, variable                  —                  —                  1                  Friction (cutsheet or roll)                  —                  Parallel; Tandy/Radio Shack                  Color Computer-compact                    Vendor                  —                  \$599                  —                  Prints yellow, violet, red,                  green, cyan, magenta, and                  black; 560 or 640 dots/line</p>	<p><b>Tandy/Radio Shack</b>                  DMP 105 Dot Matrix Printer                  Serial                    Dot matrix                  96 ASCII, 64 special, 30                  block graphics                  80                  43 lpm at 10 cpi                  10, 12, 16.7                  6, 8, 12                  Std                  2                  Tractor, friction                  —                  Parallel; Tandy/Radio Shack                  Color Computer compat                    Vendor                  —                  \$199.95                  1985                  400-800 dots/line</p>

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 NA Not applicable



<p><b>Vendor Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                    Print Column (char.)                  Speed                  Print Pitch (cpi)                    Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface    <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Tandy/Radio Shack</b>                  DMP 130                  Serial                    Dot matrix                  96 ASCII + Tandy or IBM special char.                    —                  20-24, 50, 100 cps                  10, 12, 17.1                    —                  Std (draft mode)                  3                  Tractor, friction                    —                  Parallel; Tandy/Radio Shack Color Computer compat</p>	<p><b>Tandy/Radio Shack</b>                  DMP 2100P                  Serial                    24-wire dot matrix                  96 ASCII + 31 intl, 31 graphics                  80, 132                  100, 160 cps                  10, 12, 16.7, proportional                    —                  —                  3                  Friction                    —                  Parallel</p>	<p><b>Tandy/Radio Shack</b>                  DMP 2200                  Serial                    Dot matrix                  95 ASCII, 31 graphics, spec chars. IBM set                    —                  90, 380 cps                  10, 12, 17.1, proportional, compressed proportional                    —                  —                  7                  Tractor                    —                  Parallel</p>
<p><b>Vendor Model Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                    Print Column (char.)                  Speed                  Print Pitch (cpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface    <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Tandy/Radio Shack</b>                  DMP 430                  Serial                    18-wire dot matrix                  96 ASCII + Tandy std set; 64 spec chars w/30 block graphics; or full 128 char Tandy Model 2000/IBM set                  80, 132                  180 cps                  10, 12, 16.7                    —                  —                  3                  Tractor                    —                  Parallel; Tandy/Radio Shack Color Computer-compat</p>	<p><b>Tandy/Radio Shack</b>                  DWP 220                  Serial                    Daisywheel                  100 (modified ASCII plus intl)                    136, 163                  20 cps                  10, 12, proportional                  Progrmble                  Std                  4                  Friction                    —                  Parallel; Tandy/Radio Shack Color Computer-compat</p>	<p><b>Tandy/Radio Shack</b>                  DWP 510                  Serial                    Daisywheel                  124 (96 ASCII plus special &amp; intl)                    136, 163                  43 cps                  10, 12, proportional                    —                  No                  6                  Friction; tractor opt.                    —                  Parallel</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Vendor Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set</p> <p>Print Column (char.) Speed Print Pitch (cpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface</p> <p><b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee</p> <p><b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>Tandy/Radio Shack</b> TRP 100 Thermal Ribbon Printer Serial</p> <p>Thermal ribbon 96 ASCII, plus Tandy std; 64 spec chars w/30 block graphics</p> <p>80 50 cps 5, 10 — Std w/thermal roll paper 1 Friction — Parallel, Tandy/Radio Shack Color Computer compat.</p> <p>Vendor — \$299.94 1985 480-960 dots/line; IBM PC compat.; prints on plain paper</p>	<p><b>Texas Instruments</b> Model 880 Serial</p> <p>Dot matrix 96 ASCII</p> <p>— 75, 250, 300 cps 5, 6, 8.3, 10, 12, 16.7 3, 4, 6, 8 Std 6 Tractor 2KB, 4KB, 16KB opt. RS-232C, Centronics-type parallel</p> <p>Vendor \$35 on site; \$21 carry-in \$2,195 February 1985 NA</p>	<p><b>Texas Instruments</b> Model 880 AT Serial</p> <p>Dot matrix 96 ASCII</p> <p>— 75, 250, 300 cps 5, 6, 8.3, 10, 12, 16.7 3, 4, 6, 8 Std 6 Tractor 2K char.; 4K, 16K char. opt. RS-232C, Centronics-type parallel</p> <p>Vendor \$35 on site; \$21 carry-in \$2,195 June 1985 NA</p>
<p><b>Vendor Model</b> <b>Type</b> <b>Characteristics</b> Print Mechanism Character Set Print Column (char.) Speed Print Pitch (cpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface</p> <p><b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee</p> <p><b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b></p>	<p><b>Texas Instruments</b> Model 880 DP Serial</p> <p>Dot matrix 96 ASCII</p> <p>— 150, 300 cps 5, 6, 8.3, 10, 12, 16.7 3, 4, 6, 8 Std 6 Tractor 2K char.; 4K, 16K char. opt. RS-232C, Centronics-type parallel</p> <p>Vendor \$35 on site; \$21 carry-in \$2,195 October 1985 NA</p>	<p><b>Texas Instruments</b> TI 810 Serial</p> <p>Dot matrix 96 ASCII; intl opt. 132; 218 opt. 150 10, 12, 16.5 6, 8 Std 9 Tractor — Serial; DC current loop or parallel opt.</p> <p>Vendor \$35 on site; \$21 carry-in \$1,645 1977 Accepts paper up to 15-in. wide</p>	<p><b>Texas Instruments</b> TI 820 Serial</p> <p>Dot matrix 96 ASCII; intl opt. 132 150 cps 10, 16.5 6, 8 — 6 Tractor — Serial; DC current loop opt.</p> <p>Vendor \$36 on site; \$22 carry-in \$2,165 1978 Accepts paper up to 15-in wide</p>

**Notes:**  
— Information unavailable at press time  
NA Not applicable



<b>Vendor Model Type</b> <b>Characteristics</b> Print Mechanism Character Set Print Column (char.) Speed Print Pitch (cpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Texas Instruments</b> TI 850 XL Serial Wire dot matrix 96 ASCII; intl avail. 134 35, 150 5, 6, 8.3, 10, 12, 16.7 3, 4, 6, 8 Std 3 Friction; tractor opt. 256 char.; 4K char. opt. RS-232C, Centronics-type parallel Vendor \$17 on site; \$11 carry-in \$599 friction; \$659 tractor November 1984 144 x 144 dpi; accepts paper up to 11-in. wide	<b>Texas Instruments</b> TI 855 Serial Wire dot matrix 96 ASCII; plug-in fonts avail. 134 35, 150 5, 6, 8.3, 10, 12, 16.7 3, 4, 6, 8 Std 3 Friction; tractor opt. 256 char.; 4K char. opt. RS-232C, Centronics-type parallel Vendor \$31 on site; \$18 carry-in \$739 friction; \$799 tractor September 1983 144 x 144 dpi; accepts paper up to 11-in. wide	<b>Texas Instruments</b> TI 860 XL Serial Wire dot matrix 96 ASCII; intl avail. 227 35, 150 5, 6, 8.3, 10, 12, 16.7 3, 4, 6, 8 Std 3 Friction; tractor 256 char.; 4K char. opt. RS-232C, Centronics-type parallel Vendor \$21 on site; \$12 carry-in \$899 November 1984 144 x 144 dpi; accepts paper up to 16-in. wide
<b>Vendor Model Type</b> <b>Characteristics</b> Print Mechanism Character Set Print Column (char.) Speed Print Pitch (cpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Texas Instruments</b> TI 865 Serial Wire dot matrix 96 ASCII; plug-in fonts avail. 227 35, 150 5, 6, 8.3, 10, 12, 16.7 3, 4, 6, 8 Std 3 Friction, tractor 256 char.; 4K char. opt. RS-232C, Centronics-type parallel Vendor \$24 on site; \$13 carry-in \$999 November 1984 144 x 144 dpi; accepts paper up to 16-in. wide	<b>Toshiba America</b> P1340 Serial 24-pin dot matrix 96 ASCII 30, 132 37 cps 10, 12, 16.7, proportional 6, 8 Std 3 Friction, pinfeed 4KB Parallel, RS-232C Vendor NA \$799 — NA	<b>Toshiba America</b> P341 Serial Dot matrix 96 ASCII, 31 graphics 136 72, 216 cps Progrmble Progrmble Std 3 Friction 2KB Centronics parallel; RS-232C Vendor NA \$1,299-\$1,349 — NA

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<p><b>Vendor</b>  <b>Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (dpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                    Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Toshiba America</b>                  P351                  Serial                    24-pin dot matrix (impact)                  96 ASCII, 31 graphics                  136                  200, 240, 288 cps                  Progrmble                  Progrmble                  Std                  4                  Friction; tractor, sheet feeder                  opt.                  4KB                  Centronics parallel, RS-232C</p>	<p><b>Wang Laboratories</b>                  2233                  Serial                    Dot matrix                  96 ASCII                  132, 158                  100, 120 cps                  10, 12.2                  6, 8                  Std                  6                  Pinfeed                    1 line                  —</p>	<p><b>Wang Laboratories</b>                  2235                  Line                    Dot matrix                  96 ASCII                  132, 158                  181, 222 cps                  10, 12.2                  6, 8                  —                  6                  Forms tractor                    1 line                  —</p>
<p><b>Vendor</b>  <b>Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (dpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Wang Laboratories</b>                  2273-1, -2                  Line                    Band                  48, 64, 96                  —                  250 lpm (-1), 600 lpm (-2)                  —                  —                  NA                  6                  Tractor                  —                  —</p>	<p><b>Wang Laboratories</b>                  2281W                  Serial                    Daisywheel                  86 ASCII                  132, 157                  30 cps                  10, 12                  6, progrmble                  Std                  —                  Friction; tractor opt.                  1 line                  —</p>	<p><b>Wang Laboratories</b>                  5535-1                  Serial                    Dot matrix                  152 ASCII                  80, 132                  180 cps                  10                  6                  —                  6                  Tractor                  —                  —</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Vendor Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (dpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                    Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Wang Laboratories</b>                  5577                  Serial                    Dot matrix                  114, 224                  132, 158, 198                  40, 48, 60 cps                  10, 12, 15                  —                  —                  6                  Tractor; bidirectional forms tractor opt.                    —                  —                  Vendor                  \$56                  \$5,975                  NA</p>	<p><b>Wang Laboratories</b>                  6581 WC-1                  Serial                    Daisywheel                  96 ASCII                  180, 216                  35 cps                  10, 12, proportional                  —                  —                  6                  Tractor                    —                  —                  Vendor                  \$52                  \$7,000                  —                  Designed for use w/Wang Word Processor Systems 20, 25, 30, and OIS</p>	<p><b>Wang Laboratories</b>                  DW/22-20                  Serial                    Daisywheel                  —                  —                  20 cps                  10, 12; 15, proportional opt.                  —                  Std                  6                  Friction, tractor opt.                    —                  —                  Vendor                  \$39                  \$2,695                  —                  Designed for use w/Wang WP, OIS, IIS, 2200, and VS systems; accepts paper up to 15-in. wide</p>
<p><b>Vendor Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (dpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Wang Laboratories</b>                  DW/OS-55                  Serial                    Daisywheel                  96 ASCII                  132, 158, 198                  40-50 cps                  10, 12, 15                  6, 8                  —                  Tractor, cutsheet                  —                  —                  Vendor                  \$43                  \$4,500                  NA</p>	<p><b>Wang Laboratories</b>                  LIS-12 Laser Imaging System                  Page                    Laser                  —                  —                  12 ppm text, 6 ppm graphics                  10, 12, 15, proportional                  6, 8, progrmble                  NA                  1                  Friction (cutsheet)                  —                  —                  Vendor                  \$300                  \$26,000                  —                  Compat w/Wang OIS, Alliance, and VS Systems; 300 x 300 dpi</p>	<p><b>Wang Laboratories</b>                  LPS-8 Laser Printing System                  Page                    Laser                  —                  —                  8 ppm                  10, 12, 15, proportional                  —                  —                  1                  Friction                  —                  —                  Vendor                  \$74                  \$5,000                  —                  300 x 300 dpi</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable



<p><b>Vendor Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (cpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                  Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Wang Laboratories</b>                  WOA-PM015                  Serial                    Daisywheel                  96 ASCII                  132, 158, 197                  40 cps                  10, 12, 15, proportional                  6, 8                  Std                  —                  Friction; tractor opt.                  —                  RS-232C                    Vendor                  \$12                  \$895                  —                  For use w/Wang PC, Wang OA, and Wang OIS 40, 50, and 60 systems</p>	<p><b>Xerox/Diablo</b>                  2700                  Page                    Laser                  Over 200 fonts avail.                  Variable                  12 ppm                  4-20                  3-12.5                  NA                  1                  Friction (cutsheet)                  3 pages max.                  —                    Vendor                  —                  \$19,995                  —                  IBM compatible</p>	<p><b>Xerox/Diablo</b>                  34LQ                  Serial                    Dot matrix                  IBM Extended set                  132, 226                  60, 200 cps                  5-17.1                  6, 8, 216                  —                  5                  Tractor, friction                  256 char                  RS-232C, Centronics                    Vendor                  —                  \$1,399                  1985                  9 x 11 and 18 x 60 dot matrix</p>
<p><b>Vendor Model</b>  <b>Type</b>  <b>Characteristics</b>                  Print Mechanism                  Character Set                  Print Column (char.)                  Speed                  Print Pitch (cpi)                  Vertical Spacing                  Bidirectional Printing                  No. of Copies                  Feed Mechanism                    Buffer Size                  Interface  <b>Maintenance</b>                  Maintenance Provided By                  Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Xerox/Diablo</b>                  3700                  Page                    Laser                  Over 200 fonts avail.                  Variable                  24 ppm                  4-20                  3-12.5                  NA                  1                  Friction (cutsheet)                    30MB max.                  —                    Vendor                  —                  \$30,000 (avg.)                  —                  IBM compatible</p>	<p><b>Xerox/Diablo</b>                  4045                  Page                    Laser                  Over 200 fonts avail.                  Variable                  10 ppm                  4-20                  3-12.5                  NA                  1                  Friction (cutsheet)                    4 pages max.                  Centronics, RS-232C async,                  Dataproducts parallel                    Vendor                  —                  \$4,995                  April 1985                  300 x 300 dpi; IBM compatible</p>	<p><b>Xerox/Diablo</b>                  Advantage D25                  Serial                    Daisywheel                  ASCII                  132, 158, 197                  25 cps                  10, 12, 15                  6, variable                  Std                  3                  Friction; tractor, single bin feeder opt.                  512B                  RS-232C, Centronics parallel,                  IEEE                    Vendor                  —                  \$745                  November 1984                  NA</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable





<b>Vendor Model Type</b> <b>Characteristics</b> Print Mechanism Character Set Print Column (char.) Speed Print Pitch (cpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism  Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Xerox/Diablo Advantage D80 Serial</b> Daisywheel ASCII 132, 158, 198, 264 80 cps 10, 12, 15, 20 6, variable Std 6 Friction; tractor, feeder opt.  1.5KB RS-232C, Centronics parallel Vendor — \$2,195 August 1985	<b>Xerox/Diablo Advantage D80IF Serial</b> Daisywheel ASCII 132, 158, 198, 264 80 cps 10, 12, 15, 20 6, variable Std 6 Integrated dual bin feeder; opt. envelope module 1.5KB RS-232C, Centronics parallel Vendor — \$2,995 November 1984 Tractor feed opt., 200 char printwheel	<b>Xerox/Diablo Diablo 635 Serial</b> Daisywheel ASCII 132, 158, 197 55 cps 10, 12, 15 6, variable Std 4 Friction; tractor, single, dual and envelope feed opt. 1.3KB RS-232C, Centronics parallel Vendor — \$1,485 November 1985 56 dBA; Xerox 630 compatible; auto paper load; auto printwheel recognition
<b>Vendor Model Type</b> <b>Characteristics</b> Print Mechanism Character Set Print Column (char.) Speed Print Pitch (cpi) Vertical Spacing Bidirectional Printing No. of Copies Feed Mechanism Buffer Size Interface <b>Maintenance</b> Maintenance Provided By Monthly Maintenance Fee <b>Purchase Price</b> <b>First Delivery</b> <b>Comments</b>	<b>Xerox/Diablo P101 Serial</b> Dot matrix IBM Extended set 40, 60, 80 80 cps 5, 10 6, 8 Std 3 Tractor, friction 1KB Centronics parallel Vendor — \$499 — 9 x 11 dot matrix	<b>Xerox/Diablo P12CQ1 Serial</b> Dot matrix Full IBM extended set 20-132 60, 150 cps 5, 6, 8.33, 10, 12, 16.5 6, 8, 216 Std 5 Tractor, friction 2KB Centronics parallel Vendor — \$699 — 9 x 11 and 16 x 36 dot matrix	<b>Xerox/Diablo P32CQ1 Serial</b> Dot matrix Full IBM extended set To 220 60, 150 cps 5, 6, 8.33, 10, 12, 16.5 6, 8 Std 5 Tractor, friction 128KB Centronics parallel Vendor — \$799 — 9 x 11 and 16 x 36 dot matrix

**Notes:**

- Information unavailable at press time  
 NA Not applicable



<p><b>Vendor</b>  <b>Model</b>  <b>Type</b>  <b>Characteristics</b>          Print Mechanism          Character Set          Print Column (char.)          Speed          Print Pitch (dpi)          Vertical Spacing          Bidirectional Printing          No. of Copies          Feed Mechanism          Buffer Size          Interface  <b>Maintenance</b>          Maintenance Provided By          Monthly Maintenance Fee  <b>Purchase Price</b>  <b>First Delivery</b>  <b>Comments</b></p>	<p><b>Xerox/Diablo</b>          P38          Serial            Dot matrix          96 ASCII, intl          40, 60, 80, 132          400 cps          5, 10          6, 8          Std          5          Tractor, friction          256 char          Centronics parallel            Vendor          —          \$2,195          —          7 x 7 dot matrix</p>		

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable

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# MONITORS

## Market Analysis Report

### INTRODUCTION

Unless the PC you purchase is already equipped with a monitor, you will have to select one independently. You may also be faced with this decision if you are dissatisfied with your present monitor or if the monitor supplied with your PC is inadequate for your needs.

There are several compelling reasons for giving this decision thorough consideration. A poor-quality monitor can cause eye strain and headaches. These problems can in turn lead to decreased concentration and productivity, eventually affecting the integrity of the data input to and manipulated on the system. The lack of data integrity may cause nothing more than occasional embarrassment if only business letters are prepared on the system, but if the company's accounts receivable also reside on the system, a mistake could prove costly.

Judging by the variety of responses to our recent monitor market survey, the purchase decision can be difficult. In the survey that follows, 25 vendors are represented, offering 134 different monitors. However, the choice can be made easier by narrowing the field according to certain preselected criteria.

### MONITOR CATEGORIES

The major consideration in choosing a monitor is the applications for which the system will be used. Monitors can be divided into two general categories: monochrome and color. To decide which would be the most appropriate for a particular installation, you must first understand which types of applications run best on which category of monitors.

### Applications

Applications, like monitors, can be divided into two general types: text-based applications, such as word processing and data entry; and graphics-based applications, such as architectural plans, diagrams, or charts. If your applications are primarily text intensive, a monochrome monitor is probably the most suitable. These monitors provide much sharper, brighter characters than do color monitors. Because the character resolution is not as high as on a monochrome monitor, a color monitor can quickly tire an operator's eyes. Although monochrome monitors are generally less expensive than color monitors, some may be fairly sophisticated and have comparably higher price tags. Purchase prices in our survey ranged from \$129 to \$939 for monochrome monitors. If your monitor use involves primarily graphics-intensive applications, a color monitor would be appropriate. A monochrome monitor cannot come close to matching the visual clarity that a color monitor

provides for graphics display. However, you will pay for those dazzling graphics. Prices for color monitors included in our survey ranged from \$229 to \$4,995.

Difficulties in selecting a monitor arise when applications on your system are evenly divided between text and graphics. In this case, the choice becomes a matter of personal preference. Although color monitors do not perform as well as monochrome monitors for text display, they are acceptable for short viewing periods. If, however, you will be spending long hours at the monitor, you may want to consider a monochrome model. A possible solution may be one of the newer model color monitors that is equipped with a switch to convert the screen output from color to monochrome.

### Display Considerations

There has been (and continues to be) debate over which type of monochrome monitor is easiest for the operator's eyes. Nearly all of the early monochrome monitors displayed green characters on dark screens. Amber characters became popular as the more ergonomically minded Europeans entered the monitor market in earnest a few years ago. Amber display proponents cite scientific studies illustrating that amber is easier on the eyes; however, these tests, for the most part, were performed using electronic measuring equipment rather than human eyes. The best deciding factor here is personal preference.

A third alternative in display selection has recently been introduced: black characters on a white screen, similar to the Apple Macintosh display. The rationale behind this type of screen is that a dark-background monitor forces your eyes to constantly adjust to the light intensity as you look away from the screen to a piece of paper and then back to the dark screen. The light-colored background of the black-and-white monitor is designed to minimize the adjustment your eyes must make.

### NARROWING THE FIELD

Having selected the basic type of monitor that is best suited for your particular environment, you must then choose a specific monitor for your system. Two main criteria are used to judge a monitor on its technical merits: the resolution and the refresh rate.

### Monitor Resolution

Resolution refers to the image definition that a monitor provides or, in other words, how sharply the images are displayed. The less sharp the images on the monitor, the harder the operator's eyes have to work and the faster eye strain (and

all its related afflictions) set in. Resolution is influenced primarily by the pixel count. A pixel (contraction for picture element) is the smallest unit or dot of light that can be illuminated on a screen. The pixel count is usually stated in width by length. A monitor with a resolution of 320 by 240 is capable of displaying rows of 320 pixels across the width of the screen and columns of 240 pixels down the length of the screen. This example represents fairly good resolution for text-based applications and is about as low as you would want for graphics-based applications.

Also affecting the resolution is the display circuitry of the computer to which the monitor is attached. This circuitry, which is quite independent of the monitor, may or may not be standard with the computer. For example, the IBM Corporation Personal Computer does not include display circuitry and must be equipped with an optional plug-in board to operate a monitor. The Compaq Corporation Portable, on the other hand, is equipped not only with a monochrome monitor but also with a plug for an optional add-on monitor and internal display circuitry for both monochrome and color graphics output. This distinction is important. If you plan to purchase a color monitor, make sure your computer has a display circuit that supports color output.

Display circuits also vary in the pixel resolution they can transmit to the monitor. It does not, for example, make sense to purchase a monitor that is capable of displaying a resolution of 720 by 480 if your display circuitry only outputs a maximum resolution of 320 by 240. The latter is the maximum resolution your computer can achieve, so be careful to match the resolution of the monitor with the resolution of the display circuitry you have installed or are planning to install in your computer.

For text-based applications, the resolution is also affected by the character matrix. The character matrix is measured, as is the screen resolution, in width by length. It represents the size of the pixel block that the computer uses to create a single character. A screen that uses a character matrix of 9 by 14 produces a much sharper and clearer character than does a monitor with a character matrix of 5 by 7.

## Monitor Refresh Rate

Characters or images are formed on the screen by a beam of electrons projecting from the back of the monitor and hitting the proper dots (pixels) of phosphor on the inside of the screen. A chemical reaction with the phosphor causes the pixel to glow. This reaction lasts only a short time, however, so the dots must continually be recharged. The process of recharging the phosphor pixels is called refreshing the screen, and the rate at which the monitor is capable of refreshing is measured in hertz (Hz). A monitor that is capable of a 60 Hz refresh rate recharges each dot of an image on the screen 60 times a second. A refresh rate of 50 or 60 Hz is generally a good figure to aim for when selecting a monitor. The refresh rate is important for the same reason that resolution is—it affects how hard your eyes must work to see what is displayed on the screen. Operator comfort level is closely allied with monitor resolution and refresh rate.

In a monitor with a low refresh rate, the phosphor dots may begin to fade, losing their intensity. When this happens, the image appears to flicker as the screen goes from a very high, fully charged intensity to a lower, dimmer intensity and back to a high intensity as the screen is refreshed. Flicker can quickly tire an operator's eyes, as the eyes try to adapt to the flicker thousands of times each minute. A monitor with a higher refresh rate does not present this flicker problem, but a monitor with too high of a refresh rate carries problems of its own.

When the pixels are constantly bombarded with electron charges, the phosphor pixels remain at a very high, fully charged intensity. When a character is moved from one position on the screen, the pixels that were charged may need some time to release that charge and return to a normal status. This causes a problem called ghosting: latent images holding residual charges remain visible after the image has moved position on the screen. When an operator scrolls through a lengthy spreadsheet or manipulates a three-dimensional object in a CAD/CAM application, the operator's eyes can tire just as much and just as quickly from ghosting as from flicker. The best way to ensure which monitor has the proper refresh rate is a thorough hands-on demonstration.

## Other Selection Considerations

Several other factors that, while not directly affecting the performance of a monitor, bear consideration include size, ergonomic design, warranty, and, of course, price. Monitors included in our survey ranged in size from 9 inches diagonally to 45 inches diagonally. The majority of screens fall into the 12- to 13-inch diagonal range. Smaller screens may be useful in environments where desk space is limited or if viewing periods are brief and sporadic. In general, the small (i.e., 8- or 9-inch) screens should not be chosen if the monitor will be used for an extended amount of time (i.e., more than 30 minutes). The characters and graphics on larger screens may be too large for close-up viewing, so these screens are typically used only when they can be located some distance from the operator. The large-screen monitors are, however, useful for manipulating intricate images; CAD/CAM applications make particularly good use of these larger screens.

Some monitors are equipped with an antiglare screen. These screens are usually very effective in shielding the operator's eyes from reflected office light. Of the monitors in our survey, 61 percent include this feature as standard, and 16 percent offer it as an option.

Another ergonomic aid is a tilt-and-swivel stand on which the monitor is placed to allow operator adjustment of the screen viewing angle. This feature is especially beneficial if more than one operator uses the system. Of the monitors we surveyed, 12 percent include this feature as standard, and 42 percent offer it as an option.

Warranties are perhaps the most important nontechnical factor to be considered in monitor selection. The longer the unit is warranted against defects by the manufacturer, the less risk you, as owner, must assume. Most warranties are divided into



parts and labor with time periods specified for each, so be sure to read the fine print carefully. Such nontechnical considerations, including the warranty and choice of dealer, do not affect the technical performance of a monitor but can make a big difference in user satisfaction after the choice is made.

### Some Simple Tests

A hands-on demonstration should be the final test in your selection of a monitor. With a color monitor, one of the first tests to perform determines proper convergence (where the electron beams hit the inside surface) of the monitor screen. The areas you should examine are the corners of the screen, where the beams form their greatest angle. Fill the entire screen with a single character, then compare the characters in the corners with those at the center of the screen. The character size, formation, and color should be very similar. Watch for malformed characters or characters whose color is tinged around the edge. Next, stand approximately six feet away from the monitor, looking for all perfectly horizontal lines and vertical rows. Still standing away from the screen, check for flicker; if flicker is apparent, the refresh rate is probably not

high enough. Next, clear the screen of all images, and move the cursor as quickly as possible across the face of the monitor from side to side and from top to bottom. Do you see images trailing after the cursor? If so, the refresh rate is too high, and the images are ghosting. The ideal testing situation is to have those few monitors that are the best candidates for your installation connected to your computer on a trial basis. If you are buying in volume, this is not an unreasonable request of your supplier.

### CONCLUSION

These guidelines can greatly help to narrow the choice for a monitor from the 134 units presented on the following pages to the most likely prospects for your particular environment and applications. The final analysis then comes down to your objective opinion and comfort. Take time to sit in front of the monitor, preferably with one of your applications running. If you like what you see, you're likely to be satisfied in the long run. If, however, you're not satisfied with the test run, keep looking for a better match.



# MONITORS

## Company Directory

236.0032.001

Vendor	Address/Telephone	Model
Amdek Corp	2201 Lively Blvd Elk Grove Village IL 60007 (312) 364-1180	310A Color 300 Color 500 Color 600 Color 700 Color 710 Color 722
Amtron	2260 De La Cruz Blvd Santa Clara CA 95050 (408) 748-8500	CD Series
Apple Computer	20525 Mariani Ave Cupertino CA 95014 (408) 996-1010	Color Monitor IIC/IIe Monitor II Monitor IIC
Aydin Controls	414 Commerce Dr Ft Washington PA 19034 (215) 542-7800	8810 8815 8830 8831 8835 8836
Bright Up Industries	366 Paseo Sonrisa Walnut CA 91789 (714) 595-6146	CC1411/CC1421 CC1421-LP CC1424
Cambridge Graphic Systems	11020 E Rush St South El Monte CA 91733 (818) 448-6173	1211 1230 MD-3
Electrohome	809 Wellington St N Kitchener, Ontario Canada N2G 4J6 (519) 744-7111	ECD 1904/2504 ECM 1311 ECM 1901 EVM 1220 EVM 1519 EVM 1719 EVM 2319 EVM 920
Emulex	3545 Harbor Blvd PO Box 6725 Costa Mesa CA 92626 (714) 662-5600	BoB-compatible Color Monitor
Hewlett-Packard	8020 Foothills Roseville CA 95678 (800) FOR-HPPC	HP 35731 HP 35741
MICROTOUCH	400 W Cummings Park Woburn MA 01801 (617) 935-0080	AMBER*TOUCH ENHANCED*TOUCH NTSC*TOUCH RGB*TOUCH
Mitsubishi Electronics America	991 Knox St Torrance CA 90502 (213) 515-3993	6679 AT1332A C3479 C3920 C6479 C6920 C9918 XC 1404C XC 1412C
NEC Home Electronics	1401 Estes Ave Elk Grove Village IL 60007 (312) 228-5900	JB-1201 JB-1205M JB-1260M JB-1280DA



Vendor	Address/Telephone	Model
Panasonic Industrial	One Panasonic Way Secaucus NJ 07094 (201) 348-5200	JB-1285DA JC-1216DF JC-1225MA JC-1270MA JC-1275MA JC-1460D
Princeton Graphic Systems	601 Ewing St, Bldg A Princeton NJ 08540 (609) 683-1660	BT-P4500D DT-D1000G DT-D1300D DT-H103 DT-M140 DT-S101 TR120MDPA/TR120MIPA TR122M9P/TR122MYP TX-12H3P
Quadram	4355 International Blvd Norcross GA 30093 (404) 923-6666	Amberchrome Quadchrome Quadchrome II
RCA	New Products Div New Holland Ave Lancaster PA 17604 (717) 295-6922	VP4012
Roland DG	7200 Dominion Circle Los Angeles CA 90040 (213) 685-5141	CC-121 CD-240 MA-121 MA-122 MB-121 MB-122 MB-142
Sakata USA Corp	651 Bonnie La Elk Grove Village IL 60007 (312) 593-3211	SA1000 SC100 SC150 SC200 SC300P SG1000 SG1500
Sanyo	51 Joseph St Moonachie NJ 07074 (201) 440-9300	CRT40 CRT41 CRT 80 CRT 88
Sony	9 W 57th St New York NY 10019 (212) 371-5800	CPD-1201 CPD-9000 KV-1311CR
Tatung	2850 El Presidio St Long Beach CA 90810 (213) 637-2105	CM-1380
Taxan Corp	18005 Cortney Ct City of Industry CA 91748 (818) 810-1291	115/116 121/122 220 400 410/411 420

Vendor	Address/Telephone	Model
Thomson	330 Washington St, Suite 509 Marina del Rey CA 90292 (213) 821-2995	425 CM31311SI CM31481VI CM36311ID CM36432SI CM36512VI CM36632V VM3101 VG/VA VM3102 IG/IA VM3102 VG/VA
Zenith Data Systems	1000 Milwaukee Ave Glenview IL 60025 (312) 391-8860	ZVM-1220A/ZVM-1230A ZVM-124 ZVM-1240 ZVM-130
Zentec Corp	2400 Walsh Ave Santa Clara CA 95051-1374 (408) 727-7662	Zephyr 100 Zephyr 220 Zephyr 52





# MONITORS

## Specifications Chart Guide

Monitors are output devices that provide an immediate means of viewing data. The Monitors Specifications Chart is designed to facilitate the evaluation and comparison of alternate systems. The chart lists monitors alphabetically by vendor and summarizes the significant characteristics of each product. The following sections explain the parameters used for the charts.

### MANUFACTURER AND MODEL

These entries provide the manufacturer and product name or model number.

### DISPLAY UNIT

This section describes the video and display characteristics of the monitor.

- **Screen Size**—The display screen's diagonal measurement is provided in inches.
- **Characters/Line**—This is the total number of characters contained in a display line.
- **Lines/Display**—This is the total number of horizontal lines that can be displayed.
- **Character Generation**—This entry lists the size of the dot matrix (e.g., 7 by 9 dots) used to form a character on the monitor screen. All other factors being equal, a denser matrix (one with more dots) results in a sharper, more defined character image.
- **Resolution**—This entry lists the number of rows of picture elements or pixels (i.e., individual dots illuminated by the electron gun in the cathode-ray tube) and the number of pixels per row. For some monochrome monitors in which individual pixels are not addressable, the resolution is given only as the number of horizontal lines. In general, the greater the number of pixels, the better the quality and clarity of the screen image. High resolution is especially important in graphics applications. The microcomputer hardware and software driving the monitor must be capable of individually addressing every pixel on the screen to take full advantage of the monitor's capabilities.
- **Monochrome**—This entry describes the color (e.g., amber, green) used for displaying text on monochrome monitors or on color monitors with a text mode in which one color is specified. The specific phosphor (e.g., P39) used to obtain color is listed if supplied by the vendor.
- **Number of Colors**—For color monitors, this entry lists the number of colors the vendor specifies can be displayed simultaneously on the screen. In some cases, the screen resolution decreases as the number of colors increases.
- **Refresh Rate**—This number, expressed in cycles per second (Hz), is the rate at which a given pixel on the screen is struck and illuminated by the electron stream. A com-

mon rate is 60 Hz, which means that each pixel is illuminated 60 times per second.

- **Brightness**—This control varies the overall intensity of the light illuminating the screen image.
- **Contrast**—This control varies the relative brightness of the illuminated screen image and the background.

### ERGONOMIC FEATURES

This section describes features that improve the ease of using the monitor.

- **Tilt/Swivel**—Both features enable users to adjust the viewing angle of the monitor vertically or horizontally and thus avoid glare from surrounding lights.
- **CRT Saver**—This feature reduces power consumption by shutting the monitor off after a given period of system inactivity.
- **Nonglare Screen**—This entry indicates whether a monitor provides a screen surface or cover designed to reduce glare from light sources in the work area.

### COMPATIBILITY

This entry lists microcomputers with which the monitor is compatible.

### FIRST DELIVERY

This entry lists the date when the monitor was first delivered in quantity. A monitor with a recent first delivery date might have state-of-the-art features; however, a monitor that has been in production longer is likely to have fewer unresolved design or manufacturing problems.

### PRICE DATA

Pricing information is obtained from the manufacturers and does not necessarily reflect the distributor or dealer price.

- **Purchase**—The purchase price is the basic U.S. list price for a "quantity one" order. Actual retail prices are often lower than this price, especially in the lower-priced segment of the market.
- **Volume Discount**—This entry indicates whether the manufacturer offers discounts for quantity buyers. Because some vendor discounting policies are flexible and sensitive to changes in market conditions, discount breakpoints and percentages are not included. Current discounting details should be obtained directly from each vendor.

### COMMENTS

Additional noteworthy features are listed in this section.



# SPECIFICATIONS CHART

## Monitors

236.0045.001

<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels)  Monochrome No. of Colors  Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b>  <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Amdek Corp</b> Color 300  13 40 25 5 x 7  260(H) x 300(V)  NA Sys dependent  60Hz Std Std  Opt. No No No Apple II; Atari; IBM Family; Commodore; Any system w/composite video output August 1984  \$349 Yes Incl 2 yr. warranty electronics, 3 yr. warranty for CRT; built-in speaker w/audio amplifier; separate chrominance & luminance input for Commodore 64; dark bulb	<b>Amdek Corp</b> 310 A  12 80 25 7 x 9  720 x 350  Amber NA  18.2KHz Std Std  No No Std IBM PC Family; Columbia PC  March 1983  \$230 Yes Incl 2 yr. warranty for electronics, 3 yr. warranty for CRT	<b>Amdek Corp</b> Color 500  13 80(RGB); 64(composite) 25 5 x 7  320 x 240 (composite); 560 x 240 (RGB) White, Green Sys dependent (composite); 16 (RGB [Apple/IBM]) 60Hz Std Std  Opt. No No No Apple II; Atari; Commodore; IBM PC Family; Sys w/composite video output November 1984  \$399 Yes Includes 2 yr. warranty for electronics; 3 yr. warranty for CRT; composite, RGB, & VCR inputs; built-in speaker & headphone jack w/audio amplifier; switchable color matrix; text switch; built-in comb. filter; dark bulb
<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b>  <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Amdek Corp</b> Color 600  13 80 25 5 x 7  640 x 240 White, Green 16 (Apple/IBM) 60Hz Std Std  Std No No No Apple and IBM PC-compatible systems  August 1984  \$599 Yes Includes 2 yr. warranty for electronics; 3 yr. warranty for CRT; built-in speaker & headphone jack w/audio amplifier; switchable color matrix; text switch; dark bulb	<b>Amdek Corp</b> Color 700  13 80 25 5 x 7  720 x 240 White, Green 16 IBM/Apple 60 Hz Std Std  Opt. No Opt. Apple II family; IBM PC Family; Corona; Columbia, Compaq August 1984  \$649 Yes Includes 2 yr. warranty for electronics, 3 yr. warranty for CRT; switchable color matrix (700/710) text switch; dark bulb CRT; non-glare screen (710/722)	<b>Amdek Corp</b> Color 710  13 80 25 5 x 7  720 x 480 White, Green, Amber 16 IBM/Apple 60Hz Std Std  Opt. No Opt. Apple II family; IBM PC Family; Corona; Columbia; Compaq August 1984  \$699 Yes Includes 2 yr. warranty for electronics, 3 yr. warranty for CRT; switchable color matrix (700/710) text switch; dark bulb CRT; non-glare screen (710/722)

**Notes:**

— Information unavailable at press time  
 NA Not applicable



<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Amdek Corp</b> Color 722 13 80 25 5 x 7 720(H) x 350(V) White, Green, Amber 16 IBM/64 Palette 60Hz Std Std Opt. No Opt. IBM PC Family; Compaq; Columbia August 1985 \$799 Yes Includes 2 yr. warranty for electronics, 3 yr. warranty for CRT; switchable color matrix (700/710) text switch; dark bulb CRT; non-glare screen (710/722)	<b>Amtron</b> CD Series 19 80 25 8 x 8 1,280 x 1,024 NA 16 60Hz (noninterlaced) Std Std Opt. Std Opt. Any sys generating graphics images; BNC connector 1983 \$4,700 Yes —	<b>Apple Computer</b> Monitor II 12 80 24 — 560 x 192 Green NA 15.699KHz Std No Std No Opt. No Std Apple II family July 1983 \$129 — —
<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Apple Computer</b> Monitor IIc 10 80 24 — 560 x 192 Green NA 15.699KHz Std Std Opt. — Std Apple IIc April 1984 \$129 — —	<b>Apple Computer</b> Color Monitor IIe/Color Monitor IIc 13 80 25 — 640 x 200 NA 16 15.7KHz Std Std No — — Apple II family September 1985 \$379 Contact vendor —	<b>Aydin Controls</b> 8810 13 80 48 5 x 5 640 x 400 non-interfaced; 640 x 800 interfaced NA 16 digital Infinite analog 15-25KHz Std No No No Opt. IBM PC/XT/AT; HP 9000; Digital Equipment Professional Series April 1982 \$1,650 Yes —

**Notes:**

— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model</b>  <b>Display Unit</b>                  Screen Size (in., diag)                  Characters/Line                  Lines/Display                  Character Generation (dots)                  Resolution (pixels)                  Monochrome                  No. of Colors                  Refresh Rate                  Brightness                  Contrast  <b>Ergonomic Features</b>                  Tilt/Swivel                  CRT Saver                  Nonglare Screen  <b>Compatibility</b>  <b>First Delivery</b>  <b>Price Data</b>                  Purchase                  Volume Discount  <b>Comments</b></p>	<p><b>Aydin Controls</b>                  8815                  13                  80                  96                  5 x 5                  700 x 400 non-interfaced; 700 x 800 interfaced                  NA                  Sys dependent                  25-35KHz                  Std                  No                  No                  No                  Opt.                  IBM PC/XT/AT; HP 1000                  September 1984                  \$2,450                  Yes                  —</p>	<p><b>Aydin Controls</b>                  8830                  19                  80                  48                  5 x 5                  700 x 400 non-interfaced; 700 x 800 interfaced                  NA                  16 digital                  Infinite analog                  15-25KHz                  Std                  No                  No                  No                  Opt.                  IBM PC/XT/AT; HP 9000;                  Digital Equipment                  Professional Series                  April 1981                  \$2,450                  Yes                  —</p>	<p><b>Aydin Controls</b>                  8831                  19                  80                  48                  5 x 5                  700 x 400 non-interfaced; 700 x 800 interfaced                  NA                  16 digital, infinite analog                  15-25KHz                  Std                  No                  Opt.                  No                  Opt.                  IBM PC/XT/AT; HP 9000;                  Digital Equipment                  Professional Series                  June 1984                  \$2,450                  Yes                  —</p>
<p><b>Manufacturer Model</b>  <b>Display Unit</b>                  Screen Size (in., diag)                  Characters/Line                  Lines/Display                  Character Generation (dots)                  Resolution (pixels)                  Monochrome                  No. of Colors                  Refresh Rate                  Brightness                  Contrast  <b>Ergonomic Features</b>                  Tilt/Swivel                  CRT Saver                  Nonglare Screen  <b>Compatibility</b>  <b>First Delivery</b>  <b>Price Data</b>                  Purchase                  Volume Discount  <b>Comments</b></p>	<p><b>Aydin Controls</b>                  8835                  19                  80                  96                  5 x 5                  700 x 400 non-interfaced; 700 x 800 interfaced                  NA                  Infinite                  25-38KHz                  Std                  No                  No                  No                  Opt.                  IBM PC/XT/AT; HP 1000                  August 1983                  \$3,200                  Yes                  —</p>	<p><b>Aydin Controls</b>                  8836                  19                  80                  96                  5 x 5                  1280 x 600 non-interfaced;                  1280 x 1200 interfaced                  NA                  Infinite                  25-38KHz                  Std                  No                  Opt.                  No                  Opt.                  IBM PC/XT/AT; HP 1000                  September 1984                  \$3,200                  Yes                  —</p>	<p><b>Bright Up Industries</b>                  CC1411/CC1421                  14                  80                  25                  1200 lines                  640 x 200/820 x 340                  Opt. text switch, green                  16                  15.75KHz/50Hz                  Std                  Std                  Opt.                  No                  No/Std                  IBM PC                  June 1983                  \$579/\$629                  Yes                  110V/220V</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable





<b>Manufacturer</b> <b>Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Bright Up Industries</b> CC1421-LP 14 80 25 7 x 14 720 x 480 Opt. text switch, green 16 15.75KHz Std Std Opt. No Std IBM PC August 1984 \$689 Yes 110V/220V; 9 pin connector	<b>Bright Up Industries</b> CC1424 14 80 25 7 x 14 720 x 400 Opt. text switch, green 16 15.75KHz Std Std Opt. No Std IBM PC May 1985 \$749 Yes 110V/220V	<b>Cambridge Graphic Systems</b> 1211 12 80 25 8 x 8 800 lines Amber, Green NA 15.75KHz Std Std Std No No Std Apple composite monitor May 1984 \$175 Yes Includes 1 yr. warranty; RCA phone jack
<b>Manufacturer</b> <b>Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Cambridge Graphic Systems</b> 1230 12 80 25 8 x 8 1000 lines Amber, Green NA 18.432KHz Std Std Std No No Std IBM PC, XT, AT May 1984 \$199 Yes Includes 1 yr. warranty; TTL 9 pin connector	<b>Cambridge Graphic Systems</b> MD-3 14 80 25 8 x 8 640 x 400 Amber, Green 16 15.75KHz Std Std No No Opt. IBM PC, XT, AT February 1985 \$480 Yes Includes 1 yr. warranty; TTL 9 pin connector	<b>Electrohome</b> ECD 1904/2504 19/25 80 25 — 560 x 480 NA Infinite 15.75KHz Std Std No No Opt. Any RGB/RS170 signal; IBM PC family 1985 \$995/\$1,071 Yes —

**Notes:**

— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model</b>  <b>Display Unit</b>                      Screen Size (in., diag)                      Characters/Line                      Lines/Display                      Character Generation (dots)                      Resolution (pixels)                      Monochrome                      No. of Colors                      Refresh Rate                      Brightness                      Contrast  <b>Ergonomic Features</b>                      Tilt/Swivel                      CRT Saver                      Nonglare Screen  <b>Compatibility</b>    <b>First Delivery</b>  <b>Price Data</b>                      Purchase                      Volume Discount  <b>Comments</b></p>	<p><b>Electrohome ECM 1311</b>                      13                      80                      24                      —                      720 x 560                      NA                      Infinite                      15KHz                      Std                      Std                      No                      No                      Std                      Any RGB/RS 170 signal; IBM PC family                      1983                      \$999                      Yes                      —</p>	<p><b>Electrohome ECM 1901</b>                      19                      80                      24                      —                      900 x 600                      NA                      Infinite                      15KHz                      Std                      Std                      No                      No                      Std                      Any RGB/RS 170 signal; IBM PC family                      1983                      \$2,150                      Yes                      —</p>	<p><b>Electrohome EVM 920</b>                      9                      80                      24                      —                      800 lines                      White Std                      NA                      15.75KHz                      Std                      Std                      No                      No                      Std                      Any video signal adhering to the refresh rate; TTL connector; BNC connector                      1981                      \$571                      Yes                      Horizontal scan rate user adjustable</p>
<p><b>Manufacturer Model</b>  <b>Display Unit</b>                      Screen Size (in., diag)                      Characters/Line                      Lines/Display                      Character Generation (dots)                      Resolution (pixels)                      Monochrome                      No. of Colors                      Refresh Rate                      Brightness                      Contrast  <b>Ergonomic Features</b>                      Tilt/Swivel                      CRT Saver                      Nonglare Screen  <b>Compatibility</b>    <b>First Delivery</b>  <b>Price Data</b>                      Purchase                      Volume Discount  <b>Comments</b></p>	<p><b>Electrohome EVM 1220</b>                      12                      80                      25                      —                      800 Lines                      White Std                      NA                      15.7KHz-25.5KHz                      Std                      Std                      No                      No                      Std                      Any video signal adhering to the refresh rate; TTL connector; BNC connector                      1981                      \$645                      Yes                      Horizontal scan user adjustable</p>	<p><b>Electrohome EVM 1519</b>                      15                      80                      24                      —                      800 lines                      White Std                      NA                      15.7KHz-25.5KHz                      Std                      Std                      No                      No                      Std                      Any video signal adhering to the refresh rate; TTL connector; BNC connector                      1981                      \$711                      Yes                      Horizontal scan user adjustable</p>	<p><b>Electrohome EVM 1719</b>                      17                      80                      24                      —                      800 lines                      White Std                      NA                      15.7KHz-25.5KHz                      Std                      Std                      No                      No                      Std                      Any video signal adhering to the refresh rate; TTL connector; BNC connector                      1981                      \$792                      Yes                      Horizontal scan user adjustable</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Electrohome</b> EVM 2319 23 80 24 — 800 lines White Std NA 15.7KHz–25.5KHz Std Std No No Std Any video signal adhering to the refresh rate; TTL connector; BNC connector 1981 \$939 Yes Horizontal scan user adjustable	<b>Emulex</b> BoB-compatible Color Monitor 12 80 25 — 720 x 400 NA 16 24.75KHz Std Std No No No IBM PC Series 1985 Vendor declined to provide information Vendor declined to provide information Switchable from monochrome to color	<b>Hewlett-Packard</b> HP 35731 12 80 25 — 512 x 390 Green NA 50Hz Std Std Std No No Std Hewlett-Packard systems 1985 \$310 Vendor declined to provide information —
<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Hewlett-Packard</b> HP 35741 12 80 25 — 640 x 400 NA Sys dependent 50Hz Std Std Std No No Std Hewlett-Packard systems 1985 \$995 Vendor declined to provide information —	<b>MICROTOUCH</b> AMBER*TOUCH 12 80 25 5 x 7 640 x 400 Amber NA 18.432KHz Std Std No No Std IBM PC Series October 1985 Vendor declined to provide information Yes Touch screen; 256 x 256 touch resolution	<b>MICROTOUCH</b> ENHANCED*TOUCH 13 80 25 5 x 7 640 x 200 B/W 16 21.85KHz Std Std No Std Std IBM PC Series October, 1985 Vendor declined to provide information Yes Touch screen; 256 x 256 touch resolution

## Notes:

— Information unavailable at press time  
NA Not applicable



<b>Manufacturer</b> <b>Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>MICROTOUCH</b> NTSC*TOUCH 13 80 25 5 x 7 640 x 250 Green 16 15KHz Std Std No No Std IBM PC Series; Apple; Atari; Commodore; Compaq October 1985 Vendor declined to provide information Yes Touch screen; 256 x 256 touch resolution	<b>MICROTOUCH</b> RGB*TOUCH 13 80 25 5 x 7 640 x 400 B/W 16 50KHz Std Std No Std Std IBM PC Series October 1985 Vendor declined to provide information Yes Touch screen; 256 x 256 touch resolution	<b>Mitsubishi Electronics                  America</b> 6679 15 80 25 5 x 7 720 x 530 NA Infinite 31-32KHz Std Std Opt. — Opt. IBM PC Series & compatibles — \$1,260 Yes —
<b>Manufacturer</b> <b>Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Mitsubishi Electronics                  America</b> AT1332A 14 80 25 5 x 5 640 x 200 NA 16 15.7KHz Std Std Opt. — Opt. IBM PC Series & compatibles — \$345 Yes —	<b>Mitsubishi Electronics                  America</b> C3479 13 80 24 8 x 8 720 x 540 NA Infinite 15.75KHz Std Std Opt. — Opt. IBM PC Series & compatibles — \$814 Yes —	<b>Mitsubishi Electronics                  America</b> C3920 19 80 24 5 x 7 512 x 680 NA Infinite 15.5-23.5KHz Std Std Opt. — Opt. IBM PC Series & compatibles August 1984 \$1,686 Yes —

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer</b> <b>Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Mitsubishi Electronics America</b> C6479 13 80 25 5 x 5 1024 x 780 NA Infinite 31.5KHz Std Std Opt. — Opt. IBM PC Series & compatibles — \$1,032 Yes —	<b>Mitsubishi Electronics America</b> C6920 19 80 25 8 x 8 1024 x 874 NA Infinite 28-35KHz Std Std Opt. — Opt. IBM PC Series & compatibles — \$1,790 Yes —	<b>Mitsubishi Electronics America</b> C9918 19 80 25 5 x 7 1280 x 1024 NA Infinite 60-65KHz Std Std Opt. — Opt. IBM PC Series & compatibles — \$3,100 Yes —
<b>Manufacturer</b> <b>Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Mitsubishi Electronics America</b> XC1404C 13 80 24 5 x 5 640 x 200 NA 16 15.7KHz Std Std Opt. — Opt. IBM PC Series & compatibles — \$450 Yes —	<b>Mitsubishi Electronics America</b> XC-1412C 13 80 25 5 x 5 640 x 480 NA Infinite 30.488KHz Std Std Opt. — Opt. IBM PC Series & compatibles — \$700 Yes —	<b>NEC Home Electronics</b> JB-1201 12 80 25 8 x 8 800 x 230 Green NA 15.75KHz Std Std No No No Apple Ile w/80-col cd; IBM PC w/graphics cd PC w/graphics cd — \$199 —

**Notes:**

— Information unavailable at press time  
NA Not applicable



<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>NEC Home Electronics</b> JB-1205M 12 25 25 8 x 8 800 x 230 Amber NA 15.75KHz Std Std No No No Apple IIe w/80-col cd; IBM — \$199 — —	<b>NEC Home Electronics</b> JB-1260M 12 80 25 8 x 8 600 x 230 Green NA 15.75KHz Std Std No No No Apple IIe w/80-col cd; IBM 1983 \$150 Yes —	<b>NEC Home Electronics</b> JB-1280DA 12 80-25 25 9 x 14 720 x 350 Green NA 18.43KHz Std Std Opt. No Std IBM PC, AT & compatibles 1985 \$199 Yes —
<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>NEC Home Electronics</b> JB-1285DA 12 80-25 25 9 x 14 720 x 350 Amber NA 18.43KHz Std Std Opt. No Std IBM PC, AT & compatibles 1985 \$199 Yes —	<b>NEC Home Electronics</b> JC-1216DF 12 80 25 8 x 8 600 x 240 NA 16 15.75KHz Std Std No No No All sys w/80-col display w/RGB signal; may need color cd — \$599 — —	<b>NEC Home Electronics</b> JC-1225MA 12 40-25 25 8 x 8 250 Center NA 16 15.734KHz Std Std Opt. No No Apple/IBM/Commodore 1985 \$299 Yes —

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>NEC Home Electronics</b> <b>JC-1270MA</b> 12 80-25 25 8 x 8 800 x 200 Green NA 15.75KHz Std Std Opt. No Yes Apple/IBM/Commodore 1985 \$179 Yes —	<b>NEC Home Electronics</b> <b>JC-1275MA</b> 12 80-25 25 8 x 8 800 x 200 Amber NA 15.75KHz Std Std Opt. No Yes Apple/IBM/Commodore 1985 \$179 Yes —	<b>NEC Home Electronics</b> <b>JC-1460D</b> 14 80 25 8 x 8 500 x 240 NA 16 15.75KHz Std Std No No No IBM PC w/color cd; PC's w/RGB signal 1984 \$499 — —
<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Panasonic Industrial</b> <b>BT-P4500D</b> 45 80 25 8 x 6 640 x 240 NA 16 60Hz Std Std No No Std IBM PC Series/Apple III, IIe, II 1984 \$4,995 Yes Rear projection	<b>Panasonic Industrial</b> <b>DT-D1000G</b> 10 80 25 7 x 9 333 x 220 NA 16 60Hz Std Std Opt. No Std IBM PC Series; Apple III 1983 \$229 Yes —	<b>Panasonic Industrial</b> <b>DT-D1300D</b> 13 80 25 5 x 7 400 x 280 NA 16 15.75KHz Std Std No No Std Any sys w/20 pin rectangular connector (RGB mod); any sys w/RCA phono-type connector (composite mod) 1983 \$399 Yes Composite & RGB mod; data grade picture tube

**Notes:**

— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model</b>  <b>Display Unit</b>                      Screen Size (in., diag)                      Characters/Line                      Lines/Display                      Character Generation (dots)                      Resolution (pixels)                      Monochrome                      No. of Colors                      Refresh Rate                      Brightness                      Contrast  <b>Ergonomic Features</b>                      Tilt/Swivel                      CRT Saver                      Nonglare Screen  <b>Compatibility</b>  <b>First Delivery</b>  <b>Price Data</b>                      Purchase                      Volume Discount  <b>Comments</b></p>	<p><b>Panasonic Industrial</b>                      DT-H103                      10                      80                      25                      8 x 8                      640 x 480                      NA                      16                      60Hz                      Std                      Std                      Std                      No                      No                      Std                      Any sys w/20 pin rectangular connector                      1984                      \$579                      Yes                      —</p>	<p><b>Panasonic Industrial</b>                      DT-M140                      14                      80                      25                      Sys dependent                      480 x 240                      NA                      Sys dependent (RGB linear, NTSC); 16 (RGB TTL)                      15.75KHz                      Std                      Std                      Std                      No                      No                      Std                      Any sys w/RGB (TTL), RGB (linear), composite, teletext, videotex output                      1983                      \$499                      Yes                      Audio, square corner</p>	<p><b>Panasonic Industrial</b>                      DT-S101                      10                      40                      25                      5 x 7                      250 x 300                      NA                      16                      15.75KHz                      Std                      Std                      No                      No                      Std                      Any RCA-type sys (audio/vid)                      1983                      \$249                      Yes                      Dual mode; composite color/b&amp;w monochrome; audio</p>
<p><b>Manufacturer Model</b>  <b>Display Unit</b>                      Screen Size (in., diag)                      Characters/Line                      Lines/Display                      Character Generation (dots)                      Resolution (pixels)                      Monochrome                      No. of Colors                      Refresh Rate                      Brightness                      Contrast  <b>Ergonomic Features</b>                      Tilt/Swivel                      CRT Saver                      Nonglare Screen  <b>Compatibility</b>  <b>First Delivery</b>  <b>Price Data</b>                      Purchase                      Volume Discount  <b>Comments</b></p>	<p><b>Panasonic Industrial</b>                      TR120MDPA/TR120M1PA                      12                      80                      25                      7 x 9                      1,100 lines                      Green, Amber                      NA                      15.75KHz                      Std                      Std                      Opt.                      No                      Std                      Any RCA phono-type sys                      1983                      \$159                      Yes                      Built-in amplifier &amp; speaker</p>	<p><b>Panasonic Industrial</b>                      TR-122M9P/TR-122MYP                      12                      80                      25                      7 x 9                      1,500 lines                      Green, Yellow                      NA                      60Hz                      Std                      Std                      Opt.                      No                      Std                      IBM PC Series                      1984                      \$219                      Yes                      —</p>	<p><b>Panasonic Industrial</b>                      TX-12H3P                      12                      80                      25                      5 x 7                      640 x 200                      NA                      16                      50Hz                      Std                      Std                      Std                      Std                      No                      No                      Std                      IBM PC Series                      1984                      \$619                      Yes                      —</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable





<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Princeton Graphic Systems HX-9</b> 9 80 25 8 x 8 640 x 200 NA 16 60Hz Std No Std No Std IBM PC Series 1985 \$650 Yes IBM Color Graphics adapter compatible	<b>Princeton Graphic Systems HX-9E</b> 9 80 25 8 x 8 640 x 200 NA 16 60Hz Std Std Std No Std IBM PC Series March 1985 \$750 Yes IBM Color Graphics adapter compatible	<b>Princeton Graphic Systems HX-12</b> 12 80 25 8 x 8 640 x 200 NA 16 60Hz Std No Std IBM PC Series September 1982 \$695 Yes IBM Color Graphics adapter compatible
<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Princeton Graphic Systems HX-12E</b> 12 80 25 8 x 8 640 x 200 NA 16 60Hz Std Std Opt. No Std IBM PC Series March 1985 \$785 Yes IBM Color Graphics adapter compatible	<b>Princeton Graphic Systems MAX-12</b> 12 80 25 Mono mode: 9 x 14 Color mode: 8 x 8 Mono mode: 720 x 350 Color mode: 640 x 200 Amber NA Mono mode: 50Hz Color mode: 60Hz Std Std Opt. No Std IBM PC Series 1984 \$249 Yes Compatible w/IBM monochrome card, and graphics adapter	<b>Princeton Graphic Systems SR-12</b> 12 80 25 8 x 8 640 x 400 NA 16 60Hz Std Std Opt. No Std IBM PC Series March 1984 \$799 Yes IBM Color Graphics adapter compatible

## Notes:

— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model</b>  <b>Display Unit</b>                  Screen Size (in., diag)                  Characters/Line                  Lines/Display                  Character Generation (dots)                  Resolution (pixels)                  Monochrome                  No. of Colors                  Refresh Rate                  Brightness                  Contrast  <b>Ergonomic Features</b>                  Tilt/Swivel                  CRT Saver                  Nonglare Screen  <b>Compatibility</b>  <b>First Delivery</b>  <b>Price Data</b>                  Purchase                  Volume Discount  <b>Comments</b></p>	<p><b>Princeton Graphic Systems SR-12P</b>                  12                  80                  25                  8 x 8                  640 x 400                  NA                  16                  60Hz                  Std                  Std                  Opt.                  No                  Std                  IBM PC Series                  1985                  \$999                  Yes                  IBM Color Graphics adapter compatible</p>	<p><b>Quadram Amberchrome</b>                  12                  80                  25                  7 x 8                  720 x 350                  Amber                  NA                  60Hz                  Std                  Std                  No                  Sys dependent                  Std                  IBM PC Series                  May 1984                  \$250                  Yes                  —</p>	<p><b>Quadram Quadchrome</b>                  12                  80                  25                  8 x 8                  690 x 240                  NA                  16                  60Hz                  Std                  No                  No                  No                  Std                  IBM PC Series                  1983                  \$695                  Yes                  —</p>
<p><b>Manufacturer Model</b>  <b>Display Unit</b>                  Screen Size (in., diag)                  Characters/Line                  Lines/Display                  Character Generation (dots)                  Resolution (pixels)                  Monochrome                  No. of Colors                  Refresh Rate                  Brightness                  Contrast  <b>Ergonomic Features</b>                  Tilt/Swivel                  CRT Saver                  Nonglare Screen  <b>Compatibility</b>  <b>First Delivery</b>  <b>Price Data</b>                  Purchase                  Volume Discount  <b>Comments</b></p>	<p><b>Quadram Quadchrome II</b>                  14                  80                  25                  8 x 8                  640 x 200                  NA                  16                  60Hz                  Std                  Std                  No                  No                  No                  IBM PC Series                  May 1984                  \$650                  Yes                  —</p>	<p><b>RCA New Products Division VP4012</b>                  12                  80                  25                  6 x 8                  800 x 400                  Green                  NA                  15.75KHz                  Std                  Std                  Std                  No                  No                  Std                  IBM PC Series/Apple family                  May 1985                  \$199                  Yes                  Built-in audio amplifier &amp; speaker</p>	<p><b>Roland DG CC-121</b>                  12                  80                  25                  5 x 7                  640 x 240                  RGB                  16                  15.75KHz                  Std                  Std                  No                  No                  No                  IBM PC, Apple family                  February 1985                  \$599                  Yes                  —</p>

**Notes:**  
 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Roland DG</b> <b>CD-240</b> 12 80 25 5 x 7 720 x 400 NA 16 26.5KHz Std Std No No Std IBM PC, Apple family April 1985 \$799 Yes —	<b>Roland DG</b> <b>MA-121</b> 12 80 25 5 x 7 640 x 240 Green, amber NA 15.75KHz Std Std No No No No IBM PC, Apple family October 1984 \$179 Yes —	<b>Roland DG</b> <b>MA-122</b> 12 80 25 9 x 14 720 x 350 Green, amber NA 18.432KHz Std Std No No No No IBM PC, Apple family October 1984 \$215 Yes —
<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Roland DG</b> <b>MB-121</b> 12 80 25 5 x 7 640 x 200 Green, amber NA 15.75KHz Std Std No No Std IBM PC, Apple family October 1984 \$200 Yes —	<b>Roland DG</b> <b>MB-122</b> 12 80 25 9 x 14 720 x 350 Green, amber NA 18.432KHz Std Std No No Std IBM PC, Apple family October 1984 \$225 Yes —	<b>Roland DG</b> <b>MB-142</b> 14 80 25 9 x 14 720 x 350 Black/white NA 18.432KHz Std Std No No Std IBM PC, Apple family October 1984 \$375 Yes —

**Notes:**

— Information unavailable at press time  
NA Not applicable



<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors  Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b>  <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Sakata USA Corp</b> SA1500  12 80 25 5 x 7  800 x 750 Amber NA  18.43KHz Std Std No No Std IBM PC family  August 1985  \$189 No Video bandwidth of 25MHz; IBM cable integral	<b>Sakata USA Corp</b> SC100  13 40 25 5 x 7  280 x 300 NA Sys dependent  15.73KHz Std Std Opt. No No All systems that accept composite video signal  September 1983  \$299 No Equipped with audio speaker; earphone jack std	<b>Sakata USA Corp</b> SC150  13 40 25 7 x 12  280 x 300 Green w/text switch Composite 16 15.7KHz Std Std Opt. No No All systems that accept composite video signal; IBM PC family  October 1983  \$519 No Changes from composite to RGB/green text switch
<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b>  <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Sakata USA Corp</b> SC200  13 80 25 5 x 7  640 x 240 Green NA 15.75KHz Std No Opt. No No No IBM PC family  October 1983  \$599 No Unit shipped w/IBM cable	<b>Sakata USA Corp</b> SC300P  13 80 25 5 x 7  800 x 400 NA 16 24.83KHz Std No Opt. No No No IBM PC family  October 1983  \$799 No Designed to work with 28.83KHz board	<b>Sakata USA Corp</b> SA1000  12 80 25 5 x 7  900 x 800 Amber NA 15.75KHz Std Std No No Std Systems that accept composite video signal  January 1984  \$159 No Video bandwidth of 18MHz

Notes:

— Information unavailable at press time  
 NA Not applicable



<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Sakata USA Corp</b> <b>SG1000</b> 12 80 25 5 x 7 900 x 800 Green NA 15.75KHz Std Std No No Std Systems that accept composite video signal December 1983 \$149 No Video bandwidth of 18MHz	<b>Sakata USA Corp</b> <b>SG1500</b> 12 80 25 5 x 7 800 x 750 Green NA 18.43KHz Std Std No No Std IBM PC family August 1985 \$169 No Video bandwidth of 25MHz; IBM cable integral	<b>Sanyo</b> <b>CRT 40</b> 12 80 25 7 x 9 640 x 200 Green NA 18.43KHz Std Std Opt. No Std Sanyo Series 675, 775, 880, and all PC compatibles September 1985 \$209 Yes —
<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Sanyo</b> <b>CRT 41</b> 12 80 25 7 x 9 640 x 200 Amber NA 18.43KHz Std Std Opt. No Std Sanyo Series 675, 775, 880, and all PC compatibles September 1985 \$209 Yes —	<b>Sanyo</b> <b>CRT 80</b> 12 80 25 8 x 8 540 x 200 NA 16 15.75KHz Std Std Opt. No Std Sanyo Series 675, 775, 880, and all PC compatibles September 1985 \$599 Yes —	<b>Sanyo</b> <b>CRT 88</b> 12 80 25 8 x 8 640 x 200 NA 16 15.75KHz Std Std Opt. No Std Sanyo Series 675, 775, 880, and all PC compatibles September 1985 \$699 Yes —

**Notes:**

— Information unavailable at press time  
NA Not applicable



<p><b>Manufacturer Model</b>  <b>Display Unit</b>                  Screen Size (in., diag)                  Characters/Line                  Lines/Display                  Character Generation (dots)                  Resolution (pixels)                  Monochrome                  No. of Colors                  Refresh Rate                  Brightness                  Contrast  <b>Ergonomic Features</b>                  Tilt/Swivel                  CRT Saver                  Nonglare Screen  <b>Compatibility</b>  <b>First Delivery</b>  <b>Price Data</b>                  Purchase                  Volume Discount  <b>Comments</b></p>	<p><b>Sony</b>                  CPD-1201                  12                  100                  25                  8 x 8                  800 x 240                  NA                  16                  15.75KHz                  Std                  Std                  No                  No                  Std                  IBM PC Series                  March 1985                  —                  —                  —</p>	<p><b>Sony</b>                  CPD-9000                  9                  80                  25                  8 x 8                  640 x 240                  NA                  16                  15.75KHz                  Std                  Std                  No                  No                  No                  IBM PC Series                  March 1985                  Vendor declined to provide information                  Vendor declined to provide information                  —</p>	<p><b>Sony</b>                  KV-1311CR                  13                  80                  25                  8 x 8                  640 x 200                  No                  16                  15.75KHz                  Std                  Std                  No                  —                  No                  IBM PC Series, others                  w/composite video input                  March 1985                  \$595                  Yes                  Built-in TV channel tuner</p>
<p><b>Manufacturer Model</b>  <b>Display Unit</b>                  Screen Size (in., diag)                  Characters/Line                  Lines/Display                  Character Generation (dots)                  Resolution (pixels)                  Monochrome                  No. of Colors                  Refresh Rate                  Brightness                  Contrast  <b>Ergonomic Features</b>                  Tilt/Swivel                  CRT Saver                  Nonglare Screen  <b>Compatibility</b>  <b>First Delivery</b>  <b>Price Data</b>                  Purchase                  Volume Discount  <b>Comments</b></p>	<p><b>Tatung</b>                  CM-1380                  13                  80                  25                  8 x 8                  640 x 200                  NA                  16                  15.75KHz                  Std                  Std                  No                  No                  Std                  IBM PC Series                  1984                  —                  —                  —</p>	<p><b>Taxan</b>                  115/116                  12                  80                  25                  5 x 7                  1,000 x 262                  Green, amber                  NA                  15.75KHz                  Std                  Std                  Opt.                  No                  Std                  IBM PC Series; Apple; Atari;                  Commodore; Tandy;                  Columbia; Compaq                  1982/1984                  \$169.95/\$179.95                  Yes                  —</p>	<p><b>Taxan</b>                  121/122                  12                  80                  25                  7 x 9                  1,000 x 360                  Amber/ green                  NA                  18.432KHz                  Std                  Std                  Opt.                  No                  Std                  IBM PC Series                  1984                  \$189.95/\$199.95                  Yes                  —</p>

Notes:  
 — Information unavailable at press time  
 NA Not applicable



<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Taxan</b> <b>220</b> 14 40 25 5 x 7 500 interlaced NA Sys dependent 15.75KHz Std Std Opt. No No IBM PC; Compaq; Columbia; Apple; Atari — \$349.95 Yes Built-in 2-watt audio	<b>Taxan</b> <b>400</b> 12 160 24 9 x 10 720 x 200 NA 16 24.75KHz Std Std No No No IBM PC Series; Columbia; Compaq \$609.95 Yes Switchable to green for text; built-in audio includes cable	<b>Taxan</b> <b>410/411</b> 12 80 25 5 x 7 510 x 262 NA Sys dependent 15.75KHz Std Std No No No IBM PC Series; Compaq; Apple; Tandy 1984 \$469.95/\$499.95 Yes Built-in audio cable
<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Taxan</b> <b>420</b> 12 80 25 5 x 7 640 x 262 NA Sys dependent 15.75KHz Std Std No No No IBM PC Series; Tandy; Apple 1983 \$579.95/\$599.95 Yes —	<b>Taxan</b> <b>425</b> 12 80 25 5 x 7 640 x 262 NA Sys dependent 15.75KHz Std Std No No Std IBM PC Series 1983 \$799.95 Yes Switchable to green for text; .31 dot pitch	<b>Thomson</b> <b>CM31311 SI</b> 12 80 25 Sys dependent 560 x 240 Amber, green, blue NA 15.7KHz Std Std No Sys. dependent Std IBM PC Series November 1985 \$629 Yes —

**Notes:**

— Information unavailable at press time  
NA Not applicable



<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b>  <b>First Delivery</b> <b>Price Data</b> Purchase  Volume Discount <b>Comments</b>	<b>Thomson</b> <b>CM31481 VI</b> 12 80 25 Sys dependent 560 x 246 Amber, green, blue NA 15.7KHz Std Std No Sys dependent Std Apple II family; Commodore; Osborne (text); Apple IIc & IIe (RGB mode) IBM PC family and compatibles may require color graphics adapter 1986 \$499 Yes —	<b>Thomson</b> <b>CM36311 ID</b> 14 80 25 Sys dependent 640 x 200 NA 16 15.7KHz Std Std No No Std IBM PC family  1985 Vendor declined to provide information Yes —	<b>Thomson</b> <b>CM36432 SI</b> 14 80 25 Sys dependent 560 x 240 Amber, green, blue NA 15.7KHz Std Std No Sys dependent Std Apple IIc & IIe (RGB mode) IBM PC family and compatibles may require color graphics adapter 1985 \$529 Yes —
<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b>  <b>First Delivery</b> <b>Price Data</b> Purchase  Volume Discount <b>Comments</b>	<b>Thomson</b> <b>CM36512 VI</b> 14 80 25 Sys dependent 560 x 246 Amber NA 15.7KHz Std Std No Sys dependent Std Apple family; Commodore; Osborne; Atari (text); Apple IIc & IIe (RGB mode) IBM PC family and compatibles may require color graphics adapter 1985 \$429 Yes —	<b>Thomson</b> <b>CM36632V</b> 14 40 25 Sys dependent 260 x 300 NA 16 15.7KHz Std Std No No No Apple family; Commodore; IBM PC family; Osborne  1985 \$299 Yes —	<b>Thomson</b> <b>VM 3101 VG/VA</b> 12 80 25 Sys dependent 1,000 lines (center) Amber, Green NA 15.7KHz Std Std Opt. Sys dependent Std Apple; Atari; Commodore; IBM PC Series 1985 Vendor declined to provide information Yes —

## Notes:

— Information unavailable at press time  
NA Not applicable



<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Thomson</b> VM3102 IG/IA 12 80 25 Sys dependent 1,000 (center) Green / Amber NA 18.432KHz Std Std No No Std IBM PC family 1984 \$199 Yes —	<b>Thomson</b> VM3102 VG/VA 12 80 25 Sys dependent 1,000 (center) Green / Amber NA 15.5KHz Std Std No No Std Apple family; Commodore; IBM family; Osborne 1985 \$179 Yes —	<b>Zenith Data Systems</b> ZVM-124 12 80 25 — 720 x 350 Amber NA — Std Std Std No Std IBM PC Series 1984 \$199 Yes —
<b>Manufacturer Model</b> <b>Display Unit</b> Screen Size (in., diag) Characters/Line Lines/Display Character Generation (dots) Resolution (pixels) Monochrome No. of Colors Refresh Rate Brightness Contrast <b>Ergonomic Features</b> Tilt/Swivel CRT Saver Nonglare Screen <b>Compatibility</b> <b>First Delivery</b> <b>Price Data</b> Purchase Volume Discount <b>Comments</b>	<b>Zenith Data Systems</b> ZVM-130 13 40 25 — 390 lines NA 13 — Std Std Opt. No No Apple family; IBM PC family; Commodore; Atari 1984 Vendor declined to provide information Yes —	<b>Zenith Data Systems</b> ZVM-1220 A/ZVM-1230 A 12 80 25 8 x 9 800 lines Amber/Green NA — Std Std Opt. No Std Apple family; IBM PC family; Commodore; Atari; Zenith 100, Zenith 200 1983 \$199 Yes —	<b>Zenith Data Systems</b> ZVM-1240 12 80 25 — 720 lines Amber NA — Std Std Opt. No Std IBM PC family; Zenith 100 1984 \$229 Yes —

**Notes:**

— Information unavailable at press time  
NA Not applicable



Manufacturer	Zentec	Zentec	Zentec
<b>Model</b>	Zephyr 52	Zephyr 100	Zephyr 220
<b>Display Unit</b>			
Screen Size (in., diag)	12	14	14
Characters/Line	80	80	80
Lines/Display	25	—	25
Character Generation (dots)	10 x 12	10 x 10	10 x 10
Resolution (pixels)	7 x 9	7 x 9	7 x 9
Monochrome	Green	Green, amber	Green, amber
No. of Colors	NA	NA	NA
Refresh Rate	Std	Std	Std
Brightness	No	Std	Std
Contrast	Std	Std	Std
<b>Ergonomic Features</b>			
Tilt/Swivel	Std	Std	Std
CRT Saver	Std	Std	Std
Nonglare Screen	Std	Std	Std
<b>Compatibility</b>	—	—	—
<b>First Delivery</b>	1983	May 1985	November 1984
<b>Price Data</b>			
Purchase	\$490	\$650	\$850
Volume Discount	Yes	Yes	Yes
<b>Comments</b>	—	—	—

Notes:  
 — Information unavailable at press time  
 NA Not applicable





# LONG-HAUL MODEMS

## Specifications Chart Guide

Informed equipment selection depends on knowing which equipment characteristics are important. The characteristics detailed in the modem specifications charts have been selected to provide the user with sufficient information for a fair comparison of competing units.

A modem is usually defined as a device that performs modulation and demodulation—converting a computer's digital data to analog signals for transmission over telephone lines and then reconverts the analog signals to digital at the other end of the line. A modem also serves as an interface between data processing equipment and the transmission facility. Although devices that interface without converting—for example, AT&T DATAPHONE® Digital Service units, Electronic Industries Association (EIA) extender units, and some interface devices used in short-haul transmission—are sometimes called modems, they are not included here. The specifications charts cover traditional long-haul modems that are hardwired, as opposed to acoustically or inductively coupled, to the transmission facility. Acoustic and inductive couplers, as well as short-haul modems, are listed in separate specification charts. Specifications for long-haul modems are presented in five specifications charts, which are grouped according to transmission speed: 0 to 300, 300 to 1,200, 1,200 to 2,400, 2,400 to 9,600, and over 9,600 bits per second (bps).

### MANUFACTURER AND MODEL

These entries list the vendor name and equipment model designation. In some cases, it is not practical to list each model separately. If more than one model is included in a given listing and the specifications do not apply to all models, the affected model is inserted in parentheses. For example, if the Line Type entry says “DDD (301) and 3002,” all versions of the unit can operate on a 3002 circuit but only the model inserted in parentheses (i.e., 301) can operate on DDD.

### TRANSMISSION CHARACTERISTICS

This section lists the data communications facilities and characteristics of the modem.

- **Data Rate**—The maximum synchronous and asynchronous data rates are given. The synchronous rate is omitted for long-haul modems with speeds up to 300 bits per second because this type of modem is usually asynchronous.
- **Mode**—Mode refers to data direction. All modems can operate in at least the simplex mode (data travels in only one direction). Generally, the simplex term is used when it represents the modem's maximum capability. Simplex mode requires a 2-wire circuit only. The term *2 wire* refers to a single communications channel, the term *4 wire* refers to two channels. A single channel typically utilizes a single telephone circuit and involves two physical wires. In

some isolated instances, a single channel requires two telephone circuits and four physical wires. Any requirement for multiple telephone circuits is noted in the Line Type category.

A half-duplex (HDX) modem can transmit data in both directions but not simultaneously. HDX can be 2 or 4 wire. Because an HDX modem can always operate in a simplex mode, this information is not indicated in the chart.

A full-duplex (FDX) modem can transmit data in both directions simultaneously. FDX can also be 2 or 4 wire. An FDX modem can always operate in HDX mode; however, unless stated otherwise, the wire indication given for FDX must be observed with HDX.

- **Electrical Interface**—Electrical Interface refers to the type of connection between the modem and a terminal, front-end processor, or CPU. Adherence to a particular standard, however, does not imply total adherence. Each vendor decides which portions of the standard are essential for proper operation of a particular modem. If communications hardware or software has been designed to utilize uncommon interface signals, the modem vendor should be questioned about those signals.
- **Line Type**—Line Type refers to the physical and electrical characteristics of the telephone circuit required by the modem. The term *DDD* refers to direct-distance dialing (the public dial-up telephone network). The term *3002* refers to voicegrade circuits leased from a telephone company. If a 3002 circuit requires any special conditioning (supplied by Telco at extra charge), the specific conditioning is indicated.

The designation 43401 represents a particular type of leased telephone circuit that is frequently available from telephone companies. This circuit is generally used with short-haul modems. The 43401 designation means that a unit can operate with a 43401 circuit without violating Telco-imposed restrictions. Twisted wire pair refers to a telephone circuit installed by user personnel. A modem designed for one line type does not necessarily operate on another line type; however, those designed for DDD or for the 3002 or 43401 line type can always be used with a twisted wire pair. When EIA is indicated as the line type, the unit being described is actually an EIA distance extension unit. A single unit would replace two modems, and EIA cables are connected to each side of the unit.

- **RS/CS Delay**—This entry supplies, usually in milliseconds, the request-to-send/clear-to-send (RS/CS) delay time. This is only one aspect of total turnaround time that is affected when a system requires the cycling of RS/CS data. If the requirement results from software only, continuous carrier delay would apply; hardware restrictions result in the need to consider the switched carrier delay. Hardware restrictions are usually experienced when a



multipoint network or HDX (2-wire) modems are used. This delay is often misrepresented as half-duplex turnaround time, but, in fact, this delay is only one portion of the actual turnaround time. The following factors also contribute to the actual turnaround time:

- Propagation delay through the telephone network for the message and its acknowledgment
- The actual time duration of the message
- The time required for the message and its acknowledgment to pass through the electronics of the modems involved
- **Transmit Clock**—The modem source of timing, either internal or external, is listed in this entry. A transmit clock controls the actual data rate. A true synchronous system uses a modem with an internal transmit clock. The modem might generate a clock, or the modem might regenerate a clock from the network; in either case, the terminal's transmitter must respond to the modem clock. A true asynchronous system uses modems with no clocking; this section is omitted from long-haul modems with speeds up to 300 bits per second because these modems usually are asynchronous. The modem can accept data from a terminal regardless of the transmission speed (up to the modem's maximum capability). A hybrid type of system involves a modem clock that depends upon a clock supplied by the terminal. Modem specifications refer to this clock as external, although a corresponding specification for the terminal would refer to the clock as internal. This hybrid system is sometimes called synchronous and sometimes asynchronous; both terms are only partly correct. A more accurate term is isochronous.
- **DAA Required**—A user-owned modem can be directly connected to a leased private line provided by a common carrier. Telephone companies formerly prohibited direct attachment of modems to the DDD network. Interconnection was allowed only through a data access arrangement (DAA) provided by a telephone company. This stipulation changed when the FCC ruled in July 1979 that independent manufacturers could build protective circuitry into their modems. Direct-connect modems with built-in DAAs must conform to FCC registration guidelines. A built-in DAA adds to the cost of a modem.

The DAA Required entry indicates whether an external DAA must be obtained. The reference *No* indicates that the modem contains a built-in DAA. For this parameter and for the FCC Certified parameter, the reference *NA* means that the modem is not intended for DDD usage.

## FCC CERTIFIED

A response of *Yes* means that the modem has received Federal Communications Commission (FCC) certification for direct connection to the public telephone network.

## FEATURES

This section lists additional standard or optional features that enhance the overall performance of the modem.

- **Equalization**—Equalization adapts a modem to the characteristics of a particular telephone line. This entry states

whether the built-in equalization capability is adjustable, and if so, whether the adjustment is manual or automatic. Lower-speed modems usually do not require adjustable equalization, but higher-speed modems usually do. Automatic equalization is more convenient; manual equalization may be difficult for some users and may be impractical if line conditions change frequently.

- **Self-Test**—The Self-Test entry tells whether the modem can be tested without external equipment. If remote control is indicated, a remote modem can be placed into a test configuration by command. In general, self-tests are not conclusive; they are intended to be a guide.
- **Loopback**—The capability of a modem to loop data back to its origin is indicated. Loopbacks can be analog or digital and can be locally or remotely controlled.
- **Other**—The Other entry includes such things as automatic dial, automatic answer, alternate voice/data, and special testing.

## COMPATIBILITY

If the unit is compatible with any Bell Laboratories modems, CCITT specifications, or other standards, the appropriate model or specification number is listed.

## MODULATION

The modulation technique (e.g., FSK, PSK, DPSK, PM) used by the modem is specified.

## CONFIGURATION

A modem can be available as a standalone unit, a rack-mountable unit, or an integral printed circuit (PC) card unit.

## FIRST DELIVERY

The year in which the modem was first sold is specified. If deliveries have not yet begun, the month and year of scheduled first delivery are given.

## PRICE DATA

In this category, the purchase price is listed along with monthly rental or monthly lease rates if the vendor provides leasing arrangements.

- **Purchase**—This section lists the purchase price of the modem.
- **Rental/Unit/Month**—The monthly rental or monthly lease rate is listed if the vendor provides leasing arrangements. Because of varying vendor practices, lease length could not be standardized. Listed monthly rates are based on the shortest lease available.
- **Quantity Discount**—This entry indicates whether the manufacturer offers a discount for large orders.

## COMMENTS

This category explains options or characteristics not covered by the other categories.



# SPECIFICATIONS CHART

## Long-Haul Modems, 0 to 300 bps

237.0045.001

<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>            Max Async Data Rate (bps)            Mode            Electrical Interface            Line Type            RS/CS Delay              Switched Carrier              Continuous Carrier            DAA Required  <b>FCC Certified</b>  <b>Features</b>            Equalization            Self-Test            Loopback            Other  <b>Compatibility</b>  <b>Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>            Purchase/Unit            Rental/Unit/Month            Quantity Discount  <b>Comments</b></p>	<p><b>American Bell</b>            103JR            300            FDX (2 wire)            RS-232C            DDD            NA            NA            No            Yes            No            Yes (local, remote)            Yes (analog, digital)            Alternate voice/data;              auto-answer (opt.)            Bell Labs 101, 103, 113            FSK            Standalone, rack mountable            1965            \$605            \$19            No            —</p>	<p><b>American Bell</b>            108FR, 108GR            300            FDX (2/4 wire)            RS-232C            3002            See Comments            0 msec            No            Yes            No            Yes (remote)            Yes (digital)            —            Bell Labs 103, 108            FSK            Standalone, rack mountable            1978            \$320            \$10            No            Consult local telephone co for            special clear-to-send timing</p>	<p><b>American Bell</b>            407CR Touch-Tone Receiver            300            HDX (2 wire)            RS-232C, contact closure            DDD            NA            NA            No            Yes            No            Yes (local, remote)            No            Auto-answer, alternate              voice/data            Ball Labs 401, 407            FSK (answerback only)            Rack mountable            1976            \$4,080            \$155            No            Attended mode</p>
<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>            Max Async Data Rate (bps)            Mode            Electrical Interface            Line Type            RS/CS Delay              Switched Carrier              Continuous Carrier            DAA Required  <b>FCC Certified</b>  <b>Features</b>            Equalization            Self-Test            Loopback            Other  <b>Compatibility</b>  <b>Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>            Purchase/Unit            Rental/Unit/Month            Quantity Discount  <b>Comments</b></p>	<p><b>Astrocom</b>            1300            300            FDX/HDX            RS-232C, TTY            DDD, 3002            NA            NA            No            Yes            No            No            No            Auto-answer (DDD), LED              monitors (RS-232C)            Bell Labs 103, 113            FSK            Standalone, PC cd            1970            \$275-\$385            \$17-\$29 (1-yr lease)            Yes            —</p>	<p><b>Atari</b>            835            300            FDX/HDX (2 wire)            Atari 510            3002            —            —            —            Yes            No            Yes            Std            Autodial            Bell Labs 103            FSK            Standalone            1983            \$279            NA            Yes            Purchase price incl Telelink II            cartridge</p>	<p><b>Bizcomp</b>            1022            300            FDX (2 wire)            RS-232C            DDD, 3002            NA            NA            No            Yes            No            Yes            Yes (analog)            Autodial, auto-answer, repeat              dial            Bell Labs 103, 113            FSK            Standalone            1981            \$249            —            Yes            Incl sign-on message;            third-party leasing</p>

**Notes:**

NA Not applicable  
 — Information unavailable at press time



<b>Manufacturer Model</b> <b>Transmission Characteristics</b> Max Async Data Rate (bps) Mode Electrical Interface Line Type RS/CS Delay Switched Carrier Continuous Carrier DAA Required <b>FCC Certified</b> <b>Features</b> Equalization Self-Test Loopback Other <b>Compatibility Modulation</b> <b>Configuration</b> <b>First Delivered</b> <b>Price Data</b> Purchase/Unit Rental/Unit/Month Quantity Discount <b>Comments</b>	<b>Bizcomp</b> 1080 VersaModem  300 FDX Universal MODCON DDD  NA NA No Yes  No No No — Line powered Bell Labs 103, 113 FSK Standalone 1981  \$139 NA Yes Interface kits for Atari, Apple, and Commodore personal computers avail; originate only	<b>Campbell Scientific</b> DC103A  300 FDX TC235A DDD  — — No Yes  No No No — Bell Labs 103 FSK Standalone 1980  \$450 NA Yes Req 5v power supply; runs on 60 $\mu$ A quiescent current; answer only	<b>Campbell Scientific</b> DC103C  300 FDX TC235A DDD  — — — — — Bell Labs 103 FSK Standalone 1981  \$450 NA Yes Req 5v power supply; runs on 50 $\mu$ A quiescent current; originate only
<b>Manufacturer Model</b> <b>Transmission Characteristics</b> Max Async Data Rate (bps) Mode Electrical Interface Line Type RS/CS Delay Switched Carrier Continuous Carrier DAA Required <b>FCC Certified</b> <b>Features</b> Equalization Self-Test Loopback Other <b>Compatibility Modulation</b> <b>Configuration</b> <b>First Delivered</b> <b>Price Data</b> Purchase/Unit Rental/Unit/Month Quantity Discount <b>Comments</b>	<b>Cermetek</b> DATAMATE 103  300 — RS-232C 3002  — — No Yes  — No Yes Auto-answer, autodial Bell Labs 103 FSK — 1982  \$269 Contact vendor Contact vendor —	<b>Codex</b> 5103R, 5113  300 FDX/HDX (2 wire) RS-232C, CCITT V.24/V.28 3002  — 150 msec No Yes  No Yes Yes (local) — Bell Labs 103J, 113D FSK Standalone, rack mountable 1978  \$425 \$23 (2-yr lease) Yes RJ-11 jack allows use w/FCC-registered phones	<b>Coherent Communications</b> FSM-85A  300 FDX/HDX (2 wire) RS-232C, 20mA current loop 3002  — — — No  — — Yes (analog, digital) — Bell Labs 103 FSK Standalone, rack mountable 1978  Contact vendor — Yes Third-party leasing

**Notes:**

NA Not applicable  
— Information unavailable at press time



<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>                  Max Async Data Rate (bps)                  Mode                  Electrical Interface                  Line Type                  RS/CS Delay                  Switched Carrier                  Continuous Carrier                  DAA Required  <b>FCC Certified</b>  <b>Features</b>                  Equalization                  Self-Test                  Loopback                  Other  <b>Compatibility Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>                  Purchase/Unit                  Rental/Unit/Month                  Quantity Discount  <b>Comments</b></p>	<p><b>ComData</b>                  154E2-14</p> <p>300                  FDX/HDX                  RS-232C                  DDD</p> <p>—                  —</p> <p>No                  Yes</p> <p>No                  No                  Yes                  —</p> <p>Bell Labs 103, 113                  FSK                  PC cd                  1978</p> <p>Contact vendor                  Contact vendor                  Yes                  Integral to Teletype Series 43 term.</p>	<p><b>ComData</b>                  305E2-12</p> <p>300                  FDX (2 wire)                  RS-232C                  DDD, 3002, private</p> <p>—                  —</p> <p>No                  Yes</p> <p>No                  No                  No                  Carrier &amp; data LED indicators                  Bell Labs 103, 113                  FSK                  Standalone                  1981</p> <p>Contact vendor                  Contact vendor                  Yes                  RJ-11 jack &amp; voice/data switch allows use w/FCC-approved phones</p>	<p><b>ComData</b>                  330E2-12</p> <p>300                  FDX/HDX (2 wire)                  RS-232C                  DDD, 3002, private</p> <p>—                  —</p> <p>No                  Yes</p> <p>No                  No                  Yes (digital)                  4 LED indicators                  Bell Labs 103, 113                  FSK                  PC cd                  1978</p> <p>Contact vendor                  Contact vendor                  Yes                  Incl integral power supply; mounts in any ComData 2/8/16/32 cd enclosure</p>
<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>                  Max Async Data Rate (bps)                  Mode                  Electrical Interface                  Line Type                  RS/CS Delay                  Switched Carrier                  Continuous Carrier                  DAA Required  <b>FCC Certified</b>  <b>Features</b>                  Equalization                  Self-Test                  Loopback                  Other  <b>Compatibility Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>                  Purchase/Unit                  Rental/Unit/Month                  Quantity Discount  <b>Comments</b></p>	<p><b>ComData</b>                  330E2-42L</p> <p>300                  FDX/HDX (2 wire)                  RS-232C                  DDD</p> <p>—                  —</p> <p>No                  Yes</p> <p>No                  No                  Yes (digital)                  4 LED indicators</p> <p>Bell Labs 103, 113                  FSK                  PC cd                  1978</p> <p>Contact vendor                  Contact vendor                  Yes                  Answer only; incl integral power supply</p>	<p><b>ComData</b>                  330F2-12</p> <p>300                  FDX/HDX (2 wire; 4 wire opt.)                  RS-232C                  3002, private</p> <p>—                  —</p> <p>NA                  NA</p> <p>No                  No                  Yes (digital)                  4 LED indicators</p> <p>Bell Labs 103, 113                  FSK                  PC cd                  1975</p> <p>Contact vendor                  Contact vendor                  Yes                  Incl integral power supply</p>	<p><b>ComData</b>                  370E2-12 Phonem</p> <p>300                  FDX/HDX                  RS-232C                  DDD</p> <p>—                  —</p> <p>No                  Yes</p> <p>No                  No                  No                  Carrier &amp; data LED indicators,                  Bell Labs 103, 113                  FSK                  Standalone                  1981</p> <p>Contact vendor                  Contact vendor                  Yes                  Phone w/integral modem; incl autodial/disconnect, auto. switch between talk &amp; data modes</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time





<p><b>Manufacturer</b>  <b>Model</b>  <b>Transmission</b>  <b>Characteristics</b>  Max Async Data Rate (bps)  Mode  Electrical Interface  Line Type  RS/CS Delay  Switched Carrier  Continuous Carrier  DAA Required  <b>FCC Certified</b>  <b>Features</b>  Equalization  Self-Test  Loopback  Other  <b>Compatibility</b>  <b>Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>  Purchase/Unit  Rental/Unit/Month  Quantity Discount  <b>Comments</b></p>	<p><b>ComData</b>  370E2-42 Phonem    300  FDX/HDX  RS-232C  DDD    —  —  No  Yes    No  No  No  Carrier, data, ring, off-hook, &amp; answer indicators  Bell Labs 103, 113  FSK  Standalone  1981    Contact vendor  Contact vendor  Yes  Phone w/integral modem; incl autodial/disconnect, auto. switch between talk &amp; data modes</p>	<p><b>Commodore Business Machines</b>  VICMODEM    300  —  RS-232C, TTL  —  —  —  No  Yes  No  —  —  FSK  —  1982    \$110  NA  No  Incl parity, stop bits; prgmb!; compat w/Commodore VIC-20 computer</p>	<p><b>Commodore Business Machines</b>  8010    300  —  RS-232C, TTL  —  —  —  No  Yes  No  —  —  FSK  —  1979    \$295  NA  No  Incl parity off (send), ignore parity (receive); compat w/any Commodore PET/CBM computer</p>
<p><b>Manufacturer</b>  <b>Model</b>  <b>Transmission</b>  <b>Characteristics</b>  Max Async Data Rate (bps)  Mode  Electrical Interface  Line Type  RS/CS Delay  Switched Carrier  Continuous Carrier  DAA Required  <b>FCC Certified</b>  <b>Features</b>  Equalization  Self-Test  Loopback  Other  <b>Compatibility</b>  <b>Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>  Purchase/Unit  Rental/Unit/Month  Quantity Discount  <b>Comments</b></p>	<p><b>Datapoint</b>  9401    300  FDX (2 wire)  Datapoint parallel I/O bus  DDD, 3002    NA  0 msec  Yes  No    Yes (auto.)  No  No  Auto-answer, autodial    Bell Labs 103A  FSK  Standalone  1971    Contact vendor  Contact vendor  Yes  Compat only w/Datapoint proc</p>	<p><b>Datatronix</b>  TCK-1-1    300  FDX (2 wire)  RS-232C  DDD, TWX    NA  NA  No  Yes    Yes (auto.)  Yes  Yes (analog, digital)  Auto. speed control, alternate voice/data  Ball Labs 101C, 103J  FSK  Integral PC cd  —    Contact vendor  Contact vendor  Contact vendor  Microproc based</p>	<p><b>Datatronix</b>  TCK-2-1    300  FDX (2 wire)  RS-232C  DDD, TWX    NA  NA  No  Yes    Yes (auto.)  Yes  Yes (analog, digital)  Auto. speed control, alternate voice/data  Bell Labs 101C, 103J  FSK  Standalone  —    Contact vendor  Contact vendor  Contact vendor  Microproc based; answerback (opt.)</p>

Notes:  
NA Not applicable  
— Information unavailable at press time



<p><b>Manufacturer</b> <b>Model</b> <b>Transmission</b> <b>Characteristics</b> Max Async Data Rate (bps) Mode Electrical Interface Line Type RS/CS Delay Switched Carrier Continuous Carrier DAA Required <b>FCC Certified</b> <b>Features</b> Equalization Self-Test Loopback Other</p> <p><b>Compatibility</b> <b>Modulation</b> <b>Configuration</b> <b>First Delivered</b> <b>Price Data</b> Purchase/Unit Rental/Unit/Month Quantity Discount <b>Comments</b></p>	<p><b>Datatronix</b> TCK-3-1</p> <p>300 FDX (2 wire) 20mA current loop DDD, TWX</p> <p>NA NA No Yes</p> <p>No Yes Yes (analog, digital) —</p> <p>Bell Labs 101C, 103J FSK Integral PC cd —</p> <p>Contact vendor Contact vendor Contact vendor Microproc based</p>	<p><b>Datatronix</b> TCM-1-2</p> <p>300 FDX (2 wire) TTL; RS-232C (opt.) DDD, TWX, telex</p> <p>NA NA No Yes</p> <p>No Yes No 3 lines</p> <p>Bell Labs 101C, 103J; telex FSK Integral PC cd —</p> <p>Contact vendor Contact vendor Contact vendor Microproc based; incl 15K buffer, several protocols, delayed send</p>	<p><b>Datec</b> 33</p> <p>300 FDX/HDX (2 wire) RS-232C DDD, 3002</p> <p>— — No Yes</p> <p>Yes (auto.) Yes Yes (analog, digital) Auto-answer, front-panel voice/data control, long-space disconnect</p> <p>Bell Labs 103, 113 FSK Standalone, rack mountable 1981</p> <p>Contact vendor Contact vendor Contact vendor Incl delayed analog loop</p>
<p><b>Manufacturer</b> <b>Model</b> <b>Transmission</b> <b>Characteristics</b> Max Async Data Rate (bps) Mode Electrical Interface Line Type RS/CS Delay Switched Carrier Continuous Carrier DAA Required <b>FCC Certified</b> <b>Features</b> Equalization Self-Test Loopback Other</p> <p><b>Compatibility</b> <b>Modulation</b> <b>Configuration</b> <b>First Delivered</b> <b>Price Data</b> Purchase/Unit Rental/Unit/Month Quantity Discount <b>Comments</b></p>	<p><b>Gandalf Data</b> LDS 135AA/FSK</p> <p>300 FDX (2 wire) RS-232C, CCITT V.24/V.28 3002</p> <p>— — NA NA</p> <p>Yes (manual) — Yes (analog) LED indicators; auto-answer (opt.) PACX systems FSK Standalone 1972</p> <p>\$300; \$720 (auto-answer) Contact vendor Yes Incl thumbwheel selectors for PACX selection; originate only; provides 20mA current loop for driving teletypes</p>	<p><b>General DataComm Industries</b> DataComm 103J</p> <p>300 FDX/HDX (2 wire) RS-232C DDD</p> <p>— — No Yes</p> <p>— Yes Yes (analog, digital) —</p> <p>Bell Labs 103, 112 — Standalone, rack mountable 1981</p> <p>\$550 Contact vendor Yes Incl brownout protection</p>	<p><b>General DataComm Industries</b> 103J-M</p> <p>300 FDX (2 wire) RS-232C DDD</p> <p>— — No Yes</p> <p>— Yes Yes (analog, digital) Auto-answer</p> <p>Bell Labs 103, 113 FSK — 1981</p> <p>\$250 Contact vendor Yes —</p>

**Notes:**  
NA Not applicable  
— Information unavailable at press time



<p><b>Manufacturer</b></p> <p><b>Model</b></p> <p><b>Transmission Characteristics</b></p> <p>Max Async Data Rate (bps)</p> <p>Mode</p> <p>Electrical Interface</p> <p>Line Type</p> <p>RS/CS Delay</p> <p>Switched Carrier</p> <p>Continuous Carrier</p> <p>DAA Required</p> <p><b>FCC Certified</b></p> <p><b>Features</b></p> <p>Equalization</p> <p>Self-Test</p> <p>Loopback</p> <p>Other</p> <p><b>Compatibility</b></p> <p><b>Modulation</b></p> <p><b>Configuration</b></p> <p><b>First Delivered</b></p> <p><b>Price Data</b></p> <p>Purchase/Unit</p> <p>Rental/Unit/Month</p> <p>Quantity Discount</p> <p><b>Comments</b></p>	<p><b>GTE Lenkurt</b></p> <p>25D</p> <p>200</p> <p>FDX (4 wire)/HDX (2 wire)</p> <p>TTY</p> <p>3002</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>NA</p> <p>Bell Labs, CCITT</p> <p>FSK</p> <p>Standalone, rack mountable</p> <p>—</p> <p>Contact vendor</p> <p>Contact vendor</p> <p>Contact vendor</p> <p>—</p>	<p><b>Hayes Microcomputer Products</b></p> <p>Micromodem II</p> <p>300</p> <p>FDX/HDX</p> <p>Apple II bus</p> <p>DDD</p> <p>NA</p> <p>NA</p> <p>—</p> <p>Yes</p> <p>No</p> <p>No</p> <p>Yes</p> <p>Auto-answer, autodial</p> <p>Bell Labs 103</p> <p>FSK</p> <p>PC cd</p> <p>1979</p> <p>\$379</p> <p>NA</p> <p>Contact vendor</p> <p>Incl 2-yr warranty</p>	<p><b>Hayes Microcomputer Products</b></p> <p>Micromodem 100</p> <p>300</p> <p>FDX/HDX</p> <p>S-100 bus</p> <p>DDD</p> <p>NA</p> <p>NA</p> <p>No</p> <p>Yes</p> <p>No</p> <p>No</p> <p>Yes</p> <p>Auto-answer, autodial</p> <p>Bell Labs 103</p> <p>FSK</p> <p>PC cd</p> <p>1979</p> <p>\$399</p> <p>NA</p> <p>Contact vendor</p> <p>Incl 2-yr warranty</p>
<p><b>Manufacturer</b></p> <p><b>Model</b></p> <p><b>Transmission Characteristics</b></p> <p>Max Async Data Rate (bps)</p> <p>Mode</p> <p>Electrical Interface</p> <p>Line Type</p> <p>RS/CS Delay</p> <p>Switched Carrier</p> <p>Continuous Carrier</p> <p>DAA Required</p> <p><b>FCC Certified</b></p> <p><b>Features</b></p> <p>Equalization</p> <p>Self-Test</p> <p>Loopback</p> <p>Other</p> <p><b>Compatibility</b></p> <p><b>Modulation</b></p> <p><b>Configuration</b></p> <p><b>First Delivered</b></p> <p><b>Price Data</b></p> <p>Purchase/Unit</p> <p>Rental/Unit/Month</p> <p>Quantity Discount</p> <p><b>Comments</b></p>	<p><b>Hayes Microcomputer Products</b></p> <p>Smartmodem 300</p> <p>300</p> <p>FDX/HDX</p> <p>RS-232C</p> <p>DDD</p> <p>NA</p> <p>NA</p> <p>No</p> <p>Yes</p> <p>No</p> <p>Yes</p> <p>Yes</p> <p>Auto-answer, autodial, audio monitor</p> <p>Bell Labs 103</p> <p>FSK</p> <p>Standalone</p> <p>1981</p> <p>\$289</p> <p>NA</p> <p>Contact vendor</p> <p>Incl 2-yr warranty</p>	<p><b>Hewlett-Packard</b></p> <p>13265A</p> <p>300</p> <p>FDX (2 wire)</p> <p>—</p> <p>DDD</p> <p>NA</p> <p>NA</p> <p>No</p> <p>Yes</p> <p>NA</p> <p>NA</p> <p>Std (local)</p> <p>Manual/auto. disconnect</p> <p>Bell Labs 103, 113</p> <p>FSK</p> <p>Standalone</p> <p>1983</p> <p>\$500</p> <p>NA</p> <p>Yes</p> <p>Originate only; voice/data mode avail.</p>	<p><b>Hewlett-Packard</b></p> <p>82950A</p> <p>300</p> <p>FDX (2 wire)</p> <p>—</p> <p>DDD</p> <p>NA</p> <p>NA</p> <p>No</p> <p>Yes</p> <p>NA</p> <p>No</p> <p>No</p> <p>—</p> <p>Bell Labs 103, 113</p> <p>FSK</p> <p>PC cd</p> <p>1983</p> <p>\$395</p> <p>NA</p> <p>Yes</p> <p>Originate only; compat w/HP Series 80 personal computers</p>

**Notes:**  
 NA Not applicable  
 — Information unavailable at press time



<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>                  Max Async Data Rate (bps)                  Mode                  Electrical Interface                  Line Type                  RS/CS Delay                  Switched Carrier                  Continuous Carrier                  DAA Required  <b>FCC Certified</b>  <b>Features</b>                  Equalization                  Self-Test                  Loopback                  Other  <b>Compatibility Modulation Configuration</b>  <b>First Delivered Price Data</b>                  Purchase/Unit                  Rental/Unit/Month                  Quantity Discount  <b>Comments</b></p>	<p><b>ICOT</b>                  103J                  300                  FDX                  RS-232C                  DDD, 3002                  800 msec (originate mode)                  NA                  No                  Yes                  No                  Yes                  Yes                  Status indicators                  Bell Labs 103J                  FSK                  Standalone; rack mountable (opt.)                  1982                  \$495                  NA                  Contact vendor                  —</p>	<p><b>Infotron Systems</b>                  DL 113B                  300                  FDX (2 wire)                  RS-232C                  DDD                  150 (± 50) msec w/carrier detect on                  20 (± 10) msec w/carrier detect off                  No                  Yes                  Auto.                  Yes                  Yes (analog, digital)                  Auto-answer                  Bell Labs 103, 113B                  FSK                  Rack mountable                  1979                  \$265                  Contact vendor                  Yes                  Distributed power supply &amp; power failure isolation; monitors status &amp; control signal; 16 modems/std rack mounting</p>	<p><b>Microperipheral</b>                  Atari Bus Decoding                  300                  FDX                  Atari data bus                  DDD                  NA                  NA                  No                  Yes                  No                  No                  Yes                  Autodial (opt.)                  Bell Labs 103                  FSK                  Standalone                  1980                  \$249; \$279 (w/autodial)                  Contact vendor                  Contact vendor                  —</p>
<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>                  Max Async Data Rate (bps)                  Mode                  Electrical Interface                  Line Type                  RS/CS Delay                  Switched Carrier                  Continuous Carrier                  DAA Required  <b>FCC Certified</b>  <b>Features</b>                  Equalization                  Self-Test                  Loopback                  Other  <b>Compatibility Modulation Configuration</b>  <b>First Delivered Price Data</b>                  Purchase/Unit                  Rental/Unit/Month                  Quantity Discount  <b>Comments</b></p>	<p><b>Microperipheral</b>                  Atari RS232                  300                  FDX                  Atari 850                  DDD                  NA                  NA                  No                  Yes                  No                  No                  Yes                  Auto-answer, autodial (opt.)                  Bell Labs 103                  FSK                  Standalone                  1980                  \$199; \$239 (w/auto-answer, autodial)                  Contact vendor                  Contact vendor                  Contact vendor                  Compat w/Atari computers</p>	<p><b>Microperipheral</b>                  European Microconnection                  300                  FDX                  RS-232C                  DDD                  NA                  NA                  No                  Yes                  No                  No                  Yes                  Auto-answer, autodial (opt.)                  CCITT V.21                  FSK                  Standalone                  1980                  Contact vendor                  Contact vendor                  Contact vendor                  —</p>	<p><b>Microperipheral</b>                  IBM Microconnection                  300                  FDX                  IBM data bus                  DDD                  NA                  NA                  No                  Yes                  No                  Yes                  Auto-answer, autodial                  Bell Labs 103                  FSK                  PC cd                  1983                  \$279                  Contact vendor                  Contact vendor                  Compat w/IBM computers</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>  Max Async Data Rate (bps)  Mode  Electrical Interface  Line Type  RS/CS Delay  Switched Carrier  Continuous Carrier  DAA Required  <b>FCC Certified</b>  <b>Features</b>  Equalization  Self-Test  Loopback  Other  <b>Compatibility Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>  Purchase/Unit  Rental/Unit/Month  Quantity Discount  <b>Comments</b></p>	<p><b>Microperipheral OEM Card</b>  300  FDX  TTL  DDD  NA  NA  No  Yes  No  Yes  No  Yes  Yes  Auto-answer, autodial  Bell Labs 103  FSK  PC cd  1981  Contact vendor  Contact vendor  Contact vendor  —</p>	<p><b>Microperipheral RS232 Microconnection</b>  300  FDX  RS-232  DDD  NA  NA  No  Yes  No  No  Yes  Auto-answer, autodial (opt.)  Bell Labs 103  FSK  Standalone  1980  \$159; \$199 (w/auto-answer, autodial)  Contact vendor  Contact vendor</p>	<p><b>Microperipheral TRS-80 Microconnection</b>  300  FDX  TRS-80 data bus  DDD  NA  NA  No  Yes  No  No  Yes  Auto-answer, autodial (opt.)  Bell Labs 103  FSK  Standalone  1980  \$209; \$259 (w/auto-answer, autodial)  Contact vendor  Contact vendor  Compat w/Tandy Radio Shack TRS-80 microcomputer only</p>
<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>  Max Async Data Rate (bps)  Mode  Electrical Interface  Line Type  RS/CS Delay  Switched Carrier  Continuous Carrier  DAA Required  <b>FCC Certified</b>  <b>Features</b>  Equalization  Self-Test  Loopback  Other  <b>Compatibility Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>  Purchase/Unit  Rental/Unit/Month  Quantity Discount  <b>Comments</b></p>	<p><b>Multi-Tech Systems MODEM II</b>  300  FDX/HDX  Apple II bus  DDD  NA  NA  No  Yes  NA  Yes  Yes  Autodial  Bell Labs 103, 113  FSK  PC cd  1982  \$399  Contact vendor  Yes  Comm sys compat w/Apple II</p>	<p><b>Multi-Tech Systems MT103J</b>  300  FDX/HDX  RS-232C  DDD, 3002  NA  NA  No  Yes  NA  No  Yes (analog, digital)  Auto-answer, alternate voice/data  Bell Labs 103, 113  FSK  Standalone, rack mountable  1982  \$295  Contact vendor  Yes  Replacement for 103A/103J</p>	<p><b>Multi-Tech Systems MT113C</b>  300  FDX/HDX  RS-232C  DDD, 3002  NA  NA  No  Yes  NA  No  Yes (analog)  Alternate voice/data  Bell Labs 103, 113  FSK  Standalone, rack mountable  1982  \$235  Contact vendor  Yes  Originate only; replacement for 113A/113C</p>

Notes:  
NA Not applicable  
— Information unavailable at press time



<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>                  Max Async Data Rate (bps)                  Mode                  Electrical Interface                  Line Type                  RS/CS Delay                  Switched Carrier                  Continuous Carrier                  DAA Required  <b>FCC Certified</b>  <b>Features</b>                  Equalization                  Self-Test                  Loopback                  Other  <b>Compatibility</b>  <b>Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>                  Purchase/Unit                  Rental/Unit/Month                  Quantity Discount  <b>Comments</b></p>	<p><b>Multi-Tech Systems</b>                  MT113D                    300                  FDX                  RS-232C                  DDD, 3002                  NA                  NA                  No                  Yes                  NA                  No                  Yes (analog, digital)                  Auto-answer                  Bell Labs 103, 113                  FSK                  Standalone, rack mountable                  1977                  \$275                  Contact vendor                  Yes                  Answer only; replacement for 113B/113D</p>	<p><b>NEC America</b>                  N103JR                    300                  HDX                  RS-232C                  DDD                  —                  —                  No                  Yes                  —                  Yes                  Yes                  Auto-answer, abort timer                  Bell Labs 103, 113, 212A                  FSK                  PC cd                  1982                  \$460                  Contact vendor                  Yes                  —</p>	<p><b>NEC America</b>                  N113C/DR                    300                  HDX                  RS-232C                  DDD                  —                  —                  No                  Yes                  —                  Yes                  Yes                  Abort timer                  Bell Labs 103, 113, 212A                  FSK                  PC cd                  1982                  \$430                  Contact vendor                  Yes                  —</p>
<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>                  Max Async Data Rate (bps)                  Mode                  Electrical Interface                  Line Type                  RS/CS Delay                  Switched Carrier                  Continuous Carrier                  DAA Required  <b>FCC Certified</b>  <b>Features</b>                  Equalization                  Self-Test                  Loopback                  Other  <b>Compatibility</b>  <b>Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>                  Purchase/Unit                  Rental/Unit/Month                  Quantity Discount  <b>Comments</b></p>	<p><b>Novation</b>                  D-Cat                    300                  FDX/HDX                  RS-232C                  —                  —                  —                  —                  —                  Yes                  —                  —                  Yes (analog)                  —                  Bell Labs 100                  FSK                  —                  1980                  Contact vendor                  Contact vendor                  Yes                  Direct connect to modular handset jack</p>	<p><b>Novation</b>                  J-Cat                    300                  FDX (2 wire)                  RS-232C                  DDD, 3002                  —                  —                  No                  Yes                  No                  Yes                  Yes (analog)                  Auto-answer, autosearch                  Bell Labs 103, 113                  FSK                  —                  1982                  \$149                  Contact vendor                  Contact vendor                  —</p>	<p><b>Novation</b>                  103 Smart-Cat                    300                  FDX (2 wire)                  RS-232C                  DDD, 3002                  —                  —                  No                  Yes                  No                  Yes                  Yes                  Autodial, command set                  Bell Labs 103, 113                  FSK                  —                  1982                  \$249                  Contact vendor                  Contact vendor                  —</p>

Notes:

- NA Not applicable
- Information unavailable at press time



<p><b>Manufacturer Model</b>  <b>Transmission</b>  <b>Characteristics</b>  Max Async Data Rate (bps)  Mode  Electrical Interface    Line Type  RS/CS Delay  Switched Carrier  Continuous Carrier  DAA Required  <b>FCC Certified</b>  <b>Features</b>  Equalization  Self-Test  Loopback  Other  <b>Compatibility</b>  <b>Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>  Purchase/Unit  Rental/Unit/Month  Quantity Discount  <b>Comments</b></p>	<p><b>Nu Data</b>  T26    300  FDX/HDX (2 wire)  RS-232C, 20mA/60mA  current loop  DDD, 3002    NA  NA  No  Yes    No  No  No  —  Bell Labs 103, 108  FSK  Standalone, rack mountable    1976    Contact vendor  Contact vendor  Contact vendor  Provides access to Telex I &amp;  Telex II networks</p>	<p><b>Nu Data</b>  108 D/E    300  FDX/HDX (2 wire)  RS-232C, 20mA/60mA  current loop  3002    NA  NA  NA  No    No  Yes (local)  Yes (analog, digital)  —  Bell Labs 103, 108  FSK  Standalone, rack mountable,  PC cd  1976    Contact vendor  Contact vendor  Contact vendor  —</p>	<p><b>Omnitec Data</b>  4500    110  FDX (2 wire)  20mA current loop    TWX    0.5 sec  NA  No  Yes    NA  Yes  Yes (digital)  Auto-answer  Bell Labs 101C  FSK  Standalone    1974    \$862  NA  Yes  —</p>
<p><b>Manufacturer Model</b>  <b>Transmission</b>  <b>Characteristics</b>  Max Async Data Rate (bps)  Mode  Electrical Interface  Line Type  RS/CS Delay  Switched Carrier  Continuous Carrier  DAA Required  <b>FCC Certified</b>  <b>Features</b>  Equalization  Self-Test  Loopback  Other    <b>Compatibility</b>    <b>Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>  Purchase/Unit  Rental/Unit/Month  Quantity Discount  <b>Comments</b></p>	<p><b>Omnitec Data</b>  4700    110  FDX (2 wire)  RS-232C, 20mA current loop  DDD, TWX    0.5 sec  NA  No  Yes    NA  Yes  Yes (digital)  Auto-answer    Bell Labs 101C, 103A    FSK  Standalone  1974    \$899  NA  Yes  —</p>	<p><b>Omnitec Data</b>  4900    300  FDX (2 wire)  RS-232C, 20mA current loop  DDD, TWX    0.5 sec  NA  No  Yes    NA  Yes  Yes (digital)  Auto-answer    Bell Labs 101C, 103A    FSK  Standalone  1974    \$952  NA  Yes  —</p>	<p><b>Prentice</b>  P103J, P113C, P113D    300  FDX/HDX (2 wire)  RS-232C  DDD    —  —  No  Yes    No  No  Yes (analog, digital; local)  Front-panel status, diagnostic  indicators; auto-answer  (P103J, P113D)  Bell Labs 113A, 212A;  Prentice P113A  FSK  Standalone, rack mountable    —    Contact vendor  Contact vendor  Yes  Originate only (P113C);  answer only (P113D)</p>

**Notes:**

NA Not applicable

— Information unavailable at press time



<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>                  Max Async Data Rate (bps)                  Mode                  Electrical Interface                  Line Type                  RS/CS Delay                    Switched Carrier                    Continuous Carrier                  DAA Required  <b>FCC Certified</b>  <b>Features</b>                  Equalization                  Self-Test                  Loopback                  Other  <b>Compatibility Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>                  Purchase/Unit                  Rental/Unit/Month                  Quantity Discount  <b>Comments</b></p>	<p><b>Racal-Vadic</b>                  VA103 Modemphone                    300                  FDX (2 wire)                  RS-232C                  DDD, 3002                    NA                  NA                  No                  Yes                    No                  No                  No                  Auto-answer, alternate voice/data                  Bell Labs 103, 113                    Standalone                  1980                    Contact vendor                  NA                  Yes                  —</p>	<p><b>Racal-Vadic</b>                  VA315                    300                  FDX (2 wire)                  RS-232C                  DDD, 3002                    NA                  NA                  No                  Yes                    —                  Yes                  Yes (analog, digital)                  Auto-answer                  Bell Labs 103, 113                    Rack mountable                  1981                    Contact vendor                  NA                  Yes                  —</p>	<p><b>Racal-Vadic</b>                  VA317                    300                  FDX (2 wire)                  RS-232C                  DDD, 3002                    NA                  NA                  No                  Yes                    Yes (manual)                  Yes                  Yes (analog, digital; remote)                  Auto-answer, status indicators                  Bell Labs 113 B, C                  FSK                  Standalone, rack mountable                  1976                    Contact vendor                  NA                  Yes                  Avail w/up to 16 chan/chassis</p>
<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>                  Max Async Data Rate (bps)                  Mode                  Electrical Interface                  Line Type                  RS/CS Delay                    Switched Carrier                    Continuous Carrier                  DAA Required  <b>FCC Certified</b>  <b>Features</b>                  Equalization                  Self-Test                  Loopback                  Other  <b>Compatibility Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>                  Purchase/Unit                  Rental/Unit/Month                  Quantity Discount  <b>Comments</b></p>	<p><b>Racal-Vadic</b>                  VA355                    300                  FDX (2 wire)                  RS-232C                  DDD, 3002                    NA                  NA                  No                  Yes                    Yes (manual)                  Yes                  Yes (analog, digital)                  Auto-answer, alternate voice/data switch                  Bell Labs 103, 113                  FSK                  Standalone                  1977                    Contact vendor                  NA                  Yes                  —</p>	<p><b>Racal-Vadic</b>                  VI3021                    300                  FDX (2 wire)                  CCITT                  DDD, 3002                    NA                  NA                  No                  —                    Yes (manual)                  Yes                  Yes (analog, digital)                  Auto-answer                  CCITT V.21                  FSK                  Standalone, rack mountable                  1979                    Contact vendor                  Contact vendor                  Yes                  —</p>	<p><b>Racal-Vadic</b>                  VS103P                    300                  FDX                  RS-232C, TTL                    —                  —                  No                  Yes                    —                  —                  —                  Autodial (opt.)                  Bell Labs 103J                  FSK                  Rack mountable                  1982                    Contact vendor                  Contact vendor                  Yes                  —</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time





<p><b>Manufacturer Model</b> <b>Transmission Characteristics</b> Max Async Data Rate (bps) Mode Electrical Interface</p> <p>Line Type RS/CS Delay Switched Carrier Continuous Carrier DAA Required</p> <p><b>FCC Certified</b> <b>Features</b> Equalization Self-Test Loopback Other</p> <p><b>Compatibility</b></p> <p><b>Modulation Configuration</b> <b>First Delivered</b> <b>Price Data</b> Purchase/Unit Rental/Unit/Month Quantity Discount <b>Comments</b></p>	<p><b>Racal-Vadic</b> VS300P</p> <p>300 FDX (2 wire) RS-232C</p> <p>DDD</p> <p>— — No Yes</p> <p>— No No Auto-answer</p> <p>Bell Labs 103, 113</p> <p>FSK PC cd 1978</p> <p>Contact vendor Contact vendor Yes —</p>	<p><b>Rixon</b> R103J</p> <p>300 FDX (2 wire) RS-232C</p> <p>DDD</p> <p>NA NA No Yes</p> <p>No Yes Yes (analog) Auto-answer</p> <p>Bell Labs 103A2, A3, E, G, H, J, 113A, C FSK Standalone, rack mountable 1982</p> <p>Contact vendor Contact vendor Yes Rack mounting supports up to 8 R103J cd modems</p>	<p><b>Rixon</b> T108 Series</p> <p>300 FDX (2 wire) RS-232C, 20mA &amp; 60mA current loop 3002</p> <p>8.5/265 msec 0 msec NA NA</p> <p>No Yes Yes (analog, digital) Alternate voice, DDD backup w/aux data set</p> <p>Bell Labs 103F, 108D, E, F, G, H, J FSK Standalone, rack mountable 1978</p> <p>Contact vendor Contact vendor Yes Up to 16 T108 cd modems can be rack mounted in the Rixon RM40A/B</p>
<p><b>Manufacturer Model</b> <b>Transmission Characteristics</b> Max Async Data Rate (bps) Mode Electrical Interface Line Type RS/CS Delay Switched Carrier Continuous Carrier DAA Required</p> <p><b>FCC Certified</b> <b>Features</b> Equalization Self-Test Loopback Other</p> <p><b>Compatibility</b> <b>Modulation Configuration</b> <b>First Delivered</b> <b>Price Data</b> Purchase/Unit Rental/Unit/Month Quantity Discount <b>Comments</b></p>	<p><b>Tek-Com</b> TC3001</p> <p>300 FDX/HDX RS-232C, 20mA current loop DDD, 3002</p> <p>NA NA Yes (CDT)</p> <p>— No No No —</p> <p>Bell Labs 103, 113 FSK Standalone 1977</p> <p>Contact vendor Contact vendor Yes Switch selectable, hardwired, originate only</p>	<p><b>Tek-Com</b> TC3002</p> <p>300 FDX/HDX RS-232C, 20mA current loop DDD, 3002</p> <p>NA NA Yes (CDT)</p> <p>— No No No —</p> <p>Bell Labs 103, 113 FSK Standalone 1977</p> <p>Contact vendor Contact vendor Yes Switch selectable, hardwired</p>	<p><b>Tek-Com</b> TC3006</p> <p>300 FDX/HDX RS-232C DDD, 3002</p> <p>NA NA Yes (CDT)</p> <p>— No No No —</p> <p>Bell Labs 103, 113 FSK Standalone 1977</p> <p>Contact vendor Contact vendor Yes Originate only</p>

**Notes:**

NA Not applicable  
— Information unavailable at press time



<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>                  Max Async Data Rate (bps)                  Mode                  Electrical Interface                    Line Type                  RS/CS Delay                  Switched Carrier                  Continuous Carrier                  DAA Required  <b>FCC Certified</b>  <b>Features</b>                  Equalization                  Self-Test                  Loopback                  Other  <b>Compatibility</b>    <b>Modulation Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>                  Purchase/Unit                  Rental/Unit/Month                  Quantity Discount  <b>Comments</b></p>	<p><b>Tek-Com</b>                  TC3008                    300                  FDX/HDX                  CCITT                    DDD, 3002                    NA                  NA                  Yes (CDT)                  —                  No                  No                  No                  —                  Bell Labs 103, 113                    FSK                  Standalone                  1977                  Contact vendor                  Contact vendor                  Yes                  Originate only</p>	<p><b>Tek-Com</b>                  TC3009                    300                  FDX/HDX                  CCITT V.24/V.28, 20mA                  current loop                  DDD                    NA                  NA                  No                  No                  No                  —                  CCITT V.24, V.28                    FSK                  Standalone                  1978                  Contact vendor                  Contact vendor                  Yes                  Manual originate/answer; req                  115v/220v, 50/60 Hz</p>	<p><b>Tek-Com</b>                  TC3012                    300                  FDX/HDX                  TTL                    DDD, 3002                    NA                  NA                  Yes (CDT)                  —                  No                  No                  No                  —                  Bell Labs 103, 113; Teletype                  43                  FSK                  Standalone                  1977                  Contact vendor                  Contact vendor                  Yes                  Originate only</p>
<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>                  Max Async Data Rate (bps)                  Mode                  Electrical Interface                  Line Type                  RS/CS Delay                  Switched Carrier                  Continuous Carrier                  DAA Required  <b>FCC Certified</b>  <b>Features</b>                  Equalization                  Self-Test                  Loopback                    Other  <b>Compatibility</b>  <b>Modulation Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>                  Purchase/Unit                    Rental/Unit/Month                  Quantity Discount  <b>Comments</b></p>	<p><b>Tek-Com</b>                  TC4700                    300                  FDX/HDX                  RS-232C                  DDD                    NA                  NA                  No                  Yes                  —                  No                  Yes (remote; digital)                    Auto-answer, integral                  voice/data switch                  Bell Labs 101, 103, 105, 113                  FSK                  Standalone                  1980                  Contact vendor                    Contact vendor                  Yes                  Originate only</p>	<p><b>Timeplex</b>                  R103                    300                  FDX (2/4 wire)                  RS-232C, Mil-Std-188C                  DDD                    200 msec                  NA                  No                  Yes                  No                  No                  Yes (analog, digital; remote &amp;                  local)                  Auto-answer, autodial                  Bell Labs 103, 113                  FSK                  Standalone, PC cd                  1975                  \$399 (standalone), \$315 (PC                  cd)                  —                  Yes                  PC cd req rack holding up to                  14 PC cd modems</p>	<p><b>Timeplex</b>                  103                    300                  FDX (2/4 wire)                  RS-232C, Mil-Std-188C                  DDD, 3002                    200 msec                  NA                  Yes (1000A, 1001A/B/D/F)                  No                  No                  No                  Yes (analog, digital; local &amp;                  remote)                  Auto-answer, autodial                  Bell Labs 103, 113                  FSK                  Standalone, PC cd                  1975                  \$355 (standalone), \$255 (PC                  cd)                  —                  Yes                  PC cd req special rack                  holding up to 14 PC cd                  modems</p>

Notes:  
 NA Not applicable  
 — Information unavailable at press time



<b>Manufacturer</b> <b>Model</b> <b>Transmission</b> <b>Characteristics</b> Max Async Data Rate (bps) Mode Electrical Interface Line Type RS/CS Delay Switched Carrier Continuous Carrier DAA Required <b>FCC Certified</b> <b>Features</b> Equalization Self-Test Loopback Other <b>Compatibility</b> <b>Modulation</b> <b>Configuration</b> <b>First Delivered</b> <b>Price Data</b> Purchase/Unit Rental/Unit/Month Quantity Discount <b>Comments</b>	<b>TNW</b> Operator-103  300 FDX RS-232C DDD  — — No Yes  — — Yes (analog) Auto-answer, autodial, command interpreter Bell Labs 103 FSK Standalone 1983  \$189 — — — 	<b>Tri-Data</b> OZ34 Tri-Net  300 — RS-232C, TTL DDD, Telex I, Telex II  NA NA No Yes  No Yes No —  Bell Labs 103J FSK — 1981  \$1,350 NA Yes Incl 16KB memory, text editing	<b>Tri-Data</b> OZ200 Tri-Net  300 — RS-232C, TTL DDD, Telex I, Telex II  NA NA No Yes  No No Yes —  Bell Labs 103J FSK Standalone 1982  \$1,480 NA Yes Incl 16KB memory, text editing; 32KB memory (opt.)
<b>Manufacturer</b> <b>Model</b> <b>Transmission</b> <b>Characteristics</b> Max Async Data Rate (bps) Mode Electrical Interface Line Type RS/CS Delay Switched Carrier Continuous Carrier DAA Required <b>FCC Certified</b> <b>Features</b> Equalization Self-Test Loopback Other <b>Compatibility</b> <b>Modulation</b> <b>Configuration</b> <b>First Delivered</b> <b>Price Data</b> Purchase/Unit Rental/Unit/Month Quantity Discount <b>Comments</b>	<b>Tuck</b> 1510, 1520, 1530, 1540, 1541  300 FDX (2/4 wire) RS-232C, 20mA current loop DDD, 3002, 43401  — — Yes (CBT) Yes  No Yes (1510, 1520, 1530) Yes (digital; 1510, 1530) Auto-answer (1510, 1530); alternate voice/data (opt.)  Bell Labs 103A  FSK Standalone rack mountable  1970  Contact vendor Contact vendor Contact vendor Incl acoustic coupler (1541)	<b>Tuck</b> 1542, 1543  300 FDX (2/4 wire) RS-232C; TTL (opt.) DDD, 3002, 43401  — — Yes (CBT) Yes  No No No Alternate voice/data, remote acoustic coupler (opt.)  Bell Labs 103A  FSK PC cd  1972  Contact vendor Contact vendor Contact vendor Originate only (1542), answer only (1543)	<b>Tuck</b> 1800 Series  — HDX RS-232C DDD, 3002  NA NA Yes (Tuck 1910, 1911) Yes  NA No No Auto-answer, autodial; alternate voice/data, acoustic coupler (opt.) Bell Labs 401A, E, H, J, L, 403D, E AM Standalone, rack mountable, PC cd 1969  Contact vendor Contact vendor Contact vendor PC cd config req special housing

**Notes:**

NA Not applicable

— Information unavailable at press time



<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>                  Max Async Data Rate (bps)                  Mode                  Electrical Interface                    Line Type                  RS/CS Delay                      Switched Carrier                      Continuous Carrier                  DAA Required  <b>FCC Certified</b>  <b>Features</b>                  Equalization                  Self-Test                  Loopback                  Other    <b>Compatibility Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>                  Purchase/Unit                  Rental/Unit/Month                  Quantity Discount  <b>Comments</b></p>	<p><b>Universal Data Systems</b>                  103-1, 103-2                    300                  FDX                  RS-232C, CCITT V.24                    DDD, 3002                    —                  —                  Yes (CDT)                  No                    No                  —                  Yes (remote)                  —                    Bell Labs 103F, 113A                  FSK                  Standalone                  1973                    Contact vendor                  Contact vendor                  Yes                  Incl TTY, RS-232C receptacles</p>	<p><b>Universal Data Systems</b>                  103J                    300                  FDX                  RS-232C, CCITT V.24,                      current loop                  DDD, 3002                    800 msec (originate mode)                  NA                  No                  Yes                    No                  Yes                  Yes                  Auto-answer, status indicators                  Bell Labs 103                  FSK                  Standalone, rack mountable                  1979                    Contact vendor                  Contact vendor                  Yes                  Rack-mountable config req                  special chassis that houses                  16 modems; compat                  w/Universal Data Systems                  802 autodialer</p>	<p><b>Universal Data Systems</b>                  103J LP, 103LP O/A                    300                  FDX (2 wire)                  RS-232C, CCITT V.24                    DDD, 3002                    —                  0 msec                  No                  Yes                    No                  No                  No                  Auto-answer (103J LP),                      alternate voice/data                  Bell Labs 103                  FSK                  Standalone                  1980                    Contact vendor                  Contact vendor                  Yes                  Oper on line current—no AC                  plug req</p>
<p><b>Manufacturer Model</b>  <b>Transmission Characteristics</b>                  Max Async Data Rate (bps)                  Mode                  Electrical Interface                    Line Type                  RS/CS Delay                      Switched Carrier                      Continuous Carrier                  DAA Required  <b>FCC Certified</b>  <b>Features</b>                  Equalization                  Self-Test                  Loopback                  Other    <b>Compatibility Modulation</b>  <b>Configuration</b>  <b>First Delivered</b>  <b>Price Data</b>                  Purchase/Unit                  Rental/Unit/Month                  Quantity Discount  <b>Comments</b></p>	<p><b>Universal Data Systems</b>                  113D                    300                  FDX                  RS-232C, CCITT V.24, 20mA                      current loop                  DDD, 3002                    —                  NA                  No                  Yes                    No                  No                  Yes (analog)                  Status indicators                    Bell Labs 113                  FSK                  Standalone, rack mountable                  1979                    Contact vendor                  Contact vendor                  Yes                  Rack-mountable config req                  special chassis that holds                  up to 16 modems; compat                  w/Universal Data Systems                  801 autodialer</p>	<p><b>U.S. Robotics</b>                  Auto Link 300                    300                  FDX (2 wire)                  RS-232C                    DDD                    —                  —                  No                  Yes                    No                  Yes                  Yes                  Auto-answer, manual                      originate                  Bell Labs 103, 113                  FSK                  Standalone                  1982                    \$219                  —                  Yes                  Incl 2-yr warranty</p>	<p><b>U.S. Robotics</b>                  Micro Link 300                    300                  FDX (2 wire)                  RS-232C                    DDD                    —                  —                  No                  Yes                  Yes                  Manual answer, manual                      originate                  Bell Labs 103, 113                  FSK                  Standalone                  1982                    \$179                  —                  Yes                  Incl 2-yr warranty</p>

**Notes:**

- NA Not applicable
- Information unavailable at press time



	Ven-Tel MD103J	Ven-Tel MD103J Plus	Visionary Electronics 100
<b>Manufacturer Model</b>	Ven-Tel MD103J	Ven-Tel MD103J Plus	Visionary Electronics 100
<b>Transmission Characteristics</b>			
Max Async Data Rate (bps)	300	300	300
Mode	FDX	FDX	FDX/HDX
Electrical Interface	RS-232C	RS-232C	RS-232C
Line Type	DDD	DDD	DDD
RS/CS Delay			
Switched Carrier	NA	NA	NA
Continuous Carrier	NA	NA	NA
DAA Required	No	No	No
<b>FCC Certified</b>	Yes	Yes	Yes
<b>Features</b>			
Equalization	NA	NA	NA
Self-Test	No	No	No
Loopback	Yes (analog, digital)	Yes (analog, digital)	Yes
Other	Integral voice/data switch	Autodial, stored number dialing	Auto-answer
<b>Compatibility</b>			
<b>Modulation</b>	Bell Labs 103, 113, 212	Bell Labs 103, 113, 212	Bell Labs 103
<b>Configuration</b>	FSK	FSK	FSK
<b>First Delivered</b>	Standalone, rack mountable	Standalone, rack mountable	Standalone
<b>Price Data</b>			
Purchase/Unit	\$195	\$295	\$595
Rental/Unit/Month	Contact vendor	Contact vendor	Contact vendor
Quantity Discount	Yes	Yes	Yes
<b>Comments</b>	—	—	Incl buffer memory, real-time clock/calendar, comm software

**Notes:**

NA Not applicable

— Information unavailable at press time

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# Needs Assessment for Microcomputer LANs

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## OVERVIEW

The myriad networking options for microcomputers continue to multiply faster than networks are implemented. Choices range from mainframe-based computer networks that span continents to microcomputer links between offices in a department. Nonetheless, choosing the right LAN from all the available options appears to be an easy task: surely one particular combination matches the needs of the standard office. Unfortunately, each office and business situation is different, and thus the decision becomes complicated.

Narrowing the alternatives to private branch exchange (PBX), baseband, or broadband LANs does not help. Each LAN requires network planners to choose between twisted-pair wire or coaxial cable transmission media and from among star, tree, bus, or ring topologies. For many of these media and topologies, the proper access method (e.g., carrier sense, token passing, polled, or time assignment), code set (e.g., ASCII, BCD, or EBCDIC), and timing method (e.g., synchronous, asynchronous, or isochronous) must be selected. This report presents a methodology for assessing the need for a microcomputer LAN and using that assessment to make the right choice.

## BACKGROUND

### PBX LANs

The PBX approach typically uses existing telephone wires to connect various office devices, as illustrated in Figure 1.

This approach is the least expensive and most stable of the three technologies that support most access methods and equipment. The PBX-based LAN can also connect with other types of LAN. Although the PBX-based LAN cannot support video communications, it is the most cost-effective voice network and is also useful for data communications in the office.

Microcomputer traffic can be combined in one of two methods: in the telephone set or at the PBX switch. In the first method, digitized voice is multiplexed with data onto the telephone's cable through time-division multiplexing techniques and then separated into two paths at the switch. The Rolm Corporation CBX-II and the Northern Telecom Inc SL-100 are examples of this architecture. In the second method, analog voice and digital data must travel through separate cable pairs from the telephone location to the switch. The Northern Telecom SL-1 typifies this dual-path architecture.

The typical PBX uses twisted-pair cable for all devices, including telephone, data terminal, printer, and facsimile device. When a device wants to establish a connection, it signals the PBX. Upon acknowledgement, the device sends a destination address, and the PBX uses its switching matrix to complete the connection and establish a session.

Table 1 compares the four digital PBX products expected to lead the market over the next few years. The digital data transfer rate for the present generation of digital PBX products is limited to 56K bits per second per line. The number of simultaneously available lines varies from several hundred to several thousand. Because all data is fed into the network over dedi-

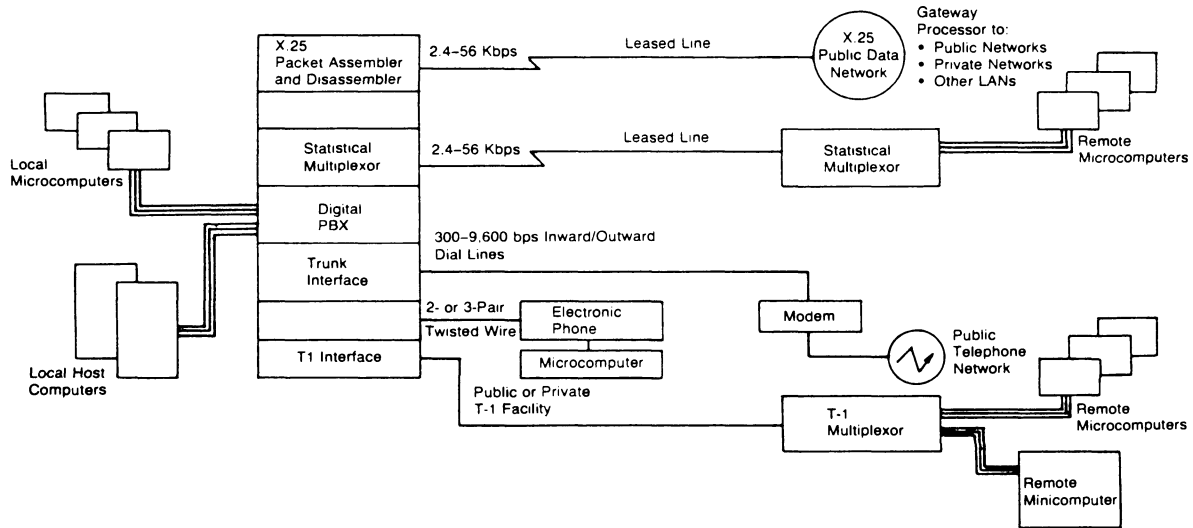


Figure 1. The PBX LAN Model

cated cable, the topology is a star or tree and the access method is usually a type of time-division multiplexing. Most PBX products use 64K bit-per-second pulse code modulation (PCM) encoding that results in satisfactory data transmission quality in the network and reduced memory in the switch. The number of simultaneous connections depends on processor speed, memory, and control software. PBX-based LANs usually support data rates ranging from 300 to 19.2K bits per second, with 56K bits per second supported occasionally.

### Baseband LANs

Baseband technology is becoming very popular for microcomputer local networking. The baseband LAN model is

shown in Figure 2 and is typical of all Ethernet-compatible products. Baseband LANs use time-division schemes to allocate their single channel and have a ring or star topology. Baseband networks support microcomputers at aggregate data rates of 5M or 10M bits per second and connection of up to a hundred data devices. Baseband technology should be used when a small group of microcomputers needs to share information but does not need to support video transmission.

Baseband signals are encoded onto the cable using various techniques. The most common design uses carrier-sense, multiple access with collision detection (CSMA/CD). Other contention-type schemes used in baseband LANs include carrier-sense, multiple access with collision avoidance

Table 1. Comparison of Selected Digital Private Branch Exchanges

Vendor	RoIm	ATTIS	Intecom	Northern Telecom
<b>Model</b>	CBX-II	System 85	IBX	SL-1
<b>Switching Technique</b>	Proprietary	T1 compatible	T1 compatible	T1 compatible
<b>Sampling Rate (KHz)</b>	12	8	8	64
<b>Companding Technique</b>	Linear	Log PCM ( $\mu = 255$ Law)	Log PCM ( $\mu = 255$ Law)	Log PCM ( $\mu = 255$ Law)
<b>Frame Size (Kbps)</b>	192	64	64	64
<b>Number of Time Slots</b>	More than 4,000*	512	4,096	1,050
<b>Data Integration Technique</b>	Submultiplexed	Port doubled; separate data line to PBX	Integrated with digitized voice	Port doubled; separate data line to PBX
<b>Maximum Data Speed Supported (Kbps)</b>	56	56	56	56
<b>Purchase Cost per Station**</b>	\$850	\$1,100	\$1,100	\$900

**Notes:**

- \* Using submultiplexing
- \*\* Cost all voice; based on 500 station system in which all stations have voice capabilities and 25 percent have data capabilities.



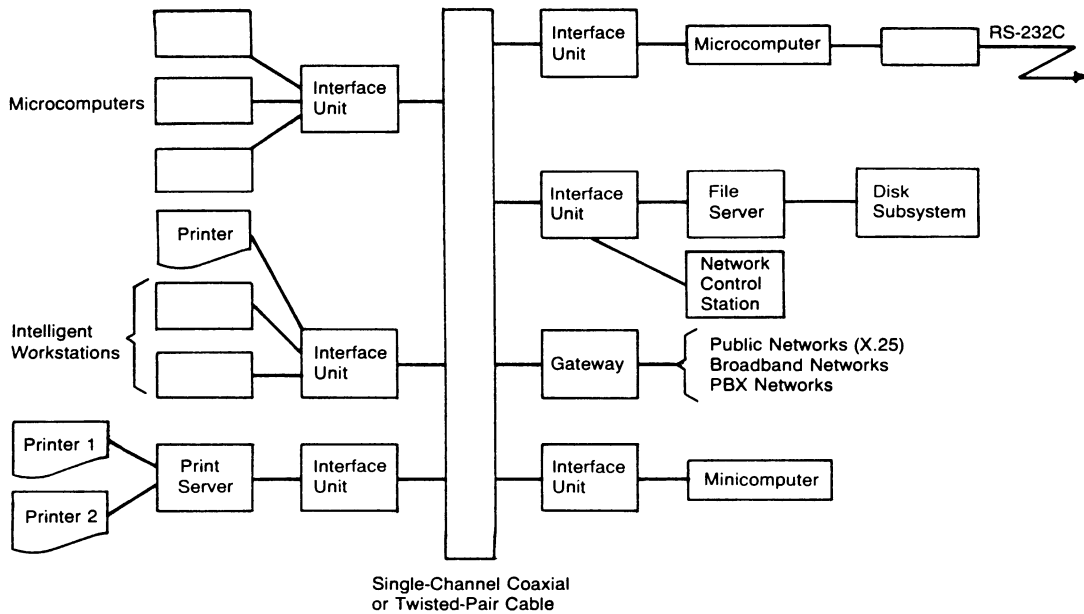


Figure 2. The Baseband LAN Model

(CSMA/CA) and token passing. Baseband LANs also use another group of access methods, known as demand assignment methods, that includes polling, assigned slots, and slotted reservation.

Baseband technology can use either twisted-pair wiring or 50-Ohm coaxial cable as a transmission media. Coaxial cable is preferred because it supports higher data rates. The Datapoint Corporation Attached Resource Computer (ARC) product historically has the largest number of installed baseband networks; Ethernet is second in number of network installations. Table 2 compares the leading baseband network products.

### Broadband LANs

Figure 3 shows how a typical broadband LAN can network microcomputers, using coaxial cable for the distribution medium and frequency-division multiplexing for the channel allocation scheme. Broadband LANs are popular because they support most of the integrated services essential to data and voice communications. Prewiring a building with coaxial cable for the maximum capacity costs less than subsequently installing coaxial cable as needed.

Broadband LAN schemes may be divided into single- and dual-cable implementations. Single-trunk systems use midsplit

Table 2. Comparison of Selected Baseband LANs

Vendor Model	Datapoint Corp ARC Local	Digital Equipment Corp DecNet/Ethernet	Nestar Systems Inc Plan Systems	Orchid Technology PC Net	Ungermann-Bass Inc NET-ONE
Microcomputer Supported	Datapoint computers	DEC and compatibles	Apple, IBM, and compatibles	IBM and compatibles	IBM and compatibles
Topology	Bus or star	Tree	Tree	Linear Bus	Linear bus
Primary Network Medium*	RG-62A	Ethernet coax.	RG-62 coax.	RG-59B/U or RG-11U coax	Ethernet coax, fiber optic
Drop Connection Medium*	RG-62A	4-pair, twisted wire	RG-62 coax	RG-59 or RG-11 coax	Transceiver cable
Max Distance Between Farthest Network Attachment Units (km)	6	6	6	2	2.5
Max Distance Between Adjacent Network Attachment Units (km)	0.50	6	6	2	2.5
Max No. of User Devices Addressable	255	1,024	255	65,536	24,567
Max Throughput on Main Data Channel (Mbps)	2.5	10	2.5	1	10
Max User Device Transmission Rate (Mbps)	2.5	10	2.5	1	1.3
Channel Access Method	Token passing	CSMA/CD	Token passing	CSMA/CD	CSMA/CD
Protocol Conversion Capabilities Supported	None	SDLC and X.25	BSC and SDLC	None	None
Number of Network Attachments Currently Installed	More than 50,000	More than 10,000	More than 6,000	More than 2,000	More than 3,000
Average Price per User Device Connected (\$)	600	800	600	700	600

Note:  
\* RG-11 is 50 Ohm; RG-59 is 63 Ohm; RG-62 is 75 Ohm





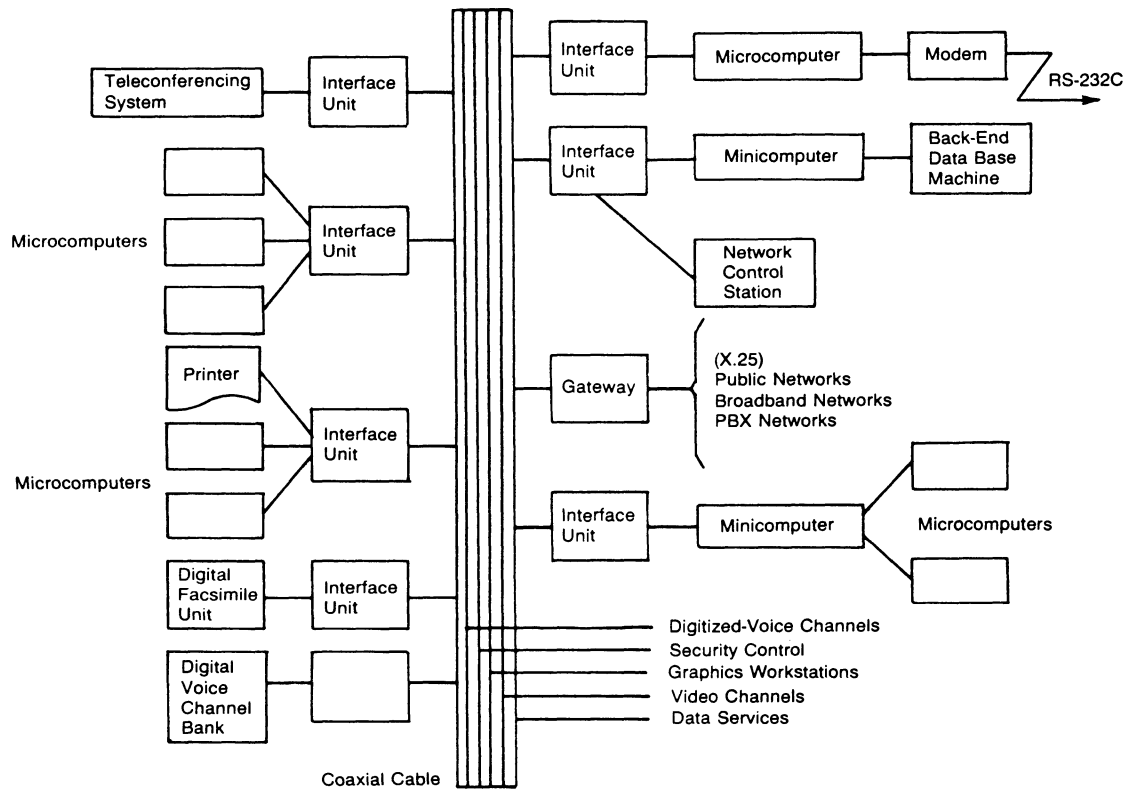


Figure 3. The Broadband LAN Model

or subplit frequency division multiplexing and typically use the lower band for transmitting and the higher band for receiving. Dual-cable broadband implementations require two coaxial cables with two connections per user. Other disadvantages of dual-cable broadband systems (in comparison with single-cable systems) include the greater cost of interface hardware, greater space required for cable and hardware mounting, the high cost of isolating signals in the terminal equipment, and the increased cost and complexity of cable installation.

Every broadband LAN provides separate transmit and receive paths for bidirectional operation. Radio frequency (RF) signals travel through the trunk network to the head end, which controls the signal distribution throughout the network. The head-end equipment includes modulators, demodulators, combiners, data translation units, control units, and power supplies.

Broadband LANs offer the greatest bandwidth capacity among the various alternatives, but they are the most costly to implement and maintain. Broadband users must perform trunk tuning several times each year to ensure proper operation. Broadband networks support full motion video, T-1 data rates (the telephone company's high-volume 1.544M bit-per-second service), and digitized voice traffic. Broadband LANs typically support data rates from 9.6K to 20M bits per second and

several transmission channels on different frequency bands. Table 3 compares the leading broadband LANs.

## Benefits of Networking Microcomputers

Microcomputer networking enables users to share information and resources. The sharing of information includes the ability to access, store, and distribute data among microcomputers. Extracting information from public and private data bases is also made possible by information sharing.

The benefits obtained from resource sharing include the ability to share expensive peripherals. For example, microcomputers can simply share a printer by using a data switch, or several microcomputers can share a laser printer or plotter by using a broadband network.

If an organization establishes a policy of network management as an information processing resource, LANs promote specific applications and control the influx of technology to the organization. LANs also help establish hardware, software, and usage standards within the company. LANs make orderly implementation and growth of microcomputer information sharing the standard within the organization.

Table 3. Comparison of Selected Broadband LANs

Vendor	Interactive Systems 3M	Sytek	Ungermann-Bass	Wang Laboratories
Model	LAN/1	LocalNet 20	NET/ONE	WangNet
Medium	Single or Dual Coax.	Single Coax.	Single or Dual Coax.	Dual Coax.
Transmit Channel Frequencies (MHz)	Various	40-70	162-300	Various
Receive Channel Frequencies (MHz)	Various	70-106	5-108	Various
Max Throughput on Main Data Channel (bps)	2M	128K	5M	12M
Max User Device Transmission Rate (bps)	100K	19.2K	1.5M	2.5M
Max No. of Stations	11,000	24,000	43,000	20,000
Max Distance Between Farthest Network Attachment Units (km)	20	80	30	15
Max Distance Between Adjacent Network Attachment Units (km)	10	0.05	30	15
Channel Access Method	Token passing	CSMA/CD	CSMA/CD	CSMA/CD and poll select
Protocol Conversion	None	BSC and X.25	None	BSC and SDLC

### THREE STEPS OF MICROCOMPUTER NETWORKING

Microcomputer LANs can be categorized according to the level of information processing and resource sharing they offer. The three sharing levels are device sharing, resource sharing, and integrated information sharing.

#### Level One: Device Sharing

Figure 4 illustrates one type of first-level device sharing among microcomputers. The devices shared include intelligent patch panels, port selectors, data switches, and most contention-type devices. Two examples of data switches for microcomputers are the IBM 5218 printer-sharing attachment and the Digital Equipment Corporation Mini-exchange. These devices can support from four to eight microcomputers sharing a printer and modem.

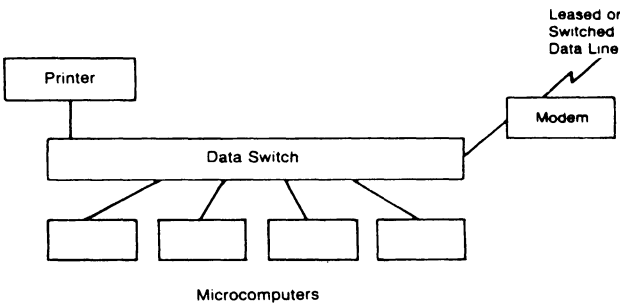


Figure 4. Microcomputer Device Sharing (Level One)

#### Level Two: Resource Sharing

Figure 5 illustrates the second LAN level typically implemented by microcomputer users. Once a few microcomputers can selectively share a modem or a printer, the next step is to enable them to simultaneously share a resource such as a customer name and address data base. For example, one microcomputer, such as an IBM PC/XT with a high-capacity disk drive, can be devoted to storing and managing a data base. This file server can also have a tape backup, manage a modem, and provide spooling to a high-speed printer. This second level of microcomputer networking requires a trunk cable, which is typically a coaxial cable or twisted-pair telephone cable.

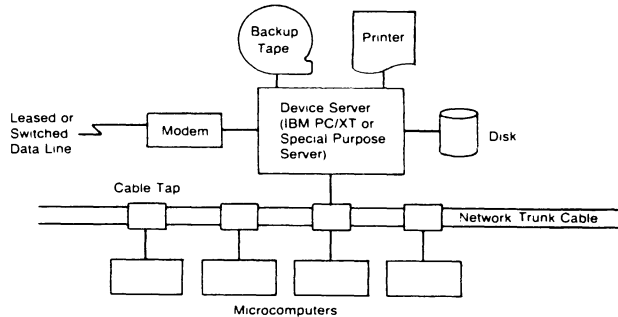


Figure 5. Microcomputer Resource Sharing (Level Two)

#### Level Three: Integrated Information Sharing

Figure 6 illustrates the third level of microcomputer LAN, which offers true information sharing among local and remote

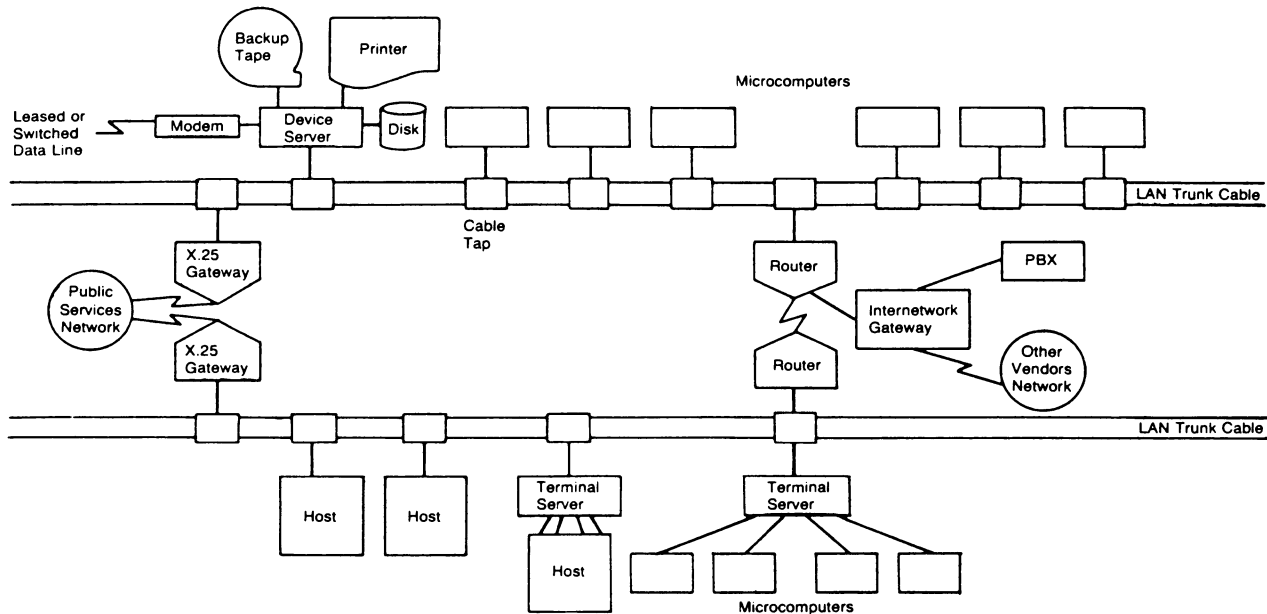


Figure 6. Microcomputer Information Sharing (Level Three)

microcomputers. Microcomputers attached to the LAN may connect to the file server or access a local host computer. The LAN provides access to public data bases through an X.25 gateway processor, which handles code conversion, protocol conversion, flow control, and link control. A gateway processor in a LAN can be used to bridge LANs to provide access to a microcomputer on another network.

## PLANNING THE NETWORK

In any network design project, the network designer must first evaluate user requirements. The next step is to evaluate the transmission media, access methods, and higher-level data services of the LAN products. The designer must perform the following microcomputer LAN planning steps:

1. Perform a needs assessment to define the network design criteria
2. Perform preliminary analysis of feasible alternatives (include rough cost estimates)
3. Develop requests for proposals for hardware and software components
4. Evaluate responses and refine rankings of alternative solutions
5. Request best and final bids from the leading vendors
6. Plan installation, acceptance testing, training, and network management
7. Install pilot phase and perform preliminary acceptance testing
8. Begin user training and volume installation

A good LAN design is truly responsive to current and future user needs. To ensure that an LAN is responsive, the designer must thoroughly assess the needs of these users.

## Performing a Needs Assessment

The designer begins the needs assessment by compiling the following six profiles, which describe current as well as potential users and their environments:

- User profile
- Usage profile
- Geographic profile
- Applications profile
- Hardware profile
- Special requirements.

**The User Profile.** The designer compiles the user profile by listing all departments within the organization that use information processing resources, specifically microcomputers. This list should include the number of people in each department, job titles, job descriptions, and a personality description of each user group. Although a written survey is a very effective means of gathering this information, properly structured discussions and meetings can be equally effective.

**The Usage Profile.** The usage profile should describe how the current microcomputer information processing resource is used. This profile should include a listing of the user's applications, programs, and requirements for online access to corporate and public data bases. The usage profile should describe the peak periods for such activities as communications, data base inquiry, and printing, with transaction volumes included whenever possible. Other useful statistics describing the usage profile include:

- Number of communications transactions per day
- Volume of file server I/O transactions
- Volume of print transactions

- Number of records stored and typical archival period
- System sensitivity to downtime (SSDT)
- Maximum acceptable response time

SSDT is a subjective measure describing the penalty for downtime of the application or information processing activity, typically rated from one to ten in which a rating of one signifies that downtime has a severe negative affect on corporate revenues and income. Maximum acceptable response time, determined from management's perspective, typically ranges from one to ten seconds. A maximum acceptable response time of one second can be equivalent to a requirement for subsecond response time.

**The Geographic Profile.** The geographic profile describes the distribution of LAN users. A logical numbering scheme is useful for logging the response to the survey. For example, buildings on a college campus are assigned a number in addition to a name. Buildings may be further subdivided by floor number and quadrant within each floor. The number of users at each location yields the geographic profile.

**The Applications Profile.** The applications profile helps the designer understand the true purpose of each individual's information processing tasks. Certain applications, such as corporate portfolio management and cash management, demand priority over more mundane applications, such as fixed assets management. The applications profile should reveal information about how extended LAN outages affect the corporation and what the costs of alternatives are.

**The Hardware Profile.** The hardware profile is a survey of each user, which lists the microcomputer manufacturer, the amount of primary memory and secondary storage, the operating systems, and the software packages regularly used. Peripheral devices used by each microcomputer user should also be listed. This list should include such information as the type of printer, modem speed, communications protocol, and network applications to which access is required.

**Special Requirements.** The network designer should consider any special requirements of the local information processing environment. These special requirements include any special communications software packages used by the various microcomputers. Special note should be made of the aggregate use of resources such as printers, and these usage statistics should be compared to the duty cycle statistics published by the peripheral manufacturer. For example, a letter quality printer cannot be used 80 percent of the time if the duty cycle is rated at 40 percent. The increased maintenance cost and aggravation associated with excessive downtime will be more than offset by the lesser cost of the additional printer.

Future growth profiles help managers plan microcomputer LANs. These profiles should be prepared with four time periods in mind: the present, six months hence, one year hence, and two years hence. Although some of the information within the profiles remains constant, much of it is changing continuously.

## Completing the Network Planning

After the needs assessment and data collection phase is complete, data analysis begins. With the exception of comparing alternatives, a microcomputer LAN project coincides with a typical data communications project. The information should be examined for trends and patterns, and the heaviest users should be identified and their requirements considered in view of the overall requirements of the user community. Analysis of the needs assessment information should reveal two important LAN design criteria: the needs of the entire user community and the data communications service priorities that must be supported by the LAN. The network plan thus integrates the communications services required by different user departments. These data communications service priorities reflect the relative importance of each user group and the benefits of supporting specific groups on a priority basis.

This analysis yields summary as well as specific microcomputer LAN requirements. The network design criteria are based on these requirements, and they should be incorporated into the requests for proposal issued to the vendors.

The needs assessment methodology must also analyze and document the corporate climate. Many banks, for example, do not modify their third-party systems support packages and are cautious about implementing state-of-the-art technology. Corporate climate includes the organization's personality and the climate within its industry.

## Comparing Competing Products and Technologies

A thorough needs assessment is an invaluable tool for evaluating different products and their technologies. First, the technology employed must be understood. Second, any vendor enhancements to that particular LAN technology must be evaluated against the priority requirements of the networks.

In many cases, vendors present very attractive product offerings. Furthermore, they often make powerful pitches trying to convince the user that their products are state of the art, expandable, and cost-effective. Although the vendors' claims may be totally credible, the product must fit the user's needs and requirements.

After the network designer has selected the feasible alternatives from among the vendor offerings, the vendors must be evaluated as business entities. Many vendors enter the microcomputer LAN market with very credible products but without the research and development budget resources to compete against IBM, AT&T Information Systems, and other leading suppliers that would enable them to survive in the long term.

A microcomputer LAN implementation depends on vendor stability for several reasons. Changing vendors is usually difficult and can be totally impractical from a cost standpoint if the organization is substantially committed to the initial vendor. After the network designer has selected specific vendors for,

the LAN products, he or she will use these vendors' products for quite some time. Vendors usually enhance their products with upward compatibility, enabling the user to replace existing products with minimum difficulty.

Network designers must be willing to replace their systems if necessary and must not reject LAN technology on the basis of what products he or she has installed, because pride of ownership clouds objective comparisons of new products. Thus, network planners must not fit their own networking solutions to a problem that is better solved by integrating a different LAN technology.

## The Multiple Network Solution

Figure 7 shows a theoretical relationship between the three types of microcomputer LANs (PBX-based, broadband, and baseband), illustrating the different LAN technologies recommended for different levels of microcomputer intelligence and different numbers of users.

Baseband networks are recommended for networking a few intelligent microcomputers; broadband networks are recommended for a large population of more intelligent microcomputers. Almost any number of less powerful microcomputers are best connected through PBX-based networks.

The most flexible situation occurs when the PBX and LAN solutions converge. Contrary to vendor advertisements, no single LAN solution is best for an entire corporation. An integration of several different LAN technologies is a more realistic and manageable environment.

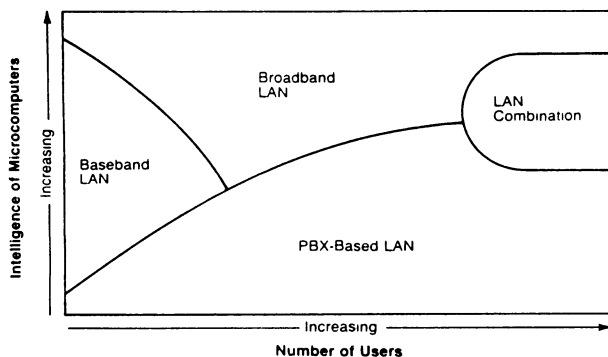


Figure 7. Local Area Network Technology Convergence

## Comparing Generic Technologies

When a choice must be made between alternatives, the following comparison of the technologies describes their inherent advantages and disadvantages.

**PBX.** The strengths of the PBX LAN approach include proven technology and low storage requirements. It is the least

expensive alternative for users with an existing telephone switch, it uses existing twisted-pair wiring, it is extremely flexible for moving users and data service, and the system can be accessed at the nearest telephone. On the other hand, the PBX LANs have a limited device capacity, slow transfer rates, are expensive to implement above specific bandwidth thresholds, and ineffectively switch high-volume terminal devices.

**Broadband.** Large-bandwidth and high-volume applications are best suited to broadband LANs. This LAN is the best choice for video transmissions, high-speed data, graphics workstations, and voice communications traffic. Currently, broadband LANs command less than 10 percent of the market; future broadband LAN growth should be slow but steady. The strengths of broadband LANs include a large bandwidth with high transfer rates, multiple data channels, the ability to carry full-motion video, the capacity for high-volume traffic, and support for a wide variety of devices. The weaknesses of the broadband approach include the high initial expense of the network, a requirement for careful design, and difficulty with adding stations in dense areas.

**Baseband.** Specific characteristics make baseband LANs best for different types of traffic and applications than normally found in either PBX or broadband LANs. Due to the relatively inexpensive implementation costs, high data transfer rates, and implementation flexibility, baseband networking is preferred when microcomputers act as intelligent workstations sharing data. Baseband LANs cost less than broadband networks, have topological flexibility, and support multiple access methods. However, baseband LANs support only lower-speed devices, have no video signal support, are limited in maximum cable distances, and have less aggregate network growth than broadband LANs.

## Key LAN Considerations

Table 4 details some of the key considerations for planning and implementing a microcomputer LAN technology. Baseband LANs typically require intelligent terminals. Twisted-pair wire LAN technology uses a matrix to switch circuits, with each circuit supporting a bandwidth of less than 3 MHz. The typical (20 to 100 stations) twisted-pair LAN using a PBX as a controller will support an equivalent aggregate bandwidth of between 50 and 300 MHz. In comparison, baseband LANs support a maximum bandwidth of 50 MHz; broadband LANs support up to 440 MHz.

Baseband networks use a single transmission path and various time-division multiplexing techniques to serve multiple users. PBX and broadband local networks typically use multiple transmission paths and multiplexing techniques to serve network users. Broadband networks are best suited for graphics terminals and specialized workstations requiring individual device transmission rates in excess of 56K bits per second.

Each local network technology has a different appeal to the office environment. PBX-based twisted-pair technology appeals to the user who already has wiring in place, to isolated

Table 4. Comparing Alternative LAN Technologies

Consideration	PBX	Baseband	Broadband
Configurations	Star and tree	Star, ring, or bus	Tree and bus
Data Security	Low	Moderate	Very high
Modification	Easiest	More difficult	Most difficult
Medium	In-place wiring	In-place wiring or install 50-Ohm coaxial cable	Install single or dual 75-Ohm coaxial cable
Terminal Types	Dumb or intelligent	Intelligent only	Dumb or intelligent
Central Intelligence	Required	Not required	Required
Maximum Device Bandwidth Supported (MHz)	3	50	440
Capacity per Cable	One voice channel and one data channel	One data channel with tens of multiplexed digital voice and data packets	Hundreds of voice, video, and data channels
Video Support	No	No	Yes
Maximum Network Distance	20 m without modem; unlimited with modem	10 km	50 km
Maximum Device Speed (bps)	56K	10M	50M

users scattered throughout an office building, to users who often change locations, and to applications using low- to medium-speed (1,200–9,600 bits per second) terminals and microcomputers. The baseband local network appeals to the user who has concentrations of microcomputers sharing information or applications programs within their departments. Broadband networks appeal to users requiring distribution of high-bandwidth video signals, large-capacity T1 transmission paths, and a large population of microcomputers.

**CONCLUSION**

Evaluating microcomputer local networking should begin with a thorough needs assessment to determine realistic network requirements. This needs assessment should include pro-

files describing the nature of the user community, applications, usage patterns, and growth projections. Geographic distribution and hardware support requirements help describe the specific network design criteria.

The network designer must compare the available LAN products with the specific needs and priority requirements of the application when evaluating the level of device, resource, and information sharing necessary to support the networked devices.

The network designer should perform a rough cost/benefit analysis to gauge the attractiveness of each LAN to the organization and should remember that use of more than one microcomputer LAN may provide the best solution.





# LOCAL AREA NETWORKS

## Company Directory

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Vendor	Address/Phone	Product Name
A. B. Dick	5700 W Touhy Ave Chicago IL 60648 (312) 647-8800	Magna Loop Local Area Network (baseband)
Alspa Computer Inc	300 Harvey West Blvd Santa Cruz CA 95060 (408) 429-6000	ALSPA-NET (baseband)
Altos Computer Systems	2360 Bering Dr San Jose CA 95131 (408) 946-6700	WORKNET (baseband)
Applitek Corp	107 Audubon Rd Wakefield MA 01880 (617) 246-4500	UniLAN (baseband & broadband)
AT&T Information Systems	475 State St Morristown NJ 07960 (201) 564-4261	Datakit Virtual Circuit Switch (baseband)
Bridge Communications	10401 Bubb Rd Cupertino CA 95014 (408) 446-2981	Communications Servers/1 & 100 (baseband) Gateway Servers/1 & 3
Codex Corp	20 Cabot Blvd Mansfield MA 02048 (617) 364-2000	Codex 4000 Series LAN (baseband & broadband)
Complexx Systems Inc	4930 Research Dr Huntsville AL 35805 (205) 830-4310	XLAN (baseband)
Computrol	15 Ethan Allen Hwy Ridgefield CT 06887-6297 (203) 544-9371	Megalink (baseband)
Concord Data Systems	303 Bear Hill Rd Waltham MA 02154 (617) 890-1394	Token/Net (broadband)
Contel Information Systems	130 Steamboat Rd Great Neck NY 11024 (516) 829-5900	ContelNET (baseband & broadband)
Control Data Corp	PO Box 0 Minneapolis MN 55440 (612) 853-5985	Loosely Coupled Network (broadband)
Corvus Systems	2029 O'Toole Ave San Jose CA 95131 (408) 946-7700	Omninet (baseband)
Data General	4400 Computer Dr Westboro MA 01580 (617) 366-8911	Xodiac Network Bus System (baseband)
Datapoint	9725 Datapoint Dr San Antonio TX 78284 (512) 699-7000	ARCnet (baseband)
Davox	6 Continental Blvd Merrimack NH 03054 (603) 424-4500	Davoxnet (baseband)
DBS International Inc	Welsh Rd Park Dr Montgomeryville PA 18936 (215) 628-4810	DBS-Net (broadband)



Vendor	Address/Phone	Product Name
Destek	830 E Evelyn Ave Suite C Sunnyvale CA 94086 (415) 968-4593	Desnet (baseband)
Digital Equipment Corp	129 Parker St Maynard MA 01754 (617) 475-4700	DECnet (baseband) Ethernet (baseband)
Excelan Inc	2180 Fortune Dr San Jose CA 95131 (408) 945-9526	Excelan Open System (baseband)
Gandalf Data	1019 S Noel Ave Wheeling IL 60090 (312) 541-6060	PACXNET (baseband & broadband)
General Instruments Corp	R F Systems Div 4229 S Fremont Tucson AZ 85714 (602) 294-1600	BroadCom (broadband)
Gould	Modicon Div PO Box 83 SVS Andover MA 01810 (617) 475-4700	Modway (baseband & broadband)
Infotron Systems Corp	Cherry Hill Industrial Ctr Cherry Hill NJ 08003 (609) 424-9400	IS4000 Data PBX (broadband)
Interactive Systems/3M	3980 Varsity Dr Ann Arbor MI 48104 (313) 973-1500	Videodata (broadband)
International Business Machines	1133 Westchester Ave White Plains NY 10604 (914) 696-1900	Series/1 Ring (baseband) 8100 Loop (baseband)
Intersil Systems Inc	1275 Hammerwood Ave Sunnyvale CA 94086 (408) 743-4300	GENet (broadband)
Intertec Data Systems	2300 Broad River Rd Columbia SC 29210 (803) 798-9100	Head Start (baseband)
Lanier Business Products Inc	1700 Chantilly Dr Atlanta GA 30324 (404) 329-8000	Lanier Business Systems 5000 (baseband)
LED Systems	1006 Apache Trail Mechanicsburg PA 17055 (717) 687-2607	4D1 (baseband) 4DT1 (baseband) 7DT1 (baseband) 4D7 (broadband)
M/A-Com Linkabit	3033 Science Park Dr San Diego CA 92121 (619) 457-2340	IDX-3000 Distributed Data Systems (baseband)
Nestar Systems	2585 E Bayshore Rd Palo Alto CA 94303 (415) 493-2223	PLAN Series (baseband)
Network Systems	7600 Boone Ave N Brooklyn Park MN 55428 (612) 425-2202	Hyperbus (baseband) Hyperchannel (baseband)

Vendor	Address/Phone	Product Name
Novell Inc	1170 N Industrial Park Dr Orem UT 84054 (801) 226-8202	Netware/E (baseband) Netware/O (baseband) Netware/S (baseband) Netware/X (baseband)
Orchid Technology	47790 Westinghouse Dr Fremont CA 94536 (415) 490-8586	PCnet (baseband)
Pragmatronics	2015 10th St Boulder CO 80302 (303) 444-2600	TIENET (baseband)
Prime Computer	Prime Park Natick MA 01760 (617) 655-8000	RINGNET (baseband)
Proteon Associates	24 Crescent St Waltham MA 02154 (617) 894-1980	PRONET (baseband & broadband)
Protex Industries	Starnet Data Systems Div 1331 W Evans Ave Denver CO 80223 (303) 935-3566	Starnet II (baseband)
Racal-Milgo	Computer Products Div 6250 NW 27th Way Fort Lauderdale FL 33309 (305) 979-4000	PLANET (baseband)
Scientific Data Systems	344 Main St Venice CA 91356 (213) 390-8673	SDSNET Local Area Network (baseband)
Software Dynamics	2111 W Crescent Suite G Anaheim CA 92801 (714) 635-4760	SDNET (baseband)
Standard Engineering	44800 Industrial Dr Fremont CA 94538 (415) 657-7555	Partyline (baseband)
Stratus Computer	17 Strathmore Rd Natick MA 01760 (617) 653-1466	StrataLink (baseband)
Syntrex	246 Industrial Way W Eatontown NJ 07724 (201) 542-1500	SYNnet (baseband)
Sytek	1225 Charleston Rd Mountain View CA 94943 (408) 734-9000	LocalNet (broadband)
Technology Concepts Inc	Old County Rd Sudbury MA 01776 (617) 443-7311	Ringway (baseband) Etherway (baseband)
Teletone Corp	10801 120th Ave NE Kirkland WA 98033 (206) 827-9626	Data Carrier System (broadband)
Texas Instruments	PO Box 2909 Austin TX 78769 (512) 250-7363	Ethernet (baseband)

Vendor	Address/Phone	Product Name
Ungermann-Bass	2560 Mission College Blvd Santa Clara CA 95050 (408) 496-0111	Net/One Baseband Net/One Broadband
Wang Laboratories	One Industrial Ave Lowell MA 01851 (617) 459-5000	WangNet (broadband)
Xerox	701 S Aviation Blvd El Segundo CA 90245 (213) 679-4511	Ethernet (baseband)
Zilog	1315 Dell Ave Campbell CA 95008 (408) 370-8000	Z-Net (baseband)

# LOCAL AREA NETWORKS

## Specifications Chart Guide

The concepts of local area networking, currently the subject of much interest and development, are not entirely new but go as far back as the advent of terminals. Computer users then found they needed a way of accessing the computer's resources, possibly from a remote location. As the number of multiterminal system installations increased, along with the ratio of terminals per person, a central communications path became necessary to manage resource-sharing, security, and multitasking applications.

A wide variety of theories and technologies are available, resulting in some confusion about local area networks. A local area network can be defined simply as a privately owned network that acts as a central path or backbone to provide high-speed communications between such multiple devices as mainframes, terminals, and peripherals. All local area networks employ some form of cable medium and interfaces for distances that range from 10 to 10,000 meters (though they are usually confined to a building or campus). Transmission speeds of up to 100M bits per second, over these limited distances, should provide an ideal compromise between internal computer buses and long-haul networks.

Two major philosophies divide local area networks into technologies—baseband and broadband—that conform to the preceding definition but differ significantly in practice.

Baseband local area networks employ the entire bandwidth (transmission capacity) of the cable to provide one channel that users must share. The advantages of baseband systems include simplicity and uniformity, since only one cable and identical interfaces are used. Additionally, they are less costly to implement than broadband systems, since radio modulation and multiplexors are not required. The disadvantages are that most baseband systems are limited in individual device data rate capacity or distance and are usually not well suited to integrated voice and video transmission, since these applications demand larger portions of bandwidth than digital communications. Another major concern is that one channel must be shared by all devices, possibly causing response delays, collision of messages on the cable, and recovery problems.

Broadband local area networks derive multiple channels from the bandwidth capacity through frequency division multiplexing (FDM) or time division multiplexing (TDM) techniques. Broadband has become the computer industry's buzzword for cable television (CATV). The advantages of broadband include the ability to dedicate some channels to individual users while other channels are shared, the accommodation of such nondigital signals as voice and video, overall throughput of the cable, and more efficient allocation of bandwidth, since channels can be dedicated to specific devices and applications. Because broadband local area networks require some form of central retransmission facility (sometimes re-

ferred to as the head-end system), the cost of implementing them is high, constituting their only major disadvantage.

Applications that require only data communications are suited to a baseband approach, while users who need to integrate data, voice, and image communications should opt for broadband. Gateways between baseband and broadband networks are already available.

This guide explains the parameters used to describe the local area networks listed in the specifications chart.

### VENDOR AND NETWORK

This section identifies the vendor or manufacturer and the name of the network described. It is not uncommon for a similar name to be used several times, since many vendors are granted a license to do so. For example, it is currently estimated that more than 80 Ethernet-type (Xerox) networks are available.

### SYSTEM COMPONENTS

Listed in this section are the hardware elements necessary for the network. Coaxial cable and interface units are usually the minimum types of equipment required, with FDM multiplexors, head-end systems, repeaters, or amplifiers being used in more sophisticated networks. Many networks feature a private automatic branch exchange (PABX) to manage voice traffic in a given building or campus.

### SYSTEM CHARACTERISTICS

The entries in this section describe the basic design features of the network:

- **Topology**—This section identifies possible configurations of the network. There are four topologies currently in common use, although several variations are possible: bus, star, ring or loop, and tree.
- **Cable Medium**—This section indicates the medium used as the communications path. Twisted pairs, coaxial cable, and fiber optics are the most commonly used media.
- **Line Access Method**—Entries in this section refer to the manner in which network users either place information on the cable or remove information from the cable. Two methods are currently gaining widespread acceptance: polling and contention.

Several variations of these two principal access methods exist. Polling includes token passing, the most popular method, as well as round robin, empty or fixed slots, and token management. Carrier Sense Multiple Access with Collision Detec-

tion (CSMA/CD) is the most widely accepted form of contention.

Token passing, implemented only on ring-type topologies, permits users to transmit messages on the network only after they have gained control of a token. The token acts as an empty envelope, traveling around the network and polling users if they have messages to send.

With CSMA/CD, the user's device listens in on the cable. If no communications noise can be heard, the device begins to transmit. If, in the process of transmission, the device hears another message, a collision occurs. Both devices are notified and must retransmit.

- **Operating Mode**—This entry indicates whether the network supports transmissions in one direction (half duplex) or both directions (full duplex) or other transmission variations (simplex).
- **Addressing**—This entry lists the word size, in bits, supported by each operational device.

## SYSTEM CAPACITIES

The overall system capacities and limitations reported in this section are:

- **Transmission Speed**—This entry identifies the maximum rate in bits per second (bps) at which information travels over the cable medium.
- **Number of Supportable Devices**—This entry indicates the maximum number of devices that can be attached to the cable. Through the use of repeaters and/or amplifiers, the network can be extended into other networks, making it necessary to report the number of devices per cable segment.
- **Maximum Geographical Span**—This entry states the maximum distance to which the network can be extended.
- **Maximum Distance between Nodes**—This entry reports the maximum distance allowed between two consecutive devices (nodes).
- **Minimum Distance between Nodes**—This entry lists any limitation on the minimum distance possible between two consecutive nodes.

## CHANNEL CAPACITIES

This section, included only with broadband networks, reports total available bandwidth in megahertz (MHz) and its breakdown into the number of available digital, voice, and video channels with their respective rates.

## SUPPORT CAPACITIES

This section is devoted to support capacities available with both baseband and broadband local area networks.

- **Data Type(s)**—This entry identifies support for digital, voice or audio, or video transmissions.
- **Interfaces**—This entry lists the types of interfaces supported; these are used to attach a device to the network. Although RS-232C, RS-422, and IEEE-488 are the most commonly supported interfaces, the specific vendor and

device are given when available.

- **Communications Protocol(s)**—This entry indicates higher-level communications protocols supported by the network.
- **OSI Reference Model**—Reports the extent to which the network supports the Open Systems Interconnect (OSI) reference model. OSI, proposed by the International Standards Organization (ISO), divides the communications process into seven logical functional layers; each layer in an operational node thus has a peer-to-peer relationship with a communicating counterpart. Strict adherence to the protocols established in a given layer is the only way to ensure compatibility, especially between multivendor devices.
- **IEEE 802 Standard**—This entry indicates the extent to which the network supports the Institute of Electrical Electronics Engineers' Project 802 (IEEE 802). This group began developing a set of standards for local area networks in 1980 and has now completed such a set for baseband local area networks that features both the token-passing and the CSMA/CD access methods. The CSMA/CD version is a blueprint model for Xerox's Ethernet (IBM is favoring token passing). Work on an IEEE 802 broadband standard is due to begin shortly.
- **SNA Model**—This entry indicates whether the network supports the standards established by IBM under its System Network Architectures (SNA) model, which is based on principles similar to the OSI reference model (such as peer-to-peer compatibility) but features only three layers.
- **Other Supported Architectures**—This entry lists any additional architectures the network supports (outside of OSI, IEEE 802, and SNA).
- **Applications**—This entry identifies the uses intended for the network by the vendor.

## GENERAL INFORMATION

This section provides general system background information.

- **Date Announced**—This entry indicates the date on which the network was announced.
- **Date of First Delivery**—This entry notes when the network is available for delivery, since in many cases the announcement date and first delivery date differ.
- **Number of LANs Installed to Date**—This entry enumerates networks installed to date, when available.
- **Average Cost per Attachment**—This entry reports the average cost per attachment, since pricing information for a local area network is complex and difficult to understand. As the number of nodes on a network increase, the overall cost goes down because there are more users to spread cost over and because equipment is cheaper in large quantities.

## COMMENTS

This section reports information that may be important for product evaluation but is not included elsewhere on the specifications chart.



# SPECIFICATIONS CHART

## Baseband Networks

238.0045.001

Vendor Network	A. B. Dick Magna Loop Local Area Network	Alspa Computer ALSPA-NET	Altos Computer Systems WORKNET
<b>System Components</b>	Twinaxial cable; all req interfacing provided within devices in network	Master computer w/disks, diskette drives, cable, worksta, printers	Cable, interfaces, term. connector
<b>System Characteristics</b>			
Topology	Ring	Bus	Bus
Cable Medium	Twinaxial	2-wire twisted pair	4-wire twisted pair
Line Access Method	CSMA/CD, token passing	CSMA/CD	CSMA/CD
Operating Mode	Simplex	FDX	Broadcast chan
Addressing (bits)	—	8	8
<b>System Capacities</b>			
Transmission Speed (bps)	0.25M, 1M	800K	800K
No. of Supportable Devices	255	1,024	30
Max Geographical Span	1,500 ft (beyond w/digital repeater)	2,000 ft	500 ft
Max Distance between Nodes	1,500 ft	2,000 ft	500 ft
Min Distance between Nodes	Unlimited	Unlimited	1 ft
<b>Support Capacities</b>			
Data Type(s)	Digital	Digital	Digital
Interfaces	Vendor-specific devices	RS-422	RS-422
Communications Protocol(s)	SDLC, modified	Async	SDLC/CRC, CCITT
OSI Reference Model	Yes (layers 1-7 in 1MB config)	No	Yes (layers 1-3)
IEEE 802 Standard	Yes (w/token passing in 1MB config)	No	No
SNA Model	No	No	No
Other Supported Architectures	No	ALSPA, TurboDOS	No
Applications	Resource sharing, electronic mail	Electronic mail, acctg, WP	File, device, & proc sharing; electronic mail, distributed data base; transparent network access
<b>General Information</b>			
Date Announced	March 1981	January 1983	October 1983
Date of First Delivery	April 1981	March 1983	October 1983
No. of LANs Installed to Date	Proprietary	200	75
Average Cost per Attachment	See Comments	Vendor declined to provide	\$330/node (incl hardware & software)
<b>Comments</b>	8 ft cable std, addl cable \$.30/ft; 2 connectors/device at \$6.00 ea	Supports Eagle I, II, III, & IV & Kaypro II, III, & X; most Zilog Z80-based microcomputers can be adapted	Network is transparent to Xenix users & application prog

**Notes:**

- Information unavailable at press time
- NA Not applicable
- CSMA/CD Carrier Sense Multiple Access with Collision Detection
- CSMA/CA Carrier Sense Multiple Access with Collision Avoidance
- FSK Frequency-shift keying
- DMA Direct memory access
- PBX Private branch exchange



<b>Vendor Network</b>	<b>Applitek</b> UniLAN	<b>AT&amp;T Information Systems</b> Datakit Virtual Circuit Switch (VCS)	<b>Bridge Communications</b> Communications Servers/1 & 100
<b>System Components</b>	NI10/T network interface unit that interfaces cable & user devices/computers	CRTs, RO printer, controllers, power supply, minicomputer, cable	Comm proc (attaches nonnetworked devices & sys to Ethernet)
<b>System Characteristics</b>			
Topology	Tree	Star	Bus
Cable Medium	50ohm coaxial	Twisted pair	50ohm coaxial (Ethernet/IEEE 802/ECMA)
Line Access Method	Concurrent token passing & CSMA/CD	Priority scheme contention	CSMA/CD
Operating Mode	FDX	FDX/HDX	FDX
Addressing (bits)	48	Determined by host	48
<b>System Capacities</b>			
Transmission Speed (bps)	10M	8M	10M
No. of Supportable Devices	1,024	450	1,024
Max Geographical Span	25km	Unlimited	2.5km
Max Distance between Nodes	2.5km	Unlimited	2.5km
Min Distance between Nodes	Unlimited	Unlimited	2.5m
<b>Support Capacities</b>			
Data Type(s)	Digital	Digital	Digital
Interfaces	RS-232C, IEEE-488, RS-449, V.35	RS-232C	RS-232C, RS-423, RS-449, IEEE-488, Versatec plotter, X.25 host
Communications Protocol(s)	Async, bisync, SDLC/HDLCL, X.25, IBM 3270	Async, bisync, IBM 3270	Async, bisync, X.25
OSI Reference Model	Yes (layers 1-6; layer 7 for specific applications)	Yes (layers 1-3)	Yes (layers 3-5 w/Xerox Network Sys; layers 6 & 7 w/Bridge VTP & UI)
IEEE 802 Standard	Yes (at interface level)	Yes (RS-232C interface level)	Yes (802.3)
SNA Model	No	No	—
Other Supported Architectures	No	No	IBM
Applications	Resource sharing, time sharing, factory automation	Resource sharing, electronic mail, time sharing, factory automation, energy management	Connects term. to host; peripheral pooling; resource sharing; connects personal computers in multivendor environment
<b>General Information</b>			
Date Announced	November 1983	December 1983	January 1983 (CS/1); November 1983 (CS/100)
Date of First Delivery	February 1984	June 1983	January 1983
No. of LANs Installed to Date	—	50	40 +
Average Cost per Attachment	See Comments	Vendor declined to provide	Less than \$500/device
<b>Comments</b>	\$145,000 for LAN w/200 term. (incl UniLINKs 25 NI10/Ts), interfaces, software	Expandable to Wide Area Network; support for 1,400 devices planned for 4Q 1984	Uses Motorola MC6800 microproc; thrupt exceeds 200 packets/sec for CS/1, 150 packets/sec for CS/100

**Notes:**

—	Information unavailable at press time
NA	Not applicable
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSMA/CA	Carrier Sense Multiple Access with Collision Avoidance
FSK	Frequency-shift keying
DMA	Direct memory access
PBX	Private branch exchange

Vendor Network System Components	Bridge Communications Gateway Servers/1 & 3 Comm proc (interconnects LANs; interfaces w/long-haul & other network architectures)	Codex Codex 4000 Series LAN Cable, entryways, transceivers, repeaters, network storage modules, bridges	Complexx Systems XLAN Twisted, shielded wire cable, interface units
<b>System Characteristics</b>	Bus	Bus	Bus
Topology	50ohm coaxial (Ethernet/IEEE 802/ECMA)	50ohm coaxial (Ethernet)	Twisted, shielded wire
Cable Medium	CSMA/CD	CSMA/CD	CSMA
Line Access Method	FDX	FDX	FDX/HDX
Operating Mode	48	48	—
Addressing (bits)	10M (Ethernet); 300K (X.25, HDLC networks)	10M	1M
<b>System Capacities</b>	—	1,024	192
Transmission Speed (bps)	Unlimited	2.5km	10,000 ft
No. of Supportable Devices	Unlimited	2.5km	10,000 ft
Max Geographical Span	Unlimited	2.5m	Unlimited
Max Distance between Nodes	Digital	Digital	Digital
Min Distance between Nodes	RS-232C, RS-423, V.35, data term. equip., data comm equip.	RS-232C, RS-442, RS-449, V.35	RS-232C
<b>Support Capacities</b>	HDLC, sync	Async, IBM BSC	Complexx .25, async
Data Type(s)	Yes (layers 1-5 w/Ethernet; layers 1 & 2 w/network session & transport)	Yes (layers 1 & 2 w/Ethernet; layers 3-7 w/proprietary)	No
Interfaces	Yes (802.3)	Yes	No
Communications Protocol(s)	—	No	Yes (layers 1-3)
OSI Reference Model	—	No	No
IEEE 802 Standard	Virtual circuits, connecting networks	Application switching, resource sharing, office automation	Resource sharing, time sharing, factory automation, teleproc
SNA Model	January 1983 (GS/1); August 1983 (GS/3)	February 1984	March 1983
Other Supported Architectures	May 1983 (GS/1); September 1983 (GS/3)	February 1984	November 1983
Applications	40 +	—	—
<b>General Information</b>	Vendor declined to provide	\$470 (min)	\$362
Date Announced	Telenet & Tymnet certified; uses Motorola MC6800 microproc; thruput exceeds 350 packets/sec	—	Menu driven; can network any type of device; modem provides local or telecomm
Date of First Delivery			
No. of LANs Installed to Date			
Average Cost per Attachment			
<b>Comments</b>			

- Notes:**
- Information unavailable at press time
  - NA Not applicable
  - CSMA/CD Carrier Sense Multiple Access with Collision Detection
  - CSMA/CA Carrier Sense Multiple Access with Collision Avoidance
  - FSK Frequency-shift keying
  - DMA Direct memory access
  - PBX Private branch exchange





Vendor Network System Components	Computrol	Contel Information Systems	Corvus Systems
<b>System Characteristics</b>	Megalink Integral phase FSK modem, SDLC controller, DMA bus interface to Q-bus, Unibus, & Multibus	ContelNet Interface units, software, coaxial cable	Omninet Twisted pair, transporter interface
Topology	Bus	Bus/tree	Bus
Cable Medium	75ohm coaxial	75ohm coaxial CATV	Twisted pair (20-gauge)
Line Access Method	SDLC, token passing/contention	CSMA/CD	CSMA/CA
Operating Mode	HDX	FDX	FDX
Addressing (bits)	8	16 (expandable)	24
<b>System Capacities</b>			
Transmission Speed (bps)	1M	Up to 2M/10M	1M
No. of Supportable Devices	256	1,000/seg (mtpl seg)	64/network
Max Geographical Span	6 miles	1,000 ft/ seg	4,000 ft
Max Distance between Nodes	—	300 ft	4,000 ft
Min Distance between Nodes	—	Less than 10 ft	Unlimited
<b>Support Capacities</b>			
Data Type(s)	Digital	Digital	Digital
Interfaces	Q-bus, Unibus, Multibus	RS-232C, serial & parallel	RS-422
Communications Protocol(s)	SDLC/HDLC	Async, bisync, X.25, transparent; IBM 3270	Async, IBM 3270
OSI Reference Model	Yes (layers 1-2)	Yes (layers 1-3)	Yes (layers 1-4)
IEEE 802 Standard	No	Yes (w/CSMA/CD)	No
SNA Model	No	No	Yes (layers 1-6)
Other Supported Architectures	—	Ethernet, DECnet, others	Yes (via opt. gateways)
Applications	Factory automation, real-time control	Resource sharing, electronic mail, host-to-host file Xfer	Resource sharing, electronic mail, education (computer laboratory tools)
<b>General Information</b>			
Date Announced	1979	July 1982 (second generation)	April 1980
Date of First Delivery	1979	1980 (first generation)	June 1980
No. of LANs Installed to Date	—	20	4,000 networks w/20,000 nodes
Average Cost per Attachment	\$1,700/10 nodes	\$500/port	\$500/node interface
<b>Comments</b>	Drivers avail. for common OS; virtual disk software package shares a large disk resource w/distributed remotes by emulating local diskettes	Baseband can be field-upgraded to broadband; cross-reference ContelNet broadband	Interface transporter cd avail. for Apple II, IBM, Digital Q-Bus, Nippon Electric PC8001, S100 Bus, Zenith Z-89, Osborne; disk server avail. for sharing Corvus-manufactured disks; Omnet avail. for licensing

**Notes:**

—	Information unavailable at press time
NA	Not applicable
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSMA/CA	Carrier Sense Multiple Access with Collision Avoidance
FSK	Frequency-shift keying
DMA	Direct memory access
PBX	Private branch exchange

Vendor Network System Components	Data General	Datapoint	Davox
<b>System Characteristics</b>	Xodiac Network Bus System Coaxial cable, wall box, network bus adapter, control.	ARCnet Coaxial cable, hubs (junction boxes), Resource Interface Modules, repeaters	Davoxnet Cable, controller, interface, IBM Personal Computer attach., printer adapter, desk sets
Topology	Multidrop bus	Any arbitrary topology w/o loops	Star/tree
Cable Medium	75ohm coaxial (RG-6/u)	93ohm coaxial (RG-62)	Twisted pair/coaxial
Line Access Method	Token passing	Token passing	Polling
Operating Mode	FDX	—	FDX
Addressing (bits)	16	8	—
<b>System Capacities</b>			
Transmission Speed (bps)	2M	2.5M	400K
No. of Supportable Devices	32	255/seg	56/cluster
Max Geographical Span	1 mile	4 miles	8,000 ft (twisted pair), 20,000 ft (coaxial)
Max Distance between Nodes	1 mile	2,000 ft	2,000 ft (twisted pair), 5,000 ft (coaxial)
Min Distance between Nodes	10 ft	Unlimited	Unlimited
<b>Support Capacities</b>			
Data Type(s)	Digital	Digital	Digital, voice (adjacent pairs)
Interfaces	Proprietary	Datapoint-specific devices	RS-232C, IBM Personal Computer
Communications Protocol(s)	Xodiac NBS protocol, X.25	Transparent within network; external to the network: SNA/SDLC; IBM 3270, 3780	SDLC compat (proprietary)
OSI Reference Model	Yes (layers 1-7)	Yes (layers 1-2)	No
IEEE 802 Standard	Yes (802.3)	No	No
SNA Model	No	No	No
Other Supported Architectures	Data General, Zodiac	No	IBM
Applications	Office automation	Full resource sharing, electronic message services, WP, financial modeling, data proc, data comm, data entry, telex management	Resource sharing; provides IBM Personal Computer gateway to other networks; file Xfer between Personal Computer & IBM mainframes
<b>General Information</b>			
Date Announced	November 1981	1977	December 1983
Date of First Delivery	February 1982	1977	January 1984
No. of LANs Installed to Date	—	More than 4,000	15 (approx)
Average Cost per Attachment	\$3,400	\$400 on Datapoint 1560 proc, integral attachment on other Datapoint proc	\$750/interface; \$288/device
<b>Comments</b>	—	—	Proprietary network; uses phone wires; compat w/IBM PC-3270

**Notes:**

- Information unavailable at press time
- NA Not applicable
- CSMA/CD Carrier Sense Multiple Access with Collision Detection
- CSMA/CA Carrier Sense Multiple Access with Collision Avoidance
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Vendor Network System Components	Destek	Digital Equipment	Digital Equipment
<b>System Characteristics</b>			
Topology	Bus	Tree	Unrooted branching tree (bus)
Cable Medium	75ohm coaxial	50ohm coaxial	50ohm coaxial
Line Access Method	CSMA	CSMA/CD	CSMA/CD
Operating Mode	FDX	HDX	HDX
Addressing (bits)	16	48	48
<b>System Capacities</b>			
Transmission Speed (bps)	2M	10M	10M
No. of Supportable Devices	350/seg	Unlimited	1,024 sta (100 sta/500-meter seg)
Max Geographical Span	6,200 ft	—	2,800m (max sta separation)
Max Distance between Nodes	6,200 ft	—	2,800m
Min Distance between Nodes	Unlimited	Unlimited	2.5m
<b>Support Capacities</b>			
Data Type(s)	Digital	Digital	Digital
Interfaces	Point-to-point, tap, RS-232C, RS-422, IEEE-488	RS-232C, most DEC devices	Ethernet comm controllers (VAX, PDP-11, DECSYSTEM-20, Professional 300)
Communications Protocol(s)	Desnet	Sync, DECnet	DECnet (Ethernet, DDCMP, & X.25 are part of Digital Network Architecture)
OSI Reference Model	Yes (layers 1-3)	Yes (layers 1-7)	DNA parallels OSI reference mod
IEEE 802 Standard	—	Yes (w/CSMA/CD)	Yes (w/CSMA/CD)
SNA Model	—	No	Yes (w/SNA gateway)
Other Supported Architectures	—	Ethernet	—
Applications	Resource sharing, electronic mail, factory automation	Resource sharing, file Xfer, task-to-task comm, adaptive path routing, network management	Most designed for Digital VAX, PDP-11, DECSYSTEM-20, & Professional 300 sys
<b>General Information</b>			
Date Announced	January 1982	—	May 1982
Date of First Delivery	July 1982	—	4Q 1982
No. of LANs Installed to Date	Proprietary	—	—
Average Cost per Attachment	\$500/interface for 50 nodes	\$4,500 (approx.) for use w/ PDP-11/RSTE; \$6,000 for use w/VAX/VMS	\$200-\$300 for H4000 transceiver, approx \$3,500 for DUENA Communication Controller
<b>Comments</b>	—	—	Ethernet is supported by DECnet software within Digital Network Architecture

**Notes:**

—	Information unavailable at press time
NA	Not applicable
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSMA/CA	Carrier Sense Multiple Access with Collision Avoidance
FSK	Frequency-shift keying
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PBX	Private branch exchange



Vendor Network	Excelan	Gandalf Data	Gould
<b>System Components</b>	Excelan Open Systems (EXOS) EXOS 101 Ethernet front-end proc board, EXOS 8010 TCP/IP Protocol package	PACXNET	Modway
<b>System Characteristics</b>			
Topology	Bus	One node: star; node-to-node: ring/star/full	Bus
Cable Medium	Coaxial (Ethernet)	Twisted pair, coaxial, fiber optic	75ohm coaxial
Line Access Method	CSMA/CD	FDX w/intranode contention, TDM, FDM	Token passing
Operating Mode Addressing (bits)	FDX logical 48	FDX/HDX NA	FDX/HDX Up to 250
<b>System Capacities</b>			
Transmission Speed (bps)	10M	5.3M (intranode bus)	1.544M
No. of Supportable Devices	1,024	1,536/node (up to 8 nodes total)	250-1,000/wire
Max Geographical Span	2.5km (w/repeaters)	Unlimited	15,000 ft
Max Distance between Nodes	2.5km	Unlimited	15,000 ft
Min Distance between Nodes	10m	Unlimited	1 ft
<b>Support Capacities</b>			
Data Type(s) Interfaces	Digital Multibus computer backplane	Digital RS-232C, RS-422C, RS-423C, 20mA current loop, Mil-Std-188-114	Digital RS-232C, RS-449
Communications Protocol(s)	Arpanet TCP/IP, Ethernet	Async, sync, protocol transparent, IBM 3270	Async, SDLC/HDLC, X.25 level 3
OSI Reference Model	Yes (layers 1-4)	No	Yes
IEEE 802 Standard	Yes (802.3)	No	No
SNA Model	No	No	No
Other Supported Architectures	ISO, Xerox XNS	No	Level 3 of X.25 maps to DECnet level 3 X.25
Applications	NA	EDP, time sharing, electronic mail, WP, automated office, resource sharing	Factory automation, data acquisition, control & monitoring
<b>General Information</b>			
Date Announced	January 1983	1976	March 1981
Date of First Delivery	January 1983	1976	April 1981
No. of LANs Installed to Date	—	1,200	1 (in Beta test)
Average Cost per Attachment	\$2,000/node	\$150-\$450	\$1,600/port (varies according to protocol)
<b>Comments</b>	Allows OEMs, sys integrators, or end users to create distributed sys based on a high-speed LAN	—	Built for the industrial market; functions in a hostile environment; supports redundant media w/auto. failover in case of media or internal modem failure

**Notes:**

- Information unavailable at press time
- NA Not applicable
- CSMA/CD Carrier Sense Multiple Access with Collision Detection
- CSMA/CA Carrier Sense Multiple Access with Collision Avoidance
- FSK Frequency-shift keying
- DMA Direct memory access
- PBX Private branch exchange



Vendor Network System Components	IBM	IBM	Intertec
<b>System Characteristics</b>	Series/1 Ring IBM Series/1 minicomputer w/local comm controller, real-time programming software	8100 Loop IBM 8100 sys, DPCX, DPPX, loop control unit, dual twisted-pair medium	Head Start Coaxial cable, interface units
Topology	Ring/star	Loop	Bus
Cable Medium	Twisted pair; dual coaxial	Dual twisted pair	93ohm coaxial
Line Access Method	Token passing/pollled	Pollled	Polling
Operating Mode	FDX	FDX	HDX
Addressing (bits)	16	—	16
<b>System Capacities</b>			
Transmission Speed (bps)	2M	Up to 56K	3M
No. of Supportable Devices	256	80 devices/loop	255
Max Geographical Span	5,000 ft	2 miles	1 mile
Max Distance between Nodes	5,000 ft	2 miles	1 mile
Min Distance between Nodes	—	—	3 ft
<b>Support Capacities</b>			
Data Type(s)	Digital	Digital	Digital
Interfaces	—	IBM Displaywriter, Personal Computer, Series/1, 3640 Plant Communications System, 6670; RS-232C	Built-in chaining adapter
Communications Protocol(s)	Async, sync, bisync (3270), HDLC, SDLC, X.25	Async; IBM 3101, 3270; SDLC	Async
OSI Reference Model	No	No	Yes (layers 1-4)
IEEE 802 Standard	Yes (w/token passing)	—	—
SNA Model	Yes	Yes	—
Other Supported Architectures	—	—	—
Applications	Resource sharing, WP	Resource sharing, file Xfer, WP	Resource sharing, electronic mail, file sharing, time slicing
<b>General Information</b>			
Date Announced	—	October 1978	November 1983
Date of First Delivery	—	—	January 1984
No. of LANs Installed to Date	—	—	—
Average Cost per Attachment	—	—	Vendor declined to provide
<b>Comments</b>	—	—	—

**Notes:**

—	Information unavailable at press time
NA	Not applicable
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSMA/CA	Carrier Sense Multiple Access with Collision Avoidance
FSK	Frequency-shift keying
DMA	Direct memory access
PBX	Private branch exchange

<p><b>Vendor Network System Components</b></p> <p><b>System Characteristics</b>                  Topology                  Cable Medium                  Line Access Method                  Operating Mode                  Addressing (bits)</p> <p><b>System Capacities</b>                  Transmission Speed (bps)                  No. of Supportable Devices                  Max Geographical Span                  Max Distance between Nodes                  Min Distance between Nodes</p> <p><b>Support Capacities</b>                  Data Type(s)                  Interfaces</p> <p>Communications Protocol(s)</p> <p>OSI Reference Model                  IEEE 802 Standard                  SNA Model                  Other Supported Architectures</p> <p>Applications</p> <p><b>General Information</b>                  Date Announced                  Date of First Delivery                  No. of LANs Installed to Date                  Average Cost per Attachment</p> <p><b>Comments</b></p>	<p><b>Lanier Business Products</b>                  Lanier Business System 5000                  Work proc, printers, disk drives, network controller</p> <p>Bus                  RG-59u coaxial cable                  Polled token                  FDX                  8</p> <p>1.25M                  15                  3,300 ft                  3,300 ft                  25 ft</p> <p>Digital                  LAPN node kit</p> <p>Async, bisync, IBM 3270, Digital Equipment VT100 emulation                  Yes (layers 1-3)                  Yes (w/token passing)                  Yes (layers 1-3)                  No</p> <p>Electronic filing, electronic mail, personal computing, WP, graphics</p> <p>September 1983                  September 1983                  —                  \$500/interface for 50 nodes                  —</p>	<p><b>LED Systems</b>                  4DT1                  2 optical transceivers, 2 control units, 2 cables to connect transceivers to control units</p> <p>Ring                  Infrared, unguided light                  Transparent to sys                  FDX                  Transparent to sys</p> <p>1.544M                  User dependent                  1,000 ft                  1,000 ft                  Unlimited</p> <p>Digital, voice                  551A emulation/V.35</p> <p>Vendor transparent, T1</p> <p>—                  —                  —                  Telephone interconnects, Network Systems Hyperchannel</p> <p>Resource sharing, electronic mail, time sharing, factory automation</p> <p>August 1982                  September 1982                  3                  \$8,450</p> <p>Can be used for interconnecting PABXs, replaces telephone lines &amp; allows PABX nodes to be connected directly into the unit</p>	<p><b>LED Systems</b>                  4D1                  2 optical transceivers, 2 control units, 2 cables to connect transceivers to control units</p> <p>Ring                  Infrared, unguided light                  Transparent to sys                  FDX                  Transparent to sys</p> <p>Up to 100K                  User dependent                  1 mile                  1 mile                  Unlimited</p> <p>Digital                  Burroughs TDI, V.35, RS-449, Bell 303, 188-C                  Sync, async, bisync</p> <p>Resource sharing, electronic mail, time sharing, factory automation</p> <p>September 1980                  January 1981                  More than 30                  \$6,950</p> <p>Takes the place of 1 telephone line and 2 modems; connects any device that does not use frequency multiplexing</p>
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- Notes:**
- Information unavailable at press time
  - NA Not applicable
  - CSMA/CD Carrier Sense Multiple Access with Collision Detection
  - CSMA/CA Carrier Sense Multiple Access with Collision Avoidance
  - FSK Frequency-shift keying
  - DMA Direct memory access
  - PBX Private branch exchange



Vendor Network	LED Systems 7DT1	M/A-Com Linkbit IDX-3000 Distributed Data Star	Nestar Systems PLAN Series
<b>System Components</b>	2 optical transceivers, 2 control units, 2 cables to connect the transceivers to the control units	Mux (T1/TDM), network exchange (T1-Switch), network controller (Motorola MC6800 based)	Coaxial cable, hub junction box, personal computers, interfaces (see Comments), disk servers, software
<b>System Characteristics</b>			
Topology	Ring	Star	Tree
Cable Medium	Infrared, unguided light	Twisted pair	93ohm, RG-62/WENC connectors
Line Access Method	Transparent to sys	NA	Token passing
Operating Mode	FDX	FDX	HDX
Addressing (bits)	Transparent to sys	—	8
<b>System Capacities</b>			
Transmission Speed (bps)	1.544M	393M (aggregate)	2.5M
No. of Supportable Devices	User dependent	3,072	255/segment
Max Geographical Span	1 mile	4.5 miles	500 miles
Max Distance between Nodes	1 mile	6,000 ft	22,000 ft
Min Distance between Nodes	Unlimited	Unlimited	Unlimited
<b>Support Capacities</b>			
Data Type(s)	Digital, voice	Digital	Digital
Interfaces	551A emulation/V.35	RS-232C	Motorola MC68000 multibus, Apple II & III, IBM Personal Computer
Communications Protocol(s)	T1	Async	Xerox XNS transport-level protocol
OSI Reference Model	—	Yes (layers 1-3)	Yes (layers 1-7)
IEEE 802 Standard	—	No	No
SNA Model	—	No	Yes (for servers w/IBM 3270/3770)
Other Supported Architectures	Telephone interconnects, Network Systems Hyperchannel	Protocol independent	Datapoint ARCnet, Ethernet
Applications	Resource sharing, electronic mail, time sharing, factory automation	Resource sharing, electronic mail, time sharing, factory automation	Resource sharing, electronic mail, financial spreadsheets, WP
<b>General Information</b>			
Date Announced	August 1982	May 1982	November 1982
Date of First Delivery	September 1982	November 1982	December 1982
No. of LANs Installed to Date	3	20	1,000
Average Cost per Attachment	\$12,000	\$200/port	\$595
<b>Comments</b>	Can be used to interconnect PABXs between buildings; replaces telephone lines & can be connected directly into the telephone PABX node	Oper can control from any term.; permits custom tailoring; T1/DSI connects to microwave, fiber optic, satellite	Compat w/Columbia, Eagle, Hyperion, Apple II & III (all models), IBM Personal Computer (all models), & COMPAQ microcomputers

**Notes:**

—	Information unavailable at press time
NA	Not applicable
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSMA/CA	Carrier Sense Multiple Access with Collision Avoidance
FSK	Frequency-shift keying
DMA	Direct memory access
PBX	Private branch exchange

Vendor Network System Components	Network Systems	Network Systems	Novell
<b>System Characteristics</b>	Hyperbus Coaxial, piercing taps, bus interface units	Hyperchannel Network adapters, coaxial cable, repeaters	Netware/E 3Com's Ethernet hardware, Novell software
Topology	Bus	Bus	Bus
Cable Medium	75ohm coaxial	75ohm coaxial	Twisted pair
Line Access Method	CSMA/CA	CSMA/CA	CSMA/CD
Operating Mode	TDMA	TDMA	FDX
Addressing (bits)	16	16	16
<b>System Capacities</b>			
Transmission Speed (bps)	10M	50M	10M
No. of Supportable Devices	4,096/seg	Unlimited	—
Max Geographical Span	Unlimited	Unlimited	7,000 ft
Max Distance between Nodes	5,000 ft/seg	Unlimited (w/satellite links)	7,000 ft
Min Distance between Nodes	Unlimited	Unlimited	Unlimited
<b>Support Capacities</b>			
Data Type(s) Interfaces	Digital All RS-232C, 16-bit parallel, DMA, IBM 3274/3278	Digital —	Digital —
Communications Protocol(s)	Async, bisync, IBM 3270 (term. to controller), DECnet, others	Async, bisync, IBM 3270	Proprietary
OSI Reference Model	Yes (layers 1-3 directly; can expand)	Yes (layers 1-5)	—
IEEE 802 Standard	No	No	—
SNA Model	Yes	Yes (overlaps 150)	—
Other Supported Architectures	DECnet, Burroughs Network Architecture (BNA)	Hyperbus	—
Applications	Term.-computer connection, resource sharing, job Xfer	Bulk file Xfer, local attachment for remote devices	—
<b>General Information</b>			
Date Announced	May 1982	1976	November 1983
Date of First Delivery	August 1982	1976	—
No. of LANs Installed to Date	Proprietary	300 +	—
Average Cost per Attachment	Proprietary	\$40,000	\$1,495 for software
<b>Comments</b>	—	Hyperchannel is a computer-to-computer network	Improves performance, security, and usability of 3Com's Ethernet

**Notes:**

- Information unavailable at press time
- NA Not applicable
- CSMA/CD Carrier Sense Multiple Access with Collision Detection
- CSMA/CA Carrier Sense Multiple Access with Collision Avoidance
- FSK Frequency-shift keying
- DMA Direct memory access
- PBX Private branch exchange





<b>Vendor Network System Components</b>	<b>Novell Netware/0</b> Corvus Systems Omninet hardware, Novell software	<b>Novell Netware/S</b> Motorola MC6800 proc; 512KB memory; mux cables; 20MB/39MB formatted disk; software; IBM/Victor/T1 microcomputers	<b>Novell Netware/X</b> Coaxial cable, IBM Personal Computer or XT, disk subsys
<b>System Characteristics</b>			
Topology	Bus	Star	Linear
Cable Medium	20-gauge twisted pair	Shielded dual-twisted pair (BELD 9302)	RG-59/RG-62 coaxial
Line Access Method	CSMA/CD	Proprietary (RS-422 compat)	CSMA/CD
Operating Mode	FDX	FDX	FDX
Addressing (bits)	16	16	16
<b>System Capacities</b>			
Transmission Speed (bps)	1M	450K	1.43M
No. of Supportable Devices	—	24	255
Max Geographical Span	4,000 ft	—	4,000 ft
Max Distance between Nodes	—	3,000 ft	4,000 ft
Min Distance between Nodes	—	Unlimited	Unlimited
<b>Support Capacities</b>			
Data Type(s)	Digital	Digital	Digital
Interfaces	—	RS-232C	IBM compat
Communications Protocol(s)	Proprietary	Proprietary	Proprietary
OSI Reference Model	—	Yes (layers 1-7)	Yes (layers 1-7)
IEEE 802 Standard	—	No	No
SNA Model	—	No	No
Other Supported Architectures	—	No	No
Applications	—	Electronic mail, file sharing, data base management, WP	Electronic mail, file sharing, data base management, WP
<b>General Information</b>			
Date Announced	November 1983	January 1982	July 1983
Date of First Delivery	—	January 1982	1983
No. of LANs Installed to Date	—	350	120
Average Cost per Attachment	\$1,495 for software	\$250/node	\$695/node
<b>Comments</b>	—	Uses a file server that allows different personal computers &/or OS to share volumes & files	One personal computer must be dedicated as the file server

**Notes:**

—	Information unavailable at press time
NA	Not applicable
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSMA/CA	Carrier Sense Multiple Access with Collision Avoidance
FSK	Frequency-shift keying
DMA	Direct memory access
PBX	Private branch exchange



<p><b>Vendor Network System Components</b></p> <p><b>System Characteristics</b>                  Topology                  Cable Medium                  Line Access Method                  Operating Mode                  Addressing (bits)</p> <p><b>System Capacities</b>                  Transmission Speed (bps)                  No. of Supportable Devices                  Max Geographical Span                  Max Distance between Nodes                  Min Distance between Nodes</p> <p><b>Support Capacities</b>                  Data Type(s)                  Interfaces</p> <p>Communications Protocol(s)                  OSI Reference Model                  IEEE 802 Standard                  SNA Model                  Other Supported Architectures                  Applications</p> <p><b>General Information</b>                  Date Announced                  Date of First Delivery                  No. of LANs Installed to Date                  Average Cost per Attachment</p> <p><b>Comments</b></p>	<p><b>Orchid Technology</b>                  PCnet                  Coaxial cable, PCnet adapter board</p> <p>Bus                  75ohm coaxial                  CSMA/CD                  HDX                  16</p> <p>1M                  256/network                  7,000 ft                  7,000 ft                  Unlimited</p> <p>Digital                  See Comments</p> <p>SDLC</p> <p>Yes (layers 1 &amp; 2)                  No                  No                  No</p> <p>Resource sharing, electronic mail</p> <p>August 1982                  October 1982                  4,000                  \$700/node</p> <p>Compat w/IBM Personal Computer XT; Tallgrass, Corvus, Tecmar, &amp; Datamac disks</p>	<p><b>Pragmatronics</b>                  TIENET                  Coaxial cable, transceiver, transceiver-to-node interface, repeaters, network diagnostic units</p> <p>Branchable bus                  75ohm/50ohm coaxial                  CSMA/CD                  HDX                  16</p> <p>1M                  16,000/seg                  5 miles                  5 miles w/repeater, 3 miles w/o repeater                  Unlimited</p> <p>Digital                  RS-232C, DTE/DCE, multivendor permissive                  Async, FDX/HDX</p> <p>Yes (layers 1-3)                  No                  No                  NBSNET</p> <p>Resource sharing, electronic mail, educational &amp; research campuses, time sharing, factory automation</p> <p>1977 (announced as NBSNET)                  1979 (NBSNET), 1982 (TIENET)                  4                  \$700/interface for 50 nodes</p> <p>TIENET is a commercial version of NBSNET; principal feature is the ability to interconnect term., wd proc, computers, etc. from many vendors w/o regard to their differences</p>	<p><b>Prime Computer</b>                  RINGNET                  PRIMENET node controller (Prime Host Interface), coaxial cable, PRIMENET software, PRIMOS OS, Prime 32-bit supermini sys</p> <p>Ring                  75ohm biaxial                  Token passing ring                  FDX                  8</p> <p>8M                  247 Prime hosts via point-to-point                  Depends on number of hosts                  750 ft                  25 ft</p> <p>Digital                  Prime-specific host interface</p> <p>PRIMENET, X.25</p> <p>Yes (layers 1-3)                  No (supports similar mod)                  No                  No</p> <p>Resource sharing, electronic mail, time sharing, factory automation, transparent file access, interprocess comm among hosts</p> <p>January 1979                  January 1979                  More than 200                  \$5,000/host interface</p> <p>RINGNET forms a high-speed, tightly-coupled network &amp; is an integral feature of PRIMENET, which provides complete local and remote network comm services for all Prime sys</p>
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- Notes:**
- Information unavailable at press time
  - NA Not applicable
  - CSMA/CD Carrier Sense Multiple Access with Collision Detection
  - CSMA/CA Carrier Sense Multiple Access with Collision Avoidance
  - FSK Frequency-shift keying
  - DMA Direct memory access
  - PBX Private branch exchange



Vendor Network System Components	Proteon Associates PRONET	Protex Industries Starnet II	Racal-Milgo Planet
System Characteristics	Host interface network, interface, wire center, twisted pair/coaxial medium	16-chan/node Starnet II w/extension via 50 conductor parallel interconnect cable, media conversion modules, fiber optics, broadband coaxial cable & other media	Cable (RG-59), cable & term. interfaces
Topology	Ring	Star-config node w/bus-structured nodal interconnect	Ring
Cable Medium	Twisted pair/coaxial intermixing	Fiber optic, coaxial	75ohm coaxial
Line Access Method	Token arbitration	Fixed switching w/mtpl access	Token passing
Operating Mode Addressing (bits)	FDX 8 (hardware), 48 (software)	FDX interactive, block	FDX/HDX 16
System Capacities			
Transmission Speed (bps)	10M	Approx 38M	10M (ring) 3.5M (data thruput)
No. of Supportable Devices	255/ring	65,000	250-500/ring
Max Geographical Span	300km	—	3 miles
Max Distance between Nodes	800m	—	980 ft
Min Distance between Nodes	Unlimited	—	Unlimited
Support Capacities			
Data Type(s) Interfaces	Digital RS-232C, Unibus, Q-bus, Multibus, IBM bus & tag chan, Versabus	Digital RS-232C, RS-449, IEEE-488, parallel & analog (vendor independent)	Digital RS-232C
Communications Protocol(s)	DECnet, TCP/IP	X-On/X-Off, ENO/ACK, DC1/DC2, IBM 327x, others	Async; IBM BSC, SDLC
OSI Reference Model	Yes (layers 1-7)	Yes (modified mod, layers 1-3)	Yes (layers 1 & 2)
IEEE 802 Standard	Yes (802.5)	—	—
SNA Model	No	—	Yes (layers 1 & 2)
Other Supported Architectures	Unix	—	—
Applications	Resource sharing, electronic mail, remote log-in, real-time process control, file Xfer	Resource sharing, electronic mail, time sharing, automatic sys reconfig, factory automation, facsimile & distributive proc	—
General Information			
Date Announced	June 1981	November 1981	November 1982
Date of First Delivery	June 1981	June 1981	March 1983
No. of LANs Installed to Date	70	17	2,000
Average Cost per Attachment	\$2,700/node for 50 nodes	\$980/port	\$800/port
Comments	Opt. fiber-optic links avail. for Tempest-approved oper	Starnet II provides extensive comm between multivendor equip., does not require special cable or modifications to computer hardware or OS, & will support architectures from various manufacturers in future releases	—

**Notes:**

—	Information unavailable at press time
NA	Not applicable
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSMA/CA	Carrier Sense Multiple Access with Collision Avoidance
FSK	Frequency-shift keying
DMA	Direct memory access
PBX	Private branch exchange



<p><b>Vendor Network System Components</b></p> <p><b>System Characteristics</b> Topology Cable Medium Line Access Method Operating Mode Addressing (bits)</p> <p><b>System Capacities</b> Transmission Speed (bps) No. of Supportable Devices Max Geographical Span Max Distance between Nodes Min Distance between Nodes</p> <p><b>Support Capacities</b> Data Type(s) Interfaces Communications Protocol(s) OSI Reference Model IEEE 802 Standard SNA Model Other Supported Architectures Applications</p> <p><b>General Information</b> Date Announced Date of First Delivery No. of LANs Installed to Date Average Cost per Attachment</p> <p><b>Comments</b></p>	<p><b>Scientific Data Systems</b> SDSNET Local Area Network Transceivers, coaxial cable, server, term.</p> <p>Bus 50ohm coaxial CSMA/CD — 8 1M 255/seg 1km 1km 1m</p> <p>Digital Proprietary SDSNET</p> <p>No (supports similar mod) No No No</p> <p>File server, print server, comm server, shared key file access, WP, accounts receivable, accounts payable, gen ledger</p> <p>June 1981 August 1981 35 —</p> <p>SDSNET is an integral part of Scientific Data's multiuser sys</p>	<p><b>Software Dynamics</b> SDNET Twisted, shielded pair, custom HDLC-based network drives/RS-232C-based serial lines w/RS-232C star repeater</p> <p>RS-232C physical star, bus Twisted pair CSMA/CD HDX 8 1M 256 nodes/network 1,000 ft 1,000 ft Unlimited</p> <p>Digital RS-232C Async/HDLC</p> <p>Yes (layers 1-3) No No No</p> <p>Resource sharing, time sharing, factory automation</p> <p>January 1982 January 1983 NA \$300/interface</p> <p>Low-to-medium speed network ties together mtpl micros from the Motorola MC6800/6809 family</p>	<p><b>Standard Engineering</b> Partyline Microlink-intelligent DMA, CPU, HDLC card; Vantage-firmware/software, FSK modem</p> <p>Bus/star Coaxial Token passing HDX 18 1M Unlimited 5-6 miles 5-6 miles Unlimited</p> <p>Digital/audio RS-422/FSK modem HDLC</p> <p>Yes (layers 1-4) Yes (w/token passing) No No</p> <p>Resource sharing, factory automation</p> <p>January 1982 September 1982 Proprietary \$3,500/node for 1-9 nodes, \$2,750/node for 10 or more nodes Operates in hostile environment w/FSK modem at 3MHz; error recovery &amp; digital filtering, redundant bus</p>
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- Notes:**
- Information unavailable at press time
  - NA Not applicable
  - CSMA/CD Carrier Sense Multiple Access with Collision Detection
  - CSMA/CA Carrier Sense Multiple Access with Collision Avoidance
  - FSK Frequency-shift keying
  - DMA Direct memory access
  - PBX Private branch exchange



Vendor Network	Stratus Computer	Syntrex	Technology Concepts
<b>System Components</b>	StrataLink Coaxial cable, StrataLink control boards, repeaters (every 1,500 ft)	SYNnet Ethernet cable, network interface units	Etherway Software, cable
<b>System Characteristics</b>	Ring 75ohm coaxial DSMA/CD (Data Sense Multiple Access with Collision Detection)	Bus Coaxial CSMA/CD	Bus 50ohm coaxial CSMA/CD
Topology			
Cable Medium			
Line Access Method			
Operating Mode	HDX	—	Broadcast chan
Addressing (bits)	8	—	48
<b>System Capacities</b>			
Transmission Speed (bps)	12.5M	10M	10M
No. of Supportable Devices	32 (255 in future release)	112 sta	1,024
Max Geographical Span	10 miles	500m	2.5km
Max Distance between Nodes	1,500 ft w/extender	500m	2.5km
Min Distance between Nodes	10 ft	—	2m
<b>Support Capacities</b>			
Data Type(s)	Digital	Digital	Digital
Interfaces	Stratus Computer devices	Syntrex devices	Interlan Ethernet controllers
Communications Protocol(s)	Stratus Computer devices	NA	DECnet
OSI Reference Model	Yes (layers 1-7)	No	Yes (layers 1-7)
IEEE 802 Standard	No	—	—
SNA Model	No	—	—
Other Supported Architectures	No	No	DECnet on Thernet chan
Applications	G-p, distribution proc	Resource sharing, electronic mail, information sharing	Office automation
<b>General Information</b>			
Date Announced	November 1981	July 1982	April 1982
Date of First Delivery	February 1982	April 1983	October 1982
No. of LANs Installed to Date	—	—	50
Average Cost per Attachment	\$5,000/interface for 64 nodes	\$400/sta	\$2,000/node
<b>Comments</b>	StrataLink provides transparent networking between up to 32 Stratus/32 Continuous Processing Computers; controller has hardware self-checking & can be paired to give fault-tolerant oper at 2.8M-bps transmission speed	—	Operates on Digital Equipment VAX/VMS & PDP-11/RSX OSs; supports DECnet comm over Ethernet, token ring, & broadband chan

**Notes:**

—	Information unavailable at press time
NA	Not applicable
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSMA/CA	Carrier Sense Multiple Access with Collision Avoidance
FSK	Frequency-shift keying
DMA	Direct memory access
PBX	Private branch exchange

Vendor Network System Components	Technology Concepts	Texas Instruments	Ungermann-Bass
<b>System Characteristics</b>			
Topology	Ring	Unrooted tree (bus)	Bus
Cable Medium	Coaxial, fiber optic, twisted pair	Coaxial	50ohm coaxial
Line Access Method	Token passing	CSMA/CD	CSMA/CD
Operating Mode	FDX/HDX	HDX	FDX
Addressing (bits)	16	48	48
<b>System Capacities</b>			
Transmission Speed (bps)	10M	10M	10M
No. of Supportable Devices	Less than 200	100/segment	2,400/seg
Max Geographical Span	2km	2.8km	2.8km w/repeaters
Max Distance between Nodes	—	2.5km	2.8km w/repeaters
Min Distance between Nodes	—	2.5m	2.5m
<b>Support Capacities</b>			
Data Type(s)	Digital	Digital	Digital
Interfaces	Proteon ring	TI S300/600/800, TI Professional Computer, IBM Personal Computer	RS-232C, 8-bit TTL parallel, IEEE-488, 32-bit parallel DMA, RS-449, V.35
Communications Protocol(s)	DECnet	Xerox Network System (XNS), X.25, IBM SNA, BSC, 3270 gateway	Async, bisync, DR11-B/W, IEEE-488, 8/16-bit parallel
OSI Reference Model	Yes (layers 1-7)	Yes (layers 1 & 2 w/Ethernet; layers 3 & 4, w/XNS; layers 5-7, w/proprietary)	Yes (layers 1-7)
IEEE 802 Standard	—	Yes (802.3 w/CSMA/CD)	Yes (IEEE 802.3 draft standard; w/CSMA/CD)
SNA Model	—	Yes (layers 1-3 SNA PU type 2, 3274/3278 emulation)	No
Other Supported Architectures	DECnet	X.25, XNS	No
Applications	Office automation	Resource sharing, electronic mail, virtual term. distributed file I/O	Resource sharing, factory automation, laboratory research, university environments
<b>General Information</b>			
Date Announced	April 1983	November 1983	July 1980
Date of First Delivery	October 1983	1984	July 1980
No. of LANs Installed to Date	4	—	More than 150
Average Cost per Attachment	\$2,000/node	\$600	\$500/interface
<b>Comments</b>	Operates on Digital Equipment VAX/VMS & PDP-11/RSX OSs; supports DECnet comm over Ethernet, token ring, & broadband chan	—	Ethernet compat.; Ungermann-Bass can extend topology thru network repeaters & interconnect networks via Ungermann-Bass network bridge unit; bridge units may be local or remote

- Notes:
- Information unavailable at press time
  - NA Not applicable
  - CSMA/CD Carrier Sense Multiple Access with Collision Detection
  - CSMA/CA Carrier Sense Multiple Access with Collision Avoidance
  - FSK Frequency-shift keying
  - DMA Direct memory access
  - PBX Private branch exchange



<p><b>Vendor Network System Components</b></p> <p><b>System Characteristics</b> Topology Cable Medium Line Access Method Operating Mode Addressing (bits)</p> <p><b>System Capacities</b> Transmission Speed (bps) No. of Supportable Devices Max Geographical Span Max Distance between Nodes Min Distance between Nodes</p> <p><b>Support Capacities</b> Data Type(s) Interfaces Communications Protocol(s) OSI Reference Model IEEE 802 Standard SNA Model Other Supported Architectures Applications</p> <p><b>General Information</b> Date Announced Date of First Delivery No. of LANs Installed to Date Average Cost per Attachment</p> <p><b>Comments</b></p>	<p><b>Xerox</b> Ethernet Coaxial cable, terminators, connectors, taps, repeater, file servers, print servers, comm servers</p> <p>Bus 50ohm coaxial CSMA/CD HDX 48</p> <p>10M</p> <p>1,024</p> <p>2.5km 2.5km</p> <p>Unlimited</p> <p>Digital RS-232C; Xerox 850, 860, 8010 TTY; IBM 3270</p> <p>Yes (layers 1-7) Yes (layers 1-7 w/CSMA/CD) No —</p> <p>Resource sharing, electronic mail; file Xfer; protocol conversion</p> <p>November 1980 1981 —</p> <p>\$250-\$1,000</p> <p>—</p>	<p><b>Zilog</b> Z-NET II Zilog System 8000, coaxial cable, transceivers, RS-232C links</p> <p>Nonbranching bus 50ohm (RG-8) CSMA/CD FDX 8</p> <p>800K</p> <p>254</p> <p>7,000 ft 7,000 ft</p> <p>Unlimited</p> <p>Digital Zilog NST 2/02 transceiver</p> <p>SDLC framing, Ethernet-type, Arpanet ICP, TCP protocol Yes (layers 1-7) No Yes (layers 1-3) No</p> <p>Resource sharing, electronic mail, file Xfer</p> <p>March 1982 September 1982 Approx 100</p> <p>\$5,750/interface for 10 nodes</p> <p>Peripherals avail. for Z-NET incl Unix OS, Winchester disks, tape cartridge &amp; 9-trk tape; can hold 1-24 users/machine for scientific languages</p>	
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**Notes:**

—	Information unavailable at press time
NA	Not applicable
CSMA/CD	Carrier Sense Multiple Access with Collision Detection
CSMA/CA	Carrier Sense Multiple Access with Collision Avoidance
FSK	Frequency-shift keying
DMA	Direct memory access
PBX	Private branch exchange

# SPECIFICATIONS CHART

## Broadband Networks

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Vendor Network System Components	Applitek UniLAN NI10/T network interface unit that interfaces broadband cable & user devices	Codex Codex 4000 Series LAN Coaxial cable, entry ways, radio frequency modems, network storage modules, bridges, chan translator	Concord Data Systems Token/Net CATV media & related equip. Token/Net interface modules, head-end translator/head-end modulator/dual cable
<b>System Characteristics</b>			
Topology	Bus/Tree	Bus	Bus
Cable Medium	75ohm coaxial	75 ohm 1/2-in. hard wire	75ohm coaxial CATV
Line Access Method	CSMA/CD, concurrent token passing	CSMA	Token passing
Operating Mode	FDX	FDX	HDX
Addressing (bits)	48	48	16/48
<b>System Capacities</b>			
Transmission Speed (bps)	10M	5M	5M/10M
No. of Supportable Devices	40,000	7,200	32,000/unlimited
Max Geographical Span	20 miles	10 miles	20 miles
Max Distance between Nodes	20 miles	10 miles	Unlimited
Min Distance between Nodes	Unlimited	Unlimited	Unlimited
<b>Channel Capacities</b>			
Total Bandwidth (MHz)	300	60	300
No. of Digital Channels	6 at 10M bps	5 at 5M bps	10 at 5M/10M bps
No. of Voice Channels	NA	NA	Unlimited
No. of Video Channels	NA	NA	Unlimited
<b>Support Capacities</b>			
Data Type(s)	Digital	Digital, audio, video	Digital
Interfaces	RS-232C, RS-449, V.35, IEEE-488	RS-232C, RS-449, RS-442, V.35	Serial: RS-232C, RS-445C, V.35, V.24; parallel: IEEE-488
Communications Protocol(s)	Async, bisync, X.25, IBM 3270, SDLC, HDLC	Async, IBM BSC	All serial sync & async
OSI Reference Model	Yes (layers 1-6; layer 7 for specific applications)	Yes (layers 1-7 proprietary)	Yes (layers 1-7)
IEEE 802 Standard	Yes (at interface level)	Yes	Yes (w/token bus, radio frequency modulation)
SNA Model	No	No	No
Other Supported Architectures	No	—	No
Applications	Resource sharing, time sharing, factory automation	Application switching, resource sharing, office automation	G-p, time sharing, batch, interactive factory automation, office automation, security, energy management, others
<b>General Information</b>			
Date Announced	November 1983	February 1984	March 1983
Date of First Delivery	February 1984	February 1984	Fall 1983
No. of LANs Installed to Date	—	—	—
Average Cost per Attachment	\$150,000 for LAN w/200 term. (incl 25 NI10/Ts), interfaces, software	\$530 (min)	Approx \$1,000/serial connection
<b>Comments</b>	—	—	Broadband modems are frequency agile across 5 TV chan; network interfaces are avail. in mtpl config

**Notes:**

— Information unavailable at press time  
 NA Not applicable  
 CATV Cable television  
 CSMA/CD Carrier Service Multiple Access with Collision Detection

FDM Frequency division multiplexing  
 TDM Time division multiplexing  
 DMA Direct memory access





Vendor Network System Components	Contel Information Systems ContelNet Interface units, software, coaxial cable, head-end sys, amplifiers	Control Data Loosely Coupled Network 380-xxx network access device, 380-1 trunk control unit, coaxial cable	DBS International DBS-Net Multibus
<b>System Characteristics</b> Topology Cable Medium Line Access Method	Bus/tree 75ohm coaxial CATV CSMA/CD	Bus Coaxial TRACE (Trunk Resource Allocation & Contension Elimination)	Bus 4 wire Multimaster prioritized interrupt scheme
Operating Mode Addressing (bits)	FDX 16 (expandable)	HDX 5/trunk	FDX 20
<b>System Capacities</b> Transmission Speed (bps)	2M/10M	50M	50
No. of Supportable Devices	1,000/chan (mtpl seg/chan)	127	45
Max Geographical Span	5-mile radius	3,000-ft radius	Unlimited
Max Distance between Nodes	5 miles	3,000 ft	2 miles
Min Distance between Nodes	Less than 10 ft	8 ft	5 ft
<b>Channel Capacities</b> Total Bandwidth (MHz)	300 (std CATV)	NA	5M
No. of Digital Channels	9 at 1M/10M bps	NA	1 chan at 5M bps
No. of Voice Channels	Not currently avail.	NA	NA
No. of Video Channels	Std VHF assignment (41)	NA	NA
<b>Support Capacities</b> Data Type(s) Interfaces	Digital, video RS-232C, serial, parallel	Digital Mainframe I/O channel I-F (intermediate frequency) ARQ char. oriented	Digital RS-232C
Communications Protocol(s)	Async, bisync, X.25, transparent; IBM 3270 (1983)		Async, bisync, Ethernet, IBM 3270
OSI Reference Model	Yes (layers 1-3)	Yes (layers 1-7 for functional structure; specific layers not supported)	No
IEEE 802 Standard	Yes (CSMA/CD)	No	No
SNA Model	No	No	No
Other Supported Architectures	Ethernet, DECnet, others	No	Ethernet
Applications	Resource sharing, electronic mail, host-to-host file Xfer, video	Resource sharing, high-speed interproc file Xfer between heterogeneous hosts	Resource sharing, business, office automation
<b>General Information</b> Date Announced	July 1982 (second generation)	May 1981	April 1983
Date of First Delivery	1980 (first generation)	April 1981	September 1983
No. of LANs Installed to Date	20	—	—
Average Cost per Attachment	\$500/port	—	\$1,575/node for 16 nodes
<b>Comments</b>	Broadband can be implemented by upgrading baseband sys w/o changing cable; cross-reference ContelNet baseband	—	—

**Notes:**

—	Information unavailable at press time	FDM	Frequency division multiplexing
NA	Not applicable	TDM	Time division multiplexing
CATV	Cable television	DMA	Direct memory access
CSMA/CD	Carrier Service Multiple Access with Collision Detection		



<b>Vendor Network System Components</b>	<b>Gandalf Data</b> PACXNET Nodes w/interface to coaxial cable, twisted pair (data or data-over voice), fiber optics, multiplexed links	<b>General Instrument</b> Broad Com Coaxial cable, amplifiers, directional couplers, multitaps, equalizers, head-end sys, point-to-point modems, connectors	<b>Gould</b> Modway Coaxial cable, tap, 2-1 splitters, drop cable, head-end sys, interfaces
<b>System Characteristics</b> Topology	Node-to-node: ring/star/full; one node: star	Tree	Bus
Cable Medium	75ohm coaxial CATV, twisted pair, fiber optics	75ohm coaxial	75ohm coaxial
Line Access Method	FDM, TDM	Point-to-point	Token passing
Operating Mode	FDX/HDX	FDX/HDX	FDX/HDX
Addressing (bits)	NA	—	Up to 250
<b>System Capacities</b> Transmission Speed (bps)	5.3M	1.544M	1.544M
No. of Supportable Devices	1,536/node, up to 8 nodes	7,920	250-1,000/wire
Max Geographical Span	Unlimited	Unlimited	15,000 ft
Max Distance between Nodes	Unlimited	Unlimited	15,000 ft
Min Distance between Nodes	Unlimited	Unlimited	1 ft
<b>Channel Capacities</b> Total Bandwidth (MHz)	5-450	450	—
No. of Digital Channels	Speed-dependent (average 75/TV channel)	800 at 19.2K bps	—
No. of Voice Channels	NA	Application dependent	—
No. of Video Channels	7 return, 14 forward	66 at 6MHz	—
<b>Support Capacities</b> Data Type(s)	Digital serial	Digital, audio, video	Digital
Interfaces	RS-232C, RS-422, RS-423, 20mA current loop, Mil-Std-188-114	RS-232C, DS-1, V.35	RS-232C, RS-449
Communications Protocol(s)	Async, sync, IBM 3270	Async, sync	Async, SDLC/HDLC, X.25 level 3
OSI Reference Model	No	No	Yes
IEEE 802 Standard	No	No	No
SNA Model	No	No	No
Other Supported Architectures	No	No	Level 3 of X.25 maps to DECnet level 3 X.25
Applications	EDP, time sharing, electronic mail, WP, automated office, resource sharing	Energy management, security	Factory automation, data acquisition, control & monitoring
<b>General Information</b> Date Announced	October 1982	1975	March 1981
Date of First Delivery	—	1976	April 1981
No. of LANs Installed to Date	—	300	1 (in Beta test)
Average Cost per Attachment	\$150-\$500	Vendor declined to provide	\$1,600/port (varies according to protocol)
<b>Comments</b>	—	—	Built for the industrial market, functions in a hostile environment, supports redundant media w/automatic failover in case of media or internal modem failure

**Notes:**

- Information unavailable at press time
- NA Not applicable
- CATV Cable television
- CSMA/CD Carrier Service Multiple Access with Collision Detection
- FDM Frequency division multiplexing
- TDM Time division multiplexing
- DMA Direct memory access



Vendor Network System Components	Infotron IS4000 Data PBX Sys controller, I/O nests, chan cd	Interactive Systems/3M Videodata Head-end sys, coaxial cable, amplifiers, CATV taps, repeaters, remodulators, radio frequency modems	Intersil Systems GENet Coaxial cable, taps, amplifiers, bus interface units (BIUs), network administration units
<b>System Characteristics</b>			
Topology	Ring	Nonrooted tree	Bus
Cable Medium	Twisted pair	75ohm coaxial	75ohm coaxial
Line Access Method	Polling	FDM, TDM	CSMA/CD
Operating Mode	FDX	FDX/HDX	FDX
Addressing (bits)	8	8	24
<b>System Capacities</b>			
Transmission Speed (bps)	40M	300K-2.1M	1M (5M in future releases)
No. of Supportable Devices	4,000	10,000	2,048
Max Geographical Span	Unlimited	50 miles	3 miles
Max Distance between Nodes	3,000 ft	50 miles	NA
Min Distance between Nodes	Unlimited	Unlimited	NA
<b>Channel Capacities</b>			
Total Bandwidth (MHz)	40	300	300 (ea chan 6MHz)
No. of Digital Channels	See Comments	225	20
No. of Voice Channels	See Comments	—	20
No. of Video Channels	See Comments	—	20
<b>Support Capacities</b>			
Data Type(s)	Digital	Digital, audio, video	Digital, audio, video
Interfaces	RS-232C	RS-232C	RS-232C, Digital Equipment parallel (DR11-W)
Communications Protocol(s)	Async, sync, IBM BSC	—	Async, DECnet, Honeywell
OSI Reference Model	No	—	Yes (layers 1-2; BIU internal supports layers 1-4)
IEEE 802 Standard	No	—	Yes (token passing)
SNA Model	No	—	No
Other Supported Architectures	No	—	No
Applications	Resource sharing, electronic mail, technology control, port contention	Electronic mail, WP, resource sharing, g-p, energy management, factory automation, process control	Resource sharing, electronic mail, factory automation
<b>General Information</b>			
Date Announced	1981	1972	March 1982
Date of First Delivery	1981	1972	May 1982
No. of LANs Installed to Date	—	Over 300	16
Average Cost per Attachment	\$200	\$400-\$1,000	\$1,000/node
<b>Comments</b>	Total chan cap. is 2,000; transmission rates up to 9,600 bps	—	—

**Notes:**

— Information unavailable at press time  
 NA Not applicable  
 CATV Cable television  
 CSMA/CD Carrier Service Multiple Access with Collision Detection

FDM Frequency division multiplexing  
 TDM Time division multiplexing  
 DMA Direct memory access



Vendor Network System Components	LED Systems	Proteon Associates	Sytek
<b>System Characteristics</b>	<b>LED Systems</b>	<b>Proteon Associates</b>	<b>Sytek</b>
Topology	4D7	PRONET	LocalNet
Cable Medium	2 transceivers (optical), two 7-chan TDM control units, 2 cables to connect transceivers to control units	Host interface, network interface, fiber-optic links, wire centers	Coaxial cable, radio frequency modem interface, microproc interface
Line Access Method	Star	Star-shaped ring	Branching tree
Operating Mode	Infrared, unguided light	Fiber optics	75ohm coaxial
Addressing (bits)	Transparent to hardware	Token arbitration	CSMA/CD
<b>System Capacities</b>	FDX	FDX	FDX/HDX
Transmission Speed (bps)	Transparent to hardware	8 (hardware); 48 (software)	Application determined
No. of Supportable Devices	9,600 (sync); 2,400 (async)	10M	Up to 19.2
Max Geographical Span	Unlimited	255/ring	24,000
Max Distance between Nodes	1 mile	100km	50km
Min Distance between Nodes	1 mile	10km	50km
<b>Channel Capacities</b>	Unlimited	Unlimited	NA
Total Bandwidth (MHz)	—	—	400
No. of Digital Channels	7 at 9,600 bps/up to 3 at 19.2K bps & 1 at 9,600 bps	—	20 at 256K bps
No. of Voice Channels	NA	—	NA
No. of Video Channels	NA	—	7
<b>Support Capacities</b>	Digital	Digital	Digital, video
Data Type(s)	RS-232C	RS-232C, Unibus, Q-bus, Multibus, IBM bus & tag chan, Versabus	RS-232C
Interfaces	Sync, async, bisync	DECnet, TCP/IP	Async, bisync
Communications Protocol(s)	—	Yes (layers 1-7)	Yes (layers 1-6)
OSI Reference Model	No	—	No
IEEE 802 Standard	No	—	Yes
SNA Model	No	Unix	No
Other Supported Architectures	Resource sharing, electronic mail, time sharing, factory automation	Resource sharing, electronic mail, remote log-in, real-time process control, factory automation, file Xfer	—
Applications	—	—	—
<b>General Information</b>	Date Announced	June 1981	Fall 1980
Date of First Delivery	May 1981	June 1981	February 1981
No. of LANs Installed to Date	6	100	238
Average Cost per Attachment	\$13,550	\$2,500/node for 50 nodes	\$575/port
<b>Comments</b>	Replaces 7 telephone lines & 14 modems; each port can have a statistical mux or TDM attached, supports a baseband mod 4D1, can opt. be extended up to 3 miles via twisted-pair medium	Fiber optics is a broadband comm medium particularly suited for a factory environment; can pass Tempest specs	—

Notes:

- Information unavailable at press time
- NA Not applicable
- CATV Cable television
- CSMA/CD Carrier Service Multiple Access with Collision Detection
- FDM Frequency division multiplexing
- TDM Time division multiplexing
- DMA Direct memory access



Vendor Network System Components	Teletone Data Carrier System-2 Sta unit, termination cd, cd file	Ungermann-Bass Net/One Broadband Coaxial cable, amplifiers, tape, network interface units, network config facility, head-end sys	Wang Laboratories WangNet Network loop head-end, splitters, amplifiers, dual-coaxial cable, CATV-type broadband components, frequency agile modems
<b>System Characteristics</b>			
Topology	Star	Bus	Branching tree (bus)
Cable Medium	Twisted pair	75ohm coaxial	75ohm dual coaxial
Line Access Method	Point-to-point	CSMA	CSMA/CD (Wangband); TDM/polling (Peripheral Band)
Operating Mode	FDX	FDX	FDX, HDX, simplex
Addressing (bits)	—	48	16
<b>System Capacities</b>			
Transmission Speed (bps)	9,600	5M	10M
No. of Supportable Devices	Determined by no. of cables	7,200/chan pair	Approx 5,000
Max Geographical Span	18,000 ft	50,000 ft	16km
Max Distance between Nodes	18,000 ft	NA	Variable
Min Distance between Nodes	Unlimited	NA	Variable
<b>Channel Capacities</b>			
Total Bandwidth (MHz)	80KHz	6/chan (up to 5 chan)	390 (10-400)
No. of Digital Channels	1 data/voice chan per cable	5 at 5M bps	See Comments
No. of Voice Channels	NA	NA	—
No. of Video Channels	NA	NA	7 (Utility Band)
<b>Support Capacities</b>			
Data Type(s)	Digital	Digital, audio, voice	Digital, audio, video
Interfaces	RS-232C	RS-232C, RS-449, IEEE-488, 8-bit TTL parallel, 32-bit parallel DMA, V.35	RS-232C, RS-449, std CATV interfaces, Wang proprietary
Communications Protocol(s)	Async, sync	Async, bisync, DR11-B/W, IEEE-488, 8/16-bit parallel	HDLC (Wangband); proprietary (Peripheral Band)
OSI Reference Model	No	Yes (layers 1-7)	Yes
IEEE 802 Standard	No	Yes	Yes
SNA Model	No	No	Yes (Interconnect Band)
Other Supported Architectures	—	No	Wang Systems Networking
Applications	Resource sharing, electronic mail, connects personal computers	Resource sharing, factory automation, laboratory research, university environments	Resource sharing, electronic mail, time sharing, file Xfer, protocol conversion
<b>General Information</b>			
Date Announced	January 1980 (async), January 1984 (sync)	February 1982	June 1982
Date of First Delivery	March 1980 (async), April 1984 (sync)	September 1982	September 1982
No. of LANs Installed to Date	More than 20,000 chan	Less than 12	Approx 20
Average Cost per Attachment	\$450/chan	\$500/interface	—
<b>Comments</b>	Geographical span can be extended w/integrated TDM (M-825) using T-1 carrier composite link	Ungermann-Bass can extend topology thru network repeaters & interconnect networks via Ungermann-Bass network bridge unit; bridge units may be local or remote; network interface units are user prgmb1	WangNet is a collection of networking services that incl: Wangband (12M bps for Wang VS-to-OIS comm), Peripheral Band (6 chan for up to 32 serial devices-to-Wang VS, OIS, or Alliance comm), Interconnect Band (16-chan leased line at 64K bps or 64-chan leased line at 9.6K bps for Wang-to-non-Wang comm), Utility Band (seven 6MHz chan for 2-way slow scan, freeze-frame, or full-motion video comm)

**Notes:**

— Information unavailable at press time  
 NA Not applicable  
 CATV Cable television  
 CSMA/CD Carrier Service Multiple Access with Collision Detection

FDM Frequency division multiplexing  
 TDM Time division multiplexing  
 DMA Direct memory access

