CHRISTMAS Brand New Gift Kita! Giant-screen Projection Color Television — pages 102-103 State-of-the-art AM/FM Stereo Receiver — page 74 Antenna Tuner is an ideal Amateur Radio gift — page 22 Digital Engine Analyzer for better time-une Digital Engine Analyzer for better tune-ups — page 12 Trigonometry Self-Instruction Program — see page 97 VHF Dual Wattmeter for the Ham Radio shack — page 20 Darkroom Timer is perfect for the photo buff — page 73 Yoke/Flyback Tester for the TV do-it-yourselfer — page 61 The whole family will enjoy the Thomas Organ — page 72 RF Speech Clipper for the Radio Amateur — see page 26 High-action Pinball Game for High-action Pinball Game for the whole family — page 104 FREE - Get a free Remote Control - \$99.95 value - with your purchase of a GR-2001, GR-2000 or GR-2050 Color TV! See pages 99, 100, 101 **HEATHKIT MAIL ORDER CATALOG NO. 847** HANDY INDEX ON BACK COVER © 1979 Heath Company "Heath" and "Heathkit" are registered trademarks of Heath Company. Simulated TV Picture

Heathkit Computer Systems put you in control



The world's leader in quality electronic kits leads the way in personal computers and computer systems that give you more value and features while saving you money

For over 30 years, Heath Company has been at the forefront of consumer electronics, most recently in computers. Since introducing the first personal computer in 1957, Heath has continued to develop one of the most complete and innovative lines of personal computers and computer systems anywhere! Whether you purchase Heathkit computer products in economical, easy-to-build kits or as fully assembled units, you get more value for your computer dollar!

- Three computer families to fill any need
- Video terminals and hard copy printers
- Floppy disk memory storage systems
- Operating and applications software
- Memory and interfacing to make your computer more versatile
- · A complete line of quality peripherals
- Thorough and accurate Heath Documentation
- · Complete nationwide service support

Three very different computers for very different people

Heath designs computers for people, and because people want very different things from computers, Heath has designed three different computers.

For convenience — the All-In-One H89. If you want a complete, balanced computer system in one convenient package, the H89 All-In-One Computer is your choice. It includes computer, terminal, floppy, 16K RAM, keyboard and keypad. Just add software and you're ready to run (See page 34).

For flexibility — the H8. If you enjoy the ins and outs of computers, the H8 is your choice. With seven plug-in board positions for memory and 1/0, you have the flexibility to design your own system (See page 36).

For power — the 16-bit H11A. If you're an advanced computerite ready to step up to the big power needed to run your complex programs, the H11Å is your choice. It features 16-bit power plus seven plug-in board positions for memory and I/O (See page 38).

Value-packed Heathkit software includes programs written for MICRO-SOFT™ BASIC and Assembly languages for home and business applications. Our complete software line can help you write your own programs easily. And we won't let your disk-based Heathkit software go out of date—for one year after purchase, we'll send you, free of charge, any changes (see page 42).



Heath documentation is the best in the computer industry. If you want to build a Heathkit Computer System yourself, it is made easy with complete, easy-to-follow assembly manuals which take you, step-by-step, from unpacking to plugging it in. You'll understand your computer from the inside out. And in both kit and assembled forms, Heath's operating and instructional manuals are fully detailed and thorough. When it comes to documentation, you'll begin to realize the full value of a Heathkit computer.

Heath offers complete service support. Technical expertise, advice and service for your Heathkit Computer System is always available! Experts at the Heath factory or at the 55 Heathkit Electronic Centers nationwide can help you keep your computer system working right. That's an important advantage of buying from a company with 30 years' computer experience.



5% System Discount: When you buy the H8, H88, H89 or H11A computer, one major peripheral and any I/O devices and accessories you need to complete your computer system, you can deduct 5 percent from the total price (excluding shipping and handling charges).

All-In-One Computer: a complete system in one compact unit

- · Heavy-duty professional keyboard
- Numeric keypad in calculator format
- Smart video terminal
- Two Z-80 microprocessors one for computer, one for terminal
- 16K random access memory, expandable to 48K
- Built-in floppy disk storage
- Rugged construction
- Easy-to-read 12" CRT

Heath builds so much computing power and so many features in one computer for this low price:

Only \$159500 for H89

You can get all the power and built-in peripherals you need for any personal computing task in one compact, desk-top computer—the Heathkit All-In-One Computer! With convenience features that make it easy to program and operate, this 8-bit computer can make computerizing your home or business a reality.

The All-In-One's heavy-duty professional keyboard can control all video terminal functions, with eight user-definable keys available to help you program special functions. Select baud rates of up to 9,600 through the keyboard. Direct cursor addressing lets you insert and delete characters anywhere on the screen, and the terminal supports line graphics characters from keyboard or computer.

Designed in calculator format, a numeric keypad makes entering arithmetic programs faster and easier. Shifted functions give you cursor control for insertions and deletions.

The smart video terminal is one of the most sophisticated ever designed. Both the terminal and the computer have their own Z80 microprocessors. This means the All-In-One Computer can perform a multitude of high-speed functions, because the terminal never has to share processing power with the computer — not the case with most other desk-top computers and computer systems.

A 12-inch (diagonal measure) cathode ray tube produces clear, sharp, easy-to-read characters. Upper and lower case letters are formed by a 5 x 7 dot matrix in the format of 24 lines by 80 characters (with a special non-scrolling 25th line). Lower case letters with descenders use a 5 x 9 dot matrix. Also features 33 line graphics characters using 8 x 10 dot matrix.

You can expand the Heathkit All-In-One Computer to meet your needs. It comes with 16K RAM, expandable to 48K, with memory diagnostics built in to make memory checks faster and easier. Accessory interfaces let you communicate with printers, cassettes or time-share systems (with appropriate software), and all communication is EIA RS-232 Standard.

The built-in floppy disk system makes this a true All-In-One Computer, giving you tremendous storage capacity for programs and data. Each 5½-inch diskette has 102K bytes of storage. The WANGCO/Siemens single-drive floppy disk system gives you virtually instant access to any information. Load programs in seconds, access and update data fast with the same H17-1 drive described on page 37.

The All-In-One Computer is built to withstand the toughest working environments, with a tough, rugged structural foam cabinet protecting its circuitry. And a convenient lift-off top gives you easy access to

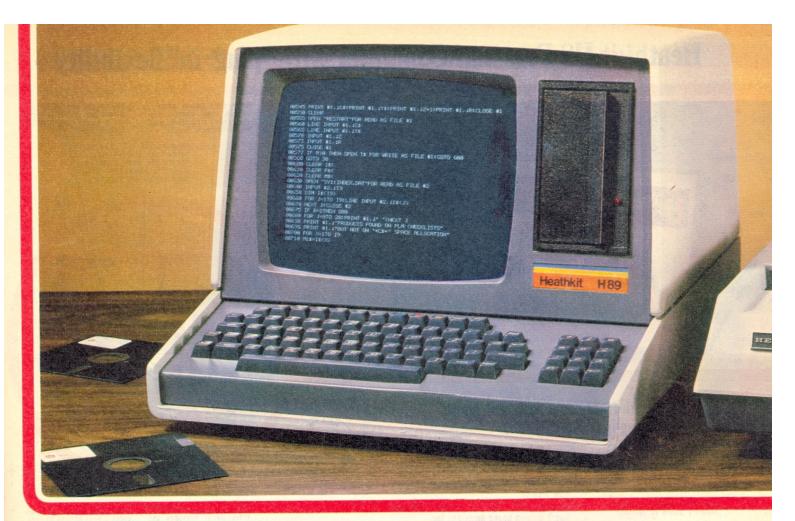
the H89 Computer's components and circuitry.

Order your Heathkit All-In-One Computer today. With so much computing power and so many features built in, this desktop computer brings exceptional value within your reach. Put this exceptional value to work for you now!

H88 All-In-One Computer without floppy disk system.

Two independent Z80 microprocessors Two-port serial I/O interface hooks up enable terminal and computer to act independently. CPU is com-pletely wired and tested. to time-share systems and printers. H88 and H89 include cassette interface. To add memory simply plug ICs into sockets. necessary High-resolution CRT with P4 phosphor produces sharp, H89 includes built-in floppy disk storage. clear images. Video screen displays , 1,920 easy-on-the-eyes characters at one time. Numeric keypad in calculator format permits faster, easier arithmetic entries. Rugged structural foan cabinet protects your All-In-One Computer. Professional electronic keyboard designed for easier reach, surer touch

SPECIFICATIONS: Processor: Z-80. Clock: 2.048 mHz. Memory: 16K bytes user RAM (expandable to 48K). Video Terminal: High-resolution CRT with P4 phosphor. Screen Character Capacity: 1,920 characters. Character Type: 5 x 7 dot matrix (upper case), 5 x 9 dot matrix (lower case with descenders). 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 line, erase to end of page, erase line and erase page. Power Requirement: 120/240 VAC, 50/100 Hz at 90 watts maximum. Dimensions: 13" H x 17" W x 20" D (33 cm x 43.2 cm x 50.8 cm).



Accessories and software let your All-In-One do even more!

The Heathkit All-In-One Computer runs programs written in MICROSOFT™ BASIC and Assembly languages, including scores of practical programs for your home or business. And the optional accessories enable you to perform more tasks, store more data and communicate with more peripherals, making the All-In-One even more versatile!

Cassette Systems Software for the Heathkit All-In-One Computer. Easy-to-use features include extended Benton Harbor BASIC, a modified version of Dartmouth BASIC, an easy-to-learn-and-use conversational language which uses simple English statements and algebraic equations; Assembly (HASL-8), a language which assembles source code and produces object code, utilizing all the standard 8080 mnemonics, extended mnemonics and numerous pseudo instructions; Text Editor (TED-8), a general-purpose, lineoriented text editor that is used primarily to prepare source code that can be assembled using the HASL-8 Assembly Language above, but can also be useful for letter writing, manuscript editing and preparation of newsletters; and Console Debugger (BUG-8), which you can use to load, execute and debug machine language programs in your computer.

Systems Software for the All-In-One Computer's Floppy Disk Storage System. Includes a diskette containing extended Benton Harbor BASIC; a two-pass absolute assembler; a text editor to prepare source code for BASIC and other languages; a full set of disk utility programs for convenient file manipulation and a console debugger to make debugging user machine language programs easier and faster. Dynamic File Allocation permits efficient use of free disk space, eliminating time-consuming disk-compacting utilities. Supplied on a standard diskette.

16K Random Access Memory Expansion Chip Set. Expand the capability of your Heathkit All-In-One Computer by adding one or two 16K RAM chip sets. The All-In-One Computer is equipped with 16K RAM; maximum memory capacity is 48K RAM.

Two-Port Serial I/O Interface. Lets the All-In-One Computer communicate with the H14 Line Printer, time-share systems (with appropriate software) or any other serial peripheral. Two serial I/O ports support an EIA standard RS-232-C interface.

Floppy Disk Storage System, Drive and Interface for the H88 All-In-One Computer. Store up to 102K bytes of information on each 5¼-inch diskette. Famous WANGO/Siemens single-drive system for speedy access to information. (Included in H89 only). Diskettes not included.

Audio Cassette Interface for WH89 All-In-One Computer. Connects your WH89 with a cassette recorder/player, such as the Heath-recommended ECP-3801 (page 40). Allows your computer to store and use more information. Standard with H88 and H89 All-In-One Computers.

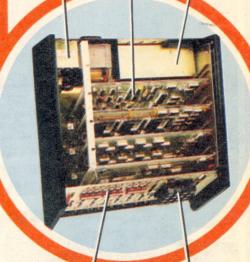
Heathkit H8 Personal Computer with "plug-in" flexibility



Heavy-duty power supply, rugged steel chassis and securely mounted and braced circuit boards.

The unique Heath-designed 50-pin bus is implemented on a heavy-duty printed circuit board.

Modular circuit boards slide into the H8 main-frame for easy memory and 1/0 expansion and easy access for servicing.



8080A-based, with front panel keyboard, digital readout and 7 plug-in board positions

\$28900

Requires at least one H8-1 Memory Board to operate

- Built-in extended ROM monitor controls front panel program
- Heavy-duty power supply handles to 65K memory
- Exclusive Heath 50 line fully-buffered bus has 7 plug-in board positions for memory and I/O's
- Built-in speaker provides audible feedback for keyboard entry
- Convection cooled power supply no fan needed
- CPU board is fully wired and tested for easy kit assembly and system setup

The computer that grows as you grow. The Heathkit H8 Computer gives you the flexibility to configure your computer just the way you want it. 7 plug-in board positions let you put together any combination of memory and I/O's. The low initial cost, along with add-on flexibility won't strain your budget either. It's the ideal choice for both the novice and the advanced computerite. The CPU board is fully wired and tested for easy system setup. It features the 8080A chip, clock, systems controller, ROM monitor and full bus buffering.

The H8, with the addition of 4K of memory, makes an ideal computer trainer. Its 16-key front panel keyboard provides octal data entry and gives you direct access to registers and memory, one-button program load and dump, and input/output keys for direct communication with any port. Its 9-digit octal readout provides far more information than conventional computers — memory, registers and I/O port displays are updated even while programs are running.

With the addition of more memory, peripherals and interfaces, the H8 can become even more powerful and versatile, allowing you to write highly sophisticated and practical programs. And because the H8 is based on the world-famous 8080A CPU, the amount of existing software (programs) from both Heath and other sources makes it one of the most immediately practical computers you can own.

Optional floppy disk system gives you vast storage capacity and instant access to data and programs. You'll be able to load programs and update files instantly.

The H8's optional software is supplied in 1200 baud audio cassette form to get you up and running fast. Benton Harbor BASIC, HASL-8 2-pass absolute assembler, TED-8 line-oriented text editor, and BUG-8 terminal console debug program let you begin communicating with the H8 right away.



The H8's "intelligent" front panel provides the most informative display of any personal computer. The memory display shows memory location and contents. The register display shows CPU-register contents. The l/o port display shows I/O port data and location.

Front panel keyboard provides direct access to registers and memory while programs are running; one-button load and dump; a single instruction key for "stepping" through programs; and input/output keys for communicating directly with any port.

The H8 is housed in a heavy-duty metal cabinet with modern, high-impact structural foam side panels $6\frac{1}{2}$ " H x $16\frac{1}{4}$ " W x 17" D. Switch-selected 120/240 VAC, 50/60 Hz. Requires at least one H8-1 memory board to operate.

 Kit H8, Shpg. wt. 31 lbs.
 289.00

 Factory Assembled and Tested H8. WH8, 30 lbs.
 349.00

HKS81 Hobbyist Computer System. Includes H8, H8-5 Serial I/O and Cassette Interface, H8-1 8K Memory Board, H8-3 4K Chip Set, H9 CRT, ECP-3801 Cassette Recorder and H8-18 Cassette Software. \$1103.00 if purchased separately. You save \$108.00. HKS81, Shpg. wt. 94 lbs. 995.00

HKS82 Advanced Computer System. Includes H8, H8-4 Four-Port Serial 1/0, WH8-16 16K Memory, H17 Floppy Disk, H19 CRT Terminal and H8-17 HDOS Software. \$2104.00 if purchased separately. You save \$109.00.

Examine Manuals before you buy. Manuals for the H8, H8-1, H8-2, H8-3, H8-5, H9 and latest software. Deduct \$25.00 when you buy an H8 Computer.

NOTE: To specify a complete computer system using the H8, you will need both memory and interface accessory cards. The type and number of memory and interface accessories that you need for the H8 will be determined by your particular applications. The memory and I/O accessories are offered separately so you have complete freedom to assemble the system that meets your specific computing needs.

Floppy Disk Storage for instant data access with the H8



Add floppy disk storage to your H8 Computer and get instant access to programs and data. Enjoy the full capability of your H8 Computer.

Vast storage. Instant access. Easy loading. You get it all with the H17 Floppy Disk

The H17 floppy disk system gives you the storage and programming capacity you need to load programs instantly. You can store hundreds of programs on a single disk and have immediate access to any one of them anytime you need it. And you can update your data instantly. Floppy disk storage is far more versatile and reliable than paper tape or cassette storage systems; it truly makes the H8 a "total versatility" computer system.

Designed exclusively for use with the H8, the H17 has been "systems" engineered to deliver a fully assembled package including: a disk drive, and interface disk/controller circuit board, and built in power supply. The controller circuit board plugs directly into the H8's mainframe and with the addition of the optional second drive you'll have optimum dual-drive versatility. Because the H17 is designed especially for the H8 Computer, you get a harmonious system that interfaces properly and runs smoothly.

The storage media for the H17 is the standard, hard-sectored 40-track diskette. Measuring just 5.25" in diameter, each disk offers access to better than 102K bytes of available program and data storage area. Disks are easy to handle and easy to load.

The drive system used in the H17 is the famous WANGCO Model 82, a performance-proven drive providing accurate high-speed data access. Specifications of this drive include a conservative 30 mS maximum track-step time and typical random sector access times of less than 250 mS. These figures are considerably better than most equivalent competitive drives.

The WANGCO 82 drive system is supplied fully assembled and tested. It's backed by extremely reliable mechanical and electrical operation. To use the H17 effectively with the H8 computer requires at least 16K of RAM for the H8 and H8-17 operating systems software, sold separately below. The H17 includes a single blank diskette.

Add the H17 Floppy Disk System to your H8 Computer and enjoy the full capability of your computer. Take advantage of all the practical and fun programs available to you.

didinatio to jou.
Kit H17, Shpg. wt. 28 lbs
WH17, Factory assembled and tested. Shpg. wt. 25 lbs550.0
Optional Second Drive. Adds dual-drive versatility to H17 for a total of over
204K bytes of available program and data storage area.
H17-1, Shpg. wt. 5 lbs
Package of 5 Blank Diskettes. H17-2, Shog, wt. 1 lb. each 25.0

H17 SPECIFICATIONS: Storage Media: 5.25" hard-sectored 40-track diskette. Drive Type: WANGCO Model 82. Track Seek Time: 30 ms maximum. Random Sector Access Time: Less than 250 milliseconds. Power Requirement: 120/240 VAC, 50/60 Hz. 75 watts. Dimensions: 6.25" H x 13.5" W x 13.5" D.

Kit with single drive

\$49500



Rugged fully assembled WANGCO model 82 disk drive offers total reliability for years of troublefree service.

The H17 includes the Interface/ Disk Controller Circuit Board an extra cost option with most other units.

Operating Software for H17 Floppy gets you up and running fast

Get your floppy system up and running fast with specially designed systems software. It's loaded with convenience features.

The Operating Systems Software for the H17 Floppy Disk System includes a diskette containing the standard H8 software. Includes extended Benton Harbor BASIC; a 2-pass absolute assembler; a text editor to prepare source code for BASIC and other languages; a console debugger for easy debugging of user machine language programs; and a full set of disk utility programs for convenient file manipulation.



Special features of this operating software include Dynamic File Allocation which automatically keeps free space available to permit unlimited file size and prevent squeezing of disks. Special facilities support running and backup of single-drive configurations to permit copying and transferring between disks even with a single-drive system.

Device independence permits direct communication between any program and any device. A file utility program allows two kinds of wild cards for fast, easy bulk manipulation of files. The software is supplied on a standard diskette.

H8-17 Operating Software helps you get the most from your H17 Floppy Disk System and from your H8 Computer.

Most powerful Heathkit Computer for the advanced computerite

- 16-bit power
- DEC® KD11-HA CPU
- Plug-in flexibility
- DEC PDP-11/03 Compatible
- Up to 60K bytes memory





H11A Computer runs your most complex programs efficiently

Rugged steel chassis and extra-thick backplane with heavy, solid connectors for added strength and years of reliable performance.

Modification Kit

Special modification kit for H11/WH11 and H11A/WH11A places line time clock switch on the front panel for easy access. Kit H11M \$50 plus \$3.50 shipping and handling.

Compact power supply uses less power and generates less heat than conventional supplies. Overvoltage and overcurrent/short circuit protection, along with auto-matic power-up and power-down sequencing, give you long life operation of your system.

modates up to seven accessory cards in addition to LSI-11/2. The card cage swings up for easy access even while the H11A is operating. Accessory boards slide di-rectly into card guides with all

Card cage with backplane accom-

connectors supplied.

Fully Assembled and Tested KD11-HA Circuit Board

The "heart" of the new H11A is the 16-bit microcomputer module, the KD11-HA. It's only half the size of the LSI-11 (KD-11F), but gives you more flexibility when you configure your system.

There is no on-board memory so you can match your RAM/ROM requirements to your particular needs. And full compatibility with the LSI-11 family means you can "mix or match" by combining components from both LSI-11 and LSI-11/2 families.

Features of the KD11-HA include: PDP-11/34 instruction set, raw computer speed of 380 nS microcycle time, resident firmware debugging (ODT) and ASCII console routines, and single and double operand instructions. The LSI-11/2 gives you the power and flex-ibility you need for virtually ANY system configuration you want! The H11A gives you all the power speed and flexibility you'll ever need in a microcomputer. It uses the same powerful microprocessor and runs all software designed for the DEC® PDP-11/03. You can choose from scores of practical programs to run your home more efficiently, to reduce the clerical costs of your business and to process all types of data. If you've been around computers awhile and the complexity of your programs requires extra power, the H11A Computer is designed for you.

New Half-size LSI-11/2

The H11A features the new, smaller KD11-HA microcomputer (LSI-11/2). That makes the H11A identical to the DEC PDP-11/03, but at a fraction of the cost. The smaller-size CPU leaves more space for computing power or I/O's.

The H11A gives you the flexibility to configure exactly the system you require. Seven plug-in slots let you add any combination of I/O's and a maximum of 60K bytes memory. The basic H11A Computer is supplied with handsome cabinet, heavy duty power supply, backplane that includes bus and fully assembled CPU board. To the mainframe you add your selection of optional memory and I/O's accessories (see page 43). Complete systems software is optionally available in floppy disk form (see page 43).

What better way to know your computer than by building it yourself. Like all Heath electronic kits, the H11A comes with easy-to-follow assembly manual and a nationwide network of service centers to help you should a problem arise. And when you build it yourself, you can also perform more of the service steps yourself to keep it in top operating form.

Value priced

Compare the price of the H11A with comparable 16-bit computers. The combination of advanced design and quality components make it one of the best 16-bit values anywhere.

WH11A, Factory Assembled and Tested version of above.

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

SPECIFICATIONS: Central Processing Unit: Uses DEC KD11-HA CPU. Word Length: 16 bits. Instruction Set: PDP-1103. Memory: Directly addresses 32 K. I/O Addressed: 28 K to 32 K. RAM/ROM: 0 to 28 K. Backplane: Eight 2-wide module slots. Power Supply: Overcurrent and overvoltage protected, switching regulator. Internal fan for cooling. Inputs: 120/ 240 VAC; 60/50 Hz, at 200 watts maximum. Outputs: +5 VDC at 15 amperes maximum and +12 VDC at 3 amperes maximum. Cabinet Dimensions (overall): 61/2" H x 19" W x 17" D. (16.5 x 48.3 x 43.2 cm).

Dual-Drive Floppy Disk Storage for H11A Computer

Get fast access to programs and data with DEC compatible floppy and 512K total capacity

\$189500 Kit

Designed especially for the H11A Computer, the H27 Floppy System gives you dual-drive convenience: one drive for your operating system disk, one drive for your program disk. You get instant access to programs and data, and vast storage capacity — so your computer can serve you better.



Now enjoy instant access to programs and data

- Z80 Microprocessor-based Controller
- Full Compatibility with DEC RX01® (PDP-11/03)
- Head Step Time of 6 mS
- Dual-drive for a total capacity of 512K bytes

You get full compatibility with DEC® RXV11® (PDP-11/03 hardware and software) to give you the capability of using the hundreds of applications programs written by users of the DEC PDP-11/03, the world's most popular microcomputer. Performance-proven hardware and software base provides outstanding computing power. Dual-drive versatility with a total of 512K bytes of program and data storage space gives you enough room for most all general-purpose application needs. And the Z80 micro-controller in the WH27 provides average access time of 252 mS. You'll have virtually immediate access to all your files and programs. The H27, while maintaining full compatibility with the RX01 system, also gives you some special features you won't find on other RX01 systems:

- 1. A built-in self-test diagnostic on power-up that protects existing programs
- A mechanical interlock that prevents accidental media damage. (If floppy is not seated properly, the door will not close and the H27 will not operate.)
- A write-protect function that protects important files and programs from being written over inadvertently.
- A reformatting procedure that gives you the capability of writing in IBM 3740 standard format.

A single board interface/bootstrap uses one backplane slot leaving more space for memory and I/O devices. 8'' H x 18'' W x 20'' D. For 100-135 or 200-270 V, 60 Hz AC.

The Operating System Software for the H27 (HT-11) described below requires at least 16K words of memory to use its full capabilities.

Kit H27	Shpg. wt. 93 lbs	J
WH27 D	al-Drive Floppy Disk. Fully assembled and tested.	
Shpg. v	: 69 lbs. Motor Freight)
H27-2,	kg. of 5 Blank Disks. IBM 3740 format. Shpg. wt. 2 lbs	3

Operating Systems Software for the H27 gets your floppy system operating quickly and efficiently

The HT-11 Systems Software lets you immediately enjoy the full benefits of a rapid access floppy disk system.

The HT-11 Operating system is a single-user, single task system for interactive program development and on-line applications for the H11 or H11A computers. Features of the HT-11 include: easy operation with NO system generation procedure; contiguous file structure for easy file manipulation; device-independent 1/O programming; real-time interrupt capabilities to handle synchronous, asynchronous and event-driven 1/O; low-overhead monitor with memory swapping functions for most efficient use of memory space. HT-11 Programs include:

EDIT - a text editor to create/modify files for programs and documentation.

EXPAND, ASMBLE and CREF — utilities for macro-expansion, assembly language processing and cross-reference listings. Supports several pseudo-operators in addition to the entire PDP-11 instruction set. Also offers the convenience of linkable object modules with global symbols.

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 creation of a runable program file for use by the rest of the system. Allows any number of overlays in any number of memory areas, subject only to memory size. Also picks called modules automatically from system or user created libraries.

LIBRARIAN — creates and maintains libraries of subroutines for use by the linker

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

00T — On-line Debugging Technique aids in debugging user programs by providing commands to display and alter the state of a running program.

BASIC INTERPRETER — high-level conversational programming language. Offers access to the HT-11 I/O system and file structure through the BASIC language. Extensions to standard BASIC in this program include: variable-length strings, sequential files, "virtual memory" arrays, chaining and overlay capability, "desk calculator" mode for once-only calculations or to aid in debugging.

MISCELLANEOUS PROGRAMS — Dump program prints the contents of HT-11 files in any of several useful formats; SRCOM compares two files and prints a summary of their differences.

Minimum requirements for operation of the HT-11 include a Heathkit H11 or H11A computer with at least 16K words of main memory, a console terminal and interface, and a Heathkit floppy disk drive, controller and interface.

FORTRAN for HT-11 System. Binary software features complete ANSI standard 1966 FORTRAN IV with extensions for increased speed. Some of the extensions include: relaxation of statement ordering, use of expressions nearly anywhere, direct access 1/0, TYPE, ACCEPT and PRINT I/O statements, ENCODE and DECODE statements, END and ERR parameters, random number generator, IMPLICIT statement, more.

*NOTE. The HT-11 Disk Operating System and HT-11-1 FORTRAN are compatible only with the Heath H27 or WH27 Floppy Disk Systems. To obtain this software, the Customer Software Sublicense Grant must be signed and you must include the make, model and serial number of your CPU in the blank provided on page 42.



The Heathkit H19 Smart Video Terminal has features like professional keyboard and super-sharp CRT display

\$67500 Kit

- Z80 microprocessor-based for fast, efficient data handing
- Kit Extremely wide bandwidth monitor for easy-to-read images
- Full professional keyboard in typewriter format
- Prints complete ASCII set including upper and lower case characters, and special graphic symbols

Look at these professional features:

- Eight separate user-definable function keys
- Separate numeric keypad
- Standard typewriter format
- Heavy-duty keyboard
- · Addressable blinking cursor

Powerful Heathkit H19 "Smart" Video Terminal for a multitude of high-speed functions

The H19 Video Terminal is a top-of-the-line generalpurpose peripheral designed for use with the Heathkit H8 and H11A computers or with any EIA RS-232 Standard interface. Its powerful Z80 microprocessor makes it ideal for high-speed data handling.

The typewriter format lets you start right in programming from the keyboard. The terminal's 32 separate functions can be controlled from keyboard or computer. A 12-key numeric pad in calculator format makes entry of arithmetic programs fast and easy. Baud rates of up to 19,200 are keyboard selectable for easy changes. Eight user-definable keys let you program your own special functions. The H19 prints the entire ASCII character set, including upper and

lower case letters. The print format is 24 lines by 80 characters (with software controlled 25th line). Addressable blinking cursor lets you make corrections or edit anywhere on the screen. Reverse video lets you emphasize any portion of the screen by reversing white on black.

The big 12" diagonal CRT has outstanding resolution for a bright, clear readout. The terminal also displays 33 different graphic characters that can be arranged for a variety of graphic displays and effects.

H19 SPECIFICATIONS: CRT: 12" Diagonal, P4 phosphor. Display Size: 61/2" high x 81/2" wide. Character Size: 0.2" high x 0.1" wide (approx.). Character Set: 128 character (95 ASCII and 33 graphic). Character Type: 5x7 dot matrix (upper case), 5x9 dot matrix (lower case with descenders). Keyboard: 80 keys (60 alphanumeric, 12 function) plus a 12-key numeric pad. Cursor: Blinking, non-destructive underline. Cursor Controls: Up, down, left, right, home, CR, LF and tab. Cursor Addressing: relative and direct. Tab: standard 8-column tab. Refresh Rate: 60 Hz. 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 an escape sequence. Interface: EIA RS-232C at 110 to 19,200 baud. Communications Mode: full or half duplex. Parity: even, odd, stick or none. Power: 120/240 VAC, 60/50 Hz, 45 W. Dimensions: 13" H x 17" W x 20" D.



Save \$100 on H9 CRT Video Terminal and Keyboard

Displays twelve 80-character lines. Has auto-scrolling, plot and erase modes, automatic line carryover, cursor, built-in speaker. Serial interface provides EIA RS-232C levels, 20 mA current loop, TTL levels. Parallel interfacing includes TTL levels, 8 bits input, 8 bits output, 4 handshaking lines. 120/240 VAC, 60/50 Hz. 12½" H x 15%" W x 20¾" D.

Assembled Cassette Recorder/Player



Ideal for data storage

This Heath-recommended assembled Cassette Recorder/Player is ideal for data storage use with computers. Features volume and tone controls, pushbutton select of record, play, rewind, fast forward, stop, eject. Also has built-in 3-digit counter with reset button. Factory wired; not a kit.

ECP-3802, Shpg. wt. 1 lb. per pack 6.00



Cat Modem by Novation lets your computer talk to other computers over standard telephone lines. Designed especially for the small computer, it features selectable originate and answer modes. LED display of unit status and special acoustic self-testing. Compact, powerful. Plugs directly into wall sockets. Data exchange occurs at any speed up to 30 characters per second, via standard EIA-RS-232C interface. The ideal computer communications link. Many practical and fun applications. Fully assembled.

Printers: from low-cost matrix to letter quality font

Popular LA36 DEC Writer II Provides Sharp, Clear "Hard Copy" Printout



Low Mail Order Price!

Assembled! Prepaid Shipment!

The H36 is an advanced technology teleprinter offering fast, reliable operation at one of the best price/performance ratios in the industry. It features a 7x7 dot matrix print head for crisp, clear character formation; switch selectable 10, 15 and 30 cps printing speeds; variable width forms handling from 3" to 14%" wide; adjustable left and right hand tractors half or full duplex operation; ANSI-standard multi-key rollover and a typewriter-like keyboard. It prints 10 characters per inch horizontal spacing and 6 lines per inch vertical spacing. Compatible with all Heathkit Computers, as well as most others. With connecting cable and integral stand. Overall size, 331/4" H x

271/2" W x 24" D. The H36 (LA36 DEC WRITER II) is shipped Motor Freight, prepaid to your nearest terminal in the Continental U.S. H36 DEC Writer II, For 120 VAC, 60 Hz1495.00

DEC is a registered trademark of Digital Equipment Cor-

Compact, Versatile DEC Desktop **Computer Teleprinter**



Desktop teleprinter prints the fuil 128 character ASCII set with switch selectable 110 and 300 baud rates. Offers true 30 cps print speed, adjustable character widths, adjustable ine spacing, clear printing through a 9x7 dot matrix head. Designed like a standard typewriter for operator ease and convenience, the LA34 features standard sculptured keyboard, cartridge ribbon change, automatic line feed and more. Includes EIA RS232C standard interface cable, tractor feed, ribbon and paper. 7" H x 22" W x 15½" D. For 120 VAC, 60 Hz. WH34 DEC Writer IV, Fully Assembled and Tested.

WH34, Shpg. wt. 40 lbs. 1295.00 WHA34-1, 3 ribbon cartridges, wt. 1 lb. 30.00



(upper and lower case) on 5/7 dot matrix print head. The impact printer uses readily available 0.5" wide nylon inked ribbon on 2" spools. Maximum instantaneous print speed is 165 characters per second with selectable line length of 80, 96 or 132 characters. Line spacing is 6 lines per inch with 8 lines per inch software selectable. Baud rates selectable from 110-4800.

The H14 connects to the H8 or H11A computer by the use of a standard (RS-232C) serial interface or 20 mA current loop. Handshaking is provided by a busy control signal. Includes 25-pin male EIA connector and a matching paper catch.

The H14 is supplied in kit form or fully assembled and factory tested. $4\frac{4}{5}$ " H x $18\frac{1}{3}$ " W x $14\frac{1}{3}$ " D. 120/240 VAC, 50/60 Hz. Requires H8-H8-18 or HC8-14 software for H8; HT-11 or H11-18 software for H11 or H11A.

WH14, Assembled version of above. Shpg. wt. 27 lbs. H14-1, 3200 sheets 91/2" x 11" Fan-Fold Paper for

Heathkit WH24/TI810 Line Printer is a complete unit at an affordable price

 Includes upper/lower case, floor stand and paper catch tray

The WH24/Texas Instruments 810 Line Printer is a high-quality, low-priced line printer that can make an impact on both your printing and your printer costs. It has features you usually don't find at such a low price — like optimized 150 cps bidirectional printing, which minimizes printhead travel time and maximizes efficiency, and vertical and horizontal tabbing, which team with bidirectional printing to produce maximized data, regardless of format.

The WH24 has a 256-character FIFO buffer that lets you receive data at speeds from 110 to 9600 baud. Programmable forms length and a wide carriage can handle multiple-part forms, tickets and reports from 3 to 15 inches in width. And a 9 x 7 dot matrix character font prints clearer, more legible characters of an original, and up to five high-quality copies. The WH-24's adjustable tractor drives make it easier to operate. Once a form has been engaged by the



tractor drives, alignment can be made at the main control panel.

Compare with other printers - and find out just how big an impact the WH24 can make in your office! 120/240 VAC. 8" H x 25¾" W x 20" D. Needs WHA11-5 Serial I/O Card for H11/H11A only. Not required with other Heathkit systems.

WH24, Shpg. wt	. 35 lbs		 1,895.00
WHA11-5, Seria	1/0 Card,	1 lb.	 150.00

Accessories and software give your Heathkit

Whether you're a hobbyist or in business, Heath has software to help 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 Customer Software Sublicense Grant. Microsoft™ BASIC: the most popular computer language. Microsoft BASIC is one of the most versatile languages for the personal computer. Scores of programs are written in this BASIC. It features the following capabilities: Direct access to CPU ports and memory locations (INP, OUT, PEEK, POKE): IF—THEN—ELSE control structure for more highly-structured programming, including editing during programming and random or sequential files; Powerful program edit and file management facilities; Powerful string processing functions including LEFTS, RIGHTS, MIDS, ASC, CHRS and concatenation; Automatic line numbering and renumbering; Double precision floating point number; PRINT USING for control of output formats; Error control via ON ERROR command; Variety of mathematical and logical functions as well including double precision math. Requires H8-17 (above) and a minimum of 32K memory. H8-21, Shpg. wt. 3 lbs. 100.00 Extended Benton Harbor BASIC: super-fast BASIC. Extended Benton Harbor BASIC is an easy-to-learn, easy-to-use conversational language. It features two different types of data: numeric data with over six digits of accuracy and Boolean values which permit logical operations. It also features free format programs, enhanced expression and conditional statement facilities. It provides even faster operation and includes character strings, additional convenience commands and math functions. Requires a minimum of 12K memory to run this BASIC. 16K is preferred for full use. Supports WH-14 line printer and WH8-4 Interface Board. Supplied in 1200 baud audio cassette format. HC8-14, Shpg. wt. 2 lbs. 20.00 Operating Systems Software Designed Especially for the H8 Comp	(BUG-8) for entry and debugging of programs. Get all the performance you want from your H8 Computer. Supplied in 1200 baud audio cassette format, which requires H8-5 (opposite) to load. H8-18, Shpg. wt. 11 lbs
Have hours of excitement and full Supplied in 1200 baud audio cassette f	
Biorhythm. Plot your body's biorhythm, know when to take on the world and when to stay home. Runs under extended BASIC, requires 16K RAM. PA-82, 1 lb	through the galaxy. Requires 24K RAM. PA-83, Shpg. wt. 1 lb
STATE STATE WHEN THE PARTY PARTY AND STATE STATE STATE STATE SAME AND STATE STATE STATE STATE	
	ARE SUBLICENSE GRANT
HEATH COMPANY ("HEATH") for itself and on behalf of the licensors liste below (referred to individually or together as "LICENSOR") grants to CUS TOMER a non-transferable and non-exclusive sublicense to use the softwar programs (referred to individually or together as "SOFTWARE") listed us der the respective LICENSOR under the terms and conditions stated in this Sublicense Grant. This form MUST accompany your SOFTWARE order for: Digital Equipment Corporation PTSP-11 Paper Tape System HT-11 Operating System with BASI FOCAL/PTS Language Processor Retail Sciences, Inc. (RSI) — for use ONLY with Heath Model H8 H8-32 General Ledger H8-33 Payroll H8-31 Accounts Receivable H8-34 Inventory H8-31 Accounts Payable Check box for each software program purchased with this order only. Signand send to HEATH another sublicense grant form with future SOFTWARE	above only and may be modified, or copied (with the inclusion of LICENSOR's copyright notice) only for use on such CPU. The CUSTOMER shall not provide or otherwise make available the Software or any portion thereof in any form to any third party without the prior approval of LICENSOR. Title to the ownership of the Software shall at all times remain with LICENSOR. 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 the 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 the SOFTWARE, in whole or in part, is granted hereby except as otherwise provided herein.

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

HEATH COMPANY

Ву_ CUSTOMER

computer system more versatility than ever before!



The ACCOUNTS RECEIVABLE package is a complete invoice and monthly
statement generating package that keeps track of current and aged accounts
receivable. The current status of any account is instantly available. Permits.
receivable. The current status of any account is module; it is
sales or dun messages to be printed on statements, facilitates posting of
payments and justifies amounts due. Debits and Credits can be passed auto-
payments and justines amounts due. Debits and credits can be passed auto-
matically to the General Ledger software above. 250 customers, 750 trans-
350.00
actions. H8-30, Shpg. wt. 5 lbs

The ACCOUNTS PAYABLE package keeps tabs on current and aged accounts payable and incorporates a check writing feature. Maintains complete vendor file, passes transactions to General Ledger. 220 vendors, 450 transac-

The PAYROLL package prepares payroll for hourly, salaried and commissioned employees while accumulating necessary tax reporting information. Can automatically write payroll checks. Up to 225 employees.

The INVENTORY SYSTEM package helps you achieve effective inventory con-

Accessories give your H8 more capability

Use any or all of these accessories to expand the capability of your H8 Computer and make your system even more versatile!

4K Chip Set	for H8-1. Kit of eight 4K static memory	ICs. Expands H8-1 to full
8K storage.	With sockets. Kit H8-3, Shpg. wt. 1 lb.	65.00

Assembled and Tested 8K Memory Board, H8-1 plus H8-3, Access time better

Parallel Interface. Connects H8 to any parallel interface, like printers which accept parallel I/O. Three parallel ports. Compatible with all Heath software.

Four-Port Serial Interface. Recommended to interface your H8 and H19 CRT to the H14 Line Printer. All four ports support a standard RS-232C interface including MODEM controls. One port is switch programmable for 20 mA serial loop. Software programmable baud rate. Includes one WH8-41 connection

Factory Assembled and Tested Version of Above.

Adapter Cable for Use with H8-4. Provides EIA standard electrical and mechanical interface between H8-4 and other peripherals.

Serial I/O and Cassette Interface. Cassette interface with one serial I/O port for control terminal. Note: H8-4 above is recommended for H8 Computer Systems without cassette data storage. Kit H8-5, Shpg. wt. 3 lbs.95.00

Factory Assembled and Tested Version of Above.

Adapter Cable for use with H8-5. Provides EIA industry standard electrical and mechanical interface between H8-5 and other peripherals. For use with H8 Computer. Factory assembled and tested. WH8-51, Shpg. wt. 1 lb. 15.00

Circuit Design Breadboard Card. Lets you custom design your own analog or digital circuits. Make additional interfacing or create your own memory boards. Uses solderless breadboard sockets. 5 VDC power supply for logic circuits is provided on the board. Kit H8-7, Shpg. wt. 2 lbs. 90.00

H11A accessories, software and interfaces add flexibility

Modification Kit for H11/WH11 and H11A/WH11A 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, Shpg. chgs. prepaid
4K Memory Expansion Module. This module plugs into the backplane of the H11 or H11A Computers. It adds 4K x 16-bit word capacity to memory. Uses high-reliability 1K x 4 static MOS RAM chips. Access time is less than 500 nS. Module contains decode circuitry for operation on 4K address boundaries, and has a handle for easy installation and removal.
Kit H11-1, Shpg. wt. 2 lbs
WH11-1, Shpg. wt. 2 lbs
Parallel Interface. General-purpose parallel interface featuring 16 diode-clamped latched data input lines, 16 latched output lines, 16-bit word or 8-bit byte data transfers. Has LSI-11 bus interface and control logic for interrupt processing and vectored addressing. Control status registers compatible with PDP-11 software routines. Maximum data transfer rate, 90K words per second under program control. Maximum drive capability, 25 ft. cable. Also compatible with TTL or DTL logic devices. The H11-2 Parallel Interface can be used to interface with

Serial Interface. Universal asynchronous receiver/transmitter serial interface module for use between LSI-11 bus and serial devices, such as the Heathkit H9 Video Terminal (see page 40) and the H36 DEC Writer II (see page 41). Has an optically isolated 20 mA current loop or EIA interfaces, selectable baud rates of 50 to 9600. Plugs into H11 backplane, fully compatible with PDP 11/03 and other LSI-11 backplane machines. The H11-5 Serial Interface is supplied with all

printers or other devices which require parallel 1/0.

Assembled and tested version of H11-2 Parallel Interface.

Assembled and tested version of H11-5 Serial Interface.

Adapter Cable for H11-5 Serial Interface. Provides EIA industry standard electrical and mechanical interface between H11-5 Serial Interface and other computer system peripherals. For use with H11/H11A computers. Fully assembled

16K Memory Module. Provides 16K dynamic MOS random access memory on a 5" x 81/2" board. Has on-board refresh, cycle time of 570 nS and access time of 250 nS. Fully assembled and tested. Fully expand memory with only two of these boards! Maximum memory capacity of H11A is 30K words.

32K Memory Module. Provides 32K words dynamic MOS random access memory, with same 570 nS cycle time and 250 nS access time as WHA11-16 16K Memory Module above. Fully assembled and tested. Fully expand memory with just a single board! Maximum memory capacity of H11A is 30K words.

H11-6 Extended Arithmetic Chip: Adds powerful arithmetic instructions to the LSI-11, including fixed point multiply, divide and extended shifts, plus full floating point add, subtract, multiply and divide. Helps minimize arithmetic subroutines. And the H11-6 saves memory space, too. The 40-pin dual-in-line package integrated circuit (IC) plugs into a socket on the H11/H11A board.

Look over the Manuals before you buy. Complete manuals for H11A Computer, H11-1 4K Memory Board, H11-2 Parallel Interface, H11-5 Serial Interface and H19 Video Terminal. Also includes complete software documentation. Get a first-hand look at the accurate, easy-to-follow assembly manuals that take you, step-by-step, from unpacking to final plug-in. Know your H11A Computer inside out before buying. And when you buy an H11A Computer, we'll deduct \$25.00 from the purchase price. HM-1100 Manual Set, Shpg. wt. 12 lbs. 25.00

HUG has over 400 exciting programs for your computer



The Heath Users' Group keeps you up to date on happenings in the Heathkit person-al computing world. There's an informative magazine, a complete program library and exchange, new product information and new computing ideas — all at your disposal when you join HUG!

HUG gives you all these advantages:

- A one-year subscription to REMark, the quarterly HUG magazine
- An attractive three-ring HUG binder to hold your magazines, software documentation and other materials
- Forms to submit your own programs to HUG
- The official HUG Identification Card
- Access to the HUG Software Library, which includes over 400 usersubmitted H8 programs — including special utility routines, computeraided instruction, financial packages, amateur radio applications programs, games and much more! See a more complete list of HUG programs below, right.

Only HUG — the Heath Users' Group — can give you all the advantages above and much, much more! HUG puts you in contact with other Heathkit computer owners. In fact, many HUG members are forming local groups to increase the benefits of belonging to HUG. These benefits include:

Your own one-year subscription to REMark, the quarterly magazine of HUG that updates you on the latest Heathkit computer product developments and lets HUG members share new hardware modifications, software enhancements, applications programs and other materials with other HUG members.

A three-ring, loose-leaf HUG binder loaded with information that helps you get the most from your membership in HUG, and gives you a place to store software documentation and back issues of REMark magazine, as well as other materials. HUG program submittal forms that enable you to share your unique programs with other HUG members by submitting them to the HUG Software Library.

An opportunity to compete for valuable prizes in HUG software contests.

The official HUG Identification Card, which entitles you to all of the special benefits that are available only to HUG members.

And access to the huge HUG Software Library, a constantly updated and expanded library which now has more than 400 user-submitted programs. Imagine between 30 and 80 programs on a tape for nominal reproduction and distribution cost. Software documentation and disks are also available. The HUG Software Library includes a diversified collection of programs, subroutines and procedures written by members of the Heath Users' Group. Whether you're an amateur radio buff, a businessman or just interested in playing games, you find a program for you in the HUG Software Library. The contents of the HUG Software ware Library, including computer-assisted instruction, business applications, personal finance programs, amateur radio programs and games, are described in the HUG Software Library Catalog, which is part of the initial HUG member-ship package. Each HUG Software Library program is listed by its author, program name, a short description of the program, language, version and equipment required to run the program.



If you like what you've seen of HUG so far, check out this partial list of program titles from the HUG Software Library:

- Accounts Receivable
- Payroll
- Inventory
- Tax Program
- Declining Interest
- Mortgage Tables
- Loan Amortization
- Accounts Payable
- Real Estate Depreciation
- Small Business Package Home Budget Maintenance
- Personal Accounts Payable
- Checkbook Programs
- Finance
- Credit Card Management
- Peak Budget Demand
- Depreciation Calendar
- Stock Reporter
- Stock Market Game
- BASIC Tutor
- Space Wars
- Star Trek
- Biorhythms

- QSL File Maintenance
- Loop Antenna Designer
- · Antenna Designer
- Handy Ham Problem Solvers
- Power Supply Design
- · Op-Amp Circuit Design
- Morse Code Review
- RTTY Send/Receive
- Solid-State Amplifier Design
- Weather Forecasting Disk Transfer Systems
- BASIC Renumbering Programs
- Create-A-Program
- Interactive Data Base
- Word Processor
- 8080 Emulator
- CHI Square Multisort Octal/ASCII Dump
- File Maintenance
- Modem Drivers
- · Pilot
- Blackjack Football

HUG membership application information and details are included with your Heath computer — or write HUG Membership, Hilltop Road, St. Joseph, Michigan 49085. H11 owners are also eligible for membership in DECUS, the Digital Equipment Computer Users' Society.

PLEASE PRINT YOUR NAME PLAINLY IN CAPITAL LETTERS USING THE MAXIMUM 14 CHARACTER (INCLUDING SPACES) BOXES PROVIDED BELOW.

Please ship GDP-1225 Name Plates as shown below at \$2.00 for one. \$1.60 each for two or more (including postage and handling). Name Plates are shipped 1st class mail under separate cover. My total remittance of is included with regular Heathkit order form (p. 53) attached. Address City_ CUT OUT ENTIRE FORM ON DOTTED LINE AND ATTACH TO YOUR KIT ORDER

Personalize your kits with this Engraved Brass Name Plate

HANDCRAFTED BY_ JOHN JONES \$160 each for 2 or more

for one

Personalize each Heathkit project with one of these handsome, en-

graved name plates. Made of solid brass with brushed jeweler's finish, the name plate is a great way to show the world your pride in the kit you built yourself. Self-adhesive backed for easy application. To order, simply complete form below and include with any regular kit order from this catalog.

Learn the programming languages that help you get more of the full capability of your computer

Heathkit Self-Instruction Program for Assembly Language

- Use the full capacity of your computer
- Execute programs faster
- Store more in less space

Assembly Language lets you do everything your computer is capable of doing. It's the most versatile, most powerful language you can use.

Assembly includes a memonic for every machine operation. No need for programmed memory, no time wasted interpreting. So programs run faster.

Assembly makes more efficient use of memory. It stores in less space because codes are shorter, more explicit. The Heathkit Self-Instruction Program teaches you to program in Assembly. You learn at your own pace through a special 400-page text de-

signed for self-study. An exercise workbook provides hands-on experience with programming exercises performed by you on your computer. The programmed instruction is so thorough that you can learn to program a computer by studying the text and test questions. To do the optional experiments — necessary for gaining the full benefit of the Program - you must have a computer.

The Heathkit Program is designed for computers using the popular 8080/8085 microprocessor series, which uses standard Intel 8080 mnemonics. This includes the Heathkit H8, H88 and H89 Computers.

Upon completion of the Assembly Program, you will be able to write your own programs to serve your specific needs. And you'll be able to do it in the most flexible, most functional of all languages. The only limit to what you can do will be the capacity of your CPU.

Along with text and workbook, the Program also includes a special Reference Placard containing all 244 Assembly Instructions for easy reference. The other side of this placard contains the ASCII code chart. Passing the Program's final exam (70% or better) earns you 6 CEU's.

With Heathkit Programs, computer languages have never been easier or more fun.

Now's the time to learn the language that puts you in total command of your computer's full potential. Send today for the Heathkit Self-Instruction Program for Assembly Language.



Heathkit Self-Instruction Program for BASIC Language

- Easiest of all languages to write
- \$2095 Now easiest of all to learn
 - Hundreds of programs available in

More programs are written in BASIC than any other language. Because it uses English words, it's the easiest to learn and the easiest to write.

When you know BASIC, you can adapt and run hundreds of existing programs. You can exchange programs with others. You can write your own programs. With BASIC your computer can express algebraic terms and automatically perform I/O operations.

The Program covers all formats, commands, statements and procedures, plus special creative problem-solving tips you can use when writing your own programs.

In 14 easy-to-follow segments, you learn BASIC words, decision making, numbers, statements, functions, loops, lists and arrays, strings, programming techniques, programming tools, how to define and plan a program, how to format and write a program, and how to adapt existing programs. Each segment has its own objectives, text and review test. A special workbook provides programming instructions and experiments performed by you on your 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. Three appendices provide descriptions and playing rules for computer blackjack, a summary of microprocessor number systems and codes, and an introduction to Benton Harbor BASIC and extended Benton Harbor BASIC.

> While the BASIC Program is keyed to Heathkit computers, it is equally applicable to any computer system using BASIC. Passing the Program's final exam (70% or better) earns you a certificate of achievement and 3 CEU's.

> With Heathkit Programs, computer languages have never been easier or more fun.

> Until you know BASIC, you're missing the full selection of programs available to you. Send today for the Heathkit Self-Instruction Program for BASIC Language.

> EC-1100, Shpg. wt. 7 lbs.

Money-back Guarantee

Programs on this page carry a complete refund of purchase price, if you're not satisfied.



Is your business ready for a computer? Here's an easy way to find out the answer.

Heath's new "Computer Concepts for Small Business" is designed to give you the information and understanding to intelligently evaluate the uses you can make of a computer in your business. Are the benefits worth the cost? Heath's new program helps you decide.

Designed for the businessman who knows little or nothing about com-puters, Heath's new Computer Concepts for Small Business shows you how a computer can serve your busi-

ness. The program covers:

The Computer and How It Works: Types of memory, types of storage media and I/O's and types of software. A detailed discussion of applications software covers the typical tasks a computer can perform for a small business.

The Data Processing Department and Personnel: Organization of a typical DP department, duties of personnel, advantages of permanent employees vs. free-lance people.

Alternatives in Computer Services: advantages of owning vs. time-sharing vs. service bureau, and the common problems of each.

How to Select a Computer: how to define your DP requirements, how to put together the right combination of hardware, peripherals and software.

The Program includes a 160-page text with 3 appendices and 3 cassettes. Completion of the final exam with a passing grade of 70% earns you 1 CEU. A computer is a big investment. Computer Concepts for Small Business is a small investment to acquire the understanding needed for an informed decision.

Accessories make computing easier



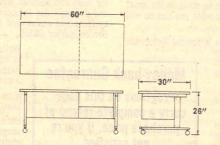
Computer Work Station organizes your computer system, adds efficiency



- Organizes your computer system in less space
- Components are easily accessible
- · Easy-to-clean desk top
- Rugged metal construction

Heath's Computer Work Station organizes your computer 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 1/0's at a comfortable height for seated operators. The lower shelf holds horizontal components. The upper shelf is 8½" H x 20" W x 19¾" D, while the lower shelf is 7" H x 20" W x 19¾" D.

Rugged black steel legs and black sheet metal shelving are designed to last under constant use. Casters make it easy to roll the Computer Work Station from place to place, while caster locks prevent the work station — and your computer system — from rolling



away by accident. The PD-11 Computer Work Station keeps your operator comfortable and efficient — puts every one of your computer system components within easy reach — and its rugged but handsome appearance make it an attractive addition to every office environment.

PD-11, Shpg. wt. 95 lbs., Motor Frt. 295.00

Multi-function calculator for the computer hobbyist



- · Versatile three-key independent memory for complex problems
- Special logic operation for computer applications
- Fifteen levels of parentheses for involved calculations

Designed especially for the computer hobbyist, this fully assembled Texas Instruments Programmer/Calculator features fast conversions between octal, decimal and hexadecimal number systems; logic operations; versatile 3-key independent memory and 15 levels of parentheses for complex problems; constant mode to simplify repetitive calculations; and an 8-digit LED display. Lightweight, ideal for any computer application. Rechargeable battery and AC adapter/charger are included. Factory tested. 5½" H x 3" W x 1½" D.

Learn more about your computer system with these books



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

FDP-239 10.00

language programming, written for beginners.





teresting new ideas for your 8080A computer.

EDP-228