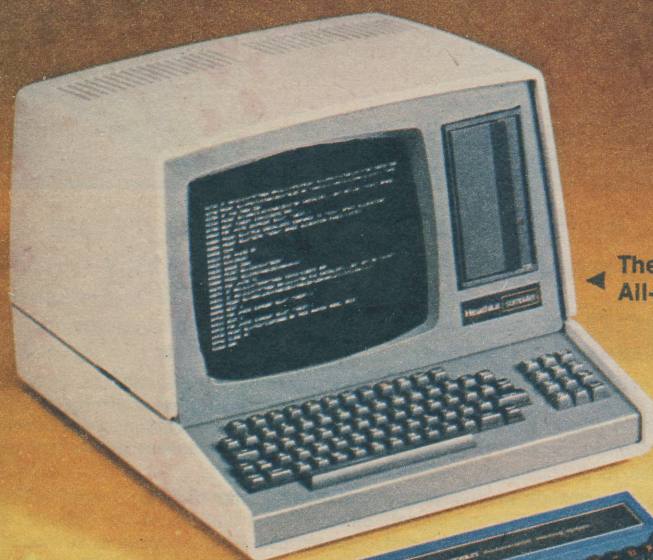


SPRING/SUMMER '81

Heathkit®

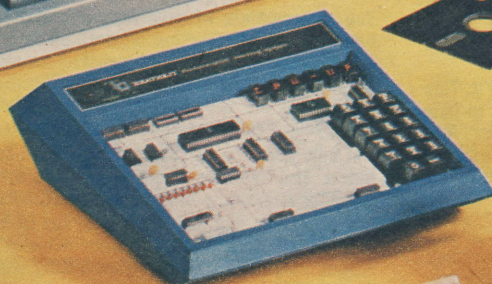
Value-packed kits designed
for spring and summer fun!



◀ The versatile H-89
All-In-One Computer



▶ Digital Weather Computer



◀ New Digital
Wall Clock

▶ IT-2250 Hand-held
Capacitance Meter



▶ The Self-paced
ETS-3401 Micro-
processor Course



▶ VF-7401 2-Meter
FM Digital Scanning
Transceiver

Rochester Hamfest 5/16/81

RETAIL CATALOG NUMBER 853



Use Visa, MasterCard
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Charge to charge
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UPS items shipped free within
50 miles of the nearest Heathkit
Electronic Center! See pages
52 through 54 of this catalog for
the address and phone number of
the Center nearest you.

When it comes to computers, Heath won't leave you out in the cold

More than a slogan: It's Heath's total commitment to give you extra value for your computer dollar. Now with more software, more peripherals, more accessories — Heath offers one of the most complete and innovative computer lines anywhere. You get more versatility and flexibility — at affordable prices.

On selecting a computer: Do you want built-in peripherals for convenience, or the flexibility to design your own system? Can you expand memory power as your skills grow? How good is the software? Is it compatible with existing software? Will the manufacturer stand behind the computer? You can be sure of the answers when you select Heath.

Choose from three very different computers for different people:

For convenience — the All-In-One H-89. If you're more interested in running software than in hardware and software development, the H-89 gives you a complete, balanced computer system in one package. It's powerful and very cost-competitive, with a personality that a first-time computer user will find comfortable. 100K of floppy disk capability is built-in. And you can expand to 64K RAM and more than 2 megabytes of on-line storage. More on page 70.

For flexibility — the H-8. If you're interested in developing hardware or write physical I/O routines in Assembly language, the H-8 is for you. Its versatile bus-oriented architecture, 64K RAM capacity, expandability and hardware front panel position it as the right choice. See page 72.

For DEC compatibility — the 16-bit H-11A. If you need a computer for scientific uses, real-time systems or similar applications, and DEC PDP-11V03 hardware and software capability is significant, the H-11A is your choice. We offer a large selection of compatible hardware and software. See page 79 to learn more.

The full line of Heath software meets your growing needs:

Operating systems let you fully utilize Heath's capabilities. Take advantage of all the programs written under CP/M, one of the world's most popular operating systems. Much of the 500-program HUG (Heath Users' Group) software library is based on HDOS (Heath Disk Operating System). The P-System with UCSD Pascal features excellent responsiveness to changing needs, clear readability and a large program library. See page 82.

Programming languages are available to fit almost any application. Assembly is the language understood by your computer. BASIC is an easy-to-learn programming language, available under HDOS or CP/M. A BASIC Compiler eliminates time-consuming interpretation, so programs run faster. FORTRAN is perfect for complicated mathematical and science programs. COBOL lends itself to business and accounting applications. All are compatible with libraries containing thousands of existing programs. See pages 84 and 85.

Utility and applications programs include word processing, office aids and others. See pages 83, 86 and 87. And Heath's SOFTSTUFF line offers a full complement of software tools at affordable prices. Turn to page 86.

HUG (Heath Users' Group) shares an extensive program library and informs you of the latest Heath Computer developments. Owners of Heath Computers can join HUG. See page 87 for details.

Expand to over 2 megabytes of on-line storage with the H-47 Floppy Disk System. Heath's first dual-sided, double-density 8-inch disk system offers more than eight times the on-line storage capacity of its predecessors. See page 75.

Heath Accessories — including wire wrapping products, memory, interfacing and others — make your computer more useful. See pages 71, 80 and 81.

You get complete, accurate documentation. Assembly, operating and instruction manuals are fully detailed.

You get the convenience of one-stop shopping. Our complete computer line is available at your Heathkit Electronic Center.

And we won't leave you out in the cold. Expert technical advice is always available by phone, letter or in person. And our service specialists help keep your Heath Computer System working right.

5% Discount on complete Heath Computer Systems: Buy any Heath Computer, one major peripheral and any amount of accessories on the same order form. Then, deduct 5% from the total price (excluding shipping and handling; one discount per customer; not combinable with other discounts).



1 All-In-One Computer: extra convenience in a compact unit — 64K RAM capacity, built-in video terminal, floppy disk drive, expanding software selection — all at an affordable price

Only
\$1695⁰⁰
 for H-89

- 16K RAM standard, expandable to 64K
- Two Z-80 microprocessors for high-speed operation
- Over 2 megabytes on-line

Are you looking for all the computing power and built-in peripherals you need — but your budget doesn't allow for extravagance? The Heathkit All-In-One Computer has the power, peripherals and convenience you need, for little more than "bare-bones" models.

This easy-to-operate 8-bit computer features separate Z-80 microprocessors for the computer and video terminal. Computer never has to share processing power with terminal, so the All-In-One can perform a variety of high-speed tasks.

Use the All-In-One as a professional video terminal. With all functions of our popular H-19 Terminal (page 75), up to twenty-four 80-character lines can be displayed — as well as a software-controlled 25th line.

The typewriter-format professional keyboard controls all terminal functions. The keyboard prints the entire ASCII set, upper and lower cases — along with 33 special graphics symbols for extra flexibility.

Select baud rates up to 9600 through the keyboard. Direct cursor addressing lets you insert or delete characters anywhere on the screen. Control all 32 terminal functions from keyboard or computer. Reverse video lets you emphasize any portion of the screen by reversing white on black.

Designed in calculator format, the 12-key numeric keypad makes entering arithmetic programs faster and easier than before. Shifted functions give you control to make insertions or deletions.

You get more memory power. 16K of random access memory (RAM) is supplied. Built-in diagnostics make memory checks faster and easier. And you can expand the All-In-One's memory capacity up to 64K RAM (using CP/M — 56K using HDOS) with accessories, so you can expand to meet your advanced computing needs.

The built-in floppy disk system gives you up to 100K bytes of on-line data storage capacity. You get fast, accurate access to data. You'll be able to load programs in seconds, update data fast. And the disk drive is factory assembled for easier kitbuilding.

If you need even more on-line storage, buy the H-77 5.25" Floppy Disk System. Designed for the All-in-One, the H-77 can give you up to 300K bytes on-line. (3-drive systems require Heath Disk Operating System, Ver. 1.6 or 2.0, Heath Standard CP/M or P-System with Pascal (all on page 82).

For maximum data storage — over 2 megabytes on-line — select the Heath H-47 8" Floppy Disk System. This dual-drive, dual-density, double-sided floppy disk system gives your Heath All-In-One Computer maximum versatility. (Requires WH-88-47 Interface on page 75, H-88-7 ROM Kit on page 71, HDOS Ver. 2.0 or CP/M Operating Systems, sold on page 82.)

You get H-8 compatibility. All Heath H-8 disk software runs on All-In-Ones with floppy disk storage.

Choose from Heath's vast software selection. HDOS 2.0, CP/M 2.2 and P-System with UCSD Pascal operating software — SOFTSTUFF™ software tools — word processing software — other applications programs — and the Heath Users' Group, with over 500 utility and applications programs (pages 82-87).

- Professional-style keyboard, 12-key numeric keypad
- Easy-to-read, 12-inch CRT displays up to 2000 characters
- Runs all Heath H-8 disk software

You get more flexibility. A RS-232C Serial Interface (page 71) lets you use peripherals (with software). Cassette interfacing is standard on kit versions.

Save when you buy — and ask your tax adviser about possible tax credits for additional savings.

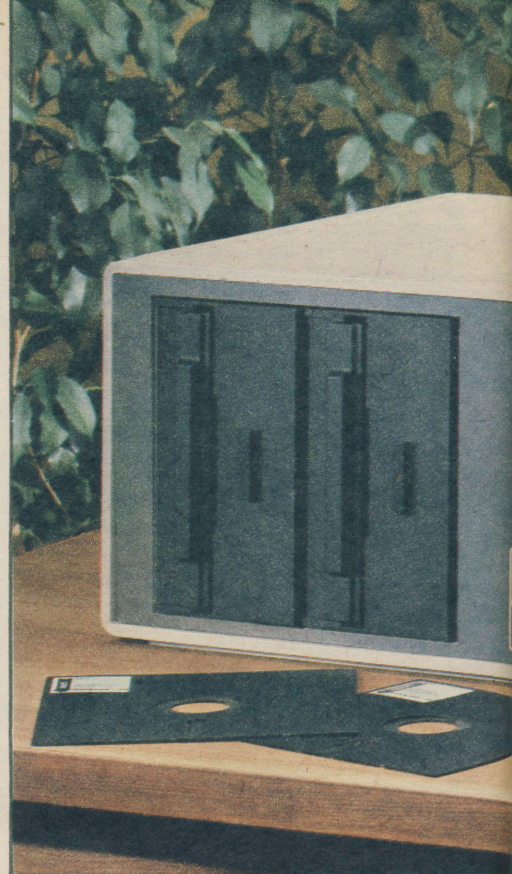
The Heath All-In-One Computer requires HDOS, CP/M or similar operating software for normal operation.

Kit H-89, Shpg. wt. 78 lbs. **1695.00**

Assembled All-In-One Computer. H-47, CP/M capable. Includes 5.25" floppy, 48K RAM, RS-232C Interface. WH-89-FA, 54 lbs., Mfr. Frt. **2895.00**

H-88 All-In-One Computer, without floppy. Kit H-88, Shpg. wt. 61 lbs. **1295.00**

H-89/WH-89-FA/H-88 SPECIFICATIONS: Clock: 2.048 mHz. Video Terminal: High-resolution CRT with P4 phosphor. Keyboard: 80 keys. Cursor: Blinking, non-destructive underline or block. Cursor Controls: Up, down, left, right, home, CR, LF, back space and tab. Cursor Addressing: Relative and direct. Tab: Standard eight-column tab. Refresh Rate: Same as AC line frequency. Edit Functions: Insert and delete character or line. Erase Functions: Erase from beginning of line, erase to end of line, erase from beginning of page, erase to end of page, erase line, erase page. Power Requirement: 120/240 VAC, 50/60 Hz. Dimensions: 13" H x 17" W x 20" D.



The H-89 All-In-One — more computer than the competition

BRAND	TWO MICRO-PROCESSORS?	PROFESSIONAL SCREEN SIZE?	COMPLETE KEYBOARD?	BUILT-IN VIDEO DISPLAY?	ALL-IN-ONE CONSTRUCTION?	BUILT-IN FLOPPY?	STANDARD CP/M AVAILABLE?	64K MEMORY CAPACITY?	PRICE*
Heath H-89	YES (Two Z-80s)	YES (25 lines x 80 char.)	YES (80 keys, upper and lower cases; includes numeric keypad)	YES (High-resolution CRT)	YES	YES	YES	YES	\$1995 KIT
Apple II	NO (Single 6502)	NO (25 lines x 40 char.)	NO (48 keys, N-key rollover)	NO (External TV or monitor)	NO (5 pieces)	NO (Extra)	NO	YES	\$2200
TRS-80 Model I Level II	NO (Single Z-80)	NO (16 lines x 64 char.)	NO (No control key)	NO (Non-integral medium resolution CRT)	NO (4 pieces)	NO (Extra)	NO	NO (48K)	\$1966

*For systems with B/W video display, one 5.25" floppy disk drive, 48K RAM, standard DOS, BASIC — as of 10/16/80.

Design an All-In-One Computer System for your needs

Memory:	Mass Storage:	Interfacing:	Peripherals: (require H-88-3 interface)
First, select the operating, utility and applications software you need (see pages 82-87). Computer, memory, peripheral and software requirements are listed in each software presentation. Then, select memory, peripherals and accessories for your All-In-One from this chart, based on the maximum requirements of your software programs.	64K (CP/M), 56K (HDOS) Expansion Set H-88-16 (requires 48K RAM, H-88-7 ROM Kit)	Cassette ECP-3801A	Printers H/WH-14, WH-24, WH-34, WH-44K, WH-54
16K Chip Set H-88-2 (can expand memory to 48K RAM — standard with WH-89 models)	Floppy H-47 (8" — requires WH-88-47 interface, H-88-7 ROM Kit)	H-47 Interface WH-88-47 (standard with WH-89-FA)	Modems WH-23, WH-33
	H-77 [5.25" — requires H-88-6 (models without external brightness control)]	Serial 3-port HA-88-3	
		Serial/Cassette for WH-89, WH-89-CA H-88-5 (Not for WH-89-FA)	





① H-89 All-In-One Computer

② H-77 Floppy Disk System

② H-77 adds even more versatility to your Heath All-In-One Computer

\$625⁰⁰
Kit
with one drive

- Additional data storage capacity, easier copying of programs
- Each drive installs vertically to take up less space
- Build in 2 evenings

Designed especially for the All-In-One Computer, the H-77 Floppy Disk System gives you all the storage and programming capacity you need for most applications. When you use the H-77 with your All-In-One, you have room for up to three disk drives. You can mount operating system and program disks at the same time, for rapid access to programs and data. And because the H-77 Floppy Disk System is designed to work with the Heath All-In-One Computer, you'll have a harmonious computer system.

The storage media for the H-77 is the standard, hard-sectored 40-track diskette. Measuring just 5.25 inches in diameter, each floppy disk offers access to 100K bytes of program and data storage.

Disk drives install vertically, so the H-77 takes up less space. And each drive is factory assembled and tested, for easier kitbuilding.

You get the flexibility to add as much data storage capability as you need. You can add the H-77 to your H-89, or to your H-88 (with the optional H-88-4 Disk Drive) for two-drive capability and 200K bytes of on-line data storage. The H-77 comes with a diskette storage box which fits into the second drive housing, so your system looks neat and efficient.

Or, for 3-drive capability and 300K bytes of on-line

storage, add the H-17-1 Second Drive to your H-77. For instant three-drive capability, the factory assembled and tested WH-87 — which includes two disk drives — can be used in place of the H-77/H-17-1. (NOTE: 3-drive systems require HDOS, Ver. 1.6, HDOS, Ver. 2.0 (HOS-817-1) or CP/M® Operating Systems (HOS-817-2) — see page 82).

Expand your All-In-One's capabilities today. No modification required for All-In-Ones with external brightness control. H-88-6 Modification Kit required for All-In-Ones without external brightness control.

Kit H-77, with one drive, 25 lbs. **625.00**

Dual-Drive Floppy Disk System Kit.

Kit H-87, with two drives, 30 lbs. **895.00**

Assembled Dual-Drive Floppy Disk System. No modification required for All-In-Ones with external brightness control. H-88-6 Modification Kit required for All-In-Ones without external brightness control.

WH-87, with two drives, 28 lbs. **1195.00**

Backplate Modification Kit. Required to use H/WH-47, H-77, H/WH-87 Floppy Disk Systems with All-In-Ones which do not have an external brightness control. H-88-6, Shpg. wt. 2 lbs. **50.00**

H-77/WH-87 SPECIFICATIONS: Diskette Size: 5.25 inches. Diskette Type: Single-sided, single-density. Number of Tracks per Diskette: 40. Number of Sectors per Track: 10. Formatted Bytes per Sector: 256. (Diskettes not included.) Spindle Motor Speed: 300 revolutions per minute (rpm), +1 percent. Data Transfer Rate: 128 kilohertz. Motor Start Time: 1 second. Operating Temperature Range: 32 to 104 degrees F (0 to 40 degrees C). Power Requirement: 120/240 VAC, 50/60 Hz. Overall Dimensions: 8.625" H x 8.875" W x 15" D (21.9 x 22.5 x 38.1 cm). Net Weight: 22.5 lbs. (10.2 kg).

All-In-One Accessories

16K RAM Expansion Chip Set. Expand your H-88- or H-89 to as much as 48K RAM with one or two of these memory expansion sets.

H-88-2, Shpg. wt. 1 lb. **60.00**

64K Wired Memory Expansion Kit expands RAM capacity of the All-In-One to 64K. Requires 48K of memory, H-88-7 ROM Kit (sold below).

WH-88-16, Shpg. wt. 1 lb. **150.00**

Replacement ROM Kit to use All-In-One Computer with H-47, CP/M and WH-88-16 Memory Expansion.

H-88-7, Shpg. wt. 1 lb. **55.00**

Three-Port EIA RS-232C Serial Interface lets All-In-One communicate with printers, time-share systems and other peripherals.

HA-88-3, Shpg. wt. 2 lbs. **120.00**

Floppy Disk Drive and Controller for H-88.

H-88-4, Shpg. wt. 17 lbs. **490.00**

Cassette Interface for WH-89-CA Computer.

H-88-5, Shpg. wt. 2 lbs. **100.00**

Wire Wrapping Board with bus connectors. Design custom circuits. Accepts forty-eight 16-pin sockets (also 54 14-pin, other combinations). Uses HCA-6, HCA-7 (p. 81).

H-88-10, Shpg. wt. 1 lb. **30.00**

Second Drive for the H-77 Floppy Disk System.

H-17-1, Shpg. wt. 5 lbs. **345.00**

Plastic Anti-Glare Filter, Clear.

HCA-3, Shpg. wt. 1 lb. **12.95**

Fabric Anti-Glare CRT Filter, Black.

HCA-4, Shpg. wt. 1 lb. **19.95**

Dust Cover for All-In-One Computer and H-19.

HCA-5-89, Shpg. wt. 1 lb. **14.00**

Dust Cover for the H-77 Floppy Disk System.

HCA-5-77, Shpg. wt. 1 lb. **14.00**



FREE delivery, within 50 miles of store, for phone charge orders that ship UPS.

1 Get immediate programming versatility, plug-in flexibility with the popular, budget-pleasing Heath H-8 Computer

Only
\$350.00

- Fully-buffered bus has 7 plug-in positions for memory and I/O
- Heavy-duty power supply handles full complement of memory, I/O devices
- Expanding software library
- Over 2 megabytes of on-line data storage available
- Built-in ROM monitor to control front panel program
- Enhanced capabilities

The Heath H-8 — the computer that grows as you grow. With its 7 positions for plug-in modules, you can put together any combination of memory, interfacing and accessories. And our expanding selection of peripherals, accessories, operating software and applications software gives your H-8 Computer unmatched versatility.

Novices can use the H-8 as a computer trainer. The 16-key front panel keyboard provides octal data entry, direct access to registers and memory, one-button program load and dump, and input/output keys to communicate directly with any port. And you can directly monitor program activity with the nine-digit front panel octal readout, which provides much more information than conventional computers.

The features we pack into the H-8 Computer mean extra value to you. A special heavy-duty power supply lets the H-8 handle up to 64K of memory (including interfacing). And our engineers have designed efficient convection cooling into the H-8.

The CPU board, including the 8080A chip, clock, systems controller and ROM monitor, is fully assembled, wired and tested for easier kit assembly and faster system setup. An exclusive Heath 50-pin fully-buffered bus gives you more room for memory and interfacing. The built-in speaker gives you audible feedback and special effects. Front panel lights keep you up to date on status. With all these features and more, the H-8 is an excellent choice to be the heart of your computer system.

Heath floppy disk systems, sold separately, provide greater flexibility. The H-17 (page 73) provides up to 100K bytes of on-line data capacity. Add a second drive to expand capacity to 200K bytes. And now, with the H-17-3 Modification Kit, you can add

a third floppy disk drive to your present H-17, expanding on-line data capacity to 300K bytes.

Expand to over 2 megabytes on-line! The H-47 Floppy Disk System, our 8-inch, dual-sided, double-density system, brings the H-8 Computer into the megabyte age of data storage. See page 75.

You get total freedom to design a system that meets your specific needs. Start with an H-8 System Package — kit or assembled (below, left). Or design your own H-8 system from an expanding selection of peripherals and accessories — including additional memory and data storage, video terminals, color graphics, printers, a music synthesizer system and two new modems.

Choose from an expanding software library. We support the H-8 with the Heath Disk Operating System (HDOS), CP/M and the UCSD P-System. Languages include a BASIC Interpreter, BASIC Compiler, FORTRAN and COBOL. See pages 82, 84 and 85.

Many new applications programs are being introduced — including problem-solvers for home, hobby and business. And the Heath Users' Group maintains over 500 programs — from business accounting and personal budgeting to computer-aided instruction, exciting games — even weather forecasting! Turn to pages 82-87 for the full story.

Get added flexibility — at a budget-pleasing price. The Heath H-8 Computer requires at least 4K of memory (p. 81) and operating software (HDOS, CP/M, P-System or similar operating system) for normal operation.

Kit H-8, Shpg. wt. 30 lbs. \$350.00

PAMGO ROM. Boot up with 1 or 3 keystrokes — not 11. **H-8-9, Shpg. wt. 1 lb. \$20.00**

Extended Configuration Option. Required to run H-47 Floppy Disk System or CP/M Operating System with H-8 Computer. Includes replacement front panel read-only memory (ROM).

HA-8-8, Shpg. wt. 1 lb. \$65.00

Dust Cover for H-8. HCA-5-8, 1 lb. \$14.00

Look at the Manuals — with no risk. Manuals for H-8, H-8-4 Interface, H-14 Printer, WH-8-16 Memory Board, H-19 Terminal. When you order the H-8 Computer, deduct \$30.00 from the purchase price (ex-

cluding shipping and handling charges).

HM-800, Shpg. wt. 11 lbs. \$30.00

NOTE: Product manual also included with each kit.

H-8/WH-8 SPECIFICATIONS: Microprocessor: 8080A. Monitor: In on-board 1K x 8 ROM. Octal addresses, data input and display from the front panel. **Monitor Functions:** Memory display and alter, register display and alter, memory load and dump, single instruction execution, program execution, port input and output. **Clock:** 2.048 MHz. **Interrupts:** Seven, priority vectored. **Power Supplies:** +8 VDC at 10 amperes maximum, regulated to +5 VDC on each circuit board; +18 VDC at 500 milliamps, regulated to +12 VDC and -5 VDC on the CPU circuit board. **Chassis Capacity:** Seven locations on the mother circuit board for memory or interfacing cards. Four memory cards maximum. One bus expansion maximum. **Operating Temperature:** 32 degrees F to 104 degrees F. **Power Requirement:** 120/240 VAC, 50/60 Hz. **Dimensions:** 6.5" H x 16.25" W x 17" D (16.51 x 41.28 x 43.18 cm).

Assembled 16K H-8 System. 16K RAM, 100K bytes on-line storage. Just add terminal, plug in, connect cables, boot up. Includes WH-8 Assembled Computer, WH-17 Assembled 5.25" Floppy Disk, WH-8-4 4-Port Serial Interface, WH-8-16 Assembled 16K Memory Board, HOS-817-1 Heath Disk Operating System, Ver. 2.0. \$1844.00 separately. **BUY THE SYSTEM AND SAVE \$169.00.**

WHS-83, Shpg. wt. 81 lbs. \$1675.00

Complete 16K H-8 System Kit. 16K, 100K bytes of on-line storage, video terminal. Includes H-8 Computer, H-8-4 Four-Port Serial Interface, WH-8-16 16K Wired Memory Board, H-17 5.25" Floppy Disk, H-19 CRT Terminal and HOS-817-1 Heath Disk Operating System, Version 2.0. \$2314.00 separately. **SAVE \$219.00 WHEN YOU PURCHASE THE SYSTEM.**

HKS-82, Shpg. wt. 143 lbs. \$2095.00

How to configure a Heathkit H-8 Computer System

With 7 plug-in positions for memory and I/O, your H-8 Computer System can grow as your needs grow. You can expand to 64K of memory, and up to over 2 megabytes of on-line data storage. You'll find that the tremendous benefits provided by these H-8 accessories is well worth your hard-earned computer dollar.

Memory:
(4 cards, up to 64K)

Wired 16K
WH-8-16

Mass Storage:

Cassette
ECP-3801A
(requires H-8-5
Interface)

Floppy
H-17 (5.25" — requires
minor modifications, HA-8-8
Ext. Configuration to run CP/M)
H-47 (8" — requires
HA-8-8, WH-8-47)

Interfacing:

Wired
H-47 Interface with
2 Serial Ports
WH-8-47

Serial/
Cassette
1-port
H-8-5

Serial
4-port
H-8-4

Parallel
3-port
H-8-2

Peripherals:

Terminal
H-9, H-19
(requires H-8-4, H-8-5 or
WH-8-47)

Color Display
GDZ-1320
(requires HA-8-3
Board)

Printers
H/WH-14, WH-24,
WH-44K, WH-54
(requires H-8-4 or WH-8-47)

Modem
WH-23, WH-33
(requires H-8-4, H-8-5 or
WH-8-47)



② H-17 Floppy Disk System (shown with three-drive modification and 2 additional drives installed)

① H-8 Computer



② Instant access and increased capacity — yours with the H-17 Floppy Disk System

\$625⁰⁰
Kit

- Up to 300K bytes of on-line data storage (using accessories)
- Build in just 2 evenings
- Take advantage of the hundreds of disk-based H-8 software programs
- Assembled and tested drive system

Make your H-8 Computer System a total versatility system — with the H-17 Floppy Disk System. With the H-17, you get the data storage capacity you need to load programs quickly. Store hundreds of programs on a single disk and have rapid access to any one of them, anytime you need it.

The H-17 provides up to 100K bytes of on-line data storage (up to 300K bytes with additional drives — order at right). Data is stored on standard, hard-sectored 40-track diskettes — just 5.25 inches in diameter. Disks are easier to handle — and load — than paper tape or cassettes.

The H-17 includes a single disk drive, a disk interface/controller circuit board which plugs directly into the H-8's mainframe, and a built-in power supply. Because the H-17 Floppy Disk System is especially designed for the H-8 Computer, you get a harmonious computer system that interfaces properly and runs smoothly.

See the expanding line of systems and applications software for the Heath H-8 Computer — including the complete line of SOFTSTUFF™ software tools, utility programs and the Heath Users' Group software library, with more than 500 useful programs. Turn to pages 82-87.

The H-17 uses the famous Siemens 82 single-drive system, a performance-proven 5.25-inch floppy disk drive which provides accurate high-speed access to data. The assembled Siemens drive performs much better than most equivalent drive systems.

For more data storage area, add the optional H-17-1 Second Drive and make your H-17 a more versatile dual-drive floppy disk system. With two drives, you'll have up to 200K bytes of program and data storage area. You'll be able to run operating system and program disks at the same time.

If you need even more on-line data storage capacity, buy the new H-17-3 Three-Drive Modification Kit and another H-17-1 Drive. Add this kit to your H-17 to get up to 300K bytes of on-line storage — 50% more than on previous versions. With the H-17-3, your H-17 can provide even more versatility.

To use the H-17 Floppy Disk System effectively, you need an H-8 Computer with at least 16K of Random Access Memory (RAM), as well as a Heathkit disk-based operating system (sold on page 82).

Your choice of operating systems includes the Heath Disk Operating System, which many of the 500 utility and applications programs in the Heath Users' Group software library (p. 87) are based on; Heath Standard CP/M, with hundreds of existing programs available; and the UCSD P-System with Pascal, a modular system with a large program library.

Kit includes one blank 5.25-inch floppy diskette.
Kit H-17, with one drive, 28 lbs. **625.00**

Factory Assembled and Tested H-17 Floppy Disk System. Comes with the same extra-value features found on the kit version above. With one drive.

WH-17, Shpg. wt. 28 lbs. **695.00**

Three-Drive Modification Kit for H-17 Floppy Disk. Increases capacity of the H-17 to three 5.25-inch floppy disk drives, instead of two. Enjoy even more programming flexibility and versatility. Includes new sheet metal, fan and power supply components, 3-drive cable. Easy kit assembly — takes as little as one evening. Requires H-17 or WH-17. Drive not included; order H-17-1 Drive separately (below) to take advantage of additional data storage capability.

Kit H-17-3, Shpg. wt. 8 lbs. **85.00**

Optional Second or Third Drive adds versatility to your H-17. Run operating system and program disks simultaneously. 100K on-line bytes per drive.

H-17-1, Assembled, Shpg. wt. 5 lbs. **345.00**

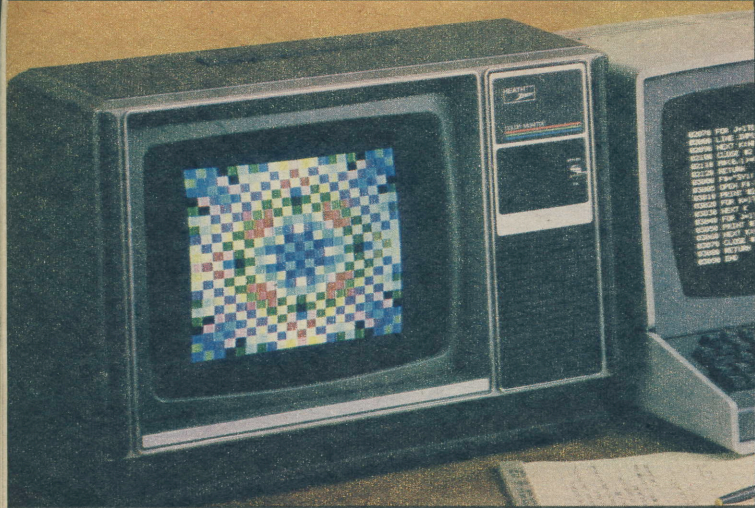
Dust Cover for H-17 Floppy Disk System.

HCA-5-17, 1 lb. **14.00**

H-17/WH-17 SPECIFICATIONS: Storage Media: 5.25-inch, hard-sectored diskette. Number of Tracks per Diskette: 40. Number of Sectors per Track: 10. Formatted Bytes per Sector: 256. Drive Type: Siemens Model 82. Track Seek Time: 30 milliseconds. Random Sector Access Time: Less than 250 milliseconds. Power Requirement: 120/240 VAC, 50/60 Hz, 75 watts. Dimensions: 6.25" H x 13.5" W x 13.5" D (15.89 x 34.29 x 34.29 cm).



FREE delivery, within 50 miles of store, for phone charge orders that ship UPS.



Give your computer system a brilliant burst of color with the Heath/Zenith Color Video Display

\$399⁹⁵

- This quality-built color video display is the right product, at the right time, at the right price
- Fully assembled and tested Heath/Zenith unit features 13-inch (diagonal) color picture
- Accepts composite NTSC color video signal from computer systems, video cassette recorders and color cameras

Add a colorful new dimension to your computer system. The Heath/Zenith GDZ-1320 Color Video Display is the ideal complement for the Heath HA-8-3 Color Graphics Board below — as well as many other computers, video cassette recorders (VCRs) or color video camera with NTSC composite video output.

Now is the time to add a color video display to your computer system. You can take advantage of the HA-8-3 and the new color software to be offered soon by SOFTSTUFF™ for the H-8 and All-In-One Computer Systems.

The Heath HA-8-3 Color Graphics Board lets you create colorful displays for your H-8 Computer

\$495⁰⁰

- Includes advanced color video generator, programmable sound generator for maximum enjoyment
- Capable of accepting up to four X-Y joystick consoles and an arithmetic processing chip (both not included)
- Board is fully assembled and tested, for fast and easy installation in your Heath H-8 Computer

The Heath HA-8-3 Color Graphics Board will add colorful capabilities to your H-8. It connects to the Heath/Zenith GDZ-1320 Color Video Display above (preferred), or to other video devices which accept the NTSC composite video signal. The HA-8-3's advanced features make it a very useful accessory board.

This Color Graphics Board includes the TI-9918 Color Video Display Generator from Texas Instruments — the most advanced color video generator available. The TI-9918 produces vivid color pictures for color video displays — as well as monochrome levels for black-and-white monitors.

Maximum resolution of the TI-9918 Video Display Generator is 256 x 192 pixels. The video display screen consists of 35 display planes: the External Video, Backdrop and Pattern Planes — as well as Sprite Planes 0 to 31. The planes are stacked, with the external video the innermost or lowest plane. The sprite 0 plane is the outside or highest plane.

The Color Video Display Generator can produce three color display modes:

The Pattern Mode causes the pattern plane to be broken up into groups of 8 x 8 pixels, called pattern positions. Since the full image is 256 x 192 pixels, there are 32 x 24 pattern positions on the screen in Pattern Mode. Within each pattern position, two unique colors are allowed.

In Text Mode, the pattern plane is broken into groups of 6 x 8 pixels, called text

The Heath/Zenith Color Video Display represents outstanding value. You get a higher-quality color picture, because this 13-inch (diagonal) color display accepts the composite NTSC color video signal directly from the HA-8-3 Color Graphics Board — as well as other devices. You get a better picture than produced by an RF Modulator, because direct reception eliminates the two steps of modulating and demodulating the signal.

The GDZ-1320 also accepts a Hi-Z audio input. An RCA-type phono jack, with an impedance of 75 ohms, is provided for NTSC video input — while a miniature phone jack is built-in to the unit for audio input.

Fast warm-up capability lets you use the Heath/Zenith Color Video Display right away. Fully automatic color processing, built into the Display, assure consistent color levels and vivid hues, for a better all-around color picture. The GDZ-1320's picture stays so rock-steady that the vertical hold and horizontal hold controls have been eliminated! And a built-in audio amplifier and speaker faithfully reproduce each sound.

When you want top-notch color video reproduction from your computer, video cassette recorder or camera, you can count on Heath/Zenith. The Zenith name has meant quality in the color television field, year after year. And the same quality has been built into the GDZ-1320 Color Video Display. Service is available from Zenith service centers nationwide.

The GDZ-1320's high-impact black styrene cabinet protects the Heath/Zenith Color Video Display's electronic components, under normal operating conditions. This fully assembled and tested product runs on 120 VAC, 60 Hz. Draws 82 watts of power. UL and CSA listed. Overall Dimensions, 14" H x 20.25" W x 14.75" D (35.56 x 51.44 x 37.47 cm).

GDZ-1320, Assembled and tested, Shpg. wt. 44 lbs. **399.95**

GDZ-1320 SPECIFICATIONS: Screen Size: 13 inches (diagonal measurement). Video Input: Composite NTSC-system video (1 Volt P-P, negative sync), via RCA-type phone jack. Input Impedance: 75 ohms. CRT: 13VBAP22 (100 degree deflection angle); vertical-stripe screen with black surround negative guardband, EFL (R) in-line tri-potential electron gun, automatic degaussing. Video Resolution: 240 lines (at 3.125 MHz. Light Output: 90 Foot-lamberts (average) at maximum beam current. Chroma Bandwidth: 0.7 MHz, +3 dB. Color Level and Processing: Fully automatic. Vertical, Horizontal Hold: No adjustments required. Warm-Up Time: 15 seconds maximum. Audio Input: Hi-Z/high-impedance audio (2 Volts P-P), via miniature phone jack. System includes built-in speaker and front panel volume control. Cabinet Material: High-impact Styrene, UL Rated V-O. Cabinet Finish: Black, with hot stamp chrome trim. Power Requirement: 120 VAC, 60 Hz, 82 Watts. UL and CSA listed. Conforms to technical requirements of 21 CFR, Subchapter J, for X-radiation. Overall Dimensions: 14" H x 20.25" W x 14.75" D (35.56 x 51.44 x 37.47 cm).

positions. There are 40 x 24 text positions on the screen in this mode. Sprites do not display in the screen, and two colors are defined for the entire screen.

In Multicolor Mode, the screen is broken into groups of 4 x 4 pixels. This provides a grid of 64 x 48 positions on the screen. With each of the 3072 positions, one unique color is allowed.

The TI-9918 Video Display Generator can also display eight different levels of gray, for black-and-white displays.

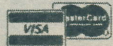
The AY-3-8910 Programmable Sound Generator, built into the Color Graphics Board, is a Large-Scale Integrated (LSI) circuit which is capable of making nearly any sound desired for your game or other application, under software control. The analog sound outputs can each provide 4 bits of digital-to-analog conversion, greatly enhancing the dynamic range of the sounds produced.

To perform sound effects while allowing the processor to continue its other tasks, the PSG can continue to produce sound after the initial commands have been given by the control processor. Realistic sound production with more than one effect is accomplished by the 3 independently controllable channels.

Eight channels of analog-to-digital conversion are provided, for up to four X-Y joystick consoles (not included). Each channel has 4 bits of parallel input/output for switches and LEDs. A built-in socket will accommodate the AMD-9511 Arithmetic Processor Chip (not supplied), which permits extremely rapid floating point, trigonometric and transcendental computations — as well as hardware multiplication and division of both integer and floating point numbers.

Demonstration software for our Color Graphics Board is supplied on a 5.25-inch single-density, single-sided, hard-sectored floppy diskette. Additional software for this Color Graphics Board will be developed and offered by SOFTSTUFF™ in the near future. Due to the use of wait states and a special 18 VDC power requirement, proper operation of the Heath HA-8-3 Color Graphics Board is guaranteed only when it is used with Heath memory boards — or with other memory boards which use fully static single-supply RAM chips.

HA-8-3, Assembled and tested, Shpg. wt. 3 lbs. **495.00**



Versatile H-19 Video Terminal with full ASCII set, professional keyboard and super-sharp CRT display

\$695⁰⁰
Kit

- Z-80 microprocessor-based for efficient data handling
- Typewriter-style keyboard, 12-key numeric pad
- DEC VT-52™ software-compatible
- Now expandable to an H-88 All-In-One Computer

Exceptional capabilities: The H-19 is designed for the H-8 and H-11A, or any device using RS-232C interfacing. A Z-80 microprocessor makes it ideal for high-speed data handling. Typewriter-format keyboard lets you begin entering data right away. The H-19's 32 functions can be controlled from the keyboard, or a computer. A 12-key numeric keypad, in calculator format, makes the entry of mathematical programs faster and easier. Keyboard-selectable 110-9,600 baud rates make changes easy. Eight user-function keys give extra flexibility.

The H-19 displays the entire ASCII set, upper and lower case. Thirty-three graphics characters can be arranged for a variety of effects. Prints twenty-four 80-character lines (with software-controlled 25th line). Using direct or relative addressing, you can make corrections or edit, anywhere on the video screen.

Now, you can change your H-19 into an H-88 All-In-One Computer, with the new H-19-2 Conversion Kit (below). And the H-19's ROM listing is available (p. 83) to help you understand how this powerful, versatile video terminal operates — or to allow you to alter its personality and cursor control protocols to match those of other terminals. 120/240 VAC, 50/60 Hz. 13" H x 17" W x 20" D.

Kit H-19, Shpg. wt. 54 lbs.	695.00
WH-19, Assembled Video Terminal, Shpg. wt. 43 lbs.	995.00
H-19-1, Source Listings for ROM of H-19 Video Terminal, 1 lb.	25.00
HCA-4, Black Fabric Anti-Glare CRT Filter, 1 lb.	19.95
HCA-3, Clear Plastic Anti-Glare CRT Filter, 1 lb.	12.95
NEW! HCA-5-89, Dust Cover for H-19 Terminal, Shpg. wt. 1 lb.	14.00

NEW! Convert the H-19 to an H-88 All-In-One Computer! Easy assembly — includes detailed assembly manual, all necessary parts. When finished, you'll have an H-88 with 16K RAM — and a powerful video terminal. Add an H-88-4 Disk Drive/Controller (p. 71), and you can expand to a full-fledged H-89!

Kit H-19-2, Shpg. wt. 19 lbs. **695.00**

Move up to over 2 megabytes of on-line storage with the Heath H-47 8-Inch Floppy Disk System

\$2595⁰⁰
Kit

- Supplied with two disk drives for over 2 million bytes of on-line data and program storage area
- Stores over a million bytes on each 8" floppy disk — more than 10 times the capacity of a 5.25" disk
- Fully compatible with Heath 5.25" disk systems
- Supported by HDOS and CP/M Operating Systems

Over 2 megabytes of on-line storage: Each 8-inch dual-density, dual-sided, soft sector floppy disk can hold over one million bytes of data. Because the H-47 is supplied with two pre-assembled 8-inch drives, this means you can have over 2,000,000 bytes of data on-line at any one time — more than 10 times the capability of a 5.25" dual-drive system.

Compatible with Heath 5.25" systems: Use up to three 5.25" drives with the two 8" drives in the H-47, for maximum storage — over 2.3 million on-line bytes! **Less than half the access time:** 191 mS — compared to the 490 mS time of currently available disk systems for the H-8 and All-In-One.

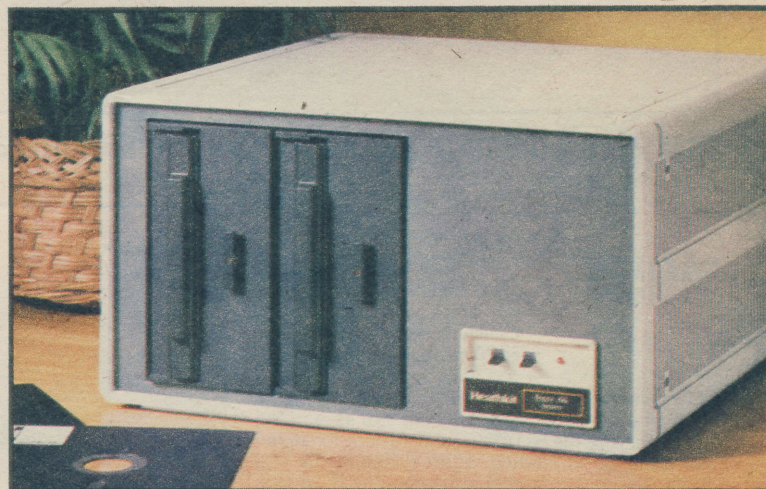
Move up to new software capabilities: With the H-47, you can run both HDOS and CP/M. These systems open the door to thousands of useful programs. And you can transfer data between 8" and 5.25" disks at any time.

Includes 40-conductor flat cable for connection to H-8, All-In-One. Requires WH-8-47 and HA-8-8 for H-8; WH-88-47 and H-88-7 for All-In-Ones (except WH-89-FA). Also requires H-88-6 (listed at right).

Kit H-47, Shpg. wt. 87 lbs., Motor Freight	2595.00
WH-47, Assembled 8-Inch Floppy Disk System, 66 lbs., Mtr. Frt.	3500.00
Wired H-47 Interface with two RS-232C Serial Ports, for use with H-8 Computer.	
WH-8-47, Shpg. wt. 2 lbs.	235.00
HA-8-8, Extended Configuration Option for H-8, Shpg. wt. 1 lb.	65.00
WH-88-47, Wired H-47 Interface for All-In-One Computers, 2 lbs.	195.00



H-19/WH-19 SPECIFICATIONS: Character Set: 128 (95 ASCII, 33 graphic). Character Type: 5 x 7 (upper, lower case), 5 x 9 (lower case with descenders). Keyboard: 80 keys (60 alphanumeric, 12 function), 12-key numeric pad. Cursor Controls: Up, down, left, right, home, CR, LF, tab. Tab: 8 columns. Erase: Page, to end of line, to end of page. Scroll: Auto, line/page freeze. Bell: On receipt of control G. Video: Normal and reverse (using escape sequence). Interfacing: RS-232. Mode: Full or half-duplex. Parity: Even, odd, stick, none. Handshaking: Software, ctrl S — ctrl Q; all RS-232 lines tied high internally. Buffered terminal capable of keeping up with most operations and normal scrolling text output, at 9600 baud or less. Power Requirement: 120/240 VAC, 50/60 Hz. Overall Dimensions: 13" H x 17" W x 20" D (33.02 x 43.18 x 50.80 cm).



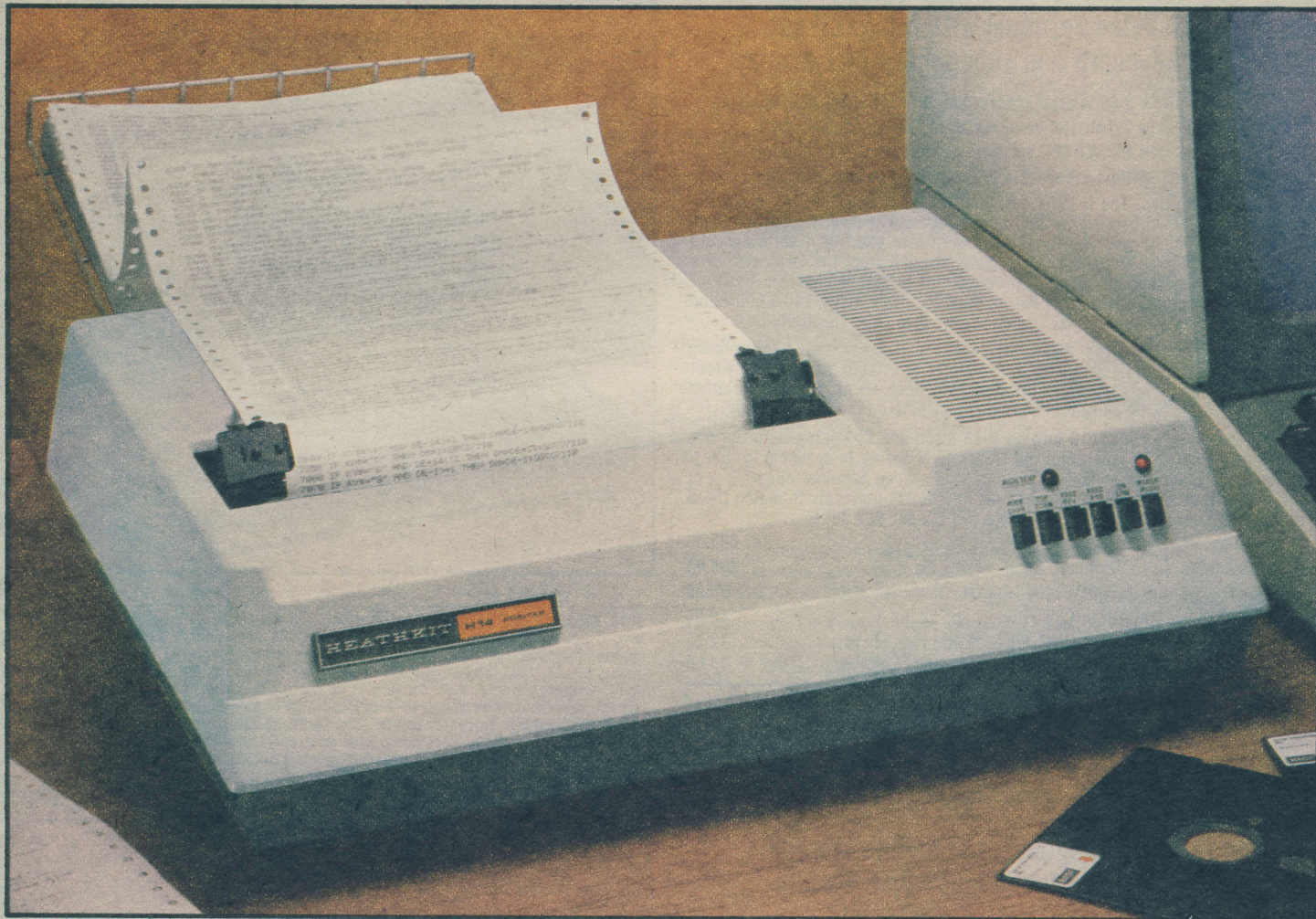
Backplate Modification Kit. Required to use H-47 with H-88, H-89, WH-89 and WH-89-CA Computers which do not have an external brightness control.

H-88-6, Shpg. wt. 2 lbs.	50.00
H-88-7, Replacement ROM for All-In-One Computers, 1 lb.	55.00

H-47 SPECIFICATIONS: Number of Tracks per Surface: 77. Recording Density: Outer Track, 1836 BPI single — 3672 BPI double; Inner Track, 6536 BPI. Track Density: 48 tracks per inch. Data Transfer Rate: Rotational Speed: 360 rpm, $\pm 2.5\%$. Average Rotational Latency: 83.3 mS. Average Seek Time: 78 mS. Head Settle Time: 15 mS. Average Access Time: 191 mS, including settle. Power Requirement: 120/240 VAC, 50/60 Hz, 204 Watts. Overall Dimensions: 10.2" H x 18.9" W x 18" D (25.91 x 48.00 x 45.72 cm).



FREE delivery, within 50 miles of store, for phone charge orders that ship UPS.



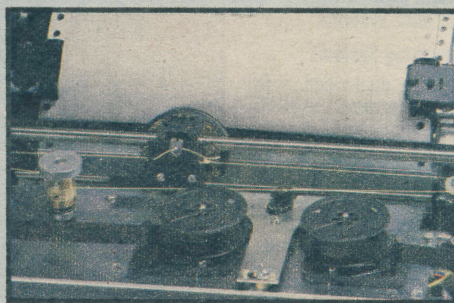
Now save \$100 or more on the microprocessor-based H-14 and WH-14 Line Printers

\$495⁰⁰
Kit

- Has extra features you won't find on comparably priced dot matrix line printers
- Prints std. 96-char. ASCII set at speeds of up to 75 cps
- Use with most computers — communicates via RS-232C or 20 mA loop interfacing

Now save even more on the Heath H-14 Line Printer with a new lower price on both kit and assembled versions. With the H-14 you get hard copy for added convenience in reading, editing, debugging and modifying your computer programs. The H-14 Line Printer can also provide handy printed copies of address lists or other data you need for any of your personal or business applications.

The H-14 prints the standard 96-character ASCII set (upper and lower case) on a 5 x 7 dot matrix print head. Uses readily available 0.5-inch nylon inked ribbon on 2-inch spools. Maximum throughput rate is 75 characters per second, with selectable 80, 96 or 132 character line length. Standard spacing is 6 lines per inch; 8 lines per inch spacing is software selectable. Baud rates are user-selectable, from 110 to 4800. Adjustable width sprocket



Sharp printout, low payout: The Heath H-14 is one of the lowest-cost microprocessor-based line printers available today.

feed handles edge-punched fan-fold paper from 2.5 inches to 9.5 inches wide, with a maximum form thickness of 0.006 inch.

The H-14 Line Printer provides extra value and performance — at a price that won't break your budget. Connects to most computers with std. RS-232C serial interface or 20 mA current loop. Handshaking provided by busy control signal.

Standard equipment for the H-14 Line Printer includes a 25-pin male EIA connector and a matching paper catch. For 120/240 VAC, 50/60 Hz. Dimensions, 4.80"H x 18.33"W x 14.33"D (12.19 x 46.56 x 36.40 cm). Requires HDOS or CP/M Operating System Software for H-89 All-In-One Computer; H-88-18 Operating System Software for H-88 Computer; HDOS, CP/M or H-8-18 Operating System Software for H-8 Computer Systems.

Kit H-14, 30 lbs. . . Was \$635.00, NOW ONLY 495.00

Assembled and Tested Heath H-14 Line Printer.

WH-14, 27 lbs. . . Was \$795.00, NOW ONLY 695.00

NEW! Dust Cover for Heath H-14 Line Printer.

HCA-5-14, Shpg. wt. 1 lb. 14.00

H-14/WH-14 SPECIFICATIONS: **Printing Speed:** Initial time per full line is approximately 1.75 seconds on 60 Hz power line, 2.1 seconds on 50 Hz power line. Avg. throughput approx. 40 cps with 96 char. line. Print head temp. controlled by varying print speed. **Characters:** Impact prints 0.11" high characters. **Format:** 80, 96 or 132 cpi (96 cpi software selectable only). **Forms Handling:** Sprocket feed with adj. widths, 2.5"/sec slewing rate. Form depth selectable from 0.0210" to 0.1365". **Ribbon System:** Standard typewriter ribbon with automatic reversing mechanism. **Panel LED Indicators:** Power on/off, print head temp. **Operator Controls:** Power on/off, on/off line, fwd/reverse feed, top of form, wide characters.





Save \$40 on WH-24-1/TI-810 — our fastest printer

\$1695⁰⁰

- Utilizes optimized 150 cps bi-directional printing
- Handles forms up to 15" wide, prints up to 5 copies
- Assembled unit includes BOTH upper and lower case

Make a big impact on both your printing and your printer costs with the WH-24-1/TI-810 Dot Matrix Printer. Optimized bi-directional printing, at a fast 150 characters per second/64 lines per minute, minimizes printhead travel time and maximizes efficiency. Vertical and horizontal tabbing features help produce maximized data, regardless of format.

The built-in 256-character FIFO (First In, First Out) buffer receives data at speeds from 110 to 9600 baud. Programmable forms length and a wide carriage handle multiple-part forms from 3 to 15 inches wide. The WH-24-1's 9 x 7 dot matrix font prints clearer, more legible characters of an original, and can produce up to five high-quality copies.

The WH-24-1/TI-810 printer can reproduce the full 96-character ASCII set, featuring both upper and lower case letters. Line width is adjustable up to 132 characters per line, while 6 or 8 lines per inch printing density can be selected by operator or software.

Once a form has been engaged by the tractor drives, alignment can be made at the main control panel. Adjustments for forms thickness can be made by use of the printhead-to-platen control.

Self-testing capabilities verify the WH-24-1's electronic and electromechanical capabilities. Includes upper and lower cases. For 120/240 VAC, 50/60 Hz. 8" H x 25.75" W x 20" D. Needs WHA-11-5 Serial I/O Card (p. 79) for use with H-11A; not required for other Heath computers. See the full line of quality Heath-recommended ribbons and printer paper on page 80.

WH-24-1, Assembled, 66 lbs., Motor Freight **Was \$1735.00, NOW ONLY 1695.00**

WH-24-1 SPECIFICATIONS: Printing: Technical: Seven-wire matrix, impact. Speed: 150 characters per sec.; 64 lines per min. (at 132 chars./line), up to 450 lines per min. (at 10 chars./line). Character Set: 96-character ASCII. Characters Per Inch: 10. Format: Up to 132 chars./line max.; 6 or 8 lines/inch (operator or software selectable). Forms Handling: Tractor feed with adjustable widths. 5 in./second (127 mm/second) slewing rate. Panel Indicators: Power on/off, on line/off line, error, paper out LEDs. Operator Controls: Power on/off, on line/off line, forward and reverse feed, fwd. line and form feed, tab reset. Communications: Interfacing: EIA Standard RS-232C Serial Interface. Baud Rates: 110, 150, 300, 1200, 2400, 4800 or 9600 baud. Parity: Odd, even, ignore. Operating Temp. Range: 37 to 104 degrees F (5 to 40 degrees C). Operating Humidity Range: 5 to 90% (no condensation). Power Requirement: 120/240 VAC, 50/60 Hz. Overall Dimensions: 8" H x 25.75" W x 20" D.



Save \$100 on this versatile DECwriter Teleprinter

\$1095⁰⁰

- WH-34 Terminal/Printer has many convenience features
- Clearly prints the full 128-character ASCII set
- Assembled unit prints at a true speed of 30 cps

The WH-34/LA-34 DECwriter IV sets new standards for convenience in computer and data communications terminals. Small and lightweight, it's a natural for the office environment. Its keyboard is arranged like a typewriter keyboard, complete with sculptured keys. Snap-in cartridge ribbons mean no mess.

This 300 baud, 30 cps desk-top terminal can print at burst speeds of up to 45 cps. An alternate 110 baud/10 cps speed is keyboard-selectable. Terminal operates full duplex, with optional local echo. A 9 x 7 dot matrix impact printhead produces the full 128-character ASCII set, upper and lower case.

Designed for operator simplicity, the WH-34's VIEW mode can be used for last character visibility. The off-line setup mode lets the operator select performance parameters from the keyboard or a computer, making the terminal useful in almost any kind of office function.

Includes RS-232C Interface to communicate with computers, acoustic couplers and Bell 103J or equivalent modems. Also includes start-up supply of ribbon and paper. See our quality line of ribbons and printer paper on page 80.

WH-34, Assembled, 47 lbs. Was \$1195.00, NOW ONLY 1095.00

WHA-34-2, Tractor Feed, Shpg. wt. 3 lbs. 179.00

WH-34 SPECIFICATIONS: Forms Handling: Standard typewriter platen (WHA-34-2 Tractor Feed available). Slewing rate, 5 in./second. Communications: Bit Structure: Bit Serial: 1 start, 7 data, 1 parity, 1 stop bit at 110 and 300 baud. Parity: Odd, even, mark or space — switch-selectable. Power Requirement: 120 VAC, 60 Hz. Dimensions: 7" H x 22" W x 15.5" D (17.78 x 55.88 x 39.37 cm).



Universal Floor Stand for printers

Fits WH-24-1, WH-34, WH-44K and WH-54 Printers. Raises printer to desk level for easier operation. With paper rack. Overall Dimensions: 24.5" H x 22.25" W x 32.5" D (62.23 x 56.52 x 82.55 cm) — including paper rack. Printer not included.

HCA-2, Shpg. wt. 28 lbs. 99.00



FREE delivery, within 50 miles of store, for phone charge orders that ship UPS.



Letter-quality printer/terminal for word processing

\$2995⁰⁰

- Diablo 1640 KSR Printer/Terminal is fully assembled
- Features famous letter-quality daisy wheel printing
- Includes full ASCII keyboard for added versatility

The Diablo 1640 KSR Printer/Terminal is designed for applications that require a serial printer and terminal, such as data communications or word processing systems. The 1640 KSR combines the latest in microelectronic technology with its field-proven daisy wheel printing mechanism.

Terminal features professional typewriter-style Hall-effect keyboard, with full upper/lower case ASCII set. Bi-directional printing for 45 cps maximum print speed. Set horizontal, vertical tabs in any position. Top of form control, forward/reverse paper motion. Two-color/graphics capabilities with 1/120" horizontal, 1/48" vertical motion. An EIA Standard RS-232C Serial Interface and a 256-byte print buffer accept data at 110-1200 baud rates; interface is compatible with Bell 102, 113, 212 or equivalent modems.

Other extra-value standard features of the WH-44K include ETX/ACK protocol, ribbon out, paper out and cover open sensors, self-testing capability and host program control through escape sequences.

Assembled unit includes friction platen, power supply, operator control panel, HCS-22 Print Wheel (Elite 12 with unslashed zero), HCS-51 Film Ribbon. For 120/240 VAC, 50/60 Hz. Dimensions, 9.25" H x 23.5" W x 15.75" D.

WH-44K, Assembled, Shpg. wt. 72 lbs., Motor Freight \$2995.00

Bi-Directional Tractor Feed Accessory for WH-44K and WH-54 Printers. Dual tractors allow moving paper backward through printer for much better registration in word processing, forms preparation, graphics applications.

HCA-1, Shpg. wt. 9 lbs. \$259.00

WH-44 SPECIFICATIONS: **Print Wheel:** Interchangeable 96-character plastic daisy wheel. **Format:** Line length adjustable to 13.1" maximum (132 characters per line at 10 pitch, 158 characters per line at 12 pitch). **Forms Handling:** Adjustable forms width to 15.5 inches (39.3 cm) maximum; form thickness selectable to 27/1000 inch (0.0686 cm) maximum. **Dimensions:** 9.25" H x 23.5" W x 15.75" D (23.50 x 59.69 x 40.0 cm).

See our complete selection of print wheels, ribbons and paper for the Diablo 1640 KSR and 630 RO Daisy Wheel Printers on page 80.



Now save \$200 and get Diablo printing quality

\$2295⁰⁰

- Diablo 630 RO is factory assembled and tested
- Daisy wheel printing quality, less keyboard
- Fewer parts, adjustments for greater reliability

Save \$200 on another value-packed breakthrough in letter-quality printers! Now, Heath offers a choice of daisy wheel printers -- with or without keyboard. The Diablo 630 RO provides daisy wheel printing quality, less keyboard.

Designed to provide and maintain superior printing quality, the WH-54/Diablo 630 RO Printer has been re-designed, with 50% fewer moving parts. Most field adjustments have been eliminated. Carriage rail to platen accuracy is ensured by fixed positioning in the precision-stamped side plates of the frame assembly. The carriage assembly is factory pre-aligned using lasers, allowing complete replacement interchangeability.

The 630 RO prints the standard 96-character ASCII set, both upper and lower case -- at speeds up to a maximum of 35-40 characters per second.

Software-compatible with Diablo 1640/1650 series, the WH-54 uses the same ribbons, printwheels and tractor feed accessories as its siblings. And it uses both metal and plastic printwheels -- so you can take advantage of the added durability of metal in high-production word processing systems.

This state-of-the art product uses efficient bi-directional printing for maximum output. RS-232C Serial Interface with 256-byte print buffer runs at 110-1200 baud rates, compatible with many Bell modems.

Includes friction platen, power supply, operator control panel, HCS-22 Print Wheel (Elite 12 with un-slashed zero) and HCS-51 Film Ribbon. For 120/240 VAC, 50/60 Hz. Overall Dimensions, 9.25" H x 23.5" W x 15.75" D.

WH-54, Assembled, Shpg. wt. 65 lbs., Motor Freight, Was \$2495.00, NOW \$2295.00

WH-54 SPECIFICATIONS: **Printing Speed:** 35-40 characters per second (cps) maximum. **Print Wheel:** Accepts both metal and plastic 96-character daisy wheels; also metal 88 and 92-character daisy wheels. Print wheels are fully interchangeable. **Format:** Line width adjustable to 13.1" max (132 characters at 10 pitch, 158 characters at 12 pitch). **Forms Handling:** Adjustable forms width to 15.5" (39.3 cm) maximum; form thickness selectable to 27/1000 inch (0.0686 cm) maximum. **Communications: Interfacing:** EIA Standard RS-232C Serial Interface; compatible with Bell 102, 113, 212 and equivalent modems. **Baud Rate Selection:** 110, 300, 600 or 1200 baud. **Power Requirement:** 120/240 VAC, 50/60 Hz. **Overall Dimensions:** 9.25" H x 23.5" W x 15.75" D.



1 DEC-compatible H-11A Computer for laboratory and scientific applications

\$1395⁰⁰
Kit

- Full compatibility with DEC PDP-11/03 — at a savings
- Half-size KD-11HA (DEC LSI-11/2) microprocessor
- Room for up to 56K bytes (28K words) of memory
- Seven plug-in slots for memory and interfacing

Designed with full DEC LSI-11 compatibility: The H-11A offers the flexibility you need to run DEC programs and real-time laboratory applications. It uses the same microprocessor, memory, interfacing and operating system as the DEC LSI-11, and runs all software designed for the DEC PDP-11/03.

The 16-bit H-11A has adequate power for complex, sophisticated software.

Smaller, yet powerful microprocessor: A KD11-HA (half-size LSI-11/2) microprocessor — makes the H-11A identical to the DEC PDP-11/03, at a fraction of the cost. The KD11-HA features PDP-11/34 instruction set, 380 nS microcycle time, resident firmware debugging (ODT), ASCII console routines, single and double operand instructions. With no on-board memory, you get more flexibility to match ROM, RAM and interfacing to your particular needs.

Seven plug-in slots for memory, I/O: Add any combination of ROM, RAM and interfacing to a maximum of 56K bytes. You can even combine components from both the LSI-11 and LSI-11/2 microprocessor families.

Includes cabinet, heavy-duty power supply, backplane with bus and assembled CPU board. For 120/240 VAC, 50/60 Hz, 200 Watts. Dimensions, 6.5" H x 19" W x 17" D. Requires HT-11 Operating System (below) for normal operation.

Kit H-11A, Shpg. wt. 43 lbs. \$1395.00

WH-11-UL, Assembled and UL approved, Shpg. wt. 37 lbs. \$1995.00

Line Time Clock Switch Modification Kit (shown above right) places the LTC switch on the front panel for easier access. Includes new front panel. Easy access.

Kit 830-35, Postpaid \$53.50

Look at the Manuals before you buy — manuals for H-11A Computer, H-11-5 Serial Interface, H-11-2 Parallel Interface and H-19 Video Terminal. Purchase price will be refunded when you buy an H-11A Computer.

HM-1100 Manual Set, Shpg. wt. 12 lbs. \$30.00

DEC, DIGITAL and PDP® are registered trademarks of Digital Equipment Corporation.

H-11A/WH-11-UL SPECIFICATIONS: Memory: Directly addresses 64K bytes. RAM/ROM Addressed — 0 to 56K; I/O Addressed — 56K to 64K. Backplane: Eight 2-wide module slots. Power Supply: Overcurrent and overvoltage protected, switching regulator. Internal fan for cooling. Power Outputs: +5 VDC at 15 amps max., and +12 VDC at 3 amps max.

Operating Software, FORTRAN for H-11A help you program more efficiently

4K Word (8K Byte) Memory Expansion Module uses reliable 1K x 4 static MOS RAM chips. Decode circuitry to operate on 4K address boundaries.

WH-11-1, Assembled and tested, 2 lbs. \$95.00

16K Word (32K Byte) Memory Expansion Module provides additional RAM. On-board refresh, 570 nS cycle time, 250 nS access time. Maximum H-11A memory capacity, 28K words (56K bytes).

WHA-11-16, Assembled and tested, 2 lbs. \$495.00

Extended Arithmetic Chip saves memory space, adds fixed point multiplication, division and extended shifts. Also has full floating point functions.

H-11-6, Shpg. wt. 1 lb. \$190.00

Serial Interface provides RS-232 or 20 mA current loop interfacing. 50-9600 baud rates. Compatible with PDP-11V03, other LSI-11 computers. To interface printers to H-11A, use WHA-11-5 (right).

Kit H-11-5, Shpg. wt. 2 lbs. \$135.00

WH-11-5, Assembled and tested, 1 lb. \$160.00

Adapter Cable for H-11-5 Serial Interface.

WH-11-51, Assembled and tested, 1 lb. \$15.00

Operating Software, FORTRAN for H-11A help you program more efficiently

EXPAND applies macro definition from user or library whenever source program references a macro. **ASSEMBL** Assembly Language program outputs single relocatable binary object file, can also produce assembly listing with symbol table. **CREF** Cross-Reference appends index of symbol usage to assembly output. All 3 programs support PDP-11 instruction set.

EDIT text editor creates, modifies ASCII source files for use as input to other system programs. **LINKER**

converts object modules from assembler on FORTRAN compiler into run-time format for loading, execution. Relocates code, links global references, creates runnable program file for use by the system. **LIBRARIAN** creates, maintains libraries of subroutines for linker. **PIP** (Peripheral Interchange Program) transfers, merges, moves, copies, renames and deletes files; lists, zeros and compresses device directories. **ODT** (On-line Debugging Technique) provides commands to display, alter the state of a running program.

BASIC INTERPRETER offers access to HT-11's I/O system and file structure through BASIC Language. Has variable-length strings, sequential files, virtual

Printer-to-H-11A Serial Interface Board.

WHA-11-5, Shpg. wt. 1 lb. \$150.00

Parallel Interface provides 32 latched I/O lines, 16-bit word transfers, LSI-11 interface, control logic for interrupt processing and vectored addressing.

Kit H-11-2, Shpg. wt. 2 lbs. \$130.00

WH-11-2, Assembled and tested, 1 lb. \$160.00

Wire Wrapping Board for designing custom circuits is punched, etched to accept 32 16-pin IC sockets (38 14-pin, other combinations). With card extractor, hardware. Uses HCA-6, HCA-7 (see page 81).

H-11-10, Shpg. wt. 1 lb. \$35.00

memory arrays, chaining, overlays. Calculator mode performs calculations, aids in debugging programs. Requires H-11A/H-27 system with 32K bytes (16K words) of RAM, H-19 (page 75) and H-11-5 (above).

HT-11 (Requires Sublicense Grant on page 83), Shpg. wt. 12 lbs. \$350.00

FORTRAN Language for H-11A. Binary software features complete ANSI Standard 1966 FORTRAN IV with extensions for increased speed. Requires H-11A/H-27 system with HT-11 O/S above.

HT-11-1 (Requires Sublicense Grant on page 83), Shpg. wt. 9 lbs. \$250.00



2 H-27 Floppy for faster access to data

\$2195⁰⁰
Kit

- Full compatibility with DEC RX01 (PDP-11/03) and RXV11 (PDP-11V03) hardware, software programs
- Dual-drive system stores up to 1/2 million bytes
- Z-80 microprocessor-based controller for 250 mS access

Ample storage capacity: The dual-drive H-27 gives you a total of 1/2 million bytes of on-line data storage — enough for most of your general-purpose needs. It stores data on 8-inch floppy disks, compatible with the IBM 3740 format.

Fast access to data: The H-27's Z-80 microprocessor-based disk controller provides an average data access time of 250 milliseconds.

Full compatibility: The H-27 is compatible with DEC RX01 (PDP-11/03) and RXV11 (PDP-11V03) hardware and software. You can use the hundreds of applications programs written for the DEC PDP-11, one of the most popular microcomputers.

Extra-value features: Single-board bootstrap/interface circuit takes just one H-11A backplane slot. Built-in diagnostic, mechanical interlock, write-protect function guard important programs. Initialize disks in std. IBM 3740 format. 120/240 VAC, 60 Hz. 7.75" H x 18" W x 20" D. Requires H-11A with 32K bytes RAM.

Kit H-27, Shpg. wt. 93 lbs., Motor Freight \$2195.00

WH-27, Assembled, Shpg. wt. 69 lbs., Motor Freight \$2595.00

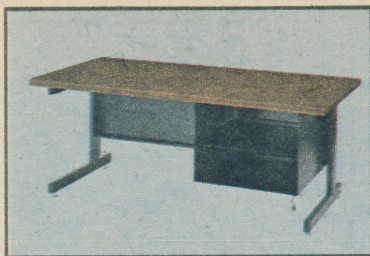
H/WH-27 SPECIFICATIONS: Recording Surfaces Per Diskette: 1. Tracks Per Diskette: 77. Sectors Per Track: 26. Track Density: 48 tracks/inch. Recording Technique: Double frequency. Data Transfer Rate: Track-to-Track Move: 6 mS/track maximum. Head Settle Time: 15 mS maximum. Rotational Speed: 360 rpm, ±2.5% (166 mS/revolution). Average Access Time: Seek (77 tracks/8.3) x Settle (3 mS + 15 mS) + Rotate (166 mS/2) = 250 mS.



FREE delivery, within 50 miles of store, for phone charge orders that ship UPS.

Space-saving Computer Work Station organizes your computer system

- Gain attractive, rugged operating efficiency. The PD-11 Computer Work Station organizes your computer system components in less space



\$295⁰⁰

Organizes your system in less space — yet all components are easily accessible. Designed to Heath specifications, the 60" x 30" easy-to-clean Formica™ desk top places terminals at a comfortable height for seated operators. Lower shelves hold the computer and disk systems (except H-47, H-77). Upper shelf measures 8.5" H x 20" W x 19.75" D (21.59 x 50.80 x 50.17 cm), while the lower shelf measures 7" H x 20" W x 19.75" D (17.18 x 50.80 x 50.17 cm).

Rugged steel legs and sheet metal shelving last under constant use. Locking casters make it easy to roll the work station from place to place — and to keep your computer system components securely in place.

Keep your operator comfortable and efficient — and welcome an attractive office centerpiece. Partially assembled. Computer system not included.

PD-11, Shpg. wt. 95 lbs., Mtr. Frt., FOB El Segundo, CA295.00

Versatile Acoustic Modem is ideal for any phone

NEW

- We now offer the assembled Lexicon Lex-11 Acoustic Modem at a far lower price than the WH-13 CAT™

The Lexicon Lex-11 Modem lets your computer talk to other computers over standard telephone lines. Also communicates with any Bell 103 compatible modem. Selectable answer/originate modes. Many practical and useful applications. RS-232 interfacing. For 120 VAC.

WH-23, Assembled and tested, Shpg. wt. 3 lbs.159.00



Direct-Connect Modem offers improved quality

NEW

- Reliable communications — the UDS Direct-Connect Modem offers better quality than acoustic modems

RS-232C interface. Two modular phone jacks — plug phone into one, use second jack to connect to standard phone line. Full or half-duplex communication, originate/answer modes. FCC Certified. Powered by phone line. Requires std. single-line phone with modular connectors. Phone-modem cable included.

WH-33, Assembled and tested, Shpg. wt. 2 lbs.195.00



Multi-Function TI Calculator for computer hobbyists

\$59⁹⁵

- Compact, goes anywhere
- Special memory, logic operations for complicated calculations and computer-related applications
- Factory assembled and tested

Designed especially for the computer hobbyist, this fully assembled Texas Instruments® Pocket Programmer/Calculator features fast conversions between octal, decimal and hexadecimal number systems; special logic operations for computer applications; three-key independent memory and fifteen levels of parentheses to handle complicated calculations; constant mode to simplify repetitive calculations; and an easy-to-read 8-digit LED display. Lightweight and compact enough to fit in your shirt pocket, this Texas Instruments product is ideal for any computer-related application. Rechargeable battery and 120 VAC adapter/charger are included with this fully assembled and tested multi-function calculator. Overall Dimensions, 5.5" H x 3" W x 1.25" D (13.97 x 7.62 x 3.18 cm).

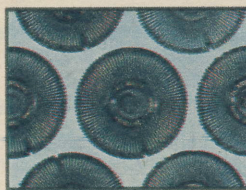
PC-11, Assembled and tested, Shpg. wt. 2 lbs.59.95

80/COMPUTERS



Now use your Visa or MasterCard credit cards or Heathkit Revolving Charge to purchase your kit!

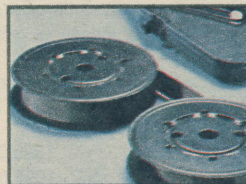
Choose from a full line of computer system supplies for highest-quality system performance



Choose from these Diablo printwheels

Courier 10 (Diablo 38100), Pica w/slash zero. HCS-20, Shpg. wt. 1 lb.8.00
 Courier 72 (D. 38107), Pica w/unslash zero. HCS-21, Shpg. wt. 1 lb.8.00
 Elite 12 (D. 38102), Elite w/unslash zero. HCS-22, Shpg. wt. 1 lb.8.00

General Scientific (Diablo 38141). Greek letters, superscripts, math symbols. HCS-23, Shpg. wt. 1 lb.8.00
 APL-10 (Diablo 38150). Special set for APL language. HCS-24, 1 lb.8.00
 OCR-A (Diablo 38144). ANSI Std. OCR Type A font. HCS-25, 1 lb.8.00
 Prestige Elite Legal 12A (Diablo 38105). Elite w/legal symbols, incl. ©, ® and ™. HCS-26, Shpg. wt. 1 lb.8.00
 Courier Legal 10 (D. 38104). Pica w/legal symbols. HCS-27, 1 lb.8.00



Ribbons for dark, clear printouts

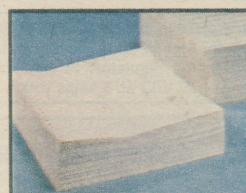
Ribbon for H-14 Line Printer. Also fits ASR-33 printers. HCS-52, 1 lb.Pkg. of 3, 8.00

Cloth Ribbons for the WH-44 Diablo Printer. HCS-50, Shpg. wt. 1 lb.Pkg. of 3, 18.00

Film Ribbons for the WH-44 Diablo Printer. HCS-51, Shpg. wt. 1 lb.Pkg. of 3, 18.00

Ribbon for the WH-24/TI-810 Bi-Directional Line Printer and the H-36/LA-36 DEC®writer II. Long-lasting, top-quality ribbon makes dark, crisp impressions. HCS-53, Shpg. wt. 1 lb.Pkg. of 3, 18.00

Ribbon Cartridges for the WH-34 DECwriter IV Computer Teleprinter. Eliminates messy ribbon changes. When old ribbon wears out, simply remove old cartridge and insert new ribbon cartridge. HCS-54, Shpg. wt. 1 lb.Pkg. of 3, 29.00



Top-quality paper for printers

Premium 8.5" x 11" Printer Paper. For all printers sold by Heath. 2800 sheets of premium, one-part fan-fold paper, approximately 20 lb. high-quality white bond. In box.

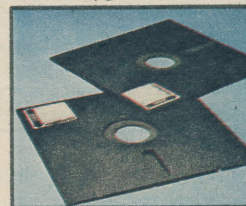
HCS-1, Shpg. wt. 28 lbs.32.00

Standard 8.5" x 11" Paper. 3200 sheets of standard, one-part fan-fold 8.5" x 11" printer paper. Approximately 15 lb. bond. White.

HCS-2, Shpg. wt. 31 lbs.32.00

14.875" x 11" Paper for WH-24, WH-34, H-36 and WH-44 Printers. Box contains 3200 fan-fold sheets of white/green lined paper.

HCS-3, Shpg. wt. 47 lbs.42.00



Floppy disks for mass storage

5.25-Inch Single-Density, Single-Sided Floppy Diskettes. For use with all Heath 5.25-inch floppy disk systems — as well as North Star and some other personal computer systems. Formattable with either 40 or 35 tracks per diskette. Hard-sectored, with 10 sectors per track. Maximum data storage capacity of each diskette, 100K bytes.

HCS-61, Pkg. of 5, 1 lb.20.00

8-Inch Single-Density, Single-Sided Diskettes. For the H-27 and H-47, virtually all other systems which use 8" soft sectored floppy disks. Std. CP/M® media. 77 tracks. 250K byte capacity. Supplied in std. IBM 3740 format.

HCS-62, Package of 5, Shpg. wt. 2 lbs.25.00

8-Inch Double-Density, Single-Sided Floppy Diskettes. For use with the Heath H-47 Floppy Disk System. 77 tracks. 500K byte capacity per diskette.

HCS-64, Pkg. of 10, Shpg. wt. 2 lbs.60.00

8-Inch Double-Density, Double-Sided Floppy Diskettes. For use with the Heath H-47 Floppy Disk System. 77 tracks. 1 megabyte capacity per diskette.

HCS-65, Pkg. of 10, Shpg. wt. 2 lbs.70.00

Accessories and interfacing give your H-8 Computer more capability

Accessories expand the world of your H-8 Computer

Boot up faster with PAMGO ROM. Only 1 keystroke required on power-up, 3 on reboot — instead of the usual 11. 2708-compatible masked, programmed ROM is exactly like the H-8 front panel ROM — except that on power-up or reset, it sets the program counter to a 030 000 split octal default address. Not for H-8s with HA-8-8 Ext. Configuration Option.

H-8-9, Shpg. wt. 1 lb. **20.00**

Extender Board lets you operate your H-8 Computer with accessory boards outside the card cage. This board allows easier access to components for servicing, prototyping or debugging purposes.

HA-8-1, Shpg. wt. 1 lb. **40.00**

Music Synthesizer System. Board connects to stereo system with two shielded cables (included). True D/A converter provides excellent 27.5-3300 Hz frequency response, up to 9 harmonics. Four-part harmony (voices) in stereo. Enter any song right from conventional sheet music — even if you've never read music before. Documentation shows how to get maximum enjoyment. Software on 5.25" disk. Requires minimum 24K RAM, H-17 Floppy and terminal.

HA-8-2, Assembled, Shpg. wt. 3 lbs. **159.00**

Color Graphics Board includes TI-9918 Color Video Display Generator — the most advanced available. Connects to GDZ-1320 (preferred — p. 74) or other devices accepting NTSC composite video. AY-3-8910 Programmable Sound Generator can make nearly any sound desired.

Demo. software on 5.25" disk; more software to be offered soon. Proper operation guaranteed only when used with Heath memory boards — or other boards using fully static single supply RAMs. Full details on p. 74.

HA-8-3, Assembled, Shpg. wt. 3 lbs. **495.00**

Wired H-47 Disk Interface with two RS-232C Serial Ports interfaces H-8 with H-47, as well as line printers, video terminals and other serial devices.

WH-8-47, Assembled, Shpg. wt. 2 lbs. **235.00**

Extended Configuration Option. Required to run H-8 with H-47 and/or CP/M. Includes PAMGO-type one-button boot.

HA-8-8, Shpg. wt. 1 lb. **65.00**

16K Wired Memory Board expands memory capacity of your H-8.

WH-8-16, Assembled, 2 lbs. **299.00**

4-Port RS-232C Serial Interface. With modem controls, WH-8-41 Cable.

Kit H-8-4, Shpg. wt. 2 lbs. **195.00**

WH-8-4, Assembled, 3 lbs. **250.00**

WH-8-41, Adapter Cable, 1 lb. **15.00**

Serial/Cassette Interface. 1200 baud, 1 serial port for console terminal. NOTE: Cannot be used to connect H-8 to H-14.

Kit H-8-5, Shpg. wt. 3 lbs. **125.00**

WH-8-5, Assembled, 2 lbs. **145.00**

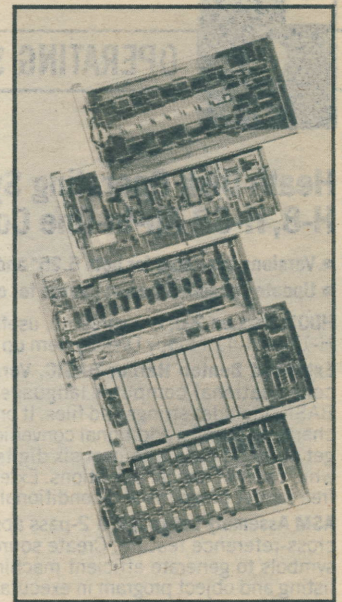
WH-8-51, Adapter Cable, 1 lb. **15.00**

Parallel Interface. Three ports, each with 8 bits I/O. Universal handshaking.

Kit H-8-2, Shpg. wt. 3 lbs. **150.00**

Circuit Design Breadboard Card. Custom design digital and analog circuits. Includes 5 VDC power supply. Reuseable.

Kit H-8-7, Shpg. wt. 2 lbs. **105.00**



Design and build custom circuits for your H-8 Computer

H-8 Wire Wrapping Board. Accepts eighty 16-pin sockets, three 50-pin flat cable connectors. Bus connectors, heat sink, 5V regulator, misc. hdwe. Uses HCA-6, HCA-7 below.

Kit H-8-10, Shpg. wt. 1 lb. **29.95**

Wire Wrapping Kit. Wire wrapping tool, 50 ft. wire, 200 pre-cut, pre-stripped wires (in 1"-4" lengths).

Kit HCA-6, Shpg. wt. 1 lb. **13.95**

Wire Wrapping Socket Kit. Thirty-six 3-level wire wrapping sockets (14-through 40-pin). Kit HCA-7, Shpg. wt. 1 lb. **29.95**

Useful H-8/H-88 Cassette Operating Software

- Form a solid base for future computer programming
- Supplied on audio cassettes, in convenient 1200 baud form

The Heath Cassette Operating System, designed for use with the Heath H-8 and All-In-One Computers, helps you get ready to program easily and quickly — with features that make it easier to use and more practical than other systems:

Automatic command completion simplifies typing, dynamic syntax checking instantly alerts you to errors, and a special user configuration feature lets you personalize the system to fit your particular needs.

This cassette operating system features these software programs:

Extended Benton Harbor BASIC™ Language, Version 6, an easy-to-learn, easy-to-use conversational computer language. This enhanced version of Dartmouth BASIC includes strings and files. It provides even faster operation and includes character strings, additional convenience commands and math functions, dynamic storage allocation, access to 2 mS clock, keyboard interrupt processing, expanded error messages and recovery ability, LED display control and keypad support for your computer system.

Extended Benton Harbor BASIC features numeric data with over six digits of accuracy, and Boolean values which permit logical operations. It also features free format programs, enhanced expression capabilities, mathematical functions and conditional statement facilities.

HASL-8 Assembly Language, a two-pass absolute assembler that lets you create source programs using letters, numbers and symbols to generate efficient machine language code. The letters, numbers and symbols used are meaningful — because they are abbreviated in English statements.

This language can assemble the source program into a listing of the source code and the machine instructions, which is especially useful for program documentation and provides you with a method for detecting program errors. Or it can assemble an object program — a binary image of the source code, which con-

tains the machine instructions used in executing the program.

Some special features include binary production by command, on the second pass — to a specified output device or directly to memory; recognition of five operators (plus, minus, *, /, unary -); and recognition of four token operand expressions (integers, symbols, character strings, origin symbol).

Also included in the Heath Cassette Operating System are:

The TED-8 Text Editor, which converts your computer and terminal system into a powerful typewriter for generating and editing text. It prepares the source code for HASL-8 Assembly Language. This versatile text editor can also be used to prepare reports, write letters and edit manuscripts.

TED-8 can read, create and output text. It can insert new text, search for a given character string, delete or print any number of lines, and replace a line or character string. It features 16 commands for text editing versatility, terminal control of I/O operations, command completion and command error analysis.

The BUG-8 Console Debugger, an enhanced and extended version of the front panel monitor. BUG-8 allows the entry and debugging of user machine language programs via an external terminal. This console debugger features either single or multiple stepping through programs, insertion of breakpoints, loading and dumping of user programs to or from tape storage. BUG-8 can also display or alter the contents of a selected memory location or any 8080 register.

A minimum of 16K bytes RAM is required to run the Heath Cassette Operating System. This cassette operating system requires an H-8-5 Serial I/O and Cassette Interface (above) to run with the Heath H-8 Computer. Cassette interfacing is standard with the Heath H-88 and H-89 All-In-One Computers. An H-88-5 Cassette Interface (sold on page 71) is required to use the Heath Cassette Operating System with the Heath H-89-A, WH-89 and Z-89 All-In-One Computers.

Cassette Operating System Software for the Heath H-8 Computer.

H-8-18, Shpg. wt. 11 lbs. **30.00**

Cassette Operating System Software for Heath All-In-One Computers.

H-88-18, Shpg. wt. 5 lbs. **30.00**



FREE delivery, within 50 miles of store, for phone charge orders that ship UPS.

Heath Disk Operating System (HDOS 2.0) for all H-8, H-89 All-In-One Computer Systems

- Versions available for both 5.25" and 8" floppy disk systems
- Updates supplied free of charge for one year after purchase

HDOS, Version 2.0, is a versatile, useful operating system which helps get your H-17 or H-47 Floppy Disk System up and running fast. You get these modules:

Extended Benton Harbor BASIC, Version 6 — an easy-to-learn, easy-to-use conversational computer language. This enhanced version of Dartmouth BASIC includes strings and files. It provides even faster operation and includes character strings, additional convenience commands and math functions. You get numeric data with over six digits of accuracy, along with Boolean values which permit logical operations. Extended Benton Harbor BASIC also features free format programs and conditional statements:

ASM Assembly Language, a 2-pass absolute 8080 assembler which includes a cross-reference feature. Create source programs using letters, numbers and symbols to generate efficient machine code. Assembles source program into listing and object program in executable binary format.

CP/M by Digital Research, Inc. — the industry standard disk operating system

- Hundreds of CP/M applications software programs are now available
- Especially engineered and configured for Heath computer systems

Digital Research's CP/M, THE industry standard disk operating system, is used by over 200 hardware manufacturers, OEMs and distributors. CP/M is the choice of over 100,000 computer users — and many software vendors.

The latest revision of Standard (Zero-based) CP/M, Version 2.2, is especially configured for Heath computer systems. This version supports all Heath 5.25" and 8" disk systems, allowing for concurrent operation and automatic density selection. It also supports all Heath printers and hard copy terminals.

You get full source code for hardware drivers, including disk drivers, so you can customize to fit your unique configuration. IOBYTE allows device assignment, permits switching between hard copy and CRT terminals — or between several printers — without rebooting. A special configuration utility permits changes to ease operation, such as setting disk step rate or selecting echo/cursor backup operation for backspace and delete keys, without reassembling.

Additional features, such as the implementation of BIOS as a disk-resident relocatable file, make this one of the best available implementations of CP/M. CP/M includes three modules, plus utilities and an operating manual with almost

UCSD P-System with Pascal Language extends your computer's capabilities

- Rapidly growing in popularity, system can run on many computers
- Modular design of this operating system makes programming easier

Pascal's rapidly increasing usage has sparked rapid software development. Pascal's clear readability, with powerful structure and data types, makes it easy and fun to use.

Modular construction adds flexibility. You need only repair a malfunctioning module to fix a program. Modular design makes each Pascal program more accommodating to changing needs, and more reliable when run.

UCSD Pascal is more versatile. Programs written for one computer can run on another, often without recompilation. And UCSD Pascal can be used on many systems, not just one. Its programs are compiled into universal P-code, which can be run on any microcomputer with a resident interpreter.

Heath's UCSD P-System with Pascal Language includes these modules:

OPERATING SYSTEM, an interactive system with disk file handling capabilities, run-time support routines and block I/O service routines.

EDIT Text Editor converts your computer and terminal into a powerful typewriter for generating and editing text. It prepares source code for Assembly Language and can help prepare reports, write letters and edit manuscripts;

DEBUG Console Debugger, an enhanced and extended version of the front panel monitor which allows entry and debugging of machine language programs via an external terminal. Features single/multiple stepping through programs, breakpointing, load/dump from tape storage (user program required);

PIP, a file utility to copy, concatenate or transfer files between devices;

INIT (Initialization), which formats new or magnetically damaged diskettes;

SYSGEN (SYSTEM GENERATION), a utility program which writes the Heath Disk Operating System (HDOS) onto a newly formatted diskette;

TEST, a diagnostic utility program which assists in checking out and maintaining your Heath floppy disk system.

HDOS' device driver for directory devices (such as floppy disks) are disk-resident, instead of internal (Example: SY.DVD). Fully dynamic non-contiguous allocation and de-allocation allows efficient use of disk space. HDOS structure consists of a resident nucleus with two non-resident relocatable overlays, plus non-resident relocatable device drivers for efficient memory utilization. A minimum of 32K RAM and one disk drive are required, although two drives are highly recommended — and may be required to use some other software products with HDOS.

Includes 713-page manual, diskette. 5.25" 8" versions identical (including code), except for media. Supports H-8, H-89; H-17, H-47 and H-77 Floppy Disk Systems; many other software products.

HOS-817-1, on 5.25" diskette, Shpg. wt. 5 lbs. 150.00

HOS-847-1, on 8" diskette, Shpg. wt. 5 lbs. 150.00

300 pages of detailed information. BIOS, supplied in source code and object code, contains all hardware-level I/O code, and is unique to Heath. BDOS is the resident nucleus, with all file level and logical I/O code. Its physical I/O is performed via calls to the BIOS. BDOS features fully dynamic allocation and de-allocation of physically non-continuous files. CCP is the transient monitor, facilitating command-level communications between the operator and CP/M.

Utilities include a 2-pass absolute 8080 assembler, a text editor, an 8080 debugger with traced execution and disassembly, file dump, system generation/relocation and utilities to display file sizes and disk usages. You can also set file flags (read only and/or system), assign physical/logical devices, display system parameters, copy files and convert Intel HEX files into memory images with this version of CP/M.

Other software available for CP/M, from Heath and other software suppliers, includes the BASIC, FORTRAN,™ COBOL,™ Pascal, "C," ALGOL, PL/I, FORTH and APL computer languages. There are also spoolers, sort-merge utilities, word processing systems, mailing list systems, general ledger, payroll, receivables, payables and inventory systems — as well as other utilities.

Heath CP/M requires 32K RAM, one or more disk drives for practical operation (2 drives recommended). H-8 systems require HA-8-8 Extended Configuration Option: H-89 systems require H-88-7 ROM Kit. Includes support and updates for one year. All versions are for Heath computers only.

HOS-817-2 (Requires Sublicense Grant, p. 83), on 5.25" diskette, 5 lbs. 150.00

HOS-847-2 (Requires Sublicense Grant, p. 83), on 8" diskette, 5 lbs. ... 150.00

PASCAL COMPILER, a fast one-pass compiler which produces universal P-code, runnable on most microcomputers.

INTERPRETER, an efficient and compact program which runs universal P-code.

TWO EDITORS, a powerful screen-oriented editor that runs in both programming and text editing modes, and a character-oriented editor with a wide variety of commands for context editing with hard-copy terminals.

FILER, a utility program to manipulate and keep track of disk files.

CONDITIONAL MACRO-ASSEMBLER for your computer's microprocessor, which produces code that can be linked with your Pascal program.

LINKER, a utility for link-editing Pascal object code and assembly code modules.

SYSTEM LIBRARY, a collection of frequently used utility programs.

Requires 48K RAM and two disk drives. Includes manual and diskettes. For Heath computers only. Supported by Softech Microsystems, updates will be supplied for a nominal charge.

UCSD P-System with Pascal, on 5.25" diskettes for H-8 and All-In-One Computers. **HOS-817-3**, Shpg. wt. 8 lbs. 295.00

UCSD P-System with Pascal, on 8" diskettes for H-11A/H-27 Computer Systems. Supplied on IBM single-density, soft-sector diskettes.

HOS-1127-3, Shpg. wt. 8 lbs. 295.00

APPLICATIONS PROGRAMS

Cut paperwork down to size, reduce costs with improved Zenith Electronic Typing

\$395⁰⁰

- Makes word processing practical in any office
- Supports both three-drive and 8-inch floppy disk systems
- Easy-to-learn system includes improved capabilities

Zenith Electronic Typing makes word processing practical for both single-secretary offices and departmentalized secretarial staffs. Anyone who can turn on a TV and type can increase their output by 50 percent or more, usually even on the first day. All you need are standard secretarial skills. A special self-instruction course shows you how — in as little as two hours.

We've improved Zenith Electronic Typing, with new features that make it even easier to produce near-perfect documents in a fraction of the time required by conventional typing — with no white-outs, strike-overs or erasures.

The new Document Index Format shows document number, title, size in characters and creation date. Page numbering is now automatic. You can now scroll (move) back to the beginning of a document, from anywhere. And entire blocks of text can now be moved, copied elsewhere or indented.

Two Search Modes quickly locate areas which need editing. Insert or delete any word, sentence or paragraph. Automatically replace any word, name or phrase to speed up production of customized form letters. Automatic Realignment saves hours of retyping. Automatic Centering and Justification, on command, means no counting or guessing.

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Control the cost of paperwork, by using Zenith Electronic Typing. This complete software system includes a detailed set-up and operating manual, easy-to-use training disk and master disk.



Zenith Electronic Typing requires a Heath H-8 (p. 72) or H-89 (p. 70) Computer System with 48K bytes of Random Access Memory (RAM), two or three 5.25" floppy disk drives and a printer. Not for H-11 Computer Systems. And Heath-offered printer will work with the system; we recommend the WH-54 (Diablo 630 RO) or WH-44K (Diablo 1640 KSR) Letter-Quality Printers (see page 78).

H-8-40, on 5.25" disk, Shpg. wt. 6 lbs. **\$395.00**

Save with complete Word Processing packages

SAVE \$200! Just purchase Zenith Electronic Typing, an H-8 or H-89 All-In-One Computer and any printer in this catalog. Then, subtract \$200.00 from the total of the order (not including shipping and handling).

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Source Listings for selected Heath software gives better understanding of system operation

Listing for Heath Disk Operating System (HDOS), Ver. 1.6.

Includes H-8-51, all other utilities and device drivers.
HOS-1-SL, Shpg. wt. 11 lbs. **\$95.00**

Source Listing for the ROM of the H-17 Floppy Disk.

H-8-51, Shpg. wt. 1 lb. **\$25.00**

Source Listing for the ROM of the H-19 Video Terminal.

H-19-1, Shpg. wt. 1 lb. **\$25.00**

Source Listing for Cassette version of Extended Benton Harbor BASIC Language, included in H-88-18 Software.

H-8-60, Shpg. wt. 2 lbs. **\$25.00**

Source Listing for Cassette version of Assembly Language, included in H-88-18 Cassette Software.

H-8-54, Shpg. wt. 2 lbs. **\$25.00**

Source Listing for Cassette version of Text Editor.

H-8-53, Shpg. wt. 2 lbs. **\$25.00**

Source Listing for Cassette Console Debugger.

H-8-52, Shpg. wt. 1 lb. **\$25.00**

NOTE: All source listings are copyrighted. Reproductions of these software source listings is expressly prohibited. HDOS updates available at nominal charge.

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☐ Digital Research MAC ☐ Digital Research DESPOOL

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CP/M SERIAL NUMBER

VERITECHNOLOGY ELECTRONICS CORPORATION

by *Joseph M. Schulte*
ACCEPTED AND AGREED:
CUSTOMER'S SIGNATURE

DATE

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Write in the blank below your CPU make, model and serial number.
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CPU

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by *Joseph M. Schulte*
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DATE

UTILITY PROGRAMS

We're proud to offer these three utility programs, which are compatible with the Heath Standard CP/M Operating System (page 82). Each of these utility programs includes full documentation and free updates for one year from the date of purchase, when the registration card enclosed with each software package is signed and returned.

MAC makes it easier to assemble programs

\$85⁰⁰

- Use full Intel-compatible macro definitions
- Full documentation, diskette with macro libraries
- Fully compatible with CP/M's ASM Assembly Language

MAC is Digital Research's optional Macro Assembler, for the Heath CP/M Operating System. Fully compatible with CP/M's ASM Assembly Language program, MAC has macros which make writing Assembly programs easier.

Many features are specifically designed for the sophisticated Assembly Language programmer, such as: Additional conditional Assembly operators; title and page pseudo-operators; full Intel-compatible macro definitions, including recursive macro calls and disk macro libraries. And MAC also has the ability to generate a SID-compatible symbol table file for use in debugging.

The 168-page manual is practically a textbook on macro assemblers. The MAC diskette contains a variety of useful macro libraries for performing disk I/O, assembling Z-80 op codes and performing other useful tasks.

MAC requires a Heath H-8 (p. 72) or H-89 (p. 70) Computer with one or more floppy disk drives, and the Heath CP/M Operating System (p. 82).

HDR-817-1 (Requires Sublicense Grant, p. 83), on 5.25" disk, 2 lbs. 85.00

HDR-847-1 (Requires Sublicense Grant, p. 83), on 8" disk, 2 lbs. 85.00

DESPOOL for multi-tasking printer operation

\$50⁰⁰

- Perform two tasks at the same time, on your computer
- Print one file while working on another file
- Quick set-up, easy to use on Heath computers

Have you ever had a mountain of work to finish—but you have to wait, because your computer is printing a file out to your printer? Wait no more! The DESPOOL Spooler gives your system maximum efficiency—by allowing it to do both tasks at the same time! Print one program through your printer, while continuing to use the assembler, editor, BASIC or an applications program.

When you want to use DESPOOL, just load into memory (DESPOOL takes up very little memory space), type CONTROL-F, wait for the spooler prompt and type the file name. DESPOOL will instantly return your terminal to the previous program, while printing the specified file through your line printer.

DESPOOL requires a Heath H-8 (p. 72) or H-89 (p. 70) Computer with one or more floppy disk drives, and Heath Standard CP/M (p. 82).

HDR-817-3 (Requires Sublicense Grant, p. 83), on 5.25" disk, 2 lbs. 50.00

HDR-847-3 (Requires Sublicense Grant, p. 83), on 8" disk, 2 lbs. 50.00

Advanced SID/ZSID Debugging Utility for CP/M

\$125⁰⁰

- Get both 8080-compatible SID and Z-80-compatible ZSID—save substantially over separate prices
- For MAC, other Digital Research/Microsoft products; designed for use on Heath computer systems

This advanced version of CP/M's DDT Debugging Utility maintains all DDT features. But it allows use of names used at the source level, instead of addresses, in dumping and modifying memory, setting breakpoints and making patches using Assembly (symbolic) Language instead of numeric values.

SID/ZSID also contains the ability to draw histograms showing the execution frequency of a group of subroutines, maintaining pass counts and providing a trace-back of the execution path to selected breakpoints.

SID/ZSID is fully functional in a DDT-type mode without symbol file.

Requires H-8 (p. 72) or H-89 (p. 70) Computer with 1 or more disk drives, Heath CP/M (p. 82), MAC (above) and LINK-80 Linkage Editor or Digital Research's Linkage Editor (to create table file used for symbolic references).

HDR-817-2 (Requires Sublicense Grant, p. 83), on 5.25" disk, 2 lbs. 125.00

HDR-847-2 (Requires Sublicense Grant, p. 83), on 8" disk, 2 lbs. 125.00

84/COMPUTERS

PROGRAMMING LANGUAGES

Write your own computer programs with surprising ease. And execute programs just as easily. Each language functions best in its own unique programming environments. We'll even keep your language current by supplying updates free of charge for one full year—when you sign and return the registration card enclosed with each software package.

Microsoft BASIC—general-use language

As low as
\$150⁰⁰

- Extra-value features make programming easier
- Has many math, algebraic and trigonometric functions
- Available for both HDOS and CP/M Operating Systems

Microsoft BASIC is one of the most versatile general-purpose programming languages available for microcomputer systems. Scores of practical utility and applications programs are written in this BASIC. This version of Microsoft BASIC is especially written for use with Heath 8-bit computer systems, including the H-8 Computer and the H-89 All-in-One Computer.

Capabilities include direct access to CPU ports and memory locations; an IF-THEN-ELSE control structure which allows more highly-structured programming (including editing during programming and random or sequential filing capabilities); mathematical and logical operators; and a DEF statement, which allows user-defined functions which are not listed as intrinsic functions.

You also get many extended features: Program edit facilities, including insertion, deletion, character change and search capabilities; file management facilities which include random files, sequential files and file manipulation.

Powerful string processing functions are provided, including LEFT, RIGHT, MID, ASC, CHR and concatenation; extended statement, operators, functions and commands which are not available in most other BASICs (ERASE to eliminate arrays from a program, LINE INPUT to add lines to string variables without delimiters, SWAP to exchange the values of two variables, the TRON and TROFF debugging aids to help trace the execution of program instructions, and WIDTH to set the width of the terminal printing line).

Microsoft BASIC also includes automatic line numbering and renumbering features; branching, loops and subroutines; and more aids.

Math functions include double precision floating point number and double precision mathematics, as well as algebraic and trigonometric capabilities.

This software package requires a Heath H-8 (page 72) or H-89 (page 70) Computer with 32K RAM and HDOS or CP/M (both on page 82).

Microsoft BASIC Language Interpreter, Version 4.7. Includes manual and 5.25" diskette. Requires the Heath Disk Operating System (HDOS—page 82).

H-8-21 (Requires Sublicense Grant, p. 83), Shpg. wt. 3 lbs. 150.00

Microsoft BASIC Language Interpreter, Version 5.1. Includes manual and 5.25" diskette. Requires the Heath Standard CP/M Operating System (page 82).

HMS-817-1 (Requires Sublicense Grant, p. 83), Shpg. wt. 5 lbs. 175.00

Microsoft BASIC Language Interpreter, Version 5.1. Includes manual and 8" diskette. Requires the Heath Standard CP/M Operating System (page 82).

HMS-847-1 (Requires Sublicense Grant, p. 83), Shpg. wt. 5 lbs. 175.00

BASIC Compiler speeds general programming

\$250⁰⁰

- Compiled computer programs run much faster
- Includes these useful utility programs—MACRO-80 Assembler, LINK-80 Editor and LIB-80 Library Manager

Microsoft's BASIC Compiler System eliminates time-consuming interpretation when you run a program. First, compile your program through this versatile program. It converts each line of the program into machine code—the language your computer understands. You'll find that a pre-compiled program runs much faster than a similar program run through an interpreter.

Many utility programs are included to make compiling easier: The MACRO-80 Relocating Assembler converts Assembly Language programs into source code for the LINK-80 Editor. The LINK-80 Linkage Editor converts relocatable libraries and modules into runnable load modules. The useful LIB-80 Library Manager allows you to build your own library of relocatable modules.

The Microsoft BASIC Compiler System requires a Heath H-8 (p. 72) or H-89 (p. 70) Computer with at least 40K bytes of RAM, two floppy disk drives and the Heath Standard CP/M Operating System (see page 82).

HMS-817-4 (Requires Sublicense Grant, p. 83), on 5.25" disk, 5 lbs. ... 250.00

HMS-847-4 (Requires Sublicense Grant, p. 83), on 8" disk, 5 lbs. 250.00



Now use your Visa or MasterCard credit cards or Heathkit Revolving Charge to purchase your kit!

Microsoft FORTRAN for science, math uses

As low as
\$175⁰⁰

- Includes powerful Microsoft ANSI-66 FORTRAN IV Compiler
- Macro-Assembler, Linkage Editor, Cross-Reference Generator
- Linkable library of mathematical, I/O and utility routines

With more power to help you perform highly-structured programming on your Heath computer, the Microsoft FORTRAN Programming System features:

1. **The unique Microsoft FORTRAN-80 Compiler**, which uses the powerful ANSI-66 FORTRAN IV Computer Language — so you can draw from a large base of programs;
2. **The MACRO-80 Relocating Assembler**, for use with 8080 and Z-80 CPUs;
3. **The CREF Cross-Reference Generator**, for sorted cross-reference listings;
4. **The LINK-80 Linkage Editor**, which generates runnable load modules;
5. **The Microsoft FORTRAN Library**, filled with floating point mathematical routine — plus all FORTRAN I/O and utility routines;
6. **Sample FORTRAN-80 and MACRO-80 Assembler source programs.**

The Microsoft FORTRAN-80 Compiler is a true native-code compiler which supports the full ANSI-66 FORTRAN IV Language, except for complex numbers. This allows you to take advantage of the large base of utility and applications programs already written in the FORTRAN Language.

A microprocessor-based FORTRAN development package, which generates relocatable object modules, is included with the compiler. You can link these modules, using the loader in the LINK-80 Linkage Editor, and generate an absolute file.

This compiler also includes many extensions to increase system utility and efficiency — and it performs some object code optimization. An option to list generated object code in 8080 Assembly Language is available.

The Microsoft MACRO-80 Relocating Assembler is an assembler designed for use with both the 8080 and Z-80 microprocessors. It has complete facilities for macro development. The MACRO-80 Assembler generates relocatable object modules for use with the Microsoft LINK-80 Linkage Editor. It accepts Intel 8080 and Zilog Z-80 mnemonics, features macros and conditional assembly, and will generate a sorted cross-reference listing (when used with the CREF Cross-Reference Generator, included with this software package).

The LINK-80 Linkage Editor, included with this programming system, converts relocatable libraries or modules (such as those produced by Microsoft FORTRAN, BASIC, COBOL and Pascal languages — as well as by the Microsoft MACRO-80 Relocating Assembler and Digital Research's PL/I Compiler) into runnable load modules for direct execution or disk storage.

Capabilities of the Microsoft LINK-80 Linkage Editor include options to specify proppable code, and the ability to separately specify origin addresses for code and data segments. An absolute symbol table listing of the generated load module may be obtained.

Microsoft's FORTRAN Library includes all FORTRAN mathematical, I/O and utility functions. Using the FORTRAN Library, you can perform a multitude of functions — absolute values, truncation, remainders, maximum values, conversion, transfer of signs, positive differences, exponentials, logarithms, sines, cosines, hyperbolic tangents, arctangents and square roots.

The library contains arithmetic routines, conversion subroutines and subprogram linkages. Special functions (INP, CALL OUT, PEEK, CALL POKE and other subprogram linkages), allow sophisticated programming.

The versatile Microsoft LIB-80 Library Manager, included with CP/M versions of the Microsoft FORTRAN Programming System, allows the building of your own libraries of relocatable modules.

This programming system requires a Heath H-8 (see page 72) or H-89 All-In-One (see page 70) Computer with a minimum of 40K bytes of Random Access Memory (RAM). Microsoft FORTRAN also requires two or more floppy disk drives (for the H-8 Computer, use the H-17 on page 73 or the H-47 on page 75; for the H-89 All-In-One Computer, use the H-77 on page 71 or the H-47 on page 75), and the Heath Disk Operating System (HDOS — see page 82) or the Heath Standard CP/M Operating System (see page 82), as indicated below.

Microsoft FORTRAN Programming System, supplied on 5.25-inch floppy diskette. Requires the Heath Disk Operating System (HDOS — see page 82).

H-8-20 (Requires Sublicense Grant on page 83), Shpg. wt. 4 lbs. **175.00**

Microsoft FORTRAN Programming System, supplied on 5.25-inch floppy diskette. Requires the Heath Standard CP/M Operating System (page 82).

HMS-817-2 (Requires Sublicense Grant on page 83), Shpg. wt. 5 lbs. ... **195.00**

Microsoft FORTRAN Programming System, supplied on 8-inch floppy diskette. Requires the Heath Standard CP/M Operating System (page 82).

HMS-847-2 (Requires Sublicense Grant on page 83), Shpg. wt. 5 lbs. ... **195.00**

The Microsoft COBOL Programming System is a popular, powerful, business-oriented language

\$395⁰⁰

- The business world's most popular computer language
- Includes most Level-I features and many Level-II extras
- Available in 5.25" and 8" disk versions, for H-8 or H-89

COBOL is the ideal programming language for business data processing and many other tasks, which consist primarily of processing disk files and data bases. Microsoft's COBOL-80 Programming System, Version 4.0, makes this powerful, versatile language practical to use on your Heath computer system.

Microsoft COBOL-80 far exceeds the minimum specifications of ANSI-74 COBOL, and has so many Level-II features and optional modules that you can easily use COBOL programs written for large computer systems (Minimum required by ANSI Standard for COBOL Language is Nucleus, Table Handling and Sequential I/O modules, at full Level-I implementation):

MODULE

Nucleus

CONDITIONS — Level 88 conditions with value series or range; use of logical AND/OR/NOT in conditional use of algebraic relational symbols (>, =); implied subject, or both subject and relation, in relational conditions; sign test; nested IF statements; parentheses in conditions.

VERBS — Extensions to ACCEPT and DISPLAY for formatted screen handling; ACCEPTance of data from DATE/DAY/TIME; STRING and UNSTRING statements; COMPUTE with multiple receiving fields; PERFORM VARYING.

IDENTIFIERS — Mnemonic names for ACCEPT or DISPLAY devices; procedure names consisting of digits only; qualification of names (in procedure division statements only).

Table Handling

Sequential I/O

Relative I/O

Interprogram Communication

Library

Communication

Debugging

Report Writer

Segmentation

Sort/Merge

IMPLEMENTATION LEVEL

Level-I plus these Level-II features:

Level-I, some Level-II features

Level-I, most Level-II features

Level-I, some Level-II features

Level-I

Level-I

None

Special extensions to ANSI-74

Standard providing convenient trace-

style debugging

None

Level-I

None now; Level-II implementation

will be available in late 1981, as

extra-cost option

The Microsoft COBOL Programming System includes the MACRO-80 Assembler — an 8080/Z-80 assembler with complete facilities for macro development. It generates relocatable object modules for use with the Microsoft LINK-80 Linkage Editor. MACRO-80 accepts Intel 8080 and Zilog Z-80 mnemonics, features macros and conditional assembly; **the LINK-80 Linkage Editor**, which converts relocatable libraries or modules into runnable load modules for direct execution or disk storage; **the LIB-80 Library Manager**, which allows you to build your own libraries of relocatable modules; **the Microsoft COBOL Library**; and **run-time software** designed to make this system even more versatile.

This package also has important extensions which make COBOL easier to use in a microcomputer environment — such as extended debugging facilities which feature special extensions to the ANSI-74 Standard for more convenient debugging, and advanced screen handling facilities which permit easy forms handling on CRT terminals with cursor control (like the H-19 Professional Video Terminal, sold on page 75).

Microsoft COBOL can typically handle a 600-1000 line program, in a Heath H-8 or H-89 Computer with 48K bytes of Random Access Memory (RAM).

The Microsoft COBOL Programming System requires a Heath H-8 (see page 72) or H-89 All-In-One (see page 70) Computer with at least 48K bytes of Random Access Memory (RAM), two floppy disk drives (the Heath H-47 Floppy Disk System, shown on page 75, is recommended for applications involving large data files), and the Heath Standard CP/M Operating System (sold on page 82). All versions of Microsoft COBOL are identical, except for media. Available in 5.25" or 8" versions (see below). For Heath computers only.

Microsoft COBOL Programming System, supplied on 5.25-inch floppy diskette.

HMS-817-3 (Requires Sublicense Grant, p.83), on 5.25" disk, 5 lbs. ... **395.00**

Microsoft COBOL Programming System, supplied on 8-inch floppy diskette.

HMS-847-3 (Requires Sublicense Grant, p. 83), on 8" disk, 5 lbs. **395.00**



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COMPUTERS/85

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General Ledger II helps keep your books up to date

SOFTSTUFF's General Ledger II Business Software Package is an integrated software system. It includes powerful, useful programs you can use for the entry, maintenance, reporting and analysis of accounting data. Many features make the General Ledger II package more convenient to use. They include a Custom Chart of Accounts to determine account names and numbers. You can use any numbering system with this feature, with or without decimal notation.

Comprehensive Printouts are provided upon request.

The Double Entry and Automatic Entry Checking features check each debit and credit entered into the system. Data can be entered fast, using only one keystroke. Entries to non-existent accounts are prevented by General Ledger II's Account Verification feature. Account Verification also rejects the entry of already active account numbers.

The New Account Facility allows you to open new accounts during the entry of data — with no disruption caused to any transaction being entered. The Balance Reporting feature lets you call up the balance of any account during data entry. It also allows you to update balances with new transactions. A source number and free-form description are provided by the Audit Trail feature.

Our General Ledger II software package includes listings and sample printouts. Requires Microsoft BASIC Interpreter (p. 84).

SF-9004, for HDOS systems, Postpaid 124.95

SF-9104, for CP/M systems, Postpaid 124.95

Manual. Purchase price refunded when complete package is purchased. 595-2500, Postpaid 15.00

Know what's in stock with Small Business Inventory

For complete business inventory analysis. Alpha-numeric part numbers to 12 characters, 18-char. part descriptions. 12 items of information, including reorder level, usage history by month and year-to-date. Printouts include all information, part number/description/price, reorder list. Requires H-19 (p. 75) and Microsoft BASIC Interpreter (p. 84).

SF-9005, for HDOS systems, Postpaid 89.95

SF-9105, for CP/M systems, Postpaid 89.95

Pong Set — three fast-paced games to play

Handball — play against walls. Full X-Y paddle movement. No scoring; prepares you for Pong. Pong — popular 2-player game. Computer automatically tallies score. First player to reach 21 wins. Sound effects and various angle deflections off sections of paddle. QPong — same as Pong, but play against the computer — and you'd better be good. Requires H-8 with 32K RAM, HA-8-3 Color Graphics Board (p. 74) and joystick.

SF-8009, for HDOS systems, Postpaid 29.95

C BASIC Language for more programming flexibility

C BASIC is a disk-extended BASIC — a non-interactive BASIC language with pseudo-code compiler and run-time interpreter. Supports full file control, chaining, integer and extended precision variables. With C BASIC, your Heath computer can do more. Available on both 5.25-inch and 8-inch floppy disks, as listed below.

SF-8107, on 5.25" disk, for CP/M systems, Postpaid 115.00

SF-8108, on 8" disk, for CP/M systems, Postpaid 115.00

Write programs faster with MICROSOFT MACRO-80 Package

The MACRO-80 Relocating Assembler generates relocatable object modules for use with the LINK-80 Linkage Editor. (included). Accepts Intel 8080 and Zilog Z-80 mnemonics, features macros and conditional assembly, and will generate a sorted cross-reference listing when used with CREF (included). LINK-80 converts relocatable libraries or modules — produced by MACRO-80, other languages, compilers — into runnable load modules for direct execution or for disk storage. For H-8 and H-89 computer systems.

SF-8002, for HDOS systems, Postpaid 69.95

SF-8102, for CP/M systems, Postpaid 69.95

Full Screen Editor for more efficient programming

Uses the video display screen of the H-19 Professional Video Terminal or the H-89 All-In-One Computer as a window into a file. Changes can be typed anywhere on the screen. Function keys perform character and line insertion/deletion functions. Also features string search, move and copy single and multiple lines, scrolling of text in the window. For use with the Heath H-89 or H-8/H-17/H-19 systems.

SF-9000, for HDOS systems, Postpaid 49.95

SF-9100, for CP/M systems, Postpaid 49.95

Text Formatter for use with your Text Editor

Performs full and justification (straight right margin) functions on text prepared by your text editor. Features page numbering, headers and footers, indents, hanging indents; centering and underlining. INCLUSION feature allows the automatic insertion of up to 26 user-defined strings, as well as the merging of documents. For use with the Heath H-8/H-17/H-19 or H-89 computer systems.

SF-9001, for HDOS systems, Postpaid 54.95

SF-9101, for CP/M systems, Postpaid 54.95

Keep records in order with SORT

SORT is a very fast Assembly routine which sorts records, to 255 chars. User-defined sort fields. Could be called by MICROSOFT BASIC or standalone. This software package includes source code.

SF-8004, for HDOS systems, Postpaid 29.95

CPS give you access to more information

Permits file transfer between Heath computer and MicroNET™ Information Services. User-defined keys for auto log-in, mail check and more. Full error checking, elapsed time clock on screen. Easy to use on time-sharing systems.

SF-9003, for HDOS systems, Postpaid 39.95

SF-9103, for CP/M systems, Postpaid 39.95

RTTY Communications Processor — more fun for Hams

Split-screen feature lets you copy incoming messages, while editing outgoing messages. On-screen graphics present complete system status: time, CW ID, ASCII or Baudot operation. Disk-based autostart.

SF-9006, for HDOS systems, Postpaid 99.95

Exciting H-8 Computer Games

In 1200 baud cassette form, requires H-8 Computer and H-8-5 Interface to load. Not for H-89, H-8-4.

Biorhythm tells you when to face the world, when

to stay in bed. Requires Extended BASIC, 16K RAM.

PA-82, Shpg. wt. 1 lb. 10.00

Space War lets you command the starship Enterprise on a galactic journey, fighting Klingons and solving problems. Requires 24K or more RAM.

PA-83, Shpg. wt. 1 lb. 10.00

Game Set #1 w/Craps, Orbit, Tic-Tac-Toe, Nim, Hexapawn, Hangman, Hamrabi and Derby. Requires 8K RAM.

PA-84, Shpg. wt. 1 lb. 10.00



Over 500 useful programs for your Heath computer

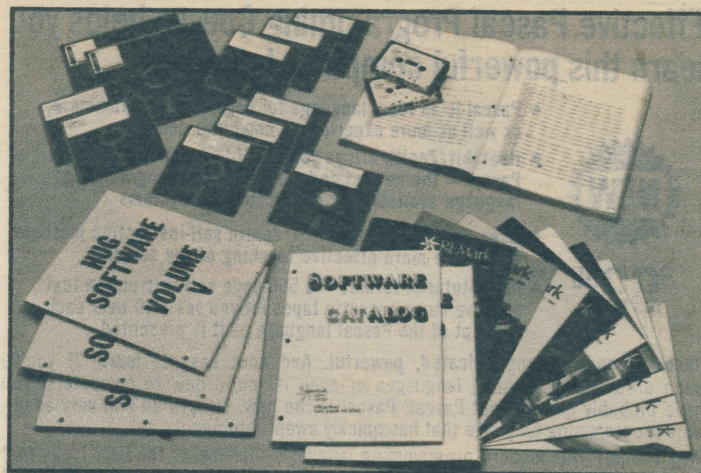


Join the Heath User's Group (HUG) and keep up-to-date on the latest computer hardware/software developments, while you expand your utility and applications software capabilities!

Here's what a HUG Membership gives you:

- 1) A one year's subscription to REMark Magazine (10 issues) — an exclusive periodical for HUG members only. It provides you with two important services: a) Sneak previews on the newest Heathkit computer products and b) A written medium where you and other members of HUG can share new hardware modifications, software enhancements, application programs, and other ideas.
 - 2) Special access to The HUG Software Library — where you can order over 500 low-cost programs for your H-8, H-88, or H-89 computer. The programs are stored on cassettes and disks, and written by HUG members (see list below).
 - 3) The HUG Software Library Catalog — listing each program in the library by program name, program description, program language, version, equipment required to run the program, and HUG author.
 - 4) A chance to win valuable prizes by competing in HUG Software Contests — a great way to further your program-writing expertise and have fun at the same time. Besides valuable gifts, winners have their names printed in REMark.
 - 5) A vinyl-covered, three-ring binder — with inside pocket containing the HUG handbook. It explains more about the group: why it was started, how members participate (some members have even formed local groups to increase the benefits of belonging to HUG), plus hints on making the most of your membership.
- Here's a quick peek at just some of the different program titles available from the HUG Software Library to its members:

- HUG Editor
- PAGE EDITOR
- Time for HDOS
- File Cruncher
- Floating Point Package
- Fixed Point Package
- Graphic Hanoi Game
- Cross-Reference Utility
- Disk Dump Utility
- Disk DUP Utility
- Disk Relabeler
- Programs for Printers
- HDOS Device Drivers
- Basic Renumbering Program
- Modem Packages
- Text Processors
- Sort Utilities
- Disk Recover Utilities
- Small Business Packages
- Loan Amortization
- Real Estate Programs
- Home Budget Maintenance
- Checkbook Programs
- Credit Card Management
- Adventure Game
- Memory Test Programs
- Mailing List
- Disassemblers
- Master Catalog System
- Solar Domes
- Tax Programs
- Morse Code
- Music
- Antenna Design Programs
- Power Supply Design
- Stock Programs
- Weather Forecasting
- Pilot (Language)



- Payroll
- Inventory Package
- Finance
- Games and Graphic Games
- 11 disks of CP/M® Programs
- OSCAR Locator

With every Heath Computer you purchase, you'll find a HUG membership application enclosed. But if you missed out on that opportunity to join the Heath Users Group, why not fill out the application below — or write to HUG Membership, Hilltop Road, St. Joseph, MI 49085.

HUG Membership Rates (per year, U.S. Funds)

	U.S.	Canada & Mexico	International
New Members:	\$18	\$20	\$28
Renewal	\$15	\$17	\$22

Send to: HUG Membership, Hilltop Rd., St. Joseph, MI 49085

Yes, I want to become a member of HUG and take advantage of keeping up-to-date on the latest Heath computer developments, while I increase my utility and applications software library.

I've enclosed \$_____ (U.S. Funds only) to cover my membership.

Name: _____

Address: _____

City: _____

State: _____

ZIP: _____

(Check one) ☐ U.S. ☐ Canada or Mexico ☐ Country _____

Signature: _____

Get more out of your computer system with these helpful books



Introduction to Microprocessors, Volume 1. Introduces you to the basic microprocessor. EDP-224 12.95

Getting Acquainted With Microcomputers. A 228-page guide explaining what microcomputers can do. EDP-275 8.95

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PDP-11 Programming Fundamentals. How to program your PDP-11 computer with assembly language and get the most out of it. EDP-239 10.00



Fortran IV Self-Teaching Guide. Teaches you High-level computer programming in FORTRAN. EDP-279 8.95

101 Basic Computer Games. 250-page book describes new computer games that the entire family can play. It's the only collection containing a complete listing, sample run, and description of each game. EDP-237 7.50

The Software Gourmet Guide and Cookbook. This 218-page publication offers you new ideas for your 8080A computer. Ideas include: general purpose routines, programming time delays, random number generators, and six appendices. EDP-228 12.95



Basic Software Library, Volume II. This volume of the Basic Software Library includes basic computer programs in the fields of engineering and statistics. EDP-241 24.95

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Basic Software Library, Volume IV. Includes general purpose computer programs for many applications. EDP-243 9.95



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