

Digi-Log Microterm II



MANAGEMENT SUMMARY

Digi-Log Systems bills the Microterm II as a "brilliant" terminal, which the company claims fills the price/performance gap between intelligent terminals and minicomputers.

Microterm II is a multi-function programmable workstation designed for DP service bureaus, large end users, and OEM vendors. The standard terminal is a single unit that contains a 12-inch CRT screen, an integral keyboard, and three integral mini-diskette drives. A two-drive version is also available. An external printer interface is provided to permit the attachment of a serial impact printer, such as a Centronics 700 Series unit.

Microterm II architecture incorporates two Z80 microprocessors. One of these performs diskette-oriented functions; the other supports terminal communications and printer control. Each microprocessor has its own memory, and through direct memory access, each one can access up to 40K bytes of the other's memory.

Microterm II's multi-task disk operating system includes a file management program for building and maintaining local user files. The user can create application programs at the keyboard in Z80-type assembly language or in Extended Business BASIC. Software utilities include sort/merge, printer spooling, and screen formatting packages.

USER REACTION

In June 1979, Datapro interviewed seven Microterm II users, whose names were supplied by Digi-Log. These users had a total of 520 Microterm II terminals, which had been installed for periods ranging from six months to one year. The number of units per user ranged from 1 to 500. The users' ratings are summarized in the table below. ➤

A programmable desktop terminal designed for remote data entry, text processing, and file management. Teletype emulation is standard; IBM 2780 emulation is available as an option.

The basic Microterm II includes dual microprocessors, 48K bytes of RAM, and three integral mini-diskette drives. An additional 16K bytes of RAM is optional. Available software includes a disk operating system; random, sequential, or indexed sequential file management programs; Extended Business BASIC; and utilities.

The standard Microterm II with 48K bytes of memory is priced at \$8,700. A Microterm II with only two mini-diskette drives is priced at \$7,800. Quantity discounts are available.

CHARACTERISTICS

VENDOR: Digi-Log Systems, Inc., Babylon Road, Horsham, Pennsylvania 19044. Telephone (215) 672-0800.

DATE OF ANNOUNCEMENT: June 1977.

DATE OF FIRST DELIVERY: May 1978.

NUMBER DELIVERED TO DATE: Over 500.

SERVICED BY: Digi-Log.

CONFIGURATION

Microterm II is a desktop display terminal equipped with dual Zilog Z80 microprocessors, three integral mini-diskette drives, a 12-inch CRT display, and an integral keyboard. One microprocessor is used for terminal control and the other for diskette control. Both microprocessors have direct access to terminal memory via DMA techniques. The basic terminal is equipped with 48K bytes of RAM, with 18K bytes available for user programs, and up to 16K bytes of PROM/ROM. An additional 16K bytes of RAM can be added.

An external parallel printer interface and an RS-232 serial communications I/O port with auto-dial and auto answer are standard.

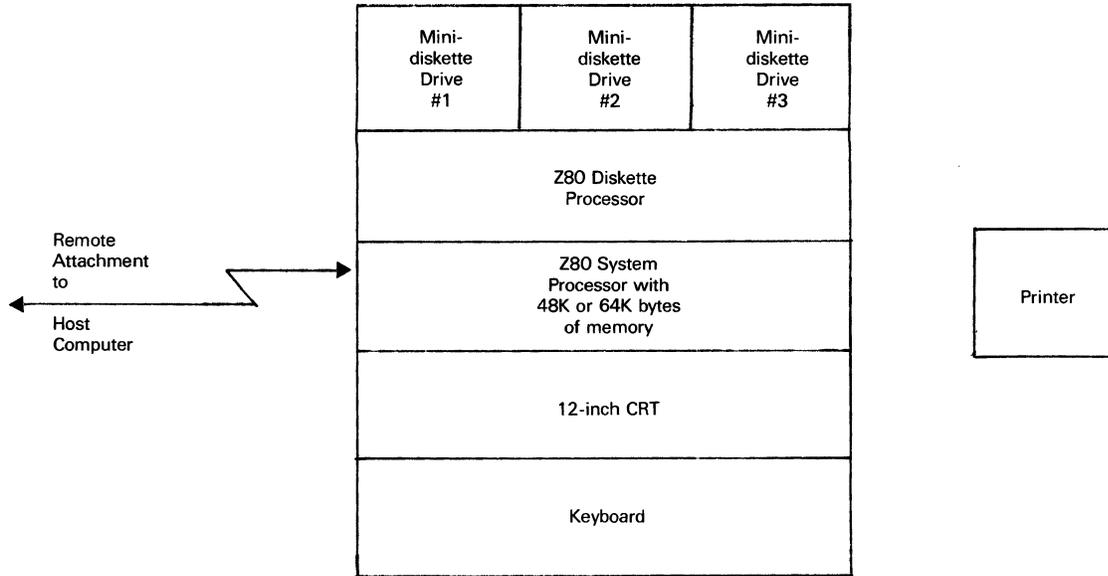
TRANSMISSION SPECIFICATIONS

Transmission is asynchronous or synchronous in the half- or full-duplex mode at speeds up to 19,200 bits/second. Eight standard configuration switches are provided for selecting transmission rate, parity, and polling address. Internal or external clocking can be used. The 7-level ASCII code is used for asynchronous transmission; synchronous transmission is in EBCDIC code. The terminal is equipped with an RS-232C/CCITT interface.

SOFTWARE

The Microterm II Advanced Operating System (AOS) ➤

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	Excellent	Good	Fair	Poor	WA*
Overall performance	2	4	1	0	3.1
Ease of operation	4	2	1	0	3.4
Display clarity	6	1	0	0	3.8
Keyboard feel & usability	5	2	0	0	3.7
Hardware reliability	2	3	1	0	3.2
Maintenance service	0	2	2	1	2.2
Software & technical support	2	3	1	1	2.8

*Weighted Average on a scale of 4.0 for Excellent.

The users' comments ranged from enthusiastic praise to sharp criticism. On the plus side, one user praised the new VIDEOFORM screen formatting package, and three users each said the Digi-Log BASIC language was easy to use and the vendor's technical personnel were very responsive in resolving problems. Two users thought that the terminal was well packaged and compact and that the internal printer was a real convenience. (The internal printer is no longer available.) One user commented that the Microterm II was very reliable and could be easily upgraded, and another described the terminal as a good buy.

On the minus side, one user said the terminal was unreliable, and two users had experienced problems with the internal printer. One user described the software documentation and the File Control System as "poor," another felt the Assembler was not very efficient, and a third complained that the sort utility did not work properly. Another user stated that the programming manual was "not designed for beginners" and thought it should provide more examples.

We asked the user who had 500 Microterm II terminals if he had experienced any of the above-mentioned problems with the software. He said that he had experienced no problems with the software and that his company had chosen the Microterm II because of its software capabilities. □

includes a multi-task executive, the File Control System (FCS), screen editing capabilities, the Extended Business BASIC language, utilities, and Teletype or IBM 2780 data communications emulators.

The multi-task executive (MTX/80) is used to control real-time events; schedule and control communications, printing, and file handling on a priority basis; schedule and control user applications and inter-task communications; and provide interrupt drive control for standard devices. MTX/80 can handle up to 256 simultaneous tasks.

FCS supports the Indexed Sequential Access Method (ISAM) as well as random and sequential access files. File identification is established by file name. A dynamic file allocation capability automatically assigns diskette storage space. After naming a new file, the user enters the record size, estimates the approximate number of records the file will contain, and specifies an initial minimum record storage capacity. FCS then assigns pages of storage as needed.

Every diskette file has a corresponding File Information Block (FIB) that is loaded into memory when a file is open. Eleven FIB's can be resident in memory simultaneously. Various-length ISAM keys are also stored in memory to facilitate search operations.

User application programs can be written in an optional assembly language or in Extended Business BASIC, an expanded version of the original Dartmouth BASIC. Microterm II Extended Business BASIC consists of an edit phase and a run phase. The edit phase produces compressed source statements that reduce program memory size and increase execution speed. In the run phase, statements or programs can be executed from the terminal, or programs can be chained to other programs via the CHAIN command.

In addition to the standard features found in most versions of the BASIC language, the Digi-Log version includes: a set of utility statements allowing the user to save and update programs on diskette; file access commands for creating and updating data and text files; formatted output; byte, character, and string manipulation statements; data communications commands; a complete math package for scientific applications; and a debugging capability. User-defined functions allow repetitive statements to be coded only once. A character input/output mode provides for character detection, and a screen open mode permits screen input activities to operate in conjunction with other processing and diskette functions. A partial chain capability allows single root

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► programs to call in successive overlay modules. ELSE and ON statements are included for developing structured programs.

The VIDEOFORM utility enables users to develop business or data entry forms directly on the CRT screen without complex coding in BASIC. Forms can be assigned a file name and saved on diskette. Programs written in Extended Business BASIC can call up a form by using a pre-defined subroutine.

A Sort/Merge utility is provided for pre-processing and post-processing activities as well as for distributed file management applications such as order entry and inventory control.

A Print Spooler allows users to schedule printing operations as a background task under the control of MTX/80. Data is stored in a temporary file on the diskette until it is sent to the printer.

The Operator Interface Module (OIM) controls key/display functions. Mode controls are provided for normal data entry, formatted data entry, transparent mode, and line and screen edit modes. OIM also provides eight cursor control functions, X-Y coordinate positioning, a full set of editing functions, video highlighting, multi-character display capabilities, and the special routines assigned to function keys.

The TTY and optional IBM 2780 Emulators enable Microterm II to communicate directly with host processors in batch mode. The communications emulators run concurrently with BASIC programs as separate tasks under MTX/80. Auto dial and auto answer are supported.

The TTY Emulator supports asynchronous half- or full-duplex transmission at speeds of 50 to 9600 bits/second. The emulator permits a Microterm II terminal to communicate with another Microterm II or with a variety of mini-computer systems.

The optional IBM 2780 Emulator is compatible with the IBM 2780 terminal. The emulator supports synchronous point-to-

point or multipoint transmission at speeds of 1200 to 4800 bits/second. The emulator permits a Microterm II terminal to communicate with another Microterm II or with an IBM System 360/370, System/3, 1130, or 1800 processor.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonal measurement) CRT with a viewing area 6 inches high by 9 inches wide. The display arrangement is 24 lines of 80 characters each, for a total screen capacity of 1920 characters. The character set consists of 128 displayable ASCII characters, including upper and lower case alphabets, numerics, specials, and representative symbols for ASCII control codes. Each character is formed by a 7-by-11 dot matrix and is displayed within a 10-by-12 dot cell to compensate for line descenders. Data is displayed in green (P31 phosphor). Highlighting attributes include dual intensity, reverse video, underline, and blinking, in any combination. A limited set of graphics for line drawing is also provided.

KEYBOARD: An 86-key, typewriter-style, non-detachable keyboard. The keyboard includes a 14-key cursor/editing cluster, a 12-key numeric pad, and 26 programmable function keys. Seven optional mode-select toggle switches are available.

MINI-DISKETTE DRIVES: Three integral diskette drives provide a total formatted data storage capacity of one million bytes.

The drives accommodate quad-density (double-sided, double density) 5.25-inch diskettes and record 5 sectors per track and 35 tracks per surface. Average access time is 210 milliseconds, and track-to-track access is 12 milliseconds. Microterm II is also available with two mini-diskette drives that accommodate single-sided, double density diskettes.

PRICING

The Microterm II is available for purchase only. End-user and OEM quantity discounts are provided. Service is provided by Digi-Log on a factory repair or maintenance contract basis.

	<u>Purchase</u>
Microterm II with 48K RAM, 3 mini-diskette quad-density drives, AOS software	\$8,700
Microterm II with 48K RAM, 2 mini-diskette double-density drives, AOS software	7,800
Options	
Additional 16K RAM	600
Auxiliary RS-232 I/O port	250
7 Keyboard toggle switches	85
50-Hertz operation	NC
IBM 2780 Emulator	300
Assembler/Editor/Debugger	125
Confidence (self-testing) diskette	200■

Digi-Log Microterm II and Microcomm



MANAGEMENT SUMMARY

Digi-Log Systems is known for its TeleComputer II, a stand-alone or portable display terminal, and for its Data Line Monitor, a communications diagnostic device. The company introduced two new devices at the June 1977 NCC: Microterm II and Microcomm. Microterm II, a programmable terminal, was spawned from Microterm, a microprocessor-based terminal introduced in 1973 that was integrated into several specialized systems. Microcomm is a special turnkey version of Microterm II designed for message communications.

Microterm II is a multi-function terminal workstation designed for DP service bureaus, large end users, and OEM vendors. The terminal is a single unit that contains a 12-inch CRT screen, an integral keyboard, one or two mini-diskette drives (each having a capacity of 89.6K bytes), and an optional, integral high-speed, non-impact printer that feeds paper through the top of the unit. The terminal is also available without the mini-diskette drives for OEM orders. An external impact printer, such as a Centronics 700 series unit, is available for forms and report printing. Double-sided, double-density diskette storage, available by early 1978, will increase storage capacity to about 360K bytes per diskette.

Digi-Log selected the Zilog Z-80A microprocessor for controlling the Microterm II over the Intel 8085, Motorola 6800, and Texas Instruments TMS 9900 because the company felt that the Z-80A outperformed the others.

Specifically, the Z80A handles interrupts faster and more efficiently; contains block move, block search, and block I/O instructions; is faster in performing most 16-bit operations and substantially faster in performing most 8-bit operations; and can utilize virtually all Intel 8080 software. ➤

Multi-function programmable workstation for remote data entry, preprocessing, file management, and message handling. Text processing and IBM 2780 emulation are options.

One or two mini-diskette drives, dual Z80A microprocessors, and 36K bytes of RAM memory are standard; up to 80K bytes of memory, an integral high-speed printer, and an external forms printer are optional. Standard software includes a disk operating system, assembler, extended Dartmouth BASIC, utility programs, and an applications program for message handling (Microcomm only).

The basic Microterm II with single mini-diskette drive and 16K bytes of memory is priced at \$6,170; a full-blown terminal with two drives and integral and external printers is priced at \$10,660. Microcomm ranges in price from \$8,500 to \$12,090. Quantity discounts are available for end-user and OEM orders.

CHARACTERISTICS

VENDOR: Digi-Log Systems, Inc., Babylon Road, Horsham, Pennsylvania 19044. Telephone (215) 672-0800.

DATE OF ANNOUNCEMENT: June 1977.

DATE OF FIRST DELIVERY: December 1977.

NUMBER DELIVERED TO DATE: —.

SERVICED BY: Digi-Log and Sorbus.

CONFIGURATION

Microterm II is a microprocessor-based, stand-alone display terminal equipped with an integral keyboard. The terminal is available with either one or two integral mini-diskette drives and an integral high-speed, non-impact printer. The basic terminal contains a Zilog Z80A microprocessor for terminal control and a second Z80A for diskette control. Both microprocessors have direct access to terminal memory via DMA techniques. The basic terminal is equipped with 36K bytes of RAM (expandable to 80K bytes) and 1K bytes of PROM (expandable to 7K bytes). A parallel printer port is standard; it accommodates an optional external forms printer.

Microcomm is a special version of Microterm II designed for message processing and network communications. Microcomm is a Microterm II equipped with dual diskette drives with options to add the integral high-speed non-impact printer and external impact forms printer. A Store/Process/Forward Application Software package is standard.

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous or synchronous in the half- or full-duplex mode at 16 software-selectable speeds up to ➤

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➤ Microterm II architecture incorporates two Z80A microprocessors. One of these performed diskette-oriented functions, the other supports terminal control. Both microprocessors share a common memory and data bus; direct memory access architecture provides access to up to 80K bytes of RAM memory.

Microterm II's multi-task disk operating system includes a file management program for building and maintaining up to 128 local user files. The user can create application programs at the keyboard in Z80-type assembly language or in extended Dartmouth BASIC. A text editor and an IBM 2780 emulator are software options.

Microcomm is a Microterm II equipped with store, process, and forward software for message handling applications. The software package supports the creation, assembly, management, transmission, storage, and retrieval of user messages. Supervisory and processing functions are also included for message entry, reformatting, application monitoring, message control and accountability, journal maintenance, address management, auto-polling and selection, and queue maintenance. The Microcom store, process, and forward applications software operates under the disk operating system. Particular user needs can be satisfied via Digi-Log's software development package.

Digi-Log is currently producing five other microprocessor-based terminals for large data services vendors and is the sole supplier of the Western Union Stored Mailgram terminal, the Mead Data Central LEXIS legal workstation, and intelligent terminals for RCA and others. □

➤ 19,200 bits/second. Internal or external clocking can be used. The 8-level ASCII code is used. A 10- or 11-unit code structure is employed with asynchronous transmission. The terminal is equipped with an RS-232C/CCITT interface.

SOFTWARE

Terminal control is directed by the *Floppy Disk Operating System (FDOS)*, which includes the File Control System (FCS) for development and support of diskette-based files, an executive, a console interface routine for user interaction, file control commands, assembly language utilities, initialization and maintenance utilities, device handlers, and a batch job processor. FDOS also features program chaining, arithmetic routines, and device listing with parameter changes; it is automatically loaded from diskette when the terminal is powered up or reset, via a bootstrap facility. FDOS executes run-time overlay of program segments, which permits the user to create programs larger than memory capacity. Entry points in the operating system permit run-time creation and use of diskette-resident files.

FCS is a random or sequential access file control system that supports up to 128 user-created files—64 per diskette. File identification is established by name and account number. FCS supports up to 32 separate accounts per diskette. As many as 16 files can be open at one time. File protection is maintained by password and write or delete protection. Files are allocated contiguously on diskette; their description and location are defined by a file directory. A bit map keeps track of available file space and is changed when files are added or deleted.

Each diskette contains its own directory and bit map. File parameters are maintained by a File Control Block. Information includes the next sector to be accessed, the number of sectors in a file, the number of sectors per record, the logical file number, and the buffer location in the user program area.

FCS commands include a directory command that lists each file and its size in decimal (printed or displayed); diskette copy and initialize commands; and commands for deleting a file by name, creating a file by name and length, altering the file name, password, or protect codes, and for making a file an executable module. File functions provide for opening and closing a file and for reading and writing a file.

A standard error reporting technique is employed by all commands and utilities. Two types of error messages are employed for non-recoverable errors: the short form and the expanded form. The short form indicates "file error" with a number for each error type. The expanded form presents an error message for each type of error.

Two types of files are employed: ASCII and binary. ASCII files are sequentially accessed files of data and include menu modules, text processors, merge and list utilities, assembler, editor, etc. Binary files are randomly accessed files and include the directory, installed executable modules, and saved BASIC programs.

User application programs can be written in extended *Dartmouth BASIC* or a Z80-type *assembly language*. BASIC programs are created from the terminal keyboard via a BASIC interpreter. Programs can be saved on diskette and reloaded for execution. The macroassembler is supplemented with utilities. Programs generated via the macroassembler or BASIC interpreter can be listed on the integral high-speed printer.

The *Programmers Editor* is used to create new source programs and to correct existing ones. Large amounts of text can be generated from pre-existing files or the assigned system console device. Additions, deletions, and corrections can be made to the text on either a character-by-character or line-by-line basis, and the resulting text can be transferred to an output file or assigned system console device.

The optional *IBM 2780 Emulator* is compatible with the IBM 2780 terminal. The emulator supports three logical I/O components, which correspond to the three physical I/O components of the IBM 2780. The logical components can have a variety of physical components assigned to them with complete system transparency. Standard emulator features include horizontal tabulation, two carriage controls, a diagnostic trace, normal and transparent transmission, multiple record transmission, extended ENQ retry, keyboard facility for operator messages, and two-wire operation. ASCII transmission code and multipoint operation are not supported.

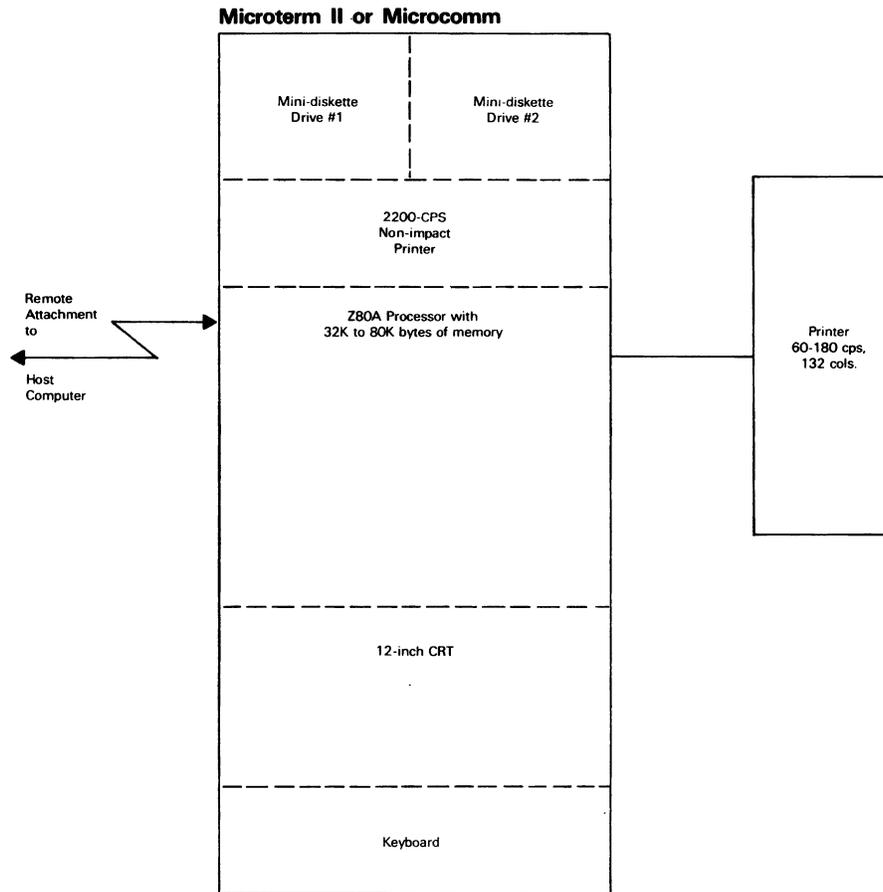
The *Store/Process/Forward package for Microcomm* operates under FDOS and consists of modules for application monitoring, console interfacing, message generation, message management, message processing, and communications interfacing.

The Application Monitor interfaces with FDOS via a system vector table and controls the program flow and module linkage for all application jobs. It schedules jobs based on application commands and monitors job performance and status. It also receives the results of the processing of the last module and determines the next module to be selected as a result of processing, error conditions, present results, and requested results.

The Console Interface module consists of a set of routines for updating workstation status, operator interface control, ➤

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Configuration



➤ application inquiry/response, application command entry and status request, and message input and display.

The message modules support free-form text entry or formatted data entry message storage or retrieval to or from diskette, message updating or reformatting, message printout, and message communication. All messages are catalogued. Formats for data entry can be created or modified and are catalogued and stored on diskette. Message communication functions establish and terminate communications links, establish communications protocols (Teletype or BSC), perform code conversion, restart and resynchronize interrupted communications, perform error recovery, and maintain performance statistics for local printout. When operating within packet-switched or Value Added Networks, SDLC or X.25 protocols will be used. These protocols will be implemented by mid-1978.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonal measurement) CRT with a viewing area 6 inches high by 9 inches wide. The display arrangement is 24 lines of 80 characters each, for a total screen capacity of 1920 characters. The character set consists of 128 displayable ASCII characters, including upper and lower case alphabets, numerics, specials, and representative symbols for ASCII control codes. Each character is formed by a 7-by-9 dot matrix and is displayed within a 10-by-12 dot cell to compensate for line descenders. Data is displayed in green (P31 phosphor). Highlighting attributes include dual intensity, reverse video, underline, and blink. A limited set of graphics for line drawings is also provided.

KEYBOARD: A 60-key, typewriter-style, non-detachable keyboard. The keyboard includes a 14-key function key

cluster and a 14-key numeric pad. The keyboard can generate any of 128 PROM-programmable character codes.

MINI-DISKETTE DRIVE: Accommodates a 5.25 inch diskette and provides a formatted data storage capacity of 89.6K bytes. The recording density and transfer rate are 2600 bits/inch and 16K bytes/second, respectively.

The drive (Shugart SA 400) records 10 256-byte sectors/track and 35 tracks per mini-diskette (one surface only). Positioning time is 463 milliseconds average and 40 milliseconds track-to-track. Head loading and settling times are 75 and 10 milliseconds, respectively. The average rotational delay is 100 milliseconds.

INTEGRAL PRINTER: A non-impact printer rated at 2200 characters/second. The printer (produced by SCI Systems) employs a 200-foot, 4-inch wide roll of electrosensitive paper. Up to 24 lines are printed at 7 lines/inch across the paper tape. Line length is unlimited. Character spacing is 10 characters/inch. The character set includes 96 print symbols. Each character is formed via a 5-by-9 dot matrix.

EXTERNAL PRINTER: A serial, impact, matrix printer (Centronics 700 series) rated at 60 or 180 (bi-directional) characters/second. The printer features 132 print positions and a 64-character set of ASCII symbols. It accommodates pin-fed, 6-part continuous forms up to 14½ inches wide.

PRICING

The Microterm II and the Microcomm are available for purchase only. End-user and OEM quantity discounts are provided. Service is provided by Sorbus, a nationwide service organization. ➤

Digi-Log Microterm II and Microcomm



Microterm II End User Prices

	Purchase Prices			
	1-9 Units	10-49 Units	50-149 Units	150+ Units
Microterm II with single mini-diskette storage, 1K PROM, and 32K RAM	\$6,170	\$5,550	\$5,150	\$4,950
Microterm II with dual mini-diskette storage, 1K PROM, and 32K RAM	7,075	6,370	5,900	5,660
Microterm II with dual mini-diskette storage, integral 2200 cps printer, 1K PROM, and 32 RAM	8,990	8,100	7,575	7,250
External Forms Printer, 60 cps, bi-directional	2,100	2,100	2,100	2,100
Software Packages:				
IBM 2780 Emulator	250	200	200	200
Text Processor	300	250	250	250

Microcomm End User Prices

	Purchase Prices	
	1-9 Units	10-49 Units
Microcomm Dual Disk Workstation (without integral non-impact printer)*	\$8,500	\$7,650
Microcomm Dual Disk Workstation (with integral non-impact printer)*	9,990	9,000
External Forms Printer, 60 cps	2,100	2,100
Software Packages:		
IBM 2780 Emulator	250	200
Text Processor	300	250

*Includes Store/Process/Forward application software.

Microterm II OEM Prices

	Purchase Prices			
	1-49 Units	50-99 Units	100-499 Units	500+ Units
Microterm II with single mini-diskette storage, 1K PROM, and 32K RAM	\$5,170	\$4,750	\$4,320	\$4,100
Microterm II with dual mini-diskette storage, 1K PROM, and 32K RAM	5,920	5,440	4,950	4,700
Microterm II with dual mini-diskette storage, integral 2200 cps printer, 1K PROM, and 32K RAM	7,595	6,980	6,350	6,030
External Forms Printer, 60 cps, bi-directional	1,950	1,895	1,800	1,750
Software Packages:				
IBM 2780 Emulator	250	200	200	200
Text Editor	300	250	250	250