Heathkit®

RETAIL CATALOG 850R
FALL, 1980

NOW FREE SHIPMENT WITHIN A 50 MILE RADIUS WITH YOUR CHARGE ORDER BY PHONE!

VISA master charge

Now use Visa or MasterCard credit cards or Heathkit Revolving Charge at your nearby Heathkit Electronics Center and order from an array of new kits.

Heathkit Computer Systems let you take control of your specific computing needs

The world's leader in quality electronic kits leads the way again — with computer systems that give you more versatility and flexibility — at affordable prices

Heath Company offers one of the most complete and innovative lines of computers, computer systems, peripherals, software, accessories and supplies available anywhere. Heathkit Computer Products offer extra value for your computing dollar.

How to select a computer: Do you want built-in peripherals or the flexibility to design your own system? Do you want to expand your memory power as your skills grow? How good is the systems software? Is it compatible with existing software? Will the manufacturer stand behind the computer? You can be sure of the answers when you consider Heathkit Computer Systems.

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. The H-89 will run all disk-based H-8 software. And the new H-77 Floppy Disk system adds a new dimension of flexibility — up to three drives, including the H-89's built-in floppy. For more information on the All-In-One, see page 34.

For flexibility — the H-8. If you're interested in developing hardware, need more than 48K of read-write memory or write physical I/O routines in Assembly language, the H-8 is for you. Its versatile bus-oriented architecture, expandability and hardware front panel position it as the right choice. More details can be found on page 36.

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 38.

Heathkit Accessories — including new wire wrapping products, memory, interfacing and others — make your computer more useful. See pages 35 and 43.

Value-packed Heathkit Software includes programs written in BASIC™ and Assembly languages, on floppy or cassette, that make your computer more versatile. In this catalog, we introduce MICROSOFT™ FORTRAN for the H-8/H-89, Zenith™ Electronic Typing Word Processing Software and source listings for selected Heathkit software. Our complete software line can help you write your own programs easily. And for one year after purchase, we'll send you any changes to our disk-based software, free of charge. See pages 45, 46 and 47 for more.

HUG — the Heath Users' Group — keeps you informed of new programs, written by other members and available to you. It also keeps you up to date on new Heathkit computer developments. Owners of Heathkit Computers can become members of this group, which shares an extensive program library. See page 48 for more information.

Our documentation is the best in the industry. If you want to build a Heathkit Computer yourself, we make it easy with complete assembly manuals which take you from unpacking to plug-in. You'll understand your computer from the inside out. Operating and instruction manuals are fully detailed.

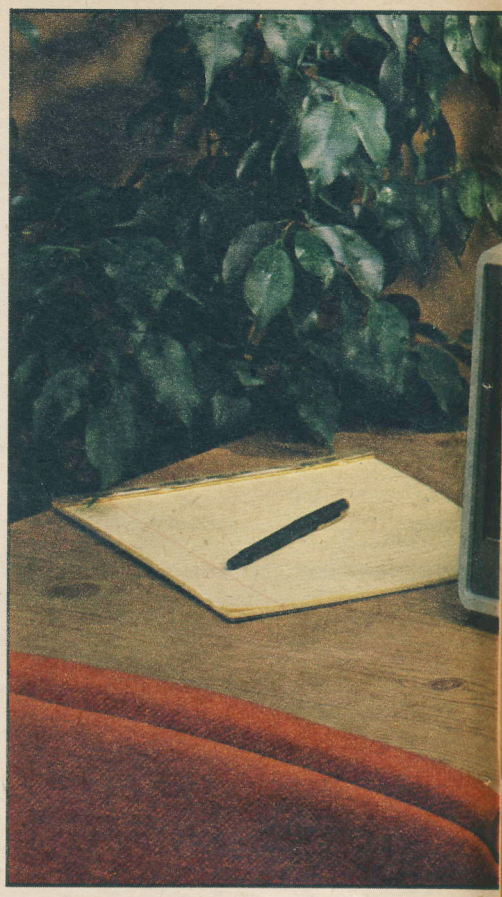
We offer complete service support. Technical expertise, advice and service are always available. Service experts at the Heath factory and Heathkit Electronic Centers can help you keep your computer system working right.

You get the convenience of one-stop shopping. The complete selection of Heathkit Computer Products is available here in the Heathkit Catalog, and at Heathkit Electronic Centers.

The Heathkit All-In-One Computer: extra convenience in a compact unit — built-in video terminal, 16K RAM expandable to 48K, built-in floppy, H-8 disk software compatibility — at an affordable price

Only $1695.00 for H-89

- Two Z-80 microprocessors — one for computer, one for video terminal
- Heavy-duty professional keyboard
- Easy-to-read 12-inch CRT monitor
- Runs all disk-based H-8 Software
- Kit versions include audio cassette interface
- Numeric keypad in calculator format



Are you looking for all the computing power and built-in peripherals you need — but your computer budget doesn't allow for extravagance? The Heathkit All-In-One Computer has the power, peripherals and convenience features 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.

The professional video terminal displays data in the format of 24 lines by 80 characters per line — up to 1920 characters at any one time. The terminal also features a special-purpose, non-scrolling 25th line, software-controlled.

The heavy-duty professional keyboard, designed in typewriter format, controls all terminal functions. The keyboard prints the entire ASCII set, including both upper and lower case letters — along with 33 special graphics symbols for an extra measure of flexibility.

Select baud rates up to 9600 through the keyboard. Direct cursor addressing lets you insert or delete characters anywhere on the screen. All 32 terminal functions can be controlled 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.

The All-In-One Computer comes with more memory power. 16K of random access memory (RAM) is supplied. And memory diagnostics are built-in to make memory checks easier and faster.

You can expand to meet your specific needs. The All-In-One will accept up to 48K (RAM). To add memory, just plug integrated circuits into sockets. No soldering is necessary.

The built-in floppy disk system makes this a true All-In-One Computer, giving you tremendous storage capacity for programs and data. Each 5.25-inch standard, hard-sectored 40-track diskette stores up to 100K bytes of data. The Siemens 82 single-drive system gives you fast, accurate access to data. You'll be able to load programs in seconds, access and update data fast. And the disk drive is factory assembled and tested, for easier kitbuilding.

If you need even more data storage, buy the H-77 Floppy Disk System. Designed with the All-In-One Computer in mind, the H-77 (with appropriate accessories) can give your All-In-One system up to 300K bytes of on-line data storage (3-drive systems require Heath Disk Operating System, Version 1.6).

The All-In-One gives you instant H-8 compatibility. All disk-based H-8 software will run on All-In-One systems with floppy disk storage.

Choose from a wide selection of software. The Heath Users' Group (page 48) maintains over 500 applications programs, most of them compatible with the All-In-One.

You get more flexibility with the All-In-One. An audio cassette interface, standard with kit versions, lets you communicate with cassette storage systems. With other accessory interfaces, you can communicate with printers or time-share systems (all with appropriate software). All communication is EIA RS-232C.

The All-In-One is built to withstand the toughest working environments. And a convenient lift-off top gives you easy access to the components and circuitry.

With so much power and so many features built in, this desktop computer brings exceptional value within your reach. Put it to work for you now. Requires HDOS or similar systems software for normal operation.

Kit H-89, Shpg. wt. 86 lbs. **1695.00**

WH-89-CA Completely Assembled All-In-One Computer, with floppy, 48K memory and serial I/O. Does not include audio cassette interface.

WH-89-CA, Shpg. wt. 54 lbs. **2895.00**

H-88 All-In-One Computer, without floppy. Includes H-88-5 Audio Cassette Interface.

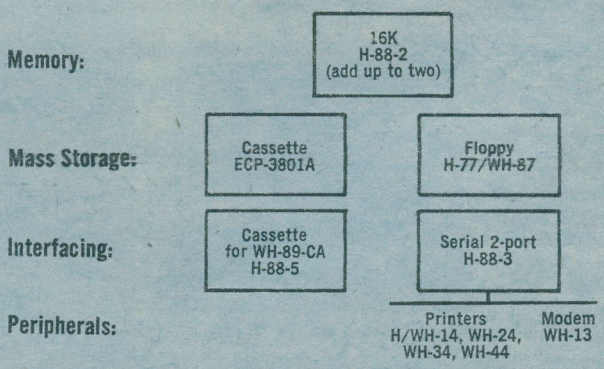
Kit H-88, Shpg. wt. 59 lbs. **1350.00**

H-89/WH-89-CA/H-88 SPECIFICATIONS: Microprocessor: Two Z-80 microprocessors (one in computer, in video terminal). **Clock:** 2.048 mHz. **Memory:** 16K bytes user random access memory (RAM) — expandable to 48K. **Video Terminal:** High-resolution 12″ diagonal CRT with P4 phosphor. **Keyboard:** 80 keys, typewriter format, with numeric keypad in calculator format. **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:** 60 Hz at 60 Hz line frequency, 50 Hz at 50 Hz 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 and erase page. **Power Requirement:** 120/240 VAC, 50/60 Hz at 90 watts maximum. **Overall Dimensions:** 13″ H x 17″ W x 20″ D (33.02 x 43.18 x 50.80 cm).

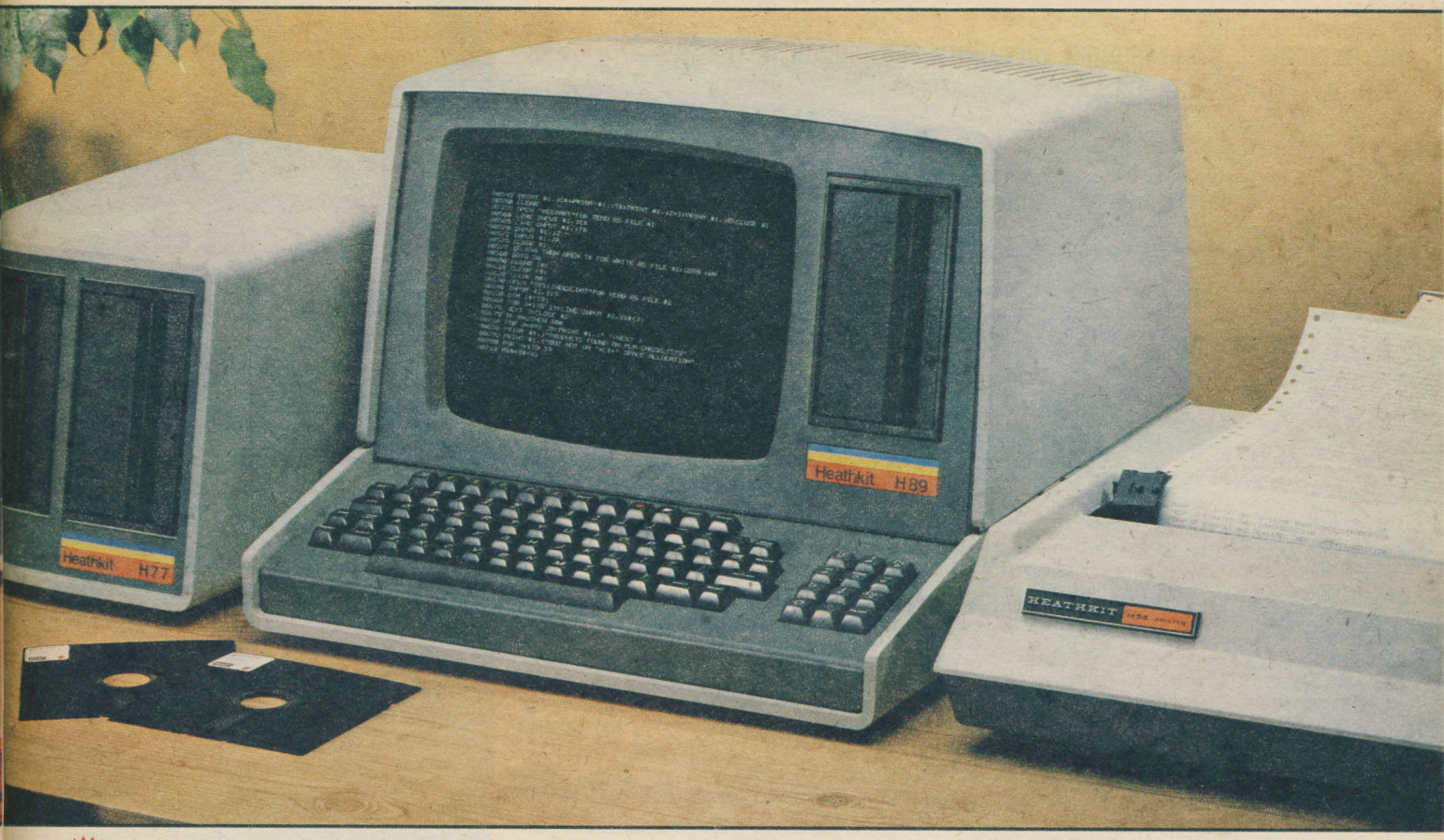
Design an All-In-One system for your needs

Add memory up to the All-In-One's 48K RAM capacity. Add cassette storage or other I/O accessories to your All-In-One.

Choose from a full line of printers and other accessories, because the All-In-One is flexible enough to meet your needs.



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



NEW

H-77 Floppy Disk adds even more versatility and flexibility to your Heathkit All-In-One Computer

$595.00 Kit

- Additional data storage capacity, easier copying of programs
- Each disk drive is fully assembled and tested for easier kitbuilding
- Each drive installs vertically to take up less space

Designed especially for the Heathkit 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 Floppy Disk with your All-In-One Computer, you have room for up to three disk drives. You can mount your operating system and program disks at the same time, to get rapid access to programs and data.

Floppy disk storage is far more versatile and reliable than paper tape or cassette storage systems. You'll be able to load programs in seconds, access and update data fast. And because the H-77 Floppy Disk System is designed with the All-In-One Computer in mind, 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.

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 three-drive capability and 300K bytes of on-line data storage, add the optional 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 Heath Disk Operating System, Ver. 1.6.)

Expand the capability of your All-In-One Computer today — with the H-77 Floppy Disk System.

Kit H-77, with one drive, 25 lbs. **595.00**

Assembled Dual-Drive Floppy Disk System. Requires H-88-6 Modification Kit for installation.

WH-87, Shpg. wt. 28 lbs. **1195.00**

H-88-6 Modification Kit. Cables, junction box to connect WH-87, future accessories to H-88, H-89. Not required, but may be used with H-77.

H-88-6, Shpg. wt. 2 lbs. **50.00**

H-77/WH-87 SPECIFICATIONS: Number of Tracks per Diskette: 40. **Number of Sectors per Track:** 10. **Formatted Bytes per Sector:** 256. **Spindle Motor Speed:** 300 rpm, +1 percent. **Data Transfer Rate:** 128 kilohertz. **Motor Start Time:** 1 sec. **Operating Temperature Range:** 32 to 104 degs. F (0 to 40 degs. C). **Power Requirement:** 120/240 VAC, 50/60 Hz. **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 Random Access Memory Expansion Chip Set. H-88-2, 1 lb. .....**Was $150, Now 95.00**

Two-Port Serial I/O Interface. Communicate with printers, other peripherals (w/appropriate software). RS-232C serial interfacing. **H-88-3,** Shpg. wt. 2 lbs. **100.00**

Floppy Disk Storage System/Interface for H-88 All-In-One Computer. Diskettes not included. **H-88-4,** Shpg. wt. 22 lbs. **490.00**

Audio Cassette Interface for WH-89-CA. H-88-5, Shpg. wt. 2 lbs. **75.00**

NEW! Wire Wrapping Board for the All-In-One. Design custom circuits. Punched, etched board with room for 48 16-pin sockets (or other combinations). With bus connectors. Full description, p. 43. Uses HCA-6, HCA-7 below. **Kit H-88-10,** Shpg. wt. 1 lb. **30.00**

NEW! Wire Wrapping Kit. Description on page 43. **Kit HCA-6,** Shpg. wt. 2 lbs. **12.95**

NEW! Wire Wrapping Socket Kit. Description on p. 43. **Kit HCA-7,** 1 lb. **29.95**

NEW! Pannelgraphix Anti-Glare CRT Filter. Plastic. **HCA-3,** Shpg. wt. 1 lb. **8.95**

NEW! Sun-Flex CRT Filter. Fabric anti-glare cover. **HCA-4,** Shpg. wt. 1 lb. **19.95**

Optional Second Drive for H-77 Floppy Disk. H-17-1, Shpg. wt. 5 lbs. **345.00**

See the complete line of All-In-One Software, including the new Zenith Electronic Typing Word Processing System, on pages 45-47.

Your phone charge order shipped FREE within 50-mile radius of the nearest Heathkit Electronic Center!

Get immediate programming versatility and plug-in flexibility — with the popular, budget-pleasing Heathkit H-8 Computer

Only **$299.00** Kit

- **Built-in ROM monitor to control front panel program**
- **Heavy-duty power supply handles full complement of memory, I/O devices**
- **Fully-buffered bus has 7 plug-in positions for memory and I/O**
- **Convection-cooled power supply — no noisy fan needed**

The Heathkit H-8 — the computer that grows as you grow. You get flexibility to design a computer system just the way you want it. With 7 positions for plug-in modules, you can put together any combination of memory and I/O. And our large selection of peripherals, accessories and software give your H-8 Computer unmatchable 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 H-8's nine-digit octal readout, which provides much more information than conventional computers.

The features we pack into the H-8 Computer mean more value to you. A heavy-duty power supply lets the H-8 handle up to 65K of memory (including I/O), while convection cooling means no fan is needed to prevent overheating.

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 I/O. The H-8's built-in speaker gives you audible feedback and special effects. Front panel lights keep you up to date on your computer's status. With all these features and more, the Heathkit H-8 Computer is an excellent choice to be the heart of your computer system.

When you add more memory, interfaces and peripherals, your H-8 system can become even more powerful and versatile. You'll be able to write more highly-sophisticated, higher-level programs.

Heathkit Floppy Disk Systems, which are sold separately, provide even greater flexibility for your H-8 Computer. The H-17 Floppy Disk System, available in both kit and fully assembled forms, provides up to 100K bytes of on-line data storage capacity. And when you add an optional second drive, on-line data storage capacity is expanded to a capacity of 200K bytes. Designed especially for the H-8 Computer, the H-17 Floppy Disk System gives you the capability to load programs and update files instantly.

The unique flexibility of the H-8 means you have total freedom to design a system that meets your own needs. You can start with our Complete Advanced H-8 System, described at right. Or choose from a vast selection of peripherals and accessories — including additional memory, cassette data storage, CRT terminals, hard-copy printers and an acoustic modem.

Choose from a vast software library. An expanding selection of languages — including new Microsoft™ FORTRAN — lets you start programming right away. And the Heath Users' Group maintains over 500 applications software programs for the H-8 — from business accounting and personal budgeting to computer-aided instruction, exciting computer games — even weather forecasting! Open the door to this expanding world of software when you order your H-8 Computer.

Memory and I/O accessories are offered separately from the computer itself, so you have complete freedom to assemble a computer system that meets your specific computing needs. To build a complete system using the Heathkit H-8, you'll need both memory and interface accessory cards. The type and number of memory and interface accessories you'll need will be determined by your particular application.

The H-8's optional software is supplied in 1200 baud audio cassette or diskette forms to help get you up and running faster.

The value-priced H-8 is housed in a heavy-duty metal cabinet with modern, high-impact structural foam side panels.

Get the flexibility and versatility you need to really personalize your computer system — at a price that fits your budget. Requires at least 4K of memory to operate (see page 43 for memory).

Kit H-8, Shpg. wt. 31 lbs. **299.00**

Factory Assembled and Tested H-8 Computer.
WH-8, Shpg. wt. 30 lbs. **399.00**

Look at the Manuals before you buy — with no risk. Complete assembly and operating manuals for H-8 Computer, H-8-4 Interface, H-14 Line Printer, WH-8-16 Memory Board and H-19 CRT Terminal. When you order the H-8 Computer, deduct $30.00 from the purchase price (not including shipping and handling charges).

HM-800, Shpg. wt. 13 lbs. **30.00**

NOTE: Individual product manuals are included with each kit.

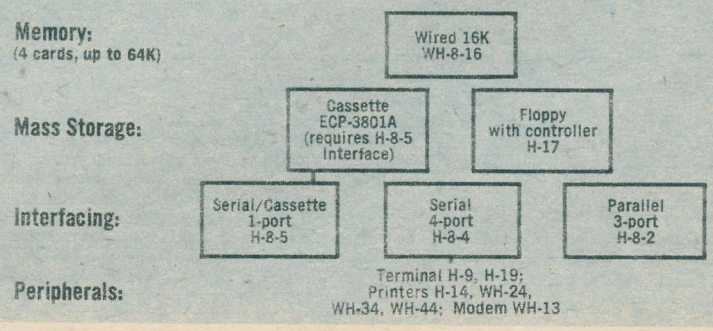
H-8/WH-8 SPECIFICATIONS: Microprocessor: 8080A. **Monitor:** In on-board 1K x 8 ROM. Octal addresses, data input and display from the front panel. **Monitor Functions:** Memory display and alter, register display and alter, memory load and dump, single instruction execution, program execution, port input and output. **Clock:** 2.048 mHz, crystal-controlled. **Interrupts:** Seven, priority vectored. **Power Supplies:** +8 VDC at 10 amperes maximum. Regulated to +5 VDC on each circuit board. +18 VDC at 500 mA. Regulated to +12 VDC and −5 VDC on the CPU circuit board. **Chassis Capacity:** Seven locations on the mother circuit board for memory or I/O cards. Four memory cards maximum. One bus expansion maximum. **Operating Temperature:** 32 deg. F to 104 deg. F (0 deg. C to 40 deg. C). **Power Requirement:** 120/240 VAC, 50/60 Hz, 150 watts. **Dimensions:** 6.5 " H x 16.25" W x 17" D (16.51 x 41.28 x 43.18 cm). **Net Weight:** 21 lbs. (9.5 kg).

Complete Advanced H-8 Computer System. Includes Heathkit H-8 Computer, H-8-4 Four-Port Serial I/O, WH-8-16 16K Wired Memory Card, H-17 Floppy Disk System, H-19 CRT Terminal and H-8-17 HDOS Operating Software. $2193.00 if purchased separately. **Save $198.00 when you purchase the complete advanced H-8 Computer system.**
HKS-82, Shpg. wt. 143 lbs. **1995.00**

Design your own H-8 Computer System

With 7 plug-in positions for memory and I/O devices, your H-8 Computer System can grow as your needs grow.

Some of your options are described on the chart below. Each box represents a plug-in module.



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

Increased data storage capacity — yours with the H-17 Floppy Disk

$575.00 Kit

- Make your H-8 Computer System even more versatile
- Store up to 100K bytes of data on a single 5.25-inch disk
- Rapid access to any program
- Easier loading of programs
- Assembled and tested Siemens 82 drive system for easier kitbuilding
- Optional second drive available to double on-line storage capacity
- Take advantage of disk-based H-8 software

The Heathkit H-17 Floppy Disk System gives you the storage and programming 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. And you can update your data in place, in real-time. The H-17 makes your Heathkit H-8 Computer System a total versatility computer system.

Designed exclusively for use with the H-8, the H-17 stores up to 100K bytes of data on a standard, hard-sectored 40-track diskette which is just 5.25 inches in diameter. The floppy disks are easier to handle — and easier to load — than paper tape or cassettes.

See the complete line of systems and applications software for the Heathkit H-8 Computer. Turn to pages 45, 46 and 47 for full details. And turn to page 48 to see the expanding world of H-8 applications software available through the Heath Users' Group.

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 is designed especially for the H-8 Computer, you get a harmonious system that interfaces properly and runs smoothly.

The H-17 uses the famous Siemens 82 single-drive system, a performance-proven disk drive which provides accurate high-speed access to data. This drive performs much better than most equivalent competitive drive systems. Specifications of this drive system include a 30 millisecond track seek time and a typical random sector access time of less than 250 mS. The Siemens 82 disk drive system is supplied fully assembled and tested for the Heathkit H-17 Floppy Disk System.

For even 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.

Add the Heathkit H-17 Floppy Disk System to your Heathkit H-8 Computer and enjoy the full capabilities of your computer system. Take advantage of all the practical and fun programs available to you.

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 the H-8-17 HDOS Operating System Software (see page 47). Includes a single blank 5.25-inch floppy diskette.

Kit H-17, with one drive, 28 lbs. **575.00**

Factory Assembled and Tested H-17 Floppy Disk System. Includes all of the features in the H-17. Maximum on-line data storage capacity, 100K bytes. Supplied with one disk drive.

WH-17, Shpg. wt. 28 lbs. **645.00**

Optional Second Drive for the H-17 Floppy Disk System. Adds dual-drive versatility to your H-17 Floppy Disk System. Run operating system and program disks simultaneously. Gives you up to 200K bytes of available on-line data storage area.

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

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 Hertz, 75 watts. **Dimensions:** 6.25" H x 13.5" W x 13.5" D (15.89 x 34.29 x 34.29 cm).

Your phone charge order shipped FREE within 50-mile radius of the nearest Heathkit Electronic Center!

DEC®-compatible educational/science computer for laboratory and scientific applications — available at a price you can afford

Only **$1295.00** Kit

- DEC half-size KD11-HA (LSI-11/2) CPU
- Full compatibility with DEC PDP-11/03 — at a fraction of the cost
- Choose from a wide variety of DEC-compatible software programs
- Room for up to 60K bytes (30K words) of memory
- Plug-in flexibility—with seven plug-in positions for memory and interfacing
- Rugged, long-life construction
- 16-bit computing power

Designed with full DEC LSI-11 compatibility, the Heathkit H-11A Computer offers the versatility and flexibility you need to perform DEC programs and real-time laboratory applications.

The H-11A uses the same microprocessor, memory I/O and operating system as the DEC LSI-11, and runs all software designed for the DEC PDP-11/03. You can choose from a vast selection of practical programs to run your home more efficiently, to reduce the clerical costs of your business and to process all types of data more efficiently than before.

The 16-bit vs. 8-bit issue: Your choice of a 16-bit or 8-bit computer depends upon your needs. If you're a professional who needs full DEC compatibility, the 16-bit H-11A is your choice. The H-11A has adequate computing power, even for the more complex and sophisticated jobs that you will be tackling later.

The H-11A features the physically smaller KD11-HA Microcomputer Module (a half-size LSI-11/2 microprocessor). That makes the Heathkit H-11A identical to the DEC PDP-11/03, but at a fraction of the cost. There's no on-board memory, so the KD11-HA Microcomputer Module gives you more flexibility to match your ROM, RAM and interfacing requirements to your particular needs.

This smaller configuration allows you to put more computing versatility into the H-11A by providing an an extra plug-in slot for additional memory or I/O interfacing. The H-11A's total of seven plug-in slots lets you add any combination of ROM, RAM and interfacing, up to a maximum memory capacity of 60K bytes. And full compatibility with the LSI-11 family means you can combine components from both the LSI-11 and LSI-11/2 families.

Features of the KD11-HA Microcomputer Module include a PDP-11/34 instruction set, a raw computer speed of 380 nS microcycle time, resident firmware debugging (ODT) and ASCII console routines, as well as single and double operand instructions. With the KD11-HA Microcomputer Module, you set the capabilities you need for effective system configurations.

The extra-value features built into the H-11A Computer ensure longer life and greater return on your computer investment. A switching power supply uses less electricity than other power supplies, which saves money. And it generates less heat than other supplies, which prolongs the life of the H-11A. The H-11A Computer features a rugged steel chassis and an extra-thick backplane to help ensure long, reliable performance.

Available in economical, easy-to-build kit form — or in factory assembled and tested form, the basic Heathkit H-11A Computer includes a handsome cabinet, a heavy-duty power supply, and a backplane that includes the bus and a fully-assembled CPU board. You can add your selection of optional memory and I/O accessories to the mainframe.

Learn by building it yourself. What better way is there to get to know your computer than by building it yourself? The Heathkit H-11A Computer lets you understand it better. You can build it yourself and benefit from the knowledge — and the savings. Like all Heathkit computers, the H-11A comes with an easy-to-follow assembly and operation manual. When you build it yourself, you can also perform more of the service steps yourself, to keep your computer in top operating form. A nationwide network of Heathkit service centers are ready to help you with technical advice and expert service.

Whether you buy a full Heathkit H-11A Computer System or the computer itself, compare the price of the Heathkit H-11A with comparable 16-bit computers. Buy this DEC compatible Heathkit computer and find out why the combination of advanced design and quality components make the Heathkit H-11A Computer one of the best 16-bit computer values anywhere. For 120/240 VAC, 50/60 Hertz, 200 watts maximum power consumption. Dimensions, 6.5" H x 19" W x 17" D (16.5 x 48.3 x 43.2 cm).

Kit H-11A, Shpg. wt. 43 lbs. **1295.00**

Factory Assembled and Tested H-11A Computer.
WH-11A, Shpg. wt. 43 lbs. **1995.00**

Modification Kit for H-11/H-11A Computers. This special modification kit places the line time clock switch on the front panel for easier access. It's easy to assemble, and includes an entirely new front panel.

Kit 830-35, Shipping charges prepaid **53.50**

Look over the Manuals before you buy. Complete assembly and operation manuals for the Heathkit H-11A Computer, the H-11-2 Parallel Interface, the H-11-5 Serial Interface and the H-9 Video Terminal. Get a first-hand look at the accurate, easy-to-follow Heathkit assembly manuals that take you, step-by-step, from unpacking to final plug-in. Know your H-11A Computer System inside out — before buying. And when you do buy the H-11A Computer, we'll deduct the price of this manual set.

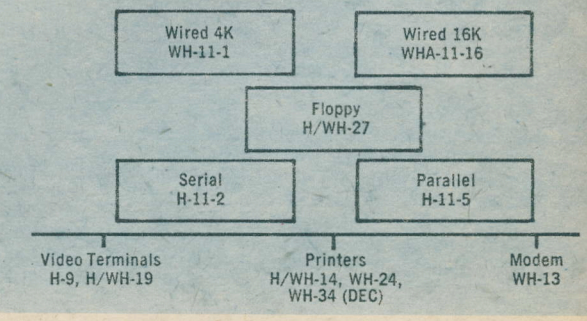
HM-1100 Manual Set, Shpg. wt. 12 lbs. **30.00**

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

H-11A/WH-11A SPECIFICATIONS: Central Processing Unit: Uses DEC KD11-HA CPU. **Word Length:** 16 bits. **Instruction Set:** PDP-11/03. **Memory:** Directly addresses 32K. I/O Addressed: 28K to 32K. RAM/ROM: 0 to 28K. **Backplane:** Eight 2-wide module slots. **Power Supply:** Overcurrent and overvoltage protected, switching regulator. Internal fan for cooling. **Power Requirement:** 120/240 VAC, 50/60 Hz, 200 watts maximum. **Power Outputs:** +5 VDC at 15 amperes max., and +12 VDC at 3 amperes maximum. **Dimensions:** 6.5" H x 19" W x 17" D (16.5 x 48.3 x 43.2 cm).

Configure your own H-11A Computer System

With seven plug-in positions for memory and I/O, you can design a Heathkit H-11A Computer System to meet your exact needs. Choose from a full selection of memory, interfacing and peripherals to complement your H-11A Computer. And with full DEC compatibility, you can be sure to get full use from all H-11A hardware and software.



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

Shown with optional 830-35 LTC Switch

H-27 Floppy Disk gives much faster access to data and information

$1995.00 Kit

- **Full compatibility with DEC RX01 (PDP-11V03) system**
- **Z-80 microprocessor-based controller**
- **Dual-drive system for more on-line storage — up to ½ Meg bytes**
- **Fast 6 mS head step time**
- **Uses larger 8" floppy disks with greater capacity**

The Heathkit H-27 Floppy Disk System gives you dual-drive versatility, with a total of ½ Meg bytes of on-line program and data storage area — enough room for most of your general-purpose application needs. The H-27 stores data and information on 8-inch floppy disks, which are compatible with equipment using the IBM 3740 format.

The Z-80 microprocessor-based disk controller in the Heathkit H-27 Floppy Disk System provides an average data access time of 250 milliseconds. This means you will have very fast access to data.

You get full compatibility with DEC and RXV11 RX01 (PDP-11/03 and PDP-11V03) hardware and software when you use the Heathkit H-27 Floppy Disk System. This gives you the capability of using the hundreds of application programs written by users of the DEC PDP-11, one of the most popular microcomputers. Performance-proven hardware and software bases, including the Heathkit H-11A Computer, provide outstanding computer power.

See the full line of software for the H11A Computer, including the FORTRAN language, on pages 45, 46 and 47.

While compatible with the DEC systems, the H-27 Floppy Disk System gives you even more. A built-in self-test diagnostic, which operates during power-up, protects existing programs on your disks. A mechanical interlock prevents accidental damage to data and information — if the floppy disk is not seated properly, the door will not close and the H-27 Floppy Disk System will not operate. A write-protect function protects important files and programs from being inadvertently written over. And a reformatting procedure gives you the capability of initializing a diskette with the standard IBM 3740 format.

A single-board bootstrap/interface circuit uses just one backplane slot on the Heathkit H-11A Computer, leaving more space for memory and I/O additions to your Heathkit H-11A Computer System. The H-27 Floppy Disk System measures 7.75" H x 18" W x 20" D. It operates on 120 or 240 VAC, 60 Hz power, and draws a maximum of 240 watts. To use the full capabilities of the HT-11 Operating Systems Software, which is designed for used with the Heathkit H-27 Floppy Disk System, you need a Heathkit H-11A Computer with at least 16K words of memory.

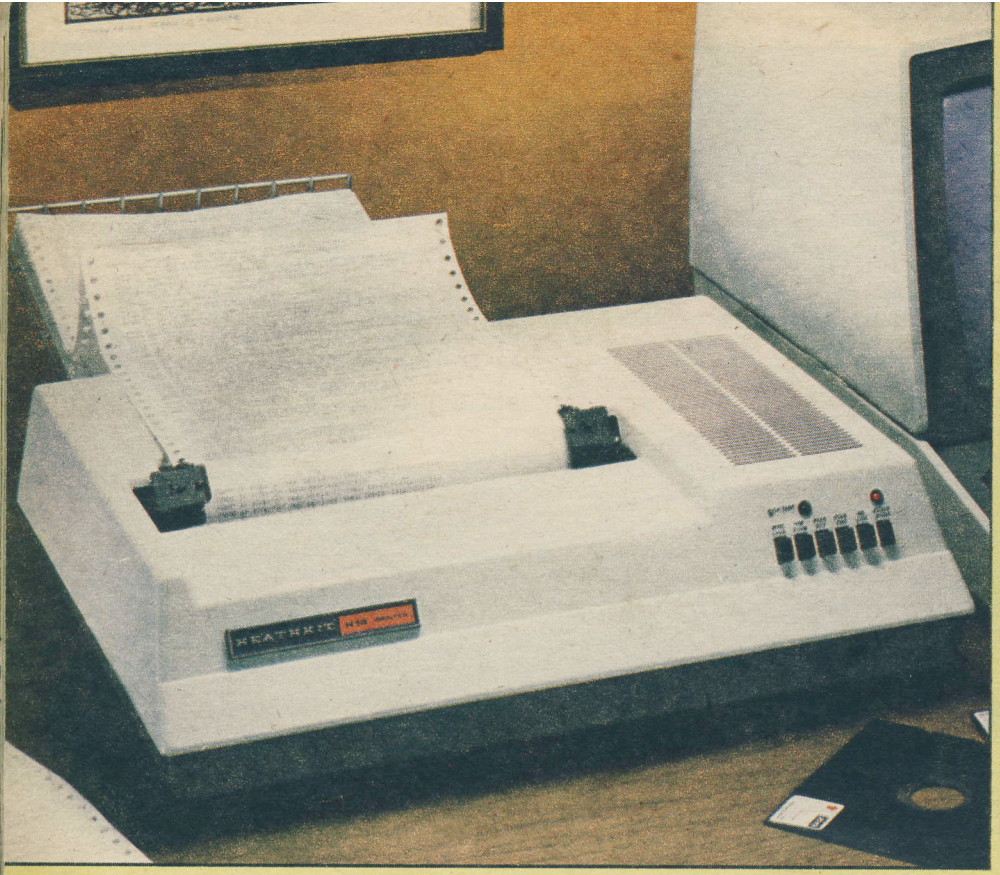
Kit H-27, Shpg. wt. 93 lbs., Motor Freight . . **1995.00**

Assembled WH-27 Dual-Drive Floppy Disk System.
WH-27, Shpg. wt. 69 lbs., Motor Freight . . . **2595.00**

Package of 5 Blank 8-Inch Floppy Disks for the Heathkit H-27 Floppy Disk System, supplied in standard IBM 3740 format.
H-27-2, Shpg. wt. 2 lbs. **30.00**

H-27/WH-27 SPECIFICATIONS: Diskette: 8-inch. **Capacity (8-bit bytes, IBM 3740 format):** 256,256 bytes per diskette; 3,328 bytes per track; 128 bytes per sector. **Recording Surfaces Per Diskette:** One. **Tracks Per Diskette:** 77 (0-76 or 0-114[8]). **Sectors Per Track:** 26 (1-26 or 1-32[8]). **Bit Density:** 3200 bpi at inner track. **Track Density:** 48 tracks per inch. **Recording Technique:** Double frequency. **Data Transfer Rate: Diskette to Controller Buffer:** 4 μS/data bit (250k bps). **Track-To-Track Move:** 6 mS/track maximum. **Head Settle Time:** 15 mS maximum. **Rotational Speed:** 360 rpm, ±2.5%; 166 mS/revolution nominal. **Average Access:** 250 mS, calculated as follows: Seek (77 tracks/8.3) x Settle (3 mS + 15 mS) + Rotate (166 mS/2) = Total (250 mS). **Temperature: Operating:** 59 deg. F to 90 deg. F (15 deg. C to 32 deg. C) ambient. **Maximum Temperature Gradient:** 20 deg. F/hr (11.1 deg. C/hr). **Non-Operating:** −30 deg. F to +140 deg. F (−35 deg. C to +60 deg. C). **Diskette Non-Operating:** −30 deg. F to +125 deg. F (−35 deg. C to +52 deg. C). **Humidity: Operating:** 77 deg. F (25 deg. C) maximum wet bulb; 36 deg. F (2 deg. C) minimum dew point, 20 to 80% relative humidity. **Non-Operating:** 5 to 98% relative humidity (no condensation). **Diskette Non-Operating:** 10 to 80% relative humidity. **Power Requirement:** 120/240-VAC, 60 Hz, 240 watts maximum. **Interface Module Power Requirement:** 5 VDC, 1 amp typical, 1.5 amps maximum. **Dimensions:** 7.75" H x 18" W x 20.75" D (20.32 x 45.72 x 52.71 cm). **Net Weight:** 61 lbs. (27.67 kilograms).

Your phone charge order shipped FREE within 50-mile radius of the nearest Heathkit Electronic Center!



Low-cost, microprocessor-based Line Printer provides hard copy

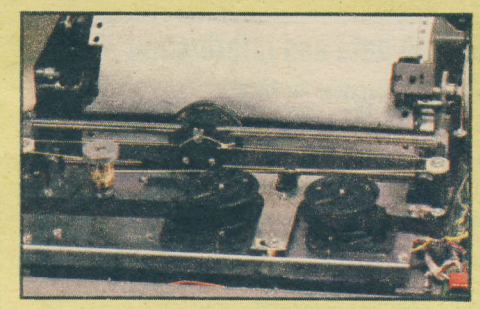
Only $635.00 Kit

- **Packed with extra features you won't find on comparably priced line printers**
- **Use with most any computer — RS-232C or 20 mA loop interfacing**

The Heathkit H-14 Line Printer brings hard-copy value and performance comparable to units costing $800 to $1000 — for hundreds of dollars less. Hard copy provides added convenience in reading, editing, debugging and modifying your computer program. The H-14 can also provide handy printed copies of address labels, 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 cps, with selectable 80, 96 or 132 character line length. 6 lines per inch spacing, 8 lines per inch software selectable. 110-4800 baud rates. Adjustable width sprocket feed handles edge-punched fan-fold paper from 2.5" to 9.5" wide, with a maximum thickness of 0.006 inch.

Whatever your computer system, the H-14 Line Printer provides extra value and performance — at a price that won't break your budget. Connects to H-8, H-11A Computers with standard RS-232C serial interface or 20 mA current loop. Handshaking provided by busy control signal. Includes 25-pin male EIA connector and matching paper catch. Dimensions, 4.80" H x 18.33" W x 14.33" D (12.19 x 46.56 x 36.70 cm). For 120/240 VAC, 50/60 Hz. Requires H-8-17, H-8-18 or HC-8-14 software for H-8; HT-11 software for H-11A.



The Heathkit H-14 Line Printer is one of the lowest-cost microprocessor-based line printers available today

Kit H-14, Shpg. wt. 30 lbs. **635.00**

Factory Assembled and Tested H-14 Line Printer. WH-14, Shpg. wt. 27 lbs. **895.00**

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 w/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 w/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. **Internal Controls:** 120/240 VAC, 50/60 Hz operation, baud rate selection.

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

WH-24-1/TI-810 — get more performance without spending more

$1695.00

- **Fully assembled and tested for fast system setup**
- **Optimized bi-directional printing system**
- **Prints up to 5 clear copies on up to 15-inch wide paper**
- **Includes upper and lower cases, self-testing capabilities**

The WH-24-1/TI-810 Line Printer is a high- quality, low-priced printer that can make a big impact on both your printing and your printer costs.

The WH-24-1's optimized 150 cps bi-directional printing minimizes printhead travel time and maximizes efficiency. Vertical and horizontal tabbing help produce maximized data, regardless of format.

A 256-character FIFO buffer lets you receive data at speeds from 110 to 9600 baud. Programmable forms length and a wide carriage handle multiple-part forms, tickets and reports from 3" to 15" wide. A 9 x 7 dot font prints clearer, more legible characters, and produces up to five high-quality copies.

The WH-24-1's adjustable tractor drives make it easy to operate. Once a form has been engaged by the tractor drives, alignment can be made at the main control panel. And adjustments for forms thickness control can be made by use of the printhead-to-platen adjustment while the WH-24 is printing.

The WH-24-1 has both rear and bottom paper/forms loading. And its status and fault indicators supplement extensive self-testing capabilities.

This printer includes upper and lower cases. Needs WHA-11-5 Serial I/O Card for use with H-11/H-11A Computers only; not required for other Heathkit Computer Systems.

WH-24-1/TI-810 Printer. Floor stand not included.
WH-24-1, Shpg. wt. 66 lbs., Mtr. Frt. **1695.00**

WHA-11-5, Serial I/O Card for H-11 and H-11A Computers, Shpg. wt. 1 lb. **150.00**

WH-24-1 SPECIFICATIONS: Printing: Technique: Seven-wire matrix, impact. **Method:** Bi-directional. **Speed:** 150 characters per second; 64 lines per minute (at 132 characters per line), up to 450 lines per minute (at 10 characters per line). **Characters:** 9 x 7 dot matrix. **Character Set:** 64-character ASCII. **Characters Per Inch:** 10. **Format:** Up to 132 characters per line maximum; 6 or 8 lines per inch (operator or software selectable). **Forms Handling:** 5 in/sec (127 mm) slewing rate. Paper feeds from rear or bottom. **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 from feed, tab/reset. **Communications: Interfacing:** EIA Standard RS-232C Serial Interface. **Baud Rates:** 110, 150, 300, 1200, 2400, 4800 and 9600. **Parity:** Odd, even or ignore. **Operating Temperature Range:** 37 to 104 deg. F (5 to 40 deg. C). **Operating Humidity Range:** 5 to 90% (no condensation). **Power Requirement:** 120/240 VAC, 50/60 Hz, 200 watts. **Dimensions:** 8" H x 25.75" W x 20" D (20.3 x 65.4 x 50.8 cm), without floor stand or paper catch tray. **Net Weight:** 55 lbs. (25 kg).

Letter-quality daisy wheel printing for word processing systems

$2995.00

- **The WH-44/Diablo 1640 Printer features famous daisy wheel printing quality**
- **2-color and graphics capabilities**
- **Also available with optional keyboard for more versatility**

The WH-44/Diablo 1640 Printer is designed for applications that require a serial printer, such as data communications or word processing systems. The 1640 combines the latest in microelectronic technology with its field-proven daisy wheel printer mechanism.

This printer produces the standard 96-character ASCII set, both upper and lower case. With bi-directional printing, maximum print speed is 45 characters per second. Adjustable horizontal and vertical tabs can be directly set in any position. Adjustable forms width means the Diablo 1640 will accept forms up to 15.5 inches (39.3 cm) wide. Adjustable forms length lets you set page length to your needs. Top of form control, combined with full forward and reverse paper motion, give you complete control of most any form.

Graphics capability is also featured, with 1/120" horizontal, 1/48" vertical incremental motion. 2-color printing capability provides more versatile, more striking document production, when used with two-color ribbons.

The serial interface provides RS-232C levels. With a 256-byte print buffer, the serial interface runs at standard baud rates from 110 to 1200, and is compatible with Bell 102, 113, 212 and equivalent acoustic modems.

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

Includes friction platen, power supply, operator control panel, HCS-22 Printwheel (Elite 12 with unslashed zero) and HCS-51 Film Ribbon. For 120/240 VAC. Dimensions, 9.25" H x 23.5" W x 15.75" D (23.5 x 59.69 x 40.0 cm).

Assembled and Tested Diablo 1640 RO Printer.
WH-44, Shpg. wt. 60 lbs., Mtr. Frt. **2995.00**

NEW! Diablo 1640 KSR Printer/Terminal. Includes full ASCII upper/lower case professional typewriter-style keyboard. Factory assembled.
WH-44K, Shpg. wt. 60 lbs., Mtr. Frt. **3295.00**

Bi-Directional Tractor Feed Accessory. Dual tractors, before and after print head, allow moving paper backward through printer for high resolution graphics, and provide much better registration for word processing and forms preparation.
HCA-1, Shpg. wt. 8 lbs. **259.00**

See page 44 for the full selection of Diablo 1640 printwheels and ribbons

WH-44 SPECIFICATIONS: Printing Speed: 45 cps maximum. **Print Wheel:** Interchangeable 96-character daisy wheel. **Format:** Line length adjustable to 13.1" max. (132 chars. at 10 pitch, 158 chars. at 12 pitch). **Forms Handling:** Adj. forms width to 15.5 in. (39.3 cm) max.; form thickness selectable to 27/1000 in. (0.0686 cm) max. **Communications: Baud Rate Selection:** 110, 300, 600 or 1200 baud.

Compact, versatile DEC Desktop Teleprinter — now $100 less

$1195.00

- **Save an additional $100 on this ideal office tool**
- **Fully assembled and tested**
- **Clearly prints the full 128-character ASCII set**
- **True 30 cps print speed**

Reduced an additional $100 from Catalog 848, the WH-34/LA-34 DECwriter IV Teleprinter sets new standards for convenience in computer and data communications terminals. Small and lightweight, it's a natural for the office environment. The keys are sculptured and arrange like a typewriter keyboard. And snap-in cartridge ribbons mean easier changes and no mess.

This 300 baud, 30 cps desk-top terminal can print at burst speeds up to 45 cps. An alternate 110 baud/10 cps speed is keyboard-selectable. The terminal operates full duplex, with optional local echo. A 9 x 7 dot matrix impact printhead clearly prints the full 128-character ASCII set, upper and lower case. Adjustable character width from 10 to 16.5 cpi, with adjustable 6-12 lines/inch vertical spacing.

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

Also included is an EIA Standard RS-232C Serial Interface to communicate with computers, acoustic couplers and Bell 103J or equivalent modems. A start-up supply of ribbon and paper is provided, so you can use the DECwriter right away.

Assembled WH-34/LA-34 DECwriter IV.
WH-34, 40 lbs. .....**Was $1295, Now 1195.00**

Tractor Feed Accessory for WH-34 DECwriter IV.
WHA-34-2, Shpg. wt. 3 lbs. **150.00**

See the complete selection of Heathkit printer supplies and accessories on page 44

WH-34 SPECIFICATIONS: Printing Speed: 10 or 30 cps, asynchronous. **Character Size:** 9 x 7 dot matrix, upper and lower case. **Character Set:** Full 128-character ASCII set. **Format:** 10, 12, 13.2 or 16.5 characters per inch horizontal spacing, keyboard selectable — up to 132 characters per line maximum; 2, 3, 4, 6, 8 or 12 lines per inch vertical spacing, keyboard selectable. **Forms Handling:** Standard typewriter platen. Optional WHA-34-2 Tractor Feed available. 5 inches per second slewing rate. **Communications: Code:** ANSI Standard. **Bit Structure: Bit Serial:** 1 start, 7 data, 1 parity, 1 stop bit at 110 and 300 baud. **Interfacing:** EIA Standard RS-232C Serial Interface; compatible with Bell 103J or equivalent modems. **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). **Net Weight:** 25 lbs.

NEW! Universal Floor Stand fits WH-24, WH-34 and WH-44/WH-44K Printers. Raises printer to desk level for easier operation. Includes paper rack.
HCA-2, Shpg. wt. 28 lbs. **99.00**

Professional Video Terminal with full ASCII set, pro keyboard and super-sharp CRT display

Only

$695.00

Kit

Look at all these professional features:

- **Z-80 microprocessor-based for fast, efficient data handling**
- **Heavy-duty typewriter-format keyboard with separate 12-key numeric keypad**
- **Eight separate user-definable function keys for more versatility**
- **Addressable blinking cursor**
- **DEC VT-52™ software-compatible**

The Heathkit H-19 Professional Video Terminal is designed for use with the Heathkit H-8 and H-11A Computers, or with any device which uses a standard RS-232C Interface. Its powerful Z-80 microprocessor makes it ideal for high-speed data handling.

The H-19's typewriter format lets you begin entering data from the keyboard right away. The terminal's 32 separate functions can be controlled from the keyboard, or from a computer. A 12-key numeric keypad, in calculator format, makes entry of arithmetic data fast and easy. Baud rates of up to 9,600 are keyboard selectable for easy changes. Eight user-function keys give you extra flexibility.

The H-19 prints the entire ASCII character set, including upper and lower case letters. The terminal can also display 33 different graphics characters, which can be arranged for a variety of graphic displays and effects. Prints 24 80-character lines (with a software-controlled 25th line). Using direct addressing, a blinking cursor lets you make corrections or edit, anywhere on the video screen.

The 12-inch diagonal CRT features extremely wide bandwidth for outstanding resolution and bright, clear readouts. Reverse video lets you emphasize any portion of the screen by reversing white on black.

Kit H-19, Shpg. wt. 49 lbs. **695.00**

Factory Assembled and Tested H-19 Video Terminal. WH-19, Shpg. wt. 43 lbs. **995.00**

NEW! Pannelgraphix CRT Filter. Plastic cover makes video displays of the H-19 Terminal easier to see. **HCA-3,** Shpg. wt. 1 lb. **8.95**

NEW! Sun-Flex™ CRT Filter. Nylon anti-glare cover makes video displays stand out, cuts eye strain. **HCA-4,** Shpg. wt. 1 lb. **19.95**

H-19/WH-19 SPECIFICATIONS: Character Set: 128 characters (95 ASCII and 33 graphic). **Character Type:** 5 x 7 dot matrix (upper and lower cases), 5 x 9 dot matrix (lower case with descenders). **Keyboard:** 80 keys (60 alphanumeric, 12 function) plus a 12-key numeric pad. **Cursor:** Blinking, non-destructive underline or block. **Cursor Controls:** Up, down, left, right, home, CR, LF and tab. **Cursor Addressing:** Relative and direct. **Tab:** Standard 8-column tab. **Erase Functions:** Erase page, erase to end of line, erase to end of page. **Scroll:** Auto or line/page freeze. **Bell:** Audible alarm on receipt of control G. **Video:** Normal and reverse (using escape sequence). **Communication: Interfacing:** EIA Std. RS-232C Serial Interface. **Baud Rates:** 110 to 9600. **Mode:** Full or half duplex. **Parity:** Even, odd, stick or none. **Handshaking:** Software, control S — control Q; all RS-232 control lines tied high internally. Buffered terminal is 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, 45 watts. **Dimensions:** 13" H x 17" W x 20" D.

Versatile, budget-priced Heathkit Video Terminal

For auxiliary or starter systems, the H-9 is the least expensive CRT terminal available today.

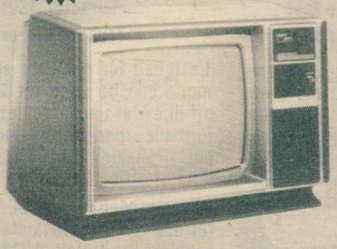
The H-9 displays up to twelve 80-character lines, or forty-eight 20-character lines in short form. A built-in speaker serves as an end-of-line warning. Automatic line carryover and auto-scrolling, in long or short form, are standard. A special plot mode permits graphs, curves and simple figures to be entered from keyboard or external inputs.

Serial interface provides EIA RS-232C levels, a 20 mA current loop and standard TTL levels. Parallel interfacing includes standard TTL levels, 8 bits input or output and 4 handshaking lines for connection to other peripherals. 120/240 VAC, 50/60 Hz. 12.5" H x 15.625" W x 20.75" D.

Kit H-9, Shpg. wt. 50 lbs. **299.95**

WH-9-1, Interface Adapter Cable, Shpg. wt. 1 lb. **15.00**

NEW — Add color to your computer system with the Heath/Zenith Color Display



Only $399.95 Assembled

- **13" (diagonal) color display**
- **Accepts composite color video from computers, VCRs, cameras**

Add a colorful new dimension to your video displays. The new Heath/Zenith 13-inch (diagonal measurement) Color Video Display is the ideal choice to complement your computer system, video cassette recorder or color camera.

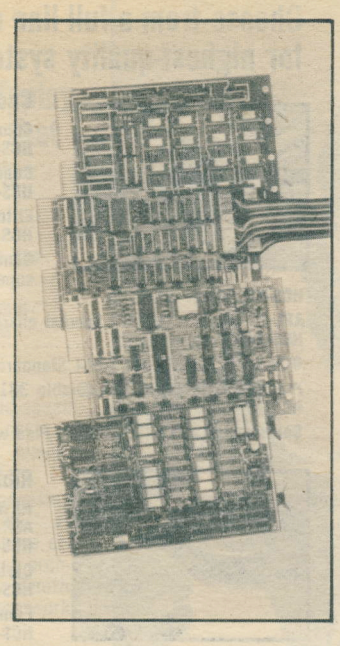
Accepts composite NTSC-system color video and Hi-Z audio inputs. A built-in audio amplifier and speaker are also included.

Supplied with RCA-type phone jack for video input, miniature phone jack for audio input. 120 VAC, 60 Hz. Cabinet measures 14" H x 20.25" W x 14.75" D.

GDZ-1320, Shpg. wt. 42 lbs. **399.95**

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

H-11A Accessories and Interfaces for flexibility



Save $65.00 on the WH-11-1 Assembled 4K Memory Expansion Module. Plugs into H-11/H-11A backplane, adds 4K x 16-bit word capacity to memory. Uses reliable 1K x 4 static MOS RAM chips. Access time, less than 500 nS. Decode circuitry to operate on 4K address boundaries. Handle for easier installation/removal. Factory assembled and tested.

WH-11-1, 2 lbs., **Was $160.00, NOW 95.00**

Assembled 16K Memory Expansion Module. 16K dynamic MOS RAM on a 5″ x 8.5″ board. On-board refresh, 570 nS cycle time, 250 nS access time. Fully expand memory with only two of these boards. Max. H-11A memory capacity, 30K words.

WHA-11-16, Shpg. wt. 2 lbs. **480.00**

Extended Arithmetic Chip adds powerful mathematical instructions to any LSI-11 Computer. Instructions include fixed point multiplication, division and extended shifts. Also includes full floating point addition, subtraction, multiplication and division operations. This extended arithmetic chip minimizes the need for subroutines and saves memory space in your computer.

H-11-6, Shpg. wt. 1 lb. **190.00**

Serial Interface. Use this interface between the bus of any LSI-11 Computer and serial peripherals (like video terminals and line printers). EIA or optically isolated 20 mA current loop interfaces are available. Baud rates between 50 and 9600 are selectable. This serial interface is fully compatible with PDP-11V03 Computers, as well as other LSI-11 machines. It plugs directly into the LSI-11 backplane. Includes mating connectors. To interface the WH-24-1/TI-810 Teleprinter to the Heathkit H-11A Computer, order the WHA-11-5 Interface (see page 41 for description).

Kit H-11-5, Shpg. wt. 2 lbs. **115.00**

Assembled and Tested Version of Above.

WH-11-5, Shpg. wt. 1 lb. **160.00**

Adapter Cable for H-11-5 Serial Interface. This fully assembled cable provides EIA interfacing between the H-11-5 Serial Interface and other peripherals.

WH-11-51, Assembled and Tested, Shpg. wt. 1 lb. **15.00**

Parallel Interface. Provides 32 latched input/output lines, 16-bit word transfers and an LSI-11 interface, as well as control logic for interrupt processing and vectored addressing. Control status registers are compatible with PDP-11 software routines. Includes four control lines, data ready and accepted operations. Maximum data transfer rate, 90K words per second. Drives cable to 25 feet. Compatible with TTL and DTL devices.

Kit H-11-2, Shpg. wt. 2 lbs. **100.00**

Factory Assembled and Tested Version of Above.

WH-11-2, Shpg. wt. 1 lb. **160.00**

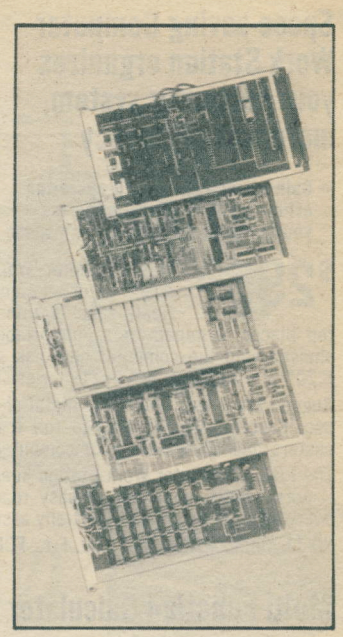
Versatile acoustic modem — ideal for any telephone

SAVE $20.00

Designed especially for the small computer, the Cat Acoustic Modem by Novation lets your computer system talk to other computer systems over standard telephone lines. Also communicates with any Bell 103 compatible modem. Selectable originate and answer modes, LED display of unit status, and special acoustic self-testing. Order yours today.

WH-13, Assembled, 3 lbs. .....**Was $195.00 in Cat. 848, NOW ONLY 175.00**

H-8 Accessories give your computer more capability



NEW! Boot up faster than ever with PAMGO ROM. Boot with 1 button on power-up/3 on reboot, instead of the usual eleven. PAMGO ROM is a 2078-compatible masked, programmed ROM. On power-up or reset, it sets the program counter to a 030 000 split octal default address. PAMGO ROM makes booting up a breeze.

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

NEW! Extender Board allows easy access for servicing, prototyping or debugging.

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

NEW! Music Synthesizer System. Synthesizer board connects to stereo system with two shielded cables (included). True D/A converter provides excellent 27.5-3300 Hz frequency response, with up to 9 harmonics. 4-part harmony (voices) in stereo. Enter any song, right from conventional sheet music — even if you've never read music before. Software on 5.25″ disk. Requires min. 24K memory, H-17 Floppy, terminal.

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

SAVE on the 16K Wired Memory Board. Assembled, factory burned-in.

WH-8-16, Assembled, 2 lbs. .....**Was $395.00 in Cat. 848, NOW 299.00**

Four-Port Serial Interface. Interface H-8 to H-14 Printer, H-19 Terminal. RS-232C Interface with modem controls. One port switch programmable for 20 mA loop. Software programmable baud rate. Solderless addressing, vector interrupt jumpers for easy setting. Connector for DCE, DTE modes. With WH-8-41 Cable.

Kit H-8-4, Shpg. wt. 2 lbs. **175.00**

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

Adapter Cable connects H-8-4 Interface with peripherals.

WH-8-41, Assembled, 1 lb. **15.00**

Serial I/O and Cassette Interface. Cassette interface with 1 serial I/O port for control terminal. Connects H-8 to cassette mass storage devices (like ECP3801A), as well as serial devices. 110-9600 baud rates. Byte/Manchester cassette interface runs at 1200 baud. I/O interfacing includes RS-232C, 20 mA current loop. NOTE: A second H-8-5 cannot be used to connect the H-8 to the H-14 Printer. H-8-4 Serial Interface recommended for H-8 systems without cassette storage.

Kit H-8-5, Shpg. wt. 3 lbs. **95.00**

WH-8-5, Assembled and Tested, Shpg. wt. 2 lbs. **120.00**

Adapter Cable connects H-8-5 Interface with peripherals.

WH-8-51, Assembled and Tested, Shpg. wt. 1 lb. **15.00**

Parallel Interface. Connects the H-8 to any parallel device, such as printers. Three independent ports, each with 8 bits input and output, universal handshaking capability. Compatible with all Heathkit software.

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

Circuit Design Breadboard Card. Custom design your own analog or digital circuits for the H-8 Computer. 5 VDC power supply included. Reuseable.

Kit H-8-7, Shpg. wt. 2 lbs. **90.00**

NEW! Wire Wrapping Card for H-8. Similar to H-8-7 above, but much greater capacity. Includes punched, etched PC board with room for 80 16-pin wire wrapping sockets (also 96 14-pin, or other combinations of 14, 16, 24 or 40-pin sockets). Provisions for three 50-pin flat cable connectors. Includes bus connectors, heat sink, 5 V regulator and miscellaneous hardware. Uses HCA-6, HCA-7 below.

Kit H-8-10, Shpg. wt. 1 lb. **30.00**

NEW! Wire Wrapping Kit. With wire wrapping tool, 50 ft. roll of wire, pre-cut wire in 1″-4″ lengths (50 wires per package), pre-stripped 1″ on both ends.

Kit HCA-6, Shpg. wt. 2 lbs. **12.95**

NEW! Wire Wrapping Socket Kit. Total of 36 three-level wire wrapping sockets (12# 14-pin, 10# 16-pin, 8# 18-pin, 3# 20-pin, 2# 24-pin, 1# 40-pin).

Kit HCA-7, Shpg. wt. 1 lb. **29.95**

Your phone charge order shipped FREE within 50-mile radius of the nearest Heathkit Electronic Center!

Space-saving Computer Work Station organizes your computer system, increases efficiency

- **Gain attractive, rugged operating efficiency. The PD-11 organizes your computer system in less space**

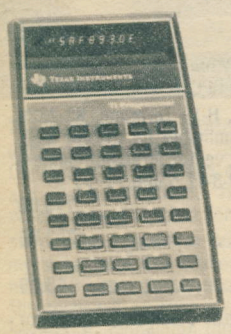
$295.00 This Computer Work Station organizes your system in less space — yet all components are easily accessible. Designed to Heath specifications, the 60" x 30" easy-to-clean formica desk top places terminals at a comfortable height for seated operators. The lower shelves hold the computer and disk systems. The upper shelf measures 8.5" H x 20" W x 19.75" D, while the lower shelf is 7" H x 20" W x 19.75" D.

Rugged steel legs and sheet metal shelving are designed to last under constant use. Casters make it easy to roll the work station from place to place, while casters lock to prevent your computer system from rolling away by accident.

The PD-11 Computer Work Station keeps your operator comfortable and efficient — puts every component in easy reach — and makes an attractive addition to every office environment. Partially assembled; not a kit.

PD-11, Shpg. wt. 95 lbs., Mtr. Frt., FOB El Segundo, CA **295.00**

Multi-Function Calculator for computer hobbyists



$59.95

- **Factory assembled and tested**
- **3-key independent memory**
- **Special computer logic operation**

Designed especially for the computer hobbyist, this fully assembled Texas Instruments 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 for complex, involved calculations; constant mode to simplify repetitive calculations; and an eight-digit LED display. Lightweight for easier handling, this product is ideal for any computer application. Rechargeable battery and AC adapter/charger are included. Dimensions, 5.5" H x 3" W x 1.25" D (13.97 x 7.62 x 3.18 cm.)

PC-11, Shpg. wt. 2 lbs. **59.95**

Assembled Cassette Recorder/Player — ideal for program and data storage

$60.00

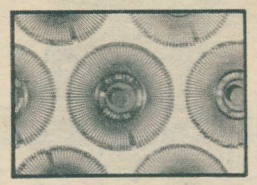
- **Counter to locate data quickly and easily**
- **Separate volume and tone controls**
- **Factory assembled and tested**

This Heath-recommended General Electric Cassette Recorder/Player is a quality unit that's the ideal choice for data storage use with computers. Ruggedly constructed, it features separate volume and tone controls, pushbutton selection of record, play, rewind, fast forward, stop and tape eject. It also features a convenient built-in 3-digit counter with a reset button that enables you to locate specific information on a tape quickly and easily. Built-in microphone and quality speaker also make it perfect for general recording and playback use. Factory assembled and tested.

ECP-3801A, Shpg. wt. 4 lbs. **60.00**

Heath-recommended high-output, low-noise, premium-grade audio recording tape. ECP-3802, Pack of Three 30-Minute Cassettes, Shpg. wt. 1 lb. **6.00**

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



Choose from these Diablo printwheels

Courrier 10 (Diablo 38100), Pica w/slashed zero. **HCS-20,** Shpg. wt. 1 lb. **8.00**

Courrier 72 (D. 38107), Pica w/unslashed zero. **HCS-21,** Shpg. wt. 1 lb. **8.00**

Elite 12 (D. 38102), Elite w/unslashed zero. **HCS-22,** Shpg. wt. 1 lb. **8.00**

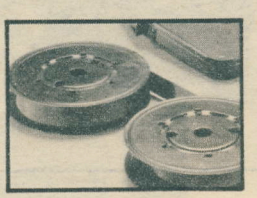
General Scientific (Diablo 38141). Greek letters, superscripts, math symbols. **HCS-23,** Shpg. wt. 1 lb. **8.00**

APL-10 (Diablo 38150). Special character set for APL computer language. **HCS-24,** Shpg. wt. 1 lb. **8.00**

OCR-A (Diablo 38144). ANSI Standard OCR Type A font. **HCS-25,** 1 lb. **8.00**

Prestige Elite Legal 12A (Diablo 38105). Elite w/legal symbols, incl. ©, ® & ™. **HCS-26,** Shpg. wt. 1 lb. **8.00**

Courrier Legal 10 (D. 38104), Pica w/legal symbols. **HCS-27,** 1 lb. **8.00**



Ribbons for clear printouts

NEW! Ribbon for the H-14 Line Printer. Also fits ASR-33 printers. **HCS-52,** Shpg. wt. 1 lb. ..... **Pkg. of 3, 8.00**

Cloth Ribbons for 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 DECwriter II. Long-lasting ribbon makes dark, crisp impressions. **HCS-53,** Shpg. wt. 1 lb. ..... **Pkg. of 3, 15.00**

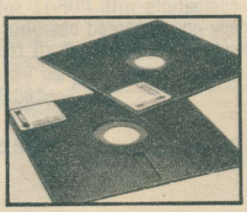
Ribbon Cartridges for the WH-34 DECwriter IV Computer Teleprinter. Eliminates messy ribbon changes. When old ribbon wears out, simply remove old cartridge and insert new ribbon cartridge. **HCS-54,** Shpg. wt. 1 lb. ..... **Pkg. of 3, 25.00**

Top-quality fan-fold printer paper

NEW! Premium 8.5" x 11" Paper. For WH-24/TI-810, WH-34, WH-44 Printers. 2800 sheets of premium, one-part fan-fold paper, approx. 20 lb. bond. **HCS-1,** Shpg. wt. 28 lbs. **30.00**

Standard 8.5" x 11" Paper. Recommended for the H-14 Line Printer. 3200 sheets of standard, one-part fan-fold paper, approx. 15 lb. bond. **HCS-2,** Shpg. wt. 31 lbs. **30.00**

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. **35.00**



Floppy disks for mass data storage

Save $5 on Blank 5.25-inch Floppy Diskettes. For use with all Heath 5" disk systems, as well as North Star and some other personal computer systems. Hard-sectored with 40 tracks per diskette, 10 sectors per track. Max. data storage capacity, 100K bytes. Sold in pkgs. of 5. **HCS-61,** Shpg. wt. 1 lb. ..... **Was $25.00, NOW ONLY 20.00**

8-inch Floppy Diskettes. For H-27 Floppy Disk System, and virtually all other computers using 8" soft sector diskettes. Store ¼ Meg bytes per disk. IBM 3740 standard format. Package of 5. **HCS-62,** Shpg. wt. 2 lbs. **25.00**

Paper tape storage supplies for your computer system

Three 900-foot rolls of Blank Paper Tape. Each roll is eight inches (20.32 cm) in diameter. Paper tape is 1" (2.54 cm) wide. Just load the roll of tape onto your paper tape punch/reader — and you're ready to begin writing or reading programs. Rolls are easier to store, easier to use than fan-fold boxes of paper tape. At this price, why not stock up on paper tape today? Make sure you have enough on hand, when you need it. **HCS-10,** Shpg. wt. 6 lbs. **10.00**

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

NEW

Zenith Electronic Typing — word processing that cuts your paperwork problems down to size

$395.00

- Quick to learn — easy to use
- Special training disk
- Straightforward and uncomplicated — you're up and running quickly

You would undoubtedly be happy if you could speed up paperwork — or reduce errors — or trim costs — or get cleaner, more professional-looking typing. With Zenith Electronic Typing, you get it all.

Zenith Electronic Typing makes word processing practical for the small, single-secretary office — as well as for large secretarial staffs. Firms where error-free documents are a must — such as legal, architectural and insurance offices — can look to Zenith Electronic Typing to significantly reduce paperwork costs and speed up work flow.

Anyone who can turn on a TV and type on a standard keyboard can increase their output by 50 percent or more, practically on the first day. You don't have to know a computer from a coffee cup. All you need is common sense and standard secretarial skills.

No longer do you have to take a computer programmer's course to learn electronic typing. Zenith Electronic Typing shortens the learning curve to just a few hours, so you can enjoy the many benefits of computerized word processing right away.

There's nothing to program, no complicated computer programs to understand. A specially-developed self-instruction course, contained on a single floppy disk, shows you how to use the system — in as little as two hours. All training is done in your office, at your own pace — with the system itself.

All documents can be typed at rough draft speed, with corrections made electronically — producing near-perfect documents in a fraction of the time required by conventional typing. All with no white-outs, strike-overs or erasures.

Now you can type, make alterations, insert, rearrange, combine documents, correct errors and do much more — quickly, easily and accurately — to increase the speed and efficiency of even the best secretary:

Automatic Carriage Return at the end of each line of text eliminates concern about margins, so typing can continue at top speed.

Forward and Reverse Scrolling (rolling forward or backward through a document), along with **two Search Modes,** quickly locate the precise area where editing or revisions are needed.

Insertion Capabilities let you insert any word, sentence or paragraph — anywhere on the document. And you can still see the next 60 characters of text, displayed at the bottom of the screen.

Append Capability allows you to join separate paragraphs and sub-documents together, to create a new document.

Deletion Capabilities mean you can rapidly delete from any desired point to the end of the document. You can even make different revisions on different copies of the same document.

Automatic Replacement of a word, name or phrase with any other word, name or phrase — wherever it is repeated throughout a document — provides excellent ability to produce customized form letters or documents.

Automatic Realignment of the entire text after additions, alterations or deletions saves hours of retyping time.

Automatic Centering on command means no counting or guessing.

Automatic Justification provides flush left and/or right margins, if desired.

Automatic Character Count tells you exactly how many characters of space are left on a disk, so you can decide when and where to begin a new disk.

Automatic Margins and Spacing are provided for most documents, with simple resetting for special parameters.

Horizontal Pitch Selection allows you to vary horizontal spacing between 6 and 12 characters per inch.

You can see your work and make corrections BEFORE one word is printed on paper. And by only retyping those characters, words or paragraphs that require changing — not the entire document — an enormous savings of time is achieved.

As changes are being made, Zenith Electronic Typing automatically respaces words, lines or paragraphs at the touch of a key. Once you're satisfied that the document is letter perfect, the touch of another key automatically prints a clear copy of the document — on a separate printer (not included) — at an error-free rate of up to 450 words per minute.

The systems software supports copying of files and the Zenith Electronic Typing system itself, storing individual documents up to approximately 30 pages (maximum total of 60,000 to 70,000 characters) in length.

Documents can have names up to 24 characters long and may be created, copied, duplicated or deleted at will.

For rapid manipulation of text, documents are stored on low-cost, lightweight 5.25-inch floppy diskettes. Up to forty documents can be stored on a single diskette, with an automatic index to keep track of each document.

Zenith Electronic Typing is your solution to impossible deadlines, soaring clerical costs, overflowing files and laborious re-typing. Requires an H-89 Computer with 48K and a printer. You can also use equivalent Heathkit H-88/H-88-4 or H-8/H-17/H-19 Systems. Although any printer we offer will interface with the system, the WH-44 Diablo 1640 RO Letter-Quality Printer is recommended. Dual-drive floppy disk capability is also recommended.

H-8-40, Shpg. wt. 6 lbs. **395.00**

Save with complete Word Processing packages

We make Zenith Electronic Typing an even better value, with discounts on word processing packages:

SAVE A BIG $200! Just buy a complete word processing system. Purchase Zenith Electronic Typing, any Heathkit computer and any printer in this catalog. Then, subtract $200.00 from the total (not including shipping and handling charges).

SAVE A BIG $100! Buy Zenith Electronic Typing and any printer in this catalog. Just subtract $100 from the total of your order (not including shipping and handling charges).

VISA master charge

Your phone charge order shipped FREE within 50-mile radius of the nearest Heathkit Electronic Center!

Operate your H-11 more efficiently

Operating System Software for the H-11A Computer/H-27 Floppy Disk System. Immediately enjoy the full benefits of the H-11A and the H-27. You get seven easy-to-use programs, including:

ASMBLE, EXPAND AND CREF: Assembly Language processing and cross-reference listings. Utility programs for macro-expansion. Supports the entire PDP-11 instruction set, as well as several pseudo-operators.

EDIT: A text editor to create or modify files for programs and documentation.

LINKER: Converts object modules produced by the assembler, or the FORTRAN compiler, into a run-time format. Services include: relocation of code, linking of global references and the creation of a runable program file for use by the rest of the system.

LIBRARIAN: Creates and maintains subroutines for use by the linker.

PIP: The Peripheral Interchange Program is the file maintenance and transfer utility program of the HT-11. It has commands for moving, copying and renaming files, plus other commonly-used file operations.

ODT: On-line Debugging Technique aids in debugging user programs by providing commands to display and alter the state of a running program.

BASIC INTERPRETER: Offers access to the HT-11's I/O system and file structure through the BASIC language. Extensions include variable-length strings, sequential files, virtual memory arrays, chaining and overlay capability. A desk calculator mode can perform once-only calculations or serve as an aid in debugging programs.

MISCELLANEOUS PROGRAMS: Prints file contents in any of several useful formats. SRCOM compares two files, prints summary of differences.

MINIMUM REQUIREMENTS include an H-11 or H-11A Computer with a least 16K words of main memory, a console terminal and interface, the H-27 Floppy Disk System, controller and interface.

HT-11, Shpg. wt. 12 lbs. **350.00**

FORTRAN Language for HT-11 Operating System. Binary software features complete ANSI Standard 1966 FORTRAN IV with extensions for increased speed. Some extensions include: relaxation of statement ordering, use of expressions nearly anywhere, direct access I/O, TYPE ACCEPT and PRINT I/O statements, ENCODE and DECODE statements, END and ERR parameters, random number generator and more.

HT-11-1, Shpg. wt. 9 lbs. **250.00**

NOTE: HT-11 Operating System, HT-11-1 FORTRAN compatible only with H-27 Floppy. To obtain software, Sublicense Grant below (including make, model and serial no. of CPU) must be signed and returned with order.

CUSTOMER SOFTWARE SUBLICENSE GRANT

HEATH COMPANY (HEATH) for itself and on behalf of the licensors listed below (referred to individually or together as LICENSOR) grant to CUSTOMER a non-transferrable and non-exclusive sublicense to use the software programs (referred to individually or together as SOFTWARE) listed under the respective LICENSOR under the terms and conditions stated in this Sublicense Grant.

This form MUST accompany your SOFTWARE order for:

Digital Equipment Corporation:

☐ **HT-11 Operating System with BASIC** ☐ **HT-11-1 FORTRAN**

Check box for each software program purchased with this order only. Sign and return to HEATH another Sublicense Grant form with future SOFTWARE orders.

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

_____

(Fill in blank)

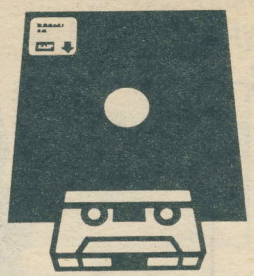
(If CPU is purchased with this order, Heath will fill in the blank.)

SOFTWARE is furnished to CUSTOMER for use only on the single CPU listed above and may be modified, or copied (with the inclusion of LICENSOR's copyright notice) only for use on such CPU. CUSTOMER shall not provide or otherwise make SOFTWARE, or any portion thereof, available in any form to any third party without the prior approval of LICENSOR. LICENSOR retains title to the ownership of SOFTWARE at all times. LICENSOR AND HEATH JOINTLY AND SEVERALLY DISCLAIM ALL IMPLIED WARRANTIES WITH REGARD TO THE SOFTWARE LICENSED HEREUNDER, INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS; and any stated express warranties are in lieu of all obligations or liability on the part of either LICENSOR or HEATH for damages, including but not limited to: special, indirect or consequential damages arising out of or in connection with the use or performance of SOFTWARE licensed hereunder. This Sublicense Grant, the licenses granted hereunder and the SOFTWARE may not be assigned by the CUSTOMER without prior written consent from LICENSOR. No right to reprint or copy SOFTWARE, in whole or in part, is granted hereby, except as otherwise provided herein.

HEATH COMPANY
By William F. Johnson

CUSTOMER
By _____

(Customer's Signature)



H-8/H-88/H-89 Cassette Software for more uses from your system

Heathkit Cassette Software can form a solid base for future computer programming. Cassette-based software is supplied on audio cassettes, in 1200 baud form. Begin programming right away; cassette interfaces are standard with the H-88 and H-89 Computers. Interfacing is available with the H-8 (see p. 43) and the WH-89-CA (see p. 35). Use with Heath-recommended ECP-3801A Cassette Recorder/Player (p. 44), or with your recorder.

Cassette Operating System Software. Designed especially for Heathkit 8-bit computers used with cassette storage, this software 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 lets you personalize your system.

This operating system includes: Benton Harbor BASIC, a conversational programming language which uses simple English statements and familiar algebraic equations to perform operations and solve problems; 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. It assembles the source program into a listing and an object program in an executable binary format.

Also included are: the TED-8 Text Editor, which converts your computer and terminal into a powerful typewriter for generating and editing text. It prepares the source code for HASL-8 Assembly Language and can be used to prepare reports, write letters and edit manuscripts; and BUG-8 Console Debugger, an enhanced and extended version of the front panel monitor which allows entry and debugging of user machine language programs via an external terminal. It features single or multiple stepping through programs, breakpointing, load and dump from tape storage; and a full set of utility programs, including Dynamic File Allocation to permit unlimited file size and prevent squeezing of disks, file manipulation, and device independence for direct communication between any program and any device.

A minimum of 8K memory is required to run this software. Requires an H-8-5 Serial I/O and Cassette Interface to load with H-8; H-88-5 Cassette Interface is required to load with WH-89-CA. Interfacing standard with H-88, H-89.

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

H-88-18, for H-88, H-89, WH-89-CA, Shpg. wt. 5 lbs. **30.00**

Extended Benton Harbor BASIC™ Language. 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 inculdes 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 expressions, math functions and conditional statement facilities.

A minimum of 12K memory is required to run Extended Benton Harbor BASIC. 16K memory is preferred if full use is to be made of its capabilities. Extended Benton Harbor BASIC supports the H-14 Line Printer and the H-8-4 Interface

HC-8-14, Shpg. wt. 13 lbs. **30.00**

Have fun with exciting H-8 Computer Games

Games supplied in 1200 baud audio cassette form, which requires H-8 Computer and H-8-5 Interface to load. Won't work with H-89 or H-8-4.

Biorhythm plots your body's biorhythm. Know when to face the world, when to stay in bed. Runs under Extended BASIC, requires 16K RAM.

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

Space War lets you command the starship Enterprise through the galaxy, fighting Klingons and solving problems. Requires 24K of RAM to run.

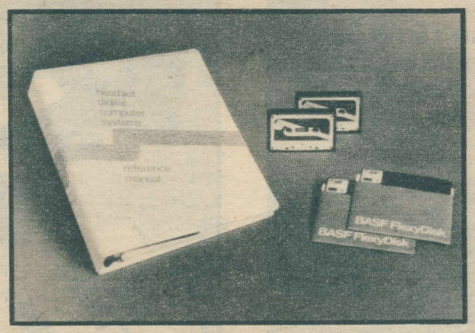
PA-83, Shpg. wt. 1 lb. **10.00**

Game Set #1 includes games like Craps, Orbit, Tic-Tac-Toe, Nim, Hexapawn, Hangman, Hamrabi and Derby. 8K or more RAM required.

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

Heathkit Disk-Based Software gives your system new versatility — in hobby or business applications

Heathkit software, designed especially for the H-8, H-88 and H-89 Computers, helps you do your work — or have fun — faster and easier than before. And when you buy any of our disk-based software packages, we'll supply you with any changes that are incorporated into the program for the next year — free of charge, when you sign and return the Software Sublicense Grant on page 46.



Heath Disk Operating Software (HDOS) for the H-17 Floppy System. Specially engineered to help get your system running fast. Loaded with convenience features, HDOS includes all of the following programs:

Extended Benton Harbor BASIC — an easier conversational programming language;

ASM Assembly Language — a two-pass absolute 8080 assembler that lets you create source programs using letters, numbers and symbols to generate efficient machine language code. It assembles the source program into a listing and an object program in binary format executable by your computer;

EDIT Text Editor, which converts your computer and terminal into a powerful typewriter for generating text and editing. It prepares the source code for H-8 Assembly Language and can be used to prepare reports, write and edit;

DBUG Console Debugger, an enhanced and extended version of the front panel monitor which allows the entry and debugging of user machine language programs via an external terminal. This console debugger features single or multiple stepping through programs, breakpointing, load and dump from tape storage. A user program is required to use the Console Debugger;

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

INIT — to format new or magnetically damaged diskettes;

SYSGEN — a utility to place the operating system itself on a diskette;

TEST — a diagnostic to help check out and maintain your floppy disk system.

HDOS features fully dynamic non-continuous allocation and de-allocation, for fast and efficient use of disk space. Its structure consists of a resident nucleus with two non-resident relocatable overlays, plus non-resident relocatable device drivers for efficient memory utilization. Utilities are included to make the system useable in a 16K single-drive system, although 32K (or more) of memory and two disk drives are highly recommended — and may be required for operation of some other software products used in conjunction with HDOS.

Get the most from your H-8 Computer and H-17 Floppy Disk System.

H-8-17, on 5.25" diskette, Shpg. wt. 14 lbs. **150.00**

Operating Systems Software Designed Especially for the Heathkit H-89 Computer. Diskette with features above.

H-89-17, Shpg. wt. 6 lbs. **150.00**

```
                          360X
030.264  013             361X          DCX     B
030.265  011             362X          DAD     B
030.266  345             363X          PUSH    H
030.267  353             364X          XCHG
030.270  011             365X          DAD     B
030.271  345             366X          PUSH    H
                         367X
030.272  176             368X MOV1     MOV     A,M
030.273  022             369X          STAX    D
030.274  033             370X          DCX     D
030.275  053             371X          DCX     H
030.276  013             372X          DCX     B
030.277  170             373X          MOV     A,B
030.300  247             374X          ANA     A
030.301  362 272 030      375X          JP      MOV1
030.304  321             376X          POP     D
030.305  341             377X          POP     H
030.306  023             378X          INX     D
030.307  043             379X          INX     H
030.310  311             380X          RET
                         381X
```

NEW

Heathkit Software Source Listings give you more flexibility

Modify Heathkit software to suit most special applications. Learn the techniques used by professional programmers in developing systems software. In Assembly language. NOTE: No support — updates not supplied without charge.

Source Listings for Heath Disk Operating System. Includes all utilities and device drivers. **HOS-1-SL,** 11 lbs. **195.00**

Source Listings for the Read-Only Memory (ROM) of the H-17 Floppy Disk System. H-8-51, Shpg. wt. 1 lb. **25.00**

Source Listings for the ROM of the H-19 Professional Video Terminal. H-19-1, Shpg. wt. 1 lb. **25.00**

Listing for Cassette Extended Benton Harbor BASIC Language. H-8-60, 2 lbs. **25.00**

Listing for Cassette Assembly Language. H-8-54, 2 lbs. **25.00**

Listing for Cassette Text Editor. H-8-53, 2 lbs. **25.00**

Listing for Cassette Console Debugger. H-8-52, 1 lb. **25.00**

(NOTE: All source listings are copyrighted. Reproduction prohibited.)

MICROSOFT™ BASIC™ — the most popular computer language. MICROSOFT BASIC is one of the most versatile languages available for the personal computer. Scores of practical programs are written in this BASIC. This version of MICROSOFT BASIC is specially written for use with Heathkit 8-bit systems, including the H-8, H-88 and H-89 Computers.

MICROSOFT BASIC features these capabilities:

Direct access to CPU ports and memory locations (INP, OUT, PEEK, POKE); an IF-THEN-ELSE control structure, which allows more highly structured programming — including editing during programming and random or sequential filing capabilities; a full range of mathematical and logical operators; and a DEF statement which allows user-defined functions which are not listed as intrinsic functions.

MICROSOFT BASIC also features powerful program edit facilities, including insertion, deletion, character change and search capabilities; versatile file management facilities, which include random files, sequential files and file manipulation; powerful string processing functions, including LEFT, RIGHT, MID, ASC, CHR and concatenation; extended statements, 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 which help trace the execution of program instructions, and WIDTH to set the width of the printing terminal line; automatic line numbering and renumbering; branching, loops and subroutines to change the order of program line execution in various ways; PRINT USING for control of output formats; ON ERROR command for error trapping routines.

This software includes a variety of mathematical and logical functions as well, including double precision floating point number and double precision mathematics. Algebraic and trigonometric capabilities are also included.

MICROSOFT BASIC requires H-8-17 or H-89-17 Disk-Based Operating Systems Software, as well as a minimum of 32K memory.

H-8-21, Shpg. wt. 3 lbs. **150.00**

NEW

MICROSOFT™ FORTRAN™ System

- **Powerful ANSI-66 FORTRAN IV Language Compiler**
- **Macro-Assembler, Linkage Editor, Cross-Reference Generator**
- **Linkable library of math, I/O, utility routines**

Designed especially for Heathkit disk-based computer systems, the MICROSOFT FORTRAN Programming System features the powerful ANSI-66 FORTRAN IV Computer Language, a cross-reference generator, the MACRO-80 Relocating Assembler, the LINK-80 Linkage Editor and MICROSOFT FORTRAN Library, filled with floating point mathematical routines, plus I/O and utility routines.

The MICROSOFT FORTRAN-80 Compiler is a true native-code compiler which supports the full ANSI-66 FORTRAN IV Language, except for complex numbers. The compiler also includes many extensions to the FORTRAN language, to increase the utility and efficiency of the system — and it performs some object code optimization. An option to list the generated object code in 8080 Assembly Language is available.

MICROSOFT'S MACRO-80 Relocating Assembler generates relocatable object modules for use with the LINK-80 Linkage Editor. It accepts both 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).

MICROSOFT'S LINK-80 Linkage Editor converts relocatable libraries or modules (such as those produced by MICROSOFT FORTRAN, COBOL, BASIC and Pascal languages — as well as by the MACRO-80 Assembler and Digital Research's PL/I Compiler) into runnable load modules for direct execution, or for disk storage. Capabilities include options to specify prommable code, and the ability to separately specify the origin address for code and data segments. An absolute symbol table listing of the generated load module may also be obtained.

MICROSOFT'S FORTRAN Library includes all FORTRAN mathematical, I/O and utility functions. Routines in the Library may be called by — and linked with — mathematical programs created by the MACRO-80 Assembler.

MICROSOFT FORTRAN-80 is one of the most powerful, sophisticated and impressive programming systems available to micro-computer users. Your computer system must have dual-drive floppy disk capability and minimum of 40K memory.

H-8-20, Shpg. wt. 4 lbs. **150.00**

Your phone charge order shipped FREE within 50-mile radius of the nearest Heathkit Electronic Center!

Heath Computer owners and buyers: join HUG

Heath User's Group

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

Here's what a HUG Membership gives you:

1) A one year's subscription to REMark Magazine — an exclusive periodical for HUG members only. It provides you with two important services: a) Sneak previews on the newest Heath peripheral 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, H-89, or H-11 computer. The programs are stored on cassettes and disks, and written by HUG members (see list at right).

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.

HUG Membership Rates (per year)

	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 software library.

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

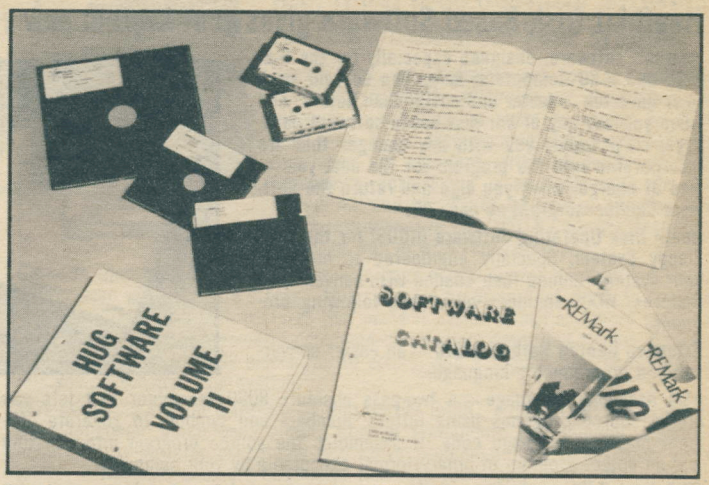
Name:_____

Street:_____

City:_____ **State:**_____ **ZIP:**_____

(check one) ☐ U.S. Citizen ☐ Canada or Mexico ☐ Other Country

Signature:_____

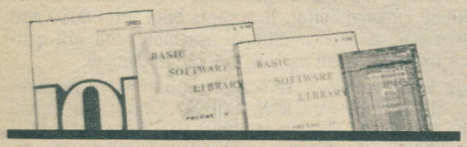


Here's a quick peek at just some of the different program titles available from the HUG Software Library to its members . . .

- Create-A-Program
- Basic Tutor
- Basic Renumbering Programs
- 8080 Emulator
- Octal/ASCII Dump
- Modem Drivers
- Disk Transfer Systems
- Interactive Data Base
- Word Processor
- Chi Square Multisort
- File Maintenance
- Small Business Package
- Accounts Receivable
- Accounts Payable
- Payroll
- Inventory
- Finance
- Peak Budget Demand
- Depreciation Calendar
- Declining Interest
- Loan Amortization
- Real Estate Depreciation
- Home Budget Maintenance
- Checkbook Programs
- Credit Card Management
- Tax Program
- Home Budget Maintenance
- Handy Ham Problem Solvers
- Morse Code Review
- Loop Antenna Designer
- Antenna Designer
- Power Supply Design
- Op-Amp Circuit Design
- RTTY Send/Receive
- Solid-State Amplifier Design
- QSL File Maintenance
- Stock Market Games
- Football
- Star Trek
- Space Wars
- Blackjack
- Weather Forecasting
- Pilot
- Biorhythms

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

Get more out of your computer with these books

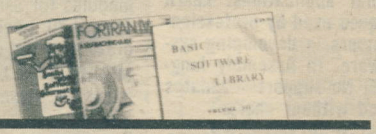


Introduction to Microprocessors, Volume 1. Introduces you to the basic microprocessor. **EDP-224** **9.50**

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

8080 Machine Language Programming For Beginners. A guide to 8080 machine language for new computerites. **EDP-272** **7.95**

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** . . . **5.95**

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** **10.95**

Basic Software Library, Vol. I. Covers business and recreational programs. **EDP-240** **24.95**

Basic Software Library, Vol. II. Basic programs in engineering and statistics. **EDP-241** **24.95**

Basic Software Library, Vol. III. Advanced business programs help cut clerical costs. **EDP-242** . . . **39.95**

Basic Software Library, Vol. IV. General purpose programs for many applications. **EDP-243** **9.95**

Basic Software Library, Vol. V. A collection of experimental programs. **EDP-251** **9.95**

VISA master charge

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

NEW

COBOL Programming introduces you to this popular business language

$119.95

- **Priced much lower than most other COBOL instruction courses**
- **COBOL — the language used in most all commercial data processing systems**

Learn about COBOL — one of the most popular business computer languages. Most all commercial data processing systems, as well as all computer mainframes used by the Federal Government, use COBOL Language. COBOL is especially useful in any repetitive application which uses large quantities of reduplicative data. It's more efficient in these applications than BASIC, and gives the programmer far greater productivity than Assembly Language.

You'll find COBOL used in accounting functions, inventory control and other business applications. It's more self-documenting; you can see each step of each operation, because of the language's structure.

Now, it's easier than ever to learn about COBOL Language with the newest self-instruction course in this catalog. COBOL Programming, from Heath/Zenith Educational Systems, is designed for beginning programmers. And it also costs less than ever to learn about COBOL — the Heath/Zenith COBOL Programming Course is priced far below the competition.

This COBOL Course covers the basics of encoding, input characteristics, program hierarchy, identification, environment, data and procedure divisions. Both the ANS 74 and ANS 68 versions of COBOL are used in the program.

COBOL Programming uses the effective audio-tutorial learning method. You get a clearly written student handbook with diagrams, tables, illustrative programs and unit tests. The text covers these aspects of COBOL: a simple COBOL program; program variations; the structure and syntax of COBOL; simple arithmetic statements, comments and diagnostics; advanced arithmetic and control statements; additional data concepts; magnetic tape and disk concepts; and an applied COBOL program. A set of nine audio cassettes complements the student workbook, allowing you to see AND hear each concept as it's presented in this Heath/Zenith Educational Course.

A set of six practice COBOL programs is located at the end of the workbook. You can work on them at specified points in the program — or you may prefer to complete all of the exercises at the end of the program. A master COBOL coding sheet is also included. Use it as an aid in writing COBOL programs.

When you complete COBOL Programming, you'll be able to write COBOL programs, encoding arithmetic logic and control statements. The Heath/Zenith COBOL Programming package should take about 20 hours to complete. When you pass the optional final examination, with a score of 70 percent or better, you will earn 3.0 CEUs and a Certificate of Achievement.

Learn the programming language that thousands of businesses use world-wide. Order the Heath/Zenith COBOL Programming course today. A computer with a COBOL compiler is recommended; the H-8, H-88 and H-89 do not have COBOL compilers at this time.

EC-1105, Shpg. wt. 7 lbs. **119.95**

Gain the basic knowledge needed to begin a computer hobby with the Personal Computing Program

$39.95

- **Do you own a computer — or are you considering buying one? The Heath/Zenith Personal Computing Program can help. It introduces you to the fundamental concepts, capabilities and terminology of personal computing. With our new program, you'll learn some of the ways you can benefit from a computer**

Designed for the curious, motivated individual who is uninitiated to computing, the Personal Computing Program shows you how a computer can serve you.

You'll be able to determine if your particular problem can be solved by a computer, because you will understand what a computer can do. You'll be able to cut through the technical fog, and understand what different computer system components do — in easier, simpler terms.

The Heath/Zenith Personal Computing Program is divided into five easy-to-understand units, which explain different parts of the personal computing system and put the system into perspective, so you can make an informed decision. Among the many things you will learn:

The Fundamentals of Computers: You'll examine the types of problems that can be solved by a computer, and how to apply the capabilities of a computer to your specific problems. You'll find out how computers "understand" electronic data. Then, you will learn how to convert written words into electronic data.

Computer Hardware: When you complete this section, you won't be intimidated by long lists of specifications when you shop for computer system components. You'll be able to easily and simply compare different computers — because you will understand how each performs.

Interfacing: You'll learn how the computer communicates with other components. You will also be able to distinguish between analog and digital data.

Personal Computing Systems: You will learn how to evaluate various types of small computer systems, by understanding how different combinations of components function.

Computer Software: When you read this section, you'll learn about the different types of computer software, and how each can solve different problems.

Instructing the Machine: The final section shows you how you can control the computer system, by introducing you to BASIC Language Programming.

You don't need an extensive math, electronics or computer background to learn about personal computing with our program. The easy-to-read text, supported and reinforced by three audio cassettes, makes personal computing clear and understandable to most individuals with high school backgrounds.

Upon completion, pass the optional final exam with a 70% or better score, and earn 1 CEU and a Certificate of Achievement.

EC-1000, Shpg. wt. 5 lbs. **39.95**

MONEY-BACK GUARANTEE **If you're not satisfied with any Heath/Zenith Self-Instruction Program, we'll completely refund the purchase price. Just return all program materials and your receipt.**

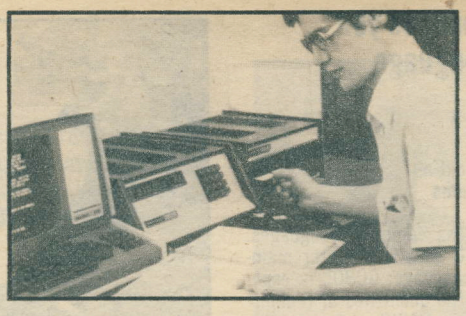
VISA master charge

Your phone charge order shipped FREE within 50-mile radius of the nearest Heathkit Electronic Center!

The most powerful programming language is yours with the Assembly Language Program

$49.95

- Use your computer system's entire capacity
- Store more information in less space
- Execute your computer programs much faster



Assembly Language is the most powerful language that can be used on any computer. Anything that can be done in any other language can be done in Assembly. It's a true programming language, not just a convenient notation for machine code. The use of labels, computed operands, comments and assembler directives allows creation of a source code that is adaptable to the system and easily read. No need for programmed memory; no time wasted interpreting. So your programs run much faster.

You can use your computer system's memory more efficiently when you use Assembly Language. It stores more data in less space because codes are shorter and more explicit. By using computed origin statements and other assembler directives, you can make an Assembly Language program operate wherever the computer has space. The use of meaningful labels for subroutines, along with as many remarks or comments as you desire, make a program listing quite readable in Assembly Language.

One of the most important and useful requisites of a programming language is that it be flexible, not dependent upon specific addresses and hardware of the computer. In an Assembly Language program, hardware specifications can be made at the beginning of the program and referred to symbolically through the rest of the program. In this way, changes can be located together — easily.

The Heathkit Assembly Language Self-Instruction Program teaches you to program your computer in Assembly. You learn the details at your own pace, using a special 400-page text designed for self-study. An exercise workbook provides hands-on experience with programming exercises — you perform each exercise on your own computer. To perform the optional experiments, which are necessary to gain full benefit from the Assembly Language Program, you must have a computer. This Program is designed for computers using the popular 8080/8085 microprocessor series and Heathkit Z80 CPU. This includes the Heathkit H-8, H-88 and H-89 Computers.

The Assembly Language Program includes text, workbook and a special Reference Placard with all 244 assembly instructions for easy reference. The other side of the Placard contains the ASCII code chart.

Passing the optional final examination with a score of 70 percent or better will earn you a Certificate of Achievement and 6.0 Continuing Education Units (CEUs). Classroom version of the Assembly Language Program is listed on page 80.

EC-1108, Shpg. wt. 7 lbs. **49.95**

Learn to communicate with your computer in BASIC Language using this proven Program

$39.95

- BASIC is the easiest of all programming languages to write
- Now BASIC has become one of the easiest languages to learn
- Hundreds of computer programs are available in BASIC

More computer programs are written in BASIC™ than any other computer language. It's the easiest computer language to write — and the easiest to learn. BASIC uses familiar English words, which cause the computer to perform standardized operations. When a number of these words are strung together to form a program, the computer performs each of the specified operations in turn to complete the task the operator desires. When you know BASIC, you can adapt and run hundreds of existing programs to meet your specific needs. You can exchange computer programs with others. And you can write your own original programs.

The Heathkit BASIC Language Self-Instruction Program covers all BASIC Language versions, formats, commands, statements and procedures, plus special problem-solving tips you can use when you write your own programs. This program is divided into 14 easy-to-follow programmed instruction segments which will teach you all of the standardized words of the BASIC Language, and the operation that each word causes the computer to perform. You will get a grasp of the tools of BASIC Language programming, including numbers, statements, functions, loops, lists, arrays and strings.

You will understand the importance of proper syntax in BASIC programming, and why the computer needs another program to interpret the words it reads and perform the desired operations. It also teaches you the creative aspect of writing a computer program. Using the tools you learn, you'll participate in the decision-making factors that are part of writing a meaningful computer program. You will learn useful techniques, such as how to define and plan a program, how to format and write it in BASIC, and how to adapt existing programs to suit your needs.

The course material includes a programmed instruction text explaining BASIC, a special workbook of programming instructions, and experiments you can perform on your own computer. Also included are handy reference cards for Benton Harbor BASIC Statements, ASCII number codes, BASIC direct command statements and a reference chart for math and Boolean algebra operations. Passing the optional final exam with 70% or better will earn you a Certificate of Achievement and 3.0 Continuing Education Units (CEUs).

While the BASIC program is keyed to Heathkit computers, it's equally applicable to any computer system using BASIC. And with our BASIC Language Program, learning a computer language has never been easier or more fun.

EC-1100, Shpg. wt. 7 lbs. **39.95**

MONEY-BACK GUARANTEE

If you are not completely satisfied with any Heathkit Self-Instruction program, we will refund the purchase price upon return of materials and proof of purchase.

Does your business need a computer? This Program helps you decide

The Heathkit Computer Concepts for Small Business Program is designed to give you the information and understanding you need to evaluate the usefulness of a computer in your business.

When you consider making a computer investment that can run into thousands of dollars, you need to know as much about computers as possible — before making the investment. Our program gives you everything you need to intelligently evaluate how a computer can benefit your business. It covers:

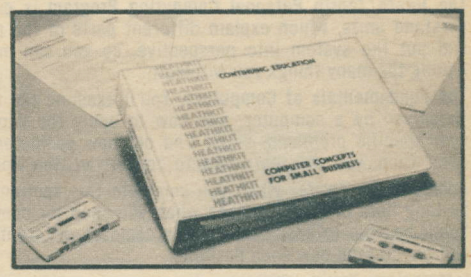
The Computer and How It Works: Types of memory; capabilities of different types of storage media and I/O; and applications software, covering the typical tasks a computer can perform in a small business.

The Data Processing Department and Personnel: Organization of a typical data processing (DP) department; roles of the data processing manager, data processing engineer, systems analyst, operator and other personnel.

Alternatives in Computer Services: A comparison of the advantages of owning your own computer system versus a time-sharing arrangement or computer service bureau.

How To Select a Computer: How to define your data processing requirements. Shows you how to put together the computer system that's right for you, including the right combination of hardware, peripherals and software.

The program includes a 160-page self-instruction text with three appendices. Two audio cassettes are included to reinforce the text material. Completion of the optional final exam with 70% or better will earn you 1 CEU and a Certificate of Achievement.



A computer is a big investment. Our Computer Concepts for Small Business Program is a small investment to get the understanding you need to make an informed decision. Classroom version on page 80.

EC-1103, Shpg. wt. 5 lbs. **49.95**

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