



# WICAT Systems

## System 140, System 150, System 155, System 160, System 200, System 220

### PROFILE

**Operating Systems** • WICAT's MCS (Multiuser Control System) single-/multiuser, real-time, multitasking operating system, or Uni Plus (Unix-based) multiprogramming, multiprocessing operating system.

**Data Management** • KSAM (keyed sequential access method) integrated into MCS; Pacific Software Manufacturing Company's Sequitar, relational database system; and various other OEM-developed data management software for Motorola 68000-based microcomputers.

**Communications/Networks** • emulation for 3275, and 2780/3780.

**Languages** • RM/COBOL, CIS COBOL, SMC BASIC, Coherent BASIC, Pascal, C, FORTRAN 77, APL 68000, and assembler.

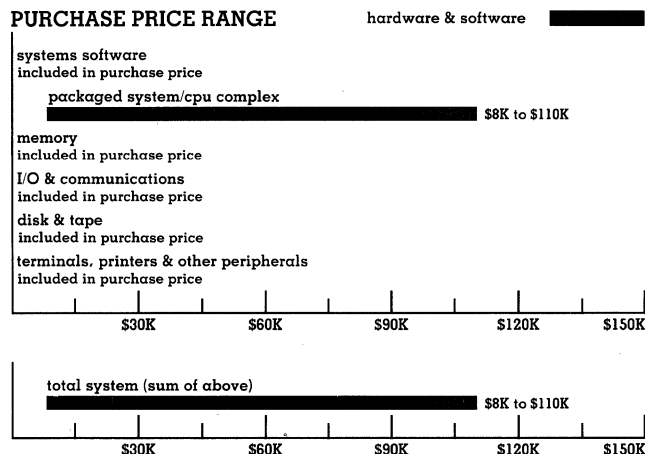
**Models** • single-user System 140, and System 150; multiuser Systems 150-3WS, 150-6, 155, 160, 200, and 220.

**CPU** • all WICAT systems based on the Motorola 68000 L8 processor (32-bit processor with 16-bit data paths).

**Memory** • 16K bytes to 32K bytes of ROM which contains System Boot Strap program; 512K bytes of main memory on System 140; 256K bytes to 1.5M bytes of main memory on System 150—all models; 512K bytes to 4.5M bytes of main memory on Systems 155 and 160; 512K bytes to 5M bytes of main memory on System 200; and 1M bytes to 16M bytes of main memory on System 220.

**Chassis Slots** • standard chassis slots per system are: System 140, 6 slots; System 150, 6 slots; System 155, 12 slots; System 160, 12 slots; System 200, 8 slots; System 220, 20 slots.

**Ports** • System 140 provides 1 RS-232C serial and 1 parallel port; System 150 accommodates 5 serial and 1 parallel port; Systems 155/160 provide 2 RS-232C serial, 12/10 async-only RS-232C serial ports, and 2 parallel ports; Systems 200 and 220 support 32 asynchronous ports, 8 synchronous ports, and 1 Master Control Port.



**WICAT SYSTEMS PURCHASE PRICING** bar graphs illustrate price ranges for small to large systems, with solid bars reflecting software/hardware purchase pricing • **SMALL SYSTEM** is based on **SYSTEM 140 packaged system** based on a minimum operational system includes both hardware & software • **LARGE SYSTEM** is based on **System 220 packaged system** (includes a maximum operational system including all hardware & software).

**Mass Storage** • 630K bytes of diskette storage and 15M bytes of disk storage on System 140; 630K bytes of diskette storage and 60.6M bytes of disk storage on System 150; 60M bytes of disk storage on System 155; and 1.684G bytes of disk storage on System 160, System 200, and System 220.

**Terminals** • System 140 and System 150-1WS, one terminal; System 150-3WS, 3 terminals; System 150-6WS, 6 terminals; Systems 155 and 160, 12 terminals; System 200, 32 terminals; and System 220, 64 terminals.

**Printers** • 2 types of printers available: a Prism dot-matrix printer and an impact thimble letter-quality printer.

**First Delivery** • January 1984 for System 140; October 1981 for System 150; May 1983 for System 155; October 1982 for System 160; October 1982 for System 200; May 1983 for System 220.

**Systems Delivered** • information is not available.

**Comparable Systems** • any Motorola 68000-based single-/multi-user systems ranging from entry-level systems priced at \$8,000 to \$25,000 to the high-end systems priced at \$32,000 to \$110,000 for example, the high-end Alpha Micro models, and the Altos 8086-based systems.

**Vendor** • WICAT Systems; PO Box 539, 1875 South State, Orem, UT 84057 • 801-224-6400.



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**Canada** • OEM Distributors: Cohesive Computer Systems; 1250 Leeds Avenue, Ottawa, ONT K1B 3W3; 613-748-1100 • Becterm; 12 Trans Canada Quest, Levis, QUE G6V 4Z2; 418-837-5894 • WI Systems; 1020 Principal Plaza, 10303 Jasper Avenue, Edmonton, ALTA T5J 3N6 • 403-428-0235.

**Distribution** • United States and Canada through company sales/service offices.

#### ■ ANALYSIS

WICAT Systems have developed in their Systems 140 through 220, microprocessor-based systems a series that provides speed and capabilities available only in mainframes until a few years ago. All Systems in the series are based on the Motorola MC68000L8 microprocessor, which is a 32-bit processor with 16-bit data paths. The Systems range from the single-user entry-level System 140 which supports up to 512K bytes of dynamic parity and ECC RAM, to the System 220 which supports up to 64 users and 14M bytes of dynamic parity ECC RAM. The other models in the series the System 150, 155, 160, and 200 support most of the logical increments of users and memory between the low and high end systems. Disk capacities supported range from the 15.6M bytes on System 140 to 1.89G bytes on the System 220. With the wide range of support provided by the models within the WICAT series, prospective customers should have no trouble finding a model to meet their specific needs.

Two operating systems are supported, the MCS (Multiuser Control System) and an optional UNI Plus (UNIX Version 7-based) operating system. Various program/system development languages are available, as is a database management system, a word processing package, spreadsheet package, and an interactive system for education. This is the limit of application programs available although packages developed by OEM's for the Motorola 68000 might be available.

WICAT was an outgrowth of a research institute which designed and developed interactive videodisc instruction programs. WICAT Systems was founded to assist in distributing these programs, to create a delivery system, and to combine the needed hardware capability with the software. Because of this there is a definite limitation on the amount of application software that is available.

#### □ Strengths

One of the most obvious pluses that the WICAT Systems provide is their wide range of memory, terminals, and disk storage that are supported within the models offered. The ability to support from 1 to 64 users, handle 512K bytes to 14M bytes of memory, and support disk storage from 15M to almost 2G's gives users quite a nice range to choose from.

The WICAT-developed MCS (Multiuser Control System) operating system, which provides multitasking/multiuser capabilities, appears to combine many of the features and capabilities of such popular minicomputer operating systems as Bell Laboratories UNIX and DEC's VAX/VMS operating systems. MCS appears easy to learn and use due to the tutorial documentation that is part of MCS.

The 3 separate maintenance options offered by WICAT, as well as the option to create a customized maintenance plan appear to be somewhat above those offered by the normal microprocessor vendor. In addition, the toll-free hotline that is available for technical assistance, should prove a boon to most first-time users, in the event of any unexpected problems.

WICAT's Systems support a large number of language compilers which makes them very versatile as far as program/system development is concerned. Any user ready to develop their own systems will probably find a familiar language that is supported, thus saving on training. In addition, the hierarchical file management system supported by MCS appears easy to use and flexible. If that is not enough the Sequitor relational database management system that is available should handle any other file management problems which arise.

#### □ Limitations

Since WICAT grew out of a research institute that developed interactive videodisc instruction programs their tutorials are excellent, but the documentation available for parts of the system not covered by tutorials is not quite as good. In fact, some of the documentation is a little confusing. There is no ready explanation about what is needed to attach additional memory, peripherals and terminals. The number of chassis slots available are indicated, but attachment requirements of various items are not indicated. Documentation on available software is also rather sketchy, as well as whether packages operate under both operating systems or either one of the two.

What is considered a plus in one area, can in return be a limitation in another. On the one hand, there are many different languages supported for program/system development, but on the other hand there are very few application packages available. This might prove to be a drawback in that the systems might not be a viable system for the first-time user that doesn't have a little expertise somewhere within the office since it will be difficult to get full utilization of the system without applications running. The very low end can probably use the office automation and spreadsheets applications, but the higher-end users might require some experienced personnel to develop applications to fully utilize the machines.

There doesn't appear to be any upgrade capability within the series. With the wide range of systems support provided with the Series, it would seem logical that a user could grow from one system to the next without much problem, but nothing is indicated in the documentation that this is a possibility. Communications capabilities are somewhat limited also.

#### ■ SOFTWARE

##### □ Terms & Support

**Terms** • each standard WICAT system includes MCS (Multiuser Control System) and a language (customer's choice) at no additional charge • all other optional software products are available on a one-time license fee basis.



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**Support** • corrective updates and enhancements are provided during 30-day warranty period • optional Master Support Plan, which covers both software and hardware, provides all software and documentation updates and enhancements for the life of the plan.

### Software Overview

All WICAT systems have bundled into the standard system price MCS (Multiuser Control System) and the customer's choice of any of the available languages.

WICAT also offers the UniPlus operating system for an additional fee. UniPlus is based on UNIX Version 7, and includes UNIX System III enhancements, the 4.1 Berkeley Standard Distribution enhancements, and enhancements made by WICAT Systems.

Various languages are available for program/system development including: RM/COBOL, CIS COBOL, SMC BASIC, Coherent BASIC, Pascal, FORTRAN 77, APL 68000, assembler, and a "C" compiler.

All standard data management, including sequential, random, and keyed sequential access methods, are supported through the operating systems. Relational database management is provided through the Sequitar package; Office Information System (OIS) provides word processing, editing and formatting capabilities, and the UltraCalc package provides electronic spreadsheet capabilities.

Communications support comes in the form of emulation for IBM 3275 and 2780 terminals.

Computer-aided instruction is provided through WISE (WICAT Interactive System for Education) package.

### Operating Systems

MCS (Multiuser Control Program) is included as part of each standard WICAT system. Other optional operating systems that are available are WICAT's UniPlus, and Bell Lab's UNIX.

**MCS** • multiuser, multitasking real-time operating system • memory-resident portion consists of 3 parts: kernel, class handlers, and system buffers requiring from 20K bytes to 85K bytes of memory depending on configurations; disk-resident portion includes system utilities, command interpreter, online help files, and device drivers • kernel includes: dynamic memory management facilities; a scheduler which controls all user tasks based on their priority and time slice; and twenty common routines, known as system services, which are available for use by the operator or can be accessed through all languages • class handlers for disks, terminals, and tapes can be configured in or out of the system depending on the needs of the application • KSAM, which is considered a class handler, provides services for keyed file access, in addition to the standard sequential and random access methods • system buffers area grows dynamically to support the necessary I/O buffers, disk cache and nine drivers; the kernel also manages its control tables in this area • provides 75 standard system utilities including • sort program, text editor, incremental system backup, archive file management, and system-to-system file transfer • command interpreter program is user interface to the operating system; provides user access to system utilities as well as help facilities, wild carding, background execution, and I/O redirection • requires 256K bytes of memory and 10M bytes of disk storage.

**UniPlus** • based on Bell Laboratories UNIX Version 7 • kernel and utilities are essentially those of Version 7, with enhancements from UNIX System III, and the 4.1 Berkeley Standard Distribution, as well as WICAT System's enhancements • includes a sort utility • requires 512K bytes of memory on any WICAT system with a minimum of 15M bytes of disk storage.

### Data Management

Standard data manipulation for sequential, random, and keyed sequential access method are handled through the operating system.

**Sequitur** • a relational database management and word processing system • provides facilities for database management,

word processing, report generation, forms generation, and word processing which manages documents • uses step-by-step visual prompting to guide novice users; uses a fill-in-the-blanks style of prompt to guide users in setting up tables, combining data, generating and printing lists and performing calculations • an integrated editing technique allows any part of a table or section to be changed throughout the database wherever that information is stored.

Prices for System 140, 150, 155 & 160:

\$1,260 lcns

Prices for System 200 & 220:

1,920

### Communications/Networks

Communications supported by the WICAT Systems are provided from within the operating system itself (MCS). Bisynchronous communications consist of IBM 3275 and 2780/3780 emulation. Since this is built into the operating system there is no additional charge for this facility.

### Program Development/Languages

**RM/COBOL** • high-level implementation of the ANSI 74 COBOL standard • provides for development and execution of COBOL business applications • provides most of the features commonly required on minicomputer and mainframe applications.

**CIS COBOL** • a GSA-approved version of COBOL • compiler exceeds the ANSI Level I COBOL requirements; provides special screen handling features and extensions for interactive debugging; handles sequential, relative, and indexed sequential files.

**SMC BASIC** • a Business BASIC implementation of the original Dartmouth BASIC • includes ease-of-use enhancements which make the language particularly simple and easy to use in business applications.

**Coherent BASIC** • an extended version of BASIC that can be used interactively as an interpreter • produces code like a compiler and then executes the code.

**Pascal** • an enhanced version of the ISO standard Pascal • produces optimized native 68000 code; extensions include: random file access, UCSD-compatible strings, and liberal-set capabilities.

**FORTRAN 77** • a GSA-validated, full implementation of the ISO standard FORTRAN 77 • provides enhanced I/O and program structure; provides full support for FORTRAN 66 standard.

**APL 68000** • an APL interpreter • provides a powerful file system, formatter, and IEEE floating-point arithmetic.

**Assembler** • standard 68000 Assembler • supports the standard mnemonics and pseudo-instructions contained in Motorola's portable cross-assembler; allows easy transport of applications; operates at approximately 2000 lines per minute.

**C** • compiler derived from standard UNIX C compiler • includes full standard I/O and math libraries; a low-level language supporting easy access to the operating system and hardware, as well as to FORTRAN and Assembler.

### Application Packages

In addition to the following application packages provided by WICAT, various OEM software applications are available for the WICAT MC68000-based microcomputers. These packages must be purchased from the OEM and also supported by them.

**Office Automation** • a screen-oriented, interactive package providing facilities for: word processing, a spelling dictionary, data manipulation, and office management functions such as time, calendar, and activity scheduling • word processing features include: centering, underscoring, margin control, scrolling, automatic realignment/page numbering, superscript/subscript, global search and replace, and various others • spelling dictionary fea-

*LCNS: one-time fee for license purchase. NA: not available. Prices effective as of January 1983.*



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tures are: identifies misspelled words; and provides the ability to add job specific related special words • data manipulation facilities include: ability to merge/file documents, sorting in ascending/descending sequences, label generation, and report generation • office management capabilities are: calendaring; meeting scheduling; activities autoscheduler; telephone message tracking; electronic mail; and reminder list maintenance.

**UltraCalc** • an electronic spreadsheet • provides the ability to manipulate and analyze tabular data using graphs, automatic recalculations, 15-digit arithmetic, and advanced math features; supports economic forecasting, trend analysis, as well as other computations • major features are: full, online HELP facilities; automatic swapping of pages to disk for expanded workspace; support of multiuser simultaneously; attribute highlighting including columns, rows or items with bold, blinking, reverse video, or underlined character fields; display of non-adjacent rows or columns together on the screen which can be scrolled in sequence; automatic recalculation of all figures effected by a change in any number or formula; provision for full set of arithmetic, exponential, and trigonometric functions; and allows entry of data from external programs or files on an UltraCalc worksheet, as well as allowing transfer of data from the worksheet to external programs • provides over 20 commands to manipulate data, and 8 commands to set global worksheet options.

**WISE (WICAT Interactive System for Education)** • a computer-aided instruction (CAI) interactive system, that enables non-programmers to compose text, design graphics displays, outline progress through courseware, and define criteria for evaluation; commands are written in ordinary language and simple two-letter commands • text and graphics features are: multiple character fonts and type sizes; variable intercharacter spacing and rotation; color graphics; production of any combination of circles, squares, rectangles, ellipses, spline, curves, and arcs; and creation of graphics objects patterned, filled, moved, copied, rotated, scaled, and animated along X- or Y-axis • instructional design is generated through a series of menu options which allow the author to choose standard formats or specify details for each frame; features provided allow authors: to define menu frames, presentation frames, and routines for complex branching or simulations: to define linear/branched progress through courseware; to set stringent or flexible time limits for uniform or individual pacing, to set variable answer formats such as: screen locations (cursor or touch panel), multiple choice, or free response; specify routines for judging free responses such as: synonym dictionaries, ignorable words, key words, spelling tolerance algorithms, and numeric ranges; and to allow prescriptive criteria for weighting and scoring students' responses • software capabilities which aid in support of the WISE application are: high-resolution graphics, digitized audio, and videodisc interface.

#### ■ HARDWARE

##### Terms & Support

**Terms** • hardware products are available on purchase-only basis • discounts available from 5% to 15% based on the number of systems purchased.

**Support** • 30-day warranty provided with purchase • after 30-day warranty, users can choose from 3 maintenance plans: Master Support Plan, Depot Support Plan, or Time-and-Material Support. Master Support Plan provides on-site service for emergency repairs, regularly scheduled preventive maintenance, and software assistance; in addition the user automatically receives any hardware engineering changes • Depot Support Plan is an off-site alternative to full-support service costing half as much; it provides a guaranteed 10-day turnaround once the system is received, free return shipping, and a 30-day warranty on repaired or replaced parts • Time-and-Material Support provides for service to be charged at an hourly rate plus parts and material; service can be performed at user's site or WICAT maintenance depot; when equipment is sent to WICAT depot, a normal turnaround is 15 days from the time the system arrives at the depot • telephone hot-line is available for all plans • customized plans to fit any users' needs are also available.

##### Physical Specifications (H x W x D); Weight

###### System 140

**CPU** • 16 x 19 x 16.5 inches; 50 pounds.

**Display** • integrated with CPU unit.

**Keyboard** • information not available.

###### System 150

**CPU** • 16 x 19 x 16.5 inches; 50 pounds.

**Display** • integrated with CPU unit.

**Keyboard** • 1.56 x 20.5 x 9.44 inches; weight not available.

###### System 155

**CPU** • 25.5 x 10.3 x 23.5 inches; information not available.

**Display** • 12 x 14.5 x 15.8 inches; 30 pounds.

**Keyboard** • information not available.

###### System 160

**Rack Mount** • 43 x 21 x 33 inches; 170 pounds.

**CPU** • 10 x 19 x 26 inches; 40 pounds.

**Display** • 12 x 14.5 x 15.8 inches; 30 pounds.

**Keyboard** • information not available.

###### System 200

**Rack Mount** • 43 x 21 x 33 inches; 170 pounds.

**CPU** • 10 x 19 x 26 inches; 50 pounds.

**Display** • 12 x 14.5 x 15.8 inches; 30 pounds.

**Keyboard** • information not available.

###### System 220

**Rack Mount Quarter Bay** • 31 x 21 x 33 inches; 120 pounds.

**Rack Mount Half Bay** • 43 x 21 x 33 inches; 170 pounds.

**CPU** • 10 x 19 x 26 inches; 50 pounds.

**Display** • 12 x 14.5 x 15.8 inches; 30 pounds.

**Keyboard** • information not available.

##### Systems Overview & Configurability

All WICAT Systems are built around the Motorola 32-bit MC68000 processor. The Systems 140, 150, 155, and 160 use IEEE 796 extended Multibus architecture, while the 200 and 220 use a proprietary bus. The entry-level systems include the single-user System 140 and the System 150 which comes in 3 models that support 1, 3, and 6 terminals. The System 155 and 160 both support up to 12 terminals, while the top-of-the-line 200 and 220 support 32 and 64 terminals respectively. The 140, 150 and 155 support 15M-byte Winchester disk subsystems, while the 160, 200 and 220 support 80/160/474M-byte disk subsystems. Backup is handled through diskettes on the 140 and 150, through cartridge tape subsystems on the 155, and with cartridge tape subsystems or 9-track 1600-/3200-bpi tape drives on the 160, 200, and 220. Memory supported ranges from 512K bytes on the low-end System 140, to the 14M bytes supported on the high-end System 220. In between, the System 150 supports 1.5M bytes, the System 155 and 160 support 4.5M bytes, and the System 200 supports 5M bytes. All processors provide 7 vectored interrupt levels. On the System 220 a Zilog Z80 co-processor is dedicated to every group of 16 RS-232 ports.

Maximum configurability is stated below; minimum configurations are discussed under Packaged Systems.

**System 140 Maximums** • single user; 512K bytes of memory; 15.6M bytes of disk storage on a 15M-byte 5.25-inch Winchester disk drive and a 630K-byte 5.25-inch diskette drive; an RS-232C serial interface; and a 16-bit parallel printer port.

**System 150 Maximums** • 6 users; 1.5M bytes of memory; 60.6M bytes of disk storage on 4 15M-byte 5.25-inch Winchester disk



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drives and one 616K-byte 5.25-inch diskette drive; single 12M-byte 0.25-inch cartridge tape; 5 RS-232C serial ports; 1 parallel interface printer; and 2 programmable interval timers.

**System 155 Maximums** • 12 users; 4.5M bytes of memory; 60M bytes of disk storage on 4 15M-byte 5.25-inch Winchester disk drives; single 12M-byte 0.25-inch cartridge tape; 2 RS-232C serial ports (async or sync), 12 RS-232C serial ports (async only), and 2 general-purpose parallel ports; and 12-slot chassis (IEEE 796, extended Multibus).

**System 160 Maximums** • 12 users; 4.5M bytes of memory; 1.684G bytes of disk storage on 4 474M-byte 10.5-inch SMD Winchester disk drives; single 37M-byte 0.5-inch 9-track tape drive; 2 RS-232C serial interfaces (async or sync), 10 RS-232C serial interfaces (async only), and 2 general-purpose parallel interfaces; and 12-slot chassis (IEEE 796 multibus architecture).

**System 200 Maximums** • 32 users; 5M bytes of memory; 1.684G bytes of disk storage on 4 474M-byte 10.5-inch SMD Winchester disk drives; single 37M-byte 0.5-inch 9-track tape drive; 32 async intelligent ports, 8 sync intelligent ports, and a Master Control Port; and an 8-slot chassis.

**System 220 Maximums** • 64 users; 16M bytes of memory; 1.684G bytes of disk storage on 4 474M-byte 10.5-inch SMD Winchester disk drives; single 37M-byte 0.5-inch 9-track tape drive; 32 async intelligent ports, 8 sync intelligent ports, and a Master Control Port; and a 20-slot chassis.

#### Packaged Systems

The vendor was reluctant to give individual pricing breakdowns for all components for the WICAT Systems. Instead they gave us ranges for each of the systems based on complexity of the individual configurations.

**System 140** • typical system ranges:

\$8,000/\$9,000 prch

**System 150** • typical system ranges:

9,500/20,000

**System 155:** • typical system ranges:

15,000/25,000

**System 160** • typical system ranges:

25,000/43,000

**System 200** • typical system ranges:

27,000/80,000

**System 220** • typical system ranges:

32,000/110,000

#### CPU

**Motorola 68000 Processor** • 32-bit internal (ALU) architecture, 16-bit data bus interface • 24-bit addressing to 16M bytes; CPU has eight 32-bit data registers and eight 32-bit address registers; two 32-bit stack pointers, a 16-bit status register and a 23-bit program counter • powerful 56 mnemonic instruction set includes 16- and 32-bit data manipulation, signed and unsigned multiply and divide, five basic addressing modes with pre- and post-incrementing, offsetting and indexing, seven levels of priority interrupt with 256 possible interrupt vectors, a trace mode and sophisticated trap operations for debugging; Motorola "HMOS" technology large-computer geometric architecture.

#### I/O & Communications

The Systems 140, 150, 155, and 160 all use the Intel IEEE 796 (Extended Multibus), while the System 200 and 220 use a proprietary bus. Serial ports (RS-232) on all systems provide 50- to 19.2-baud rate, while the parallel ports support up to 1M-byte-per-second transfer rate.

The System 140 includes a single RS-232C serial interface and a 16-bit parallel port; System 150 supports 5 RS-232C serial interface and a 16-bit parallel port; System 155 and System 160 provide 2 RS-232C serial ports that can be asynchronous or synchronous as well as 12/10 (155/160) asynchronous-only RS-232C serial ports and

2 general-purpose parallel ports; System 200 and System 220 handle 32 asynchronous intelligent ports, 8 synchronous intelligent ports, and a Master Control Port.

#### Mass Storage

##### Disk

The 616K-byte diskette system is standard on all models of the 150 Systems. A 15M-byte Winchester disk is standard on all models of the System 150 expandable to 4 drives. The basic System 155 comes with two 15M-byte Winchester drives, expandable to 4 drives. All other models can accommodate up to 4 474M-byte SMD disk drives.

**Floppy Diskette** • 5.25-inch double-sided, double-density diskette drive; 616K bytes per formatted diskette • 31K-bps transfer rate; 267-millisecond average seek time • one drive per system available where applicable:

NA prch

**Winchester Disk Subsystem (5.25-Inch)** • 13M-/19M-byte and 10M-/15M-byte formatted/unformatted capacities • 625K-bps transfer rate; 85-millisecond average seek time • up to 4 drives per system where applicable:

NA

**84MB SMD Disk Subsystem** • 8-inch Winchester disk drive; 84M-byte (unformatted), 76M-byte (formatted) capacities • 1.2M-bps transfer rate; 20-millisecond average seek time • up to 4 drives per system where applicable:

NA

**168MB SMD Disk Subsystem** • 14-inch Winchester disk drive; 168M-byte (unformatted), 152M-byte (formatted) capacities • 1.2M-bps transfer rate; 30-millisecond average seek time • up to 4 drives per system where applicable:

NA

**474MB SMD Disk Subsystem** • 10.5-inch Winchester disk drive; 474M-byte (unformatted), 421M-byte (formatted) capacities • 1.8M-bps transfer rate; 18-millisecond average seek time • up to 4 drives per system where applicable:

NA

##### Tape

The System 150 or 155 can include a DEI Cartridge Tape for backup, while all the others are capable of handling the DEI Cartridge Tape or a 9-track Cipher Tape.

**Cartridge Tape** • 0.25-inch cartridge tape; 450-foot tape capacity • 6400 bpi; 30/90 ips; 24K-bps transfer rate; 17M-byte (unformatted), 12M-byte (formatted) capacities:

NA prch

**9-Track Tape Drive** • 0.5-inch, 9-track, 2400-foot magnetic tape • 1600/3200 bpi; 25 ips; 160K-bps transfer rate; 46M-byte (unformatted), 37M-byte (formatted capacities):

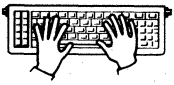
NA

#### Printers/Graphics

There are currently 2 printers available: a 1055 Letter-Quality Printer and an 1100 Dot-Matrix Graphics Printer. 1055 is a micro-processor (8080-based) controlled impact printer; ideally suited for applications requiring letter quality, it also provides plotting and graphics capabilities; supports 5,760 addressable points per square inch for graphics and plotting. 1100 is a microprocessor (8048-based) controlled dot-matrix impact printer; provides 1K of PROM per formatting routines; 4896 dots per inch with dots on a X/Y matrix; program accessible.

**1055 Letter-Quality Printer** • 55-cps bidirectional impact thimble printer • 128-character ASCII character set; 34 standard print

*PRCH: first figure is low-end one-time purchase price, second figure is high-end one-time purchase price. NA: not available. Prices effective as of January 1984.*



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timbles including various international character sets; 163 columns; 10 cpi; handles 4- to 16-inch wide fanfold paper or 5.5- to 12-inch single-sheet paper; graphics capabilities support 48 positions per inch vertical and 120 positions per inch horizontal • full range of control codes and forms handling options • attachment via ASCII or Diablo serial interfaces or Centronics-type parallel interface:

NA prch

**1100 Dot-Matrix Graphics Printer** • 1000-cps or 3300-dot-per-second, dot-matrix impact printer • 7 × N dot addressable raster scan; 128-character ASCII character set with additional fonts user or factory installed; 80, 96, or 132 programmable columns; 8 pre-programmed forms length; 5, 6, 8, 10, 12, or 16 cpi; 6 or 12 lpi; handles 3-part paper, 4- to 16-inch wide fanfold paper or 1.5- to 9-inch single-sheet paper; graphics capabilities support 3600- or 4896-dot-per-inch resolution • full range of control codes and forms-handling options • attachment via RS-232C serial or parallel interface or 20-mA current loop:

NA

#### Terminals/Workstations

There are currently 2 general-purpose monochrome video terminals available; the T7000 which is designed to handle word processing and office management needs, and the MG8000 which provides graphics capabilities. The T7000 includes a Z80 microprocessor allowing users to program function keys and ports, define I/O modes and video attributes, and protect screen fields from all but specifically designated input. Terminal functions can be defined for text editing and word processing programs. The

MG8000 includes a Z-800Z microprocessor allowing users to program the same functions as the T7000, as well as graphics functions. Designs can be stored in the terminal's memory and effect animation by displaying one graphics plane while modifying another. An asynchronous attachment via RS-232C serial interface is provided. Selectable transmission speeds range up to 19.2K bps; other features include a 12-inch diagonal screen, detached keyboard, and optional touch panels, with 768 discrete touch points.

**T7000 Video Terminal** • 2000-character display (25 lines × 80 characters); 7 × 9 dot-matrix characters in a 10 × 12 cell • 128 ASCII characters with an additional user-definable character set, available from an on-board EPROM, for special symbols and non-Latin alphabets; terminal functions can be defined for text editing and word processing programs; cursor controls, video attributes, and editing commands conform to ANSI X3.64 standards; features include: half intensity, reverse video, blank, blinking, underscore, and blinking underline:

NA prch

**MG8000 Video Terminal** • includes all attributes and features of T7000 plus includes graphic capabilities • 400 × 300 pixel resolution; two independent graphics planes; and graphics commands for lines, curves, arcs, circles, graphic text characters, and pattern fill; supports object definition and relocation; and is compatible with SIGGRAPH CORG standard:

NA

• END